



IAS 2023

IAS 2023

abstract book

IAS 2023, the 12th IAS Conference on HIV Science

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Over 3,800 abstracts were submitted to the 12th IAS Conference on HIV Science.

The Organizing Committee (OC) is very grateful for all the abstract submissions received. While the OC found many very high-quality abstracts among the submissions, due to limitations in the conference programme, more abstracts were rejected than accepted – with an overall acceptance rate of 38%.

All abstracts went through a blind peer-review process completed by over 700 abstract reviewers. These reviewers are international experts in the field of HIV, including members of the OC and track committees. Each abstract was reviewed by three to four reviewers. The abstracts were reviewed for the quality and originality of the work. Late-breaking abstract reviews included an additional assessment of the late-breaking nature of the research.

All reviewers were instructed to abstain from scoring any abstract on which they were an author or co-author, had a financial or personal conflict of interest, or did not have the appropriate expertise to evaluate. Each abstract was scored numerically against five pre-determined criteria, which were equally weighted to get a final score. The final score ranged from one (the lowest) to six (the highest). Any abstracts that received less than two reviews or where there was a scoring discrepancy between reviewers were additionally reviewed by the track committees.

Statistics for abstracts

3,857	Regular abstracts submitted
1,474	Regular abstracts accepted
92	Oral abstracts
225	Poster exhibition abstracts
1,100	E-poster abstracts
395	Late-breaking abstracts submitted
97	Late-breaking abstracts accepted
28	Late-breaking oral abstracts
15	Late-breaking poster exhibition abstracts
54	Late-breaking e-poster abstracts
4,252	Total abstracts submitted
1,571	Total abstracts accepted



The 12th IAS Conference on HIV Science received more than 3,800 abstract submissions, which went through a blind, peer-reviewed process carried out by an international panel of reviewers who play a critical role in designing a strong scientific programme.

More than 700 specialists from around the world volunteered their time and expertise to serve as peer reviewers, helping to ensure that the abstracts presented were selected on the basis of rigorous review and were of the highest scientific quality.

We extend our special thanks to the large pool of abstract reviewers for the time they dedicated to the success of the conference.

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OAA01 Viral replication and reservoirs beyond the periphery: A deeper look at tissues

OAA0102

Resident microbiota enhance HIV acquisition, replication, and pathogenesis in vivo

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Background: Resident microbiota maintain intestinal homeostasis by regulating digestion, metabolism, immune development, and providing protection from infection. Pioneering work has also shown that resident microbiota enhance the transmission of a limited number of viruses that target the intestinal tract. The intestinal tract is a major site of HIV infection. However, the effect of resident microbiota on HIV acquisition, replication, and pathogenesis in the intestinal tract is unknown due to the strict species tropism of HIV.

Methods: Bone marrow/liver/thymus (BLT) humanized mice have been extensively utilized to study HIV acquisition, pathogenesis and prevention strategies *in vivo*. To examine the role of resident microbiota in HIV acquisition and infection, we constructed germ-free (GF) BLT mice and BLT mice colonized with resident intestinal microbiota. First, we rederived a GF strain of immune deficient mice by sterile embryo transfer. GF-BLT humanized mice were then surgically constructed in a sterile gnotobiotic surgical isolator. All GF mice were housed and experiments performed in sterile gnotobiotic isolators and the GF status of mice confirmed longitudinally. BLT mice colonized with resident microbiota were also constructed. We then evaluated HIV acquisition, replication, and pathogenesis in GF BLT mice and BLT mice colonized with resident microbiota following an oral or rectal HIV exposure. HIV-RNA levels were monitored longitudinally in the peripheral blood plasma of mice weekly by real-time PCR analysis. At necropsy, we measured the levels of HIV-DNA, HIV-RNA, and T cell activation blood and tissues.

Results: Our results show that HIV acquisition, replication and pathogenesis in the intestinal tract is greatly enhanced in the presence of resident microbiota. HIV acquisition was 300% higher following an oral HIV challenge ($P=0.013$) and 200% higher following a rectal HIV challenge ($P=0.0286$) in the presence of resident microbiota. Mean plasma viral loads were up to 34-fold higher and cell-associated HIV-RNA levels in tissue were also over a 1000-fold higher in the presence of resident microbes. Furthermore, HIV-associated CD8⁺ T cell activation was higher in the intestinal tract in the presence of resident microbiota.

Conclusions: These data directly demonstrate for the first time that resident microbiota are a major driver of HIV acquisition, replication, and pathogenesis.

OAA0103

Gut dysfunction as an independent driver of neuroinflammation in ART-suppressed SIV

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Background: Currently ~30% of people with HIV (PWH) who are virally suppressed with antiretroviral therapy (ART) develop a form of HIV-associated neurocognitive disorder (HAND). The presence of a viral reservoir (and associated neuroinflammation) in the brain and ongoing systemic inflammation penetrating the central nervous system (CNS) are thought to play crucial roles. However, the precise effects of viral mediated and/or independent pathways on the brain remain ill-defined.

Methods: Here we characterized the CNS reservoir and immune environment of SIV-infected (SIV+) rhesus macaques (RMs) during acute ($n=4$), chronic ($n=12$) or ART-suppressed SIV infection ($n=11$) using spatial multiplex immunofluorescence analyses. Specifically, measures of SIV vRNA/DNA, blood-brain barrier integrity and ongoing immune activation/inflammation were quantified at a cellular level in the brain and matched gut tissue of SIV-infected animals.

Furthermore, immune activation/inflammation was also measured in a novel model of gut damage in SIV uninfected RMs ($n=4$) to understand whether gut damage alone can drive neuroinflammation independent of SIV.

Results: SIV DNA+ and RNA+ cells were detected in the brain and gut tissue of all SIV+ groups tested. Additionally, the frequency of vDNA+ cells were not reduced in the brain or gut in ART-treated animals ($P<0.05$), supporting the presence of a stable viral reservoir in the brain. SIV+ animals had enhanced inflammatory responses, expansion of activated astrocytes and myeloid cells as well as reduced BBB integrity compared to uninfected animals, which persisted despite ART ($P<0.05$ for all). Surprisingly, BBB breakdown and neuroinflammation correlated strongly with measures of gut inflammation, but not brain viremia. Similar immune activation profiles were present in the brains of the SIV uninfected gut damage model group, indicating that damage to the gut can contribute to immune activation in the brain independent of SIV-infection.



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Conclusions: Here we show that ART-suppressed SIV+ RMs have BBB breakdown and heightened activation of astrocytes and myeloid cells which is associated in part with SIV vDNA and immune activation in the gut and not resolved by ART treatment. These findings provide the strongest evidence to date that the brain of SIV-infected animals remains in an activated state despite long-term ART treatment and that gut damage can induce neuro-immune activation.

OAA0104

Gut memory CD4+ T cells from people with HIV on suppressive ART express high levels of intracellular HIV sensors

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Background: Memory CD4+ T cells (CD4+ Tm) are major targets of HIV infection. Despite antiretroviral therapy (ART), HIV persists in tissues, with the gastrointestinal tract harboring a major proportion of the reservoir. Here, we test whether CD4+ Tm from different tissue sites differentially express viral sensors with potential roles in detecting, restricting, or responding to HIV infection.

Methods: We developed a CyTOF panel designed to quantify 19 intracellular viral sensors. To determine if sensor expression differs across tissues, we applied our CyTOF panel on freshly isolated CD4+ Tm from 8 tissue sites (gastrointestinal tract, lymph node, spleen, liver, kidney, bone marrow, heart, and lung) harvested by rapid research autopsy from five people with HIV (PWH) on suppressive ART enrolled in the Last Gift Cohort. Last Gift is an end-of-life cohort of PWH that were diagnosed with a terminal illness, and who donate their bodies for HIV cure research.

Results: The gastrointestinal tract uniquely harbored a sub-population of CD4+ Tm cells co-expressing high levels of multiple sensors targeting viral components from multiple stages of the HIV replication cycle. These sensors included PQBP1 and MX2 which sense incoming viral capsid protein, STING and IRF3 which indirectly sense HIV DNA, SLFN11 which senses HIV RNA and inhibits viral protein synthesis, and MX1 which responds to type I interferons induced as a result of viral sensing. This sub-population of CD4+ Tm was absent in the other tissues. As the gut is a main site of HIV persistence during ART suppression, elevated viral sensor expression at this site may reflect ongoing detection of viral components produced by the persistent HIV reservoir. Consistent with this observation, in vitro infection assays revealed that infection of CD4+ Tm upregulated expression of these same viral sensors.

Conclusions: CD4+ Tm express a diverse array of intracellular host factors capable of detecting and responding to the presence of HIV in a tissue-dependent manner, with particularly high levels in the gastrointestinal tract, a major site of HIV persistence. The constant sensing of HIV components in the gastrointestinal tract may contribute to ongoing low levels of chronic inflammation in PWH.

OAA0105

Are moto-neurons susceptible to SARS-CoV-2 infection?

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Background: COVID-19 typically causes respiratory disorders, but surprisingly a high proportion of patients also reported CNS symptoms as well as myopathies during and after SARS-CoV-2 infection. Notwithstanding, the impact of SARS-CoV-2 exposure on motor neuronal cells has not been investigated so far. Thus, by using human iPSC-derived motor neurons (MNs) we assessed: their infectability by SARS-CoV-2; the expression of SARS-CoV-2 main receptors; and the effect of SARS-CoV-2 exposure on iPSC-MN transcriptome.

Methods: Human iPSC lines from healthy donors were obtained by reprogramming fibroblasts and MNs were obtained by iPSC differentiation. The expression of the main SARS-CoV-2 human-receptors was assessed in MNs by PCR and Immunofluorescence (IF). MNs were in vitro infected with SARS-CoV-2, and viral replication was assessed by qPCR on two viral targets (N1, N2) in cell culture supernatants at 24, 48 and 72 hours post infection (hpi). To confirm the results obtained these same supernatants were used to re-infect susceptible VeroE6 cells. Viral infection was monitored by IF and Qgene expression as well. In parallel, we profiled the gene expression of 46 different target involved in viral entry as well as antiviral and immune response in SARS-CoV-2 infected MNs.

Results: Gene expression profiling of the main receptors recognized by SARS-CoV-2 revealed that all of them are expressed with lower level of ACE2 compared to CD147 and NRP1. By analyzing N1 and N2 gene expression over time, we observed that human iPSC-MN were productively infected by SARS-CoV-2, although viral replication was not accompanied by cytopathic effect. Supernatant collected from SARS-CoV-2 infected MNs was able to re-infect Vero

E6 cells. Image analyses of SARS-CoV-2 Nucleocapsid proteins by IF confirmed the results obtained. Furthermore, SARS-CoV-2 infection was accompanied by the activation of the antiviral and inflammatory response (HLA-A, MX1, BCL2) in MNs.

Conclusions:

These results suggest for the very first time that SARS-CoV-2 can infect human MNs probably by binding CD147 and NRP1 receptors. New evidence, indicate that these proteins have higher and broader patterns of expression in the human brain than ACE2 or TMPRSS2.

Such information will be essential to unveil the neuromuscular disorders characterizing SARS-CoV-2 infection and the so called long-COVID symptoms.

OAA02 Immune-based interventions towards an HIV cure

OAA0202

Depletion of plasmacytoid dendritic cells in ART-suppressed SIV-infected rhesus macaques to reverse dysfunction and exhaustion of cytotoxic CD8+ T lymphocytes and perturb the SIV reservoir

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Background: For people living with HIV (PLWH), unabated activation of plasmacytoid dendritic cells (pDCs) and Type I IFN signaling is associated with immune suppression



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and HIV-1 persistence. Depletion of pDCs or blocking of the IFN I receptor during ART-treated chronic HIV-1 infection in humanized mice reverses HIV-1 pathogenesis and rescues HIV-specific CD8⁺ T cells.

Methods: We performed pDC depletion in SIVmac251-infected rhesus macaques under long-term ART using 1D3, a novel anti-BDCA2/CD303 monoclonal antibody, and assessed the impact on CD8⁺ T cell exhaustion and SIV reservoirs. To study the SIV-specific CD8⁺ T cell response, we generated barcoded Gag-CM9 tetramers and performed CITE-Seq and TCR immune profiling.

Results: We achieved depletion of pDCs in the peripheral blood (PB), lymph nodes (LN) and bone marrow. In the LN, we observed a significant reduction in ISGs in CD4⁺ and CD8⁺ T cells at 16 days post-infusion and a reduced expression of PD-1 on central memory (CD95⁺ CCR7⁺) CD8⁺ T cells at 30 days post-infusion. Two out of six macaques that received 1D3 controlled viremia after ART interruption compared to 0/6 control animals. There was no change in SIV-DNA and SIV-RNA in PB and LN CD4⁺ T cells after pDC depletion. Gag-CM9 Tetramer⁺ CD8⁺ T cells of three Mamu-A*01⁺ control animals were tracked at 26 days before and at 5 weeks after treatment interruption. We identified two major populations of LN SIV-specific CD8⁺ T cells: exhausted (TOX⁺ PD-1⁺ TIGIT⁺) and stem-like cells (TCF1⁺ PD-1^{int}). By matching TCR clones at both time points, we demonstrate that the expansion of these populations to recrudescence SIV differs significantly.

Conclusions: Taken collectively, we report that in vivo pDC depletion was able to effectively suppress expression of ISGs and checkpoint blockade proteins in LN CD8⁺ T cells. Importantly, a subset of RMs in the depletion group maintained virological control off ART. These data suggest that therapeutics targeting the pDC/IFN axis are capable of functionally improving anti-SIV CD8⁺ T cell responses to control SIV infection. Ultimately, this is a promising strategy to reverse the effects of chronic inflammation in ART-suppressed PLWH that could be used to restore host immunity and contribute to an HIV cure.

OAA0203

In vivo genome engineering of human T cells results in ART-free control of HIV-1 in humanized mice

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Background: Autologous cell transplant approaches for HIV cure typically involve re-infusion of a person's own gene-modified hematopoietic stem and/or T cells. However, poor post-infusion engraftment of the gene-modified cells remains a major hurdle for achieving successful control of HIV-1 viral loads and ART-free remission. In vivo gene therapy, which does not involve ex-vivo cell manipulations, may address this issue. That said, effective transgene delivery to human hematopoietic cells in vivo is a formidable challenge in the gene therapy field.

Methods: We exploited the dominant surface expression of CD7 on human T cells and monocytes to allow targeted and effective transduction of these cell types with virus-like particles (VLPs) surface-decorated with a humanized antibody to human CD7. Importantly, as a key step toward clinical application, we adapted this platform for the delivery of genome-integrating ORFs encoding short-hairpin RNA (long-term expression) and/or 'scarless' delivery of packaged CRISPR ribonucleoprotein complexes (RNPs, transient expression). The platform was tested for abrogating expression of HIV-1 host dependency factors in human T cells in humanized mouse models of HIV-1 infection after systemic (intravenous) administration.

Results: Simple intravenous injection of CD7 antibody-guided VLPs into humanized mice resulted in selective transduction of primary human T cells (and monocytes) with negligible off-targeting and hepatotoxicity. We obtained impressive *in vivo* gene marking frequencies of > 50% of human T cells. Gene-marked CD4 T cells selectively expanded in HIV-1_{JRC5F}-infected humanized mice after withdrawal of antiretroviral therapy (ART) resulting in control of plasma viral loads and stabilization of CD4 T cell levels.

Importantly, treated mice were resistant to repeated challenge with HIV-1. ART-free control of viral loads was also achieved in humanized mice transplanted with CD4 T cells from people living with HIV (PLWH) demonstrating potential applicability as a cure strategy for HIV-1.

Conclusions: The approach we report here represents an important advance to the field of gene therapy-based cure for HIV in that it obviates the need for cell transplant protocols with ex-vivo transduced hematopoietic cells. We expect our work to be a significant advance towards achieving ART-free remission and of compelling interest to the fields of clinical gene-therapy for HIV-1 and other diseases.



OAA0204

The EZH2 inhibitor Tazemetostat increases MHC-I antigen presentation *in vitro* and *in vivo*, enhancing antiviral activities of HIV-specific CTLs

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Background: Infected cells vary in their intrinsic susceptibilities to cytotoxic T-lymphocytes (CTLs) mediated killing. We reported that overexpression of the survival factor BCL-2 in reservoir cells confers a degree of resistance to CTLs, and that inhibiting BCL-2 potentiated 'shock and kill' reservoir reduction *ex vivo*. Here, we evaluate Enhancer of Zeste Homolog 2 (EZH2) as additional mechanism of resistance, implicated by its transcriptional overexpression in HIV-infected CD4+ T-cells that survive CTL co-culture. EZH2 is a histone-methyltransferase that negatively regulates MHC-I expression and is inhibited by the FDA-approved drug Tazemetostat.

Methods: CD4+ T-cells isolated from HIV+ donors were superinfected with HIV-1_{JRCSP} treated with Tazemetostat and cocultured with HIV-specific CTLs (*in vitro*-killing assay), or co-cultured with autologous CD8+ T-cells in the presence of Tazemetostat (viral-inhibition assay). Enhancement in the individual's antiviral response, driven by Tazemetostat, was evaluated by comparing reduction in Gag(p24)+CD4- T-cells in treated versus untreated conditions. NodSCID-/-IL2rnull mice were engrafted with memory CD4+ T-cells from an HIV+ donor. Mice were then infected with HIV_{JRCSP} and either co-engrafted or not with autologous memory CD8+ T-cells. Tazemetostat or vehicle control were administered orally, up to 500mg/kg BID. Viral loads and phenotypical analysis of T-cells were conducted weekly.

Results: In both the *in vitro*-killing and viral-inhibition assays, co-cultures of infected cells with HIV-specific CTL clones, or bulk CD8+ T cells, resulted in elimination of 50-70% of infected cells. However, treatment with Tazemetostat induced higher MHC-I levels on infected cells and significantly greater killing (up to 80-90%). No such enhancement was observed with cells infected with a Nef-deficient virus, suggesting that Tazemetostat may act by offsetting Nef-mediated MHC-I downregulation. In mice, viral loads were significantly reduced in +CD8 versus no-CD8 mice. Tazemetostat drove a 2.1-fold increase in surface MHC-I on infected cells (n=8, p value = 0.0004), and a further decrease of 1-log (mean value) of viral load, relative to vehicle control +CD8 mice.

Conclusions: Tazemetostat increases MHC-I expression in infected cells, counterbalancing Nef-mediated immunoevasion. This resulted in enhanced infected-cell elimination *in vitro* and decreased viral loads *in vivo*. Our results provide impetus for pre-clinical studies assessing impact on reservoir formation and for consideration of future clinical studies.

OAA0205

Anti-PD-1 chimeric antigen receptor T cells efficiently target SIV-infected CD4+ T cells in germinal centers of rhesus macaques

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Background: Programmed cell death protein 1 (PD-1) is an immune checkpoint marker commonly expressed on memory T cells and enriched in latently-infected CD4+ T cells containing replication-competent human immune deficiency virus 1 (HIV) provirus in people with HIV on anti-retroviral therapy (ART).

Methods: We engineered novel chimeric antigen receptor (CAR) T cells that can efficiently kill PD-1 expressing cells *in vitro* and *in vivo* to assess the impact of PD-1 depletion on viral reservoirs and rebound dynamics in simian immunodeficiency virus (SIV) mac239-infected rhesus macaques (RMs). Adoptive transfer experiments of anti-PD-1 CAR T cells were done in 2 SIV naïve and 4 SIV-infected RMs on ART.

Results: In 3 of 6 RMs, one SIV naïve and 2 SIV+ RMs, anti-PD-1 CAR T cells expanded efficiently and persisted for up to 100 days concomitant with the depletion of PD-1+ memory T cells in blood and tissues, including CD4+ follicular helper T cells (T_{FH}). This depletion of T_{FH} in lymph nodes was also associated with depletion of detectable SIV RNA from the germinal center (GC).

However, following ART interruption, there was a marked increase in SIV replication in extrafollicular portions of lymph nodes, a 2-log higher plasma viremia relative to controls and accelerated disease progression, associated with the acute depletion of CD8+ memory T cells after CAR T infusion in SIV+ RMs on ART.

Conclusions: These data indicate anti-PD-1 CAR T cells can target and deplete PD-1+ T cells *in vivo* including GC T_{FH} cells and eradicate SIV from this immunological sanctuary. Approaches to limit CAR T cell-mediated depletion to PD-1+ CD4+ T cell reservoirs and reduced off target CD8+ memory T cell depletion should be pursued.



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OAA03 Novel insights into viral persistence

OAA0302

Differential susceptibility of cells infected with defective and intact proviruses to HIV-selective cell killing by small molecule therapies

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Background: Some drugs that augment cell-intrinsic defenses or modulate cell death/survival pathways have been reported to selectively kill HIV-infected cells and/or reduce HIV DNA. We hypothesized that these drugs may differ in their ability to kill cells infected with intact and defective proviruses.

Methods: We tested drugs currently in clinical use or human trials, including interferon alpha2A, interferon gamma, acitretin (RIG-I inducer), GS-9620/vesatolimod (TLR7 agonist), nivolumab (PD-1 blocker), auranofin (p53 modulator), obataclax (Bcl-2 inhibitor), FX-1 (Bcl-6 inhibitor), bortezomib (proteasome inhibitor), birinapant (IAP inhibitor), and INK128/sapanisertib (mTOR[c]1/2 inhibitor). Drug concentrations were chosen based on levels attainable in plasma (if known) or previously tested in vitro. PBMCs were isolated from eight ART-suppressed PWH, aliquoted into single or duplicate wells (6x10⁶ cells/well), and cultured for six days with ARVs and either DMSO (negative control), anti-CD3/CD28+IL-2, or individual drugs. After six days, we measured cell counts/viabilities and extracted DNA/RNA. Total, intact, and defective HIV DNA were measured by IPDA (4-10 replicates), normalized to copies/million cells (using DNA mass and housekeeping genes), expressed as percent of the DMSO control, and compared to DMSO (Wilcoxon signed rank test).

Results: A trend toward lower cell viability was observed with auranofin (median=86.7% of DMSO; P=0.11), FX-1 (median=84.6%; P=0.063), and obataclax (median=93.9%; P=0.078), so the doses were subsequently reduced. Obataclax reduced intact HIV DNA (median=17.0% of DMSO [range 0-82.9%]; P=0.0078) but not defective or total HIV DNA. A trend towards lower intact HIV DNA was also observed with auranofin (median=53.9%[0-156.5%]; P=0.11), bortezomib (median=78.6%[0-121.5%]; P=0.11), and INK128 (median=33.2%[0-138.2%]; P=0.12). IFNalpha2A resulted in the lowest median intact HIV DNA (18.2%), but effects were not consistent (range:0-232%; P=NS). Vesatolimod reduced 3'-defective HIV DNA (median=63.7%[0-87.3%]; P=0.031) and tended to reduce 5'-defective DNA (medi-

an=75.0%[0.5-101.4%]; P=0.063) but not intact or total HIV DNA. Other drugs showed no statistically significant effects.

Conclusions: Several drugs induced selective ex vivo depletion of cells with intact proviruses (obataclax, possibly auranofin, INK128, and bortezomib) or defective proviruses (vesatolimod). Their distinct modes of action on cell death/survival and innate immune response provide a strong rationale to compare the effects of drug combinations ex vivo and in animal or human trials.

OAA0303

Follicular T helper cells (TFH) are a minor source of the active HIV reservoir in secondary lymphoid tissues of people with HIV (PWH) on prolonged suppressive antiretroviral therapy (ART)

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Background: TFH are considered major HIV RNA expressing (vRNA+) cells in secondary lymphoid tissues during chronic, untreated HIV/SIV. TFH are variably defined based on location in germinal centers, and/or expression of the canonical transcription factor BCL6 and multiple cell surface markers including PD-1. The phenotype of vRNA+ cells within secondary lymphoid tissues of PWH on prolonged suppressive ART is unknown. We investigated the distribution and expression of BCL-6 and PD-1 by vRNA+ cells in lymph nodes (LN) and spleen of PWH receiving virally suppressive ART.

Methods: Formalin-fixed paraffin-embedded LN tissue from 6 males on suppressive ART a median of 20 years were sectioned, baked at 60°C, deparaffinized and subjected to antigen retrieval and protease treatment. In situ hybridization (ISH) for vRNA (ACDbio), and immunofluorescent antibody staining for CD20 was performed and vRNA+ cell frequencies determined. Spleen from 6 male PWH on suppressive ART a median of >5 years were embedded in OCT, sectioned and fixed in paraformaldehyde. ISH for vRNA and BCL6, and immunofluorescent antibody staining for PD1 and CD20 was performed in 3 LN and 6 spleens and vRNA+ cell phenotypes determined. CD20+/CD20- areas defined follicular/extrafollicular regions, respectively. Data are reported as medians.

Results: Most vRNA+ cells in LN (55%; range, 33-69%) and spleen (91%; range 82-100%) were located in extrafollicular regions. Frequencies of vRNA+ cells were higher in follicular vs extrafollicular regions in LN (0.28 vs 0.17 cells/mm²) and spleen (0.07 vs 0.05 cells/mm²), but only 31% and 5.4% of tissue consisted of follicle, respectively. Twenty-five



HIV RNA+ cells were evaluated in LN (9, range 7-9 cells; n=3) and 182 in spleen (32, range 6-52 cells; n=6). Germinal centers were not observed. BCL6 was observed in 71% and 27%, and PD1 in 14% and 12% of vRNA+ cells in LN and spleen, respectively. Of vRNA+ cells, 14% (range 0-33%) in LN and 4% (range, 0-17%) in spleen were TFH (BCL6+/PD1+).

Conclusions: TFH are a minor source of the active reservoir in secondary lymphoid tissues of PWH on prolonged suppressive ART. Strategies to eliminate the active reservoir must identify and target additional cell phenotypes.

OAA0304

Hypoxic adaptation uncovers a glycolytic dependence of HIV-1 latency reversal

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Background: The main barrier to HIV-1 curative strategies is the persistence of latently infected CD4 T cells in lymphoid tissue compartments which readily fuel viral rebound following antiretroviral therapy (ART) interruption in people living with HIV (PLWH).

However, our incomplete understanding of the role of the unique metabolic microenvironment in these tissues in controlling latency reversal remains a limitation to advancements in the field of HIV curative research.

Based on prior associations of glycolytic metabolites with post-translational modifications that facilitate HIV-1 replication during primary infection, and with viral rebound following ART interruption, we directly tested the hypothesis that glycolysis facilitates epigenetic modifications that promote HIV-1 latency reversal.

Methods: We utilized orthogonal pharmacological, metabolomic, and genetic tools in functional cell-based assays using multiple CD4 T cell models of HIV-1 latency. We also utilized Epi-FLOW, a single-cell flow cytometry-based assay developed in our lab to assess global epigenetic marks in reactivating cells.

All experimentation was performed in our hypoxic workstation which is maintained at 1% oxygen (physiologic hypoxia) or in standard normoxic tissue culture conditions (21% O₂).

Results: We show that CD4 T cell adaption to physiological hypoxia present in lymphoid tissues drives glucose sensitivity and glycolytic-dependence of HIV-1 latency reversal. By modelling physiologic variations in oxygen and glucose availability as found in HIV-1-harboring tissues *in vivo*, we uncover a differential glycolytic dependence of compounds from two clinically relevant latency reversal agent (LRA) classes; the PKC agonists and histone deacetylase inhibitors (HDACis) during physiologic hypoxia. Our metabolomic profiling reveals that this differential dependence on glycolysis is attributable to differential capacities of LRAs to induce glucose uptake and glycolytic

flux. We further define a role for glycolysis in facilitating both histone acetylation and lactylation, post-translational modifications associated with latency reversal.

Conclusions: Taken together, our current findings uncover glucose and oxygen availability as critical metabolic determinants of HIV-1 latency reversal and underscore the importance of executing studies of latency reversal under physiological conditions to identify compounds that effectively target the latent reservoir *in vivo*.

OAA0305

Analysis of HIV transcribing cells from viremic and virally-suppressed individuals living with HIV using novel single-cell RNAseq method

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Background: Latently-infected CD4+ T cells are considered the main barrier to a cure for HIV-1. During viral suppression under antiretroviral therapy (ART), a proportion of infected cells transcribe HIV and these are predictive of time to viral rebound after ART cessation. Characterization of this HIV-transcribing "reservoir" has been limited by technical challenges, including the very low frequency of HIV-1-transcribing cells, the low levels per cell of HIV RNA (most of which is not polyadenylated) in ART-treated individuals, the lack of cellular biomarkers to identify HIV-infected cells, and the fact that most HIV-infected cells reside in lymphoid tissues.

Methods: To address these limitations, we developed "HIV-Seq", a new single-cell (sc)RNAseq approach that incorporates custom-designed HIV-specific capture sequences and DNA-barcoded antibodies to key cell surface proteins (CITE-seq) into a single cell RNAseq (scRNAseq) workflow (10X Genomics).

Using this approach, we characterized the transcriptome and surface proteome of unstimulated HIV-infected cells from blood and gut tissue from people living with HIV (PWH).

HIV-Seq was applied to longitudinal samples obtained from 4 PWH before ART (Week 0) and after ART suppression (Week 24 or 45). CD4+ T cells were enriched using magnetic beads and stained with DNA-tagged antibodies. HIV capture sequences were incorporated during library preparation.



We also characterised leukocytes (CD45+) and T cells (CD3+) from the blood and gut of one ART-suppressed individual. scRNAseq and CITE-seq analyses were performed and sequences were aligned to a constructed subtype B consensus reference sequence.

Results: In the viremic samples, HIV-seq enabled identification of 32-72% more HIV RNA+ cells than scRNAseq without HIV-specific primers. HIV transcripts aligned to pol and gag regions at the highest frequency, irrespective of capture, however HIV-seq typically yielded more HIV transcripts/infected cell.

In total, we identified 1345 HIV RNA+ cells from viremic timepoints and 26 HIV RNA+ cells from the ART-suppressed timepoints representing the transcriptionally-active reservoir.

Conclusions: Our HIV-Seq method enables efficient identification and characterization of HIV-infected cells including in the context of ART suppression, allowing for in-depth transcriptomic and surface phenotypic analysis of HIV-transcribing reservoir cells.

OAA04 Mechanisms of transmission and novelties in vaccine design

OAA0402

Novel V1 deleted-envelope vaccine based on VLP protects against SHIV infection

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Background: Our group have demonstrated that vaccination based in Viral Like Particles (VLP) using DNA/ALVAC/gp120+Alum platforms delivering SIV envelope immunogens engineered by V1 deletion to favor α -helix conformation of V2, was superior to wild type (WT) envelope immunogens in decreasing the risk of SIVmac₂₅₁ acquisition in macaques. In the current study we investigate whether a similarly engineered vaccine based on HIV also differed from WT-based envelope immunogens in immunogenicity and efficacy.

Methods: We created a DV1 gp160 DNA vaccine by deleting V1 (DV1 gp160) in the envelope of HIV clade A/E (HIV A244) and expressed also the corresponding DV1 A244 gp120 protein in CHO cells. DV1 or WT gp160 combined with p55Gag DNA vaccine were given at week 0, 4, followed by two immunizations with ALVAC-HIV at week 8 and 12; one WT or DV1 HIV A244 gp120 protein boost in alum was given at week 12. Two months following the last immunization animals were exposed to 11 weekly low doses of SHIV 1157(QNE) Y173H intrarectally.

Results: The DV1 immunogens decreased the risk of SHIV 1157 (QNE) acquisition by 81% compared to controls, whereas the WT immunogens did not, recapitulating the results obtained with SIV-based vaccines.

Analyses of immune response elicited by the HIV A244WT and A244DV1 immunogens revealed several differences. Immunization with DV1, elicited higher V2-specific ADCC, and more efficient efferocytosis, responses correlating with the decreased risk of virus acquisition also in the SIV.

Similarly, the frequency of mucosal CD14 + cells, IgG envelope specific B-cells (that correlated directly with V2-specific ADCC), CCR2+ and of CD73+ rectal macrophages and in non-classical blood monocytes was higher in DV1 than WT immunized animals. The two immunization regimens differed also in the level of trogocytosis, that was higher in WT immunized animals and correlated negatively with V2-specific ADCC.

Conclusions: Thus, for reasons that are unclear at present, we conclude that V1 affects protective responses against HIV and further studies will be needed to address the mechanism(s).

OAA0403

Perturbation of mucosal granulocytic effector cells in lentivirus infections

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Background: Granulocytes including eosinophils and neutrophils, are critical innate effector cells bearing high Fc receptor expression and armed with a preformed pool of inflammatory and cytotoxic mediators and are also highly enriched in the GI mucosae. However, their roles in lentiviral-mediated intestinal pathology and immunoprotection have been largely overlooked.

To address this deficit, we studied granulocyte phenotypes, distribution, function and signaling using nonhuman primate models of HIV infection and as well as human blood samples.

Methods: Mononuclear cells and tissue samples from jejunum, colon, cervix, vagina, lymph nodes, spleen, liver, and whole blood of naïve, acute SIVmac251-, and chronic SHIVsf162p3-infected rhesus macaques (RM) were analyzed by imaging cytometry and advanced polychromatic flow cytometry.

Peripheral granulocytes of naïve RM and humans were used for controls and for functional assays, including respiratory burst assay by flow cytometry, 'net'osis assay by confocal microscopy and multiplex signaling analyses.

A neutrophil antibody-mediated cell phagocytosis (ADNP) assay used HIV-gag opsonized fluorescent microbeads and HIV-specific antibodies.

Results: Flow cytometric and imaging data confirmed granulocyte phenotypes as CD45⁺CD66abce⁺CD14⁺CD49d⁺ neutrophils and CD45⁺CD66abce⁺CD14⁺CD49d⁺ eosinophils



based on their surface marker expression, nuclear morphology, and cytoplasmic granularity in whole blood and tissues.

Significant modulation of granulocytic subsets was observed in mucosal sites of SIV/SHIV replication as evidenced by depletion of jejunal eosinophils and vaginal neutrophils and eosinophils. Interestingly, neutrophils in circulation and colorectal biopsies were elevated indicating tissue-specific modulation of granulocytes in chronic SHIV infection.

Further, the efficacy of RM and human granulocytes as Fc effector cells was substantiated in vitro by their ability to generate reactive oxygen species, phosphorylation of important signaling adaptors including Syk, ZAP70, Lck and LAT upon CD32 and CD16 crosslinking and extracellular trap generation. In addition to FcγR-mediated responses, we observed elevated phagocytosis when neutrophils were cultured in the presence of VRC01-IgA compared to the VRC01-IgG subtype, indicating HIV-specific mucosal activity.

Conclusions: Granulocytes are depleted in SIV/SHIV infection, notably in the gastrointestinal and reproductive mucosae where significant inflammation and disruption occurs in lentivirus-induced disease. Mucosal depletion of granulocytes could potentially lead to pathogenic co-morbidities and also adversely affect the outcome of antibody-based therapies and HIV cure, thus warranting further studies.

OAA0404

Diverse envelope trimers with altered glycan coverage around the CD4-binding site elicit neutralizing antibodies of >50% breadth in NHPs

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Background: Vaccine elicitation of broadly neutralizing antibodies (bnAbs) remains a challenge to the development of an effective HIV-1 vaccine. BnAbs targeting the conserved CD4-binding site (CD4BS) have been identified in many HIV patients and are often broad and potent. Immunization with stabilized HIV-1 envelope trimers (Env) generally only elicits autologous or narrow-breadth neutralization.

We previously reported that Env trimers with four glycans removed around the CD4BS elicited strong neutralizing response to the glycan-removed CD4BS but not to wild-type glycan-covered envelopes in NHPs.

Methods: We further boosted the above NHPs with diverse Env trimers, first with removed glycans partially restored (2-3x each) and then with natively glycosylated HIV-1 Envs (6x). Sera and PBMCs were collected two weeks

after each immunization and analyzed for neutralization and B cell recognition. B cell sorting and RT-PCR for antibody identification were performed at terminal time point. Binding, neutralization, and cryo-EM analyses were performed on identified IgGs. Longitudinal NGS was performed for two NHPs with bnAb lineages.

Results: Boosting with partially glycan-restored and natively glycosylated HIV-1 Envs resulted in broadly serum neutralizing responses in a subgroup of nonhuman primates, four of which neutralized more than 10 out of 17 tested tier II isolates.

From B cell sorting with BG505.SOSIP and its CD4BS-knock-out mutant as probes, we isolated multiple neutralizing antibodies from these four NHPs. The top two antibodies, A11V093-10 and A13V144-91, from two different NHPs, neutralized 56% and 54% of viruses in a 208-isolate panel, respectively.

Cryo-EM structures showed that they both targeted the CD4BS with heavy-light chain orientation flipped relative to that of VRC01. Both mimicked key CD4 and VRC01 interactions to HIV-1 gp120, but A13V144-91 used a flexible and shortened CDR-H1 to accommodate glycan 276 while A11V093-10 bound to gp120 with an epitope that shifted away from glycan 276 to reduce interaction to this glycan and achieve broad neutralization. Longitudinal NGS analyses of the two bnAb lineages indicate that the initial expansion of the lineages coincided with immunization by the first glycan-restored trimer containing a restored glycan at N197.

Conclusions: Env trimer immunization with glycans modulated around the CD4BS can elicit broadly neutralizing CD4BS antibodies in NHP.

OAA0405

Protective efficacy of intranasal vaccination with a Sendai virus vector expressing a spike antigen against SARS-CoV-2 infection in mice

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Background: Currently approved COVID-19 vaccines have shown strong protective efficacy against disease onset and progression after SARS-CoV-2 infection. However, systemic immune responses induced by intramuscular vaccination have limited impact on protection of viral transmission. Intranasal vaccination is an important strategy for induction of mucosal immune responses for protection of viral transmission.

We have previously reported protective efficacy of intranasal vaccination with a Sendai virus (SeV) inducing CD8⁺ T cell responses against SARS-CoV-2 infection (Cell Rep



Med 3:100520, 2022). In the present study, we investigated the potential of intranasal SeV vaccination inducing mucosal neutralizing antibody responses to prevent SARS-CoV-2 infection in a mice model.

Methods: BALB/c mice received two times of intranasal vaccination with a SeV vector expressing SARS-CoV-2 S1 domain fused with foldon, the trimerization domain of T4 fibrin (SeV-S1-fol), produced by ID Pharma, Co., Ltd. SeV-S1-fol-vaccinated and unvaccinated mice were intranasally challenged with a mouse-adapted SARS-CoV-2 strain QHmusX provided by Noriyo Nagata (Sci Adv 8:eabh3827, 2022). Viral sgRNA levels and infectious viral titers were examined in bronchoalveolar lavage fluid (BALF) obtained on day 3 post-challenge.

Results: Intranasal SeV-S1-fol vaccination induced not only anti-S IgG in plasma but also anti-S IgA in BALF and nasal wash. Anti-SARS-CoV-2 neutralizing activity was detected not only in plasma but also in BALF in the vaccinated mice. After SARS-CoV-2 challenge, all the nine unvaccinated mice showed significant body weight loss and high viral loads, sgRNA levels and infectious viral titers, in BALF. In contrast, all the wight vaccinated mice with no body weight loss had no detectable viral sgRNA nor infectious viruses in BALF except for one mouse with marginal sgRNA.

Conclusions: The present study indicates the potential of intranasal SeV-S1-fol vaccination to efficiently induce mucosal anti-SARS-CoV-2 neutralizing antibody responses and confer sterile protection from SARS-CoV-2 infection.

changes in PHIV+ and healthy controls enrolled in the Cape Town Adolescent Antiretroviral Cohort Study (CTAAC).

Methods: The Illumina EPIC array was used to generate blood DNA methylation data from 60 PHIV+ adolescents and 36 age-matched controls aged 9–12 years old at baseline, and again at a 36-month follow-up. Epigenetic clock software estimated two measures of epigenetic age acceleration: extrinsic epigenetic accelerated aging (EEAA) and age acceleration difference (AAD) at both timepoints.

At follow-up, each participant completed neuropsychological testing, structural magnetic resonance imaging, and diffusion tensor imaging.

Results: At follow-up, PHIV status remained associated with increased EEAA and AAD. Accelerated epigenetic aging remained positively associated with viral load and negatively associated with CD4 ratio. EEAA was positively associated with whole brain grey matter volume and alterations in whole brain white matter integrity. These results did not differ between genders. AAD and EEAA were not associated with cognitive function within the PHIV+ group.

Conclusions: Measures of epigenetic aging, as detected in DNA methylation patterns, remain increased in PHIV+ adolescents across a 36-month period. Associations between epigenetic aging measures, viral biomarkers, and alterations in brain micro and macrostructure also persist at 36-month follow-up. Increased variance in DNAmAg-ing might indicate varying degrees of immune health response to treatment and development trajectories.

Accelerated epigenetic aging is also associated with virologic and treatment related variables such as CD4 ratio and VL, indicating the importance of disease management during the adolescent stage.

Neuroimaging results showed that epigenetic aging is associated with reduced white matter fractional anisotropy and increased mean diffusion, indicating white matter microstructural damage. PHIV+ additionally have larger grey matter volumes, possibly due to ineffective pruning during the adolescent period.

OAB01 Prioritizing the clinical HIV care of women and children in 2023

OAB0102

Persistent accelerated epigenetic aging is associated with altered neuroimaging and immune biomarkers in a longitudinal cohort of vertically-acquired HIV-positive adolescents

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Background: We have previously shown accelerated aging in adolescents living with perinatally-acquired HIV (PHIV+), based on discrepancies between epigenetic and chronological age.

The current study examines follow-up longitudinal patterns of epigenetic aging, and the association of epigenetic aging with cognition as well as whole brain structure

OAB0103

Is the recommended valganciclovir dosing for treatment of cytomegalovirus in infants adequate for treatment of cytomegalovirus pneumonia in HIV-positive infants in sub-Saharan Africa? A pharmacokinetic sub-study in the EMPIRICAL trial

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Background: Cytomegalovirus (CMV) is a cause of severe pneumonia in children with advanced HIV. Valganciclovir, the oral prodrug of ganciclovir, is used to treat CMV in immunocompromised hosts. No pharmacokinetic data is available to support valganciclovir dosing in infants living with HIV.

This study aimed to determine adequacy of dosing and sources of pharmacokinetic variability of ganciclovir in infants living with HIV with severe pneumonia.

Methods: The study was conducted within EMPIRICAL trial (#NCT03915366) for the treatment of severe pneumonia in infants living with HIV. Participants randomized to receive valganciclovir for empirical CMV treatment were recruited from hospitals in Zimbabwe, Zambia, Mozambique and Uganda between August 2020-August 2022. Valgan-

ciclovir reconstituted syrup was given at 16mg/kg/dose every 12 hours and pharmacokinetic sampling was done 2 and 5 hours post-administration on day 3 of enrolment after at least 3 doses. Ganciclovir area-under-curve for a 12-hour dosing interval (AUC_{0-12h}) was estimated using a limited sampling equation ($AUC_{0-12h} = 2.7 \cdot AUC_{2-5h} + 6$) [Villevue 2013]. The geometric mean AUC_{0-12h} and number of subjects within the pharmacokinetic target for CMV treatment ($AUC_{0-12h} = 80-120 \text{ h} \cdot \text{mg/L}$) were determined. Spearman's rank test was applied to test the extent to which baseline parameters (age, weight, weight-for-age, eGFR and BSA) correlated with ganciclovir AUC_{0-12h} .

Results: Geometric mean AUC_{0-12h} (%CV) was 77.7 (54.4) $\text{h} \cdot \text{mg/L}$. Of the 85 recruited participants, only 30 (35%) had AUC_{0-12h} within the pre-defined efficacy target for CMV treatment. The remaining subjects were either below (40 (47%)) or above (15 (18%)) the target. There was a positive correlation between AUC_{0-12h} and weight-for-height z-score ($r(83) = .22$, $p = .042$). A negative correlation was observed between AUC and age ($r(83) = -.41$, $p < .001$), eGFR ($r(83) = -.36$, $p = .001$) and BSA ($r(83) = -.25$, $p = .021$).

Conclusions: A significant number of participants did not achieve the PK target for CMV treatment when receiving valganciclovir at 16mg/kg/dose twice daily. This could result in decreased treatment response or failure. Exposure to valganciclovir decreased with increasing age, BSA, eGFR, and poorer nutritional status. Future studies should investigate the clinical significance of these findings and if higher dosing or an alternative dosing strategy is required. This project is part of the EDCTP2 programme supported by the European Union (grant number RIA RI-A2017MC-2013).

OAB0104

Pharmacokinetics, safety, and efficacy of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in virologically suppressed pregnant women with HIV

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Background: Safe, effective, and convenient treatment options are needed for pregnant women with HIV. Bictegravir (BIC) is highly protein bound and metabolized by uridine diphosphate glucuronosyltransferase 1A1 (UGT1A1) and cytochrome P450-3A4 (CYP3A4). Physiological changes during pregnancy, including increased CYP3A4 and UGT1A1 activities, have been reported; however, limited data exist on B/F/TAF pharmacokinetics, safety, and efficacy during pregnancy.



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Methods: A dedicated open-label study (NCT03960645) was conducted in 33 virologically suppressed pregnant women with HIV-1. Steady-state plasma samples were collected over 24 hours following oral administration of B/F/TAF during second and/or third trimesters of pregnancy, and 6 and 12 weeks postpartum. For BIC and TAF, protein binding was measured and serial sparse samples collected in neonates. Geometric least-squares mean (%GLSM) ratios were calculated for pharmacokinetic comparisons between pregnancy and postpartum samples. Plasma HIV-1 RNA and trough peripheral blood mononuclear cell (PBMC) tenofovir diphosphate (TFV-DP) levels were measured. The proportion of participants with HIV-1 RNA <50 copies/mL (missing=excluded) at delivery was calculated.

Results: GLSM values for plasma B/F/TAF were lower during pregnancy versus postpartum (%GLSM ratios <100). For BIC and TAF, %GLSM ratios were higher when adjusted for protein binding, although they remained lower during pregnancy (Table).

	BIC		FTC		TAF	
	AUC ₀₋₂₄	Unbound AUC ₀₋₂₄ *	AUC ₀₋₂₄	AUC ₀₋₂₄	Unbound AUC ₀₋₂₄ *	
Second trimester vs. 6 weeks postpartum	n=20/31		n=21/31		n=15/27	
	44.65 (40.04, 49.79)	61.78 (55.34, 68.97)	64.26 (60.95, 67.75)	62.50 (50.76, 76.96)	83.61 (72.86, 95.94)	
Second trimester vs. 12 weeks postpartum	n=20/32		n=21/32		n=15/30	
	41.24 (36.71, 46.32)	59.73 (52.48, 68.09)	67.38 (63.45, 71.56)	77.62 (65.40, 92.14)	89.27 (79.02, 100.84)	
Third trimester vs. 6 weeks postpartum	n=30/31		n=30/31		n=17/27	
	44.40 (39.95, 49.34)	62.40 (55.68, 68.93)	65.09 (61.79, 68.57)	56.52 (46.32, 68.96)	86.16 (71.91, 103.23)	
Third trimester vs. 12 weeks postpartum	n=30/32		n=30/32		n=17/30	
	40.57 (36.77, 44.76)	58.84 (52.74, 65.66)	89.19 (85.88, 92.56)	69.67 (56.57, 82.88)	89.15 (78.23, 101.58)	

Table. %GLSM ratios (90% CI) of AUC₀₋₂₄ for B/F/TAF between second or third trimester in pregnancy (test) versus 6 weeks or 12 weeks postpartum (reference).

Trough PBMC TFV-DP levels were generally similar during pregnancy and postpartum. All pregnant women maintained virologic suppression, with HIV-1 RNA <50 copies/mL at delivery (n=32 [100%]). In neonates, median (IQR) BIC half-life was 43 (38, 58) hours, and TAF was below the quantitation limit in all neonates.

There were no adverse events (AEs) leading to premature discontinuation and no drug-related AEs in pregnant women or neonates.

Conclusions: Despite the comparatively lower exposure to BIC, emtricitabine, and TAF during pregnancy versus postpartum, all adult participants maintained virologic suppression, and B/F/TAF was generally well tolerated, suggesting appropriateness for use of B/F/TAF during pregnancy and indicating that no dose change is needed.

OAB0105

Virological dynamics among children living with HIV transitioned to a dolutegravir-based regimen in Nigeria

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Background: Nigeria adopted the use of dolutegravir (DTG)-based regimen as the preferred first line ART regimen for children living with HIV (CLHIV) in July 2021 and immediately commenced transitioning those on protease inhibitor (PI)-based regimen to DTG. This paper aims to assess virological dynamic upon transitioning from PI- to DTG-based regimen amongst CLHIV in Nigeria.

Methods: We conducted an institutional-based retrospective cohort study using data from the electronic medical records from 155 health facilities in Akwa Ibom and Cross River States support by PEPFAR through United State Agency for International Development (USAID). The cohort included CLHIV (<=9 years) who were transitioned from PI-based to DTG-based regimen between July 2021 and December 2021.

The baseline viral load at transitioning and 12 months after transition was abstracted, and categorized as undetectable viral load (<=40 copies/ml), low-level viremia (41-999copies/ml), or unsuppressed) viral load (>=1000 copies/ml). Chi-square statistics was used to compare proportional difference in viral load change using STATA version 14 with statistical significance set at p<0.05.

Results: A total of 2,358 CLHIV were transitioned to DTG-based regimen as of December 2021. Median age was 6years [IQR: 4-7years], and 51.0% (n=1,203) were females. At baseline 81.6% (n=1,924) were undetectable, 14.6% (n=345) had low-level viremia while 3.8% (n=89) were unsuppressed (>=1000 copies/ml). Of the 2,148 (91.1%) CLHIV who remained on ART 12 months after transitioning, 90.6% (n=1,947) were undetectable, 7.0% (n=150) had low-level viremia while 2.4% (n=51) were unsuppressed (>=1000 copies/ml). There was no sex difference in virological dynamics [Male = 91.7% versus Female = 92.5%; p = 0.374].

Conclusions: Children living with HIV achieved favourable virological changes when transitioned to DTG-based regimen. Programs should prioritize DTG-based regimen in children in order to improve their treatment outcomes.

OAB0202

Prior M184V/I and multiple prior virological failures have no impact on the efficacy of switching HIV+ adults to DTG/3TC through 96Wks in SOLAR-3D

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Background: DTG/3TC is approved for virologically suppressed HIV+ adults switching from stable ART with no prior DTG or 3TC resistance or prior virologic/treatment failure. SOLAR-3D prospectively evaluated the ability of DTG/3TC to maintain virologic suppression in adults switched in the setting of prior and current M184V/I and multiple virologic failures.

Methods: SOLAR-3D is a prospective, open-label, comparative 96-week study of HIV-1+ adults virologically suppressed for ≥6mos, with ≥3 prior ART and prior virologic failures, enrolled from May 2019-April 2020 and stratified by history of prior M184V/I. There were no exclusions for prior INSTI use, any CD4, prior M184V/I, or 3TC-associated mutations detected at BL by proviral DNA NGS.

Primary and Secondary Efficacy Endpoints: participants with PCR≥50 at Wk48 and 96, resp. by FDA snapshot (ITT-E and PP). **Additional Secondary Endpoints:** PCR<50 at Wk48 and 96 (ITT-E, PP), incidence of AEs and discontinuation due to CVF (PCR≥50 followed by PCR >200).

Results: 100 adults switched to DTG/3TC, n=50 with historical/prior M184V/I (n=15 with current M184V/I by proviral DNA NGS) and n=50 without prior M184V/I. Those with prior M184V/I had more prior virologic failures (n[IQR]: 9[7-13]v4[3-5], p<0.001) and longer median duration HIV (28.4v15.5yrs, p<0.001), were older, and had lower nadir CD4, longer ART duration, and longer duration PCR<50c/mL. Median time on DTG/3TC was 137wks for both groups. At Wks 48 and 96, no difference in efficacy was observed in those with prior M184V/I compared to those without prior M184V/I:

- Primary Endpoint: PCR≥50c/mL, n[%]: Wk48: 1[2]v3[6], ITT-E (2.1v6.4, PP); Wk96: 2[4]v1[2], ITT-E (4.6v2.2, PP);
- Secondary Endpoint: PCR<50, n[%]: Wk48: 46[92]v44[88], ITT-E (97.9v93.6, PP); W96: 42[84.0]v44[88.0], ITT-E (95.5v97.8, PP);
- Viral blips ≥50 at Wk96 (2v1) re-suppressed at follow-up. No CVF were observed in either group;
- At Wk96, no differences regarding PCR TND (<20), viral blips, AEs, or discontinuations were observed;
- Baseline Proviral DNA NGS demonstrated M184V/I was no longer present in 64.4% of those with prior M184V/I.

Conclusions: Through 96wks, SOLAR-3D, the largest prospective trial evaluating DTG/3TC switch in individuals with prior 3TC-associated mutations, confirms prior his-

tory/current presence of M184V/I doesn't impact the efficacy of switching virologically suppressed HIV+ adults with multiple prior virologic failures.

OAB0203

Weight and body composition after switch to doravirine/islatravir (DOR/ISL) 100/0.75mg once daily: week 48 results from 2 randomized active-controlled phase 3 trials, MK8591A-017 (P017) and MK8591A-018 (P018)

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Background: Some components of approved antiretroviral therapies (ART) are associated with weight gain and/or lipodystrophy (peripheral lipodystrophy and/or central fat hypertrophy). We evaluated changes in weight and body composition 48 weeks after switch to once-daily DOR/ISL (100/0.75mg) in two phase 3 studies.

Methods: P017 (NCT04223778) was an open-label study in adults receiving any oral 2- or 3-drug ART regimen. P018 (NCT04223791) was a double-blind study in adults receiving bicitgravir/emtricitabine/ tenofovir alafenamide (B/F/TAF).

Participants with HIV-1 RNA <50 copies/mL were randomized (1:1) to switch to once-daily DOR/ISL (100/0.75mg) or to continue baseline ART (bART) (P017) or B/F/TAF (P018); P017 randomization was stratified by bART, which was PI-based in 14% of participants, INSTI-based in 52%, and Other (mainly NNRTI-based) in 34%. Peripheral fat and trunk fat were measured by DEXA scan and were evaluated by a central imaging reader.

Results: 658 participants switched to DOR/ISL (100/0.75mg), 336 remained on bART, and 319 remained on B/F/TAF. Baseline weight differed by prior regimen in P017 (Table). Mean weight gain was similar for DOR/ISL vs continued B/F/TAF or other INSTI-based regimens but was higher for DOR/ISL vs continued PI-based or NNRTI-based regimens (Table).

Mean changes from baseline in peripheral and trunk fat were similar for DOR/ISL vs continued B/F/TAF in P018 but were higher for DOR/ISL vs continued bART in P017 (Table). In a post hoc analysis of P017, mean increases in weight, peripheral fat, and trunk fat were higher for DOR/ISL vs





continued bART containing efavirenz (EFV) and/or TDF but were similar for DOR/ISL vs continued non-EFV/non-TDF regimens (Table).

	Switch to DOR/ISL (100/75mg)			Continue bART (P017) or B/F/TAF (P018)			Difference (95% CI)*
	N	Baseline Mean	Mean Change	N	Baseline Mean	Mean Change	
Weight (kg)							
P017 Overall	321	80.27	1.44	326	80.08	0.30	1.30 (0.58, 2.03)
PI-based bART	45	82.75	1.83	46	81.98	0.12	1.96 (0.05, 3.86)
InSTI-based	167	80.84	0.66	169	81.07	0.10	0.44 (-0.59, 1.46)
NRTI-based	109	78.37	2.49	111	77.80	0.38	2.26 (1.03, 3.49)
w/ EFV or TDF	102	78.36	3.23	115	78.14	0.35	3.03 (1.78, 4.28)
No EFV or TDF	219	81.16	0.63	211	81.14	0.11	0.52 (-0.37, 1.42)
P018	306	80.24	0.23	302	82.28	0.55	-0.30 (-0.99, 0.39)
Peripheral fat (g)							
P017 Overall	282	12007.2	325.9	278	12156.1	-88.3	401.8 (121, 683)
w/ EFV or TDF	92	12052.9	785.5	90	13215.8	-152.9	918.2 (396, 1441)
No EFV or TDF	190	11985.1	139.1	179	11480.3	-34.5	157.8 (-169, 485)
P018	230	11345.2	19.0	232	11265.3	26.6	-6.6 (-259, 247)
Trunk fat (g)							
P017 Overall	282	13861.9	406.7	278	13589.0	-19.3	444.9 (94, 794)
w/ EFV or TDF	92	13119.8	1298.3	90	13589.8	-18.8	1281.5 (659, 1908)
No EFV or TDF	190	14221.2	4.0	179	13525.0	-6.8	52.7 (-384, 490)
P018	230	14343.7	-13.9	232	14360.1	85.0	-95.4 (-459, 261)

* Treatment difference is DOR/ISL versus comparator. For the P017 analysis overall and by presence of TDF or EFV in baseline regimen, the 95% CI for treatment difference were calculated from ANCOVA models with terms for baseline weight, sex at birth, race, the controlled weight factor, and treatment groups. For the P017 analysis by baseline ART status and for P018, the 95% CI for treatment difference are calculated from ANCOVA models with terms for baseline weight, sex at birth, race, and treatment groups.

* Treatment difference is DOR/ISL minus comparator. For the P017 analysis overall and by presence of TDF or EFV in baseline regimen, the 95% CIs for treatment difference were calculated from ANCOVA models with terms for baseline weight, sex at birth, race, the corrected stratification factor, and treatment group. For the P017 analysis by baseline ART strata and for P018, the 95% CIs for treatment difference are calculated from ANCOVA models with terms for baseline weight, sex at birth, race, and treatment group.

Table. Change from baseline in weight and body fat at week 48 by treatment group in P017 and P018.

Conclusions: Changes in weight and body fat after switch to DOR/ISL were similar to continuing bART, except among participants who switched from EFV and/or TDF, which are known to suppress weight gain. Switching from InSTI-based regimens to DOR/ISL did not reduce weight over 48 weeks.

OAB0204

High rates of long-term HIV RNA re-suppression after virological failure on dolutegravir in the ADVANCE trial

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Background: WHO Guidelines currently recommend switching to next-line antiretroviral treatment (ART) for individuals with sustained HIV RNA viral load (VL) ≥ 1000 copies/mL despite adherence counselling. However, individuals can re-suppress after adherence counselling, with no change in treatment.

We compared rates of virological failure and re-suppression in the ADVANCE trial of first-line treatment in South Africa.

Methods: In ADVANCE, 1053 treatment-naïve individuals were randomised to TAF/FTC/DTG, TDF/FTC/DTG or TDF/FTC/EFV for 192-weeks. All individuals with VL > 1000 copies/mL received enhanced adherence counselling within

4 weeks. Time to first VL ≤ 50 copies/mL was compared between treatment arms using Kaplan-Meier methods. Rates of virologic failure (any VL ≥ 1000 copies/mL after Week-24) were then compared. For individuals with virological rebound, rates of VL re-suppression < 50 copies/mL were compared with follow up to Week 192.

Results: Time to suppression ≤ 50 copies/mL was significantly shorter in the combined DTG arms (4 weeks) compared to the EFV arm (12 weeks); (log-rank $p < 0.001$). The proportion with virologic failure was similar across arms (combined DTG 87/702 [12%] vs EFV 33/351 [9%]; log-rank $p = 0.343$). However, more individuals on EFV remained viraemic prior to failure (12/33 [36%] compared with DTG 10/87 [11%]; $p = 0.002$). For individuals with rebound ≥ 1000 copies/mL after Week 24, time to re-suppression was significantly shorter for DTG (12 weeks) than EFV (26 weeks); log-rank $p < 0.001$. There were no cases of treatment-emergent DTG resistance in the individuals with virological failure ≥ 1000 copies/mL.

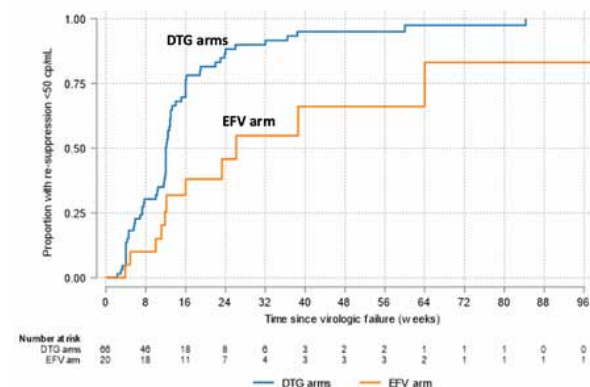


Figure. HIV RNA re-suppression rates in ADVANCE trial. Time from HIV RNA > 1000 to resuppression < 50 copies/mL

Conclusions: In ADVANCE, episodes of viraemia ≥ 1000 copies/mL were seen at similar rates across treatment arms. However, HIV RNA re-suppression after viraemia ≥ 1000 copies/mL was significantly more likely for individuals taking either TDF/FTC/DTG or TAF/FTC/DTG, compared with TDF/FTC/EFV. Long-term follow-up suggests most individuals on continued DTG after viraemia elevation can re-suppress with enhanced adherence counselling. These results question the need for switch to 2nd line PIs after VF on DTG.

OAB0205

Lenacapavir oral bridging maintains efficacy with a similar safety profile when SC LEN cannot be administered

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Background: Lenacapavir (LEN) is a first-in-class, long-acting, HIV-1 capsid inhibitor, recently approved, in combination with other antiretrovirals, for treatment of multidrug-resistant (MDR) HIV-1. Subcutaneous (SC) LEN provides a Q6M treatment option for HIV-1; however, potential SC treatment interruptions may lead to management challenges due to SC treatment gaps. This subanalysis investigated the efficacy and safety of an oral bridging (OB) regimen (LEN 300 mg PO QW) in participants with MDR HIV-1 as well as treatment-naïve people with HIV-1 (PWH) enrolled in the CAPELLA and CALIBRATE studies, respectively, when SC LEN dosing was interrupted due to its clinical hold.

Methods: Virologic suppression, CD4+ cell counts, and safety outcomes were assessed from available data at baseline (time of initiation of OB) and until SC resumption or early discontinuation from OB due to FDA clinical hold (12/2021–05/2022).

Results: Of 72 participants who received SC LEN in CAPELLA, 57 received OB (79%) and were included in this analysis. Of 105 participants who received SC LEN in CALIBRATE, 82 received OB (78%). In both studies, demographic and baseline characteristics were similar between OB and overall analysis sets. Median OB exposure was 19 weeks, and OB adherence (by pill count) was ≥95% in most participants. Results were consistent across both subanalyses. High virologic suppression rates were maintained among those already suppressed (HIV-1 RNA <50 copies/mL) at OB baseline in CAPELLA and in all participants in CALIBRATE (Table).

n/N (%)	CAPELLA ^{a,b}	CALIBRATE ^b
OB Baseline	46/46 (100)	82/82 (100)
OB Week 10	44/45 (98)	77/77 (100)
OB Week 20	30/31 (97)	58/58 (100)
OB Week 30	10/10 (100)	5/5 (100)

^aParticipants had virologic suppression at OB Baseline ^bDenominators reflect participants who reached the specified duration of OB.

Table: Number and Proportion of Participants With HIV-1 RNA < 50 copies/mL by Visit, Missing = Excluded

CD4 (abs/%) remained stable or increased from OB baseline. One participant (CAPELLA) who missed 2 non-consecutive oral LEN doses did not maintain virologic suppression during OB. Treatment-emergent AEs were similar to

SC LEN. Two participants in CAPELLA (3.5%) and 1 participant in CALIBRATE (1.2%) experienced treatment-related diarrhea.

Conclusions: High rates of virologic suppression, and stable or increased CD4, support efficacy of OB in PWH, including those with MDR HIV-1 whose SC LEN treatment was interrupted. During OB, LEN was generally safe and well tolerated.

OAB03 It's all about the bugs: Other conditions in people with HIV

OAB0302

HIV among mpox cases: clinical characteristics and outcomes in the WHO global surveillance 2022

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Background: Since May 2022, the ongoing multi-country mpox outbreak has primarily affected gay, bisexual and other men who have sex with men (GBMSM). In some countries up to 50% of cases have been reported among people living with HIV (PLHIV), and although HIV is not a risk factor for mpox, it might lead to increased risk for complications and severe disease.

Methods: We analysed data from January to December 2022 from the mpox global case-based surveillance system, established by WHO in collaboration with regional and national partners. We included all cases with available information on HIV status, and described epidemiological, clinical characteristics and outcomes in PLHIV. We used binomial logistic regression to explore whether living with HIV and immunosuppression (reported as Yes/No) were risk factors for hospitalization, ICU admission or death.

Results: Information on HIV status was available for 44% (34,973/80,843) of reported cases. Of these, 48% (16,788/34,973) were PLHIV, most of whom were male (99%; 16,497/16,550). Among PLHIV with information, 92% reported being GBMSM (12,071/13,166), 85% aged 18–44 years old (14,197/16,782), and sexual contact was reported as the main route of acquisition in 63% of cases (5,360/8,529).

Clinical symptoms among PLHIV with information included any rash (79%; 10,248/12,997), fever (64%), genital rash (53%), lymphadenopathy (35%) and headache (35%). Among PLHIV, immunosuppression was reported in 5,023 cases, 735 were hospitalized, 20 admitted to intensive



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care, and 23 died. When compared to cases who were HIV-negative and not immunosuppressed, immunosuppressed PLHIV were found to be at higher risk for hospitalization (OR=2.00, CI=1.64-2.43, $p<0.001$) as were those who were immunosuppressed and HIV-negative (OR=3.56, CI=1.80-7.01, $p<0.001$). Living with HIV alone was not a risk factor. Due to the small sample size, no risk factors for ICU admission and death were found.

Conclusions: Among cases with mpox, PLHIV were not at increased risk for hospitalization unless immunosuppressed. Given that uncontrolled HIV might have led to disproportionate mpox morbidity, health systems need to ensure PLHIV are aware of their diagnosis, linked to care, on effective antiretroviral treatment and achieve viral suppression. For individuals with unknown HIV status, mpox testing can be an opportunity for HIV testing, prevention and care.

OAB0303

High rate of hepatitis C and reinfection after direct-acting antiviral treatment among men-who-have-sex-with-men living with HIV in Bangkok, Thailand

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Background: Hepatitis C virus(HCV) infection has been increasing among men-who-have-sex-with-men(MSM) living with HIV. Direct-acting antivirals(DAAs) are associated with high HCV cure rates, but re-infection can occur if exposed to HCV again. This analysis describes HCV incidence, treatment outcomes, and reinfection rates in an early-treated acute HIV infection (AHI) cohort in Thailand. **Methods:** SEARCH010/RV254 enrolls participants with AHI. HCV antibody was measured at enrolment and annually. Participants with HCV viremia initiated DAAs. Sustained virological response(SVR) was assessed ≥ 12 weeks after treatment completion. HCV RNA was monitored annually in participants with HCV clearance (spontaneous or SVR). HCV incidence rates and reinfection rates with 95% confidence intervals(CI) per 100 person-years of follow-up (PYFU) were calculated using the exact method.

Results: Between 2009-2022, 694 HCV seronegative participants were enrolled. Most (92.5%) were MSM with median age 26.0 years (IQR 23.0-32.0). During total 3,678 PYFU, 98 (14.1%) acquired HCV infection; incidence rate was

2.7/100 PYFU (95% CI 2.2-3.3). Median time to HCV diagnosis after AHI was 3.0 years (IQR 0.5-5.5). Differences in baseline demographic characteristics between participants who developed HCV and who remained HCV negative were not statistically significant (Table 1). Among 98 incident cases, the most common HCV genotype was 1/1a(N=70, 93.3%). Sofosbuvir/ledipasvir (56.8%) and sofosbuvir/velpatasvir (33.8%) were the most frequently initiated DAAs. Of 72 participants who completed treatment, 68 (94.4%) achieved SVR. Additionally, 10 participants spontaneously cleared HCV RNA. HCV reinfection occurred in 9/78(11.5%) during 106.6 total PYFU after clearance; at a rate of 8.5/100 PYFU(95% CI 3.9-16.0). The median time to reinfection was 1.0 years(IQR 0.9-2.5). 3/10(30.0%) reinfections occurred after spontaneous clearance and 6/68(8.8%) after SVR.

Characteristics	Total (N=694)	HCV Negative (N=596)	HCV Positive (N=98)	P-value
Age (years)				
Median (IQR)	26.0 (23.0-32.0)	26.0 (23.0-32.0)	25.0 (23.0-30.0)	0.214
Age categories				0.210
18-24	272 (39.2%)	226 (37.9%)	46 (46.9%)	
25-34	312 (45.0%)	272 (45.6%)	40 (40.8%)	
35+	110 (15.9%)	98 (16.4%)	12 (12.2%)	
Gender				0.093
Female	18 (2.6%)	18 (3.0%)	0 (0%)	
Male	676 (97.4%)	578 (97.0%)	98 (100%)	
HIV transmission risk				0.142
MSM	642 (92.5%)	549 (92.1%)	93 (94.9%)	
Homosexual	621 (89.5%)	531 (89.1%)	90 (91.8%)	
Bisexual	21 (3.0%)	18 (3.0%)	3 (3.1%)	
Heterosexual	47 (6.8%)	44 (7.4%)	3 (3.1%)	
IVDU	3 (0.4%)	2 (0.3%)	1 (1.0%)	
Other	2 (0.3%)	1 (0.2%)	1 (1.0%)	
Baseline Log VL				
Median (IQR)	5.92 (5.2-6.7)	5.91 (5.1-6.7)	5.94 (5.4-6.8)	0.276
Baseline CD4 cell counts (cells/ μ L)				
Median (IQR)	362 (265-496)	362 (267-504)	365 (236-474)	0.478
Baseline CD8 cell counts (cells/ μ L)				
Median (IQR)	513 (331-856)	513 (322-833)	514 (353-1010)	0.349

Abbreviation: HCV, hepatitis C virus; HIV, human immunodeficiency virus; IQR, interquartile range; IVDU, intravenous drug use; MSM, men who have sex with men; VL, viral load

Differences in HCV negative and HCV positive participants were evaluated with Wilcoxon rank sum tests for continuous variables and Fisher exact tests for categorical variables.

Table 1. Demographic characteristics of people living with HIV with and without incident HCV infection in acute HIV infection cohort in Thailand.

Conclusions: In this early-treated AHI cohort of Thai MSM, there is high incidence of HCV infection. Treatment with DAAs resulted in high SVR rates, but HCV reinfection was common. Post-clearance follow-up with harm reduction measures is essential to identify and minimize HCV reinfection.



OAB0304

Short-course rifapentine-based regimens for latent tuberculosis infection among people living with HIV who received integrase inhibitor-based antiretroviral therapy

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Background: Rifapentine-based regimens have been shown to have a high completion rate for latent tuberculosis infection (LTBI) treatment; however, rifapentine reduces plasma concentrations of co-administered ART among PLWH. This study aimed to retrospectively evaluate the outcomes of short-course rifapentine-based regimens among PLWH who received integrase strand-transfer inhibitor (INSTI)-based ART.

Methods: During August 2019 to October 2022, PLWH testing positive or indeterminate for interferon-gamma release assay (IGRA) were advised to receive directly-observed therapy for LTBI after excluding active tuberculosis. Those receiving 3-month once-weekly rifapentine plus isoniazid (3HP) or 1-month daily rifapentine plus isoniazid (1HP) combined with INSTI-based ART were included. The primary outcome was maintenance of virologic response (PVL<200 copies/mL) at months 3-6 after completion of LTBI treatment.

Results: During the study period, 456 PLWH were included; they were mostly male (94.3%) with a median age of 43 years, and 91.9% received INSTI-based ART with a median CD4 count of 651 cells/mm³ and 97.6% having achieved PVL<200 copies/mL. Among those receiving INSTI-based ART, 142 PLWH received 1HP and bictegravir (BIC)-containing regimens (1HP/BIC group), 46 received 1HP and dolutegravir (DTG)-containing regimens (1HP/DTG group), 28 received 3HP and BIC-containing regimens and (3HP/BIC group), and 203 received 3HP and DTG-containing regimens (3HP/DTG group). In the per-protocol analysis, the proportions of PLWH who maintained PVL <200 copies/ml at months 3-6 after the completion of LTBI treatment in the 4 study groups were 100% (125/125), 100% (44/44), 100% (17/17), and 96.7% (178/184), respectively. The completion rates were similar in the 1HP and 3HP groups (92.7% vs 90.0%). None of the PLWH discontinued INSTI-based ART that had been taking before combinations with rifapen-

tine-based LTBI treatment. The rates of PLWH experiencing any adverse event (AE) were also similar in the 1HP and 3HP groups (60.9% vs 57.4%), and the AEs were mainly of grade 1 (40.1%) or 2 (13.4%) in severity. While the most commonly reported AEs were flu-like symptoms (40.1%), more dermatologic AEs were observed in the 1HP group compared with the 3HP group (17.8% vs 9.6%).

Conclusions: Combinations of INSTI-containing regimens and short-course rifapentine-based regimens had a good safety profile and maintained higher rates of viral suppression.

OAB0305

Co-infection of High-Risk Human Papillomavirus and Human T-Lymphotropic Virus-1 among women living with HIV on Antiretroviral Therapy at a Tertiary Hospital in Kenya

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Background: Virus-associated cancers have emerged in recent years and account for 15% of cancers reported globally. Cancer-causing viruses include high-risk Human Papillomavirus (HR-HPV), the causative agent of cervical cancer, and Human T-cell Lymphotropic Virus type-1 (HTLV-1), the causative agent of adult T-cell leukemia (ATL). In Kenya, there is a paucity of data on the burden of HR-HPV/ HTLV-1 co-infection among women living with HIV (WLHIV). We determined the co-infection of HR-HPV and HTLV-1 among WLHIV on antiretroviral therapy (ART) at the Kenyatta National Hospital (KNH).

Methods: We conducted a cross-sectional study among WLHIV attending KNH (Kenya's national referral hospital) ART clinics. Cervical cytology was performed by KNH medical providers per standard of care. Study nurses collected a cervical sample with a cytobrush for HPV genotyping using Gene Xpert® assays and HPV Genotypes 14 Real-



TM Quant" V67-100 FRT kits. Peripheral blood mononuclear cells (PBMCs) were used for HTLV-1 DNA detection (Bioline Ltd., London, UK). The association of HR-HPV and HTLV-1 co-infections was done using the Chi-square function for trends.

Results: A total of 647 WLHIV enrolled in this study and had a mean age of 42.8 years (SD 8.7). All of the study participants were on ART; 7% were initiated on ART in ≤ 12 months and about 8.8% were not virally suppressed (>1000 copies/mL). The HTLV-1 positivity rate among WLHIV was 3.1% and 7.6% among those with HR-HPV. Participants with HR-HPV/ HTLV-1 co-infections were significantly older (50+ years, 35.3%) than those having HPV mono-infection or did not have any infection ($p = <0.001$). A significantly higher proportion of women with HR-HPV/ HTLV-1 co-infections had their sex debut before the age of 18 years ($p = 0.015$). A higher proportion of participants (52.2%) with HPV mono-infection had previously been treated for STDs as compared to WLHIV without either HR-HPV or HTLV-1 infections ($p = 0.006$).

Conclusions: The study showed increasing trends of HR-HPV/ HTLV-1 co-infections among WLHIV on ART despite their CD4 cell count or HIV 1 RNA viral suppression at Kenya's national referral hospital.

OAB04 Beyond suppression: Improving the trajectory of co-morbidities in people with HIV

OAB0402

Integrase strand inhibitors (INSTI) related changes in BMI and risk of diabetes

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Background: Integrase strand inhibitor (INSTI) use in people living with HIV (PLWH) has been associated with increased body mass index (BMI). BMI increases have also been associated with a higher risk of diabetes (DM). This study explored the relationship between INSTI and non-INSTI regimens use, BMI changes, and the risk of DM.

Methods: RESPOND participants were included if they had CD4, HIV RNA, and multiple BMI measurements. Those with prior DM, and pregnant women, were excluded. DM was defined as a random blood glucose >11.1 mmol/L,


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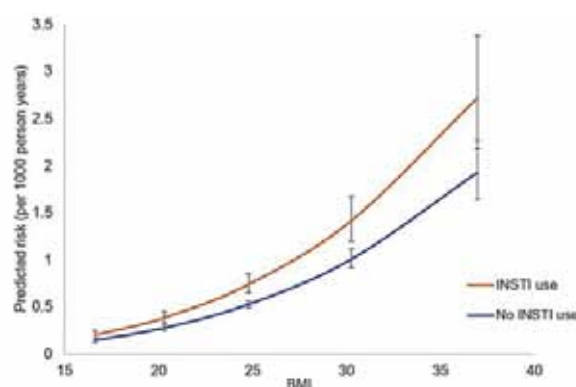

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HbA1c >6.5%/48 mmol/mol, use of antidiabetic medication or clinical diagnosis. Poisson regression assessed the association between time updated log BMI, current INSTI/non-INSTI and TDF/TAF use, and their interactions, on DM risk.

Results: 20,865 PLHIV were included, most were male (74%) and white ethnicity (73%). The median age was 45 years (IQR 37–52) with a median BMI of 24 kg/m² (IQR 22–26). Over 107,641 PYFU, there were 785 DM diagnoses, a crude rate of 0.73 (CI 0.68 – 0.78) /100 person years. Log BMI was strongly associated with DM (aIRR 18.2 per log increase, 95% CI 11.7, 28.3; p<0.001). In univariate analyses, current INSTI use was associated with increased risk of diabetes (IRR 1.58, 95% CI 1.37, 1.82; p<0.001). This was partially attenuated when adjusted for time updated log BMI and other variables (aIRR 1.48, 95% CI 1.28, 1.72; p<0.001) (Figure 1).

In adjusted analyses current TAF use had similar DM risk to current TDF (aIRR=0.98, 95%CI 0.79–1.20, p=0.818). There was little evidence of an interaction between log BMI, INSTI and non-INSTI use, and DM (p=0.130).



Note: Figure 1 shows the predicted risk per 1000 person years of DM for BMI (antilog of logBMI) among INSTI and non-INSTI users when adjusted for sex, natural log of Age, HIV risk group, ethnicity, CD4, current TDF/TAF use. Among INSTI users, raltegravir (RAL) 12%, dolutegravir (DTG) 68%, other INSTIs (shikogravir (EVQ), bictegravir (BIC), cabotegravir (CBQ)) 20%.

Figure 1. Predicted risk of DM by current INSTI use and BMI.

Conclusions: In RESPOND, current use of INSTIs vs. non-INSTI was associated with an increased risk of diabetes which partially attenuated when adjusted for BMI changes and other variables. There was no difference in DM risk between current TAF and TDF users.

OAB0403

Vitamin D and calcium intake are associated with bone deficits among adolescents living with HIV in Zambia and Zimbabwe

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Background: Adolescents living with HIV (ALWH) have lower bone density despite antiretroviral therapy (ART), and the aetiology may be multifactorial. We investigated whether dietary vitamin D and calcium intake were associated with bone density at baseline in peripubertal ALWH in Zambia and Zimbabwe, enrolled in a trial of Vitamin D and calcium supplementation.

Methods: ALWH aged 11–19 years, established on ART for ≥6 months were enrolled from five HIV clinics in Lusaka and Harare. A clinical history and examination was undertaken and HIV viral load was measured. Dual-energy X-ray absorptiometry was used to measure total body-less head bone mineral density (TBLH-BMD) Z-score.

The association between vitamin D/calcium daily dietary intake (calculated from a validated diet questionnaire) and TBLH-BMD Z-score was investigated using multi-variable linear regression. A vitamin D dietary intake of <4mcg/day was defined as low. Height- and weight- for-age z-scores of <-2 using UK reference standards were defined as stunting and wasting respectively.

Results: 842 ALWH (420 from Zambia and 422 from Zimbabwe, 448 (53.2%) female, mean age 15.0 years) were enrolled between February and November 2021. Unsuppressed HIV viral load (>1000 copies/ml) was observed in 11.7%; 29.9% were stunted and 30.3% were wasted. A low vitamin D intake was reported by 31.2%.

Among 818 participants who had a DXA scan, lower dietary vitamin D was associated with lower TBLH-BMD Z-score; 0.07 (95%CI 0.01–0.13, p=0.025) lower for each 1mcg vitamin D, after adjusting for sex, Tanner stage, socioeconomic status and country.

Similarly, lower dietary calcium intake was associated with lower TBLH-BMD Z-score; 0.10 (95%CI 0.02–0.17, p=0.015) for



each 100mg calcium, adjusting for the same covariates. Mean TBLH-BMD Z-score was 0.26 lower in participants with unsuppressed HIV viral load.

Conclusions: ALWH in Zimbabwe and Zambia have low vitamin D and calcium dietary intake, and may benefit from supplementation to improve bone health.

OAB0404

Effects of lifestyle modification and annual screening in the prevention of cardiovascular risk factors in South African women with HIV

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Background: Women with HIV (WHIV) are faced with an added burden of obesity and hypertension, particularly in under-resourced settings. We sought to assess the effectiveness of regular screening and lifestyle modification interventions in modifying CVD risk factors in South-African WHIV.

Description: Women with HIV aged 18-<50 years were enrolled in a quasi-experimental study (intervention [I-arm] and control arm [C-arm]) from two clinics in Umlazi, South Africa between November 2018 and May 2019. Women in the I-arm received lifestyle modification advice and annual screening for CVD risk. The CVD risk factors were assessed through standardised questionnaires, clinical and laboratory procedures at baseline and at end of three years of follow-up.

Prevalence of metabolic syndrome (MetS) and other CVD indices were compared between arms at end-of-study (EOS) and incidence of CVD risk factors were measured within the intervention arm from baseline to EOS.

Lessons learned: A total of 372 WHIV (186 in each arm) were enrolled, and 269 WHIV (149 I-arm and 120 C-arm) with mean(SD) age of 36(1) years were included in the EOS analyses after 32 (2) months of follow-up. The MetS prevalence at EOS was 17% (25/149) in the I-arm, and 20% (24/120) in the C-arm (aRR 0.9; 95%CI 0.5-1.1). Proportion of women with low-density lipoprotein (LDL) > 3mmol/L in I-arm and C-arm were 19% (28/149) and 30% (36/120) respectively (aRR 0.6;95%CI 0.4-0.9;p<0.05). Fasting blood glucose>5.6mmol/L was reported in 3% (4/149) of women in I-arm and 13% (16/20) in the C-arm (aRR 0.2;95%CI 0.07-0.6;p<0.01). High-density lipoprotein (HDL) improved within the I-arm with mean difference of -0.09 (95%CI: -0.16, -0.03); p<0.01) from baseline to EOS. Mean body mass index increased in both arms: I-arm from 29.6(7) kg/m² to 31.5(7); C-arm from 27.8(7) to 29.9(7) kg/m².

Conclusions/Next steps: Regular screening and lifestyle modification advice play an important role in preventing CVD risk factors such as LDL, HDL and glucose levels, and should be well integrated into HIV programmes.

Further exploration is needed to understand the social determinants and perceptions of obesity in WHIV from under-sourced settings, to inform future targeted interventions comprised of a culturally acceptable, multidisciplinary approach in the alleviation of obesity and CVD risk.

OAB0405

Re-evaluating risk: evaluating opioid-related harm associated with stimulant use in people with chronic pain living with and without HIV

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Background: Chronic pain, opioid therapy, and substance use (particularly cocaine and methamphetamine) are all prevalent among people living with HIV (PLWH). However, there is lack of clarity regarding the impact of and optimal clinical response to stimulant use among people prescribed long-term opioid therapy (LTOT) for chronic, non-cancer pain.

We sought to determine if a urine drug test (UDT) positive for stimulants was associated with opioid-related harm or subsequent discontinuation of LTOT in a publicly insured population with a high proportion of PLWH.

Methods: 300 PLWH on LTOT were matched to 300 clients without HIV on LTOT (based on age, race/ethnicity, and sex) and followed from January through June 2019. Using logistic generalized estimating equations, we assessed whether stimulant positive UDT results were associated with increased:

1. Opioid-related emergency department (ED) visits (over-sedation, constipation, infections associated with injecting opioids, and opioid seeking), and;
2. LTOT discontinuation 90 days following a stimulant-positive UDT.

Results: Overall, 1562 (24%) of 6,471 UDTs were positive for stimulants; however, 30 clients had 39% of stimulant-positive UDTs. There was no statistically significant association found between stimulant-positive UDTs and opioid-related ED visits or death within 90 days when accounting for repeated ED visits within individuals (adjusted hazard odds ratio [OR]=1.24; 95% CI 0.73-2.11). This relationship did not differ by HIV status. Stimulant-positive UDTs were associated with subsequent discontinuation of LTOT within 90 days (OR=1.95; 95% CI=1.68-2.27). This relationship was more likely among Latinx individuals (positive interaction; OR=1.97; 95% CI=1.08-3.60), and less likely among PLWH (negative interaction; OR=0.59; 95% CI=0.44-0.79).

Conclusions: The association between stimulant-positive UDT and opioid-related harm was concentrated in a minority of clients on LTOT with stimulant-positive UDT. Despite this, stimulant-positive UDT often led to LTOT discontinuation, though with heterogeneity across de-



mographic and clinical groups. It is unknown whether less LTOT discontinuation among PLWH using stimulants reflects a more holistic approach to patient care among HIV providers, difficulty with opioid stewardship, or both. Overall, these results suggest that detection of stimulant use should result in a discussion of substance use and risk, rather than reflex to discontinue LTOT.

OAC01 Progress towards HIV elimination: Are we there yet?

OAC0102

Australia's progress towards ending HIV as a public health threat: trends in epidemiological metrics over 2004-2021

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Background: We describe Australia's overall progress towards achieving the UNAIDS 95-95-95 targets by analysing the trends in epidemiological metrics over 2004-2021.

Methods: We used mathematical modelling and national HIV notification, cohort, and administration data to calculate annual estimates for the HIV cascade, the number of annual new HIV infections, and other HIV epidemic metrics during 2004-2021.

We used piecewise negative binomial regression to determine changes in trends and annual rate ratios (ARRs) for each cascade step and metric.

Results: We estimate there were 29,460 (range: 25,230-34,070) people living with HIV in Australia at the end of 2021. All 90-90-90 targets were achieved in 2020, with 91.1% of people living with HIV diagnosed, 91.6% of those diagnosed on Treatment and 97.8% of those on treatment being virally suppressed (achieving the final 95 target) at the end of 2021. There were reductions in each gap of the cascade and the number of people living and diagnosed with HIV is stabilising.

However, the percentage diagnosed and receiving treatment has plateaued under 92% since 2015 after a large fall in the number untreated over 2011-2014. Changes in the cascade gaps coincided with a slow increase in HIV notifications from 2004 to 2014, followed by a slow decline to 2019, and then a rapid fall.

Similar trends were found for the estimates of new HIV infections. Most metrics showed substantial improvement since 2004, particularly after the emergence of COVID-19 in 2020, with the incidence prevalence ratio falling below the UNAIDS global target of 0.03 in 2019.

Conclusions: While Australia saw substantial progress in the HIV cascade and achieved the 90-90-90 targets in 2020, reaching all 95-95-95 targets by 2025 is not guaranteed. Despite large falls in new infections, particularly

since the start of the COVID-19 pandemic, gaps in the cascade related to diagnosis and treatment remain. Further efforts are needed to achieve the UNAIDS targets and end HIV as a public health threat in Australia.

OAC0103

Characterising HIV incidence among people who inject drugs engaged with harm-reduction programs in four provinces in South Africa

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Background: HIV incidence among people who inject drugs (PWID) in South Africa has never been estimated, yet it is essential for informing prevention efforts and tracking progress towards ending HIV/AIDS by 2030. We estimated HIV incidence and associated risk factors among PWID engaged with harm-reduction services in four provinces in South Africa.

Methods: Programmatic data over April 2019–March 2022 were obtained from harm-reduction services funded by the Networking HIV and AIDS Community of South Africa (NACOSA), which serve PWID in four provinces (Gauteng, KwaZulu-Natal, Western Cape and Eastern Cape). At each visit, clients who were not known to be HIV-positive were offered HIV testing. They also self-reported socio-demographic characteristics, drug use patterns and uptake of harm-reduction services. HIV incidence was estimated using the person-time method among PWID at-risk of infection tested at least twice.

Characteristic	Strata	HIV incidence (95%CI)	Incidence rate ratio (95% CI)	Characteristic	Strata	HIV incidence (95% CI)	Incidence rate ratio (95% CI)
Province	Gauteng	18.9 (16.5 - 21.6)	Ref.	Gender	Male	14.2 (12.6 - 15.9)	Ref.
	KwaZulu-Natal	17.1 (13.3 - 21.7)	0.9 (0.7 - 1.2)		Female	10.1 (6.7 - 14.8)	0.7 (0.5 - 1.1)
	Western Cape	3.4 (2.1 - 5.2)	0.2 (0.1 - 0.3)	Use of opioid substitution therapy	No, never	14.7 (13.2 - 16.6)	Ref.
	Eastern Cape	6.3 (3.2 - 11.2)	0.3 (0.2 - 0.6)		Yes, prior to the first HIV test	8.4 (2.1 - 22.9)	0.6 (0.1 - 1.7)
Age (years)	17-27	18.5 (15.2 - 22.2)	Ref.	Number of harm-reduction packs received	Yes, following the first HIV test	3.8 (1.7 - 7.6)	0.3 (0.1 - 0.5)
	28-30	15.7 (12.3 - 19.8)	0.9 (0.6 - 1.2)		0-2	17.5 (15.1-20.1)	Ref.
	31-35	13.7 (10.9 - 16.9)	0.7 (0.6 - 1.0)		3-5	10.3 (8.3-12.6)	0.6 (0.5 - 0.8)
	36-75	7.4 (5.4 - 9.9)	0.4 (0.3 - 0.6)		≥6	8.7 (5.4 - 13.3)	0.5 (0.3 - 0.8)

Table.



Results: Data were available for 31,873 PWID, of whom 2,457 (7.7%) were initially HIV-negative and had ≥ 2 HIV tests, forming the sample for this study. At baseline, most were male (90.2%), black (72.2%), homeless or unstably housed (62.6%) and used heroin (97.3%).

Median age was 30 yrs and few (7.9%) ever received opioid agonist treatment (OAT). 300 (12.2%) PWID acquired HIV over 2190.2 person-years, resulting in an HIV incidence of 13.7/100 person years (95%CI: 12.2-15.3). The risk of HIV acquisition varied by province, being higher in Gauteng and KwaZulu-Natal compared to Western and Eastern Capes, and by age, being higher in younger relative to older PWID (Table).

PWID who have received OAT and a greater number of harm-reduction packs had lower risks of HIV acquisition (Table).

Conclusions: Our results indicate that HIV incidence among PWID engaged with harm-reduction services in South Africa is very high and illustrate the value of using programmatic data to monitor the HIV epidemic in this vulnerable population. An urgent expansion of prevention services is needed.

OAC0104

The effect of unplanned care interruptions on the mortality of adults resuming antiretroviral therapy in South Africa: a survival analysis

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Background: Interrupting antiretroviral therapy (ART) is associated with adverse outcomes such as viral resistance, AIDS-defining illnesses, and mortality. However, little is known about the mortality of those resuming ART after unplanned interruptions.

The objective of this study is to estimate the relative rate of mortality among adults resuming ART after unplanned interruptions compared to those who do not interrupt care.

Methods: We included data from 44386 adults with HIV initiating ART between 2014 and 2019 at four South African cohorts of the International epidemiology Databases to

Evaluate AIDS. We defined care interruption as a gap in contact longer than 180 days. Observation time prior to interruption was allocated to the "no interruption" group. Observation time after the first interruption was allocated to one of two groups based on whether the first interruption occurred before or after 6 months of ART. We determined vital status from clinic records and linkage to the National Population Register. Cox regression was used to estimate hazard ratios, which were adjusted for the effects of sex, baseline age, baseline CD4 count, year of ART initiation, and cohort.

Results: There were 79762 person-years of observation and 797 deaths. 12601 people interrupted care, of whom 7038 interrupted within the first 6 months of ART. Those resuming ART experienced increased mortality compared to those without an interruption: those whose first interruption occurred within 6 months of starting ART had a 208% (95% CI: 158%-268%) increase in mortality, and those whose first interruption occurred after 6 months had a 147% (95% CI: 96%-211%) increase in mortality. Table 1 shows adjusted hazard ratios for selected variables.

Variable		Person-years of observation	Deaths	Crude mortality rate per 1000 person-years (95% CI)	Adjusted hazard ratio (95% CI)
Interruption status	No ART interruption	62 228	484	7.78 (7.11 - 8.50)	1.00
	Interruption within the first 6 months	10 835	206	19.01 (16.59 - 21.79)	3.08 (2.58 - 3.68)
	Interruption after the first 6 months	6 699	107	15.97 (13.21 - 19.30)	2.47 (1.96 - 3.11)
Sex	Female	54 724	410	7.49 (6.80 - 8.25)	1.00
	Male	25 038	387	15.46 (13.99 - 17.08)	1.47 (1.27 - 1.70)
CD4 count at ART initiation (cells/mm ³)	500+	11 851	55	4.64 (3.56 - 6.04)	1.00
	350-499	18 656	110	5.90 (4.89 - 7.11)	1.31 (0.94 - 1.81)
	200-349	24 547	192	7.82 (6.79 - 9.01)	1.60 (1.18 - 2.17)
	<200	24 708	440	17.81 (16.22 - 19.55)	3.00 (2.25 - 4.00)

Table 1: Adjusted hazard ratios for predictors of mortality

Conclusions: The substantially increased mortality of those resuming ART after an interruption highlights the need to prioritise and support retention in care, particularly during the first 6 months of ART.

OAC0105

The impact of same-day and rapid ART initiation under the Universal Health Coverage program on HIV outcomes in Thailand

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Background: Antiretroviral therapy (ART) initiation regardless of CD4 count has been recommended since 2014 in Thailand, with same-day ART initiation recommended in 2021. We assessed HIV outcomes among Thai people living with HIV (PLHIV) by time from HIV diagnosis to starting ART under the Universal Health Coverage (UHC) program and determined factors associated with virological failure (VF).

Methods: PLHIV aged ≥15 years initiating ART between 2014 to August 2022 were included and categorized into 4 groups based on duration from HIV diagnosis (or registration) to ART initiation:

1. Same-day or 2-7 days,
2. <1 month,
3. 1-3 months, and;
4. >3 months.

VF was defined as viral load (VL) ≥1000 copies/mL after at least 6 months of ART. Factors associated with VF were analysed using a competing risk model considering death and loss to follow-up (LTFU) as competing events. Vital status was confirmed with Death Registry.

Results: Of 229,171 PLHIV who started ART, 65% had date of HIV diagnosis recorded. Median (IQR) age was 34 (26-43) years and pre-ART CD4 count was 232 (77-419) cells/mm³. ART initiation happened same-day in 17%, 2-7 days in 6%, <1 month in 23%, 1-3 months in 25% and >3 months in 30%. ART initiation within 7 days significantly increased from 19% during 2014-2016 to 30% during 2020-2022. ART initiation within 7 days resulted in the lowest mortality [10%: 1.31 (95%CI 1.27-1.36) per 100 person-years (PY)], but the highest rate of LTFU [8%: 2.29 (95%CI 2.22-2.36) per 100 PY] when compared with others initiating ART groups. VF occurred with a rate of 3.44 (95%CI 3.40-3.489) per 100 PY. PLHIV initiating ART within 1 month were at lower risk of VF (aSHR 0.79, 95%CI 0.75-0.81) when compared to ART initiation >3 month after diagnosis/registration.

Conclusions: ART initiation within 7 days became more common in Thailand over time although this occurred in less than one-third of PLHIV in the last 3 years of the

UHC program. ART initiation within 7 days significantly reduced mortality. ART initiation within 1 month significantly lowered risk of VF. To further optimize health outcomes, innovative strategies are urgently needed to implement earlier ART initiation in Thailand.

OAC02 Colliding epidemics: Prevention of HIV and co-infections

OAC0202

COVID-19 vaccine effectiveness by HIV status and injection drug use history

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Background: Some evidence suggests that people living with HIV (PLWH) and people who inject drugs (PWID) may experience lower COVID-19 vaccine effectiveness (VE).

This lower VE may be due to a direct impact of HIV acquisition / substance use on immune function, and/or an indirect effect via other comorbidities that are common in these populations. Our objective was to assess COVID-19 VE by HIV status and injection drug use (IDU) history.

Methods: We applied validated algorithms to administrative datasets in the British Columbia COVID-19 Cohort (BCC19C) to create a population-based cohort of PLWH and a matched HIV-negative cohort, and to ascertain history of IDU. We included individuals who received RT-PCR testing for SARS-CoV-2 between Dec 15th, 2020, and Nov 21, 2021. A test-negative study design was used to estimate VE. Analyses were performed using logistic regression with crossed terms for vaccination status, PLWH status and IDU history, adjusting for sociodemographics, calendar time and co-morbidities.



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Results: The analysis included 2,700 PLWH and 375,043 matched HIV-negative individuals – of whom 40.7% and 4.3% had a history of IDU, respectively. VE with 2 doses was lower among PLWH with IDU history (65.8%, 95% CI= 43.5%-79.3%) than PLWH without (80.3%, 95% CI= 62.7-89.6), and VE increased slower and decreased more quickly in the former, although confidence intervals were wide. The finding of lower VE among people with IDU history was also present in the HIV-negative cohort but was more pronounced among PLWH.

	PLWH		HIV-negative individuals	
	History of IDU	No history of IDU	History of IDU	No history of IDU
1 st dose	44.1 (-25.8-75.2)	-	36.5 (22.1-48.2)	56.3 (52.7-59.6)
2 nd dose (days)				
≥ 7*	65.8 (43.5-79.3)	80.3 (62.7-89.6)	82.1 (79.9-84.1)	88.6 (88.2- 89.0)
7-59	65.7 (17.9-85.7)	80.3 (50.9-92.1)	87.7 (85.1-89.9)	91.5 (91.1-92.0)
60-89	91.3 (62.3-98.0)	85.9 (56.8-95.4)	83.9 (80.3-86.9)	89.9 (89.4-90.3)
90-119	65.9 (21.6-85.2)	88.1 (63.6-96.1)	79.7 (75.2-83.4)	87.8 (87.2-88.4)
120-179	42.4 (-17.8-71.8)	64.0 (15.7-84.7)	71.8 (65.2-77.1)	84.6 (83.8-85.4)

Conclusions: PWID may experience lower VE against COVID-19 acquisition, particularly for people who are also living with HIV. These findings highlight the convergence of the dual public health crises and the importance of prioritizing PLWH and PWID for booster doses. The higher prevalence of IDU among PLWH may partly explain our previously published finding of slower buildup / quicker waning among PLWH overall compared to HIV-negative individuals.

OAC0203

Mpox vaccination among gay, bisexual, and other men who have sex with men in the United States, september-december 2022

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Background: During the 2022 mpox outbreak, there was disproportionate mpox risk among gay, bisexual, and other men who have sex with men (MSM), especially Hispanic men, non-Hispanic Black men, and people living with HIV(PLWH). These communities reported varying degrees of vaccine access, uptake, and 2-dose completion. Studying individual and structural determinants of vaccination can inform vaccination program implementation for both new and ongoing vaccination efforts.

Methods: A convenience sample of 3041 cisgender MSM aged 15+ years participated in a cross-sectional survey including sociodemographic and behavioral factors related to mpox vaccination uptake and 2-dose completion from 09/2022-12/2022 as part of the American Men's Internet Survey. Mpox-related stigma was measured using a 9 item scale pooled as a binary "any" vs. no reported mpox stigma variable. We conducted bivariate analyses to explore associations with

1. Receiving any dose. and;
2. Completion of 2-dose mpox vaccination.

We further conducted unadjusted and adjusted logistic regression with age group and race/ethnicity. Associations between self-reported mpox vaccination and HIV PrEP use were explored among the subset of MSM at risk for HIV acquisition.

Results: 33.3% (n=1006) of participants received at least one dose of mpox vaccination; 16.6% (167/1006) received only one dose, 83.1% (n=836) received two doses, and 0.3% (n=3) reported >two doses. HIV status was significantly associated ($p<0.01$) with any mpox vaccination, but not mpox vaccine completion ($p>0.05$).

Factors associated with both mpox vaccination and completion included STI screening, mpox-related stigma, awareness, concern, and HIV PrEP visits for individuals at risk for HIV acquisition.


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Variable	Unadjusted OR (95% CI)	P value	Adjusted* OR (95% CI)	P value
Any mpox vaccination				
HIV ⁺	1.63 (1.26, 2.06)	<.01	1.66 (1.30, 2.11)	<.01
High-risk exposure	4.71 (3.96, 5.60)	<.01	4.69 (3.94, 5.59)	<.01
High-risk contact	3.72 (2.76, 4.98)	<.01	3.32 (2.68, 4.02)	<.01
Foal vaccine	1.98 (1.54, 2.55)	<.01	2.13 (1.65, 2.75)	<.01
Social or community stigma	1.26 (1.02, 1.54)	.03	1.20 (0.98, 1.47)	.08
Stigmatized stigma	1.79 (1.12, 2.26)	.01	1.55 (1.09, 2.23)	.02
STI testing	2.59 (2.15, 3.12)	<.01	2.57 (2.12, 3.11)	<.01
Recent condomless anal sex	1.77 (1.32, 2.38)	<.01	1.74 (1.31, 2.37)	<.01
HIV PrEP use (ever)**	7.47 (6.11, 9.13)	<.01	7.44 (6.07, 9.13)	<.01
HIV PrEP use (within year)**	2.46 (1.31, 4.60)	<.01	2.80 (1.48, 5.41)	<.01
Vaccination completion				
HIV ⁺	0.68 (0.60, 1.05)	.18	0.84 (0.68, 1.04)	0.12
High-risk exposure	2.62 (1.93, 3.63)	<.01	1.92 (1.36, 2.72)	<.01
High-risk contact	1.93 (0.95, 2.46)	.07	1.91 (0.92, 2.87)	.10
Foal vaccine	1.78 (1.07, 2.97)	0.02	1.59 (0.94, 2.69)	.07
Social or community stigma	0.88 (0.57, 1.34)	.55	1.00 (0.64, 1.57)	.97
Stigmatized stigma	2.22 (0.88, 5.64)	.09	2.75 (1.07, 7.07)	.03
STI testing	1.44 (0.96, 2.19)	.08	1.51 (1.06, 2.14)	.05
Recent condomless anal sex	-	-	-	-
HIV PrEP use (ever)**	1.91 (1.26, 2.88)	<.01	1.99 (1.31, 3.03)	<.01
HIV PrEP use (within year)**	-	-	-	-

* Adjusted models included age group (15-20, 21-24, 25-34, 35-44, 45-59, 60+), and race/ethnicity (Hispanic, Non-Hispanic white, Non-Hispanic Black, Other).

** PrEP models considered for people at risk for HIV acquisition (HIV-negative).

Note: Blank cells indicate sample size not powered to determine an association.

Table 1. Determinants of mpox vaccination and mpox vaccination completion.

Conclusions: The associations between mpox vaccination and STI testing and PrEP, but low overall uptake, suggest opportunities for further integration of mpox vaccination with sexual health services. However, broader uptake will also require complementary vaccine delivery strategies to reach MSM less connected to sexual health delivery systems.

OAC0204

Risk of hepatitis C infection following bacterial sexually transmissible infections among gay and bisexual men in Australia 2016-2020

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Background: In Australia, the incidence of hepatitis C virus (HCV) infection has declined among gay and bisexual men (GBM) with HIV since 2015 and is low among GBM using HIV pre-exposure prophylaxis (PrEP).

However, ongoing HCV testing, and treatment, is required to sustain HCV elimination. Annual HCV testing is recommended in Australia for all GBM with HIV and GBM using PrEP regardless of sexual or substance use behaviours.

Bacterial sexually transmissible infections (STIs) are associated with similar behaviours as HCV among GBM, and therefore may be useful to guide more person-centered and tailored HCV testing. To examine this, we measured the association between STIs and HCV from 2016 to 2020.

Methods: Data were from a national network of primary care and sexual health clinics participating in the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance (ACCESS). GBM included had at least one HCV antibody negative test during the observation period and ≥ 1 subsequent HCV test. Discrete time modelling estimated the association between a positive syphilis, rectal chlamydia, and rectal gonorrhoea diagnosis in the preceding two years on incident HCV infection, reported as an adjusted hazard ratio (aHR). Analyses were stratified by GBM with HIV and GBM prescribed PrEP and adjusted for age and the number of each STI test undertaken.

Results: Among 6,529 GBM with HIV, 92 had an incident HCV infection which was associated with a syphilis infection (aHR 1.99, 95%CI:1.11-3.56). Of 13,061 GBM prescribed PrEP, 48 had an incident HCV infection, which was associated with rectal chlamydia (aHR 2.73, 95%CI:1.40-5.30) and rectal gonorrhoea (aHR 2.58, 95%CI:1.30-5.13).

Conclusions: HCV was associated with bacterial STIs among GBM with HIV and GBM using PrEP. These findings suggest that an STI diagnosis should prompt a conversation about HCV testing, and that more frequent HCV testing may be justified among GBM with STIs.

OAC0205

Integration of PrEP services and assisted partner notification into an STI Clinic in Lilongwe, Malawi

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Background: HIV pre-exposure prophylaxis (PrEP) has been integrated into sexually transmitted infection (STI) care in Malawi/sub-Saharan Africa (SSA); however, the success and prevention impact of integration has not been evaluated. Expanding prevention services to sexual partners of persons with STIs is another opportunity to increase PrEP reach. We evaluated an integrated PrEP and assisted partner notification (aPN) program in an STI clinic in Lilongwe, Malawi.

Methods: We enrolled "index" participants who were initiating oral PrEP at the Bwaila District Hospital STI Clinic (≥ 15 years, STI symptoms or exposure, HIV-seronegative). Participants completed surveys and provided contact information for sexual partners. Clinic staff contacted named partners who did not report to clinic within 14 days for STI treatment and HIV testing. Returning partners were screened for PrEP eligibility and, if interested and eligible, initiated PrEP and enrolled in the study.

Results: 175 index participants enrolled between March-December, 2022. The median age was 27 (interquartile range [IQR]: 23-32) and most were male (110/175; 63%).



Twenty-one percent (36/175) were adolescent girls and young women. In the preceding month, 40% (70/175) reported exchanging sex for goods/money/favors and 13% (23/175) had ≥ 1 known HIV-positive partner.

Before enrollment, 34% (60/175) had heard of PrEP. Forty-nine percent (86/175) of participants provided contact information for 100 sexual partners. Fifty-eight partners returned to clinic: 34% (20/58) were HIV-seropositive and ineligible (4 newly diagnosed; 16 previously diagnosed).

Of eligible partners, 71% (27/38) initiated PrEP and enrolled, and 29% (11/38) declined PrEP and/or study procedures. Median age of enrolled partners was 26 (IQR: 22-31) and most were female (20/27; 74%).

Conclusions: Ours is the first to demonstrate successful integration of PrEP within an STI clinic in SSA and highlights the benefits of aPN for promoting partner engagement in HIV prevention services. Although STI clinic-based PrEP does not explicitly target key populations, more than half of indexes fell into at least one priority category (exchanged sex for goods/money/favors or young women), and many were in serodiscordant relationships. Engaging young heterosexual men in PrEP care has been a historically under-examined opportunity to interrupt transmission and may be particularly powerful when coupled with PrEP referral for female partners.

OAC03 Achieving HIV prevention and treatment at scale

OAC0302

Enhanced linkage to care following home-based HIV testing improves linkage, ART initiation and retention, and 12-month viral suppression—the Ekkubo study: a cluster randomized trial in Uganda

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Background: HIV testing in the universal test and treat (UTT) era in settings where immediate ART initiation is not feasible may require support for care engagement to achieve viral suppression. The Ekkubo study, a cluster ran-

domized trial in rural Uganda, tested an enhanced linkage to care intervention vs standard-of-care+referrals to care in the context of home-based HIV testing.

Methods: Between November 2015 and March 2020, home-based HIV testing was conducted in pair-matched villages randomized to intervention or comparator arms across 4 districts in central Uganda. Individuals aged 15-59 newly diagnosed HIV positive or previously diagnosed but never linked to care in intervention villages received 3 brief sessions at-home and 1 phone follow-up focused on overcoming barriers to care, eliciting a plan to engage in care, and social support resources to address stigma and other needs. Those in standard-of-care+ villages received 2 brief sessions at-home referring them to care and reinforcing the referral.

The primary outcome was viral suppression (<20 copies/mL) at 12 months. Secondary outcomes included linkage, ART initiation, time to ART initiation, and ART retention. Intention-to-treat analyses accounted for the cluster design.

Trial registration: NCT02545673

Results: In the 56 clusters/villages (28 per arm), 284 (62.3% female) and 283 (62.9% female) individuals were enrolled in intervention and comparator arms, respectively. Average cluster size was 10.31 (SD 13.97, range 1-57). Average age was 30.77 (SD 9.45), 543 (95.8%) were newly diagnosed. At 12 months, 134/284 (47.2%) and 114/283 (40.3%) of participants in intervention and comparator clusters respectively achieved VL <20 (adjOR, 1.60, 95%CI 1.13-2.26, $p=0.008$). Intervention participants also did better for linkage to care (assessed as a 2nd visit; adjOR, 1.65, 95%CI 1.09-2.49, $p=0.017$) and ART initiation (adjOR, 1.97, 95%CI 1.33-2.90, $p<0.001$) and retention (adjOR 4.16, 95%CI 1.14-13.87, $p=0.015$) than standard-of-care+ participants, but there was no difference for time to ART initiation among those who initiated (adjHR 1.06, 95%CI 0.78-1.46, $p=0.69$). 12-month study retention was $>84\%$ in both arms, including deaths.

Conclusions: Focused linkage support at diagnosis and shortly thereafter increased linkage, ART initiation, retention, and viral suppression. This intervention may have utility with populations experiencing linkage and viral suppression challenges.

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Background: Although Primary Health Care (PHC) is part of the AIDS care and prevention services, the effect of PHC on AIDS outcomes is poorly understood in low- and middle-income countries (LMICs). We evaluated the impact of one of the largest PHC programs in the world, the Brazilian Family Health Strategy (FHS), on AIDS incidence and mortality using a cohort of 3.4 million individuals over a 9-year study period in Brazil.

Methods: We analyzed AIDS data from individuals aged 13 years or older who were members of a nationwide cohort of the poorest Brazilian people (The 100 Million Brazilians Cohort) from January 1, 2007 to December 31, 2015 and compared residents in municipalities with no FHS coverage with residents in municipalities with full FHS coverage. We used multivariable Poisson regressions, adjusted for all relevant demographic, socioeconomic, and municipal variables, and weighted with inverse probability of treatment weighting (IPTW), to estimate the effect of FHS on AIDS incidence and mortality rates.

We also estimated effects by sex, age, race/ethnicity, and by AIDS municipal incidence. We conducted sensitivity and triangulation analyses.

Results: FHS coverage was associated with lower AIDS incidence (rate ratio [RR] 0.76, 95%CI 0.68–0.84) and mortality (0.68, 0.56–0.82). The effect of FHS on incidence was greater among females (0.70, 0.61–0.82) and Black population (0.64, 0.45–0.92). The effect of FHS on mortality was greater among males (0.64, 0.49–0.83).

For both outcomes, the effect of FHS coverage was stronger among people aged 35 years or older (0.62, 0.53–0.72 – incidence and 0.56, 0.43–0.72 – mortality), although a lower incidence was also observed among people aged 13–34 years (0.83, 0.72–0.96).

Conclusions: FHS coverage impacts AIDS morbidity and mortality among the most vulnerable populations in Brazil. Our results show the importance of expanding and strengthening PHC in LMICs to contribute to the goal of ending AIDS by 2030, including the improvement of infrastructure and human resources for the decentralization of care, treatment, and monitoring of people with HIV/AIDS.

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Background: Pre-exposure prophylaxis (PrEP) is a highly effective intervention that can prevent HIV acquisition. Through the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the US Centers for Disease Control and Prevention (CDC) supports PrEP programs for key populations (KP) (i.e., Female Sex workers (FSW), men who have sex with men (MSM), transgender people (TG), people who inject drugs (PWID) and people in prisons and other enclosed settings). UNAIDS' current goal is to reach 10 million people with PrEP by 2025. We examined CDC's scale-up of PrEP during Covid-19 among KP beneficiaries to evaluate progress towards the UNAIDS goal.

Methods: Using programmatic data from PEPFAR's Monitoring, Evaluation and Reporting system, we assessed the number and percentage of KP beneficiaries who initiated PrEP, by KP group and by year, from 2019 to 2022 in 30 countries. We assessed trends by year among 27 countries with complete testing and PrEP initiation data. We also consulted narrative reports of program services to understand changes made to PrEP delivery.

Results: CDC supported 1,371,984 PrEP initiations during 2019–2022, of whom 520,981 identified as KP. The percentage of HIV-negative KP accepting PrEP increased by 532%, from 3.1% in 2019 to 19.6% in 2022. The largest relative increases in uptake were among PWID and prisoners, although the absolute percentages were <10%. Although FSW and MSM showed highest uptake in 2022, over 70% of these KP did not initiate PrEP.

Key Population groups	PrEP Initiation among Key Population beneficiaries supported by CDC in 27 PEPFAR-funded countries, 2019–2022. Numbers of KP enrolled in PrEP/ number of HIV-negative KP (%)				% Increase in proportion of HIV-negative KP accepting PrEP from 2019 to 2022
	2019	2020	2021	2022	
Female sex workers (FSW)	13,180/ 245,659 (5.4%)	34,978/ 508,598 (6.9%)	91,521/ 700,578 (13.1%)	163,638/ 695,078 (23.5%)	335%
Men who have sex with men (MSM)	66,059/ 54,209 (11.2%)	118,555/ 238,672 (7.8%)	52,350/ 381,094 (13.7%)	88,084/ 340,985 (25.8%)	130%
People who inject drugs (PWID)	690/ 90,619 (0.8%)	2,573/ 184,876 (1.4%)	9,277/ 174,085 (5.3%)	16,866/ 178,902 (9.4%)	1075%
People in prisons	5,514/ 269,276 (0.2%)	589/ 146,251 (0.4%)	8,842/ 150,051 (5.9%)	7,086/ 195,015 (3.6%)	1700%
Transgender people	183/ 1,801 (10.2%)	635/ 2,250 (28.2%)	1,516/ 4,959 (30.6%)	2,341/ 11,406 (20.5%)	101%
Total	20,626/ 661,564 (3.1%)	57,330/ 1,080,647 (5.3%)	163,506/ 1,410,767 (11.6%)	278,015/ 1,421,386 (19.6%)	532%



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Conclusions: Despite Covid-19 disruptions in service delivery, we observed substantial PrEP scale-up in CDC programs. Program modifications such as HIV self-testing, telemedicine, and community-based deliveries may have facilitated PrEP expansion during this time.

To reach UNAIDS' global goal, additional innovations, such as long-acting injectable PrEP, event-driven PrEP, and programs to increase PrEP awareness/literacy among beneficiaries and providers may increase uptake by KP. Continuous monitoring and evaluation of KP PrEP programs is critical to meet ambitious UNAIDS global targets.

OAC0305

Increased HIV prevention coverage among Australian gay and bisexual men with regular partners: results of national behavioural surveillance, 2018-22

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Background: Increasing use of biomedical HIV prevention methods has been reported among gay and bisexual men (GBM) in Australia with casual partners. Less attention has been paid to HIV prevention strategies among GBM with regular partners. We analysed trends in behavioural surveillance data to identify changes in HIV prevention methods by GBM with regular partners, and levels of prevention coverage (and risk).

Methods: Behavioural surveillance data from the Gay Community Periodic Survey (collected between 2018-22) were analysed. Trends in condom use, condomless sex with regular partners (i.e., use of any effective strategy, e.g., condoms, PrEP, undetectable viral load [UVL]) were assessed using logistic regression. Trends were stratified according to reported sexual activity with casual partners.

Results: 24,316 survey responses from participants with regular male partners were included for analysis. The mean age of the sample was 38.2 years, 68.6% were Australian-born, 90.0% gay-identified, and 8.6% living with HIV.

The proportion who reported consistent condom use declined from 12.3% in 2018 to 9.3% in 2022 while any CAIR increased from 67.2% to 74.8% (both $p < .001$). HIV prevention coverage with regular partners increased from 94.3% in 2018 to 98.4% in 2022 ($p < .001$).

The proportion of GBM with regular partners who were HIV-positive and reported UVL remained stable (6.2% to 5.5%, $p = .253$), as did the proportion of non-HIV-positive GBM whose regular partners were HIV-positive with UVL (1.2% to 1.0%, $p = .103$).

The proportion of participants with regular partners who were HIV-negative and on PrEP increased from 16.6% to 34.8% ($p < .001$), however, this increase in PrEP use was concentrated among participants with regular partners who also reported condomless sex with casual partners (from 38.0% to 68.4%, $p < .001$).

Conclusions: Risk of HIV transmission between regular partners was low and continually decreased between 2018 and 2022. GBM with regular partners increasingly use biomedical methods to prevent HIV transmission, and PrEP use was concentrated among those who also engaged in condomless sex with casual partners.

OAC04 Strengthening sexual and reproductive health for diverse populations

OAC0402

No association between in-utero PrEP exposure and bone mineral density at 36 months of age among mother-infant pairs in Kenya

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Background: Previous studies found that tenofovir-based ART use during pregnancy among women living with HIV is associated with lower bone mineral density (BMD) in neonates. It is unknown whether these differences persist beyond the neonatal period or exist among neonates born to women without HIV who used tenofovir-based PrEP during pregnancy.

Methods: We utilized data from an ongoing evaluation of perinatal PrEP use in Kenya. In the parent study (NCT03070600), HIV-negative women were enrolled and offered tenofovir-based PrEP during pregnancy at 20 public clinics and followed through 9 months postpartum regardless of PrEP status. An extension cohort to evaluate safety outcomes enrolled mother-child pairs at 4 sites to be followed until the child's 5th birthday.

A subset of singleton children aged 36 months with in-utero PrEP exposure was randomly selected and matched to children without in-utero PrEP exposure on maternal age, education level, and child sex and age. Whole-body BMD was measured by dual-energy x-ray absorptiometry


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(DEXA) at Aga Khan University Hospital in Nairobi, Kenya. Linear regression adjusting for matching characteristics was performed to evaluate the relationship between BMD and PrEP exposure.

Results: From December 2021 to December 2022, 40 children with in-utero PrEP exposure and 71 without PrEP exposure had whole-body BMD measurements. The median age at DEXA scanning was 36.7 months (IQR: 36.2-38.0), 40% of children were female, and the median maternal age at delivery was 27.6 years (IQR: 22.1-32.6).

The median height for children at DEXA scanning was similar between those with and without PrEP exposure (94.3 cm vs. 94.0 cm, $p=0.455$). The median whole-body BMD for children with and without in-utero PrEP exposure was 418.5 mg/cm² (IQR 399.2-440.0) and 423.0 mg/cm² (IQR 395.5-457.5.0), respectively. There was no difference between mean whole-body BMD among children with and without in-utero PrEP exposure (adjusted mean difference -21.6 mg/cm², 95% CI -60.1-17.0, $p=0.270$).

Conclusions: PrEP exposure was not associated with BMD or height at 36 months among children with mothers who used PrEP during pregnancy. Our findings suggest that in-utero PrEP exposure may not impact BMD into early childhood.

OAC0403

Cofactors of HIV self-testing and PrEP acceptance among pregnant women at high risk of HIV in Kenya

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Background: PrEP and HIV self-testing (HIVST) for male partners are being scaled up within antenatal clinics (ANC). Few data are available on how co-distribution influences acceptance of both interventions and the cofactors for PrEP, HIVST or combined PrEP/HIVST use among pregnant women at high risk for HIV.

Methods: We utilized data from the PrIMA (NCT03070600) trial in Kenya. Women included in this analysis were determined to be at high HIV risk and offered PrEP and partner HIVST. Characteristics were compared between women who chose:

1. PrEP and HIVST,
2. HIVST-alone,

3. PrEP-alone, or;

4. Declined both (reference), excluding women with partners known to be living with HIV.

Results: Among 911 women, the median age was 24 years, 87.3% were married, and 13.0% had history of intimate partner violence (IPV); 68.8% accepted HIVST and 18.4% accepted PrEP. Of women accepting HIVST, 84% offered them to partners; 94% of partners used HIVST; 1.2% had a reactive HIVST.

Partner HIV testing increased from 20% to 82% and women's knowledge of partner HIV status increased from 4.7% to 82.0% between pregnancy and 9-months postpartum ($p<0.001$). Overall, 54.7% accepted HIVST-alone, 4.1% PrEP-alone and 14.3% both HIVST and PrEP. Compared to women who accepted neither, choosing:

1. HIVST-alone was associated with being married, participant and partner higher level of education, and residing with partner;
2. PrEP-alone with lower social support, IPV, not residing with partner, longer time with partner, and suspicion of other sexual partners, and;
3. PrEP and HIVST was associated with being married, IPV, and suspicion that partner had other partners.

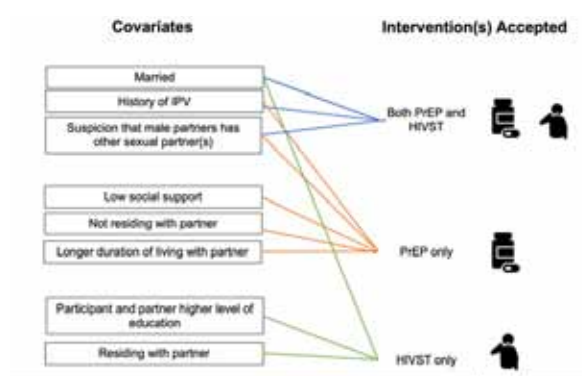


Figure 1. Cofactors for PrEP, HIVST, or combined PrEP/HIVST acceptance among pregnant women attending ANC.

Conclusions: Understanding factors associated with accepting HIVST, PrEP or both can inform HIV prevention programs for pregnant women. Strategies to improve women's self-efficacy to take up HIV prevention interventions are important to reduce incident infections during pregnancy and postpartum.



OAC0404

Drug-drug interaction between emtricitabine/tenofovir alafenamide (FTC/TAF)-based PrEP and feminizing hormones in transgender women: peripheral blood mononuclear cells and urine analysis from the iFACT3 study

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Background: We previously observed that plasma tenofovir (TFV) and emtricitabine (FTC) exposures were not significantly different among transgender women when FTC/TAF-based PrEP was administered with and without feminizing hormone therapy (FHT).

Herein, we report the impact on the intracellular TFV-diphosphate (TFV-DP) and FTC triphosphate (FTC-TP) concentrations, the therapeutically active forms, in peripheral blood mononuclear cells (PBMCs), and on TFV/FTC urine concentrations.

Methods: Twenty transgender women who had not undergone orchiectomy were enrolled between January and February 2022. FHT (estradiol valerate 2 mg and cyproterone acetate 25 mg) was initiated at baseline and prescribed until week 9, while PrEP (FTC 200 mg/TAF 25 mg) was initiated at week 3 and prescribed until the end of study at week 12. PK sampling for drug level measurement was performed at weeks 9 (with FHT) and 12 (without FHT). PBMC samples were collected at 2 and 24 hours after FTC/TAF administration to assess FHT effect on TFV-DP and FTC-TP levels; and a 24-hour urine collection was used to assess FHT effect on TFV/FTC.

Results: Eighteen participants completed the PK visits and were included in this analysis. Median (IQR) age and body mass index were 28 (23-32) years and 20.8 (19.9-21.9) kg/m², respectively. The PBMC 2 hour (C₂) and 24 hour (C₂₄) geometric mean ratios (GMRs) (95%CI) at week 9 and week 12 (reference) were as follows: TFV-DP, 1.04 (0.91-1.19, $p=0.59$) and 0.96 (0.82-1.13, $p=0.65$); and FTC-TP, 0.97 (0.85-1.10, $p=0.61$) and 0.91 (0.75-1.10, $p=0.33$) (figure). Urine GMRs for TFV and FTC were 1.05 (0.84-1.32, $p=0.67$) and 0.92 (0.75-1.13, $p=0.42$).

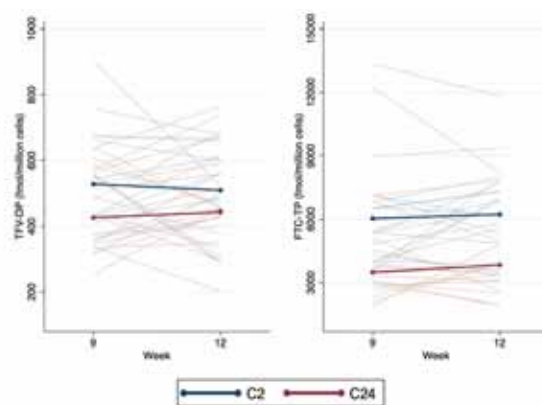


Figure. Geometric mean antiretroviral drug concentrations at week 9 (with FHT) and week 12 (without FHT)

Conclusions: Intracellular TFV-DP and FTC-TP levels in PBMCs and urine TFV and FTC concentrations were comparable when F/TAF-based PrEP was administered with and without FHT, suggesting no clinically significant drug-drug interaction from FHT towards FTC/TAF-based PrEP. Tissues rectal measurements of TFV-DP and FTC-TP levels are ongoing.

OAC0405

Experiences of reproductive coercion among women living with HIV in sub-Saharan Africa, eastern Europe and Central Asia

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Background: Evidence suggests that women living with HIV (WLHIV) experience coercion by healthcare providers related to sterilization, contraception/family planning, pregnancy and feeding practices. However, there has been limited quantification of the prevalence and determinants of reproductive coercion among WLHIV.



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Methods: The People Living with HIV (PLHIV) Stigma Index 2.0 study was implemented in 16 countries in Eastern Europe and Central Asia (EECA) and Sub-Saharan Africa (SSA). Study implementation was led by networks of PLHIV(2020-2022).

Interviewer-administered questionnaires were used to collect self-reported socio-behavioral measures among 10,555 cisgender 18+ year old WLHIV. Reproductive coercion in these analyses was categorized based on coercive experiences relating to recent (within last 12 months) sterilization; contraception/family planning; and pregnancy and feeding practices. Multilevel logistic regression models were used to assess hierarchical determinants of reproductive coercion.

Results: Among participants in SSA, 0.5% reported sterilization, 1.6% reported coercion of contraception and family planning; and 4.8% reported coercion of pregnancy and feeding practices. Among participants in EECA, 3.2% reported sterilization, 3.9% reported coercion of contraception and family planning; 8.5% reported coercion of pregnancy and feeding practices.

Women in EECA had an increased odds of sterilization, coercion related to contraception/family planning, and coercion related to pregnancy and feeding practices compared to women in SSA (Table 1).

Across regions, sex workers, migrants, and women who inject drugs, and women with disabilities had greater odds of reproductive coercion compared to other WLHIV.

Conclusions: In 2022, recent reproductive coercion is common among WLHIV globally. Programs with trainings on accurate, evidence-based, and person-centered care for PLHIV, and non-stigmatizing care practices may improve healthcare provision of reproductive and sexual health-care among WLHIV. Non-discrimination protections for WLHIV may support prevention of reproductive coercion and allow accountability when it occurs. Lastly, initiatives to support WLHIV in knowing their rights and how to seek justice may improve the health and wellbeing of WLHIV.

Characteristics	Reproductive coercion within the 12 last months			
	Sterilization - recent		Contraception and family planning - recent	
	OR (95%CI)	aOR* (95%CI)	OR (95%CI)	aOR* (95%CI)
Region				
Sub-Saharan Africa	Ref	Ref	Ref	Ref
Eastern Europe and Central Asia	7.61 (2.52, 23.48)	7.62 (2.38, 26.33)	2.82 (1.40, 5.68)	3.08 (1.46, 6.48)
Sex worker	2.43 (1.43, 3.48)	2.19 (1.46, 2.45)	1.89 (1.31, 2.81)	1.72 (1.24, 2.40)
Migrant	3.58 (1.26, 10.21)	3.52 (1.26, 10.14)	2.28 (1.12, 4.24)	2.21 (1.12, 4.37)
Disability	2.12 (1.19, 3.80)	2.05 (1.15, 3.70)	2.19 (1.14, 4.25)	2.11 (1.12, 3.98)
Injection drug use	1.75 (1.05, 2.92)	1.88 (1.08, 3.31)	2.11 (1.46, 3.17)	2.19 (1.46, 3.30)

* Multi-level logistic regression model with random intercepts adjusted for age, education, relationship, time from HIV diagnosis. Separate models are run for each exposure and each respective reproductive coercion outcomes.
Analysis 1: exposure is region and outcomes are reproductive coercion, comparing all women living with HIV in central Asia and eastern Europe to all women in sub-Saharan Africa.
Analysis 2: exposure is sex work and outcomes are reproductive coercion, comparing women who report engagement in sex work to women who do not report engagement in sex work. This analysis includes women in both regions.
Analysis 3: exposure is migrant, and outcomes are reproductive coercion, comparing women who report being a migrant to women who do not being a migrant. This analysis includes women in both regions.
Analysis 4: exposure is disability and outcomes are reproductive coercion, comparing women who report having a disability to women who do not report having a disability. This analysis includes women in both regions.
Analysis 5: exposure is injection drug use and outcomes are reproductive coercion, comparing women who report history of injection drug use to women who do not report injection drug use. This analysis includes women in both regions.

Table 1. Reproductive coercion among women living with HIV in Sub-Saharan Africa (Angola, Benin, Burkina Faso, Cote D'Ivoire, Ghana, Kenya, Mauritania, Nigeria, Lesotho, Togo, Zimbabwe) and Eastern Central Europe and Central Asia (Kazakhstan, Kyrgyzstan, Belarus, Russia, Ukraine).

OAC05 Differentiated service delivery with focus on PrEP

OAC0502

A pharmacist-led oral PrEP refill visit with client HIV self-testing significantly improved continuation in Kenya

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Background: Delivery of oral pre-exposure prophylaxis (PrEP) is being scaled up in Africa. However, health system barriers including lengthy visits endanger client continuation. We evaluated the efficiency and impact of direct-to-pharmacy PrEP refill visits with HIV self-testing (HIVST).

Methods: Between September 2020 and January 2022, we conducted a quasi-experimental study of differentiated direct-to-pharmacy PrEP refill visits among adult men and women receiving PrEP at four public health HIV clinics in Central Kenya. Two clinics implemented the intervention which included direct-to-pharmacy for PrEP refill, HIVST while waiting and 3-monthly refill visits with pharmacist-led rapid risk assessment. Two clinics comparable in size and client volume served as controls with the usual standard of care (SOC), which typically includes monthly refills with multiple client room stops.

We conducted 80 time and motion studies to determine client time in the clinics. PrEP continuation was evaluated by visit attendance and pharmacy refill records. We used logistic regression to assess the intervention effect on PrEP continuation and the Wilcoxon rank sum test to assess the impact on clinic time.

Results: Overall, 746 clients were enrolled: 338 in SOC and 380 in intervention clinics; 57% were female, the median age was 33, and 58% were in serodifferent partnerships. Prior to implementation, intervention, and controls clinics were comparable on client characteristics (female: 51% vs 47%; median age: 33 vs 33 yrs) and PrEP continuation (35% vs 37% at 1 month, and 37% vs 39% at 3 months; P>0.05 for all).

The intervention reduced total time spent at the clinic by 35%, the median time spent in SOC was 51 minutes while in intervention clinics was 33 minutes; p<0.001.

However, time spent on HIV testing (20min vs 20 min; p=0.50) and pharmacy (8min vs 8 min; p=0.8) was unchanged. Similarly, PrEP continuation was significantly higher in the intervention clinics compared to control clinics: 45% vs 33% at 1 month and 34% vs 25% at 3 months; P<0.05 for all.



Conclusions: A client-centered PrEP delivery approach with direct-to-pharmacy PrEP refill visits plus client HIV self-testing reduced clinic visit time and significantly improved PrEP continuation in public health HIV clinics in Kenya.

OAC0503

Same-day initiation of oral pre-exposure prophylaxis is high among adolescent men who have sex with men and transgender women in Brazil

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Background: In recent years, human immunodeficiency virus (HIV) incidence has increased among adolescent men who have sex with men (aMSM) and transgender women (aTGW). Expanding prevention strategies, including daily oral HIV Pre-Exposure Prophylaxis (PrEP), is crucial for controlling the epidemic. Recently, PrEP offer in the Unified Health System was expanded to individuals aged between 15 and 17 years, sexually active and vulnerable to HIV. This study aimed to analyze the sociodemographic and behavioral characteristics of adolescent men who have sex with men (aMSM) and transgender women (aTGW) initiating oral PrEP in HIV prevention clinics.

Methods: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study of aMSM and aTGW aged 15–19 living in three large Brazilian capital cities. For this analysis, we included adolescents who enrolled in PrEP1519 from February 2019–August 2021 and were followed until February 2022 to assess PrEP initiation. Adolescents who visited the PrEP clinics were classified into four groups based on PrEP eligibility and on their decision to use PrEP:

- i. Ineligible for PrEP;
- ii. Eligible, initiated PrEP at first visit;
- iii. Eligible, initiated PrEP after first visit; and
- iv. Eligible, did not initiate.

The groups were described and compared using the χ^2 and Fisher's Exact tests.

Results: Of the 1,254 adolescents who visited the PrEP clinics, 61 (4.9%) were clinically ineligible for PrEP initiation (37.7%) or had a low HIV risk (62.3%). Of the 1,193 eligible for PrEP initiation, 1,113 (93.3%) initiated PrEP, and 80 (6.7%) did not. Of the 1,113 adolescents who initiated PrEP, 87.3% did so on the same day and 12.7% later.

Half of those who initiated PrEP in subsequent visits did so within 42 days from the first visit. Despite 90% of the PrEP decliners declaring a low risk of HIV infection, most reported condomless anal sex in the past six months (70%).

Conclusions: Same-day PrEP initiation among aMSM and aTGW was high, highlighting the importance and need for promoting effective PrEP offer and access among adolescents with increased vulnerability to HIV.

OAC0504

PrEP and service utilization among sexual and gender minority youth (SGMY) were significantly improved with an intervention that includes multiple intervention strategies: automated text messages, peer support and coaching

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Background: Uptake of both health care interventions, especially pre-exposure prophylaxis (PrEP) or Post-exposure prophylaxis (PEP) with antiretroviral drugs (ARV), and sustained engagement with social services to cope with comorbid conditions of homelessness, substance abuse, mental health disorders, or a lack of food, clothing, transportation and toiletries are need by young people at risk for HIV. This study evaluates the level of intervention needed to improve uptake of these services.

Methods: Gay, bisexual, transgender and gender diverse youth aged 12–24 years old (N=895), who were predominantly Black and Latino, were recruited from 2017–2019 from 13 community agencies in Los Angeles and New Orleans and assessed at 4-month intervals over 24-months with 90%–70% follow-up. Youth were randomized to interventions designed to support uptake of the HIV Prevention Continuum (linkage to healthcare, uptake and adherence to PrEP, PEP and/or 100% condom use) and hierarchies of needs (housing, income, social relationships, mental health, risks) in a four-arm factorial design: 1) automated messaging and monitoring (AMMI) via text-messages (n = 313); 2) AMMI plus peer support via private social media (AMMI-PS; n = 205); 3) AMMI plus strengths-based telehealth Coaching (AMMI-C; n=196); or 4) AMMI plus peer support and coaching (AMMI-PS-C; n = 181). Intent-to-treat analyses used Bayesian generalized linear modelling of intervention impact over 24-months.

Results: Significant benefits were found on two outcomes. PrEP uptake matched youth national rates initially (11.3% current, 18.8% lifetime) and increased at 4-months to 15% across intervention arms but continued to increase in the AMMI-PS-C arm over time compared to other groups (OR 2.35; 95% CI:1.27–4.39 vs. AMMI control). By 12 months,



over 23% of AMMI-PS-C participants reported PrEP use, with some fall-off at 20-24 months, concurrent with the COVID-19 epidemic. About half of the youth receive no ancillary services during each assessment period. Youth receiving the AMMI condition had significantly greater use of services when recruited; however, over time the rate of service use remained most consistent in the AAMI-PS-C condition.

Conclusions: The most intensive intervention group receiving AMMI, peer support, and coaching improved and sustained PrEP use and services utilization over time compared to other groups.

OAC0505

Increased use of event-driven PrEP during COVID-19 in Australia: results from behavioural surveillance 2019-2021

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Background: COVID-19 has impacted sexual behaviour and engagement with sexual health services including HIV/STI testing and PrEP. Event-driven PrEP (ED-PrEP) has been included in Australian PrEP guidelines since 2019 and may be an attractive option for gay and bisexual men (GBM) who reduced their sexual activity due to COVID-19.

Methods: ED-PrEP use trends between 2019 and 2021 were assessed using national data from the Gay Community Periodic Surveys. Additional analyses using data from the last available COVID-19-affected rounds (2020-21) were included to compare characteristics between daily PrEP users and ED-PrEP users.

Results: Between 2019-2021, 24,815 survey responses were included. Of these, 6,754 (27.0%) reported PrEP use in the last 6 months (25.6% in 2019 to 26.9% in 2021). Among PrEP users, ED-PrEP use increased from 7.8% in 2019 to 20.0% in 2021. There were 2,077 PrEP users in the last available round in 2020-2021; 79.5% were daily PrEP users and 20.5% ED-PrEP users. Compared to daily PrEP users, ED-PrEP users were less likely to identify as gay (84.2 vs 88.7%, aOR=0.70, 95%CI=0.50-0.97), have received an STI diagnosis in the last 12 months (29.4% vs 38.5%, aOR=0.74, 95%CI=0.58-0.96), or have engaged in condomless anal sex with casual partners in the last 6 months (64.0% vs 72.4%, aOR=0.72, 95%CI=0.56-0.94). ED-PrEP users were more likely to have reduced their PrEP use due to COVID-19 (60.8% vs 46.5%, aOR=1.75, 95%CI=1.38-2.21).

Conclusions: ED-PrEP use more than doubled between 2019 and 2021. ED-PrEP users had a lower risk profile as they are less likely to engage in condomless sex or receive an STI diagnosis. ED-PrEP users were more likely to report

PrEP disruptions due to COVID-19 and may have switched from daily to ED-PrEP. Continued monitoring of ED-PrEP use is recommended for tracking the impact of COVID-19 on PrEP use and uptake of this regimen generally.

OAD01 Situating gender-based violence in the HIV field: Evidence, advances and action

OAD0102

Reporting, prevention and response of gender based violence against men who have sex with men in Taraba State, Nigeria

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Background: Men who have sex with men (MSM) in Taraba state have HIV prevalence that is 10 to 15 times higher than the general population. They are also frequently affected by Gender-Based Violence (GBV). The experience of GBV has been associated with higher vulnerability to HIV among MSM. To prevent GBV and mitigate its effects on HIV outcomes and to promote well-being of its MSM participants, ICTHARAE has implemented GBV activities for HIV prevention, treatment and care program in Taraba between 2019 to 2022.

Description: ICTHARAE's GBV reporting, prevention, and care program component promotes a dynamic of empowerment of MSM. First, we used psychosocial education and funder-support capacity building to strengthen MSM's knowledge of their human and legal rights with an enlightenment on the constitutional and legal environment in the fight against GBV as well as de-normalize the violence that they experience frequently. MSM who have been victims of GBV received legal and psychosocial services and are assisted to report and prosecute if they wish. ICTHARAE leaders and MSM community members(MSM-CM) hold advocacy sessions with authorities Taraba.

Lessons learned: From 2019-2022, 189 cases of physical, sexual, social, and emotional GBV were reported by Key Population leaders (41 cases), ICTHARAE staff (50 cases) and MSM-CM (98 cases). Cases that have elements of physical GBV were 57, sexual GBV were 85, that of social GBV were 59 and emotional GBV were 157. Between 2019 to 2022, 69 authorities participated in advocacy sessions and 130 MSM participated in capacity building and psycho-education/sensitization on GBV. Also, with funder support, a new strategy that empowers ICTHARAE to support organizations with \$1000 to tackle GBV issues was also implemented and 5 organizations participated.



Conclusions/Next steps: Unfortunately GBV continues to be a barrier to HIV prevention and treatment for MSM in Taraba. In 2023, ICTHARAE plans to strengthen GBV reporting network to include beneficiary of the \$1000 support fund while planning to reach MSM community members in other states of Nigeria.

ICTHARAE is also exploring other means to strengthen referral of GBV survivors to medical, legal, social support services and to promote the systematic documentation of violence to support national advocacy.

OAD0103

Different forms of violence among displaced and conflict-affected women living with HIV (WLHIV) in Ukraine

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Background: Women living with HIV (WLHIV) in conflict zones are at high risk of sexual and physical violence due to instability, stigma, and proximity to military personnel. Given sustained ongoing conflict in parts of Ukraine, this study evaluated the relationship between displacement and sexual violence, health care-related stigma, and reproductive coercion among WLHIV in Ukraine.

Methods: Led by the All-Ukrainian Network of PLHIV (100% Life), WLHIV aged 18+ were recruited from 17 regions of Ukraine and completed a socio-behavioral questionnaire (July-August 2020). Displacement was defined as ever being a refugee, migrant worker, or internally-displaced person.

Outcomes included sexual violence, abuse perpetrated by healthcare workers, and reproductive coercion related to pregnancy, sterilization, and contraception.

Log binomial regression models estimated prevalence ratios (PR) and 95% confidence intervals (CI) for associations between displacement and each outcome. Models were adjusted for age, education, years knowing positive HIV status, and ever being on antiretrovirals.

Results: A total of 820 WLHIV completed the questionnaire. Displaced WLHIV were significantly more likely to have experienced sexual violence (PR: 2.72; 95%CI 1.69-4.36) and verbal or physical abuse in healthcare settings due to their HIV status (PR: 2.40, 95%CI 1.38-4.19) compared to non-displaced WLHIV. Displacement was also associated with contraceptive coercion (PR: 3.31, 95%CI 1.20-9.24).

Outcome ^a	PR	95% CI	aPR	95% CI
Sexual Violence	2.72	1.69-4.36	2.64	1.62-4.29
Abuse in Healthcare	2.40	1.38-4.19	2.36	1.30-4.31
Pregnancy Coercion	1.66	0.56-3.85	1.26	0.48-3.31
Sterilization Coercion	2.78	0.85-9.10	2.24	0.62-8.11
Contraception Coercion	3.34	1.21-9.07	3.31	1.20-9.14

^a Displacement was defined as ever being a refugee, migrant worker, or internally-displaced person.
^b Outcomes were modeled separately and compared for WLHIV who were and were not displaced; models were adjusted for age, education, years knowing positive HIV status, and ever being on antiretrovirals.

Table. Prevalence ratios (PR) and 95% confidence intervals (CI) for the association of displacement with outcomes related to sexual violence, health care-related stigma, and reproductive coercion among 820 women living with HIV (WLHIV) in Ukraine^a

Conclusions: Given the growing conflict in Ukraine, these data suggest that sexual violence and stigma are fundamental barriers to health and well-being among WLHIV in Ukraine. Training uniformed officers and clinicians at all levels to ensure understanding and accountability is likely central to mitigating these rights violations in the future, and scale-up of trauma-informed care for displaced WLHIV may serve to mitigate violations to date.

As short-term humanitarian health needs lessen and long-term reproductive health needs are re-prioritized for displaced populations living with HIV, a national focus on autonomy and client communication can also serve to mitigate rights violations.

OAD0104

Violence among adult Venezuelan migrants: results from a multi-site survey in Colombia

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Background: While globally prevalent, violence victimization of migrant populations is a concern due to contexts of migration and associated social and structural vulnerabilities. We estimated the prevalence and correlates of violence victimization among Venezuelan migrants in Colombia.

Methods: Venezuelan adults who migrated since 2015 and resided in four cities from Colombia were sampled using RDS. Socio-behavioral surveys included measures of psychological, physical, sexual violence, and sexual exploitation during their time in Colombia and within the past 12 months. Referrals were provided to participants who reported victimization.

Descriptive statistics and RDS-weighted estimation were used to calculate sample characteristics and prevalence estimates, respectively. We calculate adjusted odds ratios (aOR) of correlates of victimization using logistic regression models, stratified by gender.

Results: Participants (N=6,087) were median age of 32 years; 65% women, 34% men, and 1% transgender/non-binary-identified. Twelve percent of participants reported any victimization while in Colombia (RDS-weighted population prevalence: 11.7; 95%CI:11.0-12.6), which was lower in

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Barranquilla/Soledad vs. Bogotá/Soacha (8.3% vs 14.9%, $p<0.001$) and higher among men (15%) than transgender/non-binary participants (13%) and women (10%, $p<0.001$). Five percent (RDS-weighted population prevalence: 6.0; 95%CI:5.4-6.7) reported any violence in the past 12 months. Victimization in Colombia included psychological (7%), physical (7%), forced sex (1%), and sexual exploitation (2%). Men more commonly reported psychologic and physical violence while women and transgender/non-binary participants more commonly reported forced sex and sexual exploitation. Strangers were the most common perpetrator across forms of violence, followed by intimate-partners, family members, other trusted individuals, and police.

Among women, violence was associated with unsafe housing: having 1-10 unsafe nights (aOR: 1.9, 95%CI:1.4-2.7), ≥ 11 unsafe nights (aOR: 2.6, 95%CI:1.7-4.0); food-insecurity (aOR: 2.4; 95%CI:0.9-6.7); exchange-sex (aOR: 12.8; 95%CI:7.5-21.8); and pregnancy while in Colombia (aOR: 1.4; 95%CI:1.2-1.8) after controlling for site and year of migration.

Among men, violence was associated with unstable housing: 1-10 nights unsafe nights (aOR: 1.7, 95%CI:1.2-2.5), ≥ 11 unsafe nights (aOR: 2.3, 95%CI:1.4-3.7); food insecurity (aOR: 2.0; 95%CI:0.8-5.2), exchange sex (aOR: 3.5; 95%CI:1.7-7.3), and same-sex partnerships (aOR: 1.5; 95%CI:1.0-2.2).

Conclusions: Reported violence victimization while in Colombia are slightly lower than anticipated and likely attributed to under-reported intimate partner violence due to perceived low severity of violence.

Findings highlight the experiences of violence among migrants that relate to structural vulnerabilities associated with housing instability, food-insecurity, transactional sex, and stigmatization of sexual orientation or transgender identity.

OAD0105

Prevalence of intimate partner violence among adolescent girls and young women enrolled in the determined, resilient, empowered, AIDS-free, mentored and safe program in Zimbabwe; evidence from sentinel survey, 2022

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Background: Intimate partner violence (IPV) is pervasive globally, with 27% of women aged 15-49 years having experienced IPV in 2021, whilst it was 36% in sub-Saharan Africa. IPV against women is a human rights concern with negative outcomes including physical and mental health problems, as well as associated with acquiring HIV.

IPV among adolescent girls and young women (AGYW) enrolled in the Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) program has not been explored. We assessed the prevalence of IPV among the AGYW aged 9-19 years enrolled in the DREAMS program in Zimbabwe.

Methods: We conducted an analytical study among AGYW aged 9-19 years enrolled in the DREAMS program from the 1st of October 2021 to the 30th of September 2022. AGYW were randomly selected from the DREAMS program DHIS 2 database, and data were collected across all 9 Zimbabwe Health Interventions (ZHI) DREAMS districts. Data were collected using structured questionnaires with Kobo Toolbox and were analyzed using STATA generating descriptive statistics and measures of association. Study received ethics approval from Medical Research Council of Zimbabwe (MRCZ/A/2933).

Results: Of the 1,616 AGYW interviewed, 32.1% were aged 15-19 years, 3.8% were married, and 13.4% were sexually active. Nearly 7% (121/1,616) AGYW experienced different forms of IPV, and of these, 25% were slapped, 16% were hit by fist or threatened, 15% were pushed or shoved, and 14% were forced to have sex.

AGYW who were married were more likely to experience IPV than those single and widowed [COR =3.90 (95% CI =1.68: 9.05)]. AGYW who attained lower levels of education were more likely to experience IPV than those with higher levels of education [COR=4.71; 95% CI (4.11;5.40)].

Over 62% of AGYW reported that community leaders acted against perpetrators of IPV, and this was spearheaded through community norms change intervention under the DREAMS program.

Conclusions: A significant proportion of AGYW experienced IPV including slapping and forced sex. We recommend strengthening IPV reporting and service delivery through the DREAMS GBV platforms and to cascade community norms change intervention to all DREAMS districts to prevent IPV.



OAD02 Tackling stigma: Insights and interventions

OAD0202

An incognito patient approach to measure enacted HIV and gay stigma in healthcare settings

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Background: Enacted healthcare stigma has a complex and severe impact on physical and mental health of men who have sex with men (MSM). However, most studies measured enacted healthcare stigma using self-reported measures that may have been limited by social desirability bias.

This study applies standard patient (SP) approach to covertly observe provider behaviors to assess the impact of stigma against MSM in terms of HIV, sexual or its intersection on the quality of syphilis care in healthcare settings in China.

Methods: Trained SPs conducted unannounced visits with consenting providers. We randomly varied the HIV status and sexual orientation of each presented case to quantify stigma as differences in care across case scenarios. Care quality was assessed in 4 domains including adherence to clinical guidelines, diagnostic testing, patient-centred care, and visit duration. Item response theory models were used to calculate weighted indices for continuous care scores. Fixed effect linear and logistic regressions were used to assess differences in care quality across scenarios.

Results: SPs conducted 123 clinic visits with 41 providers across 17 clinics. Scores for clinical guideline adherence were lower in all stigmatized scenarios as compared to the referent condition of an HIV negative straight man, though only the estimate for HIV- MSM was statistically significant (β , - 0.61, 95% CI, -1.18, -0.04).

Appropriate diagnostic testing was less likely when SPs presented as HIV positive irrespective of sexual orientation (HIV+ straight: OR, 0.35, 95% CI 0.00-3.35; HIV+ MSM: OR 0.08, 95%CI 0.01- 0.77).

We did not observe differences in patient-centred care scores. No adverse events or overtly hostile provider behaviours were reported.

Conclusions: Our novel incognito patient approach documented notable declines in healthcare quality among cases presenting as HIV positive, MSM, or both. SPs presenting with stigmatized identities experienced less thor-

ough clinical assessments or diagnostic testing, suggesting that stigma most often manifests in the form of less attentive or even neglectful care. Our findings provide key insights to understand how stigma in marginalized populations can impair health even in the absence of grossly negligent. Results also informed the design of a pilot stigma reduction for providers, results of which are forthcoming.

OAD0203

Effects of a novel group-based cognitive behavioral therapy (CBT) intervention on stigma, psychosocial wellbeing and HIV service use among sexual and gender minorities in Nigeria

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Background: High levels of stigma due to identifying as a sexual or gender minority (SGM) as well as living with HIV (i.e., intersectional stigma) are increasingly documented in the African setting, and often manifest as self-stigma (also called internalized stigma). Such stigmas impede psychosocial wellbeing as well as HIV prevention/care, and there are few (if any) evidence-based internalized stigma reduction interventions in this context.

We developed and evaluated a novel, group-based CBT stigma intervention for men who have sex with men (MSM) and transgender women (TGW) at risk for/living with HIV in Lagos, Nigeria.

Methods: The intervention, adapted from a Canadian curriculum, comprised four weekly in-person sessions facilitated by community health workers. We conducted a delayed intervention group randomized controlled trial, with pre-post surveys plus 3-month follow-up, as well as qualitative interviews with participants / program staff. Outcomes included internalized stigma related to SGM and HIV status, depression, resiliency, and PrEP / HIV treatment use.

Results: Mean age of the 240 participants was 26 years (range 18-42). Seventy-seven percent were MSM and 23% TGW; 27% were living with HIV. Most (88%) participants attended all 4 sessions, and 98% expressed high intervention satisfaction.

There was significant improvement in each psychosocial outcome between baseline and second surveys, in both the immediate (post intervention) and delayed (pre-intervention) arms.

Qualitative data obtained from participants post intervention described enhanced self-confidence, resilience when facing stigma, and coping skills, and indicated that positive changes found in the delayed group (pre-intervention) were mainly due to perceived support from the interviewers / survey experience.



There were further positive changes from baseline to three-month follow-up in e.g., intersectional internalized stigma and depression, for the immediate intervention group. Controlling for baseline levels of ever PrEP use, 75% of immediate-group participants reported currently using PrEP at three months post-intervention vs. 53% of delayed-group participants right after the intervention ($p < 0.01$).

Conclusions: This study demonstrated feasibility and acceptability of a group-based CBT model in Nigeria. There were also indications of preliminary efficacy related to mental health outcomes and PrEP, despite the randomized design not holding up (where study participation/contact became an intervention in itself).

OAD0204

Political conservatism and social distancing from people living with HIV among medical students: mediating roles of negative stereotypes and negative intergroup emotions

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Background: HIV-related stigma within the health care system is a major barrier preventing people living with HIV (PLWH) from accessing and continuing treatment. Psychosocial factors such as political orientation, personality characteristics, and personal moral values of health care providers have not been adequately investigated. Furthermore, a deeper understanding of the mechanisms in the effects of these drivers on social distancing from PLWH is needed, especially among medical students (future healthcare providers).

The present study aims to fill these gaps by studying stigmatizing attitudes of medical students from the perspective of the inevitability of prejudice due to negative intergroup emotions.

Methods: Participants were 609 medical students (326 women, 53.5%) attending a medical school in Izmir, Turkey. Demographic features, political orientation, endorsing stereotypes about PLWH, stigmatizing attitudes, emotional reactions toward PLWH, social distance from PLWH, and HIV knowledge were assessed via self-reported questionnaires between March 2021 and June 2021. Multiple regression analyses and a serial mediation analysis calculating indirect effects using bootstrapping were used by adjusting for demographic factors and HIV knowledge.

Results: Political conservatism, endorsing negative stereotypes about PLWH, and negative intergroup emotions toward PLWH were all significantly associated with attitudes toward social distancing from PLWH.

A serial mediation first by endorsing negative stereotypes about PLWH and then by negative intergroup emotions

toward PLWH in the association between higher political conservatism and higher social distancing from PLWH was found, supporting our hypothesis.

Conclusions: Findings suggest that interventions may target stereotyping and negative intergroup emotions to reduce discriminatory behaviors of medical students. Furthermore, to reduce HIV-related stigma and discrimination and to improve healthcare delivery to PLWH, more research is needed on the roles of stigma within the healthcare system specifically, and on governmental policies and societal factors that contribute to structural stigma in general.

OAD0205

Gender identity stigma and discrimination and condomless anal sex among transgender women of TransCITAR study from Buenos Aires, Argentina: mediating role of depressive symptoms

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Background: Co-occurrence of stigma, depression and condomless anal sex (CAS) among transgender women (TGW) is widely reported. However, interactions between these factors remain unclear. TransCITAR is a prospective cohort study of 500 trans and non-binary individuals from Buenos Aires, Argentina; initiated in September, 2019.

This sub-analysis explored the mediating role of depressive symptoms in the relation between gender identity stigma, gender identity discrimination, and CAS in TGW participating in TransCITAR.

Methods: Until December/2022, 421 TGW, recruited by peer navigators, completed baseline psychosocial interviews that included questionnaires designed ad hoc to collect information on socio-demographic variables, gender identity discrimination (in healthcare, police, etc.) in lifetime, and CAS (receptive and insertive) in the last month, a gender identity stigma (GIS) scale and the CES-D (depressive symptoms). Path analysis was performed to examine the relationships between these variables. Parameters were estimated using maximum likelihood (ML) estimator.

Model fit was assessed through several goodness of fit indices including Comparative Fit Index (CFI), Tucker-Lewis index (TLI), and Root Mean Square Error of Approximation (RMSEA).



Results: Median age was 30 years (IQR 25–37), 50% reported incomplete high school or lower, 41% unstable housing, 45% receiving financial aid, 31% being migrant and 53% current engagement in sex work.

The prevalence of CAS was 26% (n = 109) and HIV laboratory-confirmed basal prevalence was 42%. The mediation model showed an excellent goodness of fit (CFI = 1.000; TLI=1.000; RMSEA = 0.000).

The indirect effect of GIS to CAI through depressive symptoms was significant (estimate = .057, p = .000), while the indirect effect of GIS experience of discrimination to CAS was not mediated by depressive symptoms (Estimate = .138, p = .38).

GIS was positively associated with depressive symptoms (Std. estimate = .356; p<0.001), which were positively associated with CAS (Std. estimate = .161, p = .000).

Conclusions: Depressive symptoms played a mediating role in the association between gender identity stigma and CAS. HIV and STIs preventive interventions for TGW should incorporate elements of trauma-informed and skills-building care.

Moreover, it is crucial for reducing CAS to advocate for social inclusion programs, trans-inclusive environments and anti-discriminatory policies that reduce stigma and its health-related effects.

OAD03 Younger and older: HIV across the life course

OAD0302

"We want them to know that we exist": how can we better meet the needs of sexuality and gender diverse young people living with HIV? Qualitative research from Zimbabwe

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Background: There is a scarcity of research about the experiences, challenges, and needs of sexuality and gender diverse (SGD) young people living with HIV. Failing to recognise, understand and respond to this group's needs perpetuates long-standing inequities in the HIV response and restrains progress towards key targets. We present qualitative findings on experiences and challenges of SGD young people living with HIV in Zimbabwe.

Methods: We conducted two focus group discussions in 2022 with 14 self-identified SGD young people (18–24-years) all of whom were accessing a recently formed SGD HIV

support group at Zvandiri ('As I Am'), a community-based HIV program. We conducted interpretive thematic analysis to generate themes across the data.

Results: All the young people refuted the imposition of static binary categories of sexuality and gender. They understood their identities as fluid and still in the process of becoming. All participants described that being an SGD young person living with HIV had led to *"double stigma and double trouble"*. This manifested in physical and verbal harassment, social exclusion, and family rejection. In most situations, they had to keep both their sexuality and/or gender identity and HIV status hidden, but many also felt compelled to conceal their HIV status in SGD social spaces. This negatively impacted their psychosocial wellbeing and social connectedness.

Participants shared positive experiences of Zvandiri, describing the service as *"speaking to me"*. The mutual witnessing of others' experiences of living with HIV, in a safe and destigmatising environment, enhanced self-acceptance and improved motivation to maintain engagement in treatment.

However, reflecting their prevailing experiences, participants were cautious about being open about their gender and sexuality outside of their SGD group even within Zvandiri.

Conclusions: Understanding how intersectional stigma impacts SGD young peoples' social and relational lives, and their access to healthcare services, is a critical step toward appropriately responding to their needs. Community-based HIV support services who emphasise and promote principles of inclusivity are well-positioned to support and advance SGD young peoples' health rights.

Efforts to strengthen understanding and responsiveness to this group's needs should be prioritised as a mechanism to improve their wellbeing and HIV outcomes.

OAD0303

"It felt like a weight was being taken off my shoulders": the impact of lending a hand intervention in supporting migrant adolescents and young people, in KwaZulu-Natal, South Africa

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Background: In South Africa, many young people move away from their homes to semi-urban areas for education. They attend day schools while staying in rented accommodation. They may experience alcohol and drug abuse, sexual exploitation, and violence all of which put them at risk of contracting HIV.



Our aim was to develop and test the feasibility and acceptability of a support structure for migrant adolescents and young people (MAYP), aged 14-24, and to understand their experiences of the intervention, in KwaZulu-Natal, South Africa.

Methods: Five peer navigators (PNs) were trained on needs assessment (clinical, social, educational, and psychosocial) of MAYP. The PNs enrolled 283 MAYP, aged 14-24, between June 2021 and October 2022.

The intervention included:

1. Using a mobile phone to provide support identified during the needs assessment,
2. Facilitating the referral process at a call centre to the study social worker for psychosocial and emotional services, local health facilities for healthcare services and peer support on general issues.

We conducted repeat in-depth interviews (IDIs), n=20; and 5 key informant IDIs with PNs, n=5, both face-to-face and telephonically.

Results: The majority of MAYP were in grades 11 and 12 at day schools. They rented rooms in an unsafe environment on their own to be closer to their schools. Transitioning from living with their parents or guardians to living on their own in an unfamiliar environment caused physical (e.g. violence), psychological, and mental challenges. In describing the intervention most of them 'felt like a weight was being taken off of their shoulders'. They also felt that it was beneficial for them as they were linked to treatment for sexually transmitted infections, received psychosocial support from the intervention social worker, and were also supported by PNs in facing general challenges. This helped them develop adaptive coping strategies and avoid risky behaviours.

Conclusions: Interventions targeted for young people are much more effective when they are led by peers who understand young people's experiences. The intervention was designed for and centred around the needs of MAYP and the short turnaround time during the referral process made it acceptable and they felt respected.

OAD0304

"If I don't take care of me, then I can't be there for others:" a qualitative study of caregiving relationships among older women living with HIV

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Background: There are over 100,000 women ages 50+ diagnosed with HIV in the United States (U.S). Yet, the experiences of older women living with HIV (WLWH) remain understudied. Little is known about the social support networks that older WLWH use to manage their health. This study examines the social support, or care networks, of older WLWH, with an emphasis on their care giving and care receiving relationships.

Methods: We recruited women ages 50+ who are living with HIV from community-based organizations and clinics in the U.S. We conducted one-on-one, semi-structured phone interviews between May 2022 – August 2022. Interviews were recorded and transcribed verbatim. Following a Grounded Theory approach, two coders performed open coding and then thematic coding to generate themes.

Results: Participants (N = 23) came from 11 U.S states, were on average 60.3 years old (min 51, max 68), and had been living with HIV for an average of 23.7 years. 78.3% of participants were Black. 78.3% identified as heterosexual.

We identified five main themes regarding care networks and perceptions of caregiving in older adulthood:

1. Participants received the most care (i.e., instrumental/emotional support to help manage HIV) from their adult children and HIV support group peers. Participants provided the most care to their grandchildren and own parents.
2. Despite occasional periods of stress balancing caregiving responsibilities while managing HIV, participants have pride and joy in being caregivers to loved ones.
3. Caregiving and receiving networks not only help disease management, but also promote self-love and acceptance.
4. Despite receiving care, participants are highly proactive in their own HIV management.
5. Many had concerns about being able to keep up with their HIV care needs due to uncertainty about who will be in their care networks in the future and comorbidity.

Conclusions: Findings highlight that both being a care recipient and a caregiver can be sources of meaning for older WLWH to help in their HIV management. To address the concerns brought forth by our participants about aging with HIV, public health programs and policies for older WLWH may benefit from engaging their care networks in healthcare discussions and educational efforts.

OAD0305

Assessing the health-related quality of life and risk of poverty of older people living with HIV in Spain: a cross-sectional study applying a gender perspective

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Background: Modern antiretroviral therapies have increased the life expectancy of people living with HIV. However, the health-related quality of life and living conditions of older people living with HIV in Spain have yet to be studied.

Methods: We implemented a self-administered online questionnaire in 2022 to assess the health-related quality of life and risk of poverty of Spanish older people living with HIV (≥50 years) and identify gender differences. We



applied the standardised WHOQoL-HIV BREF questionnaire to estimate health-related quality of life and the Europe 2020 guidelines to calculate the risk of poverty. The statistical analysis included multivariate generalised linear models with potential confounding variables and robust estimates.

Results: A total of 242 older people living with HIV (187 men and 55 women) participated in the study. The average age of men and women was 57.1 (standard deviation (SD)=5.1) and 56.3 (SD=4.0) years respectively.

Women scored lower (compared to men) in 84% of the WHOQoL-HIV BREF questionnaire items. In consequence, women had significantly lower health-related quality of life in five (out of six) of the questionnaire domains: physical health (β : -1.5; 95% confidence interval (CI): -2.5 -0.5; p : 0.003), psychological health (β : -1.0; 95% CI: -2.0, -0.1; p : 0.029), level of independence (β : -1.1; 95% CI: -2.0, -0.2; p : 0.016), environmental health (β : -1.0; 95% CI: -1.8, -0.3; p : 0.007), and spirituality/personal beliefs (β : -1.4; 95% CI: -2.5, -0.3; p : 0.013).

The risk of poverty was substantial for both men (30%) and women (55%), but women were significantly more likely to be at risk of poverty (odd ratio: 3.3; 95% CI: 1.5, 7.7; p : 0.004).

Conclusions: Our study supports the need for policies focused on improving the structural and living conditions and comprehensive care of older people living with HIV and reducing gender inequalities in health-related quality of life.

Future policies and interventions for older people living with HIV in Spain should prioritise the improvement of the structural and living conditions in which they subsist.

OAD04 More than just oral PrEP: Innovative approaches for HIV prevention services

OAD0402

Multilevel barriers to methadone for HIV prevention among people who inject drugs in Kazakhstan: opportunities for change

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Background: Central Asia (EECA) remains one of few regions where HIV incidence and mortality continue to increase, and this epidemic is concentrated among people who inject drugs (PWID). In Kazakhstan, the prevalence of HIV among PWID (9.2%) is higher than for any other key population. Opioid agonist therapies (OAT) like methadone or buprenorphine are evidence-based treatment for opioid use disorder (OUD) and crucial primary and secondary HIV prevention. Though methadone has been provided for free in Kazakhstan since 2008 through support from international donors, there are currently only approximately 340 (<1%) people on OAT among the estimated 90,000 PWID.

Methods: To assess barriers and facilitators to methadone uptake for HIV prevention, we conducted nominal group technique (NGT) focus groups (FGs) with people with OUD in four cities in Kazakhstan.

Among the 8 FGs, 4 included people currently on methadone, while the other 4 included people who had never received methadone. Additionally, we conducted 2 focus groups with local doctors and in-depth interviews with the directors at the four OAT sites and with several political figures who shape methadone policy in Kazakhstan.

Results: Multi-level barriers included: Policy (e.g., required national registration as a "drug user" to access addiction treatment services); Structural (e.g., inaccessible locations of clinics, rigid enrollment requirements); Clinician (e.g., viewing potential methadone program participants as undisciplined, and therefore not ready for treatment); and Patient (e.g., too many logistical requirements). A detailed rank-ordered list of barriers and facilitators will be expanded below.

Conclusions: Findings from this study identify many opportunities for potential methadone scale-up, which is required to control the HIV epidemic in Kazakhstan and throughout Central Asia.

OAD0403

Dapivirine vaginal ring (DPV-R): An acceptable and feasible HIV prevention option. Evidence from Zimbabwe

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Background: HIV burden remains high in Zimbabwe. Adolescent girls and young women (AGYW) are disproportionately affected with an HIV incidence of 0.54% compared to 0.13% among their male counterparts (ZIMPHIA, 2020). Whilst oral PrEP remains a key HIV prevention modality, pill burden, and privacy are key barriers to oral PrEP uptake and continuation. Population Solutions for Health, PSI, and the Ministry of Health and Child Care are implementing a demonstration project to determine the acceptability and feasibility of using monthly DPV-R as an alternative to oral daily PrEP for HIV prevention.

Methods: A two-arm prospective cohort design is being implemented across 8 districts in Zimbabwe. AGYW aged 18-25, screened as high-risk and eligible for PrEP chose between oral PrEP and DPV-R. Clients from both arms were followed up monthly between June and November 2022. Uptake and continuation rates were compared between the two arms for significant differences. Key informant interviews were conducted with clinicians involved in PrEP service provision.

Results: A total of 1,535 AGYW were screened for PrEP, 1,466 were eligible and of these 1,128 (76.9%) (95% CIs: 74.7-79.7) chose DPV-R. Uptake was similar by age but differed significantly by residence, with higher uptake observed in rural (97.5% - 95%CI: 96.0-98.6) relative to urban (61.0% - 95%CI: 57.6.0-64.3) districts. Continuation rates were consistently higher among clients on DPV-R compared to oral PrEP as shown below. Five of 1,128 high-risk AGYW (0.4%) tested HIV positive since commencement on DPV-R compared to 1/338 (0.3%) receiving oral PrEP over the same period. Service providers reported high motivation for DPV-R among AGYW for its convenience and discretion.



Figure. DPV Ring showing higher continuation rates than Oral PrEP

Conclusions: DPV-R is a feasible and preferable PrEP option for AGYW in Zimbabwe and should be scaled up. More demand-generation activities are required in urban settings for improved uptake.

OAD0404

"PrEP4U:" how edutainment, student outreach, and multisector engagement are helping youth in Vietnam access HIV prevention and sexual health care

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Background: In Vietnam, students and youth have several risk factors for HIV acquisition and transmission including poor HIV risk perception and awareness and limited knowledge on sexual and reproductive health (SRH) services such as HIV testing and pre-exposure prophylaxis (PrEP). "PrEP4U" is a behavior change campaign co-created by the USAID/PATH STEPS Project (STEPS) and partners to promote HIV and sexual health care engagement and practices among students in Vietnam.

Description: To enhance student/youth knowledge about SRH and safe sex and encourage their use of PrEP and other health services, STEPS, the Vietnam Ministry of Health, and youth leaders generated student insights in designing the online-to-offline PrEP4U campaign.

PrEP4U targets educational settings in three urban provinces (Hanoi, Ho Chi Minh City, Dong Nai) through talk shows with clinical experts, interactive edutainment games focused on safe sex and sexual health, integration with sex-ed programs at schools, booth exhibitions, and other activities where students can interact with community influencers and staff from community-based clinics and receive HIV testing, PrEP counseling, and referral for other services directly on-site.

The campaign also runs across online platforms and leverages a network of PrEP4U Ambassadors and a PrEP4U Facebook page blending informative and humorous content derived by youth to motivate viewers to seek PrEP/SRH information and services.

Lessons learned: From March–September 2022, 32 in-person PrEP4U events reached more than 8,500 students, distributed 1,096 HIV self-test kits and enrolled 317 individuals on PrEP.

The PrEP4U Facebook page has become a hub of trustworthy SRH and PrEP information for students, supporting the campaign to garner over 1.1 million views cross-platform. Targeted edutainment activities centered around principles of choice, equity, and people-centeredness to



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ensure that PrEP4U messaging and imaging resonated with different youth segments, including gay, transgender, and gender nonbinary individuals.

Conclusions/Next steps: PrEP4U addressed a major gap in youth access to HIV and SRH services by offering these services directly within schools and engaging campaign ambassadors and influencers, and as a result increased health care access and convenience.

Drawing from lessons learned, youth-focused PrEP/SRH campaigns will be further scaled and adapted for other settings to bring PrEP and sex-ed closer to populations in need.

OAD0405

Racial inequalities in HIV testing among adolescent men who have sex with men and transgender women in three Brazilian capitals

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Background: Black people have a higher prevalence of HIV infection in several countries worldwide, including Brazil. Studies have also highlighted barriers to HIV testing in these populations because of structural racism.

We aimed to investigate the association between HIV testing in a lifetime and race among adolescent men who have sex with men (aMSM) and transgender women (aTGW) in three Brazilian state capitals.

Methods: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study of aYMSM and aYTGW aged 15-19 in three Brazilian capitals: Salvador, São Paulo, and Belo Horizonte. The outcome variable was having been tested for HIV in a lifetime (no, yes).

Race was self-reported in three categories: white, black, and mixed race (or brown; in Portuguese: "*pardo*"). In Brazil, the last one is historically combined with black in the analyses.

We compared black and mixed race combined vs. white. We conducted descriptive, bivariate, and multivariate analyses to estimate the adjusted odds ratio (aOR) and 95% confidence interval (95%CI).

Results: White adolescents underwent more HIV tests in their lifetime than black and mixed race combined (74.0% vs. 54.0%, respectively). The testing rates decreased as the skin tone darkened: 56.9% among exclusive blacks, 58.1% among exclusive mixed-race (or brown), and 63.9% among whites ($p=0.003$).

In the multivariate analysis, black and mixed-race combined people were 33% less likely to have been tested for HIV in a lifetime than whites (aOR=0.67, 95%CI: 0.51-0.90), adjusting for age, education, employment, living with family, mother's lack of knowledge about their sexual orientation, sex work, and unprotected anal sex.

Conclusions: The lower rate of HIV testing among black and mixed-race combined among aMSM and aTGW people indicates inequalities in health and structural barriers to accessing HIV testing and prevention services. Further, it evidences the structural racism in society and health institutions in Brazil.

OAD05 The HIV care continuum: Identifying barriers, devising solutions

OAD0502

Pill count effectiveness in detecting nonadherence in a mature HIV program with overall high viral suppression rates in Eswatini

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Background: Pill count is widely used as an adherence measure among clients taking antiretroviral therapy (ART). Conducted before each refill, it is a self-reported process where the actual number of pills remaining is compared against the expected. Pill count is a standard of practice to identify non-adherence for early intervention, yet its effectiveness is unknown in Eswatini. This study examines the ability of pill count to detect non-adherence among ART clients in the Lubombo and Manzini regions in Eswatini.

Methods: We used a case-control study design with chart abstraction at 11 purposively selected health facilities in Lubombo and Manzini, based on the number of clients with a high viral load between October 2021 and September 2022. Controls were matched to cases at a ratio of 2:1 giving a total of 615 study participants (205 cases and 410 controls).

Cases were adult first-line ART clients with unsuppressed viral load (VL > 1000 copies/mL) while controls were clients with a suppressed viral load (\leq 1000 copies/mL) randomly selected from the government client management information system. Adherence of 95-105% was defined as good, and social determinants and mental health evaluated to assess adherence.

Results: All cases and controls had a pillcount done. Overall, 60% of all participants with a suppressed viral load had a good pill count classification, while 98% of clients with a high viral load had a suboptimal pill count (<95% or >105%). Forty six percent and 99.5% of the cases and


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controls had a good pill count classification respectively. Eighty percent of the poor adherence was caused by social and cognitive problems. Clients with good pillcount classification had significantly reduced odds of a high viral load (OR 0.007; 95% CI: 0.003, 0.04; $p < 0.001$).

Pill count had a sensitivity of 98% (CI:92%-100%); a specificity of 59% (CI:53%-64%); a positive predictive value of 30% (CI: 24%-37%) and a negative predictive value of 99.5% (CI:97%-100%).

Conclusions: Pill count predicted nonadherence among cases, but its specificity should be improved by using a modified approach. This is vital considering the changing landscape in HIV care and increased access to more tolerable antiretroviral medication for prevention and treatment.

OAD0503

Identifying longitudinal patterns of HIV treatment (dis)engagement and re-engagement from oral histories of virologically unsuppressed adults in Uganda: a thematic trajectory analysis

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Background: There is limited study of persons deemed "harder to reach" by HIV treatment services, including those discontinuing or never initiating antiretroviral therapy (ART). We conducted narrative research in Rakai, Uganda, with virologically unsuppressed adults identified through population-based sampling to discern longitudinal patterns in HIV service engagement and identify factors shaping treatment engagement throughout the life course.

Methods: In mid-2022, we sampled adult participants with high-level viremia ($\geq 1,000$ RNA copies/mL) from the Rakai Community Cohort Study, a population-based HIV surveillance cohort. Using life history calendars, we conducted initial and follow-up in-depth interviews to elicit oral histories of participants' journeys in HIV care, from diagnosis to the present. We then used thematic trajectory analysis to identify discrete archetypes of HIV treatment engagement by "re-storying" participant narratives and visualizing HIV treatment timelines derived from interviews and abstracted clinical records.

Results: Overall, 38 participants (median age: 34 years, 68% men) completed 75 interviews. We identified six HIV care engagement archetypes from narrative timelines (Figure):

1. Delayed ART initiation,
2. Early treatment discontinuation,
3. Treatment cycling,
4. Prolonged treatment interruption,
5. Transfer-related care disruption, and;
6. Episodic viremia.

Patterns of service (dis)engagement were highly gendered, occurred in the presence and absence of optimal ART adherence, and were shaped by various factors emerging at different time points, including: denial of HIV serostatus and disclosure concerns; worsening HIV-related symptoms; psychological distress and depression; social support; intimate partner violence; ART side effects; accessibility constraints during periods of mobility; incarceration; and inflexible ART dispensing regulations.

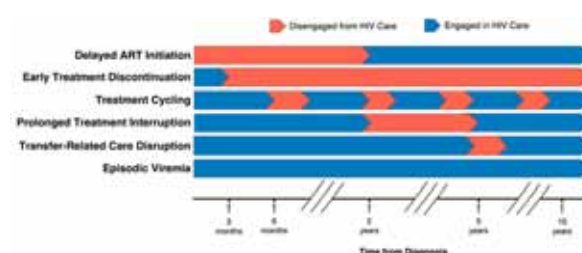


Figure.

Conclusions: Identified trajectories uncovered heterogeneities in both the timing and drivers of ART (re-)initiation and (dis)continuity, demonstrating the distinct characteristics and needs of people with distinct longitudinal patterns of HIV treatment engagement.

Enhanced mental health service provision, expanded eligibility for differentiated service delivery models, and streamlined facility switching processes may facilitate timely (re-)engagement in HIV services.



OAD0504

Characterizing TB diagnosis and the associations with economic stability and employment discrimination among women living with HIV across 11 countries in sub-Saharan Africa during the COVID-19 pandemic

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Background: Among people living with HIV, Tuberculosis (TB) is the leading cause of death and TB-related mortality increased during the COVID-19 pandemic. While poverty is an established determinant for TB progression, characterizing the role of employment discrimination and legal protections on HIV and TB outcomes can inform both programs and policy.

Methods: The People Living with Stigma Index 2.0 study was implemented in 11 countries across Sub-Saharan Africa including Angola, Benin, Burkina Faso, Cote D'Ivoire, Ghana, Kenya, Mauritania, Nigeria, Lesotho, Togo, and Zimbabwe. Study implementation was led by networks of people living with HIV in each country between 2020 and 2022. Interviewer-administered questionnaires were used to collect self-reported socio-behavioral measures. The analytic sample included 10,555 cisgender adult women living with HIV. Multilevel logistic regression was used to assess associations between exposures and recent TB diagnoses in the context of varying discrimination protections for PLHIV.

Results: Among participants, 7.8% reported TB diagnosis within the last 12 months. Among individuals in countries without non-discrimination protections, recent TB diagnosis was negatively associated with employment (AOR:0.62; 95%CI:0.51,0.76). Among individuals in countries without non-discrimination protections recent TB diagnosis was positively associated with being unable to meet basic needs often (AOR:1.77; 95%CI:1.31,2.41), being refused employment and income due to HIV status (AOR:1.95; 95%CI:1.39,2.72) and being refused a promotion due to

HIV status (AOR:2.12; 95%CI:1.45,3.10). Among individuals in countries with non-discrimination protections, recent TB diagnosis was not associated with employment; being unable to meet basic needs often; being refused employment, income, or a promotion due to HIV status.

	Total n/N	Recent TB diagnosis			
		Lack of Non-discrimination protections (N=7186)		Non-discrimination protections (N=3369)	
	n/N	N	AOR ^a 95% CI	N	AOR ^a 95% CI
Economic stability					
Employment	6202/10554	4112	0.62 0.51 0.76	2090	1.05 0.79 1.41
Unable to meet basic needs - sometimes	5762/10554	3689	1.27 0.95 1.69	1863	0.84 0.65 1.07
Unable to meet basic needs - often	2658/10554	1992	1.77 1.31 2.41	669	0.83 0.54 1.25
Employment discrimination					
Ever refused employment or income due to HIV status	5076/10554	426	1.95 1.39 2.72	171	1.32 0.88 2.18
Ever refused promotion due to HIV status	4218/10554	298	2.12 1.45 3.10	125	0.71 0.48 1.05

Table. Economic stability and employment discrimination and associations with recent TB diagnosis based on country level non-discrimination protections.

Conclusions: Employment discrimination may impede HIV and TB outcomes among women living with HIV, and may be a determinant of TB regardless of ART use. Establishment and enforcement of non-discrimination protections for women living with HIV may improve economic stability, support TB control, and reduce deaths among people living with HIV.

OAD0505

Improving mental well-being and economic empowerment of PLHIV through ODH-SEGT: An integrated and client-centered psycho-socioeconomic intervention for unemployed PLHIV experiencing homelessness in Caloocan City, Philippines

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Background: In the Philippines, a needs assessment showed significant associations between unemployment, homelessness, and mental distress among PLHIV. Gabay sa Pulang Laso Inc. (GPLI) integrated Supportive-Expressive Group Therapy (SEGT) into its Open Doors Home (ODH) initiative (a temporary shelter provision and socioeconomic support for unemployed PLHIV experiencing homelessness).

The core foundation of ODH-SEGT is reconnecting with oneself through a supportive and empowering environment where a PLHIV shares experiences with fellow PLHIV while addressing socioeconomic needs through employment and education opportunities.



Description: Through open social media invitations, 22 PLHIV voluntarily participated and completed the ODH-SEGT Programme between August 19 and October 30, 2022. The intervention was conducted in four phases:

1. Baseline screening for anxiety- and depression-related symptoms using a 7-item Generalized Anxiety Disorder and 9-item Patient Health Questionnaire (GAD-7 and PHQ-9),
2. Assessment of PLHIV perceived socioeconomic needs,
3. Conducting 12-week SEGT sessions with bi-monthly GAD-7 and PHQ-9 monitoring, and;
4. Linkage to employment or education.

Lessons learned: The participants' age ranged between 19 and 52 years old (mean=33.3 years old, SD=7.9). Among 22 participants, 18 were unemployed while four had stopped attending school.

At the end of the ODH-SEGT intervention, 16 were linked to employment while 5 were included in GPLI educational support and are currently attending the alternative learning system of the government.

While attending the SEGT, averages in PHQ-9 and GAD-7 at baseline were at moderate levels (12.2 and 12.4, respectively) and significantly decreased to be at low to no risk by Week 10 (4.8 and 4.8, respectively).

One participant reported to have stopped taking anti-retroviral medication for five years and was immediately linked back to HIV care.

Conclusions/Next steps: GPLI's ODH-SEGT has the potential to improve mental health of people living with HIV by addressing their non-biomedical needs and contributing to a higher quality of life. The next step for the project is the development of the Training of Trainers programme so that the SEGT framework can be replicated in other regions of the country. In addition, a multisectoral collaboration is currently being advocated with the local government unit, social welfare department, and academic institutions in the Philippines.

OAE01 Designing services to optimize the delivery of PrEP for all who would benefit

OAE0102

Anticipated preferences for long-acting HIV PrEP among current oral PrEP users at pharmacies: findings from a pilot study extension

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Background: As many sub-Saharan African countries prepare to implement two long-acting (LA) forms of HIV pre-exposure prophylaxis (PrEP)—injectable PrEP and the dapivirine vaginal ring (DVP-VR)—there is potential to expand delivery to new access points, such as private pharmacies.

A recent pilot study of private pharmacy-delivered oral PrEP in Kenya found that these venues may reach a different demographic than public clinics. During a six-month extension of this study, we assessed current oral PrEP users' anticipated preferences for LA PrEP.

Methods: At 12 pharmacies in Kisumu and Kiambu Counties, Kenya, trained pharmacy providers delivered oral PrEP to eligible clients ≥18 years. We surveyed PrEP clients one month following PrEP initiation, and asked whether, if given the option, they would choose to take oral PrEP every day or get a PrEP injection every two months. For those selecting "PrEP injection", we further explained that the injection would go into the muscles of the buttocks region and resolicited their preferences.

Lastly, we described the DVP-VR to female clients and asked them to rank oral PrEP, injectable PrEP, and DVP-VR in order of preference. We report our findings descriptively.

Results: From January-July 2022, we surveyed 491 pharmacy PrEP clients; 55% (270/491) were female, median age was 22 (IQR: 25-32), and 84% (412/491) had never taken oral PrEP prior to this study. About two-thirds (65%, 319/491) anticipated they would choose injectable over oral PrEP.

After being told details about the injection site, 58% (287/491) still reported a preference for injectable PrEP, with this preference notably higher among males (77%, 170/221) than females (43%, 117/270).

Among females, 57% (155/270) said their first choice would be injectable PrEP, followed by oral PrEP, then DVP-VR; an additional 30% (81/270) of females chose oral PrEP first, followed by injectable PrEP, then DVP-VR.



Conclusions: Over half of current oral PrEP users at private pharmacies anticipate that, if given the option, they would choose injectable over oral PrEP. Few female oral PrEP users in this setting thought they would choose the DVP-VR. More research is needed to test pharmacy delivery of LA PrEP and assess real-world uptake and product switching.

OAE0103

Drivers of pre-exposure prophylaxis choice for transgender women in 11 countries in Asia: a discrete choice experiment

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Background: Transgender women (TGW) are approximately 66 times more at risk of HIV acquisition than the general population. Designing appealing pre-exposure prophylaxis (PrEP) programs for TGW is urgently needed. We evaluated the drivers of choice for PrEP among TGW living in 11 Asian countries and forecasted their PrEP uptake given different PrEP program configurations.

Methods: An online discrete choice experiment (DCE) survey was delivered through trans-networks in each country between May-November 2022. Participants who identified as TGW, age ≥ 18 years and had no prior HIV diagnosis were included. Final attributes included:

1. Type of PrEP;
2. Service location;
3. Cost;
4. Side effects;
5. Visit frequency; and
6. Extra services.

We calculated the relative importance of each attribute and PrEP uptake prediction using random parameters logit (RPL) models.

Results: Overall, 1,522 TGW were included, with a mean age of 28.1 (± 7.0), 63% (956/1,522) reported multiple partners, 38% (581/1,522) had condomless vaginal sex and 16%

(249/1,522) were diagnosed with an sexually transmitted infection (STI) in the last six months. The biggest drivers of PrEP uptake were cost (62% relative importance), type of PrEP (10%), location (8%), extra services (8%), visit frequency (7%) and side effects (5%). The most wanted PrEP service (with a predicted uptake of 87%) was: free injectable PrEP with no side effects, accessing PrEP from a peer-led community clinic that provided STI testing, and requiring 6-12 monthly visits.

The least preferred PrEP service (with a predicted uptake of 50%) was: PrEP implant with out-of-pocket fees and a rare chance of kidney problems, accessing PrEP from a hospital, no extra services, and requiring 2-monthly visits.

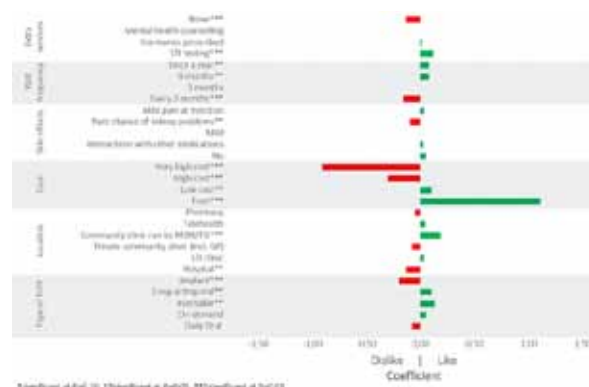


Figure. Preference for PrEP among trans women in the Asia-Pacific (N=1,522)

Conclusions: Our study, the largest DCE for TGW globally, emphasizes the importance of measuring and incorporating preferences for PrEP services to accelerate the scale-up of PrEP among TGW in Asia.

OAE0104

Snow balling peer to peer mModel - a silver bullet for improved PrEP uptake among FSWs in Zambia's border town of Chirundu

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Background: With an annual HIV incidence rate of 47%, over 56% of the female sex workers in Zambia are living with HIV (UNAIDS, 2020). However, the uptake of pre-exposure prophylaxis among FSWs in the Zambia-Zimbabwe border town of Chirundu remains low at 22% of those that test negative.

Description: Between December 2022 and January, 2023, USAID CHEKUP implemented by John Snow Health Zambia, embarked on an initiative to orient and then engage FSWs already accessing PrEP to identify peers in their network, provide PrEP messaging and facilitate them to take up PrEP. In a snow ball approach, 5 trained health care



workers, trained a pool of 15 community health workers on how to provide orientation around PrEP messaging to 75 FSWs who were mostly (75%) aged 20-24 years. FSWs in turn delivered these PrEP promotion messages alongside sharing their lived experiences around the benefits of PrEP, addressed the misgivings, and facilitated linkage to PrEP.

Lessons learned: Over a three week period, the 75 FSWs reached out to 284 of their peers among which 43 (15.1%) were discovered to be positive and already on treatment, 61 (21.5%) were newly identified positives and were linked for antiretroviral therapy.

From the remaining 180 HIV negative FSWs, 164 (91.1%) were initiated on PrEP, while the rest (16) (8.9%) indicated that they needed to think about it, or the time was not appropriate and that they could commence at a later date.

The majority (52%) of the FSWs that took up PrEP were in the same age band (20-24 years old) as their PrEP promoting peers.

Being spoken to by someone who is in my situation and also taking the medicine (85%) and then making it convenient for me to access the medicine (71%) were the prominent reasons given by the new recipients for then to be initiated on PrEP.

Conclusions/Next steps: With the PrEP uptake under the peer to peer modality being significantly higher than the routine approach (91.1% vs. 22%), the peer to peer model has potential to increase both acceptability and uptake of PrEP among FSWs particularly for programs recording low PrEP usage among FSWs.

OAE0105

The acceptability of pharmacy-delivered PrEP and PEP in Kenya: provider perceptions

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Background: Pilot studies indicate that delivering oral HIV pre-and post-exposure prophylaxis (PrEP and PEP) at private pharmacies may help increase access to these highly effective HIV prevention products among individuals with HIV risk. In many high HIV prevalence settings, most of the core components of PrEP and PEP delivery (e.g., counseling, medical safety assessment, HIV testing, and drug dispensing) fall within pharmacy providers' scope of practice.

We assessed the anticipated acceptability of delivering PrEP and PEP at private pharmacies among pharmacy providers in Kenya.

Methods: Pharmacists and pharmaceutical technologists working at 20 private pharmacies in Kisumu County completed a cross-sectional questionnaire that assessed acceptability using questions informed by the Theoretical Framework of Acceptability (TFA). The TFA posits that acceptability is a multi-faceted construct, comprising seven component constructs (e.g., affective attitude towards the intervention, perceived effectiveness, burden, and opportunity cost).

We measured select acceptability component constructs using 5-point Likert items and analyzed these using descriptive statistics. Statements with which >80% of participants agreed or strongly agreed were classified as "acceptable".

Results: From May to June 2022, 40 pharmacy providers completed the questionnaire; 42% (n=17) were pharmacy owners, 60% (n=24) were male, and the median time in pharmacy practice was 6 years (IQR 4-10).

All or nearly all providers (97-100%) liked the idea of delivering PrEP and PEP (TFA construct: affective attitude) and thought that pharmacy-delivered PrEP and PEP services could reach people with HIV risk (TFA construct: perceived effectiveness).

Most pharmacy providers (96-99%) did not think it would be hard to deliver PrEP or PEP (TFA construct: burden) or that this would interfere with their other priorities (TFA construct: opportunity cost).

Conclusions: The Kenyan pharmacy providers in this study found the idea of pharmacy-delivered PrEP and PEP services to be highly acceptable. To inform whether and how pharmacy-delivered PrEP and PEP should be implemented and scaled up in Kenya and similar settings, additional research is needed to develop and test delivery models, assessing both effectiveness outcomes (e.g., uptake, continuation) and implementation outcomes (e.g., acceptability, feasibility, and cost).



OAE02 The Power of People: Community based models to improve HIV outcomes

OAE0202

Leveraging community and private-sector HIV self-testing (HIVST) distribution to improve access to HIV testing services (HTS) and treatment for adolescent girls and young women (AGYW) in Uganda

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Background: 29% of new HIV infections in Uganda occur among AGYW, and 32% of estimated adolescents living with HIV are not on treatment (Uganda AIDS Commission, 2021; Spectrum 2022). There is need for strategies that better engage AGYW in HIV case-finding and linkage to care given persisting gaps. Through the Unitaid/STAR-III project, PATH, with Ministry of Health, leveraged human-centered design to adapt HIVST services to improve reach and uptake of HIV services for AGYW.

Description: We introduced community and private-sector distribution models to expand outlets for AGYW to access HIVST beyond public-sector facilities, including targeted community outreach, hotspots, tertiary educational institutions, pharmacies, and nurse/midwife-led clinics. We trained AGYW peers to lead mobilization during community campaigns or at popular hangout areas; link interested clients to healthcare providers for assisted or unassisted HIVST; follow up by phone/WhatsApp to confirm results; and provide escorted referrals for those with reactive self-test results.

We developed easily downloadable HIVST training videos that peers could share through social media for AGYW who preferred anonymous access options.

We analyzed program data from three central Ugandan districts from November 2020 to November 2022 to understand impact of these adaptations on HIVST uptake and preferences among AGYW.

Lessons learned: AGYW (69% between 20-24 years) received HIVST kits, 60% through community distribution (primarily targeted community or hotspot modalities), 22% through public-sector (mainly outpatient services), and 18% through private sector (mainly nurse/midwife-led clinics). 224 (2.4%) had reactive results, among whom 184 (82%) were confirmed HIV positive (2.0% positivity), 182 (99%) were linked, and 144 (79%) initiated on treatment. AGYW demonstrated preference for directly assisted HIVST (51%), and half had not tested in the last 12 months. Using peers to lead engagement/escort referrals for follow-on care was key to high follow-up and linkage rates.

Conclusions/Next steps: Our results highlight the feasibility and acceptability of using community and private-sector outlets, shareable online content, and peer-led outreach and referral to effectively reach and link AGYW to treatment through HIVST. Diversifying HTS access points and reinforcing peer-driven models are core approaches that should be scaled up to address persisting access barriers among adolescents and enable Uganda to reach epidemic control.

OAE0203

Community Led Monitoring (CLM): A new CLM toolkit to generate evidence to support community-led HIV service improvements

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Background: Community Led Monitoring (CLM) shifts the dynamic of monitoring from HIV service providers to monitoring led by the people using the services. In order to build an evidence-base for CLM, the Global Fund supported Sustainability of HIV Services for Key Populations in Asia (SKPA-2) program has developed the "Sustainable Community-led Monitoring of HIV Services Toolkit for Key Populations". This provides a framework, indicators, and guidance on how to ensure the CLM process is community-led and guided through measurable bottom-up approaches.

Description: Launched in 2022, the CLM toolkit has been piloted in Mongolia, Bhutan and Sri Lanka for key population groups including men who have sex with men, transwomen, sex workers, people living with HIV, and people who use drugs. The toolkit provides a framework of 8 core indicators to monitor Availability, Accessibility, Acceptability, and Quality (AAAQ) along with 5 indicators to measure and ensure there is follow-up for those experiencing stigma, discrimination, and/or violence. The selection of final indicators, pilot sites, data processes and follow-up should be decided by CLM technical working group made up of national stakeholders and includes key population representatives.

Lessons learned:

- Helped identify the type of facilities where stigma and discrimination (S&D) was more prevalent to support more targeted efforts to reduce S&D in healthcare settings.
- Supported the identification of the type of services with the least availability including CD4 count and viral load testing.

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- CLM data should be designed to share data visually and in an easy to digest manner to community groups such as through electronic dashboards.
- Funding for CLM is not assured as health programs also have their own feedback systems, so community led models need to be cost-effective.
- Identified the need to include well managed referral mechanisms to accountability mechanisms to manage and deal with experiences of S&D when accessing HIV services.

Conclusions/Next steps: The CLM toolkit helps provide interesting findings for other countries when designing and rolling out CLM. Future research and programs may include an evaluation to assess the impact CLM has on supporting countries to improve service quality and achieve their 95-95-95 targets as well as the sustainability of CLM funding.

OAE0204

Uptake of integrated HIV and sexual and reproductive health services for youth at community centres in Zimbabwe

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Background: Limited engagement with health services contributes to the poorer HIV outcomes observed in youth. We conducted a cluster-randomised trial of a community-based integrated HIV and sexual and reproductive health (SRH) service (CHIEDZA) for youth in 3 provinces in Zimbabwe.

Methods: Weekly integrated HIV and SRH services were delivered from community centres in 12/24 intervention clusters to cluster residents aged 16-24 years over 30 months. Fingerprint scanning was used to anonymously identify clients and track their attendances and service uptake over time.

Services included HIV testing, treatment and adherence support, management of sexually transmitted infections (STIs), menstrual health management, contraception, counselling, and registration for text messages on SRH topics. All services were optional.

Results: In total 36,991 clients attended, for a total of 78,810 visits; each centre had a median of 55 clients per day; 40.6% of clients returned for more than 1 visit. Overall, 75.0% of clients were female and 53.0% were aged <20 years. In total 84.1% of eligible clients had at least one HIV test and 17.4% had more than one. At their first visit 78.6% of eligible clients had an HIV test, and out of those who were not tested at the first visit, 28.3% later returned

and were tested. 377 clients tested HIV positive at CHIEDZA (prevalence 1.3%) and 75% linked to care, while 1162 clients were previously diagnosed young people living with HIV. HIV incidence among those with repeated visits was 0.72 per 100 person years (95%CI 0.53-0.98).

The most popular services for women were menstrual hygiene products (taken up by 96.5% of those eligible), HIV testing (83.7%) and period pain management (59.9%); for men the most popular were condoms (93.9%), HIV testing (85.6%) and text messages on SRH (67.1%). Among women aged ≥20 years, 43.7% took condoms and 60.3% took up other forms of contraception.

Conclusions: An integrated HIV and SRH programme had high attendance and uptake, with most clients taking multiple services per visit, including HIV testing. There is need for accessible, youth-friendly sources of SRH information, menstrual health management, contraception, and HIV testing in Zimbabwe.

OAE0205

Utilizing Community HIV/AIDS service agents to Find, Link, and retain in care pregnant, breastfeeding mothers and children aged 0-14 living with HIV

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Background: Despite efforts to end the AIDS epidemic by 2030, pregnant and breastfeeding mothers, children, and young adolescents continue to face barriers to accessing quality HIV and other health-related services. The Zimbabwe National Network of People Living with HIV (ZNNP+) has collaborated with communities in four (4) districts of Zimbabwe to improve service access for these groups by increasing awareness of available services and referring those who have interrupted treatment into care. Furthermore, community cadres met with community leaders to discuss barriers to service access identified during their work.

Description: As a community partner the Zimbabwe National Network of People Living with HIV compliment the Ministry of Health and Child Care in ensuring that pregnant and breastfeeding women and children aged 0-14 are linked and retained in care. The organisation trained and deployed 40 mentor mothers and 40 young Community HIV/AIDS Service Agents (yCHASAs) in the community who helped to track and trace those not in care. Each month the cadres submit data on their activities electronically to the central server where it is analysed, and insights generated to inform advocacy at the facility or community.

Lessons learned: Between Jul 2022-September 2022, the mentor mothers referred 1612 individuals for HIV services, 52 (3%) who had an unknown HIV status got tested and



had a positive result. The newly diagnosed were initiated on treatment and linked to support groups, while community cadres continued to provide adherence counselling. During the same time, 48 (3%) of those who had been interrupted in treatment (IIT) successfully returned to care. Ten survivors of gender-based violence (GBV) were linked to appropriate services. The cadres coordinated three community dialogues, which were attended by 90 community leaders, to discuss feedback from recipients of care to jointly find solutions to structural barriers that prevent people from accessing services.

Conclusions/Next steps: With proper training lay cadres can identify peers who are not on treatment or those interrupted in treatment and successfully navigate them back into care. If properly engaged community leaders are willing to offer cadres a platform for them to air concerns from their peers and help break down barriers to service access.

OAE03 Show me the money: The cost of epidemic control

OAE0302

Long-acting HIV pre-exposure prophylaxis (PrEP) among adolescent girls and young women (AGYW) in South Africa: cost-effective at what cost?

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Background: HIV Prevention Trials Network (HPTN) 084 demonstrated superior efficacy of long-acting, injectable cabotegravir (CAB-LA) compared to daily oral tenofovir/emtricitabine (TDF-FTC) for HIV PrEP in cisgender women. We projected the drug cost at which CAB-LA would provide good value compared to TDF-FTC among adolescent girls and young women (AGYW) in South Africa.

Methods: Using microsimulation modeling, we examined two PrEP strategies over 10 years among AGYW (ages 15-30y; scaled to n=10,000): TDF-FTC and CAB-LA. Published data informed model inputs, including: HIV incidence (TDF-FTC: 1.85/100 person-years, CAB-LA: 0.2/100 person-

years; HIV transmissions off-PrEP from 10,000 AGYW to partners (16/year); and 2-year retention (TDF-FTC: 88%, CAB-LA: 85%).

We assumed constant incidence and transmission risk over time. Annual costs included: PrEP drug+program (TDF-FTC: \$77+\$74, CAB-LA: \$153+\$75), ART (\$58 to \$834), and HIV-related care (\$215 to \$1,621). Model-projected outcomes include incident infections among and transmissions from AGYW, life-years (LYs), costs, incremental cost-effectiveness ratios (ICER=\$/LY), and CAB-LA's maximum price premium (MPP: the highest drug price at which CAB-LA would have an ICER below a willingness-to-pay [WTP] of 50% South Africa's per-capita GDP [\$3,500/LY]).

Results: Per 10,000 AGYW in South Africa, projected infections and transmissions were higher and LYs lower in TDF-FTC (2,050 infections / 658 transmissions / 85,889 LYs), compared to CAB-LA (1,151 / 342 / 86,057) (Table).

HIV infections avoided among male partners resulted in 143 LYs gained in CAB-LA over TDF-FTC. At \$153/year drug cost, CAB-LA would exceed the WTP threshold (ICER=\$6,600/LY). The projected MPP for CAB-LA to be cost-effective and cost-saving would be \$136/year and \$118/year, respectively. Accounting only for the benefits accruing to AGYW, the MPP to be cost-effective would be lower, \$122/year. Varying transmissions from 2/year to 40/year would yield an MPP of \$124-158/year to remain cost-effective.

Strategy	Incident infections in AGYW, n	Transmissions to male partners, n	Discounted LYs		Discounted costs, USD		ICER (\$/LY)*		CAB-LA maximum price premium, USD	
			AGYW	LYs gained from partners**	AGYW	Costs saved from partners**	AGYW	All	AGYW	All
TDF-FTC	2,050	658	85,889		12,579,969					
CAB-LA	1,151	342	86,057	143	14,979,829	340,232	14,300	6,600	122	136

Abbreviations: AGYW: adolescent girls and young women; CAB-LA: long-acting, injectable cabotegravir; ICER: incremental cost-effectiveness ratio; LY: life-year; PrEP: pre-exposure prophylaxis; TDF-FTC: tenofovir/emtricitabine; USD: United States Dollars.

*The ICER is the difference in cost divided by the difference in life expectancy for each strategy compared with the next less-costly strategy. Results are rounded to the nearest \$100.

**Life-years gained and costs saved are among male partners in CAB-LA compared to TDF-FTC who, in the absence of the PrEP strategy being provided to AGYW, would have acquired HIV. Life-years and costs are discounted at 3%/year and scaled to n=10,000 AGYW.

Table. 10-year model-projected outcomes of CAB-LA versus TDF-FTC for HIV PrEP among adolescent girls and young women in South Africa, (n=10,000)

Conclusions: Among AGYW in South Africa, CAB-LA could reduce transmissions and increase life-years compared to TDF-FTC. CAB-LA should be priced at less than twice the cost of TDF-FTC to be cost-effective in South Africa.



OAE0303

Predicted HIV acquisition rates for cabotegravir versus TDF/FTC as PrEP in Brazil: effects of compulsory licensing

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Background: Worldwide, 1.5 million people acquired HIV in 2021. Cabotegravir is the most effective drug to prevent HIV acquisition, with estimated efficacy of 90–95%, superior to oral tenofovir/emtricitabine (TDF/FTC). TDF/FTC is available as generic PrEP in most countries, costing \$48/year in LMICs. CAB-LA costs \$22,200/year in US, \$9000 in the UK. The ViiV-MPP licence permits generic companies to sell CAB-LA at low prices, estimated \$250/year.

However, the ViiV-MPP agreement excludes many middle-income countries, such as Brazil. CHAI estimated costs of production of \$34–\$63/year (median \$50).

Methods: We modelled the effects of 4 strategies for PrEP in Brazil: 1.No PrEP used 2.TDF/FTC generic used for PrEP, costing \$48/year. 3.CAB-LA used, with a high price, outside the ViiV-MPP license:\$3500/year, (68% below UK price), or \$250/year (target price). 4.CAB-LA used at CHAI target price \$50/year. TDF/FTC and CAB-LA were assumed to lower HIV acquisition risks by 70% and 94% respectively, versus no PrEP.

We assumed a target population of 125,000 people at high risk of HIV acquisition (incidence 6%), treated in Brazil with annual budget of \$6million.

Results: Using TDF/FTC costing \$48/year, the \$6 million Brazilian PrEP budget could treat all 125,000 people, lowering annual HIV acquisition from 8750 to 2525/year. By contrast, use of CAB-LA for \$3500/year covers 1714 people; the remaining 123,285 people receive no PrEP. Even at target prices of \$250/year, overall HIV acquisition rates are still higher. The CHAI cost price of \$50/year would provide for 120,000 people, lowering HIV acquisition to 854/year. CAB-LA needed to cost less than \$80/year to lead to fewer HIV acquisitions than TDF/FTC.

Budget	Cost of PrEP	Number given PrEP	HIV acquisitions
Current PrEP budget-\$6million			
No PrEP	\$0	0	8750
TDF/FTC	\$48	125,000	2250
CAB-LA base case	\$3500	1714	8637
CAB-LA target price	\$250	24,000	6632
CAB-LA cost price	\$50	120,000	732

Table.

Conclusions: When demand for PrEP is high and budgets limited, CAB-LA will only lower overall HIV acquisition rates if costing <\$80/year. If prices are higher, limited people can be given CAB-LA: then, mass use of TDF/FTC for \$48/year allows increased coverage, lowering overall HIV acquisition rates. Compulsory licensing may be required to lower CAB-LA prices in countries outside the ViiV-MPP voluntary license.

OAE0304

Cost-effectiveness and budget impact analysis of the implementation of differentiated service delivery models for HIV treatment in Mozambique – a modelling study

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Background: In 2018 Mozambique's Ministry of Health launched a guideline to implement eight differentiated service delivery models (DSDMs) to optimize HIV service delivery, improve retention in care, and ultimately reduce HIV associated mortality.

The models were:

1. Fast-track (FT),
2. Three-month Antiretrovirals Dispensing (3M),
3. Community Antiretroviral Therapy (ART) Groups (CAGs),
4. Adherence Clubs (AC),
5. Family-approach (FA), and three one-stop shop models:
6. Adolescent-friendly health services (OSS-AFHS),
7. Maternal and child health (OSS-MCH), and
8. Tuberculosis (OSS-TB).

We conducted a cost-effectiveness analysis (CEA) and a budget impact analysis (BIA) comparing these DSDMs to conventional services.

Methods: We constructed a decision tree model based on the percentage of enrolment on each DSDM and the probability of the outcome (12-months retention on ART), with and without DSDMs implementation, for each year of the study period; three for CEA (2019 to 2021), and three for BIA (2022 to 2024). The economic and financial costs for CEA and BIA, respectively, were estimated per client-year from the health system perspective, and included start-up, ARV drugs, laboratory tests, and clinical and pharmacy visits. Effectiveness was estimated using the Mozambique ART database, employing an uncontrolled



interrupted time series analysis comparing the outcome before and during the implementation of DSDMs. A one-way sensitivity analysis was conducted to identify drivers of uncertainty.

Results: During the three years of DSDMs implementation, there was a mean increase of 14.9 percentage points (95% Confidence Interval (CI): 12.2, 17.8) in 12-months retention comparing DSDMs implementation (62.5% [95%CI: 60.9, 64.1]) to conventional care (47.6% [95%CI: 44.9, 50.2]), and the mean base-case economic cost per person-year was estimated to be \$253 and \$359 for DSDMs and conventional care, respectively; therefore, DSDMs dominated conventional care. The base-case 3-year financial costs associated with the DSDMs and the conventional care for a population of 1,535,575 were estimated to be \$1,653,814,275 and \$990,194,425, respectively. The results were most sensitive to clinical visits costs.

Conclusions: DSDMs were less expensive and more effective in retaining clients 12-months after ART initiation, and their implementation was estimated to save approximately \$670 million to the health system from 2022 to 2024.

OAE0305

Cost-effectiveness of the WHO-endorsed advanced HIV care package in Malawi

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Background: In sub-Saharan Africa, more than 20% of PLHIV present with advanced HIV disease (AHD). Our objective was to project the clinical outcomes, costs, and cost-effectiveness of the WHO-recommended AHD package of care in Malawi.

Methods: Using the validated CEPAC-I model, we simulated a cohort of PLHIV aged ≥18y initiating ART with measured CD4 count using published data and assessed 7 strategies applied to people identified with AHD (CD4<200/μL and/or WHO 3/4 disease):

1. No specific AHD care (sputum Xpert for people with TB symptoms), and then sequential addition of:
2. Urine LAM;
3. Co-trimoxazole (CTX);
4. Cryptococcal antigen (CrAg) and CTX;
5. LAM and CTX;
6. LAM, CTX, and CrAg;
7. LAM, CTX, CrAg, and isoniazid preventive therapy (IPT).

The cohort had mean age 37y, 51% were female, mean CD4 362/μL (15% with CD4 <200/μL and 4% with WHO3/4 disease and CD4 ≥200/μL). Among people with CD4 <200/μL, prevalence was: 18-37% TB disease; 20-39% latent TB; 5% asymptomatic cryptococcal disease; 87% of people with TB disease had symptoms.

Test costs were \$13 (Xpert), \$5 (LAM), and \$3 (serum CrAg); medication costs were \$0.83/month (CTX), \$4/month (Fluconazole), \$1/month (IPT). Model outcomes included life expectancy, costs, and incremental cost-effectiveness ratio (ICER, \$/year-of-life saved [YLS]); we considered ICERs <\$640/YLS (Malawi's annual *per capita* GDP) cost-effective.

Results: All AHD strategies would improve clinical outcomes and increase costs (Table). The full AHD package, LAM+CTX+CrAg+IPT, would result in the greatest life expectancy (21.61 life-years) and be cost-effective (ICER, \$250/YLS). All other strategies would be less efficient than the full AHD package at the cost-effectiveness threshold. Results are most sensitive to TB and cryptococemia prevalence.

Conclusions: Using published data, the full AHD package at ART initiation would be cost-effective in Malawi compared with only some elements of the package, when CD4 count is measured.

Strategy	1y survival (%)	Undiscounted life expectancy (y)	Discounted life expectancy (y)*	Lifetime costs (\$)*	ICER (\$/YLS)*
No AHD care (ART+Xpert)	93.89	20.89	13.62	1,354	--
+LAM	94.20	21.13	13.74	1,371	140
+CTX	94.31	21.21	13.81	1,412	dom
+CrAg+CTX	94.34	21.21	13.81	1,413	dom
+LAM+CTX	94.64	21.45	13.93	1,430	dom
+LAM+CTX+CrAg	94.66	21.46	13.94	1,431	dom
+LAM+CTX+CrAg+IPT	94.88	21.61	14.03	1,444	250

*Discounted at 3%/year. Dominated (dom): the ICER of this strategy compared to the next more costly strategy is higher and therefore not preferred.

Abbreviations: AHD, advanced HIV disease; PLHIV, people living with HIV; ICER, incremental cost-effectiveness ratio; YLS, years-of-life saved; LAM, liparabinomannan; CTX, co-trimoxazole; CrAg, cryptococcal antigen; IPT, isoniazid preventive therapy.

Table. Model-projected outcomes comparing the clinical outcomes, costs, and cost-effectiveness of different strategies for AHD care for PLHIV initiating ART in Malawi.



OAE04 From silos to solutions: Embracing integration for better health outcomes

OAE0402

Blood pressure control among patients receiving Integrated care for HIV, diabetes and hypertension in primary health care facilities in Tanzania and Uganda

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Background: Non-communicable diseases (NCD) are a growing cause of morbidity and mortality among persons with or without HIV in sub-Saharan Africa. Diabetes and hypertension alone are estimated to cause about 2 million deaths annually. This dual burden requires that health care delivery systems are re-organized to address the needs of patients with chronic conditions for better outcomes. In partnership with public health services, we conducted a large cluster-randomised trial; INTE-Africa and compared blood pressure control among patients between the two arms; integrated management and standard care.

Methods: The study was part of a large cluster-randomised control trial. High volume primary care facilities were randomized. Study participants were selected systematically. In the integrated care clinic (intervention arm), participants with either HIV, diabetes or hypertension or combinations of these were managed in a single common clinic by the same clinical teams, had joint triage and waiting areas, and shared laboratory, counseling and pharmacy services. Standard care was organized in separate clinics. Participants were followed up for 12 months.

Results: A total 32 facilities were randomised. 16 to integrated care and 16 to standard care. We enrolled 7030 participants in the study, of whom 5150 (73.3%) were female. Of these 3081 (43.8%) had hypertension (either as a single or multiple condition) and had been in care for at least six months.

At the end of the study, 2440/3081 (79.2%) participants' blood pressure measurement was recorded, 1190 (48.8%) were in the integrated care arm and 1250 (51.2%) in the standard of care. In our study, 586/1190 (49.2%) participants in integrated care compared to 480/1259 (38.4%) participants in the standard of care arm had blood pressure controlled at the end of the study.

There was a difference in blood pressure control among patients with hypertension only, 379/692(54.8%) in the integrated care arm compared with 288/689(41.8%) in the standard of care arm of although not statistically significant

(p-value of 0.05). Among patients with diabetes and hypertension there was a statistically significant difference between the two arms (p=0.01).

Conclusions: There was some improvement in blood pressure control among patients in integrated care arm compared to those in the standard of care arm.

OAE0403

Scaling up cervical cancer prevention services among women living with HIV: lessons and experiences from FIKIA+ project in Mwanza, Tanzania

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Background: Cervical Cancer Prevention (CECAP) is a priority intervention as part of comprehensive HIV care for women living with HIV (WLHIV). There was low uptake of CECAP services in Tanzania's Mwanza region in the first quarter of fiscal year 2022 (FY22), with 5% achievement of the annual programmatic target of screening 26,618 WLHIV (33% of women on ART) for precancerous cervical lesions. The initial poor performance was due to low service coverage, inadequate supplies, cryotherapy machine breakdown and scale up of 6 multi-months dispensing (6 MMD) of antiretroviral therapy (ART), which reduced WLHIV's clinic appointment frequency. We describe here progress in scaling up CECAP services in Mwanza.

Description: Between January and March 2022, facilities offering CECAP services were scaled up from 29 to 54. In addition, 97 facilities were added as outreach sites following onsite mentorship and provision of technical support by trained staff. Services were integrated with community ART refill through a mobile clinic to reach WLHIV who missed services, including those with 6 MMD of ART. Bio-medical engineers were engaged to conduct corrective and preventive maintenance of cryotherapy machines and monitoring and timely delivery of CECAP supplies was done. We analyzed routine program data to illustrate trends in cervical cancer screening and treatment and how they proportionally correspond to the pre-set targets.

Lessons learned: WLHIV screened for cervical cancer increased from 1,294 in the first quarter of FY22 to 10,188 in the second quarter. By end of FY22, 25,701 WLHIV were screened, corresponding to 97% of the annual target; 65% of WLHIV were screened at outreach sites. Among WLHIV screened, 753 (3%) were found to have precancerous cer-



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vical lesions and 743 (99%) were linked to treatment with 92% completing treatment in the same visit. Out of 25,701 WLHIV screened, 103 (0.4%) were suspected to have cancer and were referred for further diagnosis.

Conclusions/Next steps: The target for cervical cancer screening was almost achieved (97%) with 99% linkage to treatment following a combination of enhanced service delivery.

The findings demonstrate that it is feasible to make substantial improvements in the uptake of CECAP services by implementing approaches to increase programmatic reach and quality.

OAE0404

Integrating hepatitis C services into ART clinics in low and middle income countries (LMICs) as an approach toward hepatitis C micro-elimination: pilot experience in Nigeria

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Background: Globally, an estimated one in ten people living with HIV (PLHIV) is co-infected with viral hepatitis B or C (HBV, HCV), which increases morbidity and mortality[1]. HCV can be cured with low-cost, well-tolerated direct acting antiviral treatment. Improving outcomes among PLHIV with HCV/HBV co-infection demands strategic service delivery approaches including integrating HCV/HBV services in antiretroviral therapy (ART) clinics. This abstract highlights HCV/HIV service integration outcomes achieved at 4 ART sites in Nasarawa State, Nigeria.

[1] <https://pubmed.ncbi.nlm.nih.gov/26922272/>

Methods: A baseline assessment was conducted at ART facilities and community ART engagements including home visits to identify critical points for service integration including HCV screening, viral load (VL) confirmatory testing, and treatment without disruption to existing services.

No routine HCV screening for PLHIV was previously available. Relevant healthcare workers were trained on HCV management and data reporting. From July 2020 – December 2022, PLHIV coming for ART visits received HCV screening during triaging and positive patients were linked to care.

Patient navigators and ART defaulter trackers identified unscreened PLHIV using facility HCV screening and enrolment data and prompted their return to the facility for HCV services through texts/calls or provided these services in community settings. Positive patients were linked to VL testing and treatment in either the facility or community.

Results: During this integration pilot, a total of 3831 PLHIV were screened of 4042 receiving ART across the sites (94.8%; Male (M)/Female (F) = 29%/71%). 426 (11.1%) were seropositive, 371 received a confirmatory HCV VL (87.1%), 218 were viremic (58.8%), and 175 initiated HCV treatment.



Figure. Hcv Care cascade for enrolled PLHIV in four ART facilities (July 2020 - December 2022).

Conclusions: Despite the effects of the COVID-19 pandemic, and financing barriers necessitating domestic resource mobilization, HIV/HCV service integration at ART clinics and community settings has been a successful strategy to dramatically expand HCV screening and treatment among HIV clients and a critical step to achieving HCV micro-elimination in PLHIVs in LMICs.

OAE0405

Willingness to access PrEP for adolescent girls and young women seeking emergency contraception at community pharmacies in Uganda

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Background: Adolescent girls and young women (AGYW) account for 26% of new HIV diagnoses in Uganda, but only 4.6% of pre-exposure prophylaxis (PrEP) users. Differentiated delivery of PrEP services at private pharmacies, often frequented by this population, could increase prevention coverage.

Methods: We recruited AGYW, aged 18-24 years, seeking emergency contraception (EC) from 13 randomly selected community-pharmacies in central Uganda between May and December 2022. We hypothesized that AGYW seeking EC at community-pharmacies would be willing to access and use PrEP. Following brief training, pharmacy providers delivered study information to interested AGYW and referred them to the research clinic for data collection.

The primary outcome was willingness of AGYW to access PrEP, evaluated using an interviewer-administered cross-sectional survey. We used descriptive statistics and modified Poisson regression to analyze the data.

Results: We enrolled 130 AGYW, median age of 22 years (interquartile range [IQR] 20-24). Of these, 104 (80%) were living alone or had no partner, and 64 (49%) had no child. Eighty-four (65%) were employed and median monthly income was \$54.4[40.8-81.6]. AGYW accessed EC a median of 3 times (IQR 2-6) in the prior 3 months. Most (81%) chose



community-pharmacies as the most convenient place to receive PrEP services instead of public/private health facilities, or community outreach. Approximately half of AGYW (73; 56%) were willing to accept PrEP from community-pharmacies.

Willingness to access pharmacy-delivered PrEP was associated with PrEP awareness (adjusted prevalence ratio [APR] 1.90; 95% confidence interval [CI]:1.43-2.51; $P<0.001$), having a busy schedule (APR 1.60; 95%CI:1.20-2.13; $P=0.001$), experiencing symptoms of a sexually transmitted disease in the prior 3 months (APR 1.58; 95%CI:1.22-2.06; $P=0.001$), number of sexual partners in the previous 3 months (APR 1.15 per partner; 95%CI:1.02-1.31; $P=0.03$), and number of sex acts in the prior 3 months (APR 1.01 per act, 95%CI:1.00-1.02; $P=0.006$).

By contrast, dysuria and condom use were associated with decreased willingness to access PrEP (APR 0.38, 95%CI: 0.20-0.71; $P=0.003$) and (APR 0.78, 95%CI:0.67-0.92; $P=0.002$), respectively.

Conclusions: More than half of AGYW in our survey were willing to access PrEP from community-pharmacies. If scaled, pharmacy-based PrEP delivery models could significantly improve PrEP access for this population.

OAE05 #SwitchUp4KeyPopulations: Worldwide advancements in meeting the growing needs of key populations

OAE0502

Tackling health facility intersectional stigma faced by men who have same-gender sex in Ghana: early results from a randomized control trial

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Background: Intersectional stigma and discrimination (ISD) in the health system towards gay, bisexual, and other men who have sex with men (GBMSM) is a barrier to

HIV prevention and treatment for this underserved population, particularly in settings where same-gender sex is criminalized. Yet, few empirically tested health-facility (HF) ISD-reduction interventions exist. Therefore, we adapted an evidence-based HIV HF stigma-reduction intervention to address the intersection of HIV, same-gender sex and gender non-conforming stigma and discrimination in Ghana, where GBMSM are 11 times more likely to be living with HIV than the general population.

Methods: We assessed the effect of the facility-level stigma reduction intervention using baseline (n=200), 3-month (n=200) and 6-month (n=200) follow up survey data of staff in 8 HFs randomly assigned to intervention and wait-list control in Greater Accra and Ashanti regions, Ghana.

Differences-in-differences analysis was conducted to assess whole-facility intervention effects using the 18-item and 3 sub-scales validated HCF Intersectional Stigma Scale (HCF-ISS). The outcomes of interest were facility-level composite stigma scores for key stigma drivers.

Results: At 3-months post intervention, we observed a significant reduction in the whole-facility intersectional stigma score (and the gender-and-sexuality norms belief subscale) in the intervention HFs compared to wait-list facilities. This difference held at 6-months post intervention for the gender-and-sexuality norms belief subscale (Table).

Healthcare Facilities Staff Intersectional Stigma Scale (HCF-ISS)	Control			Intervention		
	Mean (SD)	Stigma Scores		Mean (SD)	Stigma Scores	
Scale is average score - range 1-5, with 5 highest corresponding to highest level of stigma (undesirable outcome)	Base-line	3-month	6-month	Base-line	3-month	6-month
Subscale 1: Intersectional Identities Discomfort (Cronbach's alpha = 0.71)	2.02 (0.69)	2.09 (0.74)	1.90 (0.57)	2.12 (0.74)	1.94 (0.67)	1.88 (0.73)
Subscale 2: Gender and Sexuality Norms Beliefs (Cronbach's alpha = 0.72)	3.67 (0.63)	3.55 (0.81)	3.52 (0.76)	3.88 (0.71)	3.43 (0.88)*	3.38 (0.87)*
Subscale 3: HIV stigma (Cronbach's alpha = 0.68)	2.23 (0.73)	2.22 (0.67)	2.23 (0.68)	2.27 (0.76)	2.24 (0.75)	2.22 (0.68)
Total Intersectional Stigma Score (Cronbach's alpha = 0.74)	2.72 (0.45)	2.7 (0.51)	2.61 (0.45)	2.85 (0.49)	2.58 (0.55)*	2.56 (0.58)

*Statistically significant change in average facility stigma score in intervention hospitals compared to control hospitals

Table.

Conclusions: Upholding human rights, delivering quality services for GBMSM and ending AIDS by 2030 is not achievable without reducing the ISD faced by populations that are disproportionately impacted by HIV and underserved by the health system. Reducing ISD in HFs is particularly critical, given their essential role in providing prevention and treatment services.



This study provides evidence that it is possible to reduce intersectional stigma towards GBMSM in health systems, even in the context of challenging political and social climates. It provides a replicable intervention approach as well as practical intervention tools.

OAE0503

Catalyzing access to HIV services and essential health care for key populations: effective innovations for African countries

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Background: About four-fifths of the 24 million people in Nigeria's Lagos State live below the poverty line and cannot afford to pay for essential healthcare without risking catastrophic financial consequences. A large number of key population groups—men who have sex with men, injection drug users, female sex workers, and transgender populations reside in Lagos state.

Nigeria, like many African counties, often criminalize and stigmatize these population groups with resultant lack of access to essential health care, risk of health catastrophe and poverty as traditional government programs do not fund their health care needs.

Description: The USAID Health Policy Plus Project HP+ supported Lagos State to expand its health insurance scheme and devised a special focus to target orphans, vulnerable children, people living with HIV, and key populations. HP+ collaborated with key actors including the Network of People living with HIV and State Health Insurance Agency and secured the release of the state's equity fund—an annual contribution by the government for provision of healthcare to poor and vulnerable communities—and for key populations to be prioritized as beneficiaries of this fund, for the first time.

The program also facilitated their enrolment into the social register which enables them to access government intervention funds for improving livelihoods.

Lessons learned: These efforts led to the release of NGN750-million in equity funds, for increased access to quality health care, and HIV services. 100,000 poor and vulnerable children and people living with HIV including 12,000 from key populations were enrolled.

This policy change allowed the targeted groups to be enrolled into health insurance and receive free health care at their preferred one stop shop facilities, increasing access to essential HIV and health care services, and financial protection.

Conclusions/Next steps: Catalyzing government funding for key populations is possible even in settings where they are criminalized through strategic, targeted, collaborative and integrated approaches. This can be adapted by other countries facing similar challenges in obtaining government funding for key populations. This integrated approach also provides health, economic and social ben-

efits which is essential for ensuring the complete well-being of key population groups— a critical factor for HIV epidemiological control

OAE0504

Increasing access to SelfCare: Employing an online-based demand generation strategy to increase uptake of peer-led unassisted HIV self-testing among key populations in the Philippines

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Background: Ease of access is one factor in getting tested for HIV. The imposed limited mobility due to COVID-19 limited this access even further. Since its introduction in 2020, unassisted HIV self-testing has been established as a choice for key populations to access HIV testing in the Philippines. Aiming to bring HIV testing awareness to key populations, a program designed to generate demand is introduced in SelfCare (LoveYourself's unassisted HIV self-testing program).

Description: Guided by the AIDA model (Figure 1), this program aimed to create awareness and demand generation by creating a massive number of leads of potential clients accessing SelfCare. A communications plan was designed by members of key populations to determine the campaign architecture, keeping in mind the target market: gay, bisexual, and other men who have sex with men (GBMSM) and transgender people. The key messages focused on testing information, access, and its impact on the lifestyle of clients.

The visual theme and the messages developed include a motivational tone of espousing self-empowerment. These campaigns are promoted on various social media platforms.



Figure 1.

Lessons learned: The communications plan was implemented starting in October 2020. The continuous posting of content has increased uptake by 1,012% compared to data from July-September 2020. During the campaign, a total of 513,024 clients were reached (as of Dec 2022).

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These campaigns have generated 20,043 clients accessing SelfCare, with a reactivity rate of 6% among those who reported results. 39.13% of the clients tested for HIV for the first time. Among those reactive, 75.33% of clients have been enrolled in treatment.

Conclusions/Next steps: It was seen that demand generation campaigns powered by the community are effective in bringing awareness of HIV self-testing. Community consultations are essential in creating these programs for key communities. This momentum will be maintained with offline community engagement activities and campaigns promoted on other online platforms.

OAE0505

Differentiated online-to-offline (O2O) interventions for HIV services: impacts on HIV testing and case finding among key populations in Thailand, Nepal and the Philippines

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Background: The COVID-19 pandemic brought renewed emphasis on the strategic use of online to offline (O2O) interventions, since in-person outreach was reduced, and HIV service options were often limited. In Thailand, Nepal, and the Philippines, USAID EpiC Project-supported community-based organizations and hospitals adapted multiple O2O approaches to reach and test key populations, with a focus on reaching undiagnosed HIV-positive individuals. We identify and analyze here the impacts of these O2O approaches in the three countries from October 2021-September 2022.

Description: Social influencers, targeted ads, and online outreach engaged sexual, drug-use, and chemsex networks to promote HIV testing on social media and chat apps, e.g., Facebook, Twitter, LINE, TikTok, Grinder, Hornet, and Blued. A unique online reservation web application permitted in-depth analysis of client flow from the source of client online exposure to messaging through clinic attendance and service utilization, e.g., HIV testing.

Lessons learned: In Thailand, O2O interventions brought in 11% of all project-supported HIV testing clients (5% HIV case detection). A majority of online clients were reached by Facebook, but two apps – Blued and Twitter – had the highest case detection (10.4% and 7.8%, respectively). In Nepal, O2O interventions brought in 10.3% of all HIV testing clients, and Facebook was the most common site for recruiting clients (57% of all O2O activity). A total

of 8.4% of clients tested through O2O interventions were positive, though some platforms showed higher case detection, e.g. Whatsapp, 11.1%.

In the Philippines, O2O interventions specifically assisted project-supported government hospitals where they contributed more than one-third (37%) of the clients HIV tested and almost one-fifth (19%) of all identified HIV cases. At one government facility, the on-line reservation app contributed 56% of all HIV testing and 79% of all identified HIV cases.

Conclusions/Next steps: Differentiated O2O interventions focused on key populations clearly demonstrated their added value in HIV testing and case finding across three countries. Programs need to regularly analyze the effectiveness of specific platforms, use innovations such as online reservation apps that allow more in-depth analysis, and continually adapt O2O interventions so that they remain impactful and relevant to KP's dynamic use of social media.



Poster exhibition abstracts

Track A: Basic science

MOPEA01

Transcriptional activity of brain-derived HIV long terminal repeat sequences from ART-treated people with HIV

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Background: Recently, we demonstrated that the brain of ART-treated people with HIV (PWH) harbours a pool of both intact and defective HIV proviruses. We and others have demonstrated that HIV long terminal repeats (LTRs) isolated from the brain of viremic PWH are functional and distinct from those isolated from matched peripheral tissues from the same individual. Despite the presence of intact potentially replication competent proviral genomes, whether the LTRs are functional and transcriptionally active is unclear.

Methods: Autopsy brain and matched peripheral tissue from ART-treated (n=9) or viremic PWH (n=2) were provided by the National NeuroAIDS Tissue Consortium. Droplet-digital PCR was utilised to quantify the presence of HIV *pol* DNA within brain tissue from these individuals. HIV LTRs from brain and matched peripheral tissue (where available) were isolated through single genome amplification. Phylogenetic sequence analysis was undertaken and transcription factor binding site analysis was performed through the transfection of LTRs into astrocyte and microglial cell lines under basal and tat-transactivated conditions.

Results: HIV *pol* DNA was detected in the brain of both ART-treated and viremic PWH (median (IQR) HIV *pol* DNA copies/10⁶ cells = 32.59 (13.9 – 310.1) vs 17015 (670.3 – 33359)). A total of 18 unique sequences were isolated from brain tissue (4 ART-treated and 2 viremic PWH) and 38 unique sequences were isolated from matched peripheral tissue (3 ART-treated and 2 viremic PWH). In contrast to our previous findings in viremic PWH, compartmentalisation was not observed between brain and peripheral sequences in ART-treated PWH. All sequences isolated from the brain of ART-treated PWH retained intact core promoter regions (TATA, SP1, NF- κ B), suggesting that they are capable of transcription. Interestingly, one sequence also contained additional SP1 sites. Isolated LTRs were transcriptionally active and capable of Tat-transactivation within brain cell lines (n=4 unique sequences from two ART-treated participants).

Conclusions: These findings support the presence of a potentially transcriptionally competent inducible pool of HIV in the brain of ART-treated PWH. Understanding the

function of HIV LTRs derived from intact proviral genomes in the brain may inform the role of the HIV reservoir in ongoing disease and as a barrier to HIV cure.

MOPEA02

Genetic variation of the HIV-1 subtype C transmitted/founder viruses long terminal repeat elements and the impact on transcription activation potential and clinical disease outcomes

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Background: A genetic bottleneck is a hallmark of HIV-1 transmission such that only very few viral strains, termed transmitted/founder (T/F) variants establish infection in a newly infected host. Phenotypic characteristics of these variants may determine the subsequent course of disease. The HIV-1 5' long terminal repeat (LTR) promoter drives viral gene transcription. HIV-1 5'LTR and 3'LTR have a same genetic sequence.

The major aim of this study was to investigate the genetic and functional of T/F LTR variants. We hypothesised that HIV-1 subtype C (HIV-1C) T/F virus LTR genetic variation is a determinant of transcriptional activation potential and clinical disease outcome.

Methods: The 3'LTR was amplified from plasma samples of 41 study participants acutely infected with HIV-1C (Fiebig stages I and V/VI) in Durban South Africa. Paired longitudinal samples were also available at one year post-infection for 31 of the 41 participants. 3'LTR (referred as LTR henceforth) amplicons were cloned into a pGL3-basic luciferase expression vector, and transfected alone or together with Transactivator of transcription (*tat*) into Jurkat cells in the absence or presence of cell activators (TNF- α , PMA, Prostratin and SAHA).

Results: Inter-patient T/F LTR sequence diversity was 5.7% with subsequent intrahost viral evolution observed in 48.4% of the participants analyzed at 12 months post-infection. T/F LTR variants exhibited differential basal transcriptional activity, with significantly higher Tat-mediated transcriptional activity compared to basal (p<0.001). Basal and Tat-mediated T/F LTR transcriptional activity showed a significant positive correlation with contemporaneous viral loads and negative correlation with CD4 counts (p<0.05) during acute infection respectively.



Furthermore, Tat-mediated T/F LTR transcriptional activity significantly correlated positively with viral load set point and viral load; and negatively with CD4 T cell counts at one year post infection (all $p < 0.05$). Lastly, PMA, Prostratin, TNF- α and SAHA cell stimulation resulted in enhanced yet heterologous transcriptional activation of different T/F LTR variants.

Conclusions: Our data suggest that T/F LTR variants may influence viral transcriptional activity, disease outcomes and sensitivity to cell activation. Future studies should investigate the impact of T/F LTR genetic variation on latency development and/or reactivation.

MOPEA03

TGF- β drives HIV infected CD4⁺ T cells to adopt a tissue resident memory phenotype

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Background: Persistent reservoirs are established during the acute stage of HIV infection when high level replication occurs in gut associated lymphoid tissue (GALT). Long-lived gut CD4⁺ tissue resident memory cells (T_{RM}s) contribute to viral reservoirs. T_{RM} cell differentiation is not well understood. Identifying the cues that drive infected cells in the gut to become T_{RM}s may help identify strategies to prevent or disrupt the formation of these reservoirs.

Methods: In this study we carried out a combined gene expression and phenotypic analysis of MAdCAM costimulated cells by multicolor flow-cytometry. CD4⁺ T cells isolated from healthy donors were costimulated with MAdCAM, retinoic acid and TGF- β .

Results: 7 days after costimulation we noted upregulation of CD69 and CD103. Prolonged expression of CD69 is associated with tissue resident memory cells (T_{RM}). CD103 (integrin α_E) which combines with integrin β_7 to form $\alpha_E\beta_7$ heterodimers. Like CD69, $\alpha_E\beta_7$ is a marker of T_{RM} cells. We also observed upregulation of the gut-homing chemokine receptor CCR9. These three markers represent a signature of T_{RM} cells. Thus, MAdCAM costimulation established a differentiation program that resulted in the formation of CD4⁺ T cells with a T_{RM}-like phenotype. TGF- β is known inducer of CD103. Combining TGF- β with MAd-

CAM further differentiated CD4⁺ T cells toward a T_{RM}-like phenotype. The capacity of MAdCAM to upregulate CCR5⁺ rendered these cells susceptible to HIV infection, even in the presence of TGF- β .

Conclusions: A hallmark of acute HIV infection is infection in gut tissues. Our findings raise the possibility that during acute infection, interactions between CD4⁺ T cells and MAdCAM facilitate both the formation of T_{RM} cells, and their infection. Such an activity may contribute to the early establishment of persistent HIV reservoirs localized to the gut.

MOPEA04

Infection by high replication capacity HIV-1 viruses is associated with increased glucose metabolism by T cells

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Background: HIV viruses with high replicative capacity (RC) are associated with elevated viral loads and faster disease progression in the absence of therapy. It has also been reported that in some circumstances, lower RC viruses may be selectively favored for transmission. Understanding the underlying mechanisms of the spread of viruses with variable RCs may inform novel anti-HIV interventions. Cellular metabolism plays an important role in regulating immune cell function and there is accumulating evidence that CD4⁺ T cells' metabolic reprogramming of glucose breakdown, glycolysis, and oxidative phosphorylation favor HIV infection.

We hypothesized that viruses differ according to their RC in the ability to modulate cellular metabolism and promote virus transmission and replication.

Methods: Chimeric viruses containing patient-derived gag-protease amplicons from HIV-1 subtypes B and C were constructed in the NL4-3 backbone (n=29). Viral RC was determined using a GFP-reporter cell line assay, and the ability for *in vitro* virus cell-to-cell spread in T cells was measured by gag p24 detection using flow cytometry. In addition, glucose and fatty acid metabolism in infected cultures were quantified using flow cytometry-based 2-NBDG and Bodipy uptake assays. Glutamine levels were also measured using a luminescence-based assay.

Results: Subtype B chimeric viruses had overall higher RCs than subtype C viruses ($p=0.0003$). Virus RC correlated with the amount of cellular glucose uptake ($p=0.02$, $r=0.5$),



but not fatty acid uptake in infected T cell cultures. Moreover, fatty acid uptake was higher in HIV-infected cells irrespective of virus RC compared to bystander cells within the same culture ($p=0.01$). Cell-to-cell spread, after 24 and 48 hours of co-culture, correlated with virus RC ($p=0.02$, $r=0.7$) and this was accompanied by increased glutamine consumption in infection cultures ($p<0.0001$).

Conclusions: These results suggest that virus characteristics such as RC, may influence the host cellular glucose metabolism and further enhance virus cell-to-cell spread. These data have implications for understanding the mechanisms underlying differential clinical outcomes by viruses with variable RCs.

MOPEA05

IL7RA single nucleotide polymorphisms and CMV co-infection associate with MAIT cell dysregulation in treated HIV-1 infection

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Background: Mucosa-associated invariant T (MAIT) cells are the most abundant antimicrobial T cells in humans and recognise riboflavin-related metabolites. MAIT cells are depleted and exhausted in HIV-1-infected individuals despite long-term combination antiretroviral therapy (cART).

IL-7 treatment supports MAIT cell reconstitution in HIV-1-infected individuals *in vivo* and rescues their functionality *in vitro*. Single-nucleotide polymorphisms (SNPs) of the *IL-7RA* gene modulate the levels of soluble (s)IL-7R α levels and influence bioavailability of circulating IL-7.

Here we evaluated the potential influence of *IL-7RA* polymorphisms on MAIT cell numbers and function in healthy control (HC) subjects and HIV-1-infected individuals on long-term cART.

Methods: The *IL-7RA* promoter haplotypes were identified by haplotype-tagging SNPs of *IL-7RA* from a cohort of 35 HC and 39 HIV-1-infected individuals. The number and phenotype of MAIT cells, levels of the MAIT cell-associated

transcription factors, and MAIT cell effector function and proliferation following cognate stimulations were measured by flow cytometry.

Results: The *IL-7RA* haplotype 2 (H2*T), defined as T-allele carriers at the tagging SNP rs6897932, affects the size of the peripheral blood MAIT cell pool and their production of cytokines and cytolytic effector proteins in response to bacterial stimulation in HC. H2*T carriers had lower sIL-7R α levels and higher MAIT cell frequency with enhanced functionality linked to higher expression of MAIT cell-associated transcription factors. Despite an average of 7 years on cART, MAIT cell levels and function in HIV-1-infected individuals were still significantly lower than those of HC. Notably, we observed a significant correlation between MAIT cell levels and cART duration only in H2*T HIV-1-infected individuals. Unexpectedly, the levels of anti-CMV IgG are correlated with sIL-7R α levels and inversely correlated with MAIT cell numbers.

Finally, treatment with sIL-7R α *in vitro* suppressed IL-7-dependent MAIT cell proliferation and function following cognate stimulations.

Conclusions: Collectively, these observations suggest that *IL-7RA* polymorphisms may play a significant role in MAIT cell biology and influence MAIT cell recovery in HIV-1 infection by modulating sIL-7R α levels and IL-7 bioavailability to MAIT cells.

Our findings also suggest that CMV co-infection may potentially contribute to MAIT cell dysregulation. The potential links between *IL7RA* polymorphisms, MAIT cell immunobiology, HIV-1 infection, and concomitant CMV infection warrant further studies.

MOPEA06

Long-term HIV control and breastfeeding: HIV DNA in breast milk cells from an exceptional elite controller and a woman on-ART. Are we ready to change the paradigm?

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Background: HIV has been found to be present in breast milk, even in the context of antiretroviral therapy (ART). Formula feeding is safe in high-income settings, therefore, women living with HIV (WLWH) are advised against breastfeeding and this recommendation has not changed over time.

However, WLWH with fully suppressed viral loads and exceptional elite controllers are challenging these guidelines and even choosing to breastfeed.

Here we aimed to study the HIV RNA and reservoir present in breast milk from an exceptional elite controller (EEC, the "Esperanza patient") and to compare it with another

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woman who has been under ART with dolutegravir, lamivudine and abacavir since march 2016 (WLWH-on-ART), maintaining undetectability for over 69 months.

Methods: 5.65 liters of breast milk from the first seven weeks of lactation were processed from the EEC, and 411 mL from WLWH-on-ART. Milk was centrifuged and the fluid portion (556 ml from EEC, 146 ml from WLWH-on-ART) was ultracentrifuged and used to determine HIV viral load (VL).

Also, 1,443 billion cells from EEC and 36.6 million cells from WLWH-on-ART were obtained. DNA was extracted and total HIV DNA qPCR and FLIP assays were performed.

Results: Breast milk VL was undetectable (<40 copies/mL) for both subjects throughout the first seven weeks of lactation. Seven copies of HIV DNA were found within 87 million cells analyzed from the EEC (0.08 copies/1M cells) and 2 copies were found within 2.7 million cells from WLWH-on-ART (0.74 copies/1M cells) by qPCR. For the EEC, 9.3 million cells were analyzed by FLIP-assay and no amplicons were obtained.

Conclusions: The Esperanza patient is an EEC, and her status correlates with lower levels of HIV reservoir in blood. Our studies in breast milk are still preliminary, however, they suggest that the characteristics of HIV reservoir in breast milk are also different from the peripheral blood and from non-controllers, showing lower levels of HIV DNA.

We intend to expand our study, including more lactating subjects on-ART with long-term undetectability. This would help to estimate more accurately the real risk of HIV transmission through breast milk in this population.

MOPEA07

Novel adjuvant ALFQ elicits a strong immune stimulatory signature that correlates with remarkable magnitude T cell and humoral immune responses following pox-protein vaccination

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Background: Novel vaccine adjuvants may play an important role in eliciting immune responses capable of protecting against HIV-1 acquisition. One promising adjuvant under investigation is the monophosphoryl lipid A-containing Army Liposomal Formulation (ALF) with QS21 saponin (ALFQ). In a pox-protein vaccination study in nonhuman primates adjuvanted with ALFQ, the peak percentage of Env-specific CD4+ and CD8+ T cells were unprecedented, ranging between 0.9-5.9% and 0.4-3.4%, respectively.

We aimed to assess the contribution of ALFQ to this response by measuring innate immune activation following immunization.

Methods: Rhesus macaques were vaccinated with recombinant modified vaccinia virus Ankara encoding HIV-1 *gag/pol* and *env* in a prime-boost regimen with multimeric gp145 Env protein. gp145 was adjuvanted with either ALFQ or aluminum hydroxide followed by mixing with ALF (ALFA) (n=9/group). Soluble cytokines in the plasma were measured 0 and 24 h post-vaccination using a bead-based Luminex assay. Env-specific binding antibodies and T cell responses were measured in peripheral blood 2 weeks post-vaccination by ELISA and intracellular cytokine staining, respectively.

Results: Inflammatory cytokine levels transiently increased in plasma following vaccination. ALFQ adjuvanting induced a more robust inflammatory cytokine response than ALFA, with larger fold-change increases in IL-1RA, IL-6, IFN γ , IL-18, G-CSF, IL-15 and sCD40L one day post-vaccination ($P<0.05$).

Post-vaccination plasma cytokine levels positively correlated with the magnitude of Env-specific CD4+ T cell responses (IL-1RA, IL-18, MCP-1, IL-6, IL-15, IFN γ , IL-10, G-CSF, MIP-1 β , sCD40L) and Env-specific antibodies (IL-1RA, IL-18, IL-6, IFN γ , G-CSF, MIP-1 β , sCD40L).

In contrast, CD8+ T cell response associations with plasma cytokine levels were more limited: induction of high magnitude Env-specific CD8+ T cells correlated with levels of the pro-inflammatory cytokine, IL-6.

Conclusions: ALFQ adjuvanted pox-protein vaccination elicits vigorous innate immune activation one day post-vaccination, while the related liposomal adjuvant ALFA, lacking QS-21, was less pro-inflammatory. The cytokine milieu elicited by ALFQ may support development of exceptional T cell responses, such as via recruitment of immune cells (e.g. by MCP-1), direct action on T lymphocytes (e.g. IL-18), or antigen cross-presentation.

These results support further development of ALFQ adjuvant to augment adaptive immunity in HIV prophylactic and therapeutic immunization strategies.



MOPEA08

GITR is expressed on HIV-specific CD8⁺T-cells from people living with HIV (PLWH) and its *ex vivo* triggering enhances cell functionality: a possible target for immune reprogramming

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Background: A robust CD8⁺ T-cell (CD8TC) response is key for developing immunotherapies capable of achieving a sustained ART-free HIV remission. Glucocorticoid-induced TNF-related Protein (GITR) is a costimulatory receptor that, upon triggering, enhances the effector function of CD8TCs. However, little is known about the expression and function of this molecule in HIV infection. Here, we aimed to evaluate GITR expression and the effect of a novel GITR agonist on bulk and HIV-specific CD8TCs.

Methods: To characterize the immune-phenotype of GITR-expressing CD8TCs, peripheral blood mononuclear cells from 22 PLWH [on-ART (n=11), off-ART (n=11)] were stimulated with an HIV-peptide pool. Then, the surface expression of costimulatory molecules (GITR/41BB), exhaustion (PD-1) and memory markers (CD45RO/CCR7) were measured by flow cytometry. HIV-specific CD8TCs were defined by the expression of CD25/KI-67.

In addition, the data obtained were correlated with clinical parameters. To assess the GITR-mediated modulation of HIV-specific CD8TC function, cells from 6 on-ART PLWH were treated with a novel Fc-Flag-TNC-GITRL agonist, and IFN- γ production and degranulation (CD107a/b) were quantified by flow cytometry. When data distribution were not normal, non-parametric statistics were used.

Results: In both the on-ART and off-ART group, GITR expression was significantly higher on the HIV-specific CD8TCs compared to bulk CD8TCs ($p<0.001$).

In the off-ART group, a negative correlation was found between 41BB+/GITR+ HIV-specific CD8TCs and viral load (VL, $r=-0.523$, $p=0.024$). In both the on-ART and off-ART group, bulk PD1-expressing CD8+GITR+TCs positively correlated with an arrest in memory effector to terminal effector CD8TC differentiation ($r=0.550$ $p=0.018$ and $r=0.556$, $p=0.007$; respectively).

Finally, costimulation with GITR agonist at day four post-peptide stimulus led to a significant increase in the frequency of degranulating ($p=0.029$) and IFN- γ -producing ($p=0.031$) HIV-specific CD8TCs.

Conclusions: GITR was upregulated on HIV-specific CD8TCs and its expression pattern correlated with VL, suggesting a role of this molecule in the control of HIV infection. Moreover, GITR coexpression on exhausted CD8TCs and its association with CD8TC memory differen-

tiation arrest suggest that PD-1 and GITR could represent combined targets to revert this phenotype. Remarkably, findings indicate that costimulation through the GITR pathway enhances HIV-specific CD8TC functionality and, along with other immunomodulatory receptors, could act as a novel target for HIV immunotherapy.

MOPEA09

Patient-derived envelope sequences are differentially resistant to SERINC5-mediated restriction of HIV-1 infectivity

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Background: The host protein SERINC5 restricts HIV-1 infectivity when incorporated into the nascent virions. Although Nef can abrogate this incorporation process, certain envelope sequence of laboratory strains can intrinsically resist SERINC5 restriction in the absence of Nef. However, it remains unclear what extent patient-derived envelope sequences resist it. We examined intrinsic properties of patient-derived envelope sequences that can modulate sensitivity to SERINC5.

Methods: We isolated a total of 75 envelope clones from 26 Japanese and 49 Tanzanians with HIV-1 infection, comprising of group M subtypes; A1, B, C, D and inter-subtypes recombinants. These clones were transfected to 293T cells with the nef-deficient HIV-1 proviral vector in the absence and the presence of SERINC5.

The resultant pseudoviruses were exposed to TZM-bl cells and the fold inhibition of virion infectivity by SERINC5 was determined.

Results: The pseudoviruses' infectivity was significantly reduced by the presence of SERINC5, with a median fold inhibition of 5.4 (IQR: 3.7-8.6), albeit lower compared to sensitive control, NL4-3 envelope (fold inhibition of 64.6). Subtype C envelopes exhibited least fold inhibition compared to other subtypes ($p=0.02$, Kruskal-Wallis test).

There was no correlation between the envelopes' sensitivity to SERINC5 and plasma viral load or recency of infection (all $p>0.1$, Spearman's correlation). Interestingly,



the five most SERINC5-sensitive (>20-fold inhibition) clones were also sensitive to antibodies targeting the MPER epitopes.

Moreover, domain swapping analysis of intra-host clones with diverse sensitivities revealed a context dependent modulation of SERINC5 sensitivity by the gp120 and gp41 subunits.

Conclusions: The HIV-1 envelope sequences of multiple subtypes derived from patients were relatively resistant to SERINC5-mediated restriction of infectivity, providing additional insights into viral evasion from host restriction factors.

MOPEA10

Structure and Immunogenicity of native-like HIV-1 Clade-C envelope trimers from a pediatric elite-neutralizer across diverse platforms

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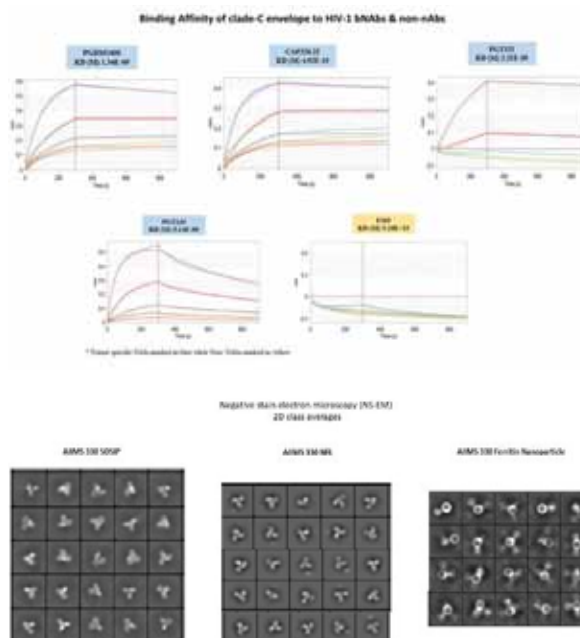
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Background: HIV-1-infected individuals that develop exceptionally strong broad neutralizing antibody (bNAbs) responses termed elite neutralizers (ENs), can inform HIV-1 vaccine design by providing blueprints for the induction of similar bNAb responses & can serve as templates for immunogen design. Clade-C accounts for the majority of HIV-1 infections worldwide, it is more challenging to produce well-ordered clade-C Env trimers due to their inherent instability.

Methods: Herein, we describe the design of native-like HIV-1 clade-C env trimers AIIMS 330 based on a chronically infected pediatric EN. The AIIMS 330 env was engineered and designed on SOSIP & NFL platforms along with the presentation of a repetitive array of env trimers on self-assembling ferritin nanoparticles (NPs) to attain multivalency.

Results: The cryo-EM structure demonstrated the formation of AIIMS 330 env in native-like prefusion closed conformations. It was correlated with a strong affinity to known HIV-1 bNAbs specifically to quaternary specific epitopes with little binding to non-nAbs rendering a superior antigenic profile of env. Biophysical characterization suggests high thermostability of env trimers.

Ferritin NPs and soluble SOSIP groups were able to elicit the potent neutralizing antibody response in rabbits over the NFL group with ID50 titers ranging from 300 to 1000 against autologous viruses along the tier-1 heterologous neutralizing responses. EM-PEM analysis of immune sera suggested the binding of multispecific nAbs both autologous and heterologous trimers.



Conclusions: Our study advances the understanding to shape conformationally stable clade-C env trimeric immunogens to induce a robust immune response and provide an arsenal of multivalent immunogens for HIV-1 vaccine development.

MOPEA11

Longitudinal profiling of immune responses to simian immunodeficiency virus throughout disease progression and antiretroviral treatment

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Background: Despite the fact that antiretroviral therapy (ART) has significantly reduced Human Immunodeficiency Virus (HIV)-associated deaths, its side effects and earlier onset of chronic illnesses continue to reduce quality of life for people living with HIV, suggesting the need for improved therapies.

However, this remains challenging due to the lack of a comprehensive understanding of the effects of viral progression and therapies on the immune system, particularly in the long term.

Methods: Using single-cell RNA-sequencing (scRNA-seq), we comprehensively characterized rhesus macaque (*Macaca mulatta*) immune responses during SIV (Simian Immunodeficiency Virus) disease and treatment, as well as viral transcripts. Peripheral Blood Mononuclear Cells (PBMCs) were analyzed from five rhesus macaques infected with SIVmac251 during acute and chronic phase of



infection (4 and 42 weeks post exposure) and short and long-term ART (12 and 72 weeks after ART initiation) using scRNA-seq to determine altered immune cell populations correlated to viral load and treatment longevity that may provide insights into improved therapeutic targets.

Results: Longitudinal comparisons of the transcriptomes of cells isolated from these samples showed an expansion of monocytes during acute infection that did not diminish to pre-infection levels at later time points, including after long term ART.

In addition, an enrichment of immune activation markers was observed during chronic infection, which may serve as targets for future studies interested in mediating immune response to high viraemia. Moreover, cells expressing viral RNA were also detected in both acute and chronic phase samples, predominantly in T cell populations.

Overall, our data highlight unreversed alterations to the immune system despite long-term ART and potential to simultaneously examine the host immune response and the phenotypes of infected cells.

Conclusions: The identification of expanding cell populations and upregulated immune activation markers further our understanding of the immune dysregulation that might underlie HIV infection and treatment, informing future therapeutic options aimed at improving quality of life for people living with HIV on long-term suppressive therapy.

The ability to identify virally infected cells while capturing host transcriptome additionally demonstrates a promising method for understanding dynamics specific to cells with viral transcripts.

TUPEA01

The impact of B cell activation on HIV-1 binding and *trans* infection of CD4⁺ T cells

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Background: Understanding the mechanisms by which the HIV-1 reservoir is established and maintained is critical in the search for a cure. We previously demonstrated that B cell-mediated HIV-1 *trans* infection of CD4⁺ T naïve cells has a more profound role than previously considered in establishing the viral reservoir (Gerberick et al., mBio 2021;12(2):e02998). In secondary lymphoid organs (SLO), B cells are activated in various ways, through both stromal cells and CD4⁺ T cell interactions, however the impact of these different stimulations on the efficiency of HIV-1 binding and *trans* infection remains unknown.

Methods: Human B cells and CD4⁺ T cells were isolated from buffy coats of HIVneg donors. B cells were stimulated alone or in combination with CD40L, BAFF, IL-4, and IFN-γ

for 48h. For *trans* infections, B cells were incubated with HIV-1_{BOL} (MOI 10⁻³), washed, and cultured with total CD4⁺ T cells. HIV-1 infection was determined by p24 ELISA. For HIV-1 uptake, B cells were incubated with HIV-1 Gag-iGFP-JRFL (MOI 10⁻¹), washed, and analyzed by FACS.

Results: B cells stimulated with CD40L/IL-4 were efficient mediators of HIV-1 *trans* infection of CD4⁺ T cells as compared to CD40L, CD40L/IFN-γ, BAFF, BAFF/IL-4, and BAFF/IFN-γ (one-way ANOVA, p<0.0001).

Using fluorescently labeled HIV-1, we show that CD40L/IL-4 stimulated B cells efficiently sequestered and bound virus compared to B cells treated with CD40L/IFN-γ, BAFF/IL-4, BAFF/IFN-γ or those that were unstimulated (one-way ANOVA, p=0.0116). Flow cytometry analysis highlights that the population of cells that take up virus are highly activated as evidenced by increased CD23 expression.

Ongoing studies include proteomic analyses of the stimulated cells to identify surface molecules associated with HIV-1 binding.

Conclusions: B cells are potentially important in the infection of CD4⁺ T cells *in vivo* via HIV-1 *trans* infection that occurs during the natural B:T cell interactions in SLO. Furthermore, certain immunologically relevant stimulations of B cells make these cells highly permissive to binding and transfer of HIV-1. Understanding the impact of B cell-mediated *trans* infection is fundamental for the design of effective treatments to significantly reduce or eliminate the viral reservoir.

TUPEA02

The effects of HIV-1 antigen expanded specific T cell therapy (HXTc) and vorinostat on persistent HIV-1 in people living with HIV on antiretroviral therapy

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Background: One approach to eradicate HIV is to interfere with mechanisms that maintain latency, and simultaneously enhance the clearance of infected cells without interrupting antiretroviral therapy (ART). The histone deacetylase (HDAC) inhibitor, vorinostat (VOR), can repeatedly induce the expression of latent HIV-1 *in vivo*, and allow clearance of infected cells *in vitro*.

However, when paired with HIV vaccines or antibodies, this approach has not yielded substantial depletion of the latent reservoir *in vivo*. Adoptive T cell therapy has had dramatic success in the treatment of virus-related malignancies.


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nancies and infections following hematopoietic stem cell transplantation and has been adapted to produce ex-vivo expanded HIV-specific T cells (HXTCs), and other cell therapy products.

Methods: In this pilot study we administered VOR and HXTCs to antiretroviral (ART)-suppressed people with HIV (PWH). Six PWH received five infusions of 2×10^7 HXTCs/m² with VOR 400 mg every three days. Three PWH received five infusions of 10×10^7 HXTCs/m² with VOR. Leukapheresis was performed at baseline and after final HXTC infusion to measure the frequency of persistent HIV by Quantitative Viral Outgrowth Assay (QVOA) of resting CD4⁺ cells, cell-associated HIV RNA (rcaRNA), and intact HIV provirus assay (IPDA).

Results: Overall, PWH tolerated VOR and HXTCs, with only transient Grade 1 AEs related to study products. Biomarkers of serial VOR effect were detected in PBMCs, but evidence of enhanced antiviral activity in the total pool of circulating cells was not detected. One of 6 PWH exhibited a decrease in measures of persistent HIV after 2×10^7 HXTCs/m² infusions with VOR, and all three PWH exhibited such declines when 10×10^7 HXTCs/m² were given with VOR. However, most QVOA declines did not exceed 6-fold, a threshold required to definitively ($p > 0.05$) attribute QVOA decline to the study intervention, rather than assay variation.

Conclusions: These findings provide some support for the therapeutic strategy of HIV latency reversal and enhanced reservoir clearance, but the modest effects seen highlight the need for more effective latency reversal agents and clearance approaches that can be repeatedly employed to achieve the profound depletion of persistent HIV needed for clinical benefit.

TUPEA03

Detection of intact HIV provirus in a microglia-enriched fraction of the CNS of a virally suppressed individual with HIV

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Background: There is compelling evidence that the central nervous system (CNS) can function as a reservoir for HIV. HIV DNA has been detected in multiple CNS cells of virally suppressed individuals, of which the microglia are the major cellular reservoir. However, the question remains whether the detected HIV DNA is intact and capable of producing replication-competent virus.

Methods: Single-cell suspension was obtained post-mortem from three fresh human brain regions (frontal lobe, occipital lobe and the subventricular zone) of an individ-

ual on long-term suppressive antiretroviral therapy (ART). A microglia-enriched (CD11b⁺) and microglia-depleted (CD11b⁻) fraction was sorted from each region and examined for the presence of intact and defective provirus with the Intact Proviral DNA assay (IPDA). Full-length envelop reporter viruses were generated using HIV env sequences derived from the microglia-enriched and -depleted fractions. Co-receptor usage was predicted using the Geno2Pheno [coreceptor] algorithm.

Subsequently, these clones were phenotypically characterized in CD4⁺ T cells, primary microglia and monocyte-derived microglia (MDMs).

Results: Intact provirus represented 13% of the total provirus detected in the brain, and was more prevalent in the microglia-enriched (0.52%) than the microglia-depleted fraction (0.19%). In both microglia-enriched and microglia-depleted fractions, intact provirus was primarily found in the occipital lobe, whereas defective provirus was more prevalent in the frontal lobe.

Phenotypic characterization of the envelope reporter viruses revealed efficient viral entry and replication via the CCR5 HIV co-receptor in CD4⁺ T cells. False-positive rate (FPR) values ranged from 3.7 to 10.2 and supported CCR5 coreceptor tropism. Infection experiments in primary microglia and MDMs are ongoing.

Conclusions: This study provides evidence of intact provirus in microglia in different brain regions, but also within non-myeloid cells which may represent CNS resident CD4⁺ T cells or astrocytes. Moreover, we demonstrate that the viral envelope region of the viral sequences obtained from the microglia are replication competent in CD4⁺ T cells, and require CCR5 for viral entry.

Altogether, this points towards the presence of replication competent virus in the CNS which may fuel viral rebound upon ART interruption. This makes the CNS reservoir an essential component for the success of cure interventions.

TUPEA04

HIV-1 infection: virus and host wrestle for control of the SUMOylation system

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Background: Microglia are the main HIV-1 target cells in the CNS and constitute an important reservoir for viral pathogenesis. In microglial cells, the co-repressor COUP-TF interacting protein 2 (CTIP2) recruits a multi-enzymatic chromatin-modifying complex at the HIV-1 promoter, leading to HIV-1 silencing.

Studies have shown that post-translational modifications (PTMs) like SUMOylation mediate CTIP2's interactions with other proteins and complexes. Whether HIV-1 manipulates the SUMO paralogs to control its replication and/or latency in glial cells like microglia is unclear.



We hypothesized that SUMOylation plays a role in productive HIV-1 infection, as well as, in the establishment and persistence of HIV-1 latency in microglia.

Methods: C20 cells were infected with vesicular stomatitis virus G (VSV-G) envelope pseudotyped HIV virus at a MOI of 0.25 and cultured for 72hrs. The latently infected cell line (HC69) was activated using tissue necrosis factor α (TNF- α), as previously described. Infection was confirmed by p24 ELISA and WB. Activation was confirmed using flow cytometry. Protein expression was assessed through immunofluorescence imaging and Western blot analysis.

Results: Here, we show that HIV-1 modulates the host cellular SUMOylation system. VSVG-pseudotyped HIV-1 infection in cultured C20 microglial cells impairs SUMO conjugation of both major SUMO paralogs, SUMO1 and SUMO2/3. Surprisingly, HIV-1 infection didn't appear to impair UBC9, the key SUMO E2 conjugating enzyme, which suggests HIV-1 likely targets other essential components of the host SUMOylation system, including the SUMO E1-activating enzyme, SUMO E3 ligases, and/or sentrin-specific proteases (SENPs).

Furthermore, the *host cellular SUMOylation system is impaired in latently infected HIV microglial cells*. Like productive HIV-1 infection both SUMO paralogs showed a modulation in SUMO conjugation following HIV-1 reactivation of the HC69 cell line. CTIP2 protein expression, which contributes to HIV-1 latency, was significantly higher in HIV-1 latency (HC69) compared to productive infection (C20).

Conclusions: Productive and latent HIV-1 infection in microglia was associated with impaired SUMOylation. Altering SUMO conjugation might be involved in abnormal anti-viral mechanisms in the CNS, leading to inflammation and neurocognitive impairment. The host SUMOylation machinery might represent potential targets of viral reservoirs in the CNS.

TUPEA05

Emergence of genetically-distinct HIV-1 populations is associated with transient virological control during analytical interruption of antiretroviral therapy

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Background: Understanding the mechanisms behind transient control of viral rebound (TCVR) following antiretroviral therapy (ART) interruption may reveal strategies to achieve an HIV-1 functional cure. Genetically-characterising rebound viruses during analytical treatment interruptions (ATI) could identify virus-related mechanisms behind this delayed viral rebound.

Methods: We obtained plasma samples from five participants (P1-P5) who initiated ART in acute/early infection, continued ART for 1 year, and underwent three successive ATIs over the course of the following year. Three participants were non-controllers with immediate rebound during the ATIs. Two participants exhibited TCVR during later phases of ART interruption. We used the plasma-derived HIV-1 RNA using long-range sequencing (PRLS) assay to genetically-characterise HIV-1 genomes from the pre-ART and ATI timepoints.

Maximum likelihood phylogenies and a tree-based compartmentalisation test (Bayesian Tip-association Significance Testing; BaTS) were used to identify phylogenetic clustering patterns of viral genomes across all timepoints. The presence of cytotoxic T lymphocyte (CTL) and drug-resistance mutations was also assessed.

Results: For non-controllers, we found little evidence for compartmentalisation between the pre-ART and ATI timepoints. For P4 and P5, who exhibited TCVR, we observed that the HIV-1 genomes were genetically-distinct during the ATI timepoints where rebound (R) was delayed. For P4, where rebound was delayed during the second (R2) and third (R3) ATI, there was strong evidence for compartmentalisation within the pre-ART ($p=0.001$) and first ATI (R1: $p=0.001$) timepoints, indicating that sequences from these timepoints are genetically-distinct from each other and from the R2/R3 timepoints.

The R2/R3 timepoint sequences were genetically-similar, with weak evidence for compartmentalisation within these timepoints (R2: $p=0.08$; R3: $p=0.03$). For P5, we observed strong evidence that the virus identified during R3, where rebound was delayed, is genetically-distinct to all earlier timepoints ($p=0.001$). No known CTL-escape or drug-resistance mutations emerged during the ATI timepoints for P4 and P5.

Conclusions: For two participants, we found plasma-derived viral genomes were genetically-distinct during the ATI timepoints where a delay to viral rebound was observed. The emergence of these distinct viral variants during an ATI may be associated with transient virological control. This viral control is not attributed to impaired viral replication caused by known CTL-escape or drug-resistance mutations.

TUPEA06

The Rainbow 5-plex digital PCR assay improves quantification of the viral reservoir resulting in a better understanding of the HIV-1 proviral landscape

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Background: The Intact Proviral DNA assay (IPDA) is considered as the gold standard to quantify the intact viral reservoir in people living with HIV-1 (PLHIV) that are treated with antiretroviral therapy (ART). By amplifying two short HIV-1 sub-genomic regions that are often deleted and/or hypermutated (psi and env), covering only 2.4% of the HIV-1 genome, this assay might overestimate the intact viral reservoir size.

Therefore, we developed the Rainbow 5-plex digital PCR assay that quantifies both the total and intact HIV-1 reservoir by targeting simultaneously 5 HIV-1 sub-genomic regions.

Methods: The Rainbow 5-plex digital PCR assay was used to quantify: a) total HIV-1 DNA (RU5), b) intact HIV-1 DNA, using either 2 regions (psi/env) or 4 regions (psi/env/gag/pol) (n = six chronic ART-suppressed PLHIV; subtype B) on the QiaCuity Four 5-plex platform, with each primer/probe set linked to a different fluorescent probe. Near full-length sequences (NFL) from the same individuals were obtained using the HIV Proviral UMI-mediated long-read sequencing (HIV-PULSE) assay.

Results: An average of 1926 total HIV-1 DNA cp/million CD4+ T cells was measured using the Rainbow assay. When considering 2 versus 4 sub-genomic regions, an average of 207.8 and 176.0 intact HIV-1 DNA cp/million CD4+ T cells were quantified, respectively.

Mapping the respective primers/probe sets from the Rainbow assay against the 510 distinct proviral genomes obtained by HIV-PULSE, we observed that some defective proviruses would be classified as intact in 5/6 participants by the 2-plex dPCR and in 3/6 participants by the 4-plex dPCR. In fact, 3 distinct sequences with frameshifts would be classified as intact by dPCR (either focusing on 2 or 4 regions).

Additionally, 3 distinct sequences harboring inversions or large deletions in the gag/pol region would be considered as intact in the original 2-plex dPCR when correctly identified as defective in the 4-plex dPCR.

Conclusions: Increasing the genomic coverage by including additional sub-genomic regions in dPCR assays provides a closer estimate of the intact proviral reservoir. Indeed, the identification of NFL proviruses with inversions or deletions in the gag/pol regions justifies the design of the Rainbow assay.

TUPEA07

Linking inducible HIV-1 reservoir to rebound after treatment interruption

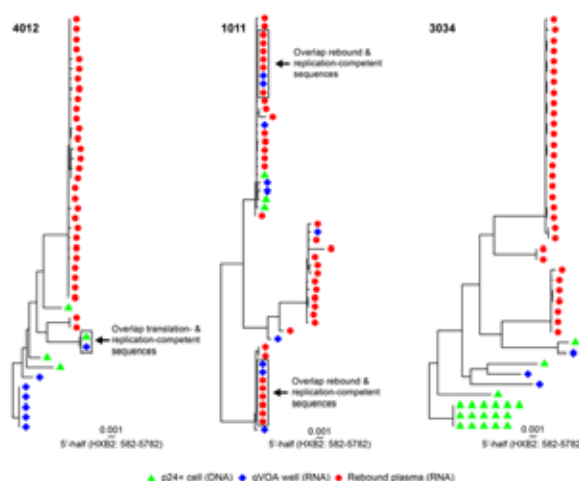
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Background: The origin of viral rebound remains elusive as only a few links between proviral sequences and rebound plasma viruses have been described. Here we characterized the translation- and replication-competent reservoirs of three individuals under ART and compared it to rebound plasma viruses detected during analytical treatment interruption (ATI).

Methods: Peripheral blood CD4 T cells were collected from 3 ART-treated individuals right before ATI. P24-expressing cells were single-cell sorted following latency reversal and near full-length proviral sequencing was performed. Replication-competent viral sequences were isolated from supernatant of positive quantitative viral outgrowth assay (qVOA) wells. During ATI, plasma was collected at first detectable viral load (>1000 copies/mL) and either 5'- or 3'-half viral RNA genomes were isolated through single genome amplification.

Results: We retrieved 20 sequences from positive qVOA wells, 30 proviral genomes from p24+ cells, 89 (median=32) 5'-half and 94 (median=32) 3'-half rebound plasma sequences acquired during ATI. Among distinct sequences retrieved from p24+ cells, 88% displayed defects in the packaging signal (PSI) region and/or major splice donor (MSD) site. Among qVOA and rebound sequences, none had PSI/MSD defects, suggesting their minor role in viral rebound and replication. One overlap between the translation- and replication-competent reservoir was observed, notably between the only p24+ cell with an intact PSI/MSD and one genome-intact qVOA sequence. Moreover, two overlaps were observed between viruses from qVOA wells and 5'-half rebound plasma sequences.



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Conclusions: The direct origin of rebounding plasma virus remains hard to identify as only few overlaps were detected by comparing the translation and replication-competent fractions to plasma viruses collected during ATI, with no overlap between the three datasets.

Yet, we report an overlap between an intact qVOA sequence and a provirus from a p24-expressing cell, confirming that some of the translation-competent proviruses are capable of inducing new cycles of replication.

TUPEA08

Potent, HIV-specific latency reversal through CRISPR activation delivered by lipid nanoparticles exhibiting a high efficiency of transfecting resting CD4⁺ T cells with minimal toxicity

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Background: Activation of HIV transcription through LTR-targeted CRISPR activation (CRISPRa) provides a promising strategy of potentially reversing HIV latency without affecting host-cell transcription. However, the advancement of this novel latency-reversing agent is hampered by the lack of an efficient delivery vehicle for the CRISPRa machinery to resting CD4⁺ T cells.

We hypothesized that mRNA-lipid nanoparticles (LNPs) could be used to advance CRISPRa as a next-generation latency-reversing agent.

Methods: Fluorescently labelled standard and modified LNPs encapsulating reporter mCherry mRNA (mCherry-LNP) or co-encapsulating the dCas9-SAM system – dCas9-VP64 mRNA, MS2-p65-HSF1 mRNA and either LTR-targeting or non-targeting control guideRNA (CRISPRa-LNP) – were formulated through microfluidic mixing. RNA concentration and encapsulation efficiency were determined using a RiboGreen assay.

Transfection efficiency of mCherry-LNPs and viability were assessed in Jurkat cells, non-stimulated or 72h αCD3/αCD28 pre-stimulated primary CD4⁺ T cells from HIV-negative donors using flow cytometry.

Reactivation of LTR-mediated transcription through CRISPRa-LNPs was assessed in J-Lat LTR-Tat-IRES-GFP reporter cells using flow cytometry.

Results: LNPs were formulated reproducibly at sub-100 nm size and exhibited RNA encapsulation efficiencies of >90%. Standard mCherry-LNPs exhibited high transfection efficiency within 24h in Jurkat cells (99%) at <5% toxicity. Transfection efficiency of pre-stimulated CD4⁺ T cells was moderate (mean±SEM mCherry⁺ cells 29±5%) but toxic (43±5% viability) after 72h.

In non-stimulated cells, few cells were transfected (2±0.3%) with lower toxicity (68±8% viability), which coincided with a 20-fold reduction in LNP association. In contrast, transfection of non-stimulated CD4⁺ T cells with modified LNPs resulted in a striking 92±2% efficiency at minimal toxicity (88±3% viability) within 72h.

Similarly, treatment with modified but not standard CRISPRa-LNPs induced potent LTR-mediated transcription with all five targeting guideRNAs, reaching up to 76±13% GFP⁺ J-Lat cells compared with 0.89±0.1% using non-targeting guideRNA, both at viabilities >90%.

Conclusions: We developed a novel LNP formulation capable of delivering nucleic acid-based therapeutics to resting CD4⁺ T cells. The three-component dCas9-SAM CRISPR activation system can be co-encapsulated into one LNP and can induce strong latency reversal in a cell line model for HIV latency.

These results provide compelling justification for the further assessment of CRISPRa-LNP as a 'shock and kill' strategy.

TUPEA09

Characterization of the intact and defective HIV-1 subtype C reservoir in South African women and men at baseline and 96 weeks after ART-therapy

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Background: To increase equity in HIV cure strategies it is important to study the viral dynamics and reservoir size of the dominant HIV-1 subtype (C) in women and men. The major obstacle to cure is the proviral reservoir. Aim of this study was to investigate impact of time of presentation and gender on immune activation, size and activity of the intact and defective reservoir in people with HIV before and during 96 weeks of antiretroviral therapy (ART).

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Methods: 83 participants were included (63% female). Median CD4-count at ART initiation was 315 cells/mm³ and viral load (VL) 169,659 copies/mL. Baseline, 48, and 96 week PBMCs were collected for Intact Proviral DNA Assay (IPDA) (in house adjusted for subtype C) and msRNA to measure reservoir activity. Plasma was used for cytokine analysis.

Results: During treatment, a significant decrease of both reservoirs and msRNA was detected ($p < 0.001$). The decrease of the intact compared to the defective reservoir was significantly more profound after 96 weeks of therapy ($p < 0.001$). msRNA and CD4 were significantly, positive, and inverse correlated respectively, with defective but not with intact provirus at baseline ($p < 0.001$ - $p < 0.05$).

Furthermore, baseline VL was significantly correlated with the intact and defective reservoir, but at 48 and 96 weeks after therapy only the defective reservoir showed a significant correlation ($p < 0.001$ - $p < 0.05$).

MCP1, sCD163 and sCD14 significantly decrease after 48 weeks, IL7 and TNF- α show a continuous decline during 96 weeks ($p < 0.001$). IL2 significantly increases between baseline and 96 weeks ($p < 0.05$).

Conclusions: A more pronounced decline of the intact reservoir was seen at 96 weeks after therapy. Interestingly, levels of msRNA correlate with the large defective viral reservoir rather than the smaller intact reservoir suggesting that the defective reservoir actively produces viral transcripts.

Also, the inverse significant correlation with CD4 cells could indicate that the defective reservoir is one of the drivers of CD4 depletion. Moreover, the significant correlation between the defective reservoir and plasma viral load during therapy could indicate an influence of the defective reservoir to low level viraemia during therapy. Therefore, besides elimination of the intact reservoir removal of the defective reservoir may be important to reduce HIV associated co-morbidities.

TUPEA10

Methylseleninic acid induces HIV viral reactivation from latently infected cells *in vitro* and *ex vivo*

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Background: We have previously shown that the circadian proteins CLOCK and BMAL-1 can bind to the HIV long terminal repeat and activate HIV transcription (Chang et al AIDS 2019). As the organic selenium compound Methylseleninic acid (MSA) increases BMAL-1 transcription and enhances apoptosis in cancer models, we investigated MSA as a latency reversing agent (LRA) and whether MSA enhances death of HIV-infected cells alone or combined with other putative LRAs.

Methods: Latent cell lines containing an integrated HIV provirus with a green fluorescent protein (GFP) reporter (J-LAT10.6), and CD4+ T-cells isolated from peripheral blood mononuclear cells from people living with HIV (PL-HIV) on antiretroviral therapy were cultured with 10uM MSA. Viral reactivation was measured by GFP expression or cell-associated unspliced (US) and multiply spliced (MS) HIV RNA in CD4+ T-cells.

Surface expression of activation markers CD38 and CD69 were quantified by flow cytometry. RNA sequencing was performed on MSA-treated CD4+ T-cells isolated from PL-HIV on ART. Synergy with LRAs was measured by Bliss Independence (BI).

Results: MSA potently induced HIV protein in J-LAT10.6 cells (23.12-fold increase in GFP expression cf. unstimulated cells, $p < 0.001$). In CD4+ T-cells from PLHIV MSA induced US HIV RNA (4.4-9 fold-increase $p = 0.016$) but not MS RNA; increased CD69 expression (6.8-52.5 fold-increase, $p = 0.016$) and decreased CD38 expression (4.21-39.6 fold-decrease, $p = 0.016$); RNA sequencing revealed that MSA significantly upregulated pro-apoptotic genes (SMAC, BIM, BAK1) and downregulated anti-apoptotic genes (XIAP, BCL2).

In J-LAT10.6 cells, MSA significantly synergised with the bromodomain inhibitor, JQ1 (BI = 0.09, $p = 0.0418$) and SMAC mimetic, AZD5582 (BI = 0.5, $p = 0.0109$) in the induction of GFP.

Conclusions: MSA increased HIV transcription and translation in latently infected cell lines, as well as initiating viral transcription in primary cells from PLHIV in the absence of sustained T-cell activation. Synergy was observed with MSA and LRAs with diverse mechanisms of action.



Although there was an increase in pro-apoptotic genes, we were unable to determine if this was in all cells or only in HIV-infected cells. MSA potentially reverses latency and may sensitise latently infected cells to apoptosis, showing promise as a dual 'shock and kill' LRA.

TUPEA11

DPP9 inhibitors: a novel class of drugs for clearance of HIV-1 infected cells

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Background: NNRTIs induce targeted cell death of HIV-1 infected cells. We recently reported that this mechanism of cell killing occurs through sensing of HIV-1 protease via the inflammasome sensor CARD8. Due to issues with NNRTI resistance and poor pharmacodynamics, it's essential to identify ways to sensitize the CARD8 inflammasome for sensing HIV-1 protease.

Here we employ chemical inhibitors to block the negative regulator of CARD8, DPP9, to increase NNRTI-mediated killing of HIV-1 infected cells.

Methods: CD4⁺ T cells were isolated from people without HIV, infected with reporter viruses or clinical HIV-1 isolates, and treated with NNRTIs and/or DPP9 inhibitors. Cells were cultured in human serum to identify reductions in efficacy. For in vivo clearance of HIV-1 infected cells, infected CD4⁺ T cells were transfused into MISTRG-6-15 mice and treated with EFV and/or VbP. For HIV latent reservoir clearance, CD4⁺ T cells were isolated from PLWH, plated in limiting dilution for quantitative viral outgrowth assay, and treated with NVP, EFV, or EFV with VbP.

Results: As high micromolar concentrations of NNRTIs are needed for effective clearance of HIV-1 infected cells, we tested DPP9 inhibitors' ability to enhance NNRTI-mediated killing. The DPP9 inhibitor Val-boroPro was able to enhance NNRTI-mediated killing and induced NNRTI-independent cell killing. While human serum reduced NNRTI efficacy, VbP completely restored the EC50 of NNRTIs tested. VbP also increased the killing efficacy of most resistance mutants tested. While EFV had modest effects in vivo, VbP was able to greatly increase cell killing of HIV-1 infected cells in humanized mice eliminating up to ~68% of infected cells. VbP was also able to significantly increase clearance of HIV-1 latent reservoirs from PLWH, eliminating 75% of latent reservoirs.

Conclusions: Here we report a novel class of drugs for potential development of an HIV cure strategy. We show the capacity of this strategy to clear HIV-1 infected cells in vitro, ex vivo, and in vivo.

We also demonstrate this strategy can overcome considerable barriers to clinical implementation proving the broad suitability of this method for the existing genetic variation seen in PLWH. This offers a promising new strategy for putting the kill in "shock and kill".

TUPEA12

Pre-existing immunity restricts plasma and mucosal antibody responses during SARS-CoV-2 Omicron breakthrough infection

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Background: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of COVID-19 disease, remains a challenge to global public health. Antibodies can mediate protection through neutralisation and Fc-mediated functions.

Understanding mucosal antibody responses from COVID-19 infection and/or SARS-CoV-2 vaccination is crucial for the development of new vaccine strategies to generate long term protective immunity against SARS-CoV-2, especially against emerging viral variants.

Methods: We developed a suite of high throughput antibody assays capable of assessing neutralization and the Fc profiles (isotype, subclass, Fc Receptor binding) to an extensive panel of SARS-CoV-2 proteins including variants of concern.

Antibody responses from paired plasma and mucosal (saliva and basal tears, where sufficient volume was available) samples were profiled from 37 COVID-19 vaccinees (vaccinated, uninfected), 22 COVID-19 recovered individuals (infected then vaccinated) and 29 individuals with breakthrough infections (vaccinated then infected) from 3 different COVID-19 waves (Delta, Omicron BA.1 and BA.2).

Results: Saliva from COVID-19 recovered vaccinees displayed improved antibody neutralizing activity, Fc Receptor engagement and IgA over COVID-19 vaccinees. Repeated ancestral spike vaccination narrowed antibody cross-reactivity in COVID-19 recovered vaccinees as vaccine-induced responses favored the imprinted ancestral spike.

Furthermore repeated mRNA vaccination also boosted SARS-CoV2-specific IgG2 and IgG4 responses in both plasma and mucosa (saliva and tears). Antibody responses to breakthrough COVID-19 were also dampened and narrowed to the ancestral strain by increased pre-existing vaccine-induced immunity.

However, despite a more delayed start compared to plasma, salivary antibodies rose rapidly following breakthrough COVID-19, especially following Omicron BA.2 infection.

Conclusions: Our data demonstrates how prior antigen exposure, including number of vaccine doses and/or prior SARS-CoV-2 infection, along with vaccine platform can influence SARS-CoV-2 antibody responses.



Furthermore we highlight how pre-existing immunity shapes both plasma and mucosal SARS-CoV-2-specific antibody responses, which has implications for long term protection from COVID-19.

TUPEA13

Immunological profiles of people living with HIV admitted with acute COVID-19 in Tshwane, South Africa

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Background: South Africa has the largest population of PLWH in the world, reporting a prevalence of 18.7% in adults in 2020. PLWH could have worse COVID-19 outcomes due to persistent immune deficiency and dysregulation. This study compared the immunological profiles and clinical outcomes of people living with and without (HIV-) admitted with COVID-19 to hospitals in Tshwane, South Africa.

Methods: In total, 174 SARS-CoV-2 PCR-positive clients with moderate to severe COVID-19 were recruited from April 2020 to November 2021. Whole blood samples were obtained on the first day of hospitalization and T-cell and monocyte phenotyping performed on a CytoFlex flow cytometer.

Data clean up and scaling were done in Kaluza and uploaded to Cytobank for analysis. Cytokine levels were determined in plasma on a Bio-Plex Suspension Array platform.

Results: Thirty-seven clients were PLWH. Median CD4+ T-cell count: 256 (IQR 115-388) cells/ μ L; HIV viral load was suppressed in 76%. They were younger (46 ± 10.9 vs 55 ± 14.4 years $p=0.0064$), more likely to be female (73% vs 42.3% $p=0.0013$) and had higher ROX scores (15.3 [IQR 8.2- 22.1] vs 9.6 ([IQR 4.6-11.4] $p=0.0031$) than HIV- clients. Mortality was similar between the groups: 15.4% vs 13.5% in PLWH ($p=0.7864$).

After adjusting for age and sex, PLWH had increased non-classical ($p=0.0014$) and activated ($p=0.0045$) monocytes as well as the highest expression of PD-L1 ($p=0.0168$).

Differences in CD8+ were: lower effector memory (EM)-1 ($p=0.0127$) and exhausted TEMRA ($p=0.0284$), higher EM-2 ($p=0.0123$), activated central memory ($p=0.0001$), and pre-effector-1 ($p=0.0427$) subsets in PLWH. PLWH had increased concentrations of IL-1Ra ($p=0.0096$), IL-2 ($p=0.0173$), and IL-15 ($p=0.0217$).

Conclusions: PLWH hospitalized with COVID-19 had less severe disease, possibly due to lower levels of inflammation secondary to skewed monocyte subset ratios and CD8+ T-cell maturation, and higher levels of anti-inflammatory and immunoregulatory cytokines.

The interaction of PD-L1 and PD1 promotes immune suppression. HIV predominantly induces IL-1Ra over IL-1 synthesis that drives hyperinflammation in COVID-19. IL-2 and IL-15 both aid in T-cell responses and modulate inflammation by respectively activating and promoting the survival of T-regulatory cells. It is possible that the immune dysregulation seen in HIV could inhibit the hyperinflammatory immune response caused by SARS-CoV-2.



Track B: Clinical science

MOPEB01

Rapid two-phase decay of intact and defective HIV DNA during acute treated HIV infection, which is accelerated with earlier ART initiation

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Background: The HIV reservoir largely consists of "defective" virus. Several studies now suggest that HIV+ cells harboring "intact" (i.e., potentially replication-competent) provirus decay faster than defective provirus during long-term antiretroviral therapy (ART) suppression. However, there are limited data describing HIV reservoir decay rates during the first few months of treated acute HIV.

Methods: Individuals diagnosed with acute (<100 days) HIV were enrolled in the UCSF Treat Acute HIV study between 2015-2020. Participants were initiated on ART (tenofovir/emtricitabine+dolutegravir) and followed for 24+ weeks. Frequencies of intact vs. defective provirus were quantified using the intact proviral DNA assay (IPDA). Multivariate nonlinear general additive models included covariates for timing of ART initiation, initial CD4+ count, and pre-ART HIV RNA.

Results: A total of 67 (83% of screened) participants were enrolled. The proportions of Fiebig I, II, III, IV, V disease were 12%, 15%, 8%, 17%, and 48%. Median age was 30. The cohort was 98% male; 15% African-American, 30% Latino, 21% Asian, 33% Caucasian. Higher initial CD4+ T cell count (Figure 1a) and lower pre-ART plasma HIV RNA (Figure 1b) predicted more rapid decay of defective and intact HIV DNA. Plasma HIV RNA declined to <40 copies/mL after a median of 31 days of ART. Both intact and defective provirus decayed rapidly in the first 50 days (3.6% vs. 4.3%), followed by a slower decay after 50 days (1.1% vs. 1.8%). Earlier ART initiation (Fiebig I-III) was associated with steeper declines in both intact and defective HIV DNA (Figure 1c). For each day delay in ART initiation, intact and defective HIV DNA decreased by 0.02% vs. 0.03% in the first 50 days and by 0.006% vs. 0.01% after 50 days of ART suppression.

Conclusions: We observed a two-phase decay of intact and defective HIV DNA that was significantly faster for individuals with earlier ART initiation. Decay rates were accelerated with earlier ART initiation.

These findings may reflect virologic (rapid decay after plasma viremia suppression) and/or immunologic (contraction of activated cells to memory cells) phenomena in individuals with very small reservoirs and relatively intact immune responses, which can be leveraged in future cure strategies.

MOPEB02

Missed opportunities with symptom-based testing of chlamydia and gonorrhea among men who have sex with men and transgender women attending key population-led clinics in Thailand

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Background: Many resource-limited settings, including Thailand, have implemented symptom-based screening for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG). Asymptomatic anorectal and oropharyngeal CT and NG infections limit the usefulness of this practice.

We studied the proportions of CT and NG infections which would be missed if symptom-based screening was implemented among men who have sex with men (MSM) and transgender women (TGW) attending key population (KP)-led clinics for HIV testing and pre-exposure prophylaxis (PrEP) services.

Methods: From July 2020 to September 2021, Thai MSM and TGW aged ≥18 years, with at least one reported HIV risk in the past six months (condomless sex, >5 sexual partners, history of bacterial sexually transmitted infections (STIs), and/or substance use), were enrolled at KP-led clinics and followed up every 3 months for 12 months. STI symptoms were recorded at every visit before specimen collections. Pooled urine, pharyngeal, and rectal samples from each participant were obtained for molecular Xpert CT/NG tests.

Results: We enrolled 1,427 MSM and 138 TGW with a median (IQR) age of 28 (23-34) years. 196 were HIV-positive, 892 started/continued PrEP and 477 refused PrEP. CT was detected in 526/4,074 (12.9%) visits and NG in 359/4,074 (8.8%) visits.

STI symptoms were only reported in 23/526 CT-positive visits (4.4%) and in 15/359 NG-positive visits (4.2%). Urethral symptoms were most common (82.6%), followed by rectal (13.0%), and oropharyngeal (4.4%) symptoms among symptomatic CT infections.

For symptomatic NG infections, symptoms most commonly appeared at the urethra (86.7%), followed by oropharynx (13.3%), and rectum (6.7%). STI symptoms were also reported in 21/3,548 CT-negative visits (0.6%) and in 29/3,715 NG-negative visits (0.8%).

Conclusions: Among MSM and TGW clients of KP-led clinics in Thailand, those exposed to high risk of STIs, CT and NG infections were detected by molecular test in around 10% of their clinic visits. Symptoms were only presented in less than 5% of these CT and NG infections. Use of symptom-based screening would result in 95% missed diagnoses.

Integrating regular STI testing, regardless of symptoms, into these KP-led clinics has high potential as an entry point for STI test and treat strategy aiming at ending STIs by 2030.

MOPEB03

Safety and efficacy of 6-month rifampicin resistant TB regimens in people living with HIV: final analysis

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Background: 6-month regimens for rifampicin resistant tuberculosis (RR-TB) have been recommended by the WHO. People living with HIV (PLHIV) have poorer TB treatment outcomes. In an interim analysis, PLHIV had similar outcomes in both standard care (SoC) and bedaquiline, pretomanid, linezolid and moxifloxacin (BPaLM) arm with a better safety profile in the BPaLM arm.

Methods: Participants with RR-TB were recruited from Uzbekistan, Belarus and South Africa irrespective of HIV status. Participants with negative or unknown HIV status were offered testing. Antiretroviral treatment was offered to all PLHIV. The HIV status subgroup was analysed at week 72 for both efficacy (unfavourable outcome being composite of death, recurrence, treatment failure, early discontinuation and loss-to-follow up) and safety (grade 3 and above/SAE) in the modified intention-to-treat and intention-to-treat populations respectively.

Results: Of the 550 participants in the intention-to-treat population, 153 (27.8%) were HIV positive. 29/153 were newly diagnosed, 23/153 were reinitiated and 101/153 were continuing treatment. 104 participants had a VL taken at baseline and week 24. 54/55 PLHIV remained undetectable at week 24 and 36/49 PLHIV became undetectable by week 24.

79.4% of PLHIV on BPaLM had a successful outcome. The risk difference for the primary efficacy outcome for BPaLM compared with SoC was -3.1% in the HIV positive and -38.7% in the HIV negative population.

This was not maintained across arms. Safety outcome for BPaLM compared with SoC at week 72 were -27.9% (-47.5% to -8.3%) in PLHIV and -24.3% (-36.5% to -12.1%) in the HIV negative population. There were 2 deaths of PLHIV, neither were related to HIV or TB progression.

HIV status	SOC n/N (%)	BPaLM n/N (%)	Risk difference (two-sided 96.6% CI)
Negative	47/99 (47.5)	9/103 (8.7)	-38.7% (-50.9% to -26.6%)
Positive	9/38 (23.7)	7/34 (20.6)	-3.1% (-23.8% to 17.6%)
	SOC n/N (%)	BPaLC n/N (%)	Risk difference (two-sided 96.6% CI)
Negative	47/99 (47.5)	16/84 (19.1)	-28.4% (-42.4% to -14.4%)
Positive	9/38 (23.7)	11/31 (35.5)	11.8% (-11.6% to 35.2%)
	SOC n/N (%)	BPaL n/N (%)	Risk difference (two-sided 96.6% CI)
Negative	47/99 (47.5)	12/75 (16.0)	-31.5% (-45.4% to -17.6%)
Positive	9/38 (23.7)	3/36 (8.3)	-15.4% (-32.9% to 2.2%)

Table 1: Sub-group analysis by HIV status of primary efficacy outcomes for BPaLM, BPaLC and BPaL compared with SoC

Conclusions: PLHIV treated with BPaLM did as well as the HIV negative participants. BPaLM appears to be a safer option for PLHIV.

MOPEB04

Human Papillomavirus genotypes in adolescents and young adults living with HIV who received the quadrivalent HPV vaccine: The ZIMGARD cohort

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Background: Human Papillomavirus (HPV) vaccination is key in preventing HPV related disease. This study was conducted in 2021 to identify HPV genotypes in genital swabs of adolescents who received quadrivalent (6, 11, 16 and 18) HPV vaccination.

Methods: This cross-sectional study at Newlands Clinic, Zimbabwe, collected vaginal or penile swabs from 92 participants living with HIV, that received HPV vaccination at least 5 years prior to enrollment. HPV DNA was quantified using the Nanodrop spectrophotometer (Inqaba BiotechTM, South Africa). The HPV Direct Flow CHIP kit (Master Diagnostica, Spain) was used for genotyping.

Results: We present results of 92 participants (44.6% female) vaccinated at median age, 15 years (IQR:12-16). Mean duration since vaccination was 6 years (SD:±0.4). Twenty-seven (29.3%) participants were negative for HPV, whilst from those with a positive test, 52(56.5%) had at least 1 high risk (HR) type. Concomitant high- and low- (LR) risk types were identified in 36 (39%) participants (Figure 1).



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		HR					
		zero	one	two	three	four	five
LR	zero	27	9	3	1	2	0
	one	9	9	2	2	0	0
	two	3	3	3	2	1	0
	three	1	2	3	2	3	0
	four	0	0	1	0	1	0
	five	0	0	0	0	0	1
	six	0	0	0	1	0	0

Fig 1: Heat map of participant numbers with respective HR and LR types

Fifteen (16.3%) participants (10 of them female) tested positive for HPV 18 (Figure 2).

Four (4.3%), were positive with at least types 6 or 11 with respect to vaccine preventable LR types.

One participant tested positive for HPV 16.

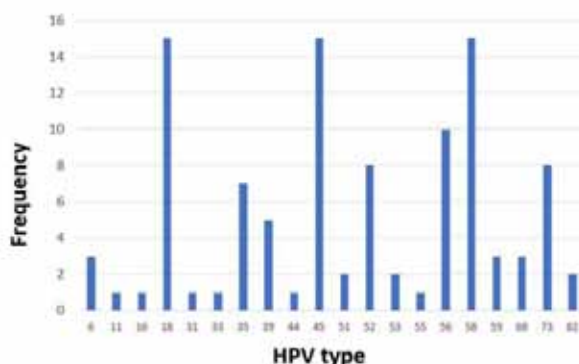


Figure 2: Frequency of vaccine types and all HR genotypes.

Conclusions: HPV 16 and 18 showed differing prevalence suggesting different vaccine efficacy for these types.

Further investigation is needed to determine if a vaccine booster is warranted. Type 45 and 58 were the most prevalent HR types

MOPEB05

Access to cervical cancer screening among women living with HIV in Malawi - analysis of Malawi population-based HIV impact assessment (MPHIA) 2020-21 and MPHIA 2015-16 surveys

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Background: Malawi has one of the highest cervical cancer (CxCa) burdens globally. CxCa screening and treatment of pre-cancer is an important intervention to eliminate CxCa. The Malawi Population-based HIV Impact Assessment (MPHIA) 2015-16 reported low coverage for CxCa screening among women living with HIV (WLHIV). Since October 2018, President's Emergency Plan for AIDS Relief (PEPFAR) Malawi has supported the provision of CxCa screen-and-treatment services for WLHIV in the highest-burden antiretroviral (ART) facilities in Malawi. We compared the MPHIA 2020-21 screening and treatment data to the MPHIA 2015-16 findings.

Methods: The MPHIA are nationally representative household surveys that include a questionnaire and HIV testing. Women aged 15-64 were asked about CxCa screening, results, and treatment.

We analyzed self-reported CxCa screening data among WLHIV by demographic factors and reported 95% confidence intervals (CI). Results were weighted and accounted for survey design.

Results: In 2015-16 and 2020-21, 1,507 and 1,616 WLHIV were interviewed, respectively. In 2015-16, 16.1% (95% CI: 13.5%-18.8%) reported CxCa screening, compared to 38.4% (95% CI: 35.3%-41.6%) in 2020-21. CxCa screening among WLHIV on ART increased from 17.0% (95% CI: 14.2%-20.2%) to 41.2% (95% CI: 38.0%-44.5%).

Although CxCa screening coverage improved across multiple demographic characteristics, the magnitude of improvement was highest in the lower education and wealth classes. There was an over 3-fold increase in WLHIV with no education (9.0%; 95% CI: 5.6%-14.2% to 30.4%; 95% CI: 24.1%-37.5%). For those in the lowest wealth quintile, screening was almost 7 times more in 2020-21 (3.8%; 95% CI: 1.6%-8.5% to 25.8%; 95% CI: 19.8%-32.9%).

There was greater improvement in CxCa screening coverage in rural settings; 11.7% (95% CI: 9.3%-14.7%) to 36.0% (95% CI: 32.3%-39.9%) compared to 27.5% (95% CI: 22.6%-33.0%) to 46.0% (95% CI: 40.9%-51.1%) in urban.


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Same-day treatment for abnormal results was 52.4% (95% CI: 27.0%-76.7%) in 2015-16 and 74.6% (95% CI: 48.7%-90.1%) in 2020-21.

Conclusions: CxCa screening among WLHIV has markedly improved, especially for those on ART and in underserved communities. This suggests that PEPFAR investments and integration of CxCa screening in ART clinics have increased demand and access. However, this can be strengthened by ensuring CxCa screening services are available at all ART facilities.

MOPEB06

Liver fibrosis regression measured by transient elastography in people living with HIV successfully treated for hepatitis C using direct acting antivirals

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Background: Successful treatment for hepatitis C virus (HCV) reduces liver fibrosis. Transient elastography (TE) has been shown to capture true fibrosis regression after successful HCV treatment, once inflammation abates. It is not clear how fibrosis regression changes with time after treatment ends.

Methods: We used data from eight of 11 cohorts in the International Collaboration on Hepatitis C Elimination in HIV Cohorts (InCHEHC), including data from Australia, Canada, France, the Netherlands, Switzerland and Spain. We selected individuals successfully treated for a primary HCV infection using all oral direct acting antivirals and with at least one TE measured within a year prior to starting treatment. This baseline measurement was used to classify fibrosis stage (F0-F1<7.2, F2-F3≥7.2-<14.6, F4≥14.6 KPa). For those selected, all TE measurements after successful treatment were included in our generalised additive modelling, provided HCV RNA remained undetectable. Our model included a random intercept allowing repeated measures from the same individual and an adaptive spline representing the change in mean over time.

Results: TE measurements were included from 1714 individuals; 513 had a measurement after treatment ended (220 F0-F1, 202 F2-F3, 91 F4) with a median follow-up of 0.8 years. For those with advanced fibrosis (F2-F3) or cirrhosis (F4), the mean response shows a rapid decline in stiffness during treatment as inflammation abates (Figure). Those with advanced fibrosis then regress towards normal (F0-

F1) with the mean response falling below 7.2KPa; those with cirrhosis show early fibrosis regression but this attenuates (Table) and the mean never approaches normal.

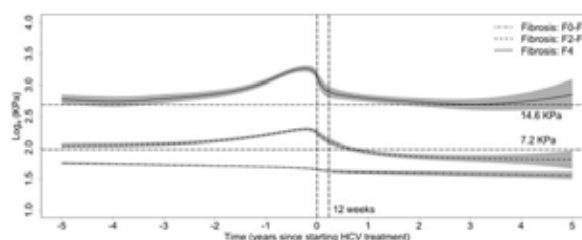


Figure. Mean response curves for transient elastography over time in HIV/HCV co-infected participants successfully treated for HCV.

Period	Change in KPa (95% credible interval)			Fibrosis stage when starting treatment		
	F0-F1 <7.2KPa	F2-F3 ≥7.2-<14.6 KPa	F4 ≥14.6 KPa	F0-F1 <7.2KPa	F2-F3 ≥7.2-<14.6 KPa	F4 ≥14.6 KPa
1.5 to 0.5 years before treatment starts	-0.1 (-0.2 to -0.1)	1.1 (0.8 to 1.4)	6.5 (4.8 to 8.2)			
0.5 to 1.5 years after treatment ends	-0.1 (-0.1 to 0.0)	-0.7 (-1.0 to -0.4)	-1.2 (-2.5 to 0.1)			
1.5 to 2.5 years after treatment ends	-0.1 (-0.1 to 0.0)	-0.2 (-0.5 to 0.0)	-0.7 (-1.7 to 0.4)			
2.5 to 3.5 years after treatment ends	-0.1 (-0.1 to 0.0)	-0.1 (-0.4 to 0.2)	0.3 (-1.0 to 1.6)			

Conclusions: Successful HCV treatment leads to meaningful fibrosis regression in those with advanced fibrosis. Those with cirrhosis do not fully recover and need continued surveillance.

MOPEB07

Early clinical experience using tecovirimat during the Mpox epidemic in Toronto suggests ongoing clinical equipoise for randomized trials

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Background: Tecovirimat is an anti-smallpox drug used for treating Mpox during the current global outbreak, but randomized controlled trials have not yet been completed.

Methods: We conducted a retrospective observational study of Mpox patients at three Toronto hospitals between MAY-AUG2022. We present a descriptive analysis of those who were prescribed oral tecovirimat 600mg



twice daily x14d for the management of severe manifestations, highlighting adherence, tolerability and clinical outcomes.

Results: Of 54 consenting study participants, 19 (35%) received tecovirimat. All were men who have sex with men, over one-third (37%) were white and 9 (47%) were living-with-HIV, with median (interquartile range) CD4 count 551 (296, 862) cells/mm³ and 8 (89%) having HIV RNA<20 copies/mL.

Median (IQR) age was 38 years (31.5, 41.5). Manifestations at clinical assessment included rash (100%), lymphadenopathy (74%), myalgia (74%), fever (63%), lethargy (63%), headache (42%), pharyngitis (37%), proctitis (32%), low mood (21%), hematochezia (16%), penile swelling (16%), pruritus (5%), conjunctivitis (5%), myocarditis (5%), and urethral discharge (5%). The indication for tecovirimat was symptom severity in 17 (89%) and anatomic site of involvement in 2 (11%).

All patients reported adherence to the full course of drug as prescribed. Tecovirimat was well-tolerated overall, but 1 participant each reported diarrhea, blurry vision, and nocturnal restless legs that resolved with completion of therapy.

At 14-day follow up, most had satisfactory clinical improvement, however, one patient continued to develop new PCR-confirmed Mpox skin lesions on day 8 of therapy with persistent PCR-positivity 6 days after completing treatment; another developed new, small, itchy, folliculitis-like chest pustules on day 14 of therapy resolving within 2 weeks (though not tested for Mpox); and one patient with myocarditis experienced exercise-induced dyspnea and chest tightness with worsening cardiac enzymes on day 11 of therapy, in the context of high-intensity aerobic training.

Conclusions: Early experience treating Mpox with tecovirimat suggests it is safe, well-tolerated and effective, but the occasional finding of ongoing symptoms despite therapy raises questions about limitations to its efficacy. In the context of considerable community demand for the drug, efforts should be made to connect Mpox patients to rigorous randomized controlled trials, given this ongoing clinical equipoise.

MOPEB08

Characterization of mpox in people who live with HIV: a country-wide observational study

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Background: Over 85,000 mpox cases have been reported worldwide. A large proportion of them are people who live with HIV/AIDS (PLWHA), some series report percentages over 50%. Mpox has been hypothesized to be more severe in PLWHA.

However, no studies have conclusively shown worse outcomes among PLWHA.

We aim to study the association between HIV and severe mpox.

Methods: We used the national epidemiologic surveillance system in Mexico to obtain data on confirmed-mpox cases.

A case report format was submitted to the General Epidemiology Directorate with clinical data on people with mpox. We used this data to construct logistic regression models using HIV as the main exposure of interest and adjusting for age, gender, and mechanism of HIV transmission. We defined severe mpox as that requiring hospitalization or that resulted in death.

Results: 3291 mpox cases were diagnosed from May-November 2022. 1930 (58.6%) were in PLWHA, 97% were men, and 87% identified as men-who-have-sex-with-men. The epidemiologic curve of mpox cases is shown in *Figure 1*. Logistic regression analyses and the proportion of persons that developed a given outcome or symptom are shown in *Figure 2*.

HIV status was associated with an increased odds of severe mpox, generalized rash, fever, fatigue, vomit, diaphoresis, painful lesions, diarrhea, and lymphadenopathies.


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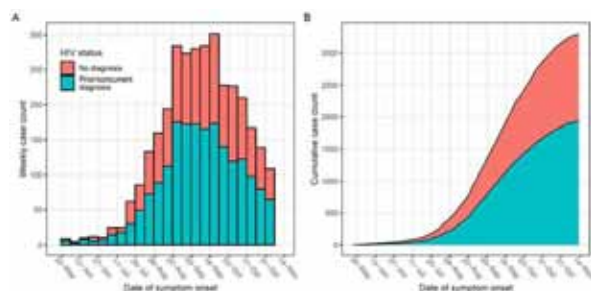
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Figure 1.

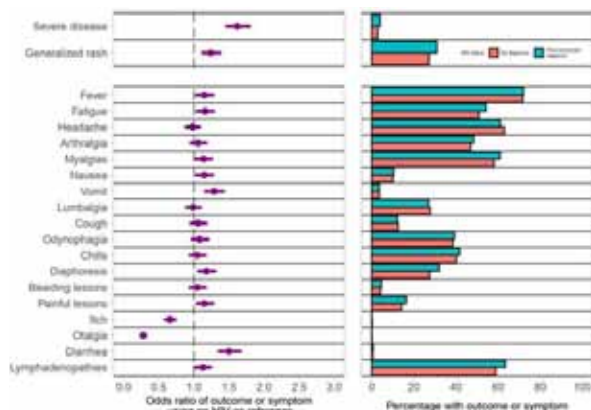


Figure 2.

Conclusions: Several symptoms, such as fever and fatigue, were more common in PLWHA. Importantly, HIV conferred an increased risk of severe mpox. This underlines the importance of directing preventive measures and clinical trials of therapeutics and preventive interventions towards this population at risk.

MOPEB09

PEPFAR tuberculosis preventive treatment coverage and remaining gaps among people living with HIV

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Background: In 2018, the President's Emergency Plan for AIDS Relief (PEPFAR) committed to providing tuberculosis preventive treatment (TPT) to all people living with HIV (PLWH) receiving antiretroviral therapy (ART) through PEPFAR-supported programs. During US government fiscal years (FY) 2017–2022, PEPFAR set cumulative targets for 22,275,651 PLWH to complete TPT. We assessed target achievement, TPT completion rates, and remaining gaps in 54 countries where PEPFAR operated in 2022.

Methods: PEPFAR Monitoring, Evaluation, and Reporting (MER) data for FY 2017–2022 were used to report the number of PLWH who started and completed TPT. Target achievement was defined as cumulative number of TPT completions divided by cumulative TPT targets. TPT com-

pletion rates were calculated by dividing the number of TPT completions by initiations, and differences in age, sex, and whether ART had been initiated recently were examined.

To estimate the number of PLWH who may remain eligible for TPT, cumulative TPT completions were subtracted from the number of PLWH currently on ART in PEPFAR-supported programs.

Results: Overall, 11,307,593 TPT completions were reported, representing 51% target achievement. The overall TPT completion rate was 78%. No major differences were noted by age or sex. TPT completion among those initiating TPT within six months of ART initiation was 72%, versus 83% among those on ART for longer than six months when TPT was initiated. By FY22, PEPFAR was providing ART to 19,238,096 PLWH, suggesting that up to 7,930,503 (41%) PLWH currently in PEPFAR-supported programs may remain eligible for TPT (Figure 1).

Conclusions: Though progress has been made in providing lifesaving TPT to PLWH, gaps remain across PEPFAR. Improved active TB case finding, surge and sustain campaigns, shorter TPT regimens, and enhanced reporting and recording systems may expand TPT coverage. Lower TPT completion rates among clients new to ART warrant interventions to improve adherence.

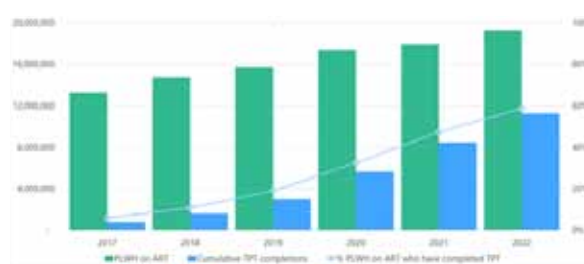


Figure 1. Number of people living with HIV (PLWH) on ART & cumulative tuberculosis preventive treatment (TPT) completions in PEPFAR, fiscal year 2017–2022



MOPEB10

Performance of rifampicin resistant TB regimens used as standard-care in the TB-PRACTECAL clinical trial

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Background: In December 2022, the WHO recommended 6-month regimens containing bedaquiline, pretomanid, linezolid and moxifloxacin (BPaLM) for the treatment of most people with rifampicin-resistant tuberculosis (RR-TB). The WHO 2019 guidelines phased out use of second-line injectables (SLI), recommending 9-12 month, all oral, short regimens or 18-20 month longer regimens and these regimens remain in practice in most settings.

We aim to show the efficacy and safety of the standard care (SoC) regimens used in TB-PRACTECAL trial and compare them to outcomes of contemporaneously recruited participants treated with BPaLM.

Methods: Participants with RR-TB were recruited from Uzbekistan, Belarus and South Africa, irrespective HIV status. Participants allocated to the standard of care (SoC) regimen were categorised into pre-2019 or post-2019 recommendations according to adoption in country and shorter (36-48 week regimens) or longer regimens (72-96 week regimens). The proportion satisfying the primary composite outcome (unfavourable outcome comprising death, early treatment discontinuation, lost-to-follow-up, treatment failure and recurrence) in each of these categories was summarised in the modified intention-to-treat (mITT) population. In the intention-to-treat population (ITT), grade 3 and above/serious adverse events (SAE) were also summarised.

Sensitivity analyses were performed comparing BPaLM to the SoC, excluding participants recruited before implementation of the 2019 guidelines.

Results: 151 participants were recruited into the SoC arms from 2017 to 2021, of which 94 and 105 were post-implementation of the 2019 WHO guidelines and met criteria for the mITT and ITT populations respectively. Unfavourable outcomes were demonstrated in 17/29 (58.6%) participants in long pre-2019 regimens; 7/13 (53.8%) short pre-2019 regimens; 24/57 (42.1%) long post-2019 regimens and 8/38 (21.1%) short post-2019 regimens. The sensitivity analysis showed a risk difference of -19.1% (-31.9% to -6.3%) favouring BPaLM regimens.

Grade ≥ 3 and SAE affected 63.6%; 53.8%; 37.5% and 48.8% of the long pre-2019, short pre-2019; long post-2019 and short post-2019 cohorts respectively. The sensitivity analysis showed a risk difference of -17.9% (-31.4% to -4.3%) favouring BPaLM regimens.

Conclusions: The short post-2019 regimen was the most efficacious of the SoC regimens. Post-2019 RR-TB regimens were both less efficacious and less safe than BPaLM, despite not having injectable agents. TB programs should transition to BPaLM regimens.

MOPEB11

Impact of HIV during standard first-line tuberculosis treatment on the risk of subsequent rifampicin-resistant TB in the Western Cape Province, South Africa

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Background: Multi-drug or rifampicin-resistant tuberculosis (MDR/RR-TB) is a major threat to people living with HIV (PLHIV). Evidence suggests that PLHIV, particularly those with advanced HIV, may be more likely to acquire rifampicin-resistance during first-line TB treatment; in turn driving the MDR/RR-TB epidemic in high burden countries like South Africa.

We aimed to assess the risk of subsequent MDR/RR-TB diagnosis in individuals with rifampicin-susceptible TB (RS-TB) disease starting first-line TB treatment.

Methods: This was a retrospective cohort analysis including individuals with laboratory confirmed RS-TB, of all ages, who started first-line TB treatment between 2007 and 2016 inclusive, attending public health facilities in the Western Cape (WC) Province, South Africa. This routinely collected data is amalgamated by the WC Provincial Health Data Centre. Participants were followed-up through the data centre to describe subsequent diagnosis of TB. We report preliminary analysis of this very large cohort.

Results: A total of 139,540 were included; 59,994 (43%) were females and 52,428 (38%) were PLHIV (Figure 1). The median age was 34.4 (IQR, 26.3-44.4). Overall, 14,662 (28%) of PLHIV and 20,870 (24%) HIV-negative individuals had a subsequent episode of TB identified, with rifampicin drug susceptibility testing (DST) available for 8,920 (61%) and 15,098 (72%) HIV-positive and HIV-negative individu-


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als respectively. PLHIV had a higher risk of a subsequent TB episode compared to HIV-negative individuals (OR 1.23, 95% CI, 1.20 - 1.26), while PLHIV were nearly twice as likely to be diagnosed with RR-TB if they had a subsequent TB diagnosis (OR 1.92, 95% CI, 1.76 - 2.11).

When restricting to 12 months follow-up after starting first-line TB treatment, PLHIV were still more likely than HIV-negative individuals to experience a subsequent TB episode (OR 1.16, 95% CI, 1.09 - 1.24). Within 12 months, PLHIV were more than three times more likely to be diagnosed with RR-TB, given a subsequent TB diagnosis (OR 3.14, 95% CI, 2.52 - 3.94).

Conclusions: These data suggest that PLHIV are at substantially higher risk of developing MDR/RR-TB during first-line TB treatment than those who are HIV negative. Further analysis of this very large cohort will assess potential contributing factors, such as the provision of antiretroviral treatment and CD4 status.

MOPEB12

Change in size-adjusted bone density by HIV status among peripubertal children in Zimbabwe: a prospective cohort study

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Background: HIV infection is associated with lower bone density, increasing the risk of fracture. We investigated how bone density changes over one year in peripubertal children living with HIV (CWH) compared to HIV-uninfected children (CWOH) in Zimbabwe.

Methods: From 2018-2020, CWH from public sector HIV clinics aged 8-16 years on antiretroviral therapy (ART) for at least two years, and CWOH of similar ages from nearby schools were recruited in Harare. At baseline and 12 months, dual X-ray absorptiometry was performed and Z-scores calculated. Bone measures included height-adjusted total-body less-head bone mineral content for lean mass (TBLH-BMC^{LB}) Z-score and size-adjusted lumbar spine bone mineral apparent density (LS-BMAD) Z-score. Linear regression models compared longitudinal changes in bone outcomes by HIV status adjusting for age, pubertal stage (by Tanner), baseline bone measurements and time since first visit.

Results: Of 609 participants recruited at baseline, 19% were lost-to-follow-up (no deaths) leaving 244 CWH (mean±SD 13.0±2.3 years, 119 (48.8%) girls) and 248 CWOH (12.9±2.4 years old, 126 (50.8%) girls) at follow-up.

Among CWH, 82% were virally suppressed (<1000 copies/ml). The prevalence of stunting (height-for-age Z-score <-2) at follow-up among CWH was 28.1% compared to 8.7% among CWOH (p<0.001).

Among girls, bone density gains over a median 35 months were similar between CWH and CWOH: adjusted mean differences in LS-BMAD (0.05[95%CI -0.06,0.16], p=0.35) and TBLH-BMC^{LB} (0.11[-0.02,0.25], p=0.11).

Male CWH gained less TBLH-BMC^{LB} (-0.15[-0.31,0.09], p<0.001) compared to CWOH, whilst LS-BMAD gains were similar (0.06[-0.44,0.55], p=0.85). HIV was associated with delayed bone mass gains, particularly among older boys who appeared to be still gaining bone at the end of study follow-up (Figure 1).

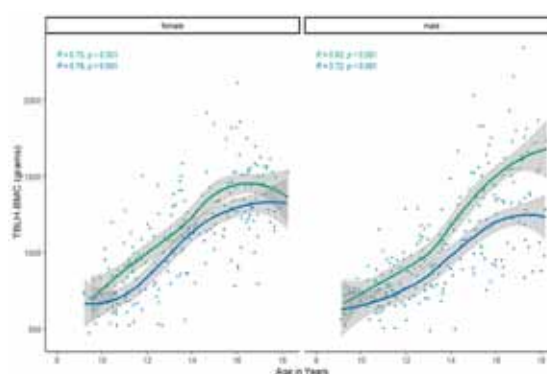


Figure 1. Best fit plot for the association between age and TBLH-BMC (grams) at follow-up stratified by sex and HIV status.

Conclusions: Unlike girls, boys living with HIV experience reduced bone mass gain over one year. Despite ART, bone growth is perturbed during adolescence which has implications for future fracture risk. Strategies to address this are warranted.

MOPEB13

Association between non-alcohol steatohepatitis with significant activity and fibrosis and neurocognitive impairment in people with HIV

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Background: The link between fatty liver diseases and cognitive impairment (CI) among people living with HIV (PLWH) remains unclear. We investigated the association



of non-alcoholic fatty liver (NAFLD), advanced liver fibrosis and non-alcoholic steatohepatitis (NASH) with significant activity and liver fibrosis [HKB1] with CI [HKB2] among well-suppressed PLWH in a Thai cohort.

Methods: PLWH ≥ 50 years old on stable antiretroviral therapy (ART) were included. The Thai-validated version of Montreal Cognitive Assessment (MoCA) was used to evaluate cognitive performance and a cut-off of $< 25/30$ was used to define CI. Liver stiffness and controlled attenuation parameters were measured using FibroScan. NAFLD and advanced liver fibrosis was defined as CAP value ≥ 248 dB/m and liver stiffness ≥ 9.5 kPa, respectively. The outcome was NASH with significant activity and liver fibrosis which was defined as FibroScan-AST (FAST) score ≥ 0.67 .

Multivariable logistic regression was employed to investigate the association of CI with NAFLD, advanced liver fibrosis and FAST score ≥ 0.67 .

Results: A total of 319 PLWH (63.3% male) with a median age of 54.4 (interquartile range [IQR], 51.7-59.6) years were included. The median duration of HIV was 18.6 (IQR, 15.3-20.9) years, and 98% had HIV RNA < 50 copies/mL. 74 (38%) participants had NAFLD and 33 (10%) had advanced liver fibrosis.

FAST score ≥ 0.67 was present in 66 (20.1%) participants. 192 (60.2%) participants had CI. In multivariable analysis, FAST score ≥ 0.67 was significantly associated with CI (adjusted odds ratio, aOR=2.11, 95% CI 1.09-3.90, $p=0.027$), after adjusting for age, sex, BMI, employment status, education, income level, smoking alcohol use, diabetes mellitus and hypertension.

After additional adjustment for HIV-related covariates such as CD4/CD8 ratio, HIV duration and ART regimen, FAST score ≥ 0.67 was still associated with CI (aOR=2.01, 95% CI 1.02-3.98, $p=0.04$). The association between NAFLD or advanced liver fibrosis and CI was not statistically significant (p -values > 0.1).

Conclusions: NASH with significant activity and liver fibrosis was associated with lower cognitive performance in a group of virally suppressed PLWH, even after controlling for demographics and HIV disease parameters. Additional research is needed to better understand this association.

MOPEB14

Accuracy of a new PHQ-9 scoring algorithm to screen for depression in PLHIV cohorts in Sub-Saharan Africa

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Background: Depression is the most common neuropsychiatric disorder in people living with HIV (PLHIV), with harmful and potentially life-threatening consequences. Screening for depression remains a priority for PLHIV in care. The 9-item Patient Health Questionnaire (PHQ-9) is a widely used depression screening tool, but with limited accuracy when applied across cultural contexts, particularly in sub-Saharan Africa.

We aimed to evaluate the performance of an alternative PHQ-9 scoring algorithm in Sub-Saharan African PLHIV.

Methods: Adult PLHIV were enrolled in five HIV programs in Cameroon, the Republic of Congo, Côte d'Ivoire, Kenya and Senegal, that are part of the leDEA collaboration. Trained study nurses or social workers administered the PHQ-9; a blinded clinical evaluation was then performed by a psychiatrist.

We compared the performance of the standard PHQ-9 algorithm (cut-off ≥ 10) to a new algorithm including:

- The presence of at least one mood symptom (PHQ-9 items 1&2) combined with at least three other symptoms listed in the PHQ-9, and;
- A simplified recoding of each 4-response item in two categories (absence/presence). Sensitivity (Se), specificity (Sp), positive predictive value (PPV), negative predictive value (NPV), and area under the curve (AUC) were assessed against the psychiatric diagnosis.


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Results: Overall, 723 participants were included [Cameroon (n=289), Congo (n=113), Côte d'Ivoire (n=141), Kenya (n=82), Senegal (n=98), female: 53%, median age: 43 years (IQR 35-50)]. Eighty were diagnosed with depression by a psychiatrist (11%). With the new scoring algorithm, Se (0.85 [95% CI: 0.75-0.92]) and NPV (0.98 [95% CI: 0.96-0.99]) were significantly increased compared to those of the standard PHQ-9 cut-off (0.46 [95% CI: 0.35, 0.58] and 0.93 [95% CI: 0.91, 0.95], respectively) (Table1).

The AUC of the new scoring algorithm was higher compared to the standard one: PHQ-9 cut off (0.85 [95% CI: 0.81, 0.90] vs 0.71 [95% CI: 0.66, 0.77]).

Conclusions: As a primary screening test, the new scoring algorithm appeared to improve the accuracy of the PHQ-9 to identify depression across settings. Recoding should also facilitate PHQ-9 administration by simplifying the response scale. This alternative PHQ-9 scoring approach might be considered to identify PLHIV in need of referral for further diagnostic evaluations.

MOPEB15

Bone mineral density changes in postpartum mothers living with HIV on antiretroviral therapy

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Background: In the IMPAACT PROMISE 1077BF study, we found that postpartum declines in bone mineral density (BMD) during breastfeeding were greater in African women living with HIV (WLWH) receiving TDF-based ART compared to those not on ART. We describe postpartum BMD changes in breastfeeding African women in the PROMISE trial who then enrolled in the PROMOTE observational cohort.

Methods: In four African countries, former PROMISE participants were enrolled in the PROMOTE study. Total hip and lumbar spine (LS) BMD were assessed by Dual Energy X-ray Absorptiometry (DXA) after delivery (week 0) and at postpartum week 74 in PROMISE, then at PROMOTE entry.

Country-specific Z-scores were created by internal standardization to the PROMISE DXA result at delivery. Linear mixed models adjusted for country were used to estimate the average 5-year change in hip and LS BMD Z-scores after postpartum week 74.

Results: At PROMOTE entry, 459 women had available DXA data from PROMISE. Median (IQR) age was 32 (29-36), BMI 24.6kg/m² (22.0-29.3), parity 3 (2-4), months on ART in PROMISE 24.8 (14.2-34.7). HIV-1 viral load was <1000 copies/mL in 93%, 92% were on TDF-ART. In the median 3.3 (2.2-3.7) years since postpartum week 74, 19% had a new pregnancy and 13% were still lactating at PROMOTE entry. At entry, mean (SD) BMD was 0.96 (0.12) for LS and 0.95 (0.12) g/cm² for hip. LS BMD Z-scores increased by 31% per 5 years (95%CI: 22%, 40%) and hip by 8% per 5 years (1%, 16%), adjusted for country. Compared to women without, women with new pregnancies had lower annualized rate of change in BMD: mean difference (95%CI) LS = -0.057 (-0.078,-0.035) and hip = -0.032 (0.053,-0.011).

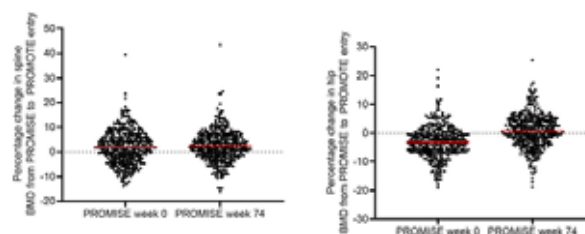


Figure 1. Relative change (%) in spine and total hip BMD from week 0 and 74 in the PROMISE to the first measurement in PROMOTE Study.

The relative change at each PROMISE time point was calculated as ((PROMOTE entry measurement - PROMISE measurement) / PROMISE measurement) x 100. Values >0 indicate that the BMD values at PROMOTE entry are greater than the BMD values measured in PROMISE (red line represents the mean).

Conclusions: Compared to women who had new pregnancies, WLWH who had no new pregnancies had greater LS BMD recovery, but not hip, in the 3 years after week 74 postpartum.



MOPEB16

Association between HIV-related factors and hypertension and diabetes among people living with HIV in Cameroon

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Background: The association of HIV acquisition with increased cardiometabolic risk is attributed to heightened and chronic inflammation in people living with HIV (PLWH) and/or the effects of antiretroviral therapy (ART). However, empirical evidence of the association of HIV-related factors with hypertension and diabetes is inconsistent.

We assessed the association of HIV-related factors with hypertension and type 2 diabetes mellitus among PLWH.

Methods: This cross-sectional study included 14,119 adult PLWH from Cameroon enrolled in the International epidemiology Databases to Evaluate AIDS (IeDEA) during 2016 through 2021. Hypertension was defined as Systolic Blood Pressure $\geq 140/90$ mmHg and/or current use of antihypertensive medication; diabetes was defined as Fasting Blood Sugar ≥ 126 mg/dL and/or use of antidiabetic medications.

Univariable and multivariable multinomial logistic regression analysis examined factors associated with hypertension alone; diabetes alone; and both outcomes together, with clients with neither condition as the reference group. Both univariable and multivariable models were fit.

Results: Of 14,119 participants, 9177 (65%) were women. The median age (25th-75th percentiles) was 42 years (35-51) years. Compared with those aged 19-29 years, age >50 years was associated with: hypertension alone (aOR: 5.62; 95%CI: 3.18, 9.95); diabetes alone (aOR: 7.07; 95% CI: 1.57, 32.0), and both (aOR: 8.52; 95% CI: 1.07, 67.8). Men had higher odds of having both conditions together (aOR: 2.41; 95%CI: 1.22, 4.77). Overweight (aOR: 2.07; 95%CI: 1.10, 3.90) and obesity (aOR: 3.46; 95%CI: 1.81, 6.64) were predictors of hypertension alone, compared with being underweight.

WHO stage II (aOR: 0.57; 95%CI: 0.41, 0.79) and WHO stage III (aOR: 0.67; 95%CI: 0.50, 0.90) were inversely associated with hypertension alone. The odds of diabetes alone were lower with ART use (aOR: 0.44; 95%CI: 0.22, 0.87). CD4 count >350 cells/mm³ and viral load ≤ 200 copies/mL were not associated with any of the conditions.

Conclusions: These findings indicate that traditional cardiovascular risk factors, including older age, male sex, overweight and obesity, are strongly associated with hypertension among PLWH. Further research examining associations between HIV disease stage and ART use with hypertension and diabetes is warranted.

MOPEB17

Renal safety parameters after switch to doravirine/islatravir (DOR/ISL 100/0.75mg) once-daily: week 48 results from 2 randomized, active-controlled phase 3 trials, MK8591A-017 (P017) and MK8591A-018 (P018)

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Background: Certain antiretroviral drugs may affect renal function. The objective of this post-hoc analysis was to evaluate renal safety parameters after 48 weeks in 2 phase 3 DOR/ISL (100/0.75mg) switch trials.

Methods: P017 (NCT04223778) was an open-label switch from any oral 2- or 3-drug regimen, with randomization stratified by baseline antiretroviral therapy (bART). P018 (NCT04223791) was a double-blind switch; bART was bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF). Adults with HIV-1 were randomized 1:1 to switch to DOR/ISL (100/0.75mg) once-daily or continue bART.

Participants with creatinine clearance ≤ 30 mL/min were excluded. Renal safety parameters were assessed, including estimated glomerular filtration rate (eGFR) using CKD-Epi Cystatin-C equation to avoid reliance on creatinine-based eGFR confounded by inhibition of renal creatinine secretion by several antiretroviral agents.

Results: 658 participants switched to DOR/ISL (100/0.75mg); 655 remained on bART, of which 319 remained on B/F/TAF in P018. In P017, bART was INSTI-based in 52%, PI-based in 14%, and Other in 34% of participants; 30% of bART included TDF, 39% included TAF, and 28% included other NRTIs. No differences in mean change from baseline between treatment arms were observed for cystatin-C or urine albumin/creatinine ratio in either trial at 48 weeks. An increase in cystatin-C based eGFR and a decrease in urine retinol-binding protein/creatinine ratio (URBP/UC)



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was observed in P017 for participants switched to DOR/ISL; a similar effect was not present in P018 (Table). Renal and urinary adverse events (RUAEs) were infrequent and similar between groups: P017 DOR/ISL 3.9%, bART 2.4%; P018 DOR/ISL 2.2%, B/F/TAF 3.4%; no participants switched to DOR/ISL had serious RUAEs or discontinued treatment due to RUAEs.

P017: Open-label Switch					P018: Blinded Switch				
	n	DOR/ISL (100/0.75mg)	n	bART	Difference (95% CI)	n	DOR/ISL (100/0.75 mg)	n	B/F/TAF
Serum creatinine (mg/dL), Mean (SD)									
Baseline	318	0.83	320	0.81	-	302	0.88	299	0.90
Wk 48 change from baseline	318	-0.05 (0.17)	320	0.01 (0.12)	-	302	-0.09 (0.21)	299	0.00 (0.13)
eGFR Creatinine Adjusted for BSA (mL/min/1.73 m ²), Mean (95% CI)									
Baseline	318	302.70	320	303.47	-	302	315.65	299	323.91
Wk 48 change from baseline	318	-6.90 (-8.81, -4.99)	320	-2.47 (-4.43, -0.50)	9.19 (5.54, 11.81)	302	-12.24 (-16.35, -8.13)	299	-1.62 (-3.77, 0.52)
Serum Cystatin C (mg/L), Mean (95% CI)									
Baseline	317	0.96	318	0.92	-	296	0.99	294	0.98
Wk 48 change from baseline	317	-0.03 (-0.04, -0.01)	318	-0.01 (-0.02, 0.01)	-0.02 (-0.03, 0.00)	296	-0.02 (-0.03, -0.00)	294	-0.02 (-0.03, -0.01)
eGFR Cystatin C (mL/min/1.73 m ²), Mean (95% CI)									
Baseline	317	88.76	318	91.50	-	296	84.59	294	84.99
Wk 48 change from baseline	317	2.85 (1.60, 4.11)	318	0.37 (-0.82, 1.56)	2.05 (0.98, 3.12)	296	1.84 (0.98, 2.70)	294	5.36 (0.27, 10.45)
Urine Albumin/Creatinine Ratio (ug/g), Mean (95% CI)									
Baseline	308	0.03	309	0.02	-	281	0.02	283	0.02
Wk 48 change from baseline	308	-0.00 (-0.01, 0.01)	309	0.00 (-0.00, 0.00)	0.00 (-0.01, 0.01)	281	0.00 (-0.01, 0.01)	283	0.00 (-0.00, 0.00)
Urine Retinol Binding Protein/Creatinine Ratio (ug/g), Mean (95% CI)									
Baseline	289	113.13	295	78.28	-	259	94.75	266	153.35
Wk 48 change from baseline	289	-29.55 (-50.66, -8.43)	295	25.42 (11.54, 39.30)	-38.89 (-46.63, -31.14)	259	-14.30 (-30.02, 1.42)	266	-17.73 (-44.54, 8.49)

Table. Renal safety parameters by treatment arm in P017 and P018.

Conclusions: Overall, DOR/ISL (100/0.75mg) had no adverse impact on renal function after 48 weeks in participants who switched from bART across 2 phase 3 trials. Switching off certain bART in P017 may account for mild improvements observed in URBP/UC and eGFR with DOR/ISL.

MOPEB18

A randomized controlled trial of (5R)-5-hydroxytryptolide in HIV INRs receiving ART

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Background: Therapeutic approaches to HIV-suppressed immunological non-responders (INRs) remain unsettled. We previously reported the efficacy of Chinese herbal Tripterygium wilfordii Hook F in INRs. Its derivative (5R)-5-hydroxytryptolide (LLDT-8) on CD4⁺ T cell recovery was assessed.

Methods: The phase II, double-blind, randomized, placebo-controlled trial was conducted in adult patients with long-term suppressed HIV infection and suboptimal CD4 recovery, at eight hospitals in China. The patients were

1:1:1 assigned to receive oral LLDT-8 0.5mg or 1mg daily, or placebo combined with antiretroviral therapy for 48 weeks. All study staff and participants were masked. The primary endpoints include change of CD4⁺ T cell counts and inflammatory markers at week 48.

This study is registered on ClinicalTrials.gov (NCT04084444) and Chinese Clinical Trial Register (CTR20191397).

Results: A total of 149 patients were enrolled from Aug 30, 2019, and randomly allocated to receiving LLDT-8 0.5mg daily (LT8, n= 51), 1mg daily (HT8, n= 46), or placebo (PL, n= 52). The median baseline CD4⁺ T cell count was 248 cells/mm³, comparable among three groups. LLDT-8 was well tolerated in all participants.

At 48 weeks, change of CD4⁺ T cell counts was 49 cells/mm³ in LT8 group (95% confidence interval [CI]: 30, 68), 63 cells/mm³ in the HT8 group (95% CI: 41, 85), compared to 32 cells/mm³ in the placebo group (95% CI: 13, 51). LLDT-8 1mg daily significantly increased CD4⁺ T cell count compared to placebo (P=0.036), especially in participants over 45 years old.

The mean change of serum interferon-γ-induced protein 10 (IP-10) was -72.1 mg/L (95% CI -97.7, -46.5) in the HT8 group at 48 weeks, markedly decreased compared to -22.8 mg/L (95% CI -47.1, 1.5, P=0.007) in the placebo group. Treatment-emergent adverse events (TEAEs) were reported in 41 of 46 (89.1%) participants in the HT8 group, 43 of 51(84.3%) in LT8, and 42 of 52 (80.7%) in the PL group. No drug-related serious adverse events (SAEs) were reported. **Conclusions:** LLDT-8 enhanced CD4 recovery and alleviated inflammation in long-term suppressed INRs, providing them a potential therapeutic option.

MOPEB19

Weight gain among people living with HIV in Zambia transitioning to dolutegravir-based antiretroviral regimens containing tenofovir alafenamide versus tenofovir disoproxil fumarate

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Background: Dolutegravir (DTG)-based antiretroviral therapy (ART) might be associated with weight gain, particularly in combination with tenofovir alafenamide (TAF) versus tenofovir disoproxil fumarate (TDF). We compared weight changes among PLHIV who switched to a DTG-based regimen using data from electronic health records in Zambia.

Methods: We conducted a retrospective cohort study of PLHIV aged ≥20 years at ART initiation with ≥2 recorded weights before and after ART switch between 2017 and August 2022. We estimated weight change over time using linear mixed effects models adjusting for age, sex,

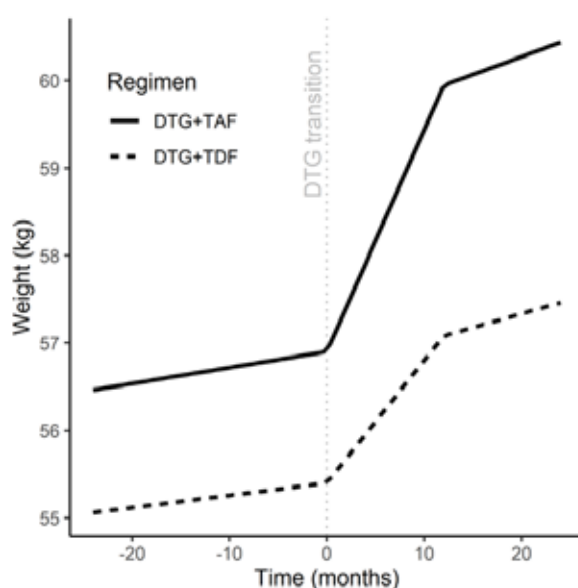


and body mass index and viral load at time of switch with participants as random intercepts and linear splines with knots at time of switch and 12-months post-switch.

Results: We analyzed 140,816 records (15.1%) of PLHIV transitioned to a DTG-based regimen; 97.9% switched to DTG+TDF while 2.1% received DTG+TAF. PLHIV on DTG+TAF were older (46 vs. 39 years, $p<0.001$) and more were female (68.8% vs. 66.7%, $p=0.016$) than PLHIV on DTG+TDF.

Trends in weight gain were greater among PLHIV on DTG+TAF versus DTG+TDF during all 3 time periods (before switch: $\beta=0.31$, 95% confidence interval [CI]=0.01-0.61; ≤ 1 year post-switch: $\beta=1.67$, 95% CI=1.40-1.94; >1 year post-switch: $\beta=2.19$, 95% CI=1.30-3.08).

Model-estimated changes in weight for PLHIV on DTG+TAF were 0.22kg/year before switching, 3.05kg in the first year after switching, and 0.49kg in the second year while for PLHIV on DTG+TDF, weight gain was 0.16kg, 1.68kg, and 0.38kg during the same periods (Figure).



Conclusions: PLHIV on ART experienced weight gain which was highest during the first year after transitioning to DTG-based regimens and in combination with TAF. Our findings provide real-world evidence of DTG- and TAF-associated weight gain from a large PLHIV population in Zambia. Given the rising burden of noncommunicable diseases among PLHIV, weight management counseling and screening for metabolic syndrome are needed for holistic clinical management of PLHIV.

MOPEB20

Sedative drug burden is associated with concurrent physical frailty in people aging with HIV in Canada: findings from the Positive Brain Health Now Study (+BHN)

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Background: Medications with sedative activity are widely prescribed for anxiety, pain, insomnia, muscle spasms, and seizures. However, sedatives have been linked to adverse outcomes such as frailty.

This study aimed to know the extent to which sedative burden is associated with concurrent physical frailty in people aging with HIV.

Methods: A cross-sectional study of people living with HIV aged ≥ 35 years, living with HIV for at least a year, enrolled in the Positive Brain Health Study recruited across five clinical sites in Canada with baseline visits between 2014 and 2016. Medication data were collected from personal interviews and chart reviews. The sedative burden was estimated using the Sedative Load Model (SLM) and the sedative list of the Anticholinergic and Sedative Burden Catalog (ACSBC-SL).

The physical frailty indicator phenotype (FIP) was adapted from Fried's criteria using validated self-report items for exhaustion, low physical activity, slow gait speed, and low grip strength. A count of $\geq 3/5$ of the FIP criteria was defined as frail.

A multivariable logistic regression model was used to estimate the association between sedative burden and physical frailty. Final models were fully adjusted for demographics, polypharmacy, and comorbidities.

Results: 824 people living with HIV (85% male, 92% virologically suppressed, mean age 53 years) were included. 102 men (15%) and 26 women (21%) were identified as frail. The overall prevalence of frailty was 16% (128). 39% of participants were using ≥ 1 medication with a sedative effect, while 16% and 23% were prescribed primary sedatives using the SLM and ACSBC-SL, respectively.

Using the ACSBC-SL tool, the Sedative burden score ($OR=1.35[1.09-1.68]$), use of any sedative ($OR=1.84[1.02-3.22]$), use of a primary sedative ($OR=1.74[1.01-2.93]$), number of



sedatives (OR=1.57[1.15-2.14]), and the number of primary sedatives (OR=1.74[1.01-2.93]) were associated with frailty. Using the SLM, only the number of sedatives was associated with physical frailty (OR=1.40[1.03-1.90]).

Conclusions: The sedative drug burden estimated using the ACSBC-SL was associated with physical frailty independent of comorbidities. Longitudinal studies are needed to understand if reducing the sedative drug burden in people aging with HIV prevents or reverses physical frailty.

MOPEB21

Disability in people living with HIV (PLWH) in Asia: a prospective multi-centre case-control study

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Background: The burden of disability among PLWH varies temporally and spatially. Understanding the burden of disability and the associated factors would improve healthcare support planning to improve quality of life.

Methods: We performed a prospective case-control study in five Asian cities. PLWH aged ≥ 35 years and age- and sex-matched HIV-uninfected controls were enrolled. We collected demographic and clinical data, and measured frailty, mood (PHQ-9 and DASS-21 for depression, anxiety and stress) and cognitive function (International HIV Dementia Scale/IHDS and Montreal Cognitive Assessment/MoCA).

The primary endpoint was moderate disability, defined as WHODAS 2.0 ≥ 2 . Secondary endpoints were complex score of WHODAS and domain-specific dichotomous scores. We compared the prevalence of moderate disability and WHODAS score between cases and controls, and determined whether HIV was independently associated with disability using multivariate binary logistic regression and linear regression models.

Results: We enrolled 695 PLWH and 228 controls. PLWH had mean (\pm standard deviation) age of 53.3 \pm 10.0 years, 561(81%) were male HIV diagnosis for 9.3 \pm 7.4 years, 82% had HIV RNA < 50 copies per mL, and current CD4 was 520 \pm 296 cells/mm³, 52% was taking integrase inhibitor-based, and 41% non-nucleoside reverse transcriptase inhibitor-based regimens. Compared with controls, PLWH had higher burden of frailty, polypharmacy, depression, anxiety, stress, and loneliness, and poorer social support. Moderate disability was present in 357(51.4%) PLWH and 112(49.1%) controls respectively. WHODAS complex score was higher in PLWH (9.58 \pm 11.93 vs. 7.06 \pm 8.25, $p < 0.001$). Among the WHODAS domains, PLWH had a trend of more impairment in participation (75.0% vs. 68.4%, $p = 0.052$).

Moderate disability was independently associated with frailty, PHQ-9 score, stress score, MoCA, and loneliness, after adjusting for age, sex and study site, but not with HIV. Complex WHODAS score was independently associated with frailty, PHQ-9, stress and anxiety scores, IHDS, MoCA, and loneliness, but not with HIV, after adjusting for age, sex and study site. Among PLWH, moderate disability was independently associated with frailty, PHQ-9 score, stress and anxiety scores, loneliness, and MoCA.

Conclusions: Compared with age- and sex-matched HIV-uninfected controls, PLWH had higher prevalence of frailty, depression, stress, anxiety and loneliness, but not that of moderate disability in Asian cities.

TUPEB01

Association of antiretroviral therapies with adverse perinatal outcomes in pregnant women living with HIV: systematic review and meta-analysis

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Background: The World Health Organization recommends integrase strand transfer inhibitor (INSTI) dolutegravir (DTG)-based antiretroviral therapy (ART) as first-line regimen in pregnant women living with HIV (WLHIV). Non-nucleoside reverse transfer inhibitor (NNRTI)-based ART and protease inhibitor (PI)-based ART are recommended as second- and third-line regimens. The impact of different ART regimens on perinatal outcomes is uncertain. We aimed to assess the comparative risk of adverse perinatal outcomes in WLHIV receiving different classes of ART.

Methods: We conducted a systematic literature review by searching PubMed, CINAHL, Global Health, and EMBASE for studies published between Jan 1, 1980, and September 20, 2022. We included studies reporting on the association of pregnant WLHIV receiving different classes of ART with 11 perinatal outcomes: preterm birth (PTB), very PTB, spontaneous PTB, low birthweight (LBW), very LBW (VLBW), term LBW, preterm LBW, small for gestational age (SGA), very SGA (VSGA), stillbirth, and neonatal death. Pairwise random-effects meta-analyses compared the risk of each adverse perinatal outcome among WLHIV receiving INSTI-ART, NNRTI-ART, PI-ART, and nucleoside reverse transfer inhibitor (NRTI)-based ART, and compared specific 'third drugs' from different ART classes. Subgroup and sensitivity analyses were conducted based on country income status and study quality. The protocol is registered with PROSPERO, number CRD42021248987.

Results: 30 cohort studies including 222,312 pregnant women met the eligibility criteria. Random-effects meta-analyses showed that INSTI-ART is not associated any ad-



verse perinatal outcomes compared to NNRTI-ART and PI-ART. PI-ART is associated with a significantly increased risk of SGA (Relative Risk (RR) 1.28, 95% CI 1.09-1.51) and VSGA (1.41, 1.08-1.83), compared to NNRTI-ART.

Specifically, lopinavir/ritonavir (LPV/r) was associated with an increased risk of SGA (1.40, 1.18-1.65) and VSGA (1.84, 1.37-2.45), compared to efavirenz (EFV), but not compared to nevirapine (NVP). We found no evidence that any class of ART or specific 'third drug' was associated with an increased risk of PTB.

Conclusions: Our findings support the recommendation of INSTI-ART as first-line ART regimen for use in pregnant WLHIV. However, the increased risks of SGA and VGSA associated with PI-ART, compared to NNRTI-ART, may impact choice of second- and third-line ART regimens in pregnancy. These findings should inform clinical guidelines.

TUPEB02

Efficacy of dolutegravir plus lamivudine in treatment-naïve people living with HIV without baseline drug-resistance testing: week 24 results of the randomized D2ARLING study

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Background: DTG-3TC dual therapy regimen is indicated for treatment-naïve people living with HIV (PLHIV). However, some concerns remain about its use when no information of baseline HIV-1 drug-resistance testing is available due to potential transmitted resistance. Efficacy data in this scenario is scarce.

Methods: D2ARLING is a randomized, open-label, phase IV study, designed to assess the efficacy and safety of DTG+3TC in treatment-naïve PLHIV with no available baseline HIV-1 resistance testing. Participants were randomized 1:1 (stratified by screening plasma HIV-1 RNA and CD4+ T-cell count) to DTG+3TC or DTG+TDF/XTC. Per protocol a genotypic drug-resistance test was performed at day 1 and remained double-blinded throughout the study. Primary endpoint: proportion of participants with plasma HIV-1 RNA <50 copies/mL at week 48 (ITT-exposed analysis, snapshot algorithm, non-inferiority 95%CI margin=10%). Week-24 analysis is reported here (ClinicalTrials.gov: NCT04549467).

Results: Out of 244 subjects screened, 214 were randomized to receive DTG+3TC (n=106) or DTG+TDF/XTC (n=108).

Baseline characteristics were similar between arms. Median age 31 years (IQR 26-39), 22.9% female, 30.8% HIV-1 RNA >100,000 copies/mL, and 19.7% CD4+ T-cell count <200 cells/mL.

At week 24, in the ITT-exposed snapshot 94.34% of participants on DTG+3TC arm and 95.37% on DTG+TDF/XTC arm achieved HIV-1 RNA <50 copies/mL (difference -1.03%;

95%CI -7.89% to 5.82%, $p=0.97$). Proportion of participants with HIV-1 RNA ≥ 50 copies/mL at week 24 was 0.94% (n=1) and 1.85% (n=2) in the DTG+3TC and DTG+TDF/XTC arms, respectively. One subject in the DTG+TDF/XTC arm met protocol-defined virological failure. No treatment-emergent mutations to any of the study drugs were observed in the virological failure genotypic resistance test. AEs overall rates were similar between arms (DTG+3TC n=36, DTG+TDF/XTC n=38), with low rates of withdrawals due to AEs for both DTG+3TC (<1%) and DTG+TDF/XTC (0%).

All serious AE were not related: DTG+3TC (1.9%) vs. DTG+TDF/XTC (4.6%). Median weight change was 2kg (IQR 0.5-4.25) and 0kg (IQR -1.5-3) in the DTG+3TC and DTG+TDF/XTC arms, respectively.

Conclusions: At week 24, DTG+3TC was non-inferior to DTG+TDF/XTC in treatment-naïve PLHIV without baseline resistance testing. Confirmation of these results at week 48 will provide strong evidence about DTG+3TC efficacy in resource-limited settings where pretreatment resistance testing is not always available.

TUPEB03

Efficacy and safety of switching older adults (≥ 60 years) from first-line art to B/F/TAF in Kenya - a randomized clinical trial (the B/F/TAF elderly study)

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Background: Age-related comorbidities overlap with ARV-related adverse events (AEs), limiting treatment options for aging populations of people living with HIV (PLWH). We evaluated the efficacy and safety of switching older PLWH from first-line treatment to bicitgravir/emtricitabine/tenofovir alafenamide (B/F/TAF).

Methods: This open-label, randomized, active controlled, non-inferiority trial is being conducted at two sites in Kenya. Eligible participants were PLWH ≥ 60 years on a first line regimen with HIV RNA <50 copies/mL for at least 12 weeks. Participants were randomized 1:1 to switch to B/F/TAF or continue current ARV regimen (CAR).

Primary endpoints are proportion of participants with plasma HIV-1 RNA ≥ 50 copies/mL at week 48 in the intention-to-treat-exposed (ITT-E) population using the FDA Snapshot algorithm with a non-inferiority margin of 4%,


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and percentage change in lumbar spine bone mineral density (BMD) at 48 weeks. We present pre-specified week 24 analysis.

Results: Between February and May 2022, 520 participants were randomized (260 B/F/TAF, 260 CAR). Of these, 296 were enrolled into the BMD monitoring population (143 B/F/TAF, 153 CAR). All participants were black, median age 64 years (range 60–80), 267 (51.4%) were female, with baseline characteristics balanced between arms. At baseline, 495 (95.2%) participants were on TDF and 177 (59.8%) of the BMD population had osteoporosis. At the week 24, 1.5% in the B/F/TAF arm and 1.9% in the CAR arm had HIV-RNA ≥ 50 copies/mL (difference [95% CI], -0.4% [-2.63 to 1.86]), meeting non-inferiority criteria. The mean percentage change in lumbar spine BMD was +0.73% (SD 5.5) in the B/F/TAF arm and +0.11% (SD 5.1) in the CAR arm (difference [95% CI], 0.62% [-0.59 to 1.84]). Grade 3 or 4 AEs were uncommon (1.2% on B/F/TAF; 0.8% on CAR) with no treatment-related serious AEs. Grade 3 to 4 laboratory abnormalities were similar between arms (16.9% on B/F/TAF; 16.5% on CAR); renal AEs were more common with CAR (12.7% on CAR; 7.7% on B/F/TAF) and low-density lipoprotein abnormalities more common with B/F/TAF (5.0% on B/F/TAF; 1.9% on CAR).

Conclusions: Switch to B/F/TAF was non-inferior to CAR in this older African population; at week 24 the improvement in BMD in B/F/TAF was not significantly better than CAR.

TUPEB04

Similar inflammatory markers after switching to cabotegravir + rilpivirine long-acting vs. continuing bicitegravir/emtricitabine/tenofovir alafenamide: data from the Phase 3b SOLAR study

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Background: Cabotegravir + rilpivirine (CAB+RPV) administered every 2 months (Q2M) is the only complete long-acting (LA) regimen for the maintenance of HIV-1 suppression. Here, we present changes from baseline to Month (M) 6 and M12 in key inflammatory markers from the Phase 3b SOLAR study, overall and by subgroups.

Methods: SOLAR (NCT04542070) is a randomized (2:1), open-label, multicenter, noninferiority study assessing virologically suppressed adults switching to CAB+RPV LA

Q2M vs. continuing daily bicitegravir/emtricitabine/tenofovir alafenamide (BIC/FTC/TAF). Subgroup analyses were carried out by sex at birth, age (<35, 35–<50, ≥ 50 years), and body mass index (BMI; ≥ 30 , <30 kg/m²). Key inflammatory markers (platelet-poor plasma D-dimer, serum interleukin-6 [IL-6], serum C-reactive protein [CRP], CD4/CD8 ratio, serum soluble (s) CD14, and sCD163) were measured at baseline, M6, and M12, and were compared between treatments and subgroups.

Results: Overall, 454 participants received CAB+RPV LA and 227 received BIC/FTC/TAF; 18% of the total population were female, 20% were aged ≥ 50 years, and 22% had a BMI ≥ 30 kg/m².

Overall, at M12, CAB+RPV LA demonstrated noninferior virologic efficacy vs. BIC/FTC/TAF (HIV-1 RNA ≥ 50 copies/mL, 1% [n=5/447] vs. <1% [n=1/223]) (presented elsewhere). There were no significant differences between CAB+RPV LA and BIC/FTC/TAF in change from baseline to M6 or M12 for key inflammatory markers (treatment geometric mean ratio [CAB+RPV LA:BIC/FTC/TAF; 95% confidence interval]): D-dimer, M6: 0.98 (0.94–1.02), p=0.258, M12: 1.00 (0.96–1.05), p=0.826; IL-6, M6: 0.94 (0.84–1.05), p=0.256, M12: 0.96 (0.84–1.10), p=0.574; CRP, M6: 0.96 (0.83–1.11), p=0.582, M12: 0.99 (0.84–1.17), p=0.927. Changes in CD4/CD8 ratio, sCD14, and sCD163 were similar between treatment groups. Changes in inflammatory parameters were similar across key subgroups for CAB+RPV LA (Table).

	Overall		Sex at birth				Age (years)							
	CAB+RPV LA n=447	BIC/FTC/TAF n=223	CAB+RPV LA		BIC/FTC/TAF		CAB+RPV LA		BIC/FTC/TAF		CAB+RPV LA		BIC/FTC/TAF	
			Female n=176	Male n=271	Female n=112	Male n=111	<35 n=173	35–<50 n=174	≥ 50 n=100	<35 n=112	35–<50 n=111	≥ 50 n=100	<35 n=112	35–<50 n=111
Key inflammatory markers*														
D-dimer (ng/mL)														
Baseline	109.9 (37.1)	108.4 (37.4)	111.0 (38.1)	107.6 (36.6)	117.4 (38.5)	106.4 (37.4)	107.9 (34.5)	106.2 (39.5)	111.0 (37.4)	106.5 (37.5)	107.9 (37.3)	117.4 (38.5)	107.9 (37.3)	117.4 (38.5)
Change at M12	28.0 (30.6)	6.2 (36.5)	6.6 (37.5)	21.6 (30.6)	28.1 (30.5)	-6.6 (39.5)	41.9 (30.8)	6.2 (38.8)	-5.7 (33.5)	43.6 (33.3)	6.6 (38.2)	-5.7 (33.5)	43.6 (33.3)	6.6 (38.2)
IL-6 (pg/mL)														
Baseline	4.0 (28.6)	2.7 (8.7)	5.7 (31.5)	3.0 (19.7)	4.8 (19.5)	2.3 (2.5)	1.9 (1.5)	4.8 (27.7)	7.9 (22.5)	2.8 (1.5)	3.6 (19.7)	2.8 (1.5)	2.8 (1.5)	2.8 (1.5)
Change at M12	-0.9 (18.5)	0.5 (7.5)	-0.6 (24.5)	-0.2 (12.3)	-1.7 (17.1)	0.9 (5.6)	1.9 (24.1)	-1.9 (24.1)	-1.7 (24.2)	1.1 (5.5)	-0.2 (17.2)	0.9 (5.6)	-1.7 (24.2)	0.9 (5.6)
CRP (mg/L)														
Baseline	2.3 (4.7)	1.9 (2.4)	4.4 (3.6)	1.9 (2.4)	2.3 (2.4)	1.8 (2.4)	1.7 (2.3)	2.3 (3.7)	3.4 (3.6)	2.8 (2.7)	1.7 (1.4)	2.3 (3.7)	2.8 (2.7)	2.3 (3.7)
Change at M12	1.0 (5.5)	1.0 (5.4)	0.3 (5.5)	1.1 (5.5)	2.1 (11.5)	0.7 (4.7)	0.2 (3.2)	2.2 (13.1)	0.2 (2.5)	0.7 (4.5)	1.9 (5.7)	0.7 (4.5)	1.9 (5.7)	0.7 (4.5)
CD4/CD8 ratio														
Baseline	1.1 (0.34)	1.07 (0.37)	1.13 (0.38)	1.09 (0.32)	1.20 (0.35)	1.06 (0.32)	1.11 (0.37)	1.09 (0.34)	1.10 (0.36)	1.02 (0.34)	1.08 (0.35)	1.10 (0.36)	1.02 (0.34)	1.08 (0.35)
Change at M12	0.00 (0.25)	0.00 (0.19)	0.12 (0.22)	0.07 (0.25)	0.00 (0.18)	0.00 (0.18)	0.00 (0.22)	0.00 (0.18)	0.00 (0.18)	0.00 (0.18)	0.04 (0.20)	0.04 (0.20)	0.04 (0.20)	0.04 (0.20)
sCD14 (pg/mL)														
Baseline	1662 (481)	1622 (435)	1662 (435)	1622 (435)	1662 (435)	1617 (435)	1619 (435)	1669 (435)	1744 (407)	1663 (435)	1663 (435)	1744 (407)	1663 (435)	1744 (407)
Change at M12	107 (385)	64 (345)	-80 (375)	30 (375)	100 (395)	40 (395)	-9 (351)	30 (375)	51 (395)	4 (375)	124 (345)	51 (395)	4 (375)	124 (345)
sCD163 (pg/mL)														
Baseline	721 (371)	707 (347)	813 (345)	702 (335)	736 (357)	700 (335)	689 (335)	708 (345)	803 (345)	648 (345)	727 (345)	700 (335)	648 (345)	727 (345)
Change at M12	-110 (276)	-104 (261)	-104 (261)	-104 (261)	-104 (276)	-104 (276)	-104 (261)	-104 (261)	-104 (261)	-104 (261)	-104 (261)	-104 (261)	-104 (261)	-104 (261)

Table. SOLAR Key Inflammation Marker Changes from baseline by Treatment Groups and Key Subgroups.

Conclusions: Over 12 months, CAB+RPV LA administered Q2M demonstrated noninferior virologic efficacy vs. daily oral BIC/FTC/TAF, with similar changes in inflammatory markers overall and by subgroups.



TUPEB05

Evaluation of therapeutic concentrations of anti-HIV antibodies 3BNC117/teropavimab and 10-1074/zinlirvimab through PK-PD modeling and prediction of the washout duration in HIV cure studies

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Background: 3BNC117 and 10-1074 are potent broadly neutralizing antibodies (bNAbs) against HIV envelope glycoproteins isolated and cloned from people with HIV (PWH). Teropavimab (3BNC117-LS) and zinlirvimab (10-1074-LS) are recombinant, fully human monoclonal antibodies derived from 3BNC117 and 10-1074, respectively, with two amino acid substitutions in the Fc domain to prolong their half-lives. 3BNC117/teropavimab and 10-1074/zinlirvimab have been shown to induce rapid decline in viremia in PWH, as well as delay the time-to-viral rebound in suppressed PWH during analytical treatment interruption (ATI). The purpose of this study is to evaluate the therapeutic concentrations of the bNAbs through pharmacokinetic-dynamic (PK-PD) modeling.

Methods: Population PK-PD models were developed based on concentration and/or viral dynamic data from 6 studies that evaluated their antiviral activity in 45 viremic and 49 suppressed PWH during ATI, and 3 PK studies of 3BNC117/teropavimab and 10-1074/zinlirvimab. The PK of the bNAbs were modeled by two-compartment linear PK models. The PD model describes viral replication using logistic growth function, and viral elimination by the bNAbs using first-order kinetics, with a saturable nonlinear relationship between bNAb concentrations and viral elimination rates.

Distinct viral populations sensitive or resistant to each bNAb were modeled to capture the mechanism of resistance selection in treated participants.

Simulations were performed to evaluate different washout durations of teropavimab and zinlirvimab to predict time-to-viral rebound during ATI.

Results: The PK-PD models adequately described the PK and viral dynamic data from all studies analyzed. The estimated half-lives of teropavimab and zinlirvimab in suppressed PWH are ~62 and 77 days, respectively. The estimated mean (95% CI) serum concentrations corresponding to 20% maximum drug effect of 3BNC117/teropavimab and 10-1074/zinlirvimab were 6.3 (4.9-8.2) and 8.1 (2.5-26) µg/mL, respectively.

Simulations predicted that after a washout period of ≥48 weeks following single dose combination of 30 mg/kg teropavimab and 10 or 30 mg/kg zinlirvimab, these bNAbs would have minimal effects on the time-to-viral rebound during ATI.

Conclusions: The PK-PD modeling analyses provided insights to the minimal therapeutic serum concentrations and washout durations of the long acting bNAbs to help define their efficacy in HIV cure studies.

TUPEB06

Patient-reported outcomes after 12 months of maintenance therapy with cabotegravir + rilpivirine long-acting compared with bictegravir/emtricitabine/tenofovir alafenamide in the Phase 3b SOLAR study

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Background: The SOLAR (NCT04542070) Phase 3b study demonstrated noninferior virologic efficacy of switching to cabotegravir+rilpivirine long-acting (CAB+RPV LA) dosed Q2M from daily oral bictegravir/emtricitabine/tenofovir alafenamide (BIC/FTC/TAF) vs. continuing BIC/FTC/TAF over 12 months in suppressed ART-experienced people living with HIV-1. Patient-reported outcomes (PROs) from SOLAR are presented herein.

Methods: PRO endpoints included a treatment preference questionnaire; overall treatment satisfaction and satisfaction with treatment flexibility, convenience, and willingness to continue treatment (HIV Treatment Satisfaction Questionnaire status version [HIVTSQs]); acceptability of injections (Perception of Injection questionnaire); and three single-item questions exploring an individual's fear of disclosure, anxiety relating to adherence requirements, and daily reminder of their HIV status (FAD questions).

Results: Of 670 participants, 447 (67%) switched to LA therapy and 223 (33%) continued BIC/FTC/TAF (2:1 randomization). After 12 months of treatment (or at withdrawal), most (90%) questionnaire respondents preferred LA injectable treatment vs. daily oral therapy (5%); the remaining 5% reported no preference. The top reason for preferring LA therapy was not having to worry about taking HIV medicine (85%).

A statistically significant increase from baseline favoring CAB+RPV LA vs. BIC/FTC/TAF was reported in overall treatment satisfaction, and satisfaction with treatment flexibility, treatment convenience, and willingness to continue treatment after 12 months of therapy (Table).



Acceptability of injections improved after 12 months of treatment. At baseline (prior to randomized treatment), 49% (n=218/447) of participants in the CAB+RPV LA arm and 43% (n=97/223) in the BIC/FTC/TAF arm reported "always"/"often" to at least one FAD question.

After 12 months of therapy, a higher proportion of respondents in the CAB+RPV LA group reported improvements in all three FAD questions compared with respondents receiving BIC/FTC/TAF.

Table.

Conclusions: Switching to CAB+RPV LA Q2M was associated with improved treatment satisfaction, preferred by 90% of participants, while also providing emotional well-being benefits including relief from the fear of disclosure and anxiety surrounding adherence.

TUPEB07

Pharmacokinetic bridging with oral Lenacapavir for missed subcutaneous Q6M dosing

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Background: Lenacapavir (LEN) is currently approved for multidrug-resistant HIV-1 infection in combination with other antiretrovirals for heavily treatment-experienced individuals.

In ongoing Phase 2/3 studies (CAPELLA and CALIBRATE), participants receive oral LEN loading (600 mg on Days 1 and 2; 300 mg on Day 8) followed by 927 mg SC given every 6-months (Q6M) starting from Day 15.

In these studies, mean trough concentrations >15.5 ng/mL, which is inhibitory quotient-4 (IQ4; ie, 4-fold in-vitro protein binding-adjusted 95% effective concentration), are associated with high rates of virologic suppression. In participants temporarily unable to receive SC LEN during its clinical hold, oral bridging (300 mg QW) was used until SC dosing was resumed.

Our objective was to evaluate the pharmacokinetics (PK) of LEN during oral bridging (OB) period to assess the adequacy of 300-mg oral QW LEN for maintaining therapeutic concentrations between missed SC LEN doses.

Methods: During OB period, sparse PK samples were collected at the start (of OB period) and every ~10-12 weeks (without regard to a prespecified time since dose) until SC

LEN was resumed. LEN plasma concentrations were summarized during OB period in the CAPELLA (N=57) and CALIBRATE (N=82) studies.

Results: In both studies, mean LEN concentration and the lower-bound 90% confidence interval (CI) were maintained above the efficacy target of IQ4 at all OB period visits (Table 1).

At the time of SC LEN resumption, mean (lower-bound 90% CI) predose concentrations in CAPELLA (74.4 ng/mL [56.2 ng/mL]) and CALIBRATE (50.7 [43.6]) exceeded IQ4.

Study	Concentration	OB Day 1	OB Week 10	OB Week 20	OB Week 30
CAPELLA	Mean, ng/mL	46.1 (n=56)	76.2 (n=57)	74.8 (n=36)	41.7 (n=39)
	90% CI	40.3, 51.9	66.1, 86.3	50.4, 99.3	29.9, 53.5
CALIBRATE	Mean, ng/mL	27.8 (n=76)	54.9 (n=68)	52.5 (n=60)	50.1 (n=6)
	90% CI	25.3, 30.4	47.1, 62.8	43.7, 61.4	24.4, 75.7

Table 1. Plasma LEN Concentrations During OB Period With LEN 300 mg QW

Conclusions: Mean LEN concentrations and the lower-bound 90% CIs were maintained above IQ4 from the first oral LEN bridging visits until SC LEN was resumed in both studies. These results indicate that LEN 300 mg oral QW provides adequate concentrations to bridge LEN dosing in participants who may miss their Q6M SC injection.

TUPEB08

Suicidal behaviors among Thai adolescents and young adults living with HIV

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Background: Suicide is the fourth leading cause of death in adolescents and young adults worldwide. Suicidality can negatively impact quality of life and HIV treatment outcomes. This study aimed to describe suicidal ideation and behaviors among Thai adolescents and young adults living with HIV (AYA-HIV).

Methods: A cross-sectional study was conducted among Thai AYA-HIV aged 15-24 years who were aware of their HIV status, and attended an HIV clinic in Chiang Mai, Thailand. Participants were interviewed about lifetime and recent suicidal ideation and behaviors by well-trained staff, using a cross-culturally validated Thai version of the Columbia-Suicide Severity Rating Scale (C-SSRS). The C-



SSRS's questions are divided into 4 subscales:

1. Suicidal ideation;
2. Intensity of ideation;
3. Suicidal behaviors;
4. Lethality of suicide attempts.

Results: Of 150 AYA-HIV enrolled, 101 (67%) were male, 90 (60%) had perinatally acquired HIV, 85 (57%) were heterosexual, and the median age was 21 (interquartile range [IQR]: 19-23) years. At enrollment, 66 (45%) had graduated with bachelor degree or higher, and 126 (84%) had monthly incomes <500 USD. All AYA-HIV were on combination antiretroviral treatment (cART), of which 70% of regimens included non-nucleoside reverse transcriptase inhibitor, and the median self-reported adherence to cART was 95% (IQR: 90-100%). The median CD4 count was 547 (IQR: 378-747) cells/mm³; 79% had viral load <50 copies/mL. Overall, 44 (29%) AYA-HIV reported lifetime suicidal ideation, 8 of whom (18%) reported symptoms within the past month.

Additionally, 16 (11%) AYA-HIV reported having suicidal behaviors during their lifetime, 2 (13%) within the previous 3 months. The characteristics of suicidal ideation and behaviors among our Thai AYA-HIV are summarized in Table 1.

Suicidality characteristics*	Lifetime (n=44)	Recent† (n=8)
Subscale 1: Suicidal ideation		
Type of suicidal ideation		
Non-specific active suicidal thoughts	35 (79.5)	8 (100)
Active suicidal ideation without intent to act	23 (52.3)	4 (50.0)
Active suicidal ideation with intent to act	12 (27.3)	1 (12.5)
Active suicidal ideation with specific plan and intent	8 (18.2)	1 (12.5)
Subscale 2: Intensity of suicidal ideation		
Frequency		
Less than once a week	20 (45.5)	4 (50.0)
Once a week	5 (11.4)	2 (25.0)
2-5 times in week	7 (15.9)	0 (0)
Daily or almost daily	10 (22.7)	2 (25.0)
Many times each day	2 (4.5)	0 (0)
Reason for suicidal ideation		
Completely to get attention/revenge/reaction from others	3 (6.8)	0 (0)
Mostly to get attention/revenge/reaction from others	2 (4.5)	1 (12.5)
Equally to get attention/revenge/reaction from others and to end/stop pain	8 (18.2)	1 (12.5)
Mostly to end/stop pain	12 (27.3)	1 (12.5)
Completely to end/stop pain	7 (15.9)	2 (25.0)
Non-specific reasons	12 (27.3)	3 (37.5)
Subscale 3: Suicidal behavior		
Type of suicidal behavior		
Actual suicide attempt	12 (27.3)	2 (25.0)
Interrupted attempt	8 (18.2)	1 (12.5)
Aborted or self-interrupted attempt	9 (20.5)	0 (0)
Preparatory acts or behavior	2 (4.5)	0 (0)
Subscale 4: Intensity of suicidal attempt† (n=12)		
Intensity of suicidal attempt	The most severe	The most recent
No or very minor physical damage	2 (16.7)	2 (16.7)
Minor physical damage	6 (50.0)	6 (50.0)
Moderate physical damage	3 (25.0)	3 (25.0)
Severe physical damage	1 (8.3)	1 (8.3)

*Data were presented as number (percent, %).

†Within 1 month for suicidal ideation, and within 3 months for suicidal behavior.

‡Among participants with actual suicidal attempt (n=12).

Table 1. Characteristics of suicidal ideation and behaviors among Thai adolescents and young adults living with HIV.

Conclusions: Suicidal ideation and behaviors were prevalent in Thai AYA-HIV in our study cohort. Screening for suicidality in primary HIV clinics could help with earlier detection and linkage to appropriate management for this population.

TUPEB09

Detectable viral load among virally suppressed adolescents on multi-month antiretroviral drug refills in four regions of the mainland of Tanzania

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Background: About half of the adolescents in HIV care in Tanzania receive their antiretroviral therapy (ART) through multi-months dispensing (MMD) at three- and six-monthly intervals. While undetectable HIV viral load (HVL) is a pre-requisite for enrolment in MMD, it's unclear whether adolescents on MMD maintain their undetectable viral load status. We assessed detectable HVL among adolescents on MMD and associated factors across four regions of Tanzania.

Methods: We identified adolescents aged 10-19 years with HIV on ART enrolled on MMD in routine healthcare in Dar-es-Salaam, Kagera, Geita and Tabora regions of Tanzania. These adolescents were followed up via their routine three/six monthly clinical visits per their MMD schedules until 30th September 2022. Our primary outcome was detectable plasma HVL (≥50 copies/mL) at their one-year HVL follow-up test since MMD enrolment.

We used Poisson estimation of the binomial regression with robust error variance, controlling for age, sex, and other clinical characteristics to investigate risk factors of detectable HVL reporting adjusted risk ratio (aRR) and 95% CI.

Results: We identified 3,439 adolescents newly enrolled on three (2,828, 82.2%) and six (611, 17.8%) monthly MMD between April and June 2021 across 395 health facilities. Among these adolescents, 1,744 (50.7%) were aged 10-14 years and 1,872 (54.4%) were females. At baseline, 1,972/3,018 with data (65.3%) were classified as WHO clinical stage 3 or 4, 215 (6.3%) were on second-line ART, and 3,340 (97.1%) had been on ART for at least a year.

At the one-year viral load follow-up test, 434 (12.6%) adolescents were found to have detectable HVL. The risk of having detectable HVL did not vary by age (p=0.31), sex (p=0.32), WHO stage (p=0.24), or ART duration (p=0.07). However, those on second-line ART regimen were twice as likely to have detectable HVL compared to those on first-line regimen (aRR 2.43, 95%CI 1.94-3.04).



Conclusions: Detectable HVL remains a clinical concern among adolescents with HIV on MMD, which may suggest sub-optimal ART adherence or drug resistance mutations. There is need to remain vigilant in monitoring the risk of detectable HVL and strengthen adherence support to prevent subsequent virologic failure and drug resistant mutations.

TUPEB10

Barriers to ART adherence in neonates and infants from the LIFE study in Mozambique

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Background: In 2021, only 65% of Mozambican children on antiretroviral therapy (ART) were virologically suppressed. Poor adherence is the principal driver of ART failure, and a deeper understanding of underlying causes is needed for improved treatment support, particularly for infants who have even lower suppression rates. Data from intensified adherence support visits for HIV-positive neonates and infants enrolled in the LIFE study in Mozambique were analyzed to address this knowledge gap.

Methods: Infants with positive point-of-care virologic tests at birth or post-natal visits initiated ART and were followed up to 18 months of age, with routine viral load monitoring. Information from adherence interventions was extracted from narrative reports and merged with clinical data.

Results: A total of 117 recruited infants tested HIV-positive. DTG-based ART was initiated in 2 (1.7%) infants and 39 (33.3%) transitioned from LPVr to DTG-based ART. At 6, 12, and 18-month study visits, 70.3%, 72.7%, and 63.6% of caregivers reported no ART interruptions in the past week. Virologic suppression rates for the same study visits were 31.1%, 47.0%, and 50.9%. Qualitative adherence data was available for 62.4% (73/117) of participants.

The percentage of infants with reported barriers by category were:

1. Paternal-related, 72.6% (53/73);
2. Maternal-related, 60.3% (44/73);
3. Socioeconomic, 42.5% (31/73);
4. Medication-related, 32.9% (24/73); and
5. Provider-related, 5.5% (4/73).

Non-disclosure to the father was a noted adherence barrier for 28.8% (21/73). Excluding infants with missing data, 33.7% (28/83) of mothers had not disclosed their serostatus to the father by the first adherence intervention, and 75.0% (21/28) of them lived with the father.

Fear of abandonment was the most common reason for non-disclosure to fathers, reported for 67.9% (19/28) of mothers.

Conclusions: Medication-related adherence barriers were common, and most children received LPVr-based ART. It was not possible to quantify in this analysis, but the recent introduction of dispersible DTG tablets, allowing for once-daily dosing, has the potential to improve the unacceptably low virologic suppression rates observed.

However, the impact of optimized pediatric ART will be minimized without intensified and proactive efforts to identify and address family-specific barriers that adversely impact adherence, with particular attention to paternal factors and serostatus disclosure.

TUPEB11

Cause of death among infants by HIV status in Zambia, 2020-2021

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Background: Although mortality is higher among HIV positive infants compared to those without HIV, optimized pediatric antiretroviral treatment (ART) has improved survival.

We explored the causes of death (COD) and survival-time by HIV status among deceased infants in Zambia from 2020-2021.

Methods: We analyzed the Zambian Ministry of Health mortality surveillance data from 2020-2021. Verbal autopsies (VA) are conducted on persons who die in the community or within 48 hours of arrival at health facilities in 27 districts representing ~50% of Zambia's population. Trained officers collect past medical history and circumstances proximal to death from close relatives/associates using a standardized World Health Organization questionnaire.

Responses are analyzed by a validated algorithm that assigns probable CODs. We analyzed CODs and survival-time by HIV status among infants (<1 year old) using R.

Results: VAs were conducted for 2,446 infants from 2020-2021. Sixty-six (2.7%) infants were HIV positive (with 50% on ART), 1,372 (56.1%) were HIV negative and 1,008 (41.2%) had unknown HIV status. Among HIV positive and negative infants, the probable CODs were mainly indeterminate or infectious.

Birth asphyxia, prematurity and neonatal sepsis were the leading probable CODs among infants with unknown HIV status, who died younger than those with known HIV sta-



tus (median days: 2 vs. 136; $p < 0.01$). Survival-time did not differ for HIV positive compared to HIV negative infants (median days: 136.5 vs 136; $p = 0.45$). Among HIV positive infants, survival-time did not differ by ART status ($p = 0.74$).

Rank	HIV Positive (n = 68) cause (%)	HIV status HIV Negative (n = 1572) cause (%)	Unknown HIV status (n = 3000) cause (%)
1	Indeterminate (27.9)	Indeterminate (25.9)	Birth Asphyxia (31.5)
2	Meningitis and Encephalitis (19.2)	Diarrheal diseases (29.8)	Prematurity (28.1)
3	Unspecified infectious diseases (12.1)	Unspecified infectious diseases (12.3)	Neonatal sepsis (11.3)
4	Diarrheal diseases (12.1)	Meningitis and Encephalitis (14.2)	Neonatal Pneumonia (9.2)
5	Cardiac disease (8.1)	Cardiac disease (14.4)	Fresh stillbirth (6.9)

*Cause of death determined by verbal autopsy

Table 1. Top five causes of death among infants by HIV status in Zambia, 2020-2021.

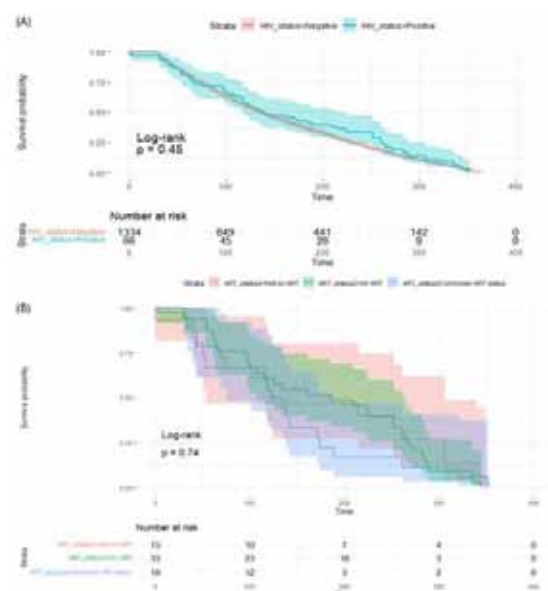


Figure 1. Survival time of infants from birth (A) HIV positive and HIV negative (B) HIV positive by ART status.

Conclusions: The lack of difference in survival-time among deceased infants by HIV status could be because other infectious diseases highly affect this age group. Infants with unknown HIV status died younger from complications of pregnancy and delivery. Improved neonatal care, diagnostics for the indeterminate COD and management of infectious diseases can improve infant outcomes. Prompt ART initiation can also improve survival of HIV positive infants.

TUPEB12

Increased dolutegravir coverage is associated with increase in viral load coverage and suppression among children living with HIV in Togo

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Background: Though a UNAIDS 2021 report shows that, between 2010 and 2020, Togo halved AIDS-related deaths in children ages 0-14, available data show low dolutegravir coverage (DTG-C) and viral load suppression (VLS) among children living with HIV (CLHIV). This analysis presents data and solutions to improve DTG-C, viral load

coverage (VLC), and VLS among CLHIV at selected public health facilities. The work was supported by the PEPFAR- and USAID-funded EAWA project, which is implemented by FHI 360.

Description: Routinely collected data were analyzed for CLHIV ages 14 and younger from October 2019 through September 2022. We assessed the proportion of CLHIV on antiretroviral therapy (ART) who received a dolutegravir-based regimen; VLC, calculated as CLHIV with a documented viral load test result (VLTR) among those on ART; VLS, calculated as CLHIV with a documented VLTR below 1,000 copies among those with a VLTR. Between October 2019 and September 2020, only half were on a dolutegravir-based regimen, less than half had a documented VLTR, and 64% reached VLS. A team was tasked with implementing solutions based on roots cause analysis: Eligible CLHIV were line listed and contacted for starting/transitioning to dolutegravir and collecting viral load samples; ART adherence support was provided; monthly dolutegravir stock monitoring was conducted; pending test results were tracked through a laboratory focal person; VLTR were documented; and CLHIV were informed within one week from test result. Granular data were used to prioritize technical assistance to sites with lowest DTG-C, VLC, and VLS.

Lessons learned: From October 2019–September 2020, October 2020–September 2021, and October 2021–September 2022, an increase was observed in the following indicators among CLHIV: DTG-C from 52% to 64% to 71%, respectively; VLC from 48% to 85% to 90%, respectively; and VLS from 64% to 70% to 82%, respectively. A positive trend in indicators was observed when disaggregated by age (Table 1).

	Oct 2019 - Sep 2020				Oct 2020 - Sep 2021				Oct 2021 - Sep 2022			
	0-4	5-9	10-14	total 0-14	0-4	5-9	10-14	total 0-14	0-4	5-9	10-14	total 0-14
Current on ART	406	600	717	1,723	428	693	807	1,928	510	841	1,046	2,397
Dolutegravir-based regimen	30%	91%	33%	52%	47%	99%	43%	64%	68%	97%	46%	71%
Documented VLTR	115 (32%)	248 (40%)	432 (62%)	795 (48%)	272 (80%)	507 (87%)	620 (85%)	1,399 (85%)	372 (95%)	676 (87%)	834 (90%)	1,882 (90%)
Virally suppressed	75 (65%)	156 (63%)	276 (64%)	507 (64%)	177 (65%)	353 (70%)	444 (72%)	974 (70%)	294 (79%)	542 (80%)	701 (84%)	1,537 (82%)

Table 1. Dolutegravir, viral load coverage, and viral load suppression by age band, by year, Togo

Conclusions/Next steps: Solutions that address root causes and granular data use were successful in increasing DTG-C, which resulted in increased VLC and VLS among CLHIV. Such approaches should be scaled up and become national standard of care.

TUPEB13

Use of second-generation INSTIs in the treatment of children and adolescents in Mexico. A real-life national experience

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Background: Antiretroviral therapy (ART) among children and adolescents living with HIV (C/ALHIV) frequently includes drugs considered obsolete among adults. Since 2019, Mexico implemented a national optimization program, based on the use of second-generation integrase inhibitors (INSTIs) –mainly co-formulated BIC/TAF/FTC– as preferred regimens for ART initiation and switch. We aimed to evaluate this rollout program among children and adolescents.

Methods: Data were obtained from SALVAR (National System for Antiretroviral Surveillance and Administration). We included information of C/ALHIV between 8 to 17 years, who started on ART or switched to BIC/TAF/FTC, from June 2019 to June 2021. We categorized them as "started BIC/TAF/FTC" (G1), "switched to BIC/TAF/FTC" (G2), or "started other than BIC/TAF/FTC" (G3). We calculated the proportion of C/ALHIV with viral suppression (VS) (<40 copies/ml) after six months of ART initiation or switch and durability of the regimen, defined as maintaining VS on the same ART versus other outcomes.

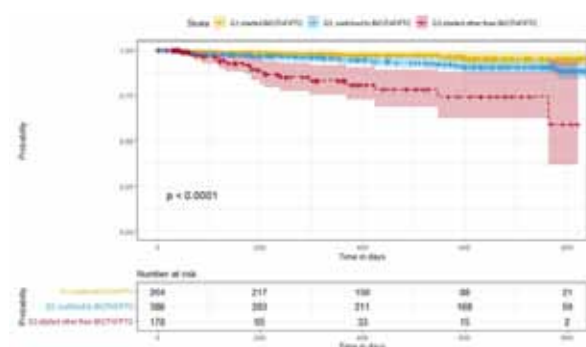


Figure 1. Probability of keeping the same ART regimen.

Results: A total of 828 C/ALHIV were included; the median follow-up was 447 days (IQR 182-702); 264 (32%) were classified as G1, 386 (47%) as G2, and 178 (21%) as G3. The median age was 17 (IQR: 16 -18), 15 (IQR: 12-17), and 16 (IQR: 14 -17) years (p-value<0.01); and 23%, 48% and 67% of participants were cisgender women for G1, G2, G3 (p-value<0.01). The last regimen used before ART switch in G2 was mainly based on protease inhibitors (PIs) in 64%, followed by NNRTIs in 20%. Within G3, 49% were started on NNRTIs, other

INSTIs in 37%, and PIs in 11%. After six months of initiation or switch, VS was present in 86%, 96% and 86% of G1, G2 and G3. The durability of ART regimen in each group is shown in Figure 1.

Conclusions: In this real-life experience analysis, second-generation INSTIs showed highly effective and long-lasting performance in Mexican children and adolescents.

TUPEB14

Recommendations for missed oral lenacapavir loading doses using population-pharmacokinetics-based simulations

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Background: Lenacapavir (LEN) is currently approved for the treatment of multidrug-resistant HIV-1 in combination with other antiretrovirals for heavily treatment-experienced (HTE) individuals. In the ongoing pivotal Phase 2/3 study (CAPELLA), participants received oral LEN loading (600 mg on Days 1 and 2; 300 mg on Day 8) followed by 927 mg SC Q6M starting from Day 15 (Phase 2/3 regimen). Current data indicate that a mean trough LEN concentration of 15.5 ng/mL (inhibitory quotient-4 [IQ4]) is associated with high antiviral activity. Given the importance of oral loading doses in achieving and maintaining concentrations >IQ4, it is imperative to consider options to manage missed oral loading doses. We used a population-pharmacokinetic (PopPK) model to simulate various dosing scenarios to guide missed oral loading-dose recommendations for the HTE population.

Methods: A previously developed 2-compartment PopPK model with 1st-order absorption and linear elimination was used to simulate plasma concentrations following missed oral LEN doses to provide recommendations for different scenarios of missed doses, and identify alternative dosing options.

Results: Recommendations for missed oral loading dose scenarios in Phase 2/3 regimen are shown (Table 1). In all scenarios, the recommended alternative dosing option maintained LEN concentrations >IQ4. Figure 1 shows a scenario in which the Day 2 oral dose is missed by ≥6 days, with alternative dosing options on Days 8 and 15.

Loading Dose Day	Missed Dose Scenario	Recommendation
Day 2	Day 2 oral dose missed by <6 days	Participant should take 600 mg PO dose as soon as possible
	Day 2 oral dose missed by ≥6 days	Participant should take 600 mg instead of 300 mg on Day 8 and 300 mg on Day 15 (along with SC injection)
Day 8	Day 8 oral dose missed by <6 days	Participant should take 300 mg PO dose as soon as possible
	Day 8 oral dose missed by ≥6 days	Participant should take 300 mg on Day 15 (along with SC injection)

Table 1. Summary of Missed Dose Recommendations for Oral LEN Loading in Phase 2/3 Dosing Regimen.



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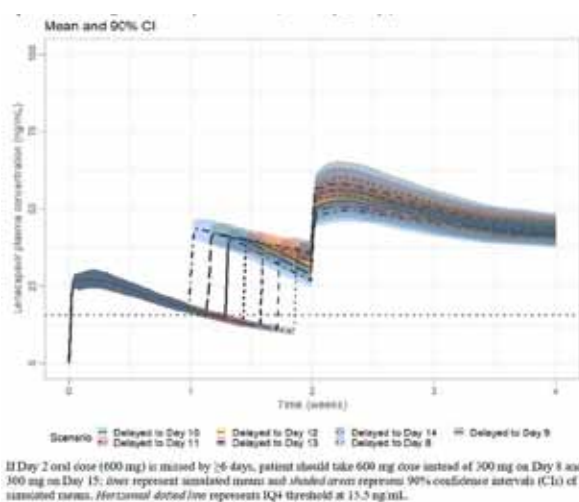


Figure 1. Simulated mean (90% CI) plasma LEN concentration with different alternative dosing options, following a missed day 2 oral dose (missed by ≥ 6 days).

Conclusions: PopPK modeling was used to provide dosing recommendations for missed oral loading doses of LEN. The dosing window for oral LEN loading is wide and forgiving, while maintaining therapeutic concentrations.

TUPEB15

Ruxolitinib-mediated HIV-1 reservoir decay in A5336 phase 2a trial

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Background: Ruxolitinib is FDA approved for myelofibrosis, polycythemia vera, atopic dermatitis and chronic graft-versus-host disease. We evaluated the impact of ruxolitinib on the peripheral HIV-1 reservoir and key immunomodulatory events driving HIV-1 persistence in people with HIV-1 (PWH) in an AIDS Clinical Trial (ACTG) sponsored open-label randomized Phase 2a multi-site trial (n=60).

Methods: Inclusion criteria: ≥ 18 age ≤ 75 , background ART regimen (NNRTI or INSTI without cobicistat for ≥ 2 years), continuously virologically suppressed, CD4⁺ T-cell count >350 cells/mm³; no significant medical condition besides HIV or hypertension. Participants were randomized to

ruxolitinib 10 mg bid plus ART (n=40) or ART alone (n=20) from week 0 through 5. Both groups were observed through week 12. Cellular markers (flow-cytometry), soluble cytokine (Mesoscale), intDNA and IPDA were measured on peripheral blood from weeks 0, 5, and 12. Sequential series of Mann-Whitney U tests were performed to understand how biomarker changes across weeks impact reservoir decay.

We evaluated:

1. Biomarkers within the ruxolitinib-treated group which were significantly ($p < 0.05$) different between weeks 5 and 12,
2. Which markers determined in test 1 were significantly ($p < 0.05$) different *versus* control group, and;
3. Which of these were trending towards significance ($p < 0.1$) between participants with high reservoir decay and those with no decay.

Significance was further confirmed through Benjamini-Hochberg testing to minimize the false discovery rate.

Results: IntDNA and IPDA reservoir measurements were highly correlated to one another ($r^2 0.86$). HIV-1 reservoir significantly decayed in the ruxolitinib group by week 12 *versus* control.

Decay correlates included decrease in activation and expansion markers (week 5), leading to reservoir decay by week 12 (CD127⁺/CD4⁺ T_N and CD127⁺/CD8⁺ T_{TD}, CD39⁺/CD4⁺ T_{EM}, and CD69⁺ in B cells). Reservoir decay by week 5 associated with change at week 5 (IL10), and change at week 12 (BCL2⁺/CD8⁺ T_{CM}).

Conclusions: Ruxolitinib decays the HIV-1 reservoir and re-sets immune balance in PWH on ART. Based on reservoir decay during treatment (week 0 to 5), our model predicts a 99.99% decay in 2.5 years, should rates of decay remain constant. These data are foundational for further human trials with Jak 1/2 inhibitors such as ruxolitinib towards HIV-1 elimination.



TUPEB16

Transformation of 3 current short-acting HIV drugs, tenofovir, lamivudine and dolutegravir (TLD) into a novel, all-in-one long-acting TLD 3-drug-combination in a single injectable dosage that produces extended pharmacokinetics

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Background: Introduction of long-acting Cabenuva, containing two HIV drugs, cabotegravir and rilpivirine, in two-intramuscular injections for HIV treatment is a significant step toward addressing adherence and pill fatigue. However, clinical and programmatic issues limit *Cabenuva* uptake worldwide. WHO has an on-going initiative to distribute a short-acting oral product called TLD (tenofovir, lamivudine & dolutegravir). Advantages to dolutegravir in TLD include its higher barrier to resistance than cabotegravir, but oral TLD requires daily dosing. Thus, the goal of this study is to develop a Next-Gen long-acting TLD 3-drug combination treatment in a single subcutaneous injection.

Methods: Previously, we reported on biocompatible lipid-exipients and a process to stabilize multiple HIV drugs with disparate physical-chemical (including water solubility) properties. This technology enables transformation of current HIV drugs (including water-insoluble lopinavir, ritonavir, efavirenz, atazanavir and water soluble tenofovir, lamivudine) into drug-combination nano-particulate (DcNP) products that are stable in suspension. Employing the DcNP process, lipid excipients composed of distearoyl-phosphatidyl-choline (DSPC) and distearoyl-phosphatidyl-ethanolamine derivatized with polyethylene-glycol (MW=2000) or mPEG₂₀₀₀-DSPE were systematically tested to produce a stable, sterile TLD suspension for non-human-primate (NHP) studies. *M. nemestrina* (~5-8 kg, n=8) were given a single subcutaneous injection of TLD in DcNP (6.2/5/10 mg/kg) and a plasma time-course was determined.

Results: TLD-DcNP product was prepared by:

1. Dissolving TLD with lipid-exipients in hydrated-alcohol, followed by controlled solvent-removal process to produce TLD-DcNP powder;
2. The particle-size of TLD-DcNP in saline suspension was reduced (d~60-80 nm) resulting in a stable- injectable TLD product, suitable for subcutaneous dosing.

Compared to the free-and-soluble form for which TLD concentrations fell below detectable levels within a few hours as previously reported, the DcNP formulation demonstrated a long-acting plasma time-course for all

3-drugs when given as a single subcutaneous dose. While NHP plasma TLD levels for DcNP dosage-forms were different for each drug substance, at the dose tested, all 3 drugs sustained concentrations above EC₅₀ > 4 weeks. These data were reproducible in making TLD-DcNP product and in NHP pharmacokinetic profile.

Conclusions: We have successfully developed a process that transforms short-acting to long-acting TLD into an all-in-one subcutaneous injection product for consideration of clinical development.

Supported by UNITAID GLAD and NIH

TUPEB17

A biodegradable, subcutaneous implant delivery platform to treat HIV for up to 6 months in young children

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Background: Long-acting HIV treatment could improve pediatric outcomes through simplified dosing. ARV-eluting implants offer advantages over monthly injections including retrievability and extended duration. Here, we apply a pharmacokinetic/pharmacodynamic (PK/PD) modeling approach to support development of a reservoir-style, biodegradable, ARV-delivery implant system for young children.

Methods: Plasma PK of islatravir (ISL), emtricitabine (FTC) and bictegravir (BIC) was characterized over 30 hours following IV dosing in rabbits (5, 30, and 0.75 mg/kg, respectively) and used to fit a PK model for estimating each drug's unit impulse response (UIR). This UIR was used to deconvolve subcutaneous (SQ) absorption from plasma PK measured over 1 year in 8 rabbits with SQ ISL-, FTC-, and BIC-eluting implants. An HIV-IIIB challenge model with TZM-bl reporter cells was used to characterize the concentration-response relationship for ARV (alone or combined) with a 43.6-fold protein-binding adjustment for BIC. The inhibitory form of the Hill equation and competitive-inhibition interaction models were fit to estimate PD parameters. Continuous-infusion PK models with literature reference values were used to predict plasma concentrations from deconvolved absorption (as µg/day dose) for 2-year-olds at 50th percentile of weight. The PD model was applied to predict percent maximal inhibition from the combination of these concentrations.

Results: Two-compartment, macro-parameter models with log-additive error fit the IV PK. All ARVs were quantifiable for >1 year in rabbit plasma. Model estimates and



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predictions in Tables 1 and 2, respectively are mean (%CV) for PK estimates or mean \pm 95% confidence-interval for PD estimates and SQ dose. ISL, FTC and BIC were synergistic with interaction parameter estimates (ψ) <1 and are predicted to exceed 50% maximal inhibition (IC_{50}) for >6 months of implantation in 2-year-old children.

ARV	A (ng/ml)	alpha (hr ⁻¹)	B (ng/ml)	beta (hr ⁻¹)	I _{max}	Hill-slope	IC ₅₀ (ng/ml)	psi
ISL	5544 (11)	0.50 (4)	13.9 (3)	0.10 (4)	1.01±0.08	0.96±0.39	0.49±0.25	0.66±0.30
FTC	29200 (8)	0.76 (11)	779 (26)	0.13 (11)	0.98±0.05	3.03±1.94	105±11	0.77±0.13
BIC	1218 (31)	0.64 (26)	168 (71)	0.18 (17)	0.97±0.07	1.07±0.46	1.96±0.89	0.63±0.16

Table 1.

Month	BIC Daily SQ Dose ($\mu\text{g/day}$)	ISL Daily SQ Dose ($\mu\text{g/day}$)	FTC Daily SQ Dose ($\mu\text{g/day}$)	% Maximal Inhibition
1	191 \pm 32	251 \pm 53	491 \pm 78	92
3	121 \pm 22	71 \pm 14	230 \pm 56	84
6	111 \pm 21	37 \pm 9.2	120 \pm 39	71
12	83 \pm 23	6 \pm 3.9	32 \pm 14	44

Table 2.

Conclusions: We believe this is the first report of an HIV-treatment implant system designed to sustain safe and effective doses for young children and predict >6-months of ARV-delivery within a potentially effective range warranting continued development.

TUPEB18

Resistance to second generation integrase inhibitors after two years of a national rollout strategy in Mexico

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Background: Until 2018, first line ART in Mexico was mainly based on efavirenz containing regimens; despite reports of pre-treatment HIV drug resistance (HIVDR) levels to non-nucleoside reverse transcriptase inhibitors (NNRTIs) reaching 10% or more. Since June 2019, a national strategy using BIC/TAF/FTC as the preferred single tablet regimen for ART initiation and switch was implemented. We evaluated patterns of resistance among individuals who initiated or switched to BIC/TAF/FTC.

Methods: National System for Antiretroviral Surveillance and Administration database was used for the analysis. We searched for archived plasma samples of adults who started or switched to BIC/TAF/FTC, from June 1st 2019 to June 30th 2021; and had viral loads over 1,000 copies/ml at least six months after BIC/TAF/FTC initiation. Protease,

reverse transcriptase and integrase were sequenced using standard next generation sequencing methods (Illumina). Reads were aligned and consensus sequences obtained with HyDRA. HIVDR was estimated using the Stanford HIVdb tool (V9.4), using both 5% (assessing low-frequency variants) and 20% (Sanger-like) consensus sequences. HIVDR was defined as a Stanford score of ≥ 315 to the drug of interest.

Results: We included 666 sequences: 208 from ART initiators and 458 from persons who switched from other regimens. Using 20% consensus sequences, resistance to any INSTI was observed in 4 (1.9%) and 5 (1.1%) initiation and switch samples, respectively (Figure 1).

INSTI resistance increased to 2.9% and 3.1% in initiators and switching, respectively, when using 5% consensus sequences. At 20% threshold, 4 INSTI Surveillance Drug Resistance Mutations (SDRM) were observed among initiators: E138AKT (0.5%), Y143CHRS(0.5%), S230R (0.2%), and R263 (0.5%). Among persons switching, 2 SDRM were observed: E138AK T (0.2%), R263K (0.2%).

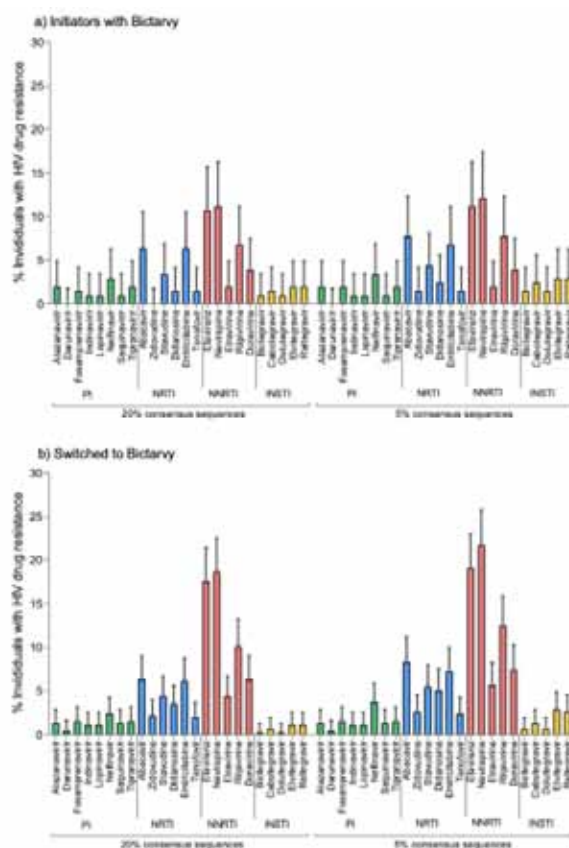


Figure 1. HIV drug resistance by drug.

Conclusions: After two years of a national rollout strategy using second-generation INSTIs in Mexico, resistance mutations to these drugs are found in a very small proportion of subjects. Nevertheless, continuous HIVDR surveillance is warranted in the country.


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TUPEB19

Doravirine Resistance Patterns Identified through week 192 in the DRIVE-FORWARD and DRIVE-AHEAD Phase 3 clinical trials

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Background: Doravirine (DOR) is a novel non-nucleoside reverse transcriptase (RT) inhibitor (NNRTI) approved for the treatment of HIV-1. DOR was rationally designed to address limitations associated with other NNRTIs, particularly resistance from HIV-1 variants bearing common NNRTI resistance-associated substitutions in RT such as K103N, Y181C, or G190A.

Methods: Resistance to DOR was assessed through Week 192 of two phase 3 clinical trials, DRIVE-FORWARD (MK-1439-018) and DRIVE-AHEAD (MK-1439A-021), in participants randomized to DOR (100mg) for the 96-week double-blind studies followed by 96-week open-label study extensions, and in participants who switched from the comparator (darunavir/r or efavirenz) to DOR in the extensions.

Resistance testing was performed by Monogram Biosciences in participants who met criteria for protocol-defined virologic failure (PDVF; non-response or rebound) or discontinued (d/c) early with HIV-1 RNA >400 copies/mL.

suppressed after PDVF. Resistance testing was performed in 51 participants (34 PDVF, 17 d/c); DOR-associated mutations were detected in 12 and phenotypic resistance in 10, mainly before Week 96 (Table).

The most common RT substitutions were V106A/I/M and F227C. In the study extensions, 502 participants switched from comparator to DOR; 26 (5.2%) had PDVF (including 9 with HIV-1 RNA ≥50 and <200 copies/mL), and 12 of 26 re-suppressed after PDVF. Resistance testing was performed in 9 switch participants (6 PDVF, 3 d/c); DOR-associated mutations were detected in 4 and phenotypic resistance in 3 (Table). Common NNRTI substitutions including K103N, Y181C and G190A were not detected.

Conclusions: In DRIVE-FORWARD and DRIVE-AHEAD, the development of DOR resistance-associated substitutions in RT was uncommon (16/1249; 1.3%) and occurred mainly during the first year of treatment. Overall, the DOR RT substitutions observed were distinct from those of other NNRTIs.

TUPEB20

HIV viral suppression and drug resistance patterns among adults and children in the era of dolutegravir use: Findings from the national representative cross-sectional survey in Tanzania

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Participants with Protocol-defined Virologic Failure (PDVF) *							
Subject, Study	PDVF type	Week of PDVF	HIV sub-type	VL at Baseline	VL at PDVF	DOR Treatment-emergent RAM†	RTI Treatment-emergent RAM
1, DA	Non-response	24	B	364349	13380	V106I, H221Y/F, F227C	M184V (S)
2, DA	Non-response	24	B	130969	34944	A88A, V106V/I, H221Y/F, F227C	M184V (R)
3, DA	Non-response	24	B	71777	14791	V106V/I, F227C, A88A/G, F227Y/C	V75V/I, M184V (R)
4, DA	Non-response	24	B	202090	106092	A88A/G, V106A, P225H, V106V/A, P225P/H, Y118V/I	K65R (R)
5, DA	Non-response	24	C	148905	32799	V106M, V108V/I, F227Y/C, V106M/I, F227C/R	K65A/R, M184V (R)
6, DA	Non-response	36	C	20664	7498	Y118Y/F	A62V (S)
7, DA	Rebound	48	AE	27034	1256	V188I	M41I, M184V (R)
8, DF	Rebound	60	B	120765	1591	V106A, P225H	V118I, M184I (R)
9, DF	Rebound	116	B	90989	401	A88A, V106V/I	None (S)
10, DF (switch)	Rebound	116	A1	96420	418	V108V/I	A62A/V, M184M/V (S)
11, DA (switch)	Rebound	116	B	94058	476	V106A, F227Y/L	None (S)
12, DA (switch)	Rebound	152	B	94050	576	V106A, Y118Y/F	M184I (R)
13, DF	Rebound	152	B	27030	1192	V106V/M, Y118P	None (S)
Participants with Early Discontinuation (d/c) without PDVF							
Subject, Study	Reason for d/c	Week of d/c	HIV sub-type	VL at Baseline	VL at d/c	DOR Treatment-emergent RAM	RTI Treatment-emergent RAM
14, DF	Adverse event	2	B	4636	430	None	None (S)
15, DA	Physician decision	4	F1	28432	472	V106I	None (S)
16, DF	Non-compliant	24	B	388431	55708	V106I, H221Y, F227C	M184V (R)
17, DA (switch)	Subject withdrew	116	B	268234	1575	V106V/A, F227Y/C/L/R	None (S)

Table. Genotypic and phenotypic resistance detected in participants with PDVF (n=109) or early discontinuation (n=271) through week 192 in DRIVE-FORWARD & DRIVE-AHEAD (N=1249)

Results: 747 ART-naïve participants received DOR in DRIVE-FORWARD and DRIVE-AHEAD; 83 (11.1%) had PDVF (including 29 with HIV-1 RNA ≥50 and <200 copies/mL), and 33 of 83 re-

Background: Tanzania and other resource-limited settings in sub-Saharan Africa have reported progress in scaling up ART usage. However, treatment success



among people living with HIV (PLHIV) has not been fully appreciated. In March 2019, Tanzania introduced a WHO-recommended dolutegravir-based combination therapy to its ART program.

Therefore, we investigated HIV viral suppression rates, associated factors, and the burden of HIV drug resistance (HIVDR) among PLHIV a year after the introduction of dolutegravir in Tanzania.

Methods: We conducted a national representative cross-sectional survey from September to December 2020. Adults and children PLHIV from 36 HIV care and treatment centres in Tanzania were recruited. Blood samples, demographic and clinical information were obtained. HIV viral load (HVL) was estimated using the COBAS 8800 TaqMan (Roche Molecular system). Viral suppression was defined at HVL<1000 copies/mL.

Independent factors associated with viral suppression were identified using regression analyses ($p<0.05$). HIVDR genotyping was performed from samples with HVL \geq 1000 copies/mL. HIV genes (reverse transcriptase, protease, and integrase) were amplified by PCR and directly sequenced. The Stanford HIVDR database was used for HIVDR analysis.

Results: A total of 2039 PLHIV were recruited, with 57.5% being adults and 64.7% of them were females; whereas children contributed 42.5% and 53.5% were females. The viral suppression rates were 96.1% and 89.1%, in adults and children, respectively.

Hereby, adults and children on the dolutegravir-based regimen recorded the highest viral suppression rates of 96.4 % and 91.3%, respectively; while the lowest suppression rates were observed in PLHIV on protease inhibitor-based regimen at 78.8% and 85.4%, respectively. In addition, factors including marital status, initial HVL, the current ART regimen, and treatment adherence were independently associated with viral un-suppression status ($p<0.05$).

Furthermore, HIVDR was detected in 71.5% of PLHIV with high viremia (HVL \geq 1000 copies/mL). Importantly, 5.8 % of participants had dolutegravir drug resistance mutations, including the major drug resistance mutations; Q148K, E138K, G118R, G140A, T66A, and R263K.

Conclusions: The present findings indicate that dolutegravir-based regimens show promise for treating HIV in Tanzania. However, there are still barriers to optimal treatment outcomes, such as the emergence of dolutegravir HIVDR and adherence among PLHIV in Tanzania.

TUPEB21

CMV-Specific IgG changes during severe COVID-19 suggestive of acute reactivation

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Background: During acute SARS-CoV-2, CMV is associated with an increased risk of hospitalization, and in non-human primates, reactivates to a greater degree in tissues than in blood. We hypothesized that CMV reactivation during severe COVID-19 might disrupt the steady-state of CMV-specific IgG production and clearance via antigen-antibody complexes, leading to dynamic CMV-specific IgG changes.

Methods: Serum from participants with PCR-confirmed COVID-19 were sampled from a hospitalized cohort with severe acute COVID-19 (COMET/IMPACC), a non-hospitalized cohort with acute mild COVID-19 (CHIRP), and a convalescent cohort of participants who had recovered from COVID-19 at least 30 days earlier (LIINC), and assessed CMV-specific IgG index using a commercial assay. Changes in those with acute COVID-19 were assessed up to 28 days later.

Results: Hospitalized participants (n=442) tended to have a higher median age than the 11 non-hospitalized acute COVID-19 participants (58 vs. 47) and the 327 LIINC participants who previously recovered from COVID-19 (44).

While the majority of hospitalized participants were CMV-seropositive or indeterminate, a much larger proportion had low (0.4-0.9) or indeterminate (0.9-1.1) CMV IgG index values than in the convalescent cohort (34% vs 21%, $P<0.001$, Panel A).

Among those with "negative" or "indeterminate" CMV IgG indices at hospital admission, CMV-specific IgG titers increased significantly over a median of just 14 days ($P<0.0001$), with many rising into the "positive" range. No change in CMV IgG index was observed in the non-hospitalized participants with acute COVID-19 over 28 days ($P=0.65$).

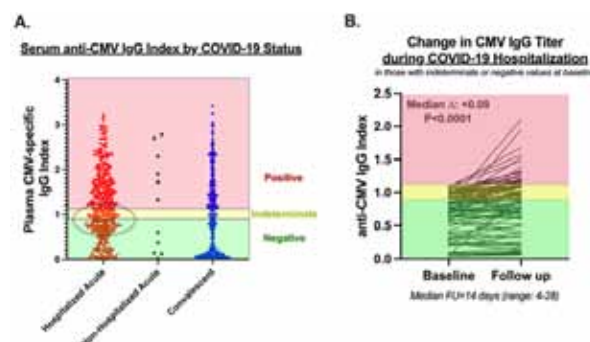


Figure.



Conclusions: Hospitalized people with acute COVID-19, while more likely CMV-seropositive, have lower serum CMV-specific IgG levels than non-hospitalized and recovered people with COVID-19, which subsequently rise during hospitalization. These findings support the hypothesis that severe acute COVID-19 induces tissue CMV re-activation, transiently clearing CMV-specific antibodies from circulation via antigen-antibody complexes before increasing B cell production.

Track C: Epidemiology and prevention science

MOPEC01

Race, place, and substance use continue to impact HIV incidence among Sexual Minority Men: active surveillance of HIV seroconversion from the UNITE Longitudinal Cohort study

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Background: Sexual Minority Men (SMM) continue to be disproportionately impacted by the U.S. HIV epidemic. We calculated the HIV incidence rate and incidence rate ratios on a large, population-based cohort of SMM in the U.S. to identify factors associated with HIV seroconversion.

Methods: UNITE is a prospective cohort study aimed at identifying biopsychosocial factors associated with HIV seroconversion among SMM. There were 7,956 participants enrolled into the cohort, recruited using geospatial, social networking apps. Enrollment occurred between November 2017 and September 2018. Individuals were eligible if they were at least 16 years of age, identified as male at enrollment, reported HIV-negative or unknown status, and were willing to conduct at-home HIV and STI testing. We conducted Poisson regression models with robust variance to identify factors associated with seroconversion, adjusting for baseline age, race, substance use, adverse childhood experiences (ACE), PrEP use at baseline, self-perceived PrEP indication, any health insurance, and condom use frequency.

Results: There were 121 seroconversions after 24 months of follow-up. 6,304 participants completed the 12-month follow-up, while 4,957 completed the 24-month follow-up with individuals contributing between 0-2 years of follow up time. Accounting for varying person-time, the incidence rate was 10.3 cases/1000 PY. Black race [compared to White (aIRR: 2.89, 95%CI: 1.84, 4.57), Asian (aIRR: 2.89, 95% CI: 1.04, 8.13), or Multiracial race (aIRR: 2.31, 95% CI: 1.20, 4.44)], not knowing if you had health insurance (aIRR: 4.19 95% CI: 1.83, 9.60), any drug use within 3 months of study enrollment (aIRR: 2.33, 95% CI: 1.44, 3.76), living in the Southern U.S. (aIRR: 2.26, 95% CI: 1.18, 4.31), and a higher frequency of no condom use at baseline (aIRR: 1.004, 95% CI: 1.002, 1.007) were all positively associated with HIV seroconversion. Older age (aIRR: 0.975, 95% CI: 0.96, 0.996) and reporting uncertainty about self identifying as having PrEP indication (aIRR: 0.57, 95% CI: 0.34, 0.98) were associated with lower HIV incidence.

Conclusions: These findings on a large sample of SMM highlight that Black SMM, those living in the Southern U.S., and those using illegal substances remain vulnerable to higher rates of HIV seroconversion, requiring socially and politically driven interventions.



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MOPEC02

Demographic and clinical characteristics of mpox among people living with HIV/AIDS (PLWHA) during the 2022 outbreak in Brazil: an observational study

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Background: The new mpox outbreak extending world-wide is mostly affecting gays and other men who have sex with men, and people living with HIV/AIDS (PLWHA). There are limited data on mpox and PLWHA. This study aims to describe and compare the demographic and clinical characteristics of mpox cases according to HIV/AIDS status in Brazil.

Methods: We conducted a cross-sectional study using data obtained from the mpox and HIV/AIDS MoH national databases in Brazil. We included confirmed and probable mpox cases aged 15 and over reported to the MoH systems between June 7th and December 31st, 2022, according to the case definition adopted in the country. Descriptive statistics and Chi-square tests were used to compare sociodemographic and clinical characteristics for PLWHA, and HIV-negative people or unknown status (HIV-).

Results: As of December 2022, 10,046 confirmed and probable mpox cases were included in this study, out of those 46%(4,657) were HIV positive. The median age was 32 (IQR:27-38), 73%(7,235) were cisgender males, and 64% were gays and other men who have sex with men (MSM). Among those PLWHA, the median age was slightly higher (34yo,IQR:29-38), 79% (3,620) were cisgender male, and 70%(3,232) were MSM. STIs were more frequent among PLWHA (n=710;15%) than HIV- people (n=372;7%) (p-value<0.001); 9%(416) PLWHA were diagnosed with syphilis at mpox notification, and 3%(165) among HIV- cases. Signs and symptoms were also significantly more prevalent among PLWHA: 93% presented at least one sign or symptom, and 58% presented rashes; among HIV- cases proportions were 90% and 51%, respectively. 5.3%(246) PLWHA and 4.5%(243) HIV- or unknown-status cases were hospitalized. Twelve deaths due to mpox and 13 due to other causes were registered; 11 and five, respectively, among PLWHA.

Conclusions: This study has shown a high frequency of HIV/AIDS among mpox cases reported in Brazil. PLWHA had more STIs, signs and symptoms, complications, hospitalization, and deaths. These results highlight the importance of reorganizing health services and investing in professional capacity building to face the mpox outbreak, especially in HIV/AIDS and other STI services. Furthermore, it reinforces the need to plan prevention strategies, including vaccination against mpox, specifically targeted at this population.

MOPEC03

Prevalence and correlates of dual mood disorders among PLHIV-PWUD in a Canadian setting

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Background: Mental disorders are pervasive among people living with HIV (PLHIV) and have been shown to impact clinical outcomes; however, little is known about correlates of mood disorders (particularly dual diagnoses) among PLHIV. This study aims to explore the prevalence and correlates of dual mood disorder symptoms among PLHIV who use drugs (PLHIV-PWUD).

Methods: Data were obtained from the ACCESS study, an ongoing prospective community-recruited cohort study of PLHIV-PWUD in Vancouver, Canada. Using multivariable generalized linear mixed-effects models, we evaluated factors associated with comorbid moderate/severe anxiety and depressive symptoms (dual mood disorders) as measured by the PROMIS instrument.

Results: Between December 2016 and November 2021, 577 PLHIV-PWUD contributed 3356 observations. 87 (15%) participants reported moderate/severe dual mood disorder symptoms at baseline. Multivariable adjusted analysis showed significant and positive associations between moderate/severe dual mood disorder symptoms and daily injection drug use (Adjusted Odds Ratio [AOR] = 1.40; 95% Confidence Interval [CI]: 1.06-1.85), daily use of stimulants (AOR = 1.61; 95% CI: 1.21-2.13) or opioids (AOR = 1.53; 95% CI: 1.14-2.05), persistent/major pain (AOR = 1.85; 95% CI: 1.44-2.37), high school level education or higher (AOR = 1.31; 95% CI: 1.01-1.68), recent incarceration (AOR = 3.57; 95% CI: 1.77-7.20), and homelessness (AOR = 2.05; 95% CI: 1.23-3.40).

Conclusions: In this cohort of PLHIV-PWUD, dual mood disorders were common and associated with several substance-use and social-structural vulnerabilities. This highlights the need for further understanding the determinants of dual diagnoses in order to improve mental health outcomes among this population.

MOPEC04

Molecular and phylodynamic approaches to the characterisation of HIV-1 transmission: a genomic epidemiological study in Victoria, Australia

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Background: In Australia, the incidence of HIV has declined steadily in recent years, although the virtual elimination of HIV transmission will require additional interventions. The use of molecular approaches to identify putative HIV-1 transmission networks may complement traditional surveillance, and could support timely contact tracing, as well as the targeted administration of pre-exposure prophylaxis (PrEP) to efficiently reduce further transmission. The efficacy and acceptability of these methods have yet to be examined thoroughly in an Australian context.

Here, to understand the public health potential of HIV-1 molecular epidemiological approaches in our setting, we analysed a comprehensive longitudinal collection of HIV-1 sequences from plasma from newly diagnosed people with HIV in Victoria, Australia.

Methods: De-identified HIV-1 *pol* gene sequences generated between 2000 and 2020 were analysed. Sequences were subtyped, and surveillance drug-resistance mutations (SDRMs) identified. Assessment of molecular transmission networks was performed using HIV-TRACE (0-4-4), and phylodynamic assessment of network growth using BEAST (2-6-6).

Additional demographic data were integrated with these molecular findings, allowing for a description of the transmission dynamics of HIV in this setting over the past two decades. Ethical approval for this project was obtained and engagement of communities in this work and its interpretation is ongoing.

Results: Based on our genetic thresholds, 70% of HIV-1 *pol* sequences were part of a putative transmission network, as defined through HIV-TRACE. SDRMs were identified in 375 people living with HIV (10.7%), becoming increasingly uncommon in recent years, with sustained transmission of these limited to a subset of smaller networks. Transmission networks showed changing patterns in epidemic growth, stabilisation and decline, providing further detail to support the control of these distinct although overlapping sub-epidemics; while many networks have

maintained an effective reproductive number (R_e) of less than 2.0, others show periods of epidemic growth reaching R_e values greater than 4.0.

Conclusions: This study provides a detailed, longitudinal view of HIV-1 transmission in Victoria, Australia. These findings provide local data to inform the ongoing discussions of the acceptability and place of molecular approaches in clarifying HIV-1 transmission and guiding public health responses in Australia.

MOPEC05

Silent transfer determination using HIV recency testing in Lusaka Province of Zambia: experience from the Catholic Relief Services Epidemic Control 90-90-90 (EpiC 3-90) project

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Background: People living with HIV (PLHIV) who silently transfer from one health facility to another, present a challenge in the correct estimation of the burden of HIV in the population, as they may be classified as recently identified in the destination facility.

An additional challenge, is the estimation of attrition, thus affecting HIV programming. The HIV recency testing programme has provided an opportunity to identify clients who have a suppressed VL result (<1,000 copies/ml) prior to ART initiation.

We utilized HIV recency programme data to identify silent transfers and design interventions tailored to mitigate this challenge.

Methods: Newly identified eligible PLHIV, (≥15 years old), were enrolled in the programme which identified recent HIV-1 acquisition using an algorithm that combined rapid test for recent HIV acquisition (RTRI) with HIV viral load (VL) testing. PLHIV who had a suppressed HIV VL result (<1000 copies/mL) before ART initiation were classified as silent transfers.

We present findings from Lusaka Province health facilities for the period January 2020 to December 2022.

Results: During the period under review, we collected 33,855 samples and received 93%(n=31,503) VL results. Approximately 35% (n=10,891) of the 31,503 results received had a suppressed VL (<1000 copies/mL) and were categorised as silent transfers from 2020 to 2022. The silent transfers were 34% (663/1,938) in 2020; 34% (3,512/10,445) in 2021 and 35%(6,716/19,120) in 2022.

Out of the 6 districts in the province, Lusaka accounted for 82%(8,889/10,891) of all the silent transfers and therefore requires prioritization in addressing this problem.



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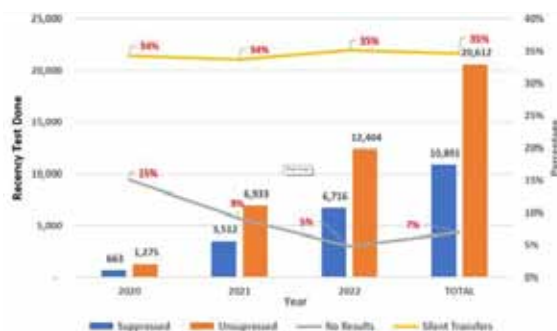


Figure 1. Recency results consolidated by year and district.

Conclusions: Strategies to curb the "silent transfers" must be employed to optimize the continuity of care. These cause inaccuracies in the number of newly identified PLHIV and in data-driven decision-making for HIV epidemic control in Zambia. Mitigation may include client education, effective use of HIV screening tools, and introduction of biometric identification systems.

MOPEC06

New metrics for understanding trends in undiagnosed HIV among key populations

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Background: We investigated novel epidemiological metrics for understanding trends in undiagnosed HIV among key populations in Australia.

Methods: We produced estimates for the number of people living with undiagnosed HIV and the number of new HIV infections using national HIV surveillance data and the European Centre for Disease Prevention and Control (ECDC) HIV modelling tool. Using these estimates, we calculated:

1. The Total Diagnosed Fraction, the proportion of all people with HIV who have received a diagnosis;
2. The Yearly Diagnosed Fraction, the proportion of people who have not yet received a diagnosis who received a diagnosis during each year, and;
3. The Case Detection Rate, which is the term used for the annual ratio of the number of new HIV diagnoses to the number of new HIV infections each year; from 2008 to 2019.

In MSM, we calculated this in Australian-born and overseas-born individuals. In heterosexual people we report this in women and men.

Results: Each metric for Australian-born MSM improved consistently over the period. In contrast, the metrics for the overseas-born group worsened (Total Diagnosed Fraction: 85.0% to 81.9%, Yearly Diagnosed Fraction: 23.1% to 17.8%, and Case Detection Rate: 0.74 to 0.63)—meaning the number of undiagnosed overseas-born MSM is growing and it will take longer to diagnose everyone at current testing rates. In heterosexuals, both women and men had consistent increasing trends for the Total Diagnosed

Fraction and Yearly Diagnosed Fraction but with women having consistently higher values. Heterosexual men had a declining Case Detection Rate (below one since 2011), compared to an increase for women (above one since 2009). Meaning the number of heterosexual women with undiagnosed HIV has been falling while the number of undiagnosed heterosexual men has been increasing.

Conclusions: The additional metrics provide important information on Australia's progress towards achieving national and international targets. The more dynamic changes seen in the undiagnosed population highlight diverging trends for key populations not seen in the Total Diagnosed Fraction. The decreasing metrics for overseas-born MSM highlight the challenges in ensuring equity of HIV prevention, testing and care among all key populations.

MOPEC07

Establishing HIV-1 recent infection surveillance using a point-of-care test for recent infection among persons newly diagnosed with HIV infection in Thailand

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Background: Recent HIV infection surveillance can be used to identify areas and groups with potential for HIV acquisition. A new surveillance model using the point-of-care test for recent HIV infection (RTRI) was integrated into routine HIV testing services in 14 of 76 provinces representing all health administrative regions in Thailand. We describe characteristics of recent HIV infections reported from April to August 2022.

Methods: All hospitals in 14 provinces, 12 high and 2 low burden HIV provinces (defined as <5,000 annual HIV diagnoses for low burden provinces), were invited to participate in the new surveillance activity. One hundred thirty-nine hospitals were trained to offer RTRI to newly diagnosed PLHIV who were at least 15 years of age and treatment naïve or on ART <1 month after diagnosis. Left-over blood specimens of consenting clients were tested by RTRI



(Asanté™ HIV-1 Rapid Recency® Assay) and linked to case surveillance data to remove re-testers and those already on treatment. Descriptive and multivariate analyses were conducted using SAS v 9.4 to characterize epidemic profile of recent infections.

Results: Of 139 public hospitals who volunteered to participate, 69 reported that newly diagnosed PLHIV had been identified (ranging from 17-260 clients per facility) during the surveillance period. Of 1,053 newly diagnosed PLHIV, 106 (10.1%) tested RTRI-recent, after correction with case surveillance data. The highest proportion of recent infections were seen among 15-19 year old (males:19.0%, females:11.6%), transgender women (18.0%), and men who have sex with men (11.4%). Two northeastern provinces reported the highest proportion of recent infections (21.0% and 19.0%) compared to other provinces. PLHIV <20 years old had a higher risk for recent infection than others in multivariate analysis (Adjusted odds ratio: 2.7, 95% CI 1.4-5.3).

Conclusions: National recent infection surveillance using RTRI was successfully implemented and identified younger age, key populations and two northeastern areas to be at higher risk for HIV acquisition. When triangulated with other program and surveillance data sources, recency data may provide better understanding of current epidemiologic trends. Targeted interventions to prevent new infections among youth, transgender and MSM may help interrupt ongoing transmission.

MOPEC08

ZAMPHIA 2021 showed reduction in advanced HIV disease (AHD) prevalence but further scale up of AHD screening and management needed

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Background: Reducing HIV-related mortality from advanced HIV disease (AHD) through timely diagnosis and management is a critical aspect of a successful HIV program. We analyzed the nationally representative Zambia Population-based HIV Impact Assessment (ZAMPHIA) 2021 data to assess the population-level AHD prevalence.

Methods: We determined AHD prevalence among people living with HIV (PLHIV) aged 15-59 years by their awareness and ART status and calculated the arithmetic mean difference with ZAMPHIA 2016 using z-scores. Participants completed a questionnaire and whole blood was collected. Awareness of HIV-positive status and treatment status were based on self-report or having detectable ART in one's blood. CD4+ testing was done for all who tested

HIV positive, with AHD defined as a CD4 count of <200 cell/mm³. Analyses were weighted and accounted for survey design.

Results: AHD prevalence was 7.0% in 2021, compared to 13.9% in 2016 (Table 1). Among PLHIV who were unaware of their status, AHD prevalence was 18.8% in 2021. Among those aware of their status and on ART, AHD prevalence was 4.8% compared to 37.9% among those aware but not on ART. While those who were aware but not on ART only comprised 1.8% (CI: 1.2-2.3%) of PLHIV, they represented 9.7% (CI: 4.5-14.9%) of those with AHD; among them, 74.3% were female, average diagnosis was 3.9 years ago and 37.1% had ever taken ART (Table 2).

Year	Overall, % (95% CI)*	Unaware HIV, % (95% CI)	Aware, on ART, % (95% CI)*	Aware, not on ART, % (95% CI)
2021	7.0 (5.7-8.5)	18.8 (13.5-25.1)	4.8 (3.5-6.3)	37.9 (20.6-57.7)
2016	13.9 (12.5-15.3)	17.7 (15.0-20.6)	10.9 (8.3-11.8)	22.8 (17.4-29.1)
p-value for mean difference	<0.01	0.74	<0.01	0.13

Table 1: Weighted proportion PLHIV aged 15-59 years with advanced HIV disease (CD4+ count <200) by awareness status in Zambia – 2016 (N = 2,446) versus 2021, (N = 2,045)

Characteristic	Overall (n=148)	Unaware of HIV (n= 46*)	Aware, currently on ART (n=88)	Aware, currently not on ART (n=14*)
Time since HIV diagnosis, mean years (95% CI)	6.1 (4.7-7.6)	n/a	6.4 (4.8-8.1)	4.1 (2.0-6.1)
Mean age, years (95% CI)	40.3 (38.7-41.9)	41.2 (38.9-43.5)	40.1 (37.8-42.5)	38.8 (35.1-42.5)
Female sex, % (95% CI)	51.6 (41.6-61.5)	51.1 (34.4-67.6)	48.1 (35.1-61.4)	74.3 (45.5-92.9)

Table 2: Characteristics of PLHIV aged 15-59 years with advanced HIV disease (CD4+ count <200) by awareness status in Zambia, 2021

(*Analyses with sample size <50 participants should be interpreted with caution)

Conclusions: The population-level burden of AHD has decreased in Zambia since 2016, likely reflecting achievements of Zambia's universal test-and-treat strategy (started in 2016). Approximately one-third of PLHIV aware of their HIV status but not on ART had AHD but they only represent ~10% of the total AHD burden.

Addressing AHD in Zambia will involve identifying the remaining undiagnosed PLHIV in addition to screening for AHD among those aware of their status, especially if they have disengaged from care.



MOPEC09

Increasing prevention coverage among Australian gay and bisexual men but elevated HIV risk among younger and bisexual men: analysis of national behavioural surveillance data 2017-21

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Background: Gay and bisexual men (GBM) in Australia increasingly use biomedical prevention methods. Rising 'net prevention coverage' (the use of any effective strategy e.g. condoms, PrEP or undetectable viral load, UVL) is associated with declining HIV infections. However, disparities in prevention coverage are believed to exist. We analysed variations in prevention coverage to identify opportunities for intervention.

Methods: Behavioural surveillance data were collected during 2017-21 from gay venues, events and online in seven states/territories. Trends in net prevention coverage and HIV risk (condomless anal sex with casual partners unprotected by PrEP or UVL) were assessed with logistic regression, stratifying by age, country of birth, sexual orientation and the proportion of gay residents in participants' residential suburbs.

Results: 25,865 survey responses from participants with casual male partners were included. The mean age was 37.6 years, 69.8% were Australian-born, 88.2% gay-identified, and 9.7% living with HIV. Net prevention coverage increased from 69.8% in 2017 to 75.1% in 2021 ($p < .001$), and HIV risk declined from 30.2% to 24.9% ($p < .001$), influenced by rising PrEP use (15.6% to 33.9%, $p < .001$). Participants aged <25 years were the most likely to consistently use condoms (33.5% in 2017 to 25.4% in 2021, $p = .02$), but also reported the highest levels of HIV risk (42.2% in 2017 to 40.8% in 2021, $p = .01$). 25-44 year olds were the most likely to use PrEP (18.7% to 39.0%, $p < .001$) and 45 year olds the most likely to use/report UVL (13.6% to 11.8%, $p = .02$). In 2021, net prevention coverage was lower among Australian-born vs. overseas-born men (73.5% vs. 78.9%, $p < .001$), and higher among gay vs. bisexual/other-identified participants (77.7% vs. 63.4%, $p < .001$). During 2017-21, net prevention coverage increased more in suburbs with 10% gay residents (73.4% to 88.3%, $p < .001$) and less in suburbs with <10% gay residents (68.9% to 73.7%, $p < .001$).

Conclusions: Recent increases in HIV prevention coverage are concentrated among older GBM and suburbs with more gay residents. Younger men and bisexual men remain more at risk of HIV, more reliant on condoms, and less likely to use PrEP or UVL. Encouraging greater prevention coverage in these groups is necessary to further reduce HIV risk in Australia.

MOPEC10

Disruptions to services for people who inject drugs in Ukraine: modelling the impact of Russia's invasion on HIV and hepatitis C virus transmission

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Background: People who inject drugs (PWID) in Ukraine have a high burden of HIV and HCV infection. We estimated the impact of disruptions to non-governmental organization (NGO) activities, opioid agonist therapy (OAT) and anti-retroviral therapy (ART) following Russia's invasion of Ukraine.

Methods: We utilised an existing dynamic HIV/HCV transmission model among PWID in Ukraine. The model assumed 4-5% OAT coverage, 35-48% ART coverage and 37-49% NGO coverage in 2017, with NGO contact reducing injecting risk and increasing condom use and OAT/ART recruitment. We estimated the 1 and 10-year impact of ceasing NGOs, OAT and/or ART from March 2022 for 12 months in terms of additional HIV/HCV infections and impact per person-year (pyr) of closure.

Using national programmatic data, we estimated the pyrs of each intervention lost since Russia's invasion by comparing monthly numbers of PWID engaged in each intervention in 2022 with 2020/21. Combining these estimates with model projections, we estimated the impact of disruptions to services since March 2022.

Results: Ceasing all services for 1 year would have resulted in an additional 2,939 (95% credibility interval: 1,954-4,112) new HIV infections and 2,501 (1,668-3,578) new HCV infections in 2022. Even if services reopened after that year, there would be an additional 19,057 (13,449-25,938) new HIV infections and 9,409 (6,134-14,290) new HCV infections by 2032, increases of 39.6% and 6.1%, respectively. For each 100pyrs of closures, there would be an additional 3.6 (2.5-4.9) new HIV infections and 1.8 (1.2-2.7) new HCV infections over 2022-2032.

The national number of PWID accessing ART and OAT has remained stable (or increased) since Russia's invasion, although reductions occurred in Eastern Ukraine. However, there were 6,187 fewer pyrs of NGO contact (compared to 2020/21), which model projections suggest will result in an additional 36 (23-53) and 84 (56-113) new HIV and HCV infections in 2022, respectively, and 144 (102-198) and 156 (108-205) by 2032.

Conclusions: Disruptions to services since the war may have had limited impact on HIV and HCV transmission among PWID. However, considerable detrimental impact could occur with larger disruptions, emphasising efforts to continue services have been crucial for maintaining recent gains.



MOPEC11

Impact and cost-effectiveness of 3 different long-acting pre-exposure prophylaxis products in 3 African countries: a mathematical modelling study

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Background: HIV incidence remains high in sub-Saharan Africa (SSA) despite treatment scale-up. Oral pre-exposure prophylaxis (PrEP) is effective when taken as directed, but has had limited impact in SSA, in part due to challenges with daily dosing. Long-acting PrEP (LA-PrEP) formulations that may ameliorate these challenges include:

1. Two-monthly injections (cabotegravir),
2. Six-monthly injections (lenacapavir), and;
3. Monthly oral pills (islatravir and its potential successors).

We estimated the potential impact of each LA-PrEP formulation and maximum cost per dose delivered to be cost-effective in western Kenya (Nyanza region), South Africa, and Zimbabwe.

Methods: We adapted an HIV network transmission model, EMOD-HIV, to estimate:

1. Impact of scaling each LA-PrEP product on when incidence falls below 1 per 1,000 adults per year,
2. Doses required to avert 1 HIV acquisition or disability-adjusted life-year (DALY), and;
3. Maximum per-dose cost to avert 1 DALY for US\$500 over 20 years.

We assumed PrEP introduction in 2025, coverage rising to 5-20% of adults by 2030, and HIV risk reduction by 95% while using injectable PrEP and 67% while using monthly oral PrEP (to account for sub-optimal adherence with self-dosing).

We performed a bounding analysis on user risk profiles:

1. Equal distribution among sexually active adults, and;
2. "Risk-prioritized" distribution from highest-risk (sex workers) to lowest.

Results: Two-monthly or six-monthly injectable PrEP with 20% risk-prioritized coverage could reduce incidence to <1 per 1,000 per adult per year in western Kenya by 2030 (2034 for monthly oral) and Zimbabwe by 2034 (2039 for monthly oral).

In South Africa, incidence remained >1 per 1,000 for 20 years, but LA-PrEP was more efficient than in western Kenya and Zimbabwe, requiring 5-7x fewer doses to avert 1 HIV acquisition. LA-PrEP could be cost-effective if delivered at ≤\$24 (two-monthly injectable), ≤\$70 (six-monthly injectable), and ≤\$7 (monthly oral) per dose in the most efficient setting (South Africa) and scenario (5% risk-prioritized coverage).

Results were sensitive to prioritization: 1 risk-prioritized dose averted as many HIV acquisitions as 2 non-risk-prioritized doses.

Conclusions: LA-PrEP has the potential to significantly accelerate HIV incidence declines in SSA. Low-cost suppliers and delivery models will be required for LA-PrEP to be cost-effective.

MOPEC12

HIV risk among men who have sex with both men and women in Australia: findings from national behavioural surveillance surveys

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Background: Men who have sex with men and women (MSMW) have not been prioritised in HIV prevention and research, despite increased HIV risk compared to the general population. We examined characteristics of MSMW (last 6 months) compared to men who have sex with men only (MSMO) from Australian behavioural surveillance.

Methods: We recruited men across Australia at LGBTQ venues/events and online. We included data from the last available round for all participating jurisdictions (2021-2022) and restricted the sample to those with ≥1 male sex partner in the last 6 months. MSMW and MSMO were compared using chi-square/t-tests.

Results: 6,447 responses were included (MSMW=7.0%, MSMO=93.0%). MSMW were more likely to be recruited online than MSMO (63.0% versus 54.7%, p=0.001). Among MSMW, 6.2% were HIV-positive, 73.8% HIV-negative and 20.0% were untested/unknown, compared to 6.8%, 85.6%, and 7.6% among MSMO (p<0.001). While 89.2% of MSMO self-identified as gay and 6.4% as bisexual/pansexual, 63.0% of MSMW identified as bisexual/pansexual and 21.7% as gay (p<0.001).

MSMW were more likely to be transgender (6.2% versus 0.8%, p<0.001) and non-binary (13.1% versus 2.5%, p<0.001). 29.7% of MSMW reported >10 male partners in the last 6 months compared to 17.5% of MSMO (p<0.001). 54.3% of MSMW had 1 female partner and 34.4% had 2-5 in the last 6 months. 50.1% of MSMW reported recent condomless anal intercourse with casual male partners (CLAIC) compared to 42.2% of MSMO (p=0.001).

When taking biomedical prevention in the participant into account, 30.4% of MSMW and 12.5% of MSMO reported having CLAIC without pre-exposure prophylaxis (PrEP) or undetectable viral load (p<0.001).

Among non-HIV-positive participants (n=6,010), MSMW were less likely to have ever tested for HIV (80.1% versus 97.0%, p<0.001) or used PrEP (26.7% versus 38.6%, p<0.001). Among those reporting CLAIC (n=2,490), the disparity in PrEP use was greater (39.9% versus 68.6%, p<0.001).

Conclusions: We found important differences between MSMW and MSMO. MSMW reported higher numbers of male partners and CLAIC, and lower PrEP use and HIV testing. Research is needed to understand these dispari-



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ties both within and outside samples of gay men/MSMO, along with tailored efforts to engage higher-risk MSMW in testing and prevention.

MOPEC13

Characteristics of HIV seroconversions in ImPrEP, a large PrEP implementation study in Latin America

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Background: Number of HIV cases continues to rise among young (18-30 years) gay, bisexual, and other men who have sex with men (MSM) and transgender women (TGW) in Latin America. ImPrEP was a PrEP implementation study conducted in Brazil, Peru, and Mexico.

We describe characteristics of HIV seroconversions in Im-PrEP by country.

Methods: Eligible MSM and TGW (HIV-negative, ≥18 years, reporting 1+ risk criteria) were screened and enrolled on the same day and received a 30-day oral TDF/FTC PrEP supply.

Follow-up visits were scheduled 4 weeks post-enrolment and quarterly thereafter. HIV rapid testing was performed at all visits.

We compared demographic (at enrollment) and behaviour (last visit prior to seroconversion) characteristics using chi-square or exact tests for the contingency tables and Kruskal Wallis tests for medians.

Results: From February 2018-June 2021, 9509 MSM/TGW were enrolled (Brazil: 3928 [41.3%]; Mexico: 3288 [24.6%]; Peru: 2293 [24.1%]); 104 were diagnosed with HIV during 12,185.25 person-years of follow-up.

Overall, 76.0% were young, 82.7% non-white, and 71.3% completed secondary education or more. The median number of partners was 5 (IQR:2-15); 70.2%, 92.2% and 85.6% reported receptive condomless anal sex, inconsistent condom use and incomplete PrEP adherence, respectively.

The median number of days between the first PrEP dispensation and HIV diagnosis was 360 days, higher in Brazil (541 days) and lower in Mexico (242 days).

The median HIV viral load after diagnosis was 12,257 copies/mL, lower in Mexico (3680 copies/mL) and higher in Peru (50100 copies/mL). Viral mutations detected were: 1 (1.8%) K70 and 6 (10.5%) M184V/I (Table).

	All N = 104 n (%)	Brazil N = 24 n (%)	Mexico N = 18 n (%)	Peru N = 62 n (%)	p-value
Gender (cisgender men)	93 (89.4)	22 (91.7)	18 (100.0)	53 (85.5)	0.29
Median Age at enrollment (years)	24 (21-30)	24 (21-29)	30 (23-33)	23 (20-29)	0.11
Aged 18-30 years at enrollment	79 (76.0)	18 (75.0)	10 (55.6)	51 (82.3)	0.07
Race (Non-White)	86 (82.7)	15 (62.5)	16 (88.9)	55 (88.7)	0.02
Education (more than secondary)	74 (71.2)	19 (79.2)	17 (94.4)	38 (61.3)	0.01
Number of sex partners	5 (2-15)	4 (1-15)	7 (2-15)	5 (2-15)	0.82
Median (IQR)	73 (70.2)	17 (70.8)	5 (27.8)	51 (82.3)	<0.001
Receptive condomless anal sex	95 (92.2)	20 (83.3)	16 (94.1)	59 (95.2)	0.15
Inconsistent condom use	43 (41.4)	13 (54.2)	5 (27.8)	25 (40.3)	0.27
Risky drinking	13 (12.5)	4 (16.7)	4 (22.2)	5 (8.1)	0.16
Stimulant use	89 (85.6)	20 (83.3)	12 (66.7)	57 (91.9)	0.03
Incomplete self-reported PrEP adherence (missed any PrEP pills in the past 30 days)	360 (186-581)	541 (244-770)	242 (108-331)	360 (245-560)	0.02
Days from first PrEP dispensation to HIV diagnosis, Median (IQR)	12,257	7227	3680	50,100	0.02
First HIV viral load after diagnosis, Median (IQR) copies/mL	(851-114,118)	(387-54,311)	(700-80,750)	(1070-156,000)	0.12
HIV genotyping with valid results	37 (54.8)	11 (45.8)	7 (38.9)	39 (62.9)	0.12
Mutations (valid results)	1 (1.8)	1 (9.1)	0 (0.0)	0 (0.0)	0.32
K70	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	—
M184V/I	6 (10.5)	1 (9.1)	2 (28.6)	3 (7.7)	0.23

Table. Characteristics of HIV seroconversion in the ImPrEP study by country.

Conclusions: We observed poor adherence among MSM and TGW who seroconverted during the ImPrEP study. Long-acting PrEP may be an appropriate strategy to overcome adherence barriers observed among young MSM and TGW in Latin America.

MOPEC14

Comparing PrEP initiation rates by service delivery models among adolescent boys and young men in KwaZulu-Natal, South Africa: preliminary findings from a population-based prospective study

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Background: Pre-exposure prophylaxis (PrEP) is an HIV prevention strategy that can reduce the risk of HIV acquisition by more than 90% if taken consistently. South Africa started rolling out PrEP in 2016, initially for selected population groups before expanding access to more people. However, there is a dearth of research focused on PrEP among adolescent boys and young men (ABYM), despite them acquiring HIV at high rates. To address this gap, we compared PrEP initiation rates by service delivery points (SDPs) among ABYM in KwaZulu-Natal, South Africa.

Methods: We conducted a population-based prospective study in 22 SDPs from July 2021 to June 2022 in uMgungundlovu – a district with 24% HIV prevalence among males aged 15-49 years in KwaZulu-Natal province. Sexually active ABYM aged 15 – 35 years who tested HIV negative were recruited at purposively selected PrEP SDPs (i.e., healthcare facilities, secondary schools and Technical Vocational Education and Training (TVET) colleges, and community-based youth zones). We defined PrEP initiation according to national guidelines. We described baseline characteristics using summary statistics and reported PrEP initiation proportions overall and by SDPs. PrEP initiation for each participant was extracted against local medical records.


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Results: The study included 1 078 ABYM were recruited from 22 SDPs, with more than half aged 15-24 years ($n=590$, 55%) and 45% ($n=488$) aged 25-35 years. Among 1 078 participants who were eligible for PrEP, 13% ($n=141$) were started on PrEP.

Among the participants who were started on PrEP, more than half (52%, $n=74$) were from high schools and TVET colleges, compared with community-based youth zones (26%, $n=37$) and healthcare facilities (21%, $n=30$). Participants were 18.4 (95% CI: 4.79 – 9.18) and 32.6 (95% CI: 6.49 –16.4) times more likely to initiate PrEP in youth zones and schools, respectively, compared to clinics ($p<0.001$).

Conclusions: PrEP initiation rates were low among AYBM in KwaZulu-Natal, South Africa. Providing PrEP in high schools and TVET colleges, and community-based SDPs resulted in improved PrEP initiation rates when compared with traditional facility-based model. High schools and TVET colleges, and community-based SDPs could serve as important additional models to the traditional facility-based model for improving PrEP accessibility and initiation among ABYM.

MOPEC15

Peer influence on Latino sexual minority men's motivation to use PrEP in Miami, Florida

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Background: Respondents in this study, implemented in Miami-Dade County, Florida, a majority-minority community and a US HIV epidemic hotspot, are Latino sexual minority men (LSMM), a group at elevated risk for HIV.

Despite the beneficial effects of pre-exposure prophylaxis (PrEP), LSMM continue to experience disparities in PrEP uptake and subsequent increased HIV vulnerability- which could perhaps be due to their social environment.

The Motivational PrEP Cascade (MPC) describes the stages of change individuals undergo in achieve PrEP adherence; however, the model lacks consideration of the social context, including peer influence.

Methods: To measure peer influence, we conducted a sociocentric network autocorrelation model to identify how a respondent's position in the MPC is associated with their social network members' position in the MPC based on their friendship status, emotional attachment, frequency of interaction, or frequency of interaction weighted by emotional attachment.

Results: Eleven seeds and their 12 friendship network members ($n=143$ LSMM) were recruited into our study. The majority of participants were in PrEP Pre-Contemplation ($n=44$); and almost one-third of our sample reported using PrEP ($n=38$).

There was a positive correlation between a participant's cascade position and their alters' cascade position that varied depending on how the ties to alters are measured: friendship, emotional attachment, frequency of interaction, or frequency of interaction weighted by emotional attachment.

As visualized in Figure 1, each network varies in density and contains individuals at various stages of the MPC. Results from a network autocorrelation model found that LSMM's MPC position was associated with the positions of their friendship network members.

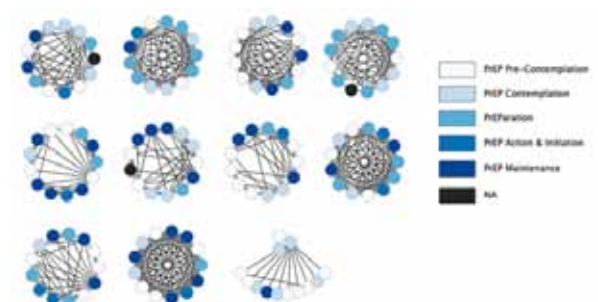


Figure 1. Visualization of LSM friendship networks and MPC position.

Conclusions: By increasing PrEP uptake, LSMM may serve as models to their peers and increase the likelihood of PrEP use. HIV prevention interventions to progress LSMM along the MPC should embrace the utility of friendship networks.

MOPEC16

Voluntary medical male circumcision and incident HIV acquisition among men who have sex with men: a randomized controlled trial

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Background: Meta-analyses and systematic reviews of observational studies suggest that voluntary medical male circumcision (VMMC) may reduce the risk of HIV acquisition among men who have sex with men (MSM), especially in men who primarily engage in insertive anal sex. We conducted a randomized controlled trial (RCT) to assess the efficacy of VMMC in reducing incident HIV acquisition among MSM.

Methods: This RCT was conducted in eight cities in China. Uncircumcised, HIV-negative men aged 18-49 years who predominantly practiced insertive anal sex and had two or more male sex partners in the past 6 months, were randomized to either intervention (immediate circumcision) or control (delayed circumcision) arms.

HIV testing was repeated at 3, 6, 9, and 12 months. HIV incidence was estimated in intention-to-treat (ITT) and per protocol (PP) analyses. HIV incidence rate ratio (IRR) and 95% confidence intervals (CIs) were calculated. This trial was registered at Chictr.org (ChiCTR2000039436).



Results: A total of 247 MSM were enrolled: 124 in the intervention arm and 123 in the control arm. Baseline characteristics of participants in the intervention and control groups were comparable. Retention rates in both arms were similar during follow-up. The two arms contributed 116 and 117 person-years of follow-up, respectively. Zero and five HIV seroconversion cases were observed in the intervention (HIV incidence rate, per 100 person-years: 0.00, 95% CI:0.00–3.18) and control (4.27, 1.38–9.97) arms. IRR was 0.00 (95% CI: 0.00–1.08) and 0.00 (0.00–1.13) in the ITT and PP analyses. All adverse events related to VMMC were mild and resolved quickly. Follow-up is ongoing and the final results will be available by July 2023.

Conclusions: This is the first RCT to demonstrate the efficacy of VMMC in preventing HIV among MSM. VMMC is very likely to be efficacious in preventing incident HIV acquisition among MSM who predominantly practice insertive anal sex. Large-scale RCTs with long-term follow-up may be necessary to further confirm this efficacy.

MOPEC17

Same-day initiation of emtricitabine-tenofovir disoproxil succinate in a demedicalized model of oral pre-exposure prophylaxis (PrEP) in Mexico: a real-world data analysis

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Background: To evaluate the feasibility of PrEP initiation at the first visit under a demedicalized delivery model implemented by Mexico City HIV Program as a strategy to expand PrEP access.

Methods: We analyzed data of 2,980 people who started PrEP in 2022 within the Mexico City HIV Program (90% cisgender men, 8% trans and non-binary people, and 2% cisgender women), with an average age of 31.9 years (S.D. 7.9). Same-day start (SDS) was defined as provision on the first visit simultaneously with risk assessment and testing, and delayed start (DS) as the provision on subsequent days.

Results: Most users (98.8%) received assessment and follow-up by non-medical health workers. PrEP was provided in 3 public units (PU) (67.2%), 3 community centers (CC) in Mexico City and 1 CC in Guadalajara. Entry routes were spontaneous request (82.1%), request for readmission

6.9%, referral at the end of Post Exposure Prophylaxis (PEP) 6.1%, sexually transmitted infections (STIs) care 2.5% and MPOX 2.4 %. 84.7% of people started PrEP on SDS mode and 15.3% on DS (Median 10 days). No differences were found between PU and CC, age, chemsex, crystal-meth or anabolic supplements use. The factors associated with DS were assessment by physicians (OR 6.1 [3.7, 9.9]), cisgender women (OR 3.9 [2.2, 6.9]), referral at the end of PEP (OR 3.8 [2.7, 5.2]) or STI care (OR 3.8 [2.4, 6.2]).

Loss to follow-up at first PrEP follow-up appointment (1 month) was 10.7% in SDS and 18.8% in DS ($p = 0.001$) and 15.3% in the SDS and 20.4% in DS for the second follow-up appointment 4 months after ($p < 0.042$). At baseline, 24 (0.8%) users with eGFR < 60 ml/min were detected, 10 the first month, and 5 in subsequent visits (incidence of 1 per 200), with no difference between SDS and DS ($p = 0.3072$). Three people living with HIV were detected at baseline in SDS group, 4 the first month and 1 incident acquisition in subsequent visits (incidence of 1.2 per 10,000 PrEP users-month).

Conclusions: Same-day initiation of PrEP by non-medical professionals in a large-scale delivery model is feasible and safe.

MOPEC18

Looking beyond the facility to reduce HIV vertical transmission among HIV positive pregnant women: making a case for TBA model in selected local government areas of Taraba State, Nigeria

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Background: The prevention of mother-to-child transmission (PMTCT) of HIV has taken a pivotal role in HIV management with the target of ending new infection in children by 2030. Vertical transmission is the leading route for HIV transmission among children globally. Nigeria has an estimated 83,000 women needing PMTCT, 38,234 (46%) were identified and 34,472 (42%) are on ART. Taraba State has only 34% PMTCT Coverage which is suggestive of high rates of vertical transmission. To improve and strengthen community interventions, existing structures such as Traditional Birth Attendants (TBAs) were identified to look beyond the facility to reduce vertical transmission of HIV among children. The aim of the study was to assess the contributions of TBA model to PMTCT.

Methods: Eight local government areas (LGAs) were selected based on high rates of TBA patronage in Taraba State. TBAs were selected randomly based on their willingness to participate in the study and trained. Documented data for pregnant women enrolled for PMTCT in facility and cohort registers between August of 2020 and July 2022, were analyzed using quantitative methods to


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assess the contribution of TBAs in identifying and linking pregnant women who acquired HIV to health care facilities.

Results: The results indicated that between August 2020 and July 2022 a total of 62,376 clients were referred for HIV testing service (HTS), 57,827 were tested, of these 304 tested HIV positive and 289 were linked to treatment. TBAs referred 20,686 (33.2%) pregnant women for HTS, 19,244 (33.3%) tested, 110 (36.2%) identified as HIV positive and all enrolled for PMTCT (100% linkage). Within the period, TBAs linked 73 infants (0-12 months) for early infant diagnosis (EID).

Conclusions: The TBA model has contributed to identifying and linking people living with HIV that are pregnant, thus recording significant reductions in vertical transmissions which emphasizes the benefits of using community structure such as TBA to improve case identification at the community.

Comprehensive training and capacity building for TBAs is key to strengthening community structure and referral system for PMTCT and ending vertical transmission of HIV among children.

MOPEC19

HIV PrEP continuation among clients formerly engaged in PrEP services at private pharmacies participating in a pilot study in Kenya

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Background: HIV pre-exposure prophylaxis (PrEP) delivery at private pharmacies is a novel and promising differentiated service delivery model that could address access barriers to public clinic-based PrEP delivery. We measured post-study PrEP continuation (i.e., linkage to clinic-based PrEP services) among individuals who initiated PrEP at one of 12 private pharmacies participating in a six-month pilot study in Kisumu and Kiambu Counties, Kenya.

Methods: During the pilot study (January-July 2022), clients that met the PrEP eligibility criteria were dispensed a 1-month PrEP supply at initiation and a 3-month supply at refill visits by trained pharmacy providers. Three months following pilot completion (October 2022), we followed up with participants who had initiated pharmacy PrEP services.

In our follow-up phone surveys, former study participants reported on their current PrEP use, and, if applicable, location of PrEP access and/or reasons for discontinuation. We reported descriptive statistics.

Results: We called 667 clients who initiated PrEP at pharmacies and reached 74% (492/667) of the participants called. The median age was 25 years (IQR 22-31), 43% (211/492) were male, and 76% (372/492) were unmarried. During the pilot study, most surveyed participants refilled PrEP at least once (79%, 388/492). Three months post-study completion, the majority of participants had stopped PrEP use (59%, 291/492).

Reasons for stopping PrEP included: not wanting to get PrEP from a clinic (60%, 175/291), no longer feeling at HIV risk (22%, 64/291), and testing HIV positive (4%, 13/291). Among the 201 clients still using PrEP, most obtained PrEP from a public clinic (59%, 118/201) and some from a private clinic (13%, 27/201). PrEP use three months post-study completion was greater among those who refilled PrEP at least once at the pharmacy (46%, 180/388) compared to those who never refilled PrEP at the pharmacy (20%, 21/104).

Conclusions: Stopping the delivery of PrEP services at private pharmacies following completion of a pilot study resulted in more than half of eligible users discontinuing use because they were not interested in clinic-delivered PrEP services. More research is needed to understand whether and how private pharmacies can be leveraged and sustained as PrEP service delivery points in Kenya and similar settings.

MOPEC20

Expanded peer outreach approach on PrEP uptake amongst key population in Nakuru County, Kenya

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Background: Effective strategies to increase pre-exposure prophylaxis (PrEP) uptake and continuation among men who have sex with men (MSM) and female sex workers (FSW) who engage in sex work or transactional sex are sparsely reported. We aimed to describe the available evidence on strategies for improving the uptake and continuation of PrEP among men who have sex with men and female sex workers or otherwise are at high risk of acquiring HIV, and report their implementation outcomes.



Description: In FY 22 between March 2022 to September 2022, USAID Tujenge Jamii initiated Expanded Peer Outreach Approach to increase PrEP utilization /Uptake amongst the key population targeting the MSMs and FSWs within Nakuru county.

This approach entailed capacity building of Peer educators/navigators and outreach workers on PrEP Module. the PrEP modules majored on demand creation, Follow up Schedule, Myths and Miss conception, Side Effects, Community PrEP Refills and PrEP Champions also identified. This was followed by referrals and linkages to the 5 DICES within hotspots for PrEP delivery by the Clinicians. Data was then collected and reviewed monthly using PrEP MOH Registers and tabulated in Excel sheets.

Lessons learned: A total of 35 MSMs and 2562 FSWs were Screened (New and Restart Clients) with 77% (27/35) of the MSM and 89% (2284/2562) of the FSWs screened being eligible for PrEP. Of those eligible, 81% (22/27) and 24% (539/2284) of eligible MSMs and FSWs were initiated on PrEP. A total of 45 MSMs and 576 FSWs were continuing with PrEP of which 2 (4%) MSMs and 28(5%) FSWs were PrEP restarts.

Of the clients who had month one refills, 100% (4/4) of the MSM were tested for HIV with no seroconversions whilst 73% (82/112) of the FSWs had a HIV test done with 7% (6/82) seroconverting. 6% (5/82) FSWs were diagnosed and treated for STI while on PrEP with no cases reported amongst the MSMs. 9% (7/82) FSWs reported Inconsistent or no condom use during intercourse for the review period.

Conclusions/Next steps: Expanded Peer Outreach Approach is a public health approach with great potential for reaching new populations and ensuring and enhancing demand creation for PrEP delivery both at facility and community settings.

MOPEC21

Using Common Elements Treatment Approach (CETA) to improve access to mental health services among people living with HIV in Rwenzori region in Western Uganda

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Background: With an estimated 1.4 million people living with HIV/AIDS in Uganda, HIV-positive individuals are three times more likely to develop mental health disorders. With funding from Health Resources and Services Administration (HRSA), Jhpiego Uganda working with Ministry of Health and John Hopkins University used the Common Elements Treatment Approach (CETA) model to scale up integration of Mental health services in HIV care

clinics in three health facilities in Western Uganda. CETA is a system of care that allows trained providers to assess symptom severity, create a treatment plan and deliver psychotherapeutic care for common mental health problems.

Description: 35 health workers from mental and HIV clinics of three high volume health facilities were selected, trained, mentored, and supported to provide psychoeducation, screening, group support therapy (for mild conditions) and individualized psychotherapy (for moderate and acute conditions) in the routine HIV care and management. Program data was collected using Client Monitoring Forms (CMF) and HIV client cards.

Lessons learned: From August to December 2022, 463 clients including 60% (282) HIV-positive individuals received mental health services through CETA providers. 73% of these benefited from a group-based care that includes psychoeducation, mental health screening, and group sessions. 27% (77) of the HIV-positive individuals presented moderate and acute symptoms and received individualized psychotherapy ranging from 8-12 sessions. 58% of clients requiring individualized sessions were improving and continuing with care while 35% had fully recovered, and 8% had stopped care due to relocation, transport challenges, and stigma.

Recipients of individualized sessions improved in adherence and appointment keeping for HIV care from 52% to 82% and 59% to 76% respectively. Improvements in HIV care outcomes were directly proportional to the reduction in mental ill health symptoms in clients. Integrating psychoeducation and screening in routine HIV/AIDS care activities increased demand for mental health care services at health facilities.

Conclusions/Next steps: Achievement of the last UNAIDS 90-target on viral load suppression requires increasing access to mental health services for HIV populations. The next phase of the program is supporting its full adoption and integration into existing differentiated service delivery (DSD) models, and scaling it up to other facilities serving big HIV-populations.

MOPEC22

PrEP versus improved HIV Care Cascade: which best drives HIV decline? A mathematical modelling study

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Background: The PrEPX study provided daily oral HIV pre-exposure prophylaxis (PrEP) to 4275 participants in Victoria, Australia between 01 Jul 2016-31 March 2018 before publicly subsidised PrEP became available via Australia's Pharmaceutical Benefits Scheme (PBS) on 01 April 2018.


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TUPEC01

A comparison of acceptability of HPV self-sampling for cervical cancer screening among women living with and without HIV in Lagos University Teaching Hospital, Nigeria

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Background: Women living with HIV have higher risk of persistence Human Papillomavirus (HPV) infection and developing cervical cancer compared to women in the general population. As part of self-care interventions, HPV testing with self-collected genital samples and timely follow-up care has the potential to improve the prevention of cervical cancer among women.

The aim of this study was to assess and compare the acceptability of HPV self-sampling method for cervical cancer screening among women living with and without HIV in Lagos University Teaching Hospital (LUTH), Lagos, Nigeria.

Methods: A comparative cross-sectional study was conducted and participants were selected using a systematic sampling technique. Data were collected using a semi-structured interviewer-administered questionnaire and analyzed using SPSS. Chi-square statistics was used at the level of significance was set at 5%.

Results: The mean age of the respondents was 42.4 years \pm 7.3SD and 64.8% were married. Awareness of HPV was low (33.6%) and this was significantly lower among women living with HIV (18.5%) than women living without HIV (50.2%). However after a brief information on HPV and cervical cancer, a significantly higher proportion of women living with HIV (92.8%) compared to women without HIV (83.6%) accepted HPV self-sampling method for collection of genital samples ($p < 0.0001$).

Awareness of HPV was significantly associated with the acceptance of HPV self-sampling method for the collection of genital samples.

Age, marital status, level of education and previous Pap test were not significantly associated with the acceptance of HPV self-sampling among the women in the two groups.

Conclusions: Acceptance of HPV self-sampling method for early detection of high-risk genital HPV infection and prevention of cervical cancer especially among women living with HIV can be achieved by increasing the awareness about HPV and HPV self-sampling method for the collection of genital samples.

Around this time concurrent increases in ART coverage and more rapid post-diagnosis ART initiation occurred, and this period coincided with declines in notifications of HIV incident infections in gay and bisexual men (GBM). We sought to determine the relative contributions of PrEP and improvements in the HIV Care Cascade to this decline.

Methods: We used a population-level, deterministic compartmental model of HIV transmission in GBM in Victoria calibrated to HIV notifications. We modelled four scenarios of PrEP uptake and improvements in key HIV Care Cascade indicators (HIV treatment uptake and virological suppression) including a status quo scenario (PrEP use and HIV Care Cascade levels taken from national reports) (Table). The annual number of HIV diagnoses and HIV incident infections from 2010 to 2019 were projected for each scenario. Each of the three counterfactual scenarios is described in the Table.

Results: Compared to the pre-PrEPX period, the number of HIV infections post-PrEPX declined 21.8% in scenario 1 (status quo), and increased by 11.2%, 18.9% and 63.7% in scenarios 2-4, respectively. The number of infections in scenario 1 was 278 less than in scenario 2 (relative reduction of 32.3% due to PrEP). The number of infections in scenario 1 was 342 less than in scenario 3 (relative reduction of 37.0% due to improvements in the HIV Care Cascade). The number of infections in scenario 1 was 740 less than in scenario 4 (relative reduction of 55.9% due to PrEP and improvements in the HIV Care Cascade combined), (Table).

	Projected number of incident HIV infections 2014-2016	Projected number of incident HIV infections 2017-2019	% Change: 3 years-post PrEPX (intervention) vs 3-years pre-PrEPX (control)	Estimated number of additional HIV infections during intervention period (2017-2019) in each counterfactual scenario vs status quo	Estimated relative increase in HIV infections during intervention period (2017-2019) in each counterfactual scenario vs status quo
Scenario 1: Status quo	746	583	-21.8%		
Scenario 2: No PrEPX or PBS PrEP uptake	774	861	11.2%	278	32.3%
Scenario 3: No improvement in HIV Care Cascade from 2015 onward	778	925	18.9%	342	37.0%
Scenario 4: No PrEPX or PBS PrEP uptake and no improvement in HIV Care Cascade from 2015 onward	808	1323	63.7%	740	55.9%

Conclusions: PrEP and improvements in HIV Care Cascade indicators each contributed an estimated one-third decline in incident HIV infections during 2017-2019 in Victoria, Australia. These findings emphasise the importance of combination biomedical HIV prevention strategies to reduce incident HIV infections.



TUPEC02

Implementing cervical cancer screening tools to identify serotypes of human papillomavirus (HPV) among women living with HIV, Cuilapa Guatemala 2022

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Background: Low- and middle-income countries (LMICs) have the highest rate of cervical cancer incidence and mortality. Women living with HIV have a six-fold increased risk of cervical cancer compared with women without HIV by acquiring human papillomavirus (HPV). Guatemala has a cervical cancer prevalence of 17%. Yet the Ministry of Health has limited access to screening tools and reagents for risk assessment of cervical cancer.

IntraHealth International's USAID-funded HIV Care and Treatment Project supports eight HIV clinics in Guatemala, providing integrated services including sexual reproductive health services to women living with HIV.

Description: The Project and another NGOs joined interventions to identify Guatemalan women at risk of cervical cancer. In 2022, one Project-supported HIV clinic (Cuilapa) screened 69 women between the ages of 25–49 for cervical cancer.

The Project provided programmatic assistance, subsidized travel costs, and followed-up on patient results in order to ensure timely interventions. Screening was performed using GeneXpert testing and strain identification to categorize women according to cancer risk.

Among the 55% with a HPV-DNA result (35/69), follow-up was performed using colposcopy and biopsy of cancer lesions. Of those 35 women, 6% were diagnosed with cancer (2/35) and received additional treatment at referral facilities.

Age Group	# screened	Total VPH DNA n(%)	HPV16 n(%)	HPV18 n(%)	Other high-risk	Colposcopy	Invasive Cancer
25 - 29	16	10(63%)	3(19%)	0	7(44%)	10	0
30 - 34	11	8 (73%)	4(36%)	0	6(55%)	8	0
35 - 39	10	6(60%)	2(20%)	0	4(40%)	6	0
40 - 44	15	4(27%)	1(7%)	1(7%)	3(20%)	4	0
45 - 49	17	10 (59%)	2(12%)	3(18%)	8(47%)	10	2(6%)
Total	69	35(55%)	12(17%)	4(6%)	28(41%)	35	2(6%)

Table. Cervical cancer screening of women living with HIV, Hospital Regional de Cuilapa, Guatemala 2022.

Lessons learned: We learned that inter-institutional coordination for the implementation of preventive tools is key to reduce comorbidities in people living with HIV, identifying type and population. This served as a milestone for new preventive strategies for women in Guatemala.

Conclusions/Next steps: We successfully integrated a cervical cancer screening program into routine HIV care at a HIV care center in Guatemala using HPV DNA testing. We observed high screening yield with a preponderance

of non-16 or 18 HPV types. Screening in Guatemala should be linked to treatment, focused on younger women and those with more advanced immunosuppression.

TUPEC03

Adoption of the *Malkia Klabu* prevention intervention in Tanzania for young women: distribution of HIV self-test kits and contraceptives at girl-friendly drug shops

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Background: In a cluster-randomized trial (NCT05357144), we are evaluating the effectiveness of *Malkia Klabu* ("Queen's Club"), a youth-centered intervention in Tanzania delivering HIV self-test (HIVST) kits and sexual and reproductive health (SRH) products to adolescent girls and young women (AGYW) through girl-friendly drug shops. At *Malkia Klabu* shops, AGYW can join a customer loyalty program to get free SRH products and earn punches for other shop purchases, redeemable for small prizes. We analyzed product distribution to assess initial adoption of the scaled intervention.

Methods: We examined 6 months of electronic sales data to female patrons (age 15–24) from 72 shops in the Shinyanga Region. We assessed time trends and heterogeneity across shops in the distribution of:

- SRH study products (HIVST kits, oral and emergency contraception, condoms, pregnancy tests) between arms, and;
- Membership cards and prizes among intervention shops. Control shops also distribute free HIVST kits to AGYW but sell other SRH products as per usual.

Results: From July 2022–January 2023, intervention shops (N=37) distributed 8,114 SRH products and HIVST kits to AGYW compared to 2,538 from control (N=35) shops. Intervention shops distributed more condoms (1648 vs. 100), emergency contraception (837 vs. 2), oral contraceptives (1487 vs. 37), and pregnancy tests (1653 vs. 193) than control shops. Distribution of HIVST kits in intervention shops was initially more rapid than among controls, but converged by 6 months (2489 vs. 2206).

Mean monthly products distributed per shop varied widely, with many intervention shops achieving several fold increases in customer transactions over their control counterparts.

At intervention shops, 2,255 AGYW joined *Malkia Klabu* (median 66 per shop; IQR=36–88), engaging in 8,221 transactions (median 159 per shop; IQR=80–380).

Conclusions: HIVST kit distribution rapidly increased in both arms, while substantially more SRH products were distributed among *Malkia Klabu* shops. These differences



largely accord with price differentials (free HIVST kits in both arms, only free contraceptives in the intervention arm), underscoring AGYW's price sensitivities.

Monitoring the trajectory of HIVST kit distribution through 24 months of the trial will determine to what extent *Mal-ika Klabu* may additionally appeal to AGYW beyond lowering cost barriers.

TUPEC04

Prevalence of sexually transmitted infections and bacterial vaginosis in South African adolescent girls and adult women at high risk of HIV acquisition

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Background: Young South African adolescent girls and young women (AGYW) are at a higher risk for HIV infection than older women. Sexually transmitted infections (STIs) and bacterial vaginosis (BV) have been associated with increased inflammation in the female genital tract (FGT), which in turn increases HIV susceptibility.

The aim of this study was to compare the prevalence of STIs/BV in AGYW versus older South African women, as well as associated risk factors, to understand the high rates of HIV infection seen in young women in this setting.

Methods: Vaginal swabs were collected from 106 AGYW (14-19 years old) and 51 older women (25-35 years old) in Cape Town, South Africa, enrolled in our National Institutes of Health funded Mucosal Injury from Sexual Contact study. Swabs were tested for STIs, *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG) and *Trichomonas vaginalis* (TV) by real-time PCR.

Vaginal smears were Gram-stained for BV diagnosis by Nugent scoring.

Results: CT was the most prevalent STI (37.6%), followed by NG (12.1%) and TV (10.2%). CT and NG prevalence was higher in AGYW than in 25-35-year-olds (51.9% versus 23.5% and 15.1% versus 3.9%, $p=0.0008$ and $p=0.0396$, respectively).

A total of 47% had BV, while 14% had intermediate microbiota and 39% were BV negative. BV prevalence was similar between AGYW (46.4%, $n=97$) and older women (48.9%, $n=47$), however, the vaginal pH of older women was lower than AGYW ($p=0.0101$).

NG positive women reported significantly fewer vaginal sexual acts in the preceding month than those who tested negative ($p=0.0009$).

Nugent score correlated positively and vaginal pH correlated negatively with the number of reported vaginal sexual acts ($\rho=0.1903$, $p=0.0209$ and $\rho=-0.2286$, $p=0.0236$, respectively).

The proportion of AGYW (57.6%) who reported male condom use was similar to older women (51.0%). In addition, the majority of STI/BV cases were asymptomatic.

Conclusions: STIs/BV prevalence is high among young South African women, with CT and NG particularly prevalent in AGYW compared to older women, potentially increasing the risk for HIV acquisition. Strategies such as point-of-care screening for FGT inflammation and STI/BV, as well as pre-exposure prophylaxis are urgently needed to reduce HIV susceptibility in this population.

TUPEC05

Medroxyprogesterone acetate and levonorgestrel levels are positively correlated with immune mediators

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Background: The injectable depo-medroxyprogesterone acetate (DMPA-IM) is the most popular form of hormonal contraception among South African women, while the levonorgestrel (LNG) implant is gaining popularity. Pharmacokinetic studies show that medroxyprogesterone acetate (MPA) and LNG levels vary among individuals using these methods. Little is known about the impact of hormone levels on immune mediators previously linked to sexually transmitted infection (STI) and HIV risk in the female genital tract (FGT).



Methods: We randomly assigned 160 South African women to DMPA-IM, copper intrauterine device (IUD), or LNG implant in the Evidence for Contraceptive Options and HIV Outcomes (ECHO) trial.

Eleven cytokines and antimicrobial peptides were measured in vaginal swabs in duplicate using Luminex and ELISA at baseline, one (M1) and three months (M3) following contraceptive initiation. Systemic concentrations of estradiol, progesterone, MPA and LNG were measured in serum samples using liquid chromatography-mass spectrometry at each timepoint.

Changes in systemic hormone levels over time for each arm were assessed using Mann-Whitney U test; and associations between serum hormone levels and vaginal immune mediator concentrations using Spearman correlations.

Results: At baseline, serum hormone levels were similar across arms. Younger women (age 15-24) had higher levels of progesterone ($p=0.012$) compared to older women (age ≥ 25). Estradiol levels were higher in copper IUD users compared to women using DMPA-IM at M1 ($p=0.0380$) and both estradiol and progesterone levels were higher in copper IUD users at M3 compared to women using DMPA-IM ($p=0.006$ and $p=0.010$, respectively) and the LNG implant ($p=0.001$ and $p=0.010$, respectively).

MPA levels in DMPA-IM users positively correlated with IL-6 ($p=0.040$) and fold changes in IL-8 ($p=0.040$), MIP-1 α ($p=0.003$) and MIP-3 α ($p=0.006$) at M1. In LNG implant users, LNG levels positively correlated with IL-6 ($p=0.045$), IL-1 β ($p=0.040$), IL-8 ($p=0.029$), MIP-1 α ($p=0.023$) and MIP-3 α ($p=0.030$) at M3. Progesterone levels were positively correlated with IL-6 ($p=0.013$) at M1 and IL-8 at M1 and M3 ($p=0.049$ and $p=0.046$, respectively) in the LNG implant arm.

Conclusions: MPA and LNG levels at M1 and M3 positively correlated with immune mediators in their respective arms, suggesting that individual-level metabolism of these contraceptive steroids may differentially influence immune profiles associated with HIV acquisition risk.

TUPEC06

High prevalence rates of chlamydia and gonorrhea among adolescent men who have sex with men (AMSM) and transgender women (ATGW) enrolled in a PrEP cohort in Salvador, Northeast Brazil

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Background: *Neisseria gonorrhoeae* (NG) and *Chlamydia trachomatis* (CT) are among the sexually transmitted infections (STIs) with high rates worldwide. These infections disproportionately affect AMSM and ATGW. This population's prevalence rates by anatomical site, sociodemographic and behavioral data (SBD) are scarce in Brazil and elsewhere.

Methods: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study of AMSM and ATGW aged 15-19. For this analysis, we included 246 adolescents who enrolled in PrEP1519 between April 2019-February 2021 in the city of Salvador, Northeast Brazil. They were tested for NG and CT by qPCR using swabs collected from oral, anal, and urethral anatomical sites. We assessed the association between SBD and the prevalence of STIs by Pearson's chi-squared test or Fisher's exact test. Poisson regression with robust variance was used to estimate the adjusted prevalence ratio (PR) and 95% confidence interval (95%CI).

Results: The prevalence of STIs by anatomical site is summarized below:

STI	Any site		Oral (n=245)		Anal (n=210)		Urethral (n=213)	
	n (%)	95%CI	n (%)	95%CI	n (%)	95%CI	n (%)	95%CI
N. gonorrhoeae	37 (17.9)	13.21-23.74	23 (9.4)	6.31-13.76	16 (7.6)	4.71-12.11	4 (1.9)	0.70-4.92
C. trachomatis	12 (5.9)	3.36-10.10	3 (1.2)	0.39-3.75	5 (2.4)	0.99-5.62	4 (1.9)	0.70-4.92
Coinfection	1 (0.5)	0.06-3.47	-	-	1 (0.5)	0.06-3.47	-	-

Table. Prevalence of *N. gonorrhoeae* and *C. trachomatis*. PrEP1519, Northeast Brazil, 2019-2021

Factors associated with NG was a lower level of schooling (PR=2.08; 95%CI 1.07-4.04) and engaging in receptive anal sex in the last three months (PR=2.45; 95%CI 0.91-6.65). Condomless oral sex in the previous three months was associated with CT (PR=3.75; 95%CI 1.28-11.00) and lower level of schooling (PR=3.00; 95%CI 0.90-9.98), but the 95%CI was wide and imprecise.

Conclusions: We found a high prevalence of NG and CT acquisition among AMSM and ATGW, especially in extra-genital sites. These findings highlight the need for test-



ing in multiple anatomical sites among HIV-vulnerable populations. The association between education, receptive anal sex and condomless oral sex with STIs expresses the role social and behavioral factors play in the greater vulnerability of MSM and ATGW to these infections.

Therefore, inclusive and comprehensive sexual health and behavior counseling tailored for these populations, especially those who are more willing to engage in riskier sexual practices, could further improve HIV and STI prevention and care.

TUPEC07

Just how far off target are we? Measuring unmet pre-exposure prophylaxis (PrEP) need among men who have sex with men (MSM) and transgender women (TGW) in Asia

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Background: Despite recent efforts to expand oral pre-exposure prophylaxis (PrEP) access in Asia, uptake has lagged significantly behind the regional 2025 target, with only 3% of the 4 million goal achieved.

We aimed to measure unmet PrEP need among men who have sex with men (MSM) and transgender women (TGW) in Asia to inform scale-up strategies.

Methods: We implemented an online cross-sectional survey among MSM and TGW across 15 and 11 countries or territories in Asia, respectively, from May to November 2022. Participants were asked about potential HIV risk, PrEP use history, and PrEP product and service preferences. We defined unmet PrEP need as those who had:

1. Heard of and wanted to take PrEP but had never taken it;
2. Never heard of PrEP but had HIV risk factors indicating need;
3. Taken oral PrEP but preferred a different PrEP product (e.g., long-acting PrEP), or;
4. Had temporarily discontinued oral PrEP due to a barrier (side effects, not liking pills, cost) but still needed it.

We generated descriptive statistics and used multivariable logistic regression models to identify factors associated with unmet PrEP need.

Results: Among 17,032 MSM and 1,260 TGW surveyed, 10,195 (59.9%) MSM and 598 (47.5%) TGW were found to have unmet PrEP need:

1. 6,130 (60.1%) MSM and 202 (33.8%) TGW were PrEP-naïve but wanted to take it;
2. 1,368 (13.4%) MSM and 134 (22.4%) TGW were unaware of PrEP but reported risk factors indicative of need;
3. 2,004 (19.7%) MSM and 182 (30.4%) TGW were taking oral PrEP but preferred using a different product;
4. 693 (6.8%) MSM and 80 (13.4%) TGW had temporarily discontinued PrEP due to a barrier.

Knowing fewer people who took PrEP (aOR=1.85; 95%CI:1.72-2.00), condomless anal sex in past 6 months (aOR=1.64 95%CI:1.54-1.75), and younger age (aOR=1.02 95%CI:1.01-1.02) were positively associated with unmet PrEP need.

Conclusions: We identified substantial unmet PrEP need among MSM and TGW respondents, in the largest known regional study on PrEP in Asia. Urgent investment is needed to increase PrEP awareness and service access, accompanied by a wider selection of products, that best align with what TGW and MSM need and want.

TUPEC08

Accuracy of indirect adherence measures among adolescent men who have sex with men (aMSM) and transgender women (aTGW) in Brazil: a longitudinal analysis

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Background: Oral PrEP has been offered free of charge in the health services of the Brazilian National Health System since 2017. In 2022, the updated Brazilian PrEP guidelines included adolescents who are at high HIV risk. Adherence evaluation is crucial for monitoring PrEP users, and indirect measures are used during clinical follow-up. We aimed to assess the accuracy of indirect PrEP adherence measures using longitudinal data and drug concentrations in dried blood spots (DBS).

Methods: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study conducted with aMSM and aTGW aged 15-19. A diagnostic accuracy analysis was performed comparing a direct measure of adher-



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ence - tenofovir diphosphate (TFV-DP) concentrations in DBS- with three indirect measures: medication possession ratio (MPR), pill count, and self-report. Generalized estimating equations (GEE) were used to assess the accuracy of each indirect measure through the computation of the Area Under The Curve (AUC) and their 95% Confidence Interval (95%CI) using the ROC (Receiver Operating Characteristics) curve analysis.

We considered the repeated (longitudinal) measures for the same participants, and we used the reference of protective TFV-DP levels $\geq 800\text{fmol/punch}$ equivalent to 4 pills weekly or more. We also analyze the combination of different methods to assess adherence.

Results: We selected a sample of 302 DBS corresponding to 188 participants. Most were aMSM (78.7%), 18-19 years old (80.3%), and non-whites (72.9%). Matched data for MPR was 294, for self-report 274, and pill count 104. AUC was 0.59 (95%CI: 0.53 - 0.66) for MPR, 0.69 (95%CI: 0.58 - 0.80) for pill count, and 0.75 (95%CI: 0.69 - 0.81) for self-report.

We observed that the combination of the three methods for evaluating adherence yielded an AUC= 0.72 (95%CI: 0.62 - 0.83) and we obtained a better performance with MPR and self-report combined (AUC = 0.77; 95%CI: 0.70 - 0.83).

Conclusions: The three indirect measures discriminated participants with drug levels equivalent to four pills weekly at different time points, indicating that these are valuable methods for monitoring PrEP use. Using more than one indirect method for adherence yields better patient adherence information.

TUPEC09

A client-centered approach to eliminate mother-to-child transmission of HIV: outcomes from a large ART program in Kisumu County, Kenya

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Background: Elimination of Mother-to-Child Transmission of HIV remains a global health priority. In a large ART program in western Kenya, we introduced several novel prevention of mother-to-child transmission (PMTCT) interventions to identify and support pregnant and breastfeeding women living with HIV. Here we report key outcomes before and after the introduction of these interventions.

Methods: Between October 2016-September 2021, Family AIDS Care & Education Services (FACES), provided PMTCT services across 63 facilities in Kisumu County, Kenya. In 2019,

we implemented individualized client-centered PMTCT interventions in addition to standard of care. The interventions included:

1. Women considered at-risk of poor care engagement (e.g., adolescent mothers, unstable support system, prior history of a treatment interruption) attended visits on a designated day to enable multidisciplinary team review of cases and social networking for teens,
2. Case management for 1:1 psychosocial support and close monitoring; and,
3. Mobile app-based module to facilitate adherence support and mother-baby pair tracking.

We conducted pre-post analyses of PMTCT outcomes before the intervention (Oct 2016- Sep 2018) versus after (Oct 2020-Sep 2021). These included ART initiation, virologic suppression, and infant outcomes following the end of breastfeeding (HIV acquisition by 18 months of age, death, loss to follow-up, or transferred out).

Results: Among 81,740 pregnant women who attended ANC at FACES-supported clinics in Kisumu County between October 2016 and September 2021, HIV prevalence was 16% with little variation over time. The proportion receiving ART during pregnancy increased from 82.4% in 2017 to 99.4% in 2021 ($p<0.001$).

Similarly, the proportion achieving viral suppression increased from 63.5% to 97.2% during pregnancy and 74.0% to 97.3% during breastfeeding (both $p<0.001$). Consequently, perinatal transmission by 18 months of follow-up declined from 5.7% (100/1752) to 2.2% (48/2156) ($p<0.001$). Moreover, loss to follow-up declined from 12% (268/2332) to 2.5% (59/2393; $p<0.001$) while the proportion who transferred out declined from 9.5% (212/2332) to 7.4% (178/2393; $p<0.02$).

Conclusions: Following the implementation of novel client-centered interventions, we observed clinically significant declines in MTCT and loss to follow-up of pregnant and postpartum women on ART. Tailored, client-centered approaches to PMTCT are essential for the achievement of elimination targets.

TUPEC10

Adolescent PrEP initiation at clinics participating in a randomized trial of a standardized client actor training intervention in Kisumu, Kenya

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Background: Adolescent girls and young women (AGYW) in Kenya experience high risk of HIV acquisition. AGYW have low PrEP initiation rates due, in part, to stigmatizing interactions with healthcare providers. Our recent randomized trial of a standardized client actor (SC) training intervention for AGYW providers found higher quality of

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PrEP service delivery at intervention sites. However, it was unknown whether higher quality care improved AGYW PrEP initiation.

Methods: This secondary analysis of the Priya-SP cluster randomized trial used routine clinic data from 12 control and 12 intervention health facilities in western Kenya. The intervention aimed to improve health provider adherence to Kenyan national guidelines and communication skills when offering PrEP to AGYW. Record sources included the MoH 731 Plus tool (and its older iterations) and facility-level PrEP registers from May 2019-June 2021.

Mirroring trial timelines, we defined May-December 2019 as the baseline period and December 2020-June 2021 as the post-intervention outcome assessment period.

We analyzed data at the facility level and used linear regression with percent initiating as the outcome, intervention and baseline initiation rates as covariates, and the number eligible during post-intervention at each facility as frequency weights.

Results: In total, 1,375 PrEP-eligible AGYW presented to PriYA-SP sites and were included in this analysis (baseline: n=706, post-intervention: n=669). Among 706 PrEP-eligible AGYW in the baseline period, 441 were at intervention sites and 265 at control sites. Overall, 410 (58.3%) initiated PrEP at baseline: n=203 (46.0%) at intervention sites and n=207 (78.1%) at control sites. Among 669 PrEP-eligible AGYW in the post-intervention period, 360 were at intervention sites and 309 at control sites.

Overall, 591 AGYW (88.3%) initiated PrEP at post-intervention: n=335 (93.9%) at intervention sites and n=256 (82.8%) at control sites. Adjusted for baseline initiation proportions, there was 12.1% higher PrEP initiation among AGYW presenting to intervention sites compared to control sites ($p < 0.001$, 95% Confidence Interval: 0.09-0.15).

Conclusions: Our study found a significant improvement in PrEP initiation among AGYW who presented to facilities that had been randomized to SC training. SC training interventions that improve quality of service delivery could lead to enhanced PrEP coverage.

TUPEC11

Implementation of Community-based HIV-Self-Testing (CB-HIVST) to improve awareness on HIV exposure: lessons learned and implications for the National AIDS Control Program of the Haitian Ministry of Health

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Background: In Haiti, HIV blood test was for decades the only way to objectively determine someone's exposure to HIV. Given the testing requirements, the burden of stigma and fear of needles, many individuals were left out. However, through the lens of health equity, HIV self-testing

(HIVST), which is an oral test was introduced in community settings (CB-HIVST) to help fill the gaps in HIV testing services (HTS).

Description: In January 2019 we collaborated with the National AIDS Control Program of the Ministry of Health to develop HIVST guidelines, data reporting tools and training package. We designed an HIVST assessment tool to identify high-risk eligible individuals. We conducted training sessions for community health workers in collaboration with the National Public Health Laboratory to ensure that CHWs accurately assist eligible clients perform the HIVST, interpret the results and advise them on follow-up. Anyone with reactive HIVST received assistance to freely access HIV-blood test to confirm HIV status at a facility of their choice.

We conducted community-based sensitization sessions targeting priority populations: male/sex workers/public transportation drivers/migrants/homeless/pregnant women without prenatal-care. We partnered with faith-based leaders and offered HIVST at Voodoo temples/Churches. We participated in interviews to disseminate knowledge about the value/limitations of HIVST.

Lessons learned: The integration of CB-HIVST into the prevention package has helped people become aware of potential HIV-exposure and confirm their HIV-status in stigma-free and confidential environment.

In FY22 (October 2021 - September 2022), 6834 HIVST were performed with assistance including 45% (3087/6834) females and 55% (3747/6834) males. Seven percent [7% (492/6834)] of HIVST performed were reactive from which 60% (298/492) females.

Overall, the data reported higher HIVST reactivity among females (10%, N=298) than males (5%, N=194). Eighty-eight percent [88% (434/492)] of HIVST reactive clients accepted the standard HIV-blood test, 84% (363/434) were confirmed HIV-positive from which 99% (360/363) initiated ART.

Despite being a screening oral-test, targeted HIVST outreach approach increased individuals access to comprehensive healthcare by addressing major barriers: transportation fees, waiting time, stigma, blood test.

Conclusions/Next steps: CB-HIVST has helped bring services to individuals unaware of HIV-exposure. That strategy is relevant to reaching the 95-95-95-UNAIDS goals and needs to be readily available at all of our borders crossing points and in more rural areas nationwide.



TUPEC12

Using the young people and adolescent peer supporters (YAPS) model as a mechanism to decentralize HIV testing services and enhance linkage among adolescents and young people in Uganda

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Background: In Uganda, progress across 95 95 95 treatment cascade for adolescents and young people (10-24) lags behind adults. By December 2019, 66% of adolescents and young people (10-24) knew their HIV status, 66% were on antiretroviral treatment (ART) and viral load suppression was 77%. This was largely attributed to absence of a differentiated peer led approach for adolescents and young people. The ministry of Health (MOH) adapted the Zvandiri CATS Model from Zimbabwe into the Young People and Adolescent Peer Supporter (YAPS) model for Uganda. This was premised on World Health Organization guidelines on Adolescents. This started as a pilot in 9 districts later scaled to 81 districts. Between July 2019-March 2020, 50% of Adolescents and Young Persons (AYPs) who received pre-test counselling by YAPS did not receive an HIV test. This created missed opportunities for identification of Adolescents and Young People Living with HIV (AYPLHIV).

Description: MOH decentralized HIV Testing Services (HTS) using YAPS model by reviewing National HIV testing policy to include YAPS as key service providers to screen, test and link AYPs into care. Extensive Consultations were conducted by MOH to collect views that informed policy.

MOH developed HTS training manual for YAPS. Training of Trainers for 30 National YAPS resource persons was conducted. MOH piloted training of the YAPS as HTS lay testers for 5 days in the 9 pilot districts with high HIV burden among adolescents 10-24 Years.

Training topics included promoting HIV testing among adolescents, HIV Self Testing among adolescents, counselling in the context of HIV testing, Linkage to care and Assisted Partner notification. Regular mentorships and support supervision were also conducted by the ministry.

Lessons learned: By March 2022 AYPs tested for HIV by YAPS was 57,215 compared to 68,213 in 2020 march. HIV positivity yield was at 2,14% compared to 1.48% in 2019, AYPs initiated into care increased from 79% in 2020 to 94% in 2022 and Linkage increased from 93% in 2020 to 95% in 2022.

Conclusions/Next steps: The YAPS model when scaled up can be utilized as an approach for decentralizing HTS and contribute to closing the gap on the 1st 95.

TUPEC13

Promoting uptake of HIV self-testing (HIVST) in the private sector through conceptual bundling: a practice of advertising HIVST along with Sexual and Reproductive Health products in Abuja, Nigeria

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Background: In Nigeria, HIV self-testing (HIVST) is still at its nascent stage with low-awareness, demand, and uptake in the private sector. Conceptual bundling is the practice of introducing additional product to an existing customer as a single package of offer. It is a common practice in the private sector such as community pharmacies and patent proprietary medicine vendor (PPMV) outlets.

To improve the uptake of HIVST in Nigeria, we implemented conceptual bundling of HIVST with sexual and reproductive health (SRH) self-care products.

Description: The Strengthening HIVST in the Private Sector (SHIPS) Project from April – December 2022 piloted implementation of conceptual bundling strategy using SRH products to promote sales of HIVST as additional benefits for potential clients in Abuja, Nigeria. 66 community pharmacies were selected based on the following: membership with pharmacy council of Nigeria, willingness to stock HIVST, and willingness to promote conceptual bundling. We accessed product uptake for SRH commodities, and HIVST product independently, and both products together as a bundle.

Lessons learned: For the period of implementation, only 7 bundled products were sold (3 HIVST kits with condom and 4 HIVST kits with emergency contraceptives). However, when products were sold independently as either HIVST or SRH, high number of sales were recorded: HIVST (1,974), condoms (172,057), Emergency contraceptives (67,905), and lubricants (10,580).

60% of providers were unwilling to promote conceptual bundling. Providers reported reasons such as low risk perception of client to HIV, stigma, and cost of HIVST. However, 95% of providers reported that clients will be interested to purchase HIVST with another SRH product if physically packaged together, and at a reduced price.

Additionally, 80% of pharmacies reported that conceptual bundling helped to increase awareness on HIVST among SRH products users.

Conclusions/Next steps: While conceptual bundling helped to improve awareness on HIVST among SRH products users, it failed to promote uptake of HIVST. A physical packaging of HIVST and SRH products together with a price reduction is encouraged to improve uptake of HIVST.



TUPEC14

Secondary distribution of HIV self-test kits from males to their female sexual partners in two fishing communities in rural Uganda: results from the PEST4MEN pilot study

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Background: Secondary distribution of HIV self-test kits from females to males has increased HIV testing rates in men in most settings but little evidence exists on the potential for secondary HIV self-test kits distribution from males to females.

We assessed the acceptability of secondary HIV self-test kits distribution from the male fisherfolk to their female sexual partners in a fishing community context.

Methods: This analysis used data from the **PEer-led HIV Self-Testing intervention for MEN** (PEST4MEN), an ongoing pilot intervention in Buvuma and Kalangala island districts in central Uganda. At the baseline visit (July 2022), data were collected from 400 male fisherfolk (15+ years) who self-reported a HIV-negative or unknown HIV status and had not tested for HIV 3+ months prior to enrolment. After enrolment, men were requested to obtain two oral HIV self-test kits from a male distributor in the community. At the first follow-up visit (September 2022), men were asked about the number of kits that they received, if they gave out any kits to anyone, and, if they did, whether or not those who received them self-tested for HIV. Data were analyzed using STATA version 16.0.

Results: Of 361 men interviewed at follow-up, 98.3% (355) received at least one kit; 79.7% (283) received two kits. Of those that received two kits, 88.0% (181) gave the second kit to someone else; almost all recipients (97.8%, n=177) accepted the kits.

Seventy-five per cent of the men (74.6%, 132/177) gave the second kit to their primary/steady or other female sexual partners. Eighty-three per cent (147/177) reported that the person that they gave the second kit to used it to self-test for HIV. Of these, 8.2% (12/147) reportedly tested HIV-positive; among female sexual partners, 5.3% (7/132) tested HIV-positive. Only 33.3% (4/12) of the HIV-positive self-testers reportedly linked to HIV care.

Conclusions: Secondary distribution of HIV self-test kits from males to their female sexual partners was well accepted and identified a significant proportion of HIV-positive self-testers. However, linkage to HIV care was sub-optimal, calling for innovative approaches to improve linkage to HIV care following secondary HIV self-test distribution in this setting.

TUPEC15

Addressing HIV testing gaps in Zimbabwe in the midst of health system and socioeconomic stressors

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Background: Zimbabwe has achieved 96/96/93 against UNAIDS three 95 benchmarks. Communicable disease outbreaks and socioeconomic strain have resulted in high levels of health care worker attrition, challenging the HIV program's achievements and progress.

PEPFAR/Zimbabwe supports >90% of the national HIV treatment cohort, and has an overarching goal to support the government to end HIV/AIDS as a public health threat by 2030. PEPFAR/Zimbabwe's HIV testing services (HTS) are focused on closing the testing gaps and supporting timely linkage to prevention and treatment services. The largest HIV case finding gaps exist among children and key populations.

Description: PEPFAR/Zimbabwe collaborated with the Ministry of Health and Child Care, Global Fund, and implementing partners to support facility- and community-based HTS.

From October 2021 - September 2022 (fiscal year [FY]22), the program directly supported 17 testing modalities in facilities and communities, including modalities where HTS is routinely recommended (e.g., PMTCT and tuberculosis [TB] service delivery points).

Targeted community testing and HIV self-test distribution helped decentralize HIV testing services. Mentoring and direct technical support was provided.

Lessons learned: From PEPFAR/Zimbabwe data, the program achieved 99% (67,195/67,777) of the FY22 case-finding target; 57% of these achievements were from women 15-49 years old. Provider-initiated HIV testing and counseling services drove case-finding (45% contribution).

The highest testing positivity was in community index testing and TB clinics (33% and 29%, respectively). 99.6% of pregnant women had a known HIV status at their first antenatal care appointment (including women who knew their status prior to the visit), and 93% of individuals with new or relapsed TB had a documented HIV status during the reporting period. 389,012 HIV self-tests were distributed in FY22; 40% were distributed to adults 20 - 29 years old. The program's estimated linkage to treatment was 96% (64,289/67,195).

Additionally, 75,371 individuals initiated HIV pre-exposure prophylaxis and 134,668 males received voluntary medical male circumcision



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Conclusions/Next steps: Zimbabwe continues to overcome challenges and is positioned to sustain HIV epidemic control through concerted efforts to achieve annual case finding targets and support linkage to treatment and prevention services. Additional effort is required to maximize HTS in TB clinics and linkage to treatment services.

TUPEC16

HIV self-testing in real-world use, a tool to end HIV in Thailand

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Background: Although the use of HIV self-tests (HIVST) is a key strategy fully endorsed by the National AIDS Committee to end AIDS in Thailand, progress towards its wide-scale implementation has been extremely slow.

We aimed to investigate the uptake, reactive testing yield, and linkages to antiretroviral treatment (ART) and PrEP of a real-world online HIVST service in Bangkok.

Methods: In May 2022, with the support from USAID Epic program, Pribta-Tangerine Clinic – a private sexual health clinic in Bangkok, Thailand, distributed free blood-based HIVST kits.

Online demand creation began one month before service availability, linking potential clients to clinic staff for risk assessment through telehealth.

Clients received an HIVST via mail, and were able to submit their result to the clinic electronically.

Clients with non-reactive results were offered PrEP, those with reactive results were linked to confirmatory testing. Same-day ART initiation was offered to those with confirmed HIV-positive status.

Results: From May–November 2022, the clinic distributed HIVST kits to 320 clients, 106 (33.1%) were first-time HIV testers. Test results were submitted by 251 (78.4%) clients, of which 18 were reactive.

Of these, 11 were confirmed positive and all initiated same-day ART, three were negative upon confirmation testing, and four did not confirm their result.

Overall confirmed HIV-positive rate was 4.4%. Among 233 non-reactive clients, 41 (17.6%) accepted PrEP services and 27 (11.6%) received sexually transmitted infection (STI) screening. Among 77 first-time HIV testers with returned results, 3 (3.9%) were confirmed positive (Figure 1).

Conclusions: HIVST delivered through telehealth successfully engaged clients with HIV in treatment, including those who never had an HIV-test before. Furthermore, non-reactive clients who otherwise might not enter prevention services, were linked to PrEP and STI services. Scale-up of this online HIVST service model is needed to optimize its potential in ending HIV in Thailand.

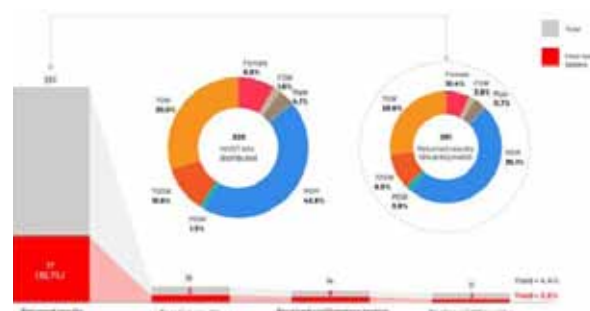


Figure 1. HIVST results returning from the clients.

TUPEC17

HIV self-testing education on TikTok: a content analysis

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Background: In 2016, the World Health Organization officially recommended HIV self-testing (HIVST) to promote privacy and encourage more people to test for their HIV status. Despite the availability of this service, there are more than 5.4 million people living with HIV who don't know their status. With over 990 million users, TikTok is a platform that has been used to educate and promote HIVST. Hence, this study conducted content analysis of HIVST education videos on TikTok.

Methods: We searched for videos on TikTok using keywords such as 'HIV self-testing', 'HIV', among others. This search was conducted between the 24th December 2022 and 5th January, 2023. Videos in languages other than the English language were not eligible for this study.

We extracted the basic information of each included video, including the URL, release date, uploader's type (individual or organization), source, diagnostic specimen, country, self-kit name, and views. The Medical Quality Video Evaluation Tool (MQ-VET) was used to evaluate the content of the videos.

Results: We extracted 108 videos that were uploaded between October 2020 and January 2023. Out of these videos, 78 videos met our inclusion criteria. Most of the videos (78.2%) provided information mainly on how to use the HIVST kit, while 21.4% of the videos also provided awareness of HIV and HIV symptoms, debunked myths and misconceptions about HIV, and fought stigmatization in addition to HIVST education. The sources of the videos were: TikTok influencers (47%), healthcare professionals (10%), non-governmental organizations (7%), the Ministry of Health (1%), PLWHIV, and persons on ART (6%). The mean MQ-VET scores for the videos were 42.38 ± 16.37 .

Conclusions: This study revealed that non-governmental organizations and healthcare professionals who have sound knowledge, expertise, and understanding of HIVST



were not actively involved in the dissemination of HIVST education on TikTok. Therefore, this widely used platform should be leveraged by experts in partnership with influencers to push accurate and simplified information on HIV self testing.

TUPEC18

Empowering adolescent school girls with SKILLZ: 6-month follow-up results from a cluster randomized trial in Lusaka, Zambia

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Background: Adolescent girls are disproportionately at high risk for HIV and unintended pregnancy, which lead many to drop out of school. Effective interventions to address risky sexual behavior and increase their uptake of HIV and contraceptives are urgently needed.

Methods: In a cluster-randomized controlled trial across 46 schools in Lusaka, Zambia, we evaluate the impact of SKILLZ, a peer-led demand generating sports-based program for empowering adolescent girls, implemented by Grassroot Soccer. SKILLZ consists of:

- 12 after school sessions of comprehensive sexuality and sexual and reproductive health (SRH) education delivered by trained young adult mentors ("Coaches"),
- a large community "graduation" soccer event where HIV testing and contraception are available, and;
- community-based distribution of HIV self-testing and contraceptives from Coaches and referrals to youth-friendly clinic services as required. We randomly sampled 2,154 Grade 11 girls from school rosters and surveyed them at baseline (March – December 2021), 6, and 12 months to measure self-reported SRH knowledge and uptake of HIV/SRH products and services.

We estimated linear difference-in-difference models on our primary outcomes: uptake of HIV testing and any contraceptive method within the last 6 months. Further, we disaggregated contraceptive uptake by method, and examined impact on new adoption and discontinuation separately.

Results: About 90% of surveyed girls in treatment arm schools participated in SKILLZ, attending a mean of 6.59 (SE: 4.30) sessions. From a baseline of 37%, SKILLZ increased HIV testing by 27 percentage points (95% CI: 0.201, 0.340), increased new adoption of HIV testing by 20 percentage points (95% CI: 0.157, 0.251) and reduced testing discontinuation by 4 percentage points (95% CI: -0.066, -0.012). From 20% at baseline, SKILLZ increased contraception uptake by 12 percentage points (95% CI: 0.049, 0.195). New adoption of contraception increased by 7 percentage points (95% CI: 0.022, 0.118) and discontinuation decreased by 2 percentage points (95% CI: -0.035, -0.001).

Conclusions: SKILLZ substantially increased both uptake of HIV testing and contraception among adolescent girls at 6 months. Additional evaluation of behavior maintenance at 12 months and related implementation processes are underway, and will better characterize how holistic, integrated demand-and supply interventions may achieve meaningful change.

TUPEC19

HIV treatment outcomes among people who inject drugs: a global systematic review and meta-analysis

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Background: People who inject drugs (PWID) are frequently assumed to have worse HIV treatment outcomes than other population groups, but data on this has never been synthesised. We aimed to quantify HIV treatment outcomes (retention in care and viral suppression) among PWID globally and compare outcomes with other population groups (general population, men who have sex with men (MSM) and female sex workers (FSW)).

Methods: We searched MEDLINE, Embase, and PsycINFO databases for studies published between 01/01/2010 – 16/02/2021, that either assess:

1. Retention in care/on antiretroviral therapy (ART) for PWID on HIV treatment;
2. Levels of viral suppression for PWID on HIV treatment or PWID living with HIV, or
3. Effect measures for how these outcomes differ compared to other population groups.

We pooled outcome data using random-effects meta-analyses. Proportions retained in care/on ART were converted into a 12-month retention estimate, assuming an exponential retention decay. Proportions virally suppressed were converted to a <1000 copies/mL threshold, using a validated Weibull distribution model of viral loads in ART patients.



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Results: 133 studies met the inclusion criteria, with 116 and 36 studies having data on viral suppression and retention in care/on ART (26 studies presented data on both outcomes) from 35 and 15 countries, respectively.

Globally, about two-thirds of PWID were retained in care/on ART at 12 months (65.6%, 95% confidence interval [CI] 58.0-73.3%), with retention being significantly lower than for MSM (odds ratio [OR] 0.61, 95%CI 0.42-0.91; 20 studies), but not for FSW or the general population.

Globally, a third of PWID living with HIV (33.0%, 95%CI 30.0-36.1%) and half of those on ART (52.8%, 95%CI 46.2-59.3%) were virally suppressed.

Viral suppression among PWID living with HIV on ART was lower compared to general population (OR 0.57, 95%CI 0.50-0.64; 30 studies) and MSM (OR 0.50, 95%CI 0.43-0.59; 26 studies), as was viral suppression among PWID living with HIV (general population OR 0.61, 95%CI 0.49-0.76, 28 studies; MSM OR 0.56, 95%CI 0.47-0.67, 35 studies).

Conclusions: Retention in care/on ART and viral suppression among PWID are suboptimal and much lower than for other population groups. Focussed interventions are urgently required to improve HIV treatment outcomes among PWID.

TUPEC20

Long-term retention in HIV care up to six years following enrolment in prevention of mother-to-child transmission: a prospective cohort study among women living with HIV in Dar es Salaam, Tanzania

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Background: To prevent mother-to-child transmission of HIV (PMTCT) during pregnancy/breastfeeding and ensure healthy mothers and children, pregnant women with HIV must remain on antiretroviral treatment (ART) for life. However, motivation to remain on ART may decline beyond the PMTCT period.

We assessed retention in ART care among women with HIV up to 6 years after PMTCT enrolment in Dar es Salaam, Tanzania.

Methods: A cohort of 22,631 pregnant women with HIV were enrolled in PMTCT care between 01/01/2015 and 31/12/2017 and followed-up to 31/07/2021.

Data were extracted from national electronic routine HIV care database. Kaplan Meier was used to estimate time to ART attrition (death, stopped ART, or lost to follow-up [no show ≥90 days since scheduled appointment]) and the proportion retained in care.

Predictors of ART attrition were estimated using Cox regression.

Results: The median follow-up was 3 years (IQR 0.1-4). The number (proportions) of women retained were 13,819 (78%), 11,233 (69%), 9,787 (63%), 7,234 (60%), 3,723 (57%) and 1,036 (56%) at years 1, 2, 3, 4, 5 and 6, respectively.

The overall attrition rate (95% CI) per 100 person-years was 13.8 (13.5-14.1), highest in the first year at 27.1 (26.3-27.9), thereafter declining to 9.5 (8.9-10.1) in year three and 2.7 (2.1-3.5) in year six.

ART attrition was higher in women aged <20 years versus 30-39 years (adjusted HR 1.63, 95% CI 1.38-1.92), women enrolled in the third versus first trimester (1.29, 1.16-1.44), and women enrolled in 2017 versus 2015 (1.28, 1.13-1.46).

In contrast, attrition was lower in women ≥40 years (0.89, 0.79-1.00), women initiating ART before versus during the index pregnancy (0.71, 0.65-0.77) and women attending health centres versus dispensaries (0.81, 0.76-0.86).

Marital status, ART regimen, entry point at HIV diagnosis, or health facility ownership (public/private) had no significant association with retention.

Conclusions: ART attrition among women with HIV enrolled in lifelong ART remains highest in the first year of PMTCT enrolment, and declines markedly after completion of the standard 24-month PMTCT period.

Targeted interventions are needed to mitigate ART attrition throughout the continuum of care from PMTCT to chronic HIV care.

TUPEC21

Care to deliver: managing HIV care cascade among HIV positive pregnant women lead to improved outcomes- Results from Global Fund supported Ahana project in 13 states of India

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Background: Integration with vast Indian public health infrastructure witnessed HIV testing service expanded till the village level ensuring increased access to HIV testing services among pregnant women. With this there was increased identification of HIV positive pregnant women needed HIV treatment & C&S while care and support services was remotely available.

Ahana project supported by The Global Fund aims to ensure ART linkage & adherence and manage cascade towards EMTCT.

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Description: Four pronged customized strategy adopted to converge service access at a very large scale and with a peripheral access of HIV treatment- care and support services for HIV positive pregnant women

A. Integration and engagement with the public health facilities for new case finding,

B. Ensuring early testing and engaging ART centre to early linkage,

C. Formation of community support group of PPWs to promote self-care and ensure treatment adherence and EMTCT outcome,

D. Capacity building of general health system and information system convergence to streamline and to facilitate one national data reporting for EMTCT.

Lessons learned: Expansion in service access led to early HIV testing and resulted in identification of more than 18 thousand HIV positive pregnant women; linkage to ART services improved from 86% during 2016-17 to 99.7% during April-Dec, 22. Institutional deliveries among HIV positive pregnant women increased from 90% during 2016-17 to more than 94% in April-Dec, 23.

While linkages of HIV exposed infants with EID testing within 2 months improved from 55% during 2016-17 to 90% in April-Dec, 22, HIV testing among spouses of PPWs increased from 74% during 2018-19 to 97% during April-Dec, 22. HIV testing at 18 months confirmed that transmission has been averted among more than ten thousand HEIs.

Conclusions/Next steps: The above results suggest that large scale successful outreach is better achievable through a community-led intervention. Strengthening of capacities of the community groups leads improved outreach and quality sustainable service delivery in the community.

With communities across 307 districts in 13 states empowered and started providing the services at the village level, Ahana project demonstrate the roadmap for the EMTCT in India.

TUPEC22

The impact of mentor mothers psychosocial groups towards optimized PMTCT services uptake among HIV positive pregnant women attending ANC: experience from 10 regions of Tanzania

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Background: In Tanzania antenatal care (ANC) services are entry point for HIV testing and linkage to PMTCT services. Tanzania HIV impact survey of 2016-2017 shows that 98.7% of pregnant women attended ANC, 92.4% know their

HIV status at first ANC visit, 51.9% were newly initiated on Antiretroviral therapy (ART) during pregnancy and 46.1% were already on ART prior to pregnancy. Despite that significant progress has been made in scaling up PMTCT services to pregnant positive women attending ANC there is a need to strengthen community interventions to tackle the fears of social discrimination and stigma that prevent positive pregnant women accessing HIV treatment and adherence to ART for PMTCT.

Description: Amref Health Africa in collaboration with Christian Social Services CSSC under Global Fund is implementing a PMTCT program in 10 regions of Tanzania, the program initiated community model called Mentor Mother "Mama Kinara" aiming at reaching HIV positive pregnant women with PMTCT services information at community level through psychosocial support groups (PSSG).

Mama Kinara are HIV positive pregnant or breastfeeding women with strong adherence to ART trained on PMTCT services at community level, the program trained 692 Mama Kinara who facilitate linkage between community and facility and provide PMTCT services education through PSSG. In a group of 5-10 positive pregnant women, Mama Kinara provide ANC information, psychosocial support to improve partners status disclose confidence and reduce self-stigma and discrimination, educate on early maternal ART initiation, encourage ART adherence and retention to care.

Lessons learned: In a period of 2021 to 2022, A total of 172 psychosocial groups were formed by 1,681 PMTCT positive members. Among 179,454 attended ANC, 100% were newly tested for HIV where by 0.92% were tested HIV positive and 97% were newly initiated on ART.

Among those attended ANC 1,738 new their HIV status prior to pregnancy which make 98.9% of total HIV positive women on ART at first ANC.

Conclusions/Next steps: The government of Tanzania to ensure Mama Kinara model through psychosocial groups is adopted and scaled up in other remaining regions to ensure women utilize the platform for fully disclosure and elevate confidence levels of accessing PMTCT services.



Track D: Social and behavioural sciences

MOPED01

Application of information-motivation-behavioural skills (IMB) HIV prevention model on hepatitis B virus infection prevention among pregnant women in Central Uganda: a baseline for a comparative interventional study on HIV/HBV prevention

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Background: The ever-increasing impact of HIV infection on the natural history of hepatitis B virus infection (HBV) pathogenesis has drastically amplified the risk of liver-related morbidity and mortality, particularly in developing countries. However, despite the transmission potential and infectivity of HBV infection known to be more than 50 to 100 times that of HIV, efforts to tackle the lingering chronicity of HIV/HBV mono or co-morbidity in developing countries like Uganda need to focus on predictors of the often neglected health behaviours of vulnerable populations such as pregnant women that contribute overwhelmingly to the mother-to-child-transmission of both infections.

We employed information-motivation-behavioural skills diagnostic model to elucidate the dynamics of HBV prevention behaviors among pregnant women attending antenatal care in Central Uganda as a baseline for a comparative interventional study geared at reducing the burden of both infections and breaking the chain of materno-foetal transmission of the infections.

Methods: A baseline health facility-based cross-sectional study capturing quantitative data using the constructs of IMB model was conducted among 385 randomly selected expectant mothers between September and October 2020. From the pilot of the instrument, 7.8 and 8.4 scores for Cronbach's internal consistency and test-retest reliability coefficient were respectively obtained. Transformation into weighted aggregate scores was done for the derived data using SPSS version 26. The study hypotheses were ascertained with ANOVA and Linear regression analysis with ($p \leq 0.05$) level of significance

Results: The respondents' mean age was 25.69 (25.33 \pm 26.05). Predominantly, most had secondary education (42.3%, 95% CI= 37.31 \pm 47.41). In corroboration with IMB model of HIV prevention, all-round positive linear associations exist between the inadequacy of HBV-related information (5.97 \pm 6.61; $B=0.57$; $p<.001$), the moderate motivation (17.10 \pm 18.31; $B=0.97$; $p=.014$), the good behavioral skills (12.39 \pm 13.37; $B=0.56$; $p<.001$) towards preventive behaviours, and the underwhelming extent of prevention practices (15.03 \pm 16.20) demonstrated by the respondents.

Conclusions: The validity of the imperativeness of IMB model for HIV-like infectious disease is evident from this novel study. Therefore it has underscored the focus points

for the comparative interventional study to be built on promoting positive behaviours towards HIV/HBV and reducing the infection magnitude among obstetric populations in low-and middle-income countries.

MOPED02

Decoding HIV science – designing an experience-based gamified intervention to understand viral diversity and latency

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Background: In order to enhance equitable, reciprocal and sustained community participation in research, it is important that participants gain better understanding of not just the 'how' but also the 'why' behind HIV research. This enhanced sense of knowledge can motivate them to actively engage in and contribute to research. However, community conversations around HIV science are often prescriptive and jargon-laden, making them difficult to comprehend.

Towards this, experiential interventions to explain viral diversity and latency were co-created and piloted among key populations in India.

Methods: 8 co-design workshops between key community representatives and researchers, across geographies in India (Delhi, Kerala, Maharashtra), helped identify key messages to be communicated around HIV science and vaccine research.

Gamified interventions were co-created and piloted with 380 key community members in rural Maharashtra to enhance understanding of hidden viruses, need for regular testing (latency) and identification of common targets across diverse strains of HIV to develop effective vaccines (diversity, conserved epitopes).

The scientific quest was simulated using lab coats, coloured inks, droppers, forceps etc. Impact of the intervention was analysed through pre- and post-game questionnaires and community conversations.

Results: Community insights from the workshops revealed that the intervention should:

- Communicate complexities of science rather than HIV awareness;
- Be participatory and engaging by playing on participants' competitive spirit.

The pilot intervention, informed by the above, generated an overall positive response from the community.

- The Intrinsic playfulness and pleasantness drove likability with 72% and 76% participants enjoying the diversity and latency games respectively. They expressed feeling more confident to understand the science behind the research when explained through games;

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- 78% participants correctly answered questions around the scientific concepts conveyed through the games. Participants felt more appreciative of the complexities of the science and better equipped to understand their role in the research.

Conclusions: The use of gamification for meaningful and inclusive community engagement helps potential participants feel more involved and engaged in the research process.

Simulating the experience of stepping into the shoes of the scientists helped create an 'HIV competent Community' which empowered them to better understand and take ownership of their role in HIV prevention research.

MOPED03

Couple dynamics, risk perception and interest for a multipurpose prevention product for HIV and pregnancy prevention

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Background: Multipurpose Prevention Technologies (MPTs), also referred to as Dual Purpose Technologies (DPTs), are innovative products for HIV and Pregnancy prevention currently under development. Interest in MPTs may be influenced by the individual's or couple's HIV risk perception, as well as how couples relate to one another. The aim of this study was to explore couple dynamics, Risk perception and their influence on interest for MPTs.

Description: This analysis uses data from 400 couples enrolled in the Microbicide Trials Network (MTN) 045/CUPID (Couple User Preferences in Dual Purpose Prevention products) study to assess influence of couple dynamics and HIV risk perception on interest for MPTs. Specifically, we assessed:

1. The influence of couple dynamics like communication, relationship efficacy, fidelity and support on interest for MPTs and
2. Whether HIV risk perception determined interest in MPTs. We used data from In-depth interviews conducted with couples (CIDI) or individuals (Female FIDI, Male MIDI), the Behavioral Demographic Questionnaire (BDQ) and Couples observation tool.

Lessons learned: Overall couples showed high interest in MPTs (91%) and had healthy couple dynamics, 67% of couples contributed equally to conversations about MPTs, with 91% males & 90% women demonstrating engagement. This was corroborated during CIDI_2178 [Uganda], "Our relationship is good we talk or plan about something together, we make decisions together so generally we do everything together".

71% females and 81% males disagreed that their partner's sexual behavior gives them a chance of getting HIV. Couples had a low HIV risk perception scoring 2 on the HIV Risk Score (0-7); Balkus 2018 (modified).

However, despite the low risk score 50% females; 35% males did not know if their partner had other sexual partners thus the interest in MPTs.

Conclusions/Next steps: Couples who had good communication, partner support, and high fidelity showed high interest in MPTs. Couples underestimate their HIV risk, nonetheless they appreciate some aspects of risk like the uncertainty of their partners having other sexual partners. It is therefore critical to develop strategies to support couples understand their HIV risk.

These findings underscore the importance of healthy couple dynamics, and risk perception in decision making about HIV and pregnancy prevention technologies.

MOPED04

Exploring the role of social determinants of health and their potential relationship in affecting dimensions of stigma and health-related quality of life in people living with HIV

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Background: HIV stigma is still prevalent in Canada, negatively impacting the health of people living with HIV. Social determinants of health also have a significant impact on health, yet there is little work examining how these determinants play a role in how stigma may impact health. This study uses moderation analysis to examine how social determinants of health affects the relationship between enacted, internalized, and anticipated stigma and health-related quality of life physical and mental health dimensions.

Methods: The study used a two-wave panel design with quantitative survey data collected on 339 participants in Ontario, Canada at baseline (t_1) between August 2018 and September 2019 and follow-up (t_2) between February 2021 and October 2021. Moderation models were constructed with each type of stigma at t_1 as antecedents predicting physical and mental health at t_2 as the outcome.

Separate models were created with each social determinant of health (age, years since HIV diagnosis, gender, sexual orientation, ethnicity, geographic region, education, employment, and basic needs) acting as the moderator.

Results: For age, those of older age had a significant negative relationship between internalized ($b = -5.20$, 95% CI: -7.81, -2.59) and enacted ($b = -3.31$, 95% CI: -5.87, -0.75) stigma and mental health. For those who live in the Greater Toronto Area, enacted ($b = -3.96$, 95% CI: -6.56, -1.37) and anticipated stigma ($b = -5.26$, 95% CI: -8.60, -1.94) had a negative impact on mental health.

For the gay/lesbian group, anticipated stigma had a negative impact on mental health ($b = -3.43$, 95% CI: -6.60, -0.26). Lastly, for those who never lacked basic needs, en-



acted ($b = -4.43$, 95% CI: -7.25 , -1.62) and anticipated ($b = -4.17$, 95% CI: -7.38 , -0.95) stigma had a negative impact on mental health. None of the models with physical health as the outcome had significant moderators.

Conclusions: Our findings demonstrate that the relationship between stigma and mental health can change based on an individual's social determinants of health. Moreover, intervention strategies to reduce stigma may be more effective if they are tailored to and consider the social determinants of health.

MOPED05

The correlates and experiences of HIV-related intersectional stigma among caregivers of adolescents living with HIV in KwaZulu Natal, South Africa: results from a mixed method study

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Background: Stigma is a formidable barrier to HIV treatment outcomes and wellbeing. Caregivers play a critical role in promoting HIV adherence and mental health among adolescents living with HIV (ALHIV). However, caregivers themselves encounter multiple stigmas that intersect with HIV-stigma, namely poverty and gender identities, and these together have substantial impact on their health and wellbeing. If we can understand the drivers of HIV-related intersectional stigma, we can develop targeted strategies to improve HIV and wellbeing outcomes among caregivers and ALHIV.

The objectives of this study were to understand the factors associated with and lived experiences of HIV-related intersectional stigma among caregivers of ALHIV.

Methods: We conducted a mixed-method study drawing on baseline data from an economic incentive trial (PACT no: PACTR202203585402090, <https://pactr.samrc.ac.za/>) that was implemented between March 2021-September 2022 with caregivers of ALHIV (10-19-year-olds) consecutively sampled from peri-urban clinics in Durban, KwaZulu Natal, South Africa.

Caregivers completed a baseline questionnaire that examined household socio-economic status, mental health, wellbeing, and stigma using the Everyday Discrimination Scale. These topics were further explored through in-depth interviews with 8 purposively sampled caregivers. Descriptive statistics and a linear regression model to assess correlates of HIV-related intersectional stigma was conducted using STATA (V17). Qualitative data were analysed thematically using NVivo.

Results: Of the N=100 caregivers enrolled in the trial, 86% were female, the median age was 42 years (IQR:34-50), and 89% were living with HIV. Factors associated with HIV-related intersectional stigma include: depressive symp-

toms ($\beta=4.36$, $p=0.01$), caregiver burden ($\beta=5.62$, $p=0.003$), caregivers happiness ($\beta=4.28$, $p=0.02$). Key themes that shaped HIV-related intersectional stigma included unemployment, food insecurity, negative coping strategies, lack of self-acceptance and isolation, ill-treatment from healthcare workers and community members due to their HIV-positive status and inability to fulfil gendered roles.

Conclusions: Findings indicate that caregivers of ALHIV encounter HIV-related intersectional stigma at multiple levels which impacts their mental health and wellbeing. Multi-sectoral interventions such as group-based mental health and economic empowerment programs that address internalized and externalized HIV-stigma, poverty and gender norms could mitigate these effects.

MOPED06

Depression, violence and stigma among people living with HIV at public sexual health clinics in urban Lima, Peru: converging syndemics in need of urgent attention

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Background: In Peru, approximately 100.000 persons live with HIV and despite free access to antiretrovirals (ARV), morbidity and mortality rates due to HIV remain high, often complicated by social and mental health issues which not been well described in service settings.

Socios En Salud (SES), a nonprofit health organization Lima which works to strengthen publicly delivered health services, collaborated with the Peruvian National HIV program to assess the social and mental health barriers to ARV adherence experienced by people with HIV (PWH) to assess the prevalence of common social and mental health barriers to HIV care services and ARV adherence.

Methods: From July 2022 – December 2022, persons attending two public sexual health clinics or identified by venue-based outreach campaigns in northern Lima, Peru were invited to complete a questionnaire which included questions on mental health, violence and stigma. Data were cleaned, analyzed and descriptive tables produced.

Results: A convenience sample of 246 persons were invited to complete the questionnaire of which 194/246 (78%) accepted. Mean participant age was 32 years (range 19-62). 89% were male, 11% female, 1% identified and transgender. 43% of participants were newly-diagnosed with HIV of which 30% were awaiting ARV initiation.

Regarding mental health, 54% reported a current mental health problem of which 92% reported depression and/or anxiety. Experiences of interpersonal violence was reported by 43% of participants and stigma (HIV and/or sex/gender-based) reported by 98% of participants.



Conclusions: Though limited in size and generalizability, high levels of mental health morbidity, stigma and violence were experienced by PLW in Lima Peru which like converge to create a syndemic of barriers that synergize to hamper access to and continuation of HIV care services.

These data will help leverage our work to improve HIV services in Peru by addressing these social and mental health problems in an integrated way at the point of HIV service delivery.

MOPED07

Intersectionality of gender, ethnicity, and sexual orientation identities and HIV stigma in people living with HIV in Canada

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Background: HIV stigma remains a challenge to excellent health for people living with HIV. This is especially significant for individuals who are disproportionately affected by HIV and who occupy intersecting racial, sexual, or sociocultural identities. Studies have examined the individual impact of various identities on one's experience of HIV stigma; however, little is known about how these identities may intersect to impact how an individual experiences stigma.

This study aims to examine the impact of intersecting ethnicity, gender, and sexual orientation identities on levels of internalized, enacted, and anticipated stigma in people living with HIV from three provinces in Canada.

Methods: Participants were recruited in Ontario, Alberta, and Québec (n=1,064) to complete the People Living with HIV Stigma Index study, a survey tool which collected various demographic information and contained externally validated quantitative scales measuring different types of stigma. Regression analysis was used to separately examine the impact of ethnicity, gender, and sexual orientation on rates of internalized, enacted, and anticipated stigma. We constructed two-way and three-way interaction models by creating interaction terms with each permutation of ethnicity, gender, and sexual orientation variables and examined how they predicted each type of stigma.

Results: In the multiple regression, the gay/lesbian group had significantly lower internalized stigma than the heterosexual group ($b=-0.13$, $p=0.02$), whereas the African, Caribbean, and Black group had significantly greater anticipated stigma than the Caucasian group ($b=0.22$, $p<0.01$). In the two-way model, gender x sexual orientation was the only significant interaction with the lesbian group having greater internalized stigma ($b=0.32$, $p=0.06$). In the three-way model, the lesbian African, Caribbean, and Black group had greater internalized stigma ($b=0.80$, $p=0.09$), whereas the lesbian Indigenous group had both greater enacted ($b=1.24$, $p=0.01$) and anticipated stigma ($b=0.71$, $p=0.09$).

Conclusions: Overall, we found that levels of HIV stigma were consistent and high across most population groups, with a few intersections including lesbian African, Caribbean, Black people and lesbian Indigenous people experiencing greater levels of stigma.

These findings suggest that it may be important in developing stigma reduction strategies that are tailored to the needs of specific population groups, which may be under-represented in research and HIV programming.

MOPED08

Stigma, social support, and symptoms of depression, anxiety, and suicidal ideation or self-harm among people with HIV with irregular interaction with the health care system in KwaZulu-Natal Province, South Africa

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Background: People with HIV (PWH) in Africa are at heightened risk of poor mental health, including self-harm and suicidal ideation. Understanding drivers of poor mental health (e.g., stigma, low social support), particularly among those with irregular interaction with the healthcare system, is critical to righting these disparities and closing the mental health treatment gap for PWH in Africa.

Methods: We randomly sampled 150 individuals who had accessed care in a peri-urban clinic in KwaZulu-Natal Province, South Africa in the prior two years who had no record of a clinic visit in the prior three months (i.e., had transferred out, died, or were lost to care). We located and interviewed 100 of these individuals or their kin to ascertain true clinical outcomes and explore individuals' psychosocial well-being. We estimated the prevalence of depression (Patient Health Questionnaire-9 scores >9) and anxiety symptoms (Generalized Anxiety Disorder-7



scores > 9) and thoughts of suicidal ideation or self-harm in the prior two weeks, and explored the relationship between high internalized, anticipated, and enacted stigma (HIV Stigma Mechanisms Measure), and low social support from friends, family, and significant others (Multidimensional Scale of Perceived Social Support) and each mental health measure using separate, unadjusted log-binomial regression models.

Results: Eighteen individuals had died (18.0%), 51 (51.0%) had reinitiated care, and 31 (31.0%) were out of care. Of the 82 individuals interviewed, 37 (45.7%), 24 (29.6%), and 18 (22.2%) reported symptoms of depression, anxiety, and thoughts of suicidal ideation/self-harm, respectively. The prevalence of depression, anxiety, and suicidal ideation/self-harm was higher among PWH reporting high anticipated and enacted stigma compared to others (Table). The prevalence of anxiety was higher among PWH reporting low family support compared to others (Table).

	Depressive disorder symptoms PR (95% CI)	Anxiety disorder symptoms PR (95% CI)	Suicidal ideation PR (95% CI)
High Stigma (scale scores > 48 = referent)			
Internalized (sub-scale scores > 12 = referent)	0.9 (0.5, 1.7)	1.5 (0.7, 3.1)	1.3 (0.5, 3.4)
Anticipated (sub-scale scores > 18 = referent)	2.0 (1.4, 3.1)	2.2 (1.1, 4.1)	2.8 (1.3, 5.9)
Enacted (sub-scale scores > 18 = referent)	2.4 (1.6, 3.4)	2.7 (1.5, 5.0)	4.8 (2.4, 9.6)
Low Social Support (scale scores < 36 = referent)			
Friends (sub-scale scores < 12 = referent)	0.7 (0.4, 1.1)	0.6 (0.3, 1.2)	0.8 (0.4, 1.8)
Family (sub-scale scores < 12 = referent)	1.4 (0.9, 2.2)	2.7 (1.4, 5.0)	1.4 (0.6, 3.3)
Significant Other (sub-scale scores < 12 = referent)	0.5 (0.2, 1.1)	0.3 (0.1, 1.3)	0.5 (0.1, 1.8)

Table. Crude associations between stigma and social support and symptoms of depression, anxiety, and suicidal ideation/self-harm in people with HIV with irregular contact with the healthcare system in KwaZulu-Natal Province, South Africa.

Conclusions: Community-level interventions that aim to minimize HIV-related stigma and increase access to mental health care are urgently needed to improve the well-being of PWH in South Africa.

MOPED09

Internalized HIV stigma compromises retention in care amongst people living with HIV in Umlazi, South Africa

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Background: HIV stigma remains a major barrier to care for people living with HIV (PLWH), but the impact has not been well characterized in high-prevalence resource-limited countries. Internalized stigma is a dimension of HIV stigma in which PLWH attribute negative beliefs and attitudes associated with HIV and AIDS towards themselves. We assessed the impact of internalized HIV stigma on care outcomes after diagnosis in Umlazi Township, South Africa.

Methods: We conducted a prospective cohort study with adults (>=18 years) who were diagnosed with HIV from September 2013 to April 2017. Stigmatizing beliefs were measured using validated scales at the enrollment visit and before HIV diagnosis, and again 12 months later. We constructed logistic regression models to determine independent predictors of internalized HIV stigma 12 months post-HIV diagnosis. Test associations between stigma, social characteristics, and negative health outcomes were estimated using Poisson regression.

Results: Among 3,105 PLWH, the mean age was 33 years and 57.13% were female. At enrollment, 34% reported stigmatizing beliefs, and 19% (n=578) reported internalized stigma 12 months after HIV diagnosis.

In the unadjusted analyses, baseline characteristics associated with 12-month stigma included male sex, higher educational attainment, not attending church, middle income-earning, and perceived HIV risk pre-diagnosis (Figure 1).

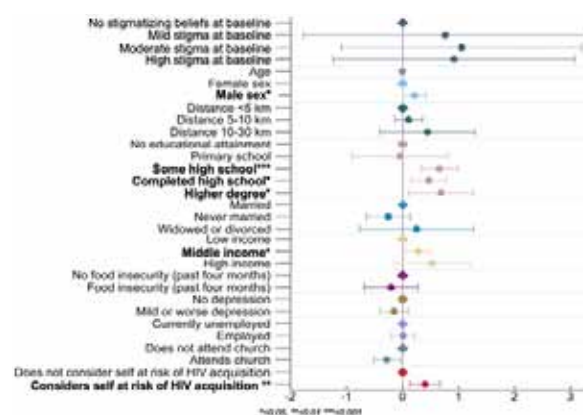


Figure 1. Associations between internalized stigma at 12 months and baseline characteristics, univariate logistic regression.


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At 12 months, lacking a supportive partner (incremental risk ratio [IRR] 1.13, 95% CI 1.10-1.17, $p < 0.001$) and not disclosing one's HIV status (IRR 1.07, 95% CI 1.04-1.09, $p < 0.001$) were associated with perceiving stigma. In the adjusted multivariate analysis, 12-month stigma was associated with a significantly higher incidence of not being retained in care (IRR 1.39, 95% CI 1.10-1.78, $p < 0.007$).

Conclusions: Internalized stigma remains common among PLWH after engagement in HIV care for one year, and leads to higher rates of dropping out of care. Routinely monitoring internalized HIV stigma and providing more social support, when needed, may help improve HIV treatment outcomes.

MOPED10

HIV disclosure experience, resilience and viral suppression among PLHIV in Ghana

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Background: Disclosure of HIV status is an important life event for people living with HIV (PLHIV). Disclosure experience may establish a foundational relationship with care and impact treatment adherence. Further, given adversities faced by PLHIV, resilience may establish behaviors that promote positive relationships with treatment. However, it is not well understood how disclosure experience and resilience interact to impact viral suppression among PLHIV.

Methods: Study implementation was led by NAP+, networks of PLHIV in Ghana through the Stigma Index 2.0 in partnership with GNP+, ICW, and UNAIDS. PLHIV completed a questionnaire to assess demographics, experiences of HIV and non-HIV related stigma and discrimination, resilience-factors, and other self-reported outcomes including viral suppression. Participants were also asked to evaluate their experiences of disclosure with friends and family. Multivariable log-binomial models were used to estimate prevalence ratios (PR) for the association between disclosure experience and viral suppression. Subgroup analysis assessed a dichotomized measure of resilience as a potential modifier.

Results: Among 1827 PLHIV, the median age was 39 (IQR 30-48) and 65.3% (n=558) of respondents identified as cis-gender women. Those with an overall positive disclosure

experience were more likely to have achieved viral suppression than participants with a negative disclosure experience (PR 1.09, 95% CI: 1.00-1.19). The magnitude of this association increased among participants with lower resilience scores (PR 1.33, 95% CI: 1.11-1.60). Among participants with higher resilience scores, the association between disclosure experience and viral suppression was attenuated (PR 1.03, 95% CI: 0.94-1.14).

	Prevalence Ratio	95% CI	p-value
Overall association	1.09	1.00-1.19	0.04
Stratified by resilience score**			
Less Resilient	1.33	1.11-1.60	<0.01
More Resilient	1.03	0.94-1.14	0.53

*Adjusted for age, gender, sexual orientation, sex worker status, years knowing HIV status, HIV support group
**Resilience developed from a composite score of ten items. The score was dichotomized with negative scores indicating less resilient and positive scores and scores of zero indicating more resilient.

Table. Adjusted prevalence ratios for the association of positive disclosure experience and viral suppression among PLHIV in Ghana.*

Conclusions: Among PLHIV in Ghana, people with a positive disclosure experience were more likely to report viral suppression suggesting the importance of early interactions for sustained engagement in treatment. The experience of disclosing one's HIV status might be particularly critical for more marginalized PLHIV with lower levels of resilience. Optimizing treatment may necessitate multi-level interventions that increase resilience resources for PLHIV in Ghana.

MOPED11

Discordance between HIV risk perception, sexual behavior, and PrEP adherence among young sexual and gender minorities in the United States: an ATN 142 analysis

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Background: Pre-exposure prophylaxis (PrEP) is a crucial component of ending the global HIV epidemic; however, PrEP use has lagged among key populations, including young sexual and gender minorities. One common belief posits that young people struggle to take daily oral PrEP due to their developing decision-making skills, yet quantitative evidence of this assumption is limited.

This study sought to examine whether individual-level decision-making factors, such as HIV risk perception and sexual behavior, predicted PrEP adherence in a randomized controlled trial of sexual and gender minority youth in the United States (U.S.).

Methods: In 2019-2021, the Adolescent Medicine Trials Network for HIV Interventions (ATN) 142 study randomized 225 HIV-negative PrEP users (ages 16-24) throughout the U.S. to either a smartphone app to improve PrEP adherence, the app plus text-based adherence coaching, or stand-



ard of care. Poisson regression with robust standard errors was used to estimate the associations between HIV risk perception (using a modified version of the Perceived HIV Risk Scale, range: 5,28), sexual behavior (any condomless anal sex in the past 3 months), and self-reported daily oral PrEP adherence (≥ 4 pills in the past week) at the same time point (baseline) and longitudinally (3 months), controlling for potential confounders.

Results: At baseline, 86.2% (N=194/225) self-reported high PrEP adherence, 55% (N=124/225) recently had condomless anal sex, and the median HIV risk perception score was 13 (interquartile range: 10,15). Baseline HIV risk perception (RR: 0.93, 95% CI: 0.83,1.04) and sexual behavior (RR: 1.09, 95% CI: 0.97,1.24) were not associated with PrEP adherence at the same time point and did not predict 3-month PrEP adherence (RR: 0.95, 95% CI: 0.83,1.08; RR: 1.05, 95% CI: 0.92,1.20, respectively).

Additionally, baseline HIV risk perception was not associated with sexual behavior at either time point (baseline RR: 1.12, 95% CI: 0.93,1.34; 3-month: RR: 1.09, 95% CI: 0.89,1.34).

Conclusions: In this national trial, HIV risk perception and sexual behavior did not predict PrEP adherence.

These findings suggest that addressing individual-level perceptions and behaviors may be insufficient for impacting PrEP use among young people at risk of HIV.

Future PrEP interventions for youth should target multi-level adherence barriers, such as community- and partnership-level barriers.

MOPED12

Integrated chronic medicine pick-up points enabled by Amazon Smart Lockers, destigmatizes the collection of antiretroviral medication and promotes adherence to treatment

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Background: The fifth decade of the HIV/AIDS pandemic has seen significant advancements in antiretroviral therapy, with HIV recognized as a manageable chronic disease. However, the stigma associated with the disease in most parts of Africa raises important questions about access to medication and the allocation of resources to clients living with HIV.

Stigma can create barriers to adherence and may result in discrimination and marginalization of people living with HIV.

Description: Collect & Go Smart Lockers have been implemented in South Africa, Botswana, Eswatini and Lesotho to create convenient pick-up points for chronic medication in rural and remote regions in Sub-Saharan Africa. In South Africa, a collaboration between the National Department of Health and health innovation provider Right ePharmacy, created a facility for chronic stable clients to collect their medication, including ART and other chronic disease medication. The Central Chronic Medicine Dispensing and Distribution (CCMDD) programme, enabled

by Amazon Collect & Go smart lockers, provides a safe, convenient, integrated mechanism for clients to collect their chronic medication discretely.



Lessons learned: Integrated chronic disease programmes can help improve adherence by providing convenient and discreet access to medication. Effective treatment of HIV requires collaboration between National Health and Innovation partners. Addressing the stigma associated with HIV is critical for improving access to treatment and adherence. Integrated programs can help address stigma by providing discreet pick-up points for medicine collections.

Conclusions/Next steps: By integrating chronic disease medicine programmes with the use of Amazon Collect & Go Smart lockers, the stigma associated with collecting antiretroviral medication can be reduced significantly, thereby improving treatment adherence. Pick-up points for integrated chronic medicine, provides a convenient and discreet way for clients to access their medication, potentially leading to higher adherence and better health outcomes.

MOPED13

Factors of age-appropriate services that influence virological suppression in children and adolescents with HIV

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Background: Viral load suppression in children and adolescents with high viral loads receiving ART is influenced by a variety of factors. A few research has revealed services that are favorably influencing re-suppression. We conducted this study as part of the USAID Family-Focused HIV Prevention Care and Treatment OVC activity, which was implemented in 16 towns in Ethiopia's Oromia region. The objective was to identify key case management services that contribute to viral re-suppression in patients with C&ALHIV who are receiving treatment but have a high viral load.

Methods: We followed 180 C&ALHIV who were virally unsuppressed for a minimum of 6 months from October 2020 to August 2022. Case management was done to

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identify adherence barriers and a care plan was developed to address these barriers. Binary logistic regression was used to determine the magnitude by which health and socio-economic service factors were associated with viral load re-suppression. The outcome variable was viral re-suppression with 12 months of documented initial high viral load. A P-value of less than 0.05 was used to determine the statistical significance.

Results: Viral re-suppression at 12 months was 85.6% ($n = 154$). Participating in peer support groups ($OR = 2.62$; $p = 0.037$), enhanced adherence counseling ($OR=1.56$; $p=0.05$), receiving economic strengthening interventions ($OR = 1.35$; $P = 0.050$), and being linked to age-appropriate sexual and reproductive health services ($OR = 1.51$; $P = 0.042$) were all associated with an increased risk of viral load re-suppression among C&ALHIV.

Conclusions: The findings revealed that case management services provided at a community level can make a difference in achieving viral re-suppression among C&ALHIV with high viral load. Among others, receiving enhanced adherence, participating in peer support groups, linkage to sexual and reproductive health services, and engaging primary caregivers in economic strengthening interventions (e.g., cash transfer, VSLA) were associated with viral load re-suppression.

MOPED14

Testing the impact of stigma focused interventions on PrEP use and mental health by age groups among Black sexual diverse men

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Background: Elevated rates of HIV/STI among sexual diverse Black men (SDBM) are not attributable to sexual-risk taking factors, and therefore, approaches to ameliorating HIV/STI incidence among SDBM must include addressing structural and social factors.

It is known that stigma undermines HIV prevention efforts for SDBM and therefore interventions grounded in stigma dissolution are needed.

Methods: Using a randomized controlled trial design, we evaluated the impact of both a structural intervention (providing all HIV testing services virtually) and a counseling intervention (using stigma focused content) to increase health care access and HIV prevention behaviors over short (3 and 6 month) and long term (12 month) outcomes with $N = 474$ participants. Participants resided in the southeastern US and data were collected from 2017-2019. Participants reported HIV negative status at

baseline. Participants also received rectal and urethral sexually transmitted infection (STI) testing for *Chlamydia trachomatis* (CL) and *Neisseria gonorrhoeae* (GN).

Results: Rectal and urethral CL and GH at baseline were found to be elevated relative to the general population (16.7% for rectal and 3.1% for urethral tests across both STI) and rates of STI were higher among younger participants (<30 , 30.7%) relative to older participants (≥ 30 , 12.9%). PrEP use at baseline was low with $N = 18$ (3.7%) of the sample reporting use.

Post intervention rates of PrEP use at follow ups were significantly higher among participants who had received the stigma focused counseling intervention compared to the control, time matched counseling condition ($aOR = 0.35$; 95% CI = 0.13,0.95; $p < .05$). Intervention effects, however, were stronger for younger participants than older participants.

Further, providing HIV prevention services virtually resulted in a 13% increase in the likelihood of attending HIV prevention appointments.

Conclusions: Results from the current study demonstrate the importance of addressing factors relating to stigma as a means of improving health related outcomes. Participants in the current study were at elevated risk for HIV (based on STI data), however, important changes in health behavior occurred post intervention that could have a considerable impact on prevention.

Results varied by age suggesting that interventions, both structural and counseling, need to adapt for age cohort related factors.

MOPED15

Improving access to social support and household economic strengthening intervention among children living with HIV in southern Nigeria: translating evidence to practice

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Background: Social determinants of health account for 30-55% of the treatment outcome, and children living with HIV (CLHIV) face significant risks and vulnerability. To reduce health inequality and optimize treatment outcomes among CLHIV, PEPFAR through USAID facilitated collaboration between its treatment program and the Orphan and Vulnerable Children (OVC) program in Akwa Ibom and Cross Rivers States, Nigeria. This paper describes how this collaboration improved the enrollment of CLHIV in the OVC program.

Description: Several meetings were held between the treatment partners (ECEWS) and the OVC partners in Akwa Ibom to identify areas of collaboration and im-



prove synergy. CLHIV (< 17 years) were referred for OVC enrolment after initiating antiretroviral therapy. Caregivers who consented were enrolled on the OVC program at the community, household enrollment number of caregivers returned to the facility, and documented on the electronic medical record.

The OVC program provided community-based adherence support, financial support for clinic visits (drug refills and viral load tests) and medical emergencies, nutritional counselling and supplements, and household economic strengthening to enrolled households. They also supported the treatment program on case identification and linkage to treatment. Joint visits by case workers from the treatment and OVC partners were conducted to CLHIV for service delivery. Joint monthly meetings were held and used to address data discrepancies. For this paper, viral load outcome assessed for children enrolled on the OVC program include viral suppression (<1000cps/mls) and undetectable viral load levels (<50cps/mls).

Lessons learned: A total of 4,840 (F:2513, M:2327) children were enrolled on the OVC program as of September 2022 representing 75% (4840/6482) of all CLHIV on treatment. Of these children enrolled, 98.8% (4637/4691) of those eligible for viral load test, had viral test done, 98.4% (4564/4637) were virally suppressed and 92.6% (4293/4637) had undetectable viral load levels.

Conclusions/Next steps: Systematic collaboration between the treatment and OVC programs improved access of children living with HIV on ART to other socioeconomic services provided by the OVC program.

MOPED16

Differences between sexual risk behaviours, HIV care utilization, and experience of stigma and violence between cisgender and transgender men who have sex with men: findings from Biobehavioural Surveys in Ukraine

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Background: Men who have sex with men (MSM) and transgender persons are at high risk for HIV in Ukraine. Transgender MSM may be more vulnerable to HIV infections than cisgender MSM due to several individual, social, and structural factors, with ~10 % of transgender persons reporting avoiding HIV services due to stigma. We assessed differences in HIV risk, intervention uptake and stigma/violence experience between cisgender and transgender MSM in Ukraine.

Methods: We analysed data from three national Integrated HIV Bio-behavioural Surveys (2013, 2015, 2018) which recruited MSM using respondent-driven sampling,

with an overall sample size of 18,621. We evaluated the differences in HIV prevalence, sexual risk behaviours, HIV testing and treatment seeking, and lifetime experiences of stigma and violence (2018 only) between cisgender and transgender MSM using multivariable regression modelling.

Results: Compared to cisgender MSM (n=18,102), transgender MSM (n=503) were more likely to be clients of non-governmental organizations (aOR = 1.37, 95%CI: 1.09-1.70), receive free condoms (last 12 months; aOR = 1.49, 95%CI: 1.24-1.78), to procure commercial sex (last month; aOR = 2.06, 95% CI:1.35-3.14), provide commercial sex (last month; aOR = 2.30, 95% CI:1.88-2.82) and engage in sexualised drug use (last month; aOR = 1.57, 95% CI: 1.11-2.21). However, we found no difference in HIV prevalence (last month; 5.61% vs 4.75%, p=0.497), HIV testing uptake in past year (73.75% vs 70.25%, p=0.395) or ART use (among HIV positives; 66.67% vs 72.12%, p=0.835) between cisgender and transgender MSM. In 2018, transgender MSM were more likely to report facing stigma from family and friends (aOR = 3.58, 95%CI: 2.54-5.04) general social stigma (aOR = 3.13, 95%CI: 2.22-4.41), anticipated healthcare stigma (aOR = 3.63, 95%CI: 2.53-5.16), physical assault (aOR = 2.73, 95%CI: 1.85 – 4.03) and coercive sex (aOR = 3.01, 95%CI: 1.99-4.55) than cisgender MSM.

Conclusions: Transgender MSM in Ukraine may engage in more high-risk practices than cisgender MSM. Whilst elevated levels of stigma against transgender MSM are concerning, higher levels of access to HIV prevention could subdue the influence of stigma on HIV transmission in transgender MSM. Stigma and harm reduction interventions for MSM should be tailored based on transgender status.

MOPED17

Complexities of managing survivors of Gender-based Violence: experiences from Beitbridge, Zimbabwe

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Background: In Zimbabwe, about 1 in 3 women aged 15-49 have experienced physical violence and about 1 in 4 women have experienced sexual violence since the age of 15. This is perpetuated by socio-cultural and religious practices that normalise sexual violation of women and girls.

We sought to determine the impact of GBV on new HIV acquisition in Beitbridge district, Zimbabwe where harmful practices such as child marriages are prevalent.

Methods: Data collected from 2020-2022 on survivors subjected to gender-based violence (GBV) at the Family Support Trust (FST) clinic, were analysed in python software to determine the extent to which GBV impacts HIV incidence. Data were filtered to retain those tested for

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HIV because of the risk and further filtered to retain the number of survivors tested for at least 3 times in line with the national guidelines with a final positive HIV test result after having tested negative on the initial test. This was calculated against the total number of those at risk of contracting HIV as a result of GBV to determine the HIV incidence rate.

Results: Of the 3220 survivors who received post GBV medical and psychosocial services at FST, 68% were sexually violated women and girls of all age groups (median age 14 years) and of those, 40% were survivors of harmful traditional practices. 93.6% (2,838) of the survivors were tested for HIV. Already on ART (10) and knowing one's status were the reasons for not testing for HIV.

Among the 2,834 that tested HIV negative, 70% presented after 72 hours and were ineligible for post-exposure prophylaxis. 511 presented already pregnant. 41 survivors had a new HIV positive result on follow-up testing at three months translating to an incidence rate of 2.1% amongst GBV survivors. Self-reported none adherence was the reason for 2 seroconversions among PEP users.

Conclusions: GBV prevention, screening and management should be integrated with combination HIV prevention services. A multifaceted and multisectoral approach to the prevention and management of GBV targeting harmful practices, legal factors, literacy on HIV prevention, early presentation and PEP adherence and linkage to PrEP is indicated.

MOPED18

The effect of a conditional cash transfer program on AIDS morbidity and mortality in the poorest daughters and mothers: a cohort study of 12.6 million women in Brazil

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Background: Poverty is a social determinant known as one of the main risk factors for a wide range of diseases and health problems, including HIV/AIDS. However, available scientific evidence is still inconclusive for the impact of conditional cash transfer programs (CCT) on HIV/AIDS, specifically for women. We evaluated the effects of one of the largest CCTs in the world, the *Bolsa Família Program* (PBF), on sequential AIDS outcomes, incidence and mor-

talidity, among women (daughters and mothers) beneficiaries and head of household, using data from a nationwide cohort of the poorest Brazilian people on the Unified Registry for Social Programs (*Cadastro Único*).

Methods: We analyzed a cohort of 12.6 million low-income Brazilian women from 2007 to 2015, comparing BFP beneficiaries and non-beneficiaries, using a quasi-experimental impact evaluation design.

We used inverse probability of treatment weighting (IPTW) to adjust for selection into receipt of PBF benefits and then fitted multivariable Poisson regressions, adjusted for all relevant socioeconomic, demographic, and healthcare confounding variables -at the individual and municipal level- to estimate the effect of PBF on AIDS incidence and mortality rates. We also evaluated PBF effects for different subpopulations to per capita wealth, age, race/ethnicity and education.

Results: PBF exposure was associated with a lower AIDS incidence (RR: 0.63; 95% CI: 0.52-0.76) and mortality (RR: 0.57; 95% CI: 0.40-0.81) for daughters and lower AIDS incidence (RR: 0.58; 95% CI: 0.55-0.61) and mortality (RR: 0.57; 95% CI: 0.53-0.63) for mothers. PBF associations were significantly stronger among women living in extreme poverty (RR: 0.58 for incidence and RR: 0.53 for mortality among daughters; RR: 0.49 for incidence and RR: 0.53 for mortality among mothers). PBF impact was also stronger among brown/black, adolescents and young and with lower education women.

Conclusions: Conditional cash transfers could significantly reduce AIDS morbidity and mortality in PBF beneficiary women, especially among the extremely poor. During the current dramatic rise in global poverty, due to the COVID-19 pandemic, CCT investments could protect against potential increases in the HIV/AIDS burden and contribute towards achieving AIDS-related Sustainable Development Goals (SDGs).

MOPED19

Displacement-related challenges faced by internally displaced persons in northern Mozambique and their implications for HIV testing: a qualitative study

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Background: Exposure to traumatic events such as forced displacement is associated with an increased risk for HIV. However, HIV testing among internally displaced populations (IDPs) is difficult, with scant literature documenting barriers to HIV testing among this group, particularly in southern Africa. Northern Mozambique has one of the



highest HIV incidence rates in sub-Saharan Africa. Our study investigated how displacement experiences were tied to risk of HIV acquisition and explored HIV awareness and testing for young adult IDPs settled in Nampula City, Mozambique.

Methods: We used a purposive sampling strategy to conduct six focus group discussions with IDPs, district representatives, and community leaders and three key informant interviews with policymakers and humanitarian personnel. We used thematic analysis to analyze the data.

Results: The study included (n=51; 29.4% Female, 21.6% under 25) participants and sampled until saturation was met. Participants reported that displaced young adults, especially young women were highly vulnerable to HIV acquisition due to transactional sex, early marriage, and sexual violence.

However those parous had at least previously engaged in HIV testing services, with young men mentioning less frequent engagement. IDPs and key stakeholders noted that for IDPs, financial, linguistic, and geographic barriers impeded engagement with health services and cited competing priorities between understanding one's HIV status, and more basic needs like food, security, and livelihood. Interrupted education and conversations around HIV stigma demonstrated potential constraints to HIV testing among displaced youth. Other challenges mentioned were the lack of interventions promoting HIV testing that previously existed in IDPs' communities of origin (i.e., HIV lay counselors and mobile clinics).

Stakeholders identified structural barriers to HIV testing, describing primary health care centers as unable to respond to the past years' influx of IDPs, and IDPs citing the need for government facilities to enable linkage to health services within their communities.

Conclusions: Although displaced young adults occupy an environment highly vulnerable to HIV acquisition, several displacement-related challenges create barriers for HIV testing. IDPs mentioned HIV testing interventions that had proven helpful in the past, demonstrating that tailoring said interventions to the needs and context of displaced young adults may prove substantive in future HIV programming.

MOPED20

The need to contextualise HIV risk reduction approaches for MSM in Indonesia: results from socioecological risks latent class analysis

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Background: Most HIV prevention education and behavioural change programmes for men who have sex with men (MSM) focus on reducing individual-level risks. However, HIV risk is also shaped by contextual social and structural factors that shape MSM's sexual risk behaviour but often lie outside an individual's control.

This study aimed to identify patterns of HIV-related risk and their relationship with socioecological factors.

Methods: Using national online survey data from the community-led Chemsex-INA study (n=1314), we determined individual HIV risk patterns among MSM using latent class analysis with posterior probability to predict subgroup membership classifications. Multinomial logistic regression was used to assess the relationship between group membership and covariates representing potential socioecological risk factors.

Results: We identified three unique subgroups: *Sexual Explorative*, *Navigating Complexities*, and *Social Normative* with distinct patterns of individual-level HIV risks that occurred alongside social/networks-level and community-level risks.

Using the *Social Normative* as the reference group, the *Sexual Explorative* group had greater odds of reporting online methods to meet sexual partners (adjusted risk ratio; aRR 4.3; 95%CI 2.1-8.9), using social media and gay-specific dating platforms (aRR 2.6; 95%CI 1.9-3.6), engaging in group sex (aRR 10.9; 95%CI 4.5-25.4), engaging in selling or buying sex (aRR 1.6; 95%CI 1.2-2.2), and experiencing homosexual-related assaults (aRR 1.4; 95%CI 1.1-1.9).

The *Navigating Complexities* group had lower odds of reporting a monthly income of >USD 669 (aRR 0.5; 95%CI 0.3-0.8), receiving HIV/STI information (aRR 0.7; 95%CI 0.5-0.9), and attending STI-related services (aRR 0.6; 95%CI 0.4-0.8), and greater odds of reporting a lack of social support (aRR 1.6; 95%CI 1.1-2.5), not disclosing their sexuality (aRR 1.4; 95%CI 1.1-1.9), reporting sex with multiple men (aRR 6.1; 95%CI 2.5-14.5), having a higher internalised homonegativity index score (aRR 1.2; 95%CI 1.1-1.4) and experiencing homosexual-related assaults (aRR 1.4; 95%CI 1.1-1.9).

Conclusions: By identifying a range of socioecological contexts associated with individual-level HIV risk patterns, our study provides a clearer understanding of the factors that shape HIV risk in Indonesia that need to be



considered when designing HIV prevention and support programs. HIV differentiated care and approaches are required to support a diverse MSM population in Indonesia.

MOPED21

I am not at HIV transmission risk: reasons for sexually active Eswatini adolescents for refusing PrEP

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Background: Evidence have shown that HIV pre-exposure prophylaxis (PrEP) is highly effective when taken correctly and consistently by individuals at substantial risk of HIV infection. Due to the high HIV incidence among the general population of Eswatini, PrEP for HIV-exposed individuals is recommended. The Triple-R project is supporting the government of Eswatini to prevent new HIV infections and reducing the HIV vulnerability for orphans and vulnerable children, adolescent girls and young women (AGYWs).

As part of the project, AGYWs are assessed for their health needs and then linked to health services as per identified needs including PrEP. Even though awareness on PrEP has been raised in the country, PrEP uptake remains very low.

Objective: To understand the reasons for Eswatini AGYWs for refusing PrEP as an HIV prevention Strategy.

Methods: Secondary data analysis of routine data collected within ongoing project implementation was explored to assess the needs of AGYWs. Trained Mentors recruit and complete needs assessment where AGYW's HIV risks and health needs are assessed. About 4300 AGYWs were assessed, 2500 were at HIV risk in which 929 of those AGYWs indicated that they are not willing to take PrEP. The 929 clients formed the study sample.

Results: About 90% of the 929 AGYWs do not consistently use condoms during sex. The median age of AGYWs was 22 years. About 50% AGYWs did not view themselves as being sufficiently at risk of HIV to warrant PrEP use.

There was also a 23% consistent belief that sexual partners will not approve PrEP as they will think they are HIV positive and on ART.

About 17% cited lack of interest in PrEP and taking the treatment daily. "It's stressful to take medication every-day when not sick", "Eish, "it will be like I am taking ARVs". Lastly, a few were scared of PrEP side effects.

Conclusions: There is need for programs to address the stigma surrounding taking ART medication and to expand PrEP messaging for both men and women to increase uptake.

Finally, there is urgent need for tailored counseling before PrEP initiation to help PrEP users identify HIV risk periods.

MOPED22

Hoping to adhere? Examining the relationship between hope and PrEP willingness and adherence among adolescent girls and young women enrolled in HIV Prevention Trial 082

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Background: Hope is a powerful psychological construct which is linked to positive health outcomes including improved HIV treatment and quality of life among people living with HIV. Less is known about the role of hope in biomedical HIV prevention product uptake and adherence. We assessed the relationship between hope for the future and oral pre-exposure prophylaxis (PrEP) willingness and adherence among African adolescent girls and young women (AGYW).

Methods: HIV Prevention Trial (HPTN) 082 was an open-label, interventional, randomized trial of AGYW (aged 16-25 years) conducted in South Africa and Zimbabwe from October 2016 to October 2018.

We analyzed a short version of the Hope for the Future Scale, a six-item instrument (6-30, 30= highest hope) and seven-item PrEP willingness subscale of the HIV Prevention Readiness Measure (6-36, 36= highest willingness) collected at baseline. PrEP adherence was measured via tenofovir-diphosphate (TFV-DP) concentrations in dried blood spots at follow-up weeks 13, 26, and 52, among participants who accepted PrEP.

We conducted linear regression to assess the relationship between hope and willingness to use PrEP at baseline and generalized estimating equations (GEE) to examine the longitudinal relationship between baseline hope and high PrEP adherence (TFV-DP concentrations ≥ 700 fmol/punch) at follow-up.

Results: Participants (n=451) reported moderate levels of hope (median=20, interquartile range [IQR]: 15-24) and PrEP willingness (mean=21, IQR 15-28). High adherence (TDF/FTC ≥ 700 fmol/punch) was observed in 25% (13-weeks), 21% (26 weeks), and 9% (52-weeks).

At baseline, hope was positively associated with PrEP willingness ($\beta=0.30$, 95% CI: 0.24, 0.36) but was not significantly associated with high PrEP adherence (RR=0.99, 95% CI: 0.95, 1.02) at follow-up.



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Conclusions: Having higher levels of hope was positively associated with willingness to use PrEP, but not with high adherence. Hope may operate differently in HIV prevention adherence. Further research is needed to examine resilience and other factors which may promote PrEP adherence.

MOPED23

Homelessness and its relationship with HIV prevention and treatment among men who have sex with men: results from the American Men's Internet Survey, 2017-2021

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Background: Men who have sex with men (MSM) are disproportionately affected by housing insecurity across the US, secondary to individual-level and structural stigmas. There are limited data characterizing the relationship between homelessness and HIV-related outcomes.

Methods: 44,559 cisgender MSM who participated from 2017-2021 in the American Men's Internet Survey (AMIS), an annual cross-sectional online survey in the US, were included.

Homelessness was defined as living on the street, a shelter, a Single Room Occupancy hotel, or a car in the past 12 months. Associations between sociodemographic characteristics and homelessness were tested using chi squared and t-tests.

Multivariable Poisson regressions with robust variance estimation assessed associations between homelessness and:

1. Current use of antiretrovirals among people living with HIV (PLWH) and;
2. PrEP in the past 12 months among non-PLWH. Interactions between self-reported race and homelessness were examined.

Results: The median age of participants was 30 years old (IQR: 22-49). Approximately 9% of those included reported living with HIV (n=3,894). Living in the South, having less than a high school education, younger age, and not having health insurance were associated with recent homelessness (p<0.001). Participants identifying as Black and PLWH were 4.34 times as likely to be homeless compared to non-Black, non-PLWH (95%CI: 3.59-5.24).

Homelessness was associated with less PrEP use [aPR: 0.82, 95%CI (0.69, 0.98)] but was not associated with antiretroviral use. Black individuals experiencing homelessness were less likely to have used PrEP than non-Black individuals with no recent homelessness.

	Use of PrEP in last 12 months	Use of antiretrovirals currently
Homelessness		
Never homeless in past 12 mo.	ref	ref
Experienced homelessness in past 12 mo.	0.82 [0.69, 0.98]	0.99 [0.95, 1.04]
Race (self-identified)		
Non-Black	ref	ref
Black	1.11 [1.01, 1.19]	1.01 [0.98, 1.03]
Age		
0-99 [0.99, 1.00]	0.99 [0.99, 1.00]	1.00 [0.99, 1.00]
Education		
High school education or less	ref	ref
Some college, associate's degree, or more	1.73 [1.56, 1.91]	1.02 [0.98, 1.05]
Year of recruitment		
2017	ref	ref
2018	1.38 [1.28, 1.50]	1.03 [0.99, 1.07]
2019	1.50 [1.38, 1.62]	1.05 [1.01, 1.07]
2020	1.23 [1.12, 1.36]	0.98 [0.94, 1.02]
2021	2.34 [2.20, 2.51]	1.05 [1.02, 1.07]
Region		
Northeast	ref	ref
Midwest	0.87 [0.81, 0.94]	0.97 [0.94, 1.01]
South	0.89 [0.84, 0.95]	0.99 [0.97, 1.02]
West	1.11 [1.04, 1.18]	0.99 [0.96, 1.02]
US dependent areas	0.23 [0.05, 0.92]	0.86 [0.56, 1.34]
Health insurance		
No insurance	ref	ref
Private only	1.85 [1.66, 2.07]	1.19 [1.10, 1.30]
Public only	1.58 [1.39, 1.80]	1.21 [1.12, 1.31]
Other/multiple	1.53 [1.33, 1.76]	1.23 [1.13, 1.35]

Table 1. Results of a multivariable Poisson regression with robust variance estimation assessing the relationship between homelessness and 1. Use of PrEP among those not living with HIV and 2. Use of antiretrovirals among those living with HIV among men who have sex with men participating in the American Men's Internet Survey, 2017-2021.

Conclusions: Social determinants of health, including homelessness and inadequate health insurance, may impede HIV service uptake. Homelessness among cisgender MSM in the US is disproportionately experienced by Black men, along with those with lower educational attainment, those in the South, and younger individuals. In 2023, HIV prevention programs that fail to address social contexts, including housing insecurity and structural racism, may continue to inadequately address the needs of those at greatest risk.


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TUPED01

HÉROS: A community- and person-centered design of healthcare service for GBMSM engaging in chemsex in Taiwan

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Background: In response to the rise of chemsex globally and in Taiwan, an integrated care model Healing, Empowerment, Recovery of Chemsex Health Center (HERO) was established in the year 2017. It transformed from a model that was located within a regional hospital to a new social enterprise approach of one-stop center (HÉROS) in May 2022. It is now independently located within the community, cooperated with a pharmacy and clinic in an urban neighborhood more accessible for people who engaged in chemsex.

HÉROS aimed to provide comprehensive care including sexual health, HIV/STI prevention and treatment, psycho-social therapy, substance use counseling and referral services for people who engaged in chemsex.

Description: Integrated medical care was provided by the clinic to reduce physical symptoms and psychological discomforts due to chemsex. The pharmacy provided home delivery services and designed customized-centered consultations helping chemsex users to reduce their carving and maintain their well-being.

In addition, HÉROS provided a series of mental health integrated services for chemsex individuals, including psychiatric outpatient clinics, individual psychological counseling, and multiple types of chemsex recovery and supporting groups for people engaging in chemsex.

The three major types of groups for chemsex include the early relapse prevention that helps participants to identify triggers and develop skills for early prevention, the 12-step group, and the interpersonal skills group designed for individuals at the maintenance stage.

Lessons learned: Less than six months after HÉROS was moved to the community in 2022, more than 2000 people visited HÉROS clinic and half of them received pharmacy services. More than 40 chemsex recovery and support groups were held and 70 GBMSM engaged in chemsex have participated. For some GBMSM, chemsex is the results of social isolation and loneliness and can benefit from interventions with a mental health focus provided by psychosocial therapy and support groups.

Conclusions/Next steps: As an integrated one-stop center rooted in the community, HÉROS incorporates a broad array of operational and ideological approaches toward care planning and delivery for people affected by chemsex.

HÉROS exists to facilitate differentiated and simplified chemsex care services which emphasizes a person- and community-centered approach of HIV/STIs, PrEP and chemsex care service delivery.

TUPED02

What do we know about bisexual behaviours and condomless sex with women among men who have sex with men in Sub-Saharan Africa? A systematic review and meta-analysis

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Background: In Sub-Saharan African (SSA), the HIV dynamic in different regions varies between generalized and mixed epidemics. Prevalence is high in men who have sex with men (MSM), a population that experiences strong social stigma and pressure to have female partners. This suggests that MSM could be a bridging group for HIV transmission to women. We provided an overview of the proportions of bisexual MSM and MSM who have condomless sex with women in various SSA regions.

Methods: Following the PRISMA guidelines, we conducted a systematic review of published peer-reviewed articles containing the following data on MSM: self-reported bisexuality, recent sex (i.e., previous 12 months or 1 month depending on the region), and condomless sex with female partners. We performed a meta-analysis, separately for each region, when the proportion was reported in at least four studies (Figure 1).

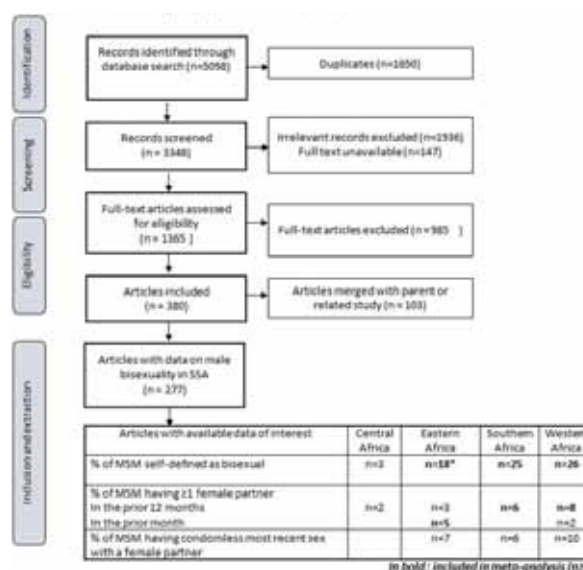


Figure 1. PRISMA flow diagram (systematic review process)

Pooled proportions were calculated using a random-effects model.



Results: The pooled proportion of self-declared bisexual MSM was 22% (95% CI [16;19]) in Southern Africa, 36%[29;43] in Eastern Africa, and 51%[45;56] in Western Africa. In Southern and Western Africa, 29%[22;38] and 47%[36;58] of MSM had ≥ 1 female partner in the prior 12 months, respectively. In Eastern Africa, 23%[9;47] of MSM had ≥ 1 female partner in the prior month.

The pooled proportion of condomless most recent sex with a female partner was 27%[21;35] in Southern Africa, 30%[10;63] in Eastern Africa, and 20%[13;28] in Western Africa.

Conclusions: A significant proportion of MSM in SSA reported bisexual orientation, especially in Western Africa. Condomless sex with female partners was frequent in all three regions, which highlights the risk of HIV bridging to this population.

HIV research, prevention, and care programmes, as well as community-based support for MSM, should be adapted to MSM who have female partners, in order to reduce the HIV bridging risk to the general female population.

TUPED03

The effects of childhood trauma and mental health symptoms on adherence among youth living with HIV in Botswana

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Background: Research findings have highlighted the evidence of co-occurring mental health problems in young people living with HIV (YLWHIV) which may be explained by high rates of exposure to trauma in this population. Mental health problems increase risk of poor treatment adherence and participation in risky behaviors which may precipitate poor health and quality of life outcomes. To inform interventions that improve quality of life, and decrease risky behaviors for youth, it is critical to understand the extent to which childhood trauma, mental health problems, and poor adherence occur and coexist. This study examined the associations between childhood trauma, mental health problems and adherence to anti-retroviral treatment (ART) among HIV infected youth in Botswana.

Methods: The study was conducted at an HIV clinic of a public hospital located 38 kilometers from the capital city of Botswana among youth (15-24 years) using a cross sectional design.

Childhood trauma questionnaire, CRAFFT 2.1, Depression, Anxiety, Stress Scale were used to collect data on childhood trauma, problematic substance use and common mental health symptoms respectively.

Adherence to ARTs was assessed objectively and subjectively using the most recent viral load and the simplified medication adherence questionnaire respectively.

Multivariate logistic regression was subsequently performed controlling for variables found to be significantly associated with childhood trauma on bivariate analysis.

Results: Of the 119 youth recruited, 51.26% were adherent to their ART and 87.39% were virologically suppressed. Childhood trauma was reported by 47% of the sample, with physical neglect being the most reported subtype. The prevalence of depression, anxiety, and problematic substance 34.45%, 41.18% and 23.53%.

Exposure to childhood trauma was significantly associated with depression, anxiety, problematic substance use, and non adherence. Sexual trauma and emotional abuse had the highest odds to predict non-adherence (OR = 3.85 and 2.30 respectively).

Conclusions: Promoting adherence and overall well-being must include an emphasis on trauma exposure and mental health. Further studies should explore the longitudinal relationship between these factors in the lives of YLWHIV to see if there are any causal mechanisms that can be explored.

Additionally, a study of protective factors would also provide targets to promote in psychosocial support programs for these youth.

TUPED04

Risk network referral and enhanced peer outreach approach (social network strategy): HIV case identification strategy for female sex workers in Kilifi county - ICRHK key population program

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Background: Female sex workers (FSWs) remain disproportionately affected by HIV, with a prevalence estimate of 45.1%[1] among FSWs in Kilifi as compared to 2.3% [2] among the general population in Kilifi counties respectively.

The National HIV program objective is to have 95% of Kenyans to know their status, however, only over 79.5% of Kenyans living with HIV are aware of HIV status which is detrimental to HIV prevention, care and treatment.

ICRHK implemented Risk Network Referral (RNR) a strategy that systematically facilitates referrals from HIV-positive FSW to their social network with a High risk of HIV/STI infection for HIV testing services and connects HIV-negative peers to services that will help them remain negative. ICRHK also implemented EPOA, an innovation that uses performance-based incentives and works through social and sexual networks to improve HIV case-finding outcomes.

Methods: ICRHK conducted a retrogressive data analysis of Key population data for 3 years (2020 to 2022). We analyzed facility-level HIV Data to determine trends of HIV positive Case identification among female sex work-


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ers. This data was compared to different models of HIV testing both at the outreach and static sites. Risk network Referrals (RNR) and EPOA as part of the Social Network Strategy (SNS) were analyzed comparatively against conventional key population HIV testing at the static and outreach sites.

Results: The analysis showed that RNR and EPOA produce high HIV positivity rates of case identification among female sex workers in Kilifi County as compared to outreach and static HIV testing methods.

Kilifi County a total of 4644 tests were done among FSWs between October 2019 and June 2022. Among those done through EPOA (1146), 8% turned positive. Out of 2229 tests done through RNR, 169(8%) turned positive while 2% of the through conventional outreach tests turned positive.

Conclusions: To achieve UNAIDS 2030 target, there's a need to scale effective HIV services with high impact. With an ongoing dynamic change in HIV programming for the Key populations, it is prudent that key population implementers adopt high-impact strategies that are sustainable and cost-effective.

TUPED05

Risk characteristics, risk perception, and long-acting PrEP awareness and interest among Black and Hispanic men: a national survey

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Background: Black and Hispanic people accounted for 70% of new HIV diagnoses but only 31% of HIV pre-exposure prophylaxis (PrEP) users in the US between 2015 and 2019. This data demonstrates the severe inequities in PrEP access and use in historically underserved racial and ethnic groups in the US. Alternative PrEP options, such as long-acting (LA) injectable PrEP, serve a critical role in addressing these gaps.

This study focused on awareness and interest in using LA-PrEP among US Black and Hispanic men by risk characteristics and risk perception.

Methods: Cisgender men were recruited between November 2021-March 2022 through targeted ads on social media platforms to complete an online, self-administered survey. Eligible participants were: 18+ years, current US residents, self-reported Black race and/or Hispanic/Latino ethnicity, reported penetrative (anal or vaginal) sex in the past six months and unknown or negative HIV status.

The survey included questions on demographics, sexual health and behavior, awareness of LA-PrEP prior to survey, and interest in using LA-PrEP after reading a brief product description. Descriptive statistical analyses were conducted using SAS v9.4.

Results: 1,728 Black and Hispanic men completed the survey (median age: 29 years; US geography: South – 53.2%, West – 30.8%, Northeast – 10.1%, Midwest – 5.8%; sexual orientation: heterosexual/straight – 61.3%, gay – 28.7%, bisexual – 5.7%, another orientation – 4.3%).

Half of participants had heard of LA-PrEP prior to survey start; three-quarters expressed interest in using LA-PrEP after reading the description. LA-PrEP awareness and interest were highest among participants who reported: STI diagnosis in the past two years, multiple male partners, injection drug use in the past year, and inconsistent condom use with male partners.

Although LA-PrEP awareness varied by participant characteristics, interest in using LA-PrEP was high across subgroups.

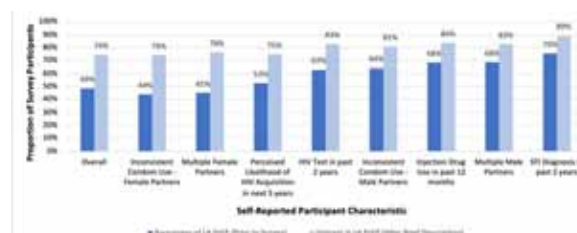


Figure. Awareness and interest to use long-acting PrEP among black and hispanic men by select characteristics.

Conclusions: These results illustrate high interest for LA-PrEP among Black and Hispanic men and the need to increase LA-PrEP awareness in this population.

TUPED06

Factors associated with frequency of drug use among people who inject drugs enrolled in HIV prevention program in Eastern Nepal

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Background: Harm reduction services are one of the key components of HIV prevention program in Nepal. The frequency of drug injection is an important factor which is related with mental health status and harms related to injecting behavior. However, little is known about the factors which influence the frequency of drug injection among PWID in Nepal.

Thus, we examined the socio-economic and injecting behavior factors associated with frequency of drug injection among PWID enrolled in HIV prevention program in Eastern Nepal.

Methods: We conducted a cross-sectional study with secondary analysis of the routine program data. We included a total of 2653 PWID clients enrolled in the harm reduction program during 2020/2021.

We measured socio-demographic variables, drug injecting behaviors such as age of initiation, types and frequency of drug use and body sites for injection. We used multi-variable linear regression model to analyze the data.



Results: Out of 2653 participants, 6% were women. The mean age was 25.8 years (SD 4.2), 27% were married. More than half of the participants had only primary level of education. The mean age of first injecting drug use was 19.7 years (SD 3.1). The mean frequency of drug use per week was 8.1 times (SD 3.3). Around 89% of the participants inject drugs in groin region and rest others in upper arm. Around 96% of the participants mix more than one type of drug during injection.

Women were more likely to inject drugs frequently per week than men ($\beta=4.10$, $p<0.001$). Those who initiate drug injecting behavior at later age were more likely to inject drugs frequently per week ($\beta=0.18$, $p<0.001$). Those who mix multiple drugs while injecting were more likely to inject drugs frequently per week ($\beta=1.58$, $p<0.001$). Those who inject drugs in groin region were more likely to inject drugs frequently per week ($\beta=1.31$, $p<0.001$) than those who inject in upper arm.

Conclusions: The frequency of drug injection is associated with gender, age of first drug injection, mixing multiple drugs and injecting site in the body. Such evidence is helpful while designing interventions for harm reduction program among PWID in Nepal.

TUPED07

Abstinence from the perspective of men who have sex with men and live in Padang, a religious city in Indonesia

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Background: HIV prevention efforts in various parts of Indonesia still focus on the central values of culture and religion. The way of life in the most religious semi-urban/urban areas expects abstinence to be the most important method promoted in HIV prevention efforts.

Various kinds of behavioral and other biomedical prevention efforts that have also proven effective in suppressing HIV transmissions, sometimes face many barriers in their implementation, especially in areas where traditional cultures, norms and religion have higher value.

This study explores the perspective of men who have sex with men on abstinence in Indonesia.

Methods: The study was conducted by carrying out phenomenological research. Data were collected between June-September 2022. In-depth interviews were conducted with 20 MSM in Padang, Indonesia by using semi structured questions.

The data analysis in this study used the Stevick-Colaizzi-Keen data analytical method.

Results: Five essential themes were found, the themes were: sex is a basic human-need, abstinence is only temporary, importance of alternative options to sex during

temporary abstinence, MSM will limit who they share their sexual preference with and expectations of other prevention options. Relying on HIV prevention by focusing solely on promoting abstinence is therefore questionable.

In practice, we face a series of behavioural challenges in implementing abstinence, and the key population itself cannot carry out this type of prevention effectively. This should be considered during the strategic planning of such programs to strengthen the acceptance and implementation of more optimal abstinence behavior so that it can significantly reduce the transmission rate.

In Indonesia, there are still few available options for HIV prevention programs based on a behavioural or biomedical approaches compared to developed countries. The limited options and outreach is even worse in under-developed, rural, and suburban areas, yet the discrimination and stigma are still the biggest barriers of all.

Conclusions: Focusing on abstinence only could increase the likelihood of risky behaviors. Being oppressed and discriminated against, the MSM group faces limited options, knowledge, and awareness to apply behavior to prevent transmission. Strengthening prevention efforts in key MSM groups must be specific and unique to identify behavioral needs that can be most effectively implemented.

TUPED08

Archetypes of PrEP discontinuation among transgender women in the United States: a longitudinal, mixed methods cohort study

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Background: Transgender women (TW) in the United States experience high HIV incidence and suboptimal PrEP engagement. We sought to estimate PrEP initiation and discontinuation rates and to characterize PrEP discontinuation experiences among a longitudinal prospective cohort of TW.


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Methods: Using a sequential, explanatory mixed methods design, 1,312 adult TW at risk for HIV acquisition were enrolled from March 2018 to August 2020 and followed for a median of 24 months (interquartile range 15-36). Cox regression models assessed predictors of initiation and discontinuation. A subset of 18 TW participated in qualitative in-depth interviews that included life history calendars to explore key events and experiences surrounding discontinuations and to establish temporality. Qualitative and quantitative data were integrated to inform meta-inferences and facilitate interpretation of findings.

Results: Among 1,312 TW, 21.8% (n=286) reported taking PrEP at one or more study visits while under observation. We observed 139 PrEP initiations over 2,127 person-years (6.5 initiations/100 person-years, 95% CI: 5.5-7.7) and 138 PrEP discontinuations over 368 person-years (37.5 discontinuations/100 person-years, 95% CI: 31.7-44.3). Predictors of initiation included identifying as Black and experiencing PrEP indication. Predictors of discontinuation included having a high school education or less and initiating PrEP for the first time while under observation. Four distinct archetypes of discontinuation emerged:

1. Seroconversion following discontinuation,
2. Ongoing HIV acquisition risk following discontinuation,
3. Reassessment of HIV/STI prevention strategy following discontinuation, and;
4. Dynamic PrEP use coinciding with changes in HIV acquisition risk.

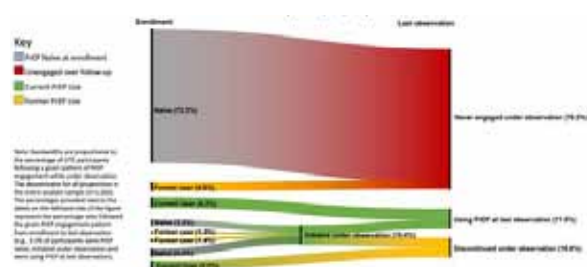


Figure 1. PrEP initiations and discontinuations among transgender women in the United States enrolled in The LITE Cohort under observation from March 2018 to July 2022 (n=1,302).

Conclusions: PrEP initiation rates were low and discontinuation rates were high. Complex motivations to stop using PrEP, which did not consistently correspond with HIV acquisition risk reduction, point to the need for continued HIV prevention support for TW who discontinue PrEP. Evidence-based interventions to increase PrEP persistence among TW with ongoing acquisition risk are necessary to optimize PrEP effectiveness in this population.

TUPED09

A growth curve model to assess the effectiveness of a community-based intervention for the empowerment of Malian females in the decision to disclose (or not) their HIV status (ANRS-12373 Gundo-So)

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Background: In Mali, women living with HIV (WLHIV) who disclose their positive status are often confronted with stigma, violence, economic pressure, and social exclusion, including from family. We aimed to evaluate the effectiveness of an intervention for the empowerment of WLHIV on the decision to disclose or not their HIV-positive status, and associated factors.

Methods: ANRS-12373/Gundo-So (Chamber of Secrets in Bambara) was implemented in 6 community-based clinics in Mali in 2019/2020. The intervention consisted of 9 weekly sessions of peer-support for strengthening the capacity of WLHIV to manage the consequences concerning (non)disclosure of their HIV-positive status. Individual and psychosocial characteristics were collected at enrolment, pre-/post-intervention, then quarterly over 9 months.

Effectiveness was evaluated using a scale measuring the psychological burden related to the sero-status secret from 0 (none) to 5 (very high). A growth curve model using Poisson distribution was estimated to investigate changes before (=0) and after the intervention (=1).

Random-effects allowed controlling for unobserved/unobservable characteristics. This technique accounts for missing data and unequally spaced time points.

Results: Among 240 WLHIV enrolled, 222 (92.5%) and 146 (60.8%) responded to the pre-/post-intervention questionnaires respectively. Then, 139 (58.0%) continued follow-up at M3, and 136 (56.6%) at both M6 and M9. Analyses were carried out over the 1019 observations.

At baseline, median age[IQR] was 33[28-39] years, 76.7% of participants did not have any education level/low-level. The psychological burden of sero-status secret was self-evaluated ≤ 1 by 50% of participants, whereas it was ≥ 4 for 23%. Estimations without confounders showed that the psychological burden decreased on average by 42% after the intervention (IRR:0.58, 95%CI[0.46-0.61]).

Including covariates showed that the psychological burden decreases with age (IRR:0.98, 95%CI[0.97-0.99]), easy ARV uptake (IRR:0.81, 95%CI[0.68-0.97]), and absence of loneliness (IRR:0.83, 95%CI[0.71-0.96]).

The intervention effectiveness persisted after including covariates. The psychological burden decreased of 44% after the intervention (IRR:0.56, 95%CI[0.48-0.65]).



Conclusions: Our results have demonstrated that the Gundo-So intervention was effective for the empowerment of Malian WLHIV to reduce the psychological burden of HIV disclosure-related issues. Social and behavioral interventions adopting a community-based approach can effectively promote health outcomes among people confronted to sociocultural hostile environments such as Mali.

TUPED10

Introducing the DOME model as a community 'one-stop' shop focusing on key populations in Ho Chi Minh City, Vietnam

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Background: HIV services are just a part of the health care needs for vulnerable populations. In Vietnam, work has been done to expand services among community-based organizations (CBOs) and social enterprises (SEs) providing HIV serves to better address these broader health care needs. The DOME model attempts to provide community-based services to augment the clinical care provided by public or private clinics/hospitals.

Description: The DOME model was co-developed with input from CBOs and SEs in Ho Chi Minh City, who serve the key populations. The initiative launched officially September 2022 with 6 organizations enlisting.

In addition to HIV testing and linkage services, DOMEs also provide key populations with a standardized, yet tailored, set of services which may include screening, rapid testing, counseling and referral for STIs, Tuberculosis, hepatitis, mental health, substance abuse, and other primary care augmentation services. The model also incorporates support for business development for sustainability, branding and seed funding to support transition.

Lessons learned: Since the launch, the number of DOMEs has increased from 6 to 10. DOMEs have completed 5 finance and administration training, reviewed the business models and reassessing their revenue streams and connected with a mentor to coach them on finance and business management. Through January 30, 2023, DOMEs have received 10,098 clients, identified 706 new cases of HIV and enrolling 1,509 on PrEP. Additionally, DOMEs providing STI screening have tested 2,265 clients and referring 83 of those for treatment for either syphilis, chlamydia and Hepatitis B/C, others will be added in the coming months.

Conclusions/Next steps: Although this model is only in its first year, it has already garnered significant interest from other CBOs, and also gotten the support and attention of the Vietnam Administration for AIDS Control/Ministry of Health as a promising model to sustain the community's contribution to the public health response.

The model will continue to be evaluated for its acceptability, performance, quality, efficacy and efficiency as the approach matures to other services and builds the business capacity of community organizations.

TUPED11

How to reach left-behind Key Population Subcommunities to end the world's fastest growing HIV epidemic in Eastern Europe and Central Asia: lessons learned for funders and implementers

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Background: Eastern Europe and Central Asia (EECA) has the world's fastest growing HIV epidemic. From 2010-2021, new HIV transmissions increased by 48% and AIDS-related deaths increased by 32%, whilst decreasing globally. Only 63% of PLHIV know their status, 51% are on ART, and 48% are virally suppressed.

The war in Ukraine has compounded this with a humanitarian crisis, with devastating impact on key populations (KPs) and PLHIV.

Description: Elton John AIDS Foundation is now the largest philanthropic HIV donor in EECA (FCAA). To turn the tide on HIV in the region, from 2020-2023 the Foundation has prioritised innovative community-led approaches to reach KP communities that have been historically left behind from the HIV response such as: KP migrants, KPs outside urban centres, KPs using new psychoactive substances (NPS), and PLHIV lost to follow-up (LTFU).

These groups' access to HIV services is impeded by neglect, criminalisation, lack of resources, and stigma and discrimination.

Lessons learned: Reaching left-behind communities is proving programmatically effective. For example: 13% of 2,500 KP migrants from Central Asia tested for HIV in our programmes have tested positive, indicating the vulnerability of this group and the importance of developing client-centred models that meet their needs; partners have also established new mechanisms that allow migrants to remotely initiate and receive ART from their home countries, which boosts initiation and retention rates. Person-centred approaches have (re-)initiated 9,773 LTFU PLHIV on ART. Approaches to decentralise state and community-led HIV services outside urban centres (where the majority of PLHIV and KPs reside in some EECA settings) has boosted HIV testing yields and ART uptake.

To engage NPS users, the Foundation is supporting online outreach, HIV prevention and incentive packages, remote self-testing and counseling, with encouraging early re-


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sults. All Foundation-supported projects include activities to reduce stigma and discrimination towards KPs and PL-HIV in order to tackle systemic barriers. Including humanitarian services has been vital for maintaining HIV services in Ukraine.

Conclusions/Next steps: If the EECA HIV epidemic continues to grow, we will not achieve SDG3 of ending AIDS by 2030.

Further local government and international funding is needed to scale up evidence-informed approaches that successfully engage left-behind communities in EECA into HIV services.

TUPED12

Preferences of gbMSM regarding sexual orientation disclosure interventions in primary care: a qualitative content analysis

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Background: Sexual orientation disclosure is an obstacle to accessing primary care among gay, bisexual and other men who have sex with men (gbMSM). We explored gbMSM preferences regarding hypothetical interventions for supporting disclosure to providers.

Methods: We recruited Ontario gbMSM (18+ years) from sexual networking applications and community-based organizations for a cross-sectional survey. A community advisory board assisted in conceiving ten potential interventions. Participants reported why they found each acceptable or unacceptable in open-ended textboxes.

Two authors coded responses independently and used content analysis to identify themes for positive opinions, negative opinions, suggestions for implementation and unrelated; discrepancies were resolved by discussion or a third author. We summarized themes from interventions with the most and least positive opinions.

Results: Of 404 gbMSM, most were White (59%) and gay (82%). Mean age was 39 (SD=12) years. We generated 378 unique codes from 1592 responses across all interventions. Seven interventions garnered mostly positive opinions (Figure 1).

The intervention with the most positive opinions (80%) was a directory of queer-friendly providers; themes suggested it could improve interpersonal experiences with providers and provide better overall healthcare (Figure 2).

The intervention with the most negative opinions (70%) was a performance-based incentive program; themes suggested it could cause clients to doubt their providers' intentions when seeking care and could result in negative consequences for clients.

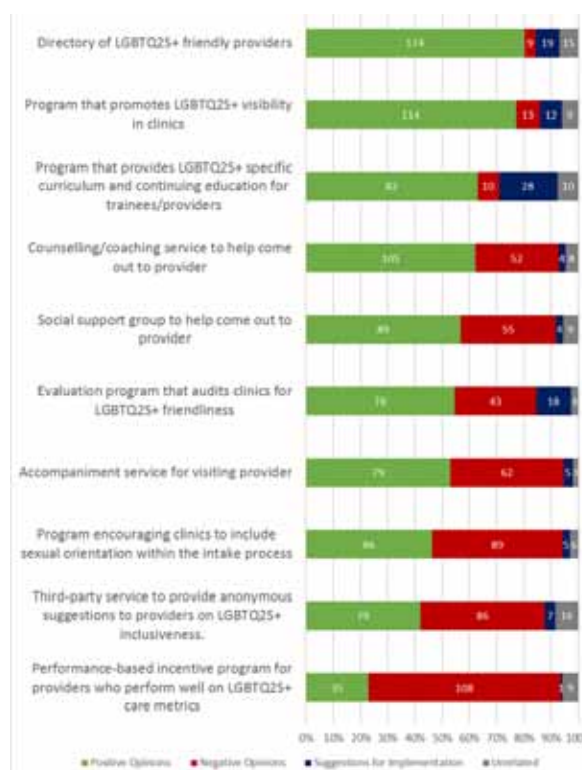


Figure 1.

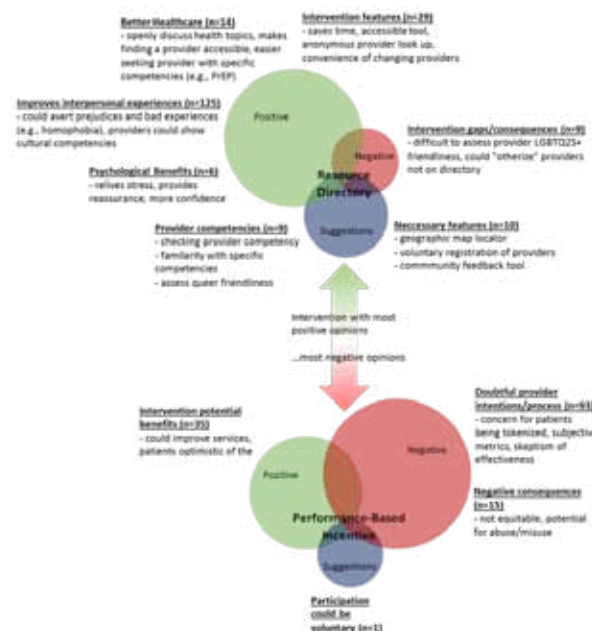


Figure 2.

Conclusions: Based on gbMSM's preferences, priority interventions are resource directories, promoting LGBTQ2S+ visibility, and further LGBTQ2S+ medical curriculum. Community-oriented implementation strategies should anticipate psychological and interpersonal benefits in supporting disclosure.

**TUPED13****"Door to door would be the best way": a qualitative analysis of peer delivered combination prevention for transgender women in Uganda**

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Background: Transgender women (TGW) have high HIV risk but low engagement in care. Peer delivery is an effective strategy for increasing HIV and sexually transmitted infection (STI) testing, but it has not been evaluated for TGW in Uganda.

Methods: We conducted formative research for a randomized trial of peer delivered HIV self-testing (HIVST), STI self-sampling and oral pre-exposure prophylaxis (PrEP) for TGW in Uganda (NCT04328025) between October 2019 and April 2020.

Twenty in-depth interviews with TGW peers explored:

- Barriers and facilitators of peer delivered combination HIV prevention, and;
- Preferences for HIV/STI testing approaches and PrEP refills.

Interviews were conducted in Luganda (local language) at a location convenient for the interviewee. They were audio recorded and transcribed verbatim to English by the interviewer.

We used an inductive content analytic approach centering on descriptive category development to analyze the data and identify themes representing TGW preferences for HIV prevention delivery.

Results: Four key themes that explain TGW preferences within a peer delivery system emerged from the qualitative data:

- Peer training.** TGW peers needed to be knowledgeable about the use and interpretation of HIV self-tests, PrEP adherence counseling and the correct way to self-collect samples for STI testing;
- Confidentiality.** Trust in peers to keep personal health information private was essential for successful delivery of HIV self-tests and PrEP refills, and for returning self-collected STI samples for laboratory testing;
- Trans-friendly care.** TGW peers and transgender-led drop-in-centers were perceived to be the most effective ways of distributing HIVST and PrEP refills and improving access to STI testing;
- Stigma reduction.** Peer delivered HIV services were seen as desirable because they would enable TGW to avoid stigma and discrimination experienced at health facilities from providers and other clients.

Overall, the desired peer attributes for facilitating HIV/STI testing and PrEP use were confidentiality, trustworthiness, and practical knowledge of biomedical HIV prevention tools.

Conclusions: Peer delivery and trans-friendly care may help to overcome barriers to HIV/STI testing and PrEP use among TGW. Community-based strategies such as peer delivery and drop-in-centers may improve testing and PrEP outcomes and decrease HIV burden in this population.

TUPED14**Interventions Targeted to Increase or Maintain Viral Suppression after Incarceration: A Systematic Review**

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Background: Transition from incarceration to the community is a crucial phase, and an individual's transition experience can impact HIV treatment outcomes such as viral load, risk of HIV complications, and viral suppression. The purpose of this study was to systematically review publications describing interventions intended to improve or maintain HIV viral suppression among individuals released from prison or jail.

Methods: The systematic review followed PRISMA guidelines, and we searched for relevant publications in PubMed, CINAHL, PsycINFO, EMBASE, and Google Scholar.

We systematically screened intervention studies published through 2022 and then performed a narrative synthesis to organize and discuss the study findings. Eligible studies reported HIV viral suppression or viral load in formerly incarcerated individuals as an outcome.

Studies were excluded if they targeted only the incarceration phase or if the full article text was not available in English.

Results: A total of 753 articles were identified, and four eligible articles were included in the final review. Using Cochrane Collaboration's tool, three studies were rated as having a low risk of bias and one as having a high risk of bias; due to the small number of eligible studies, the latter was nonetheless included in the review.

All four studies were longitudinal randomized controlled trials and were conducted in the United States between 2017 and 2019.

Across the studies, viral suppression ranged from 30% to 61% at the end of follow-up. We categorized the interventions identified into two groups: behavioral and pharmacological interventions.

Only a peer-based behavioral intervention called the LINK LA peer navigation intervention showed statistically significant maintenance of viral suppression at 12-month follow-up ($p = 0.03$).



Moreover, half the reviewed studies reported a high attrition rate and a smaller sample size than originally planned.

Conclusions: This review revealed a limited number of existing studies in the area of interest and highlighted the need for more research in all parts of the world. Based on the data available in the reviewed studies, our preliminary conclusion is that peer-based behavioral interventions are the optimal choice for maintaining or improving viral suppression in the vulnerable population of individuals newly released from prison or jail.

TUPED15

Revolution of Transgender health programming: the role of transgender activists in Health programming for Malawi

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Background: Lesbian Intersex Transgender and other Extension (LITE) is a peer led organization that was formed in 2016 but officially got registered in 2018. The organization started as a support group to provide psychosocial support to one another.

In 2017, LITE conducted a series of community dialogues, consultative meetings and needs assessments with various stakeholders to give community members an opportunity to meaningfully contribute towards LGBTI Programming in Malawi, collect data and views to inform programming for community led organizations and ensure that individuals are considering self-security and also prevention of HIV/AIDS.

Description: Transgender persons have at least experience violence in the hospital when accessing health services. The highest ranking of perpetrators being the health personnel, transgender persons have been denied health services, chased away from the hospital only to be taught to come dressed in conforming clothes.

Those who have resisted the nurses are regarded as impersonators and they call police on them, who arrest them for impersonating. We used the health for all, human rights centered approach to advocate for Transgender health programming.

Lessons learned: Through resilient advocacy, LITE organization has successfully amplified the livelihood of Transgender persons in Malawi. The organization through its transition from a support group to an established organization has also transitioned with them the Transgender Health programming especially in ensuring that Transgender persons are able to access HIV services. We contributed towards the development of a minimum standard package for Transgender person which was developed in collaboration with National Aids Commission.

We facilitated the implementation of the transgender formative study conducted and successfully advocated for the inclusion Transgender persons in the Nation-

al Strategic Plan for HIV response for Malawi. In 2020, through the Key Population Investment Fund, LITE started to implement HIV programming for Malawi.

Conclusions/Next steps: Peer based approaches have been influential in informing transgender health programming in Malawi. Using lived realities, personal experience and shared stories we have managed to set a benchmark for transgender health programming in Malawi. However, no established epidemic patterns due to lack of population studies for transgender. As such, we are advocating for a national population size estimate study.

TUPED16

Vicarious trauma among health care workers serving GBV survivors. Case Busia County, Kenya

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Background: Vicarious trauma is the result of being exposed to and empathically listening to stories of trauma, suffering, and violence caused by humans to other humans (Pearlman and Saakvitne 1995). Described as the cumulative effect of working with traumatized individuals, such as survivors of violence, that can transform and interfere with a provider's feelings, memories, sense of safety, and self-esteem (McCann and Pearlman 1990; Pearlman and Saakvitne 1995; Hernandez, Gangsei et al. 2007). A provider's trauma response may become more severe with repeated exposure to traumatic material, such as a provider responding to survivors' experiences of violence and delivering first-line support.

The objective of the study is to determine the prevalence of vicarious trauma and the general state of mental health for healthcare workers.

Methods: The study population included healthcare workers within Busia County serving the survivors of GBV. A survey was administered through Kobo collect App to the healthcare workers serving survivors of GBV. These healthcare workers include clinical officers, nurses, counselors, and social workers. The survey was administered from 30th November 2022 to 13th January 2023.

Results: The respondents were 25 health care workers (N=25, Male, 8(32%) and Female 17(68%) with majority of the respondents aged between 31-35years (40%).

Clinical officers are the majority (48%) health care workers serving GBV survivors. Using the crisis & Trauma resource institute INC scale, 80% of the respondents are highly affected by vicarious trauma while with compassionate fatigue 48% are highly affected and 40% by moderate effect.

Conclusions: Vicarious trauma, compassion fatigue, and burnout can result in decreased morale among staff; lack of team cohesion; poor communication within an organization; decreased collaboration; and delivery of poor-quality services. There may be high levels of staff turnover within sites and organizations that do not provide mental health and psychosocial support for staff.



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This results in the loss of time and resources that need to be redirected to onboard and train new staff, which also drains the reserves of the remaining staff.

TUPED17

Labor Market Assessment: unpacking opportunities for Determined, Resilient, Empowered, AIDS free, Mentored and Safe program beneficiaries in ever-changing contexts in Zimbabwe, 2022

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Background: Major factors which contribute to increased susceptibility of adolescent girls and young women (AGYW) to HIV infection include lack of education, economic dependence, gender-based violence (GBV), high rates of unemployment and underemployment, leading to high-risk sexual behaviours and early marriages. Economic strengthening and linkages to wage employment and income-generating activities for AGYW is key in disrupting HIV causal pathways.

There was paucity of data on sectors and entry points occupation with potential to grow and create opportunities for AGYW across districts implementing the Determined, Resilient, Empowered, AIDS free, Mentored and Safe (DREAMS) program in Zimbabwe.

Methods: We conducted a qualitative, descriptive cross-sectional labour market assessment (LMA) across 9 districts implementing DREAMS program to understand sectors and entry points occupation with potential to grow and create opportunities for AGYW.

Study participants were purposively selected and consisted of district economists, government stakeholders, non-governmental organizations (NGOs), training institutions and employers.

Data were collected using key informant interview guide in English, Shona, or Ndebele, audio recorded and transcribed in English. Line-by-line coding was conducted, and content analysis and constant comparison were used to identify key themes for each respondent type using NVivo.

Results: Retailing was a common sector selected as the growth sector for both rural and urban opportunities for AGYW; the sector was reportedly adaptable to prevailing operating conditions. Common sectors for urban areas were on the service side including catering, tailoring, construction, welding, and carpentry and for rural areas were

agro-based including poultry, crop production and agro-processing. Opportunities and entry points for AGYW per value chain differed within districts depending on whether they are formal or informal businesses.

There was limited engagement between the private sector and training institutions resulting in mismatch of expectations of the private sector and graduates released into the market.

Conclusions: Economic environment is constantly changing, hence the need to conduct regular LMA and value chain analysis to empower AGYW with relevant skills required in the growth sectors. This will increase AGYW's enterprises sustainability and access to employment which reduce chances of AGYW engaging in sexual behaviors which place them at risk of HIV infection.

TUPED18

Using comprehensive sexuality education to enhance uptake of HIV testing among adolescents and young people in secondary schools

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Background: Adolescents and young people (AYP) aged 15-24 years in Kenya are disproportionately affected by HIV, yet in 2018, knowledge of HIV status was only 49.8% and in 2022, correct HIV knowledge on HIV prevention stood at 54.2%. Comprehensive sexuality education (CSE) can increase HIV testing. We piloted CSE among school-going AYP to promote uptake of HIV testing services (HTS) and STI screening.

Methods: We conducted a cluster randomized-control trial with HTS uptake as the main outcome. Six secondary schools were paired based on type (girls, boys and mixed) and one in each pair randomly assigned to intervention (CSE) or control. Data were collected on HIV risk perception, sexual behaviors and self-efficacy towards abstinence. Intervention students were taken through 12 peer-led CSE sessions implemented over a 6-month period. Control students continued with the life skills curriculum offered in schools.

All participants were asked to anonymously list the services they required. After the intervention, HTS counselors and clinicians were engaged to provide services in schools.

Results: We enrolled 293 students from 6 schools (148 in intervention and 145 in control); mean age was 17 years, 51.5% were female, 83.9% were single and 73.7% were Christian. Altogether, 66.9% requested for HTS services, 10.6% for STI services, and 27.7% for SRH information. Requests for HTS, STI and SRH information was higher in the intervention arm at 12.3%, 3.2% and 20.6%, respectively, than control.

Services have been offered for 47 students in one intervention school: 25 requested for HTS and 23 received the services, 3 requested for STI management and 4 received

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(1 additional), and 19 requested for SRH information and 22 received (3 additional). The impact of the intervention on service uptake will be determined once service provision is complete in all schools in February/March 2023, and will be reported at the conference.

Conclusions: CSE led to high request for HTS services, and as demonstrated by one school where services have been offered, uptake is over 95% of the requests.

The life skills curriculum in Kenya should be expanded to include CSE to increase correct HIV knowledge and improve service uptake.

TUPED19

Prevalence and Determinants of GBV among adolescent girls and young women (AGYW) enrolled in a Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) program at a military facility in Uganda

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Background: The prevalence of HIV among young people in Uganda is three times higher among women compared to men. Harmful cultural practices such as child marriages subject women to unequal treatment and make them prone to sexual and gender-based violence (GBV) which increases their risk acquisition of HIV.

We describe the prevalence, type of GBV and support offered to GBV survivors among the AGYW from military barracks and surrounding communities enrolled in the DREAMS program at a military facility in Uganda.

Methods: We conducted a retrospective data analysis of the AGYW enrolled in the DREAMS program at a Ugandan military facility between October 2021 and Sept 2022 using a standard Ministry of Health tool for GBV. Survivors were linked to support services for GBV. Descriptive statistics were applied to determine the prevalence and types of GBV. Multivariable analysis with Odds Ratios (OR), a 95% CI using the Fisher's exact test was used to determine the factors associated with GBV.

Results: 1,832 AGYW were enrolled and screened for GBV. The prevalence of GBV was 29% (538/1832). The prevalence was highest among the AGYW aged 15-19 years at 43.7% (95% CI: 38.4-49.0) followed by those in the 20-24 years age band at 28% (95% CI: 24.7-31.6) and 25% (95% CI: 21.7-27.6) for the 10-14 years age band.

All survivors reported emotional or psychological abuse, while 15% reported physical GBV and 7% reported sexual GBV. The factors associated with GBV among the AGYW included being out of school (OR 1.48 [1.21, 1.83]), being

married increased odds of GBV by 35% (OR 1.35[1.047, 1.735]), being an orphan increased odds of GBV by 84% (OR 1.84 [1.116, 3.007]) and giving birth before the age of 15 years had a 41%, (OR 1.41 [1.252, 1.588]) higher likelihood of experiencing GBV.

Conclusions: GBV was highly prevalent among the AGYW who are out of school, orphaned and those in early marriages. Mitigation will require a targeted multi-sectoral approach that ensures AGYW enrolment and retention in school, prevention of childhood marriages as well as strengthening the policy environment addressing GBV to contribute to reduction of HIV acquisition and achieve HIV epidemic control.

TUPED20

Gay and bisexual men not on PrEP in Australia are increasingly choosing sexual partners based on their partner's PrEP use and viral load

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Background: HIV pre-exposure prophylaxis (PrEP) and viral suppression have changed the sexual practices of gay, bisexual, and other men who have sex with men (GBMSM). However, there is currently little evidence about whether GBMSM in Australia rely on their perceived partners' PrEP use ("PrEP sorting") or viral load status ("VL sorting") to prevent HIV acquisition. We therefore assessed trends in PrEP and VL sorting among GBMSM in Australia.

Methods: We analysed national data from repeated behavioural surveillance surveys of GBMSM at venues, events and online collected during 2017-2021. We used logistic regression to assess trends in PrEP sorting and VL sorting among participants who reported condomless anal intercourse with casual partners in the last 6 months and were not on PrEP.

Results: Among the 5435 surveys included of non-HIV-positive participants not on PrEP, 2682 (53.3%) reported PrEP sorting in the last 6 months, 1096 (22.3%) reported VL sorting, and 2568 (47.3%) reported neither PrEP nor VL sorting. PrEP sorting increased from 44.3% in 2017 to 63.0% in 2021 (OR=1.18, 95%CI=1.13-1.23), and VL sorting increased from 21.2% in 2017 to 27.7% in 2021 (OR=1.08, 95%CI=1.03-1.13). PrEP sorting was positively associated with having a university education (aOR=1.19, 95%CI=1.06-1.34), having 11 or more sexual partners in the last 6 months (aOR=1.44, 95%CI=1.26-1.65), having been tested for HIV in the last year (aOR=2.16, 95%CI=1.87-2.49) and having an STI in the last year (aOR=1.24, 95%CI=1.08-1.43).

VL sorting was positively associated with age (aOR=1.02, 95%CI=1.00-1.02), having 11 or more sexual partners in the last 6 months (aOR=1.62, 95%CI=1.40-1.89), having been



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tested for HIV in the last year ($\alpha\text{OR}=1.41$, $95\%\text{CI}=1.18-1.70$) and having an STI in the last year ($\alpha\text{OR}=1.29$, $95\%\text{CI}=1.10-1.52$).

Conclusions: There has been an increasing reliance among non-HIV-positive GBMSM not on PrEP to depend on their partners' PrEP use or viral load status to prevent HIV. This group may benefit from adopting an individual prevention strategy, such as PrEP or condoms, rather than relying on their perception of their partners' PrEP use or viral load to prevent HIV. The changing sexual norms of GBMSM in Australia in the context of PrEP should continue to be monitored.

TUPED21

Mobilising a rapid and comprehensive community-led response to MPOX: lessons from the RESPND-MI study team

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Background: Early mpox responses by U.S. public health agencies (PHAs) failed to provide timely vaccination, testing, treatment, and educational materials to the public. Consequently, information about the outbreak, exclusively based on testing data, was unreliable. The RESPND-MI study team (RST) was established to gather actionable data on the social and spatial epidemiology of mpox in New York City (NYC).

Description: RST consists of 19 scholar-activists. Starting in May 2022, we prepared a study about sexual activity and mpox symptoms among those most vulnerable to mpox. To promote collective decision making, we organised an online community forum (CF). In the first CF, attendees expressed the need for a space to continually coordinate response efforts across organisations, and to address gaps not immediately met by local and federal public health agencies.

CFs thus became weekly calls where participants received epidemiologic updates, discussed problems, and provided input on study design and marketing decisions. From

June to September 2022, over 80 activists, community leaders, public health professionals participated in CFs. We produced policy briefs, op-eds, and educational materials; and conducted media outreach. The RST website became a clearing house for community-generated resources, as well as community-generated information on vaccination, testing, and treatment services.

Educational materials and policy recommendations from the CF were adopted by city, state, and federal PHAs. Reporters cited the RST in over 90 press clips. Survey data were used to inform NYC vaccination outreach services.

Lessons learned: Community-led research efforts can provide useful data in the context of public health emergencies. Consulting diverse stakeholders can improve data quality; whereas the RST initially planned to disseminate an English-only survey for gay and bisexual cis-gender men, CF participants successfully advocated to include trans individuals and to add a Spanish version.

Conclusions/Next steps: Structured community engagement can facilitate comprehensive responses to novel public health threats. Facilitating spaces for community members to discuss challenges can yield creative solutions that tackle multiple aspects of an emergency, identifying otherwise obscured problems and exploiting the collective strengths of all organisations and individuals in the coalition. To prepare for future outbreaks, PHAs should invest resources in platforms that enable such engagement.

TUPED22

Implementing a digital platform to fight against COVID-19 in primary care units in Brazil: lessons learned for future pandemics

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Background: The COVID-19 (C19) pandemic affected the health, political, social, and economic sector around the world. Digital technologies with different functionalities have been widely used during the pandemic.

We aimed to describe the online digital platform based on surveillance and articulation with primary health care services (PHCS) in two Brazilian capitals.

Description: This is a case study of the digital platform implemented to expand testing, isolation, quarantine, and telemonitoring strategies for C19.

This qualitative and analytical approach design was carried out in nine PHCS in Salvador, Northeast Brazil. We conducted fifty-two interviews with health professionals,



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health managers, and community-based health agents. Interviews were analyzed according to thematic content analysis.

Lessons learned: The digital platform consists of a real-time health situation panel, participants registration modules, t-monitoring of people diagnosed with C19, contact tracking, testing and laboratory by type of test, reports with results, logistics, and database, plus a chatbot that interacted with the community sending messages of prevention, health education, testing, and tests results. The platform was developed based on formative research that sought to know the situation regarding coping with the pandemic by PHCS. It was observed that the platform enabled the fieldwork to articulate PHCS and surveillance in response to the pandemic. Managers reported that the system allowed more effective management and visibility of the actions in their services to plan the activities. Health professionals narrated that it was possible to perform and manage the surveillance steps of tracking and active search after implementing the platform. On the other hand, community-based agents highlighted the importance of real-time geospatial visualization of activities conducted in their territories, allowing the identification of C19 hotspots to articulate targeted individual and collective prevention and testing actions. The main difficulties were related to the internet's physical structure.

Conclusions/Next steps: We showed the successful implementation of a digital platform and its contributions to coping with C19 in PHCS. Furthermore, local health departments can expand the platform to monitor other diseases.

TUPED23

COVID-19 associated psychosocial outcomes among Black women with HIV affected by interpersonal violence participating in an mHealth HIV intervention in California, USA

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Background: The COVID-19 pandemic has had immeasurable negative effects on the health and wellness of people living with HIV, including mental health disorders while disrupting sustained engagement in care. Black women living with HIV experience great socio-structural burden that was likely exacerbated by the pandemic. We provide a snapshot of how the COVID-19 pandemic affected the socio-structural, healthcare, and mental health of Black women living with HIV.

Methods: We analyzed baseline cross-sectional survey data of women (n=24) participating in the *LinkPositively* Study. *LinkPositively* is a trauma-informed mHealth inter-

vention to improve HIV care among Black women living with HIV affected by interpersonal violence residing in Alameda, Los Angeles, and San Diego counties in California – priority jurisdictions for the U.S. Ending the HIV Epidemic Initiative. Descriptive analyses were conducted using frequencies and percentages for categorical variables and medians and interquartile ranges for continuous variables.

Results: Descriptive statistics: Women were highly educated (67% had completed some college, vocational school or more); identified as heterosexual (75%), were not partnered (83%), and were unemployed (67%). Women had been diagnosed with HIV for an average of 17 years. Women reported the following impacts of the COVID-19 pandemic in the past 6 months:

Socioeconomic considerations: 42% of women reported experiencing food insecurity and 38% reported a loss of income or employment.

Care: 29% of women felt less connected with HIV care, and 21% felt less connected to support services (e.g., mental health, domestic violence, substance use).

Mental Health: Overall, 38% of women reported COVID-19 specific PTSD symptoms in the past six months. Specifically, half of participants felt numb or detached from people, activities, or their surroundings. 29% of women reported trying hard not to think about COVID-19 or going out of their way to avoid situations that reminded them of COVID-19 and 38% reported being constantly on guard, watchful, or easily startled because of COVID-19.

Conclusions: Culturally-tailored resources are needed to mitigate the effects of the COVID-19 pandemic on psychosocial outcomes among Black women living with HIV, who are already disproportionately affected by socio-structural burdens, trauma, lack of sustained engagement in HIV care, and adverse mental health outcomes.

TUPED24

Intimate partner violence among couples living with HIV during the COVID-19 pandemic in Nigeria

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Background: There is substantial overlap between intimate partner violence (IPV) and HIV in Africa. The influence of COVID-19 measures on IPV among couples affected with HIV is not well documented. We assessed the magnitude, types, and IPV experiences of couples living with HIV at a tertiary center in Nigeria, during the period of COVID-19 restrictions/lockdown.

Methods: We used a cross-sectional, explanatory mixed-methods design with systematic sampling and a validated structured questionnaire (revised conflicts tactics



scales, CTS) to survey a clinic-based sample of married persons living with HIV ($n=305$). This was followed by in-depth interviews with a purposive sub-sample of respondents ($n=20$). Data were analyzed using logistic regression and a thematic framework approach. The study was conducted in March 2022.

Results: The prevalence of IPV was 34.4% in the 12-month period that encompassed COVID-19 restrictions (30th April 2020 to 1st March 2021). This number was higher than pre-COVID reported figures from the same area (22.1%). Nearly one-half (47.5%, $n=145$) of respondents had ever-experienced at least one form of IPV. Of those who ever-experienced IPV, 136 (44.6%), 43 (14.1%), and 19 (6.2%) reported verbal, physical, and sexual coercion, respectively. IPV was more prevalent among younger (<30 years) [adjusted Odds Ratio (aOR)=1.88; 95% Confidence Interval (CI) 1.15-3.35], formally educated [aOR=2.18; 95%CI=1.15-8.53], and ethnic Fulani respondents [aOR=3.27; 95%CI=1.39-7.68]. IPV risk was also higher among educated respondents [aOR=1.46; 95%CI=1.10-7.84], employed persons [aOR=2.12; 95%CI=1.17-14.93], and those whose spouses were business women [aOR=8.12; 95%CI=1.19-72.70], or traders/farmers [aOR=13.86; 95%CI=1.64-116.77]. IPV was also at least two-fold greater [aOR=2.14; 95%CI=1.16-10.76] among cigarette smokers, alcohol, and substance users. Finally, the odds of experiencing IPV was higher among sero-concordant couples [aOR=5.05; 95%CI=1.16-26.49] and inconsistent condom users [aOR=2.97; 95%CI=1.39-6.35]. Themes indicated that IPV either preceded COVID-19 or commenced during the lockdown and was related to the partner's personality, frustrations with accessing HIV care, and COVID-19 related socioeconomic stressors.

Conclusions: The prevalence of IPV in Nigeria was high during the period that encompassed COVID-19 restrictions, and influenced by the respondent's and partner's sociodemographics, sero-discordance, lifestyle, and safe sex practices. HIV programs should include context-specific IPV prevention, screening and support in contingency plans for future pandemic situations.

Methods: The PLWH cohort was identified through phenotyping based on relevant OMOP CDM concept sets. Psychiatric disorder status was derived from ICD-10 codes during 2018 to 2021. The COVID-19 impact on psychiatric disorders was examined via 6-month interval since pandemic (March 2020) via logistic regression models with mixed effects controlling key demographics, pre-existing chronic conditions (e.g., hypertension, diabetes), COVID-19 acquisition and socioeconomic status (e.g., income, education).

Results: We identified a cohort of 7,400 PLWH, of whom 3,365 had been diagnosed with at least one psychiatric disorder (45%). Regression model analysis suggests that the COVID-19 impact on psychiatric disorders varied by the pandemic period. Specifically, the psychiatric disorder increased within period 1 (March to August 2020) ($\beta=0.170$, $P<.001$), period 2 (March 2020-February 2021) ($\beta=1.084$, $P<.001$), period 3 (March 2020-August 2021) ($\beta=2.514$, $P<.001$), but decreased during period 4 (March 2020-December 2021).

These results implied that the negative impacts of COVID-19 pandemic increased each 6-month interval till March 2021, but significantly decreased afterward. The protective factors of psychiatric disorders include being male ($\beta=-.351$, $P<.001$), being married/living with partners ($\beta=-.361$, $P<.001$), and having yearly income over \$35,000 ($\beta=-1.024$, $P<.001$). COVID-19 acquisition ($\beta=.882$, $P<.001$) as well as pre-existing conditions including disability ($\beta=.397$, $P<.01$) and chronic conditions ($\beta=1.606$, $P<.001$) are risk factors of mental health.

Conclusions: Our study highlights heterogeneous experiences of PLWH during COVID-19 pandemic by time and across various disadvantaged subgroups of PLWH.

It is important to conduct assessments and intervention for mental health needs of PLWH at the early stage of the pandemic.

Among PLWH, women, people with low-income, people with disabilities and chronic conditions face higher risk of psychiatric disorders.

TUPED25

Utilizing *All of Us* data to examine the impact of COVID-19 pandemic on mental health among people living with HIV

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Background: The COVID-19 pandemic has negatively affected people's mental health around the globe, especially vulnerable populations including people living with HIV (PLWH). However, large-scale data on mental health outcomes among PLWH are limited. Protective and risk factors for this group are still unclear. Leveraging electronic health records (EHR) and Basics survey data from *All of Us* program, we aim to comprehensively explore psychiatric disorders among PLWH during the pandemic.

TUPED26

COVID-19-related impacts on HIV treatment support strategy implementation and access in female sex workers living with HIV in Durban, South Africa

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Background: COVID-19-associated restrictions in South Africa impacted local mobility and potential access to HIV prevention and treatment services, particularly among female sex workers (FSW) who rely on outreach services. We assessed both direct and indirect COVID-19-related impacts on implementation of HIV treatment support strategies among FSW.

Methods: Siyaphambili, a randomized trial of adaptive treatment support strategies among FSW living with HIV in Durban, South Africa, was implemented within an established FSW treatment program from June 2018 – January 2022. COVID-related implications were assessed through in-depth interviews (IDIs) with cohort participants (n=36) and implementors (n=12) between March 2021-January 2022. Maximum variation sampling was used to capture a diversity of FSW experiences. COVID-19-related themes emerged based on inductive coding.

Results: Key emergent themes constituted two major, interconnected components: COVID-19-related impacts on FSW and program and trial response (Figure 1).

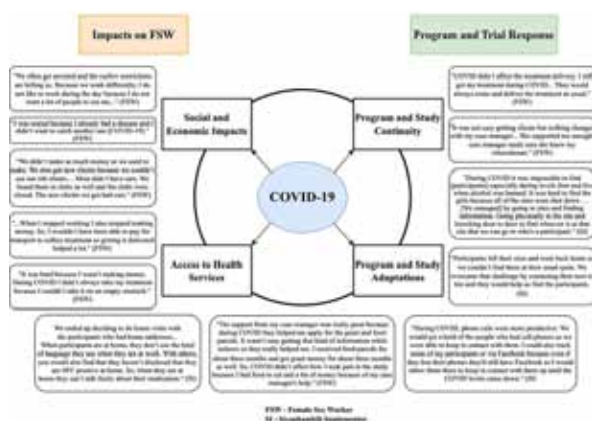


Figure 1. Framework of impacts of COVID-19 on female sex workers living with HIV, Siyaphambili study activities, and standard of care HIV services in Durban, South Africa.

Participants consistently reported adverse, complex economic and social consequences of COVID-19 lockdowns and venue shutdowns, influencing the ability to engage in sex work. These closures indirectly affected venue-based healthcare access and hindered participant en-

agement, necessitating implementor adaptations such as leveraging social networks to locate participants and bolstering social support services to alleviate pandemic-related difficulties. Nevertheless, participants and staff consistently highlighted the stable continuation of program and study activities.

Conclusions: The interplay of social, economic, and health access impacts of COVID-19 on participants caused disruptions to HIV-related care, despite the continued availability of HIV treatment services. Adaptations to address these factors mitigated the effects of these barriers to provide participants with clinical support.

However, the impacts of COVID-19 continued to highlight both new and pre-existing nuanced interactions of social well-being, economic status, and healthcare access among FSW. Increased focus from HIV care implementors is warranted to address the distinct needs and socio-economic well-being of marginalized populations, in addition to providing tailored healthcare services, particularly during periods of instability.

TUPED27

Lessons from take home dosage for Opioid Substitution Therapy (OST) during COVID-19 under National AIDS Control Programme in India

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Background: National AIDS Control Organisation (NACO) under the Ministry of Health and Family Welfare, India has made significant achievements in reducing HIV transmission among People Who Inject Drugs (PWIDs) through the Harm reduction interventions particularly Opioid Substitution Therapy (OST). The OST programme currently has 42,503 active clients on treatment through 244 centres and 145 satellite centres and is primarily provided as a directly observed treatment (DOTS) under trained medical supervision.

Description: The COVID-19 outbreak and the nation-wide lockdowns directly impacted the OST clients and their access to daily medication. To address the problem of clients unable to present for daily medication and the safety of the service providers, NACO rolled out a low threshold policy for OST centres which included take home dosage for upto 15 days for stable clients, fast-track induction of new clients, flexible timings, virtual counselling and COVID-19 prevention.

This low threshold policy of take home dosage proved to be highly beneficial to both provider and beneficiary resulting in the take home dosage being incorporated into the Clinical Practice Guidelines for Opioid Substitution in India.

Lessons learned: NACO's take home policy immediately led to a reduction in direct physical interaction while fast track induction benefited many PWIDs who came forward to register for substitution therapy of which the majority



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have decided to remain in the program (29 percent increase in enrolment). The use of virtual counselling, WhatsApp messaging groups for the Medical Doctors, Counsellors and PWIDs enabled constant support to PWIDs to cope with the psychological distress of COVID as well as treatment adherence which increased significantly (upto 82 percent). Flexible timings and travel passes issued to OST clients reduced barriers to access during lockdowns.

Conclusions/Next steps: NACO's take home policy helped to ensure uninterrupted service delivery and prevention of COVID among OST clients. This has resulted in better adherence and retention. Fast track induction provided PWIDs with an attractive option of substitution treatment with reduced waiting time.

In containment zones, take home dosage through outreach workers and virtual counselling was effective. Virtual clinical consultation was shown to be a successful option for follow up and counselling.

TUPED28

The impact of the COVID-19 pandemic on access, utilization, affordability and motivation to engage in HIV care services for African, Caribbean and Black women living with HIV in British Columbia, Canada

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Background: The Covid-19 pandemic changed the method and delivery of HIV care services. Many care services switched to virtual or telephone format, and some support services disappeared altogether. African, Caribbean, and Black women living with HIV (ACB WLWH) face structural barriers to accessing, utilizing and affording HIV care services and the addition of virtual services further decreased the motivation to engage for many.

Methods: Purposive and snowballing techniques were used to recruit participants from women's health facilities, HIV and ACB organizations in British Columbia, who were 16 and older, identified as ACB WLWH, and diagnosed with HIV at least 3 months before the COVID-19 outbreak in January 2020.

We conducted a descriptive, qualitative study using in-depth interviews. Data was analyzed using a thematic content analysis and validated by participants at a member checking event.

Results: Barriers to accessing HIV care services primarily pertained to the alienated virtual delivery of care services. Barriers to utilization of HIV care services were reports of feeling dismissed, and/or symptom stigmatization by providers. Facilitators of HIV care utilization were improved medication delivery systems. The affordability of HIV care services was not impacted by the pandemic.

However, the impact of inflation and increased cost of living negatively influenced participants and their ability to engage with HIV services. Participants listed fear as the primary deterrent to their motivation to seek care.

Conclusions: Participants indicated that access to care can be improved through increased funding and availability of support groups. Hybrid models of care were cited as improving utilization for those who preferred in-person care services. Affordability of care services can be improved by providing extended coverage for supplements and related health expenses.

Thus, improving the barriers to accessing, utilizing, and affording HIV care services will reasonably improve motivation to engage with HIV care services.

TUPED29

The perceived vulnerability-protection continuum in people living with HIV and antiretroviral treatment regarding Covid-19 during the first wave of the pandemic in France. A mixed-method study (COVIDHIV)

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Background: The vulnerability of people living with HIV (PLHIV) to severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) has been vigorously debated by clinical researchers. This poster aims to describe how PLHIV perceived their vulnerability to SARS-COV-2 during the first wave of the pandemic in France.

Methods: COVIDHIV is a retrospective and prospective, mixed-methods, cohort study involving 42 medical centers. Quantitative data were collected from PLHIV diagnosed with Covid-19 by a questionnaire with five dimensions (HIV Symptom Index, PROQOL-HIV, HAD, an *ad hoc* Covid-19 module, PCL5), which were subsequently as covariates in a logistic regression. Qualitative data were collected using semi-structured interviews from a purposive maximum-variation sample of PLHIV without or with Covid-19. Interviews were conducted until data saturation. Thematic analysis of the interviews used a General Inductive Approach.

Results: Three hundred ninety-five participants completed the questionnaire, from which 53.3% (n=168) perceived themselves as vulnerable to Covid-19. In multivariate logistic regression with perceived vulnerability as the dependent variable, perceived vulnerability was positively associated with female (AOR = 2.58; 95%CI:1.45-4.67), time between Covid-19 confirmation and study inclusion >7 days (AOR = 1.90; 95%CI=1.02-3.59), number of Covid-19 symptoms (AOR = 1.10; 95%CI=1.04-1.17), over-

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weight/obesity (AOR=2.55; 95%CI=1.45-4.55), and psychological support for Covid-19 (AOR = 1.85; 95%CI:1.05-3.30). It was negatively associated with respiratory diseases (AOR = 0.32; 95%CI:0.11-0.88), and CD4 count ≥ 500 (AOR = 0.47; 95%CI:0.26-0.81).

Thirty-four PLHIV were interviewed. Twenty were coinfect- ed with SARS-COV-2, 24 were men, with a median age of 55, 20 had a CD4 count ≥ 500 , and all were on antiretroviral therapy. Perceived vulnerability was expressed in a con- tinuum with perceived protection around 4 themes (and 14 subthemes): accepting or rejecting vulnerability, ques- tioning or affirming protection.

Affirming protection (dominant theme) indicated the general trend in our qualitative sample.

Conclusions: PLHIV reported feeling secure about their perceived vulnerability to SARS-COV-2, which appeared to result of many factors, such that perceived protection slightly outweighed perceived vulnerability.

Education may be needed for PLHIV who may be vulner- able to coinfection, but who are not motivated to seek screening, vaccination, or treatment due to a sense of se- curity, which may be overestimated.

TUPED30

Acceptability, feasibility, and preliminary effectiveness of a courier HIV-treatment delivery intervention for young people living with HIV in South Africa during the COVID-19 pandemic

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Background: Young people living with HIV (YPLWH) have historically experienced worse virological suppression outcomes compared to adults. Differentiated service de- livery models directed specifically to YPLWH are urgently needed to address this disparity.

Methods: We conducted a longitudinal pilot study among YPLWH (13-24 years) to examine the acceptability, feasibil- ity, and preliminary effectiveness of courier ART delivery and SMS support interventions to retain YPLWH in HIV care during the COVID-19 pandemic. Participants were recruited from an HIV treatment clinic near Cape Town and enrolled into the study from February to October 2021. All YPLWH had the option to enroll in the courier ART delivery service and were randomized 1:1 to receive weekly SMS support. Modified Poisson regression was used to es- timate the preliminary effectiveness of each intervention on viral suppression (HIV-1 RNA < 200 copies/mL) at months 3 and 6.

Results: A total of 227 participants were screened for the study, of which 215 were eligible and enrolled. Participants were a median of 19 years and 58% female. There were 110 participants assigned to the SMS support intervention arm and 105 to the control arm.

Among all 215 YPLWH, 82% elected to enroll in the courier service at baseline, 41% reported receiving a delivery of their ART in the past three months at month 3, and 49% reported receiving a delivery at month 6.

Among those who reported receiving an ART delivery, most (91-100%) rated the intervention as highly accept- able across three questions. The SMS intervention was also rated as highly acceptable by 75-84% of participants. Participants who reported receiving a delivery in the past three months at month 3 were 1.26 times as likely to have a suppressed viral load at month 3 (95% CI 1.05, 1.54). Fur- ther, participants randomized to the SMS intervention were 1.34 times as likely to have a suppressed viral load a month 3 (95% CI 1.05, 1.70). No effects on viral suppression were observed at month 6.

Conclusions: Findings reveal high uptake and acceptabil- ity of a courier ART intervention among YPLWH, as well as promising evidence for intervention effectiveness in in- creasing viral suppression. A fully powered effectiveness- implementation hybrid trial is warranted.



Track E: Implementation science, economics, systems and synergies

MOPEE01

Index case contact testing to improve HIV case identification in the community settings of Ethiopia

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Background: Community-based index case testing (ICT) is an innovative, person-centered and differentiated approach to increase HIV testing yield for epidemic control. This abstract summarizes the HIV testing yield in a Community HIV care and treatment (CHCT) activity in Ethiopia.

Description: Local partner organizations have been implementing the PEPFAR/USAID-funded CHCT activity since 2019. They deployed frontline community health workers, such as community engagement facilitators (CEFs), to receive index case line lists from health facilities or community platforms. CEFs located index cases, counseled, and elicited their sexual contacts or biological children, and offered them HIV testing. Index contacts who accepted the offer were tested at the community or referred to the health facility. The community ICT data from October 2020 to September 2022 were analyzed. The testing protocol was the same for community and facility testing. The yields between community- and health facility-based ICT services were compared using HIV program data from seven high burden regions. The CommCare application collected individual client level data. Excel and STATA software version-13 were used for data analysis.

Lessons learned: Between April 2019 to September 2022, 120,256 index case contacts were tested for HIV, of whom 53% were females. The majority (86,890, or 72%) were tested at the community and 33,360 (28%) were tested at the health facility.

Overall, 7,475 HIV cases were identified with 6.2% testing yield (95% CI: 6.09 to 6.3). The yield was higher among females (7.4%) than in males (5.3%) and was 19.7% in 50+ age groups. Majority of new cases 6,059 (81%) were identified at the community level, and the yield was 7% (95% CI: 6.9 to 7.1) at the community compared to 4.2% (95% CI: 4.01 to 4.50) at the facility level. The testing yield was 10.1% in Gambella region, 6.4% in Oromia and Amhara regions, 6.1% in SNNP, and 5.3% in Addis Ababa. Almost all (97.7%) of the newly identified positives were linked to care and treatment services.

Conclusions/Next steps: Community based ICT showed better testing yield, and increased access to care and treatment in older age groups. Therefore, we recommend wider implementation of the community ICT model to enhance the HIV epidemic control in Ethiopia.

MOPEE02

Measuring the performance of artificial intelligence to interpret images of HIV self-testing results

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Background: HIV self-testing (HIVST) is a promising intervention for supporting community-based HIV service delivery; however, it has yet to be fully embraced by policymakers, in part, due to concerns about result misinterpretation and subsequent incorrect treatment decisions. Identifying tools that can support correct HIVST interpretation will likely be an important prerequisite to any large-scale incorporation of HIVST into national HIV service delivery programs.

We sought to understand how well a cost-effective artificial intelligence (AI) algorithm could correctly interpret a common brand of blood-based HIVST kits.

Methods: At 20 private pharmacies in Kisumu, Kenya, we offered free blood-based HIVST to clients ≥18 years purchasing products indicative of sexual activity (e.g., condoms). Trained pharmacy providers assisted with testing, as needed. In real-time, each test was independently interpreted by:

1. The client,
 2. The pharmacy provider, and;
 3. A certified HIV testing service (HTS) counselor who then photographed the result.
- Each test image was subsequently interpreted by:
4. An AI algorithm and;
 5. A panel of three expert HIV rapid diagnostic test readers.

Using expert panel determination as the gold standard, we calculated the sensitivity and specificity of each group's interpretation.

Results: From March-June 2022, we screened 1691 pharmacy clients, enrolled 1500, and collected 855 test images. Among clients with test images, 63% (540/855) were female, the median age was 26 years (IQR 22–31), and 39% (335/855) reported casual sex partners. The AI algorithm correctly interpreted all positive tests as positive (100% sensitivity) and slightly outperformed HTS counselors and


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pharmacy providers (each 98% sensitivity; 95% CI 97%-99%) as well as clients (93% sensitivity; 95% CI 91%-94%). The AI algorithm correctly interpreted nearly all negative tests as negative (99% specificity; 95% CI 98%-99%), similar to the aforementioned comparison groups, which all had 100% specificity.

Conclusions: AI algorithms are capable of correctly interpreting HIVSTs and may perform just as well, if not better, than HTS counselors, pharmacy providers, and clients.

As differentiated HIV service delivery continues to gain momentum, AI algorithms could provide additional quality control, validation, and disease surveillance to policy-makers and HIVST end-users, including new providers to whom HIV service delivery is being task-shifted.

MOPEE03

Perceptions of using a mobile health approach to support HIV self-test among men who have sex with men

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Background: With the extensive coverage of mobile devices, mobile health (mHealth) approach offers an innovative means to support HIV self-test and related services for men who have sex with men (MSM). Their perceptions and concerns towards such an approach were evaluated.

Methods: An augmented reality-enhanced HIV self-test web application was developed with the following functionalities: HIV information provision, HIV self-test request, augmented reality models for assisting the self-test performance, and result upload.

At the self-test request process, participating adult MSM were asked to complete a self-administered questionnaire on their perceptions and experiences of HIV self-test, and perceived benefits and concerns of using this mHealth approach for assisting HIV self-test.

Results: Between 1 December 2022 and 31 January 2023, totally 200 participants with a median age of 31 years (interquartile range 27-35 years) joined the study. The majority (89%) had tested for HIV before, among which 69% had self-tested. Some 92 preferred real-time support when performing the HIV self-test, of which 40% would like a friend/sex partner to accompany and 38% preferred digital means.

Participants who had never self-tested were less confident in reading the self-test result ($p=0.043$). They were also more likely to require support for HIV self-test ($p<0.0001$), preferably from a friend ($p=0.0004$).

Regarding channels of supporting service provision, 51% preferred instant messaging, 46% preferred an mHealth approach, and 31% preferred in-person. Participants accepting mHealth support were more likely to have a

higher perceived risk of HIV ($p=0.012$), and pay more attention to the test kit's window period when choosing one ($p=0.027$). They recognised mHealth could help access follow-up referral services if necessary ($p=0.012$), but concerned about metadata collection when using it ($p=0.017$). Participants requiring self-test support believed mHealth approach carried a benefit of verifying the self-test result ($p=0.012$).

Conclusions: mHealth approach was generally accepted by MSM for assisting HIV self-test, especially for those who had a higher risk of HIV acquisition that result verification and follow-up services would become necessary if screened positive. They, however, concerned about passive data collection when using such services. Minimum metadata collection with a transparent data collection policy would be reassuring.

MOPEE04

Social network strategy to reach people with living with HIV in two Vietnamese provinces

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Background: To meet the first HIV epidemic control target (95% of people living with HIV [PLHIV] know their status) in Vietnam, testing programs must differentiate effective approaches to reach individuals with HIV risk. Vietnam has implemented facility and community testing (traditional model) since 2006 and partner notification strategy (PNS) since 2018. Social network strategy (SNS), where relationships are used to motivate those with potential HIV risk to access testing, was introduced by the Meeting Targets and Maintaining Epidemic Control (EpiC) project in 2021.

EpiC analyzed the characteristics of PLHIV reached via SNS, PNS, and a traditional model in two provinces, Tay Ninh, and Tien Giang, to identify optimal testing strategies for different populations.

Methods: We reviewed de-identified data for newly diagnosed HIV cases in two provinces from October 2021 to September 2022. Data were extracted from the testing database. Appropriate statistical analyses, including univariate and multivariate logistic regression, were used to calculate odds ratios ([OR]) reflecting associations between characteristics for clients reached by different strategies.

Results: In total, 741 clients tested positive, among them 275 (37.1%), 150 (20.2%), and 316 (42.3%) came from SNS, PNS, and the traditional model, respectively. The mean age was 29.2 (± 9.0), and there was a statistical difference in mean age among the three approaches. Subgroup analysis showed that 15- to 19-year-old clients were more likely to be found by SNS ([OR]= 2.16, 95% CI: 1.34 to 3.48).

Females were 9.7% of PLHIV identified, and there was no statistical difference for gender among approaches. Almost all cases were men who have sex with men (MSM) (72.4%) or partners of high-risk populations and PLHIV (23.2%). SNS was more likely to help find MSM ([OR]= 1.76, 95% CI: 1.23 to 2.53) but was less likely to find the latter ([OR]= 0.61, 95% CI: 0.42 to 0.89) compared to other testing strategies.

Conclusions: Though recently introduced, SNS significantly supported HIV case finding. SNS was more effective at reaching adolescent PLHIV (age 15–19) and MSM, two populations of concern in Vietnam. This information will help HIV programs tailor testing strategies among adolescents.

MOPEE05

High prevalence of unconfirmed positive HIV PCR test results among African infants with perinatal HIV exposure in the International epidemiology Databases to Evaluate AIDS (leDEA) consortium

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Background: Scale-up of vertical transmission prevention services has reduced incident infections among infants with perinatal HIV exposure (IPHE). However, as vertical transmission declines, the positive predictive value of HIV testing decreases and the probability of false-positive results increases, highlighting the importance of confirmatory testing.

This study aimed to determine the prevalence of unconfirmed positive HIV PCR test results among African IPHE in the International epidemiology Databases to Evaluate AIDS (leDEA) consortium.

Methods: This retrospective analysis utilized data from clinical sites in four leDEA regions: Central Africa (CA), East Africa (EA), Southern Africa (SA), and West Africa (WA). IPHE born 2004–2021 were included. IPHE with only one positive virologic test (qualitative or quantitative DNA and/or RNA PCRs) at <18 months and no additional positive virologic or antibody test at ≥18 months were considered “unconfirmed positives.” Among unconfirmed positives, virologic testing (or lack thereof) performed at any time after the initial positive result was described.

Results: This analysis included 72,618 IPHE. Overall, 3,652 (5%) had at least one positive virologic test at <18 months, and 1,610 (44%) of these lacked a confirmatory positive test. Among these unconfirmed positives, 1,393 (87%)

lacked additional virologic testing after the initial positive result, and 217 (13%) had ≥1 additional virologic test that was not positive (Figure and Table [stratified by region]).

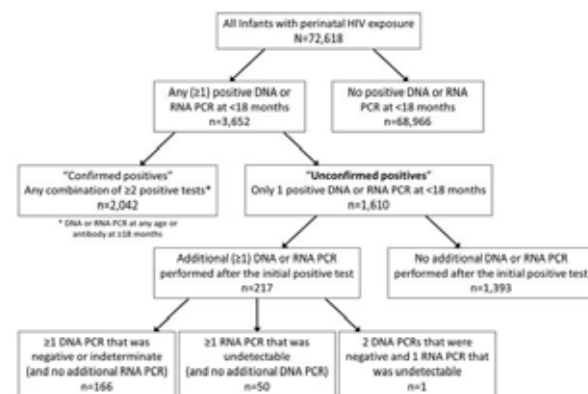


Figure: Cascade of HIV testing among African infants in the International epidemiology Databases to Evaluate AIDS (leDEA) consortium, 2004–2021.

	CA 2004–2020	EA 2004–2021	SA 2004–2019	WA 2004–2018	All Regions
1. Infants with perinatal HIV exposure [n]	10,520	47,015	8,600	6,483	72,618
2. Any positive virologic test at <18 months, among #1 [n (%)]	415 (4%)	2,980 (6%)	154 (2%)	103 (2%)	3,652 (5%)
3. Only one positive test (i.e., “unconfirmed positives”), among #2 [n (%)]	240 (58%)	1,256 (42%)	20 (13%)	94 (91%)	1,610 (44%)
4. No additional virologic test performed after the initial positive test, among #3 [n (%)]	192 (80%)	1,095 (87%)	19 (95%)	87 (93%)	1,393 (87%)
5. Additional (≥1) virologic test performed and not positive, among #3 [n (%)]	48 (20%)	161 (13%)	1 (5%)	7 (7%)	217 (13%)

Table: Infants with perinatal HIV exposure and their HIV testing data stratified by International epidemiology Databases to Evaluate AIDS region: Central Africa (CA), East Africa (EA), Southern Africa (SA), and West Africa (WA).

Conclusions: Unconfirmed positive HIV test results were highly prevalent among African IPHE in this cohort. Additional efforts are needed to ensure implementation of confirmatory testing to reduce the risk of potentially false-positive results.

MOPEE06

Empowering adolescent school girls with SKILLZ: process results from an integrated school- and community-based intervention for HIV and pregnancy prevention in Lusaka, Zambia

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Background: Adolescent girls face a confluence of unique barriers in accessing sexual and reproductive health (SRH) information and services. SKILLZ is a holistic sports-based intervention for empowering adolescent girls that


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provides comprehensive sexuality and SRH education in 12 sessions delivered by trained young adult "Coaches," who also offer community-based distribution of HIV self-testing and contraceptives and referrals to youth-friendly clinic services as needed.

As part of the 12-month cluster-randomized effectiveness trial (cRCT; NCT04429061) in Lusaka, Zambia, we assess process outcomes for characterizing intervention engagement.

Methods: We descriptively analyze routine monitoring and evaluation data from 23 schools participating in the SKILLZ evaluation. Focusing on 1,135 Grade 11 female students randomly sampled from school rosters and enrolled in the cRCT, we quantify SKILLZ attendance, changes in HIV and SRH knowledge from tests administered pre- and post-intervention, and uptake of HIV testing and contraceptives.

We examine whether each outcome is correlated by school and Coach, respectively, using F-tests for their joint significance.

Results: About 79% of sampled students attended at least one SKILLZ session, of which 90% attended at least 8 of 12 sessions, meeting the requirements to "graduate" from the program; mean attendance was 9.9 of 12 sessions. Attendance remained stable across the 12 sessions with minimal drop-off.

Mean attendance varied substantially by school (50-100%; $F=4.96$, $p<0.001$) and by coach ($F=2.85$, $p<0.001$) but was not correlated with prior HIV testing. HIV and SRH knowledge mean test scores increased by 15 percentage points, a 1.4 standard deviation from the pre-intervention quiz score. Changes in test scores also varied substantially by school (8-26 percentage points; $F=7.05$, $p<0.001$) and by coach (4-30 percentage points; $F=5.48$, $p<0.001$), but were not correlated with mean SKILLZ attendance by school. About 59% of girls received HIV testing and 10% of girls received contraceptives during the intervention period.

Conclusions: SKILLZ was well-attended and lead to large knowledge gains in HIV and SRH and substantial uptake of HIV testing during the intervention period.

Further research is needed to understand variations in attendance and knowledge gains across schools, and linking to cRCT primary outcomes for assessing pathways to impact.

MOPEE07

The effect of receiving an oral PrEP delivery model supported with a preferred HIV testing modality on PrEP continuation outcomes: findings from a randomized implementation trial in Kenya

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Background: In a randomized implementation trial in Kenya, biannual clinic visits supported with six-monthly PrEP dispensing and interim HIV self-testing (HIVST) resulted in non-inferior PrEP continuation outcomes compared to quarterly clinic visits. However, participants did not always receive their preferred model of care. We explored the effects of receiving a preferred HIV testing modality on PrEP continuation outcomes.

Methods: The JiPime-JiPrEP trial (NCT03593629) enrolled PrEP clients (≥ 18 years) in Kiambu County. At enrollment, participants stated their preferred HIV testing modality (clinic-based or HIVST) then were randomized 2:1 to six-monthly PrEP dispensing supported with interim HIVST or three-monthly dispensing with clinic-based HIV testing (standard-of-care).

We categorized participants as 'exposed' if the HIV testing modality supporting their assigned PrEP delivery model matched their preference and 'unexposed' if it did not. Participants completed follow-up visits at six and 12 months.

We used binomial regression models, adjusting for sex, serodifferent partnership status, and study arm, to estimate risk differences (RDs) for continuity in HIV testing (≥ 3 tests), PrEP refilling (at six and 12 months), and PrEP adherence (detectable tenofovir-diphosphate in dried blood spots at six and 12 months).

Results: From May 2018 to February 2020, we screened 527 and enrolled/randomized 495. The median age was 33 years (IQR 27-40), and 66.6% (329/494) were female. At enrollment, 77.3% (382/494) reported a preference for HIVST, and 22.7% (112/494) reported a preference for clinic-based HIV testing; 59.7% (295/494) were randomized to a PrEP delivery model supported with their preferred HIV testing modality.

There were no significant differences between the exposed and unexposed groups in HIV testing (exposed: 67.1%, unexposed: 62.3%; RD 7.0%; 95%CI -3.0%, 17.0%), PrEP refilling (exposed: 55.9%, unexposed: 57.8%; RD -1.6%; 95%CI -12.1%, 8.8%), or PrEP adherence (exposed: 42.7%, un-



exposed: 36.7%; RD 7.9%; 95%CI -1.9%, 17.8%). Additionally, 50.0% (70/140) of exposed and 45.2% (42/93) of unexposed participants changed their preference at 12 months.

Conclusions: PrEP continuation outcomes were similar between participants who received a PrEP delivery model supported with their preferred HIV testing modality and those who did not. Preference-based models of PrEP delivery and HIV testing can provide clients with tailored, person-centered care with comparable outcomes.

MOPEE08

Familiarity with, perceived accuracy of, and willingness to rely on U=U among Australian gay and bisexual men: results from the PrEPARE Project 2021

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Background: The Undetectable=Untransmittable (U=U) message has been promoted since it was demonstrated that viral suppression through HIV treatment prevents sexual transmission between serodiscordant partners. Awareness of U=U has not been previously assessed nationally among Australian gay and bisexual men (GBM).

Methods: A national online survey of GBM was conducted April–June 2021. We assessed familiarity with U=U, its perceived accuracy, and willingness to rely on U=U, i.e. have sex without condoms with an HIV-positive person who has an undetectable viral load (UVL).

Levels of familiarity and willingness to rely on U=U were assessed by HIV status using chi-squared tests. Factors associated with perceived accuracy of U=U were assessed using ordered regression.

Results: The mean age of 1,280 participants was 41 years, 80.8% identified as gay, 15.1% as bisexual. 82.7% were HIV-negative, 9.8% untested and 7.4% HIV-positive. 36.9% of the sample was using PrEP, and 78.6% were familiar with U=U. HIV-positive GBM were more familiar than other participants (95.8% vs. 77.2%, $\chi^2(1, 1,280)=18.04$, $p<.001$).

Among those who were familiar with U=U ($n=1,006$), 67.3% thought it was accurate. Greater familiarity with U=U was associated with greater odds of believing U=U was accurate. PrEP users, HIV-positive and university-educated participants were also more likely to perceive U=U as accurate, whereas participants aged ≥ 40 years old (compared to under 30s) and Latin-American and Asian-born participants (compared to Australian-born participants) were less likely to perceive U=U as accurate. Among those familiar with U=U ($n=1,006$), 47.0% were willing to have

condomless sex with a partner with UVL. Among those familiar with U=U who believed it was accurate ($n=677$), 90% of HIV-positive participants, 72% of PrEP users, 44% of HIV-negative and 25% of untested/unknown status participants were willing to rely on U=U ($\chi^2(1, 677)=90.82$, $p<.001$).

Conclusions: Most Australian GBM were familiar with U=U, but fewer believed it was accurate or were willing to rely upon it. HIV-positive GBM and PrEP users were more familiar with U=U, believed in its accuracy and were willing to rely upon it. As well as continuing to educate GBM (particularly HIV-negative men) about U=U, finding ways to encourage reliance upon it could be useful for combination prevention efforts.

MOPEE09

Preference heterogeneity among potential users of online pre-exposure prophylaxis provision in Kenya: a discrete choice experiment

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Background: In east and southern Africa, pre-exposure prophylaxis (PrEP) is mainly delivered through clinics, achieving limited coverage due to barriers including long wait times and privacy concerns. Obtaining PrEP via an online pharmacy is a novel approach to expanding PrEP access, but user preferences for this service delivery model are unknown.

Methods: We recruited participants for a discrete choice experiment (DCE) through an online-pharmacy retailer, MYDAWA, in Nairobi, Kenya. Eligible participants were ≥ 18 years, not known to be living with HIV, and interested in PrEP. DCE attributes included: PrEP eligibility assessment (self-administered or guided); HIV test type (oral-fluid self-test (HIVST), blood-based self-test HIVST or provider-performed test); clinical consultation (remote or in-person); and user support options (test messages, phone call, or emails).

Participants were presented with eight scenarios of two hypothetical PrEP services with varied combinations of four attributes. We also assessed willingness-to-pay for


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online PrEP services. We used conditional logit models to obtain preference weights and relative importance of attributes, and included participants' characteristics as interactions to test whether preferences differ.

Results: From May–Nov 2022, we enrolled 772 participants; with a median age of 25 years (IQR 22–29), 54% were female, and 58% were PrEP naïve users.

Overall, participants preferred remote consultation, support via phone call, and HIVST. HIV test type was the most influential attribute (relative importance: 32.1%), followed by user support (31.5%), clinical consultation (27.8%) and eligibility assessment (8.6%).

Preferences were similar across participant characteristics aside from history of PrEP use; among prior PrEP users, user support options (44%) had the highest relative importance; compared to clinical consultation (34.3%) for PrEP naïve individuals.

Most participants showed strong interest in acquiring their chosen online PrEP service if available (82% of scenarios), which was high in PrEP naïve individuals compared to prior PrEP users (85% vs 33%). The median maximum willingness-to-pay for online PrEP services was \$8.10 USD (IQR \$6.50–\$15.80).

Conclusions: Online PrEP delivery is highly acceptable and likely to attract new PrEP users. PrEP naïve users most valued clinical consultation, while experienced PrEP-users most valued user support. Findings can inform the design of an online PrEP service.

MOPEE10

What men want: preferences for pre-exposure prophylaxis for HIV among men who have sex with men in 16 countries in the Asia-Pacific: a discrete choice experiment

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Background: Scale-up of pre-exposure prophylaxis (PrEP) among men who have sex with men (MSM) in Asia-Pacific has been slow. Tailored PrEP services informed by prefer-

ences of potential users could maximise PrEP uptake. We evaluated the drivers of choice for PrEP among MSM in 16 Asia-Pacific countries and forecasted PrEP uptake given different PrEP program configurations.

Methods: We included MSM aged ≥ 18 years with no prior HIV diagnosis. An online discrete choice experiment (DCE) survey was delivered to participants between May–November 2022 through gay dating apps and local MSM networks. We used random parameters logit (RPL) models to estimate the relative importance of attributes in each country and by country-income level, and predict PrEP uptake for different program configurations.

Results: Overall, 21,722 individuals were included, with a mean age of 31.7 (± 9.6), 8% (1,709/21,722) were diagnosed with a sexually transmitted infection (STI) and 60% (12,955/21,722) reported multiple partners in the last six months. Despite variations in the relative importance of attributes across countries, cost was the biggest driver for using PrEP (Figure 1).

The least preferred PrEP program resulted in 42% uptake of PrEP in high-income Asian countries (HIC) and 47% in middle-income Asian countries (MIC). This improved to 95% with an optimal PrEP service configuration in HIC and 89% for MIC. The optimal PrEP service configurations in HIC and MIC were similar; cost (free), location (a peer-led community clinic), side effect (none), extra service (STI testing), and visit frequency (annually). But MSM in HIC preferred long-acting oral PrEP, while those in MIC preferred daily oral PrEP.



Figure 1. Drivers of choice (relative importance) of PrEP for men who have sex with men in each country (N = 21,722)

Conclusions: This is the largest DCE globally, providing rich country-level preference data from MSM in the Asia-Pacific region. The DCE demonstrated the need to tailor services to country context, including ensuring affordability, preferred type of PrEP and the need for differentiated services to accelerate uptake.



MOPEE11

Qualitative segmentation of adolescent girls and young women (AGYW) PrEP users: the role of differentiated PrEP delivery platforms

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Background: Adolescent girls and young women (AGYW), a target population for HIV prevention in Africa, show high PrEP interest but difficulty in sustained effective use. With ongoing PrEP scale-up focused on increasing PrEP access, it is important to understand what influences AGYW's choice of PrEP delivery platforms.

Methods: The POWER (Prevention Options for Women Evaluation Research) PrEP implementation study in Cape Town utilised a differentiated delivery model from July 2017 to November 2020. AGYW 16-25 years could access PrEP from any of four delivery platforms: mobile clinic, government facility, courier delivery service, or community-based youth club. At government and mobile clinics, healthcare providers delivered comprehensive integrated sexual and reproductive health services.

The courier and youth club platforms provided light-touch PrEP follow-up services incorporating rapid HIV self-testing. We conducted in-depth interviews with a purposive sample of AGYW who had ≥3 months of PrEP use based on pharmacy records and who accessed more than one PrEP delivery platform.

Thematic analysis explored the preferences, decision-making, influences, and habits related to PrEP access to inform market segmentation.

Results: We interviewed 26 AGYW (median age 20) persistent PrEP users between November 2020 – March 2021. Of these, 24 used mobile clinics, 17 courier delivery, 9 the government facility, and 4 the youth club. Qualitative findings highlighted three potential behavioural profiles.

The "Social PrEP-user" seeks PrEP delivery in shared peer spaces such as youth clubs or adolescent-friendly mobile clinics, that provide affirmation and social support for continued PrEP use.

The "Convenience PrEP-user" seeks PrEP delivery at easily accessible locations, providing quick (courier) and/or integrated service with contraception and PrEP refills in a single visit (mobile and government clinic).

The "Independent PrEP-user" seeks PrEP delivery that is discreet, outside of traditional medical environments, and offers control over delivery times that fit into their schedule as offered by the courier service.

Comfort with HIV self-testing had minimal influence on PrEP delivery choice.

Conclusions: PrEP delivery platforms and demand creation for these services must be tailored to thematic groups of AGYW and more closely aligned to individual characteristics and needs for convenience, independence, or social engagement to improve AGYW's PrEP persistence.

MOPEE12

Where are the Men? Finding high-risk men through their AGYW sexual partners who are on PrEP in Zambia using HIV prevention indexing

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Background: HIV program data in Zambia shows that men are missing from HIV prevention and treatment services despite men having a low HIV prevalence of 8% compared to females (14%), according to ZAMPHIA 2021. The lack of access to services has not only affected men but also contributed to a higher HIV incidence of 5.6 percent among adolescent girls and young women (AGYW) who have been linked to a sexual triangle with men. To reach epidemic control, men must be reached to interrupt the HIV transmission cycle.

Description: The USAID DISCOVER-Health Project implemented by JSI developed an innovative approach known as HIV prevention indexing (HPI) to reach men through AGYW at high HIV risk on PrEP in supported sites in Zambia 2021. 5687 AGYW were offered HPI, from which 4296 were elicited with 2,677 men tested for HIV. The assumption was that contacts elicited could also be at high risk of contracting HIV and may benefit from PrEP, or maybe living with HIV and would benefit from antiretroviral therapy.

Lessons learned: HPI provided an opportunity to reach unreached men and contributed to 19% of men newly initiated on PrEP. The acceptance of PrEP was high among contacts who tested negative that were at substantial HIV risk 83% of men. The HPI positivity rate of 4.4% was confirmed. high HIV risk remains within these sexual networks and the need for HPI to find men living with HIV and put them on ART is needed to further reduce the risk for AGYWs.

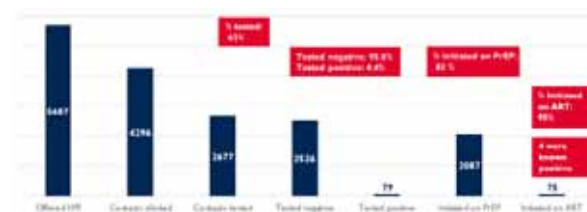


Figure. Results: Cascade for male contacts (20-40 years).



Conclusions/Next steps: HPI is useful in settings like Zambia where there are men at high HIV risk who feel “shut out” of the health system and do not access HIV services. Through the HPI approach, men can be reached and provided with HIV services, ultimately helping Zambia attain and sustain epidemic control.

MOPEE13

Healthcare worker perspectives on anticipated barriers and facilitators to implementing long-acting injectable PrEP for HIV prevention in Vietnam

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Background: Long-acting injectable cabotegravir (CAB-LA) is recommended by the World Health Organization as an additional HIV prevention option for people at substantial risk of HIV transmission. However, there are limited data on the feasibility of implementing CAB-LA in low-middle-income settings, particularly in Asia.

The study describes anticipated barriers and facilitators of implementing CAB-LA in Vietnam among healthcare workers and public health managers.

Methods: From July-August 2022, in-depth interviews following a semi-structured questionnaire were conducted with key stakeholders in HIV program implementation at the national, provincial, and clinic levels across four provinces of Vietnam. Interviews were audio recorded and data were analyzed using a rapid thematic analysis approach.

Results: Participants included healthcare providers (n=15) and provincial (n=6) and national-level (n=6) public health managers, with an average of 11.4 years working in HIV programming. Participants identified key facilitators to successful implementation of CAB-LA, including the perception that CAB-LA would be highly acceptable to clients and that nurses were already trained to administer injections.

While some participants felt existing facilities were adequate, most agreed that clinical sites lack the necessary infrastructure and equipment for CAB-LA, including physical space and beds for injection procedures and anaphylaxis response kits.

Participants expressed concern that more frequent appointments due to CAB-LA injection schedules would increase workload and necessitate additional nursing staff.

At the provincial and national health systems level, perceived barriers included the need for separate reporting systems for injectable medication management and the lengthy regulatory procedures to obtain approval for new medications.

Overall, participants agreed that the lack of clear guidelines on handling adverse reactions and client eligibility was also a barrier. Despite potential barriers, participants felt that CAB-LA could help Vietnam reach 95-95-95 targets.

Conclusions: Participants were optimistic about the benefit of CAB-LA on HIV prevention, though they acknowledged infrastructure, human resources, and systems barriers to implementation. Demonstration projects may be an important next step in order to develop real-world strategies that can be scaled to overcome these barriers and enable successful CAB-LA implementation in Vietnam.

MOPEE14

Who chooses event-driven PrEP (PrEP 2-1-1) in a US national cohort? Exploring the role of demographics, wealth, access to health care, sexual behavior and practices on PrEP choice

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Background: Event-driven PrEP (ED-PrEP) is an effective option for PrEP and is included in the US CDC PrEP clinical guidelines for off-label use. Successful implementation of ED-PrEP elsewhere has expanded PrEP access and uptake. In the US, little is known about characteristics of individuals using ED PrEP, which is detrimental to future implementation.

Methods: Our sample includes PrEP users (n =1367) from the *Together 5,000* US cohort of cis men and Trans people who have sex with men – who started PrEP in the past 36-months. We conducted an adjusted logistic regression analysis predicting ED regimen choice, including baseline demographic characteristics, income, healthcare access, sexual behaviors and practices. All variables were included together.

Results: Overall, 153 (11.2%) participants used ED-PrEP. Higher educational attainment was a significant predictor of ED PrEP with individuals who reported some college, bachelor's degree, and those with graduate school all having much greater odds of choosing ED-PrEP when compared to individuals who had high school or less (Full results on Table 1).

Individuals who reported having 2 or more hours of lead time during their last sexual encounter had 3.45 times the odds of using ED-PrEP when compared to those with no lead time or less than 2 hours. Participants who reported having an STI within the last year had 61% lower odds of using ED-PrEP when compared to those who did not have



an STI. Participants who reported not finding the science for U=U trustworthy had 3.44 times the odds of using ED-PrEP than those who said they trusted U=U.

Model output	aOR	95% CI
Age Group (ref = 24 or less)		
25-29	0.56	0.30 1.07
30-39	0.83	0.46 1.53
40+	0.73	0.35 1.51
Race/Ethnicity (ref = white)		
Black	1.43	0.68 2.84
Latino	0.78	0.44 1.35
Asian and/or Pacific Islander	1.22	0.49 2.74
Other/Multiracial	1.61	0.78 3.17
Gender (ref = cisgender male)		
transgender or non-binary	0.65	0.03 3.77
Education (ref = High school or less)		
Some College/Currently in college	3.16	1.11 15.02
Bachelor's degree	3.41	2.66 36.88
Graduate (some, mast or doc)	8.29	1.08 13.59
Income (ref = \$150,000 +)		
0 - \$49,000	1.32	0.50 4.02
\$50,000 - \$150,000	1.02	0.39 3.03
Geographic Location (ref = Northeast)		
Midwest	0.71	0.33 1.47
South	0.78	0.44 1.41
West*	1.4	0.77 2.62
Has Health Insurance (ref = no/don't know)		
Yes	0.68	0.37 1.31
Has a Primary Care Provider (ref = no)		
Yes	0.81	0.49 1.34
Had condomless receptive anal intercourse in the past 3 months? (ref = no)		
Yes	1.24	0.71 2.22
Consider themselves a PrEP Candidate? (ref = yes)		
No	1.07	0.16 4.09
Unsure	2.44	0.99 5.62
Prior PrEP Experience (ref = none)		
Former user	1.55	0.96 2.48
Lead Time for Sex (ref = less than 2 hours or none)		
2+ hours	3.45	2.23 5.47
U=U Trust (ref = trust)		
Unsure	0.82	0.43 1.47
Doesn't Trust	3.44	1.60 7.04
Has douched before sex last 3 months? (ref = no)		
Yes	0.76	0.45 1.33
Used crystal meth last year (ref = no)		
Yes	0.95	0.42 1.98
Had a positive STI** in the past 6 months (ref = no)		
Yes	0.39	0.20 0.72

*Includes U Territories

**Includes Chlamydia, Syphilis and Gonorrhea in any body part

Table 1. Demographic, wealth, access to health care, sexual behavior and practices, and PrEP-related predictors of ED PrEP use: Logistic regression analysis output (Sample ED PrEP use = 11.2%).

Conclusions: Our findings show an educational divide in access to ED-PrEP suggesting that those with lower educational attainment may not be aware of or have access to information about ED-PrEP. Instead, interventions focusing on behavior compatibility and sexual practices are likely to be more successful.

MOPEE15

Machine learning models to predict lost to follow-up of people receiving antiretroviral therapy in Brazil, 2014-2022

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Background: Antiretroviral therapy (ART) is only effective when people living with HIV (PLHIV) maintain their treatment retention. Lost to follow-up (LTFU) is the major challenge to Brazilian national public health system and traditional strategies to reach out to these people are often ineffective due to registration problems and outdated information. This study aims to apply machine learning models to predict LTFU of people receiving ART in Brazil.

Methods: Programmatic data from Brazilian MoH ART dispensing national system from 2014 to 2022 were used to build a behaviour and sociodemographic profile database of PLHIV.

Five machine learning models were initially trained and tested in the 2014-2018 database, and then accuracy and area under the receiver operating characteristic curve (AUROC) were evaluated.

False-positive individuals (classified as LTFU by the model, but were in regular ART by the end of 2018) were flagged and reassessed by the end of 2019. The same logic was annually applied until the end of 2022. Each model was performed five independent times.

Results: The best results were obtained by random forest classifier model, which had average accuracy of $0,734 \pm 0,011$ and average AUROC of $0,824 \pm 0,014$ for the studied period.

False-positive individuals flagged by this model represented an average of $25,8\% \pm 0,8\%$ of all ART patients, of which $16,9\% \pm 1,6\%$ converted to LTFU by the end of the next year, representing an average of $53,6\% \pm 1,9\%$ of all new LTFU cases in the period.

The incidence of LTFU in flagged individuals was in average $333,3\% \pm 24,4\%$ higher than in unflagged ones.

Train-test database	Predicted year	Accuracy in test database	AUROC	Flagged / Total ART (%)	LTFU conversion / Flagged (%)	LTFU conversion / All new LTFU (%)	LTFU incidence: Flagged / Unflagged (%)
2014-2018	2019	$0,746 \pm 0,005$	$0,840 \pm 0,001$	24,9	15,4	51,3	317,7
2014-2019	2020	$0,738 \pm 0,004$	$0,828 \pm 0,004$	25,4	16,4	54,2	347,6
2014-2020	2021	$0,734 \pm 0,005$	$0,820 \pm 0,001$	25,9	16,5	55,7	359,7
2014-2021	2022	$0,720 \pm 0,001$	$0,806 \pm 0,005$	26,8	19,2	53,0	308,0

Conclusions: Machine learning models are valuable tools to identify most likely lost to follow-up PLHIV. Signalling these individuals to health care professionals might allow an early and customized intervention to prevent a future LTFU case, reducing incidence of this outcome.

MOPEE16

Preparing for next-generation PrEP: awareness and willingness to use long acting injectable cabotegravir (CAB-LA) among men who have sex with men and trans women across Asia and Australia

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Background: Offering choice in pre-exposure prophylaxis (PrEP) products, including the new WHO-recommended long acting injectable cabotegravir (CAB-LA), is expected to help accelerate PrEP uptake globally. This study aimed to assess awareness, values, and preferences related to CAB-LA among gay men and other men who have sex with men (MSM) and trans women (TGW) across Asia and Australia to inform successful introduction.

Methods: We conducted an online cross-sectional survey among self-identified MSM and TGW aged ≥ 18 years in 16 and 11, respectively, countries/territories in Asia and Australia between May-November 2022. Participants were asked about CAB-LA awareness, willingness to use and reasons for preferring / not preferring CAB-LA. Descriptive statistics and bivariate logistic regression models were calculated for associations between awareness and willingness to use PrEP.

Results: Among 17032 MSM and 1260 TGW, 18.2% (n=3103) and 26.6% (n=335), were aware of CAB-LA, respectively. Willingness to use CAB-LA among all MSM and TGW respondents was 16.1% (n=2742) and 15.6% (n=196), respectively. Both awareness and willingness varied substantially across countries (Figure). Prior awareness of CAB-LA was positively associated with willingness to use CAB-LA among MSM (OR=1.74, 95% CI=1.58-1.91) but not TGW (OR=1.17, 95% CI=0.83-1.65). Perceived benefits of CAB-LA were similar between MSM and TGW: HIV protection (55.2% and 45.7%); not having to remember to take pills (37.2% and 27.8%); and longer-term protection (35.1% and 21.1%). Perceived concerns varied across populations: unaffordable cost (36.3% and 19.9%); side effects (34.0% and 20.6%); insufficient knowledge (32.5% and 21%); and pain (20.0% and 24.0%).

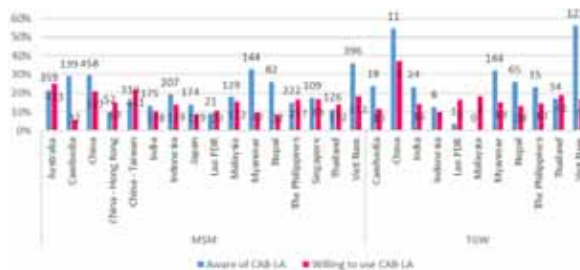


Figure. Awareness and willingness to use CAB-LA

Conclusions: Awareness of CAB-LA is low among MSM and TGW across Asia and Australia, with substantial variability between countries.

Urgent efforts are needed to increase awareness which will support higher willingness to use CAB-LA. With CAB-LA imminent registration and/or availability in some Asian countries and Australia, tailored demand generation activities are needed to address perceived benefits and concerns.

MOPEE17

High rate of missed HIV testing among oral PrEP users from 2018-2020 in the United States: a national assessment on compliance with HIV testing recommendations of the CDC PrEP Guidelines

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Background: CDC has highly recommended combined HIV Ag/Ab testing for PrEP initiation and quarterly monitoring. We examined compliance with HIV testing guidance among oral PrEP users nationally.

Methods: We conducted an analysis of 396,385 PrEP prescriptions issued to 42,890 PrEP users using MarketScan®, a national insurance claims database for private and public companies.

The primary outcome was the number of calendar months between each PrEP medication fill and the PrEP user's most recent prior HIV Ag/Ab test (identified by CPT codes).

Secondary outcomes included HIV testing patterns (with antibody only and NAAT testing) and sociodemographic and geographic differences. The inclusion criteria were PrEP prescriptions filled from 2018-2020. PrEP use was defined as two or more prescription fills in different calendar months for ARVs approved for oral PrEP in HIV-negative persons (ICD codes) who had no additional ARV prescriptions (NDC numbers).

Analyses included survival methods and proportional hazard models with persons censored to the time of enrollment in the database.



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Results: Of 42,890 PrEP users, 39,860 had private and 3,030 had public insurance, 96% identified as male, and the median age was 35 years (IQR 29-44). Individuals were 48% White, 24% Black/African American, and 10% Hispanic/Latinx. 30.9% (95% CI: 30.7-31.0%), 21.2% (21.0-21.3%), and 14.5% (14.4-14.6%) of PrEP prescriptions were filled in persons who had not received an HIV Ag/Ab test within the prior 3, 6, and 12 months, respectively. HIV testing patterns revealed 22.8% (95% CI: 22.7-23.0%), 12.7% (12.6-12.8%), and 6.5% (6.4-6.6%) of PrEP prescriptions were filled in individuals who had not received any type of HIV test in the prior 3, 6, and 12 months.

PrEP users with public insurance (HR 0.60; $p < 0.001$), rural residence (HR 0.79; $p < 0.001$), Northcentral U.S. residence (HR 0.72; $p < 0.001$), younger age (16-24 years) (HR 0.89; $p < 0.001$) and who identified as female (HR 0.84; $p < 0.001$) received less testing ($p < 0.001$).

Conclusions: Nearly one in three oral PrEP prescriptions were filled in persons who had not received a combined HIV Ag/Ab test within the prior three months, with evidence of health disparities in several key population groups. Study findings can inform efforts to optimize HIV testing compliance with national PrEP guidance.

MOPEE18

Evidence of peer-led demedicalized delivery of same-day PrEP in various community centers in the Philippines

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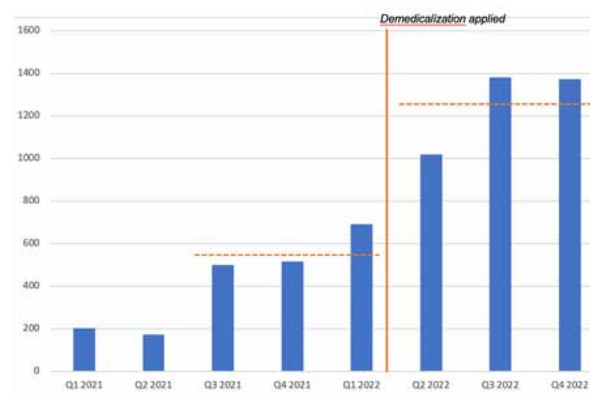
Background: LoveYourself serves a large number of clients for HIV screening and PrEP through a peer-led approach in its network of community centers in the Philippines. Observed challenges were delay of PrEP initiation due to long queues for medical consultation, long turnaround time of test results for serum creatinine, hepatitis B screening, and hesitancy of clients who use gender-affirming hormone therapy or body-building supplements. We explored the program that shifted PrEP delivery to trained peer counselors known as PrEPY Peers.

Description: An algorithm (Figure-1) was developed to guide PrEPY Peers to provide same-day PrEP, and when to refer to a physician. Counselors were trained to assess HIV non-reactive clients without symptoms of acute retroviral syndrome within 30 days, age 18-50, body weight of 35-90 kg, kidney-related comorbidity, and supplementation. They were also trained to compute creatinine clearance, and health teaching regarding follow-up care. A physician is on-call for any urgent referral. All charts were submitted to the physician for quality check. All PrEP-naïve were advised daily-PrEP for at least 3 months before considering event-driven PrEP to monitor recent exposure and possible seroconversion.



Figure 1. Updated PrEPY process flow as of April 2022.

Lessons learned: Upon demedicalizing PrEP, enrolled clients increased from a moving average of 568 since Q3 2021 to 1256 from Q2 2022 (Figure-2). The facility had a total of 7,134 enrolled at the end of Dec. 2022.



Note: Broken lines show moving average.

Figure 2. Graph showing quarterly PrEP enrolment for 2021 to 2022.

Conclusions/Next steps: This study presents evidence that peer-led demedicalized delivery is possible. This mechanism promotes task-shifting, showing that peers can provide PrEP at scale to high-priority populations. This evidence also empowers nonmedical providers through a guided approach.

MOPEE19

Fast-tracking treatment optimization to address treatment continuity among PLHIV through comprehensive approach and use of digital and telehealth platforms during the COVID -19 pandemic in Andhra Pradesh, India

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Background: Transition to DTG based regimens (DTG) in India coincided with the devastating second wave (April to June 2021) of COVID-19 pandemic. With urgency for transition to DTG due to depleting stock of the previously used ART regimens and lockdown that hit the mobility, it was critical to devise comprehensive approach to address treatment continuity and fast-track ART optimization.

Description: Between April to June 2021, we adopted multi-pronged strategy to fast track DTG transition in 13 districts of Andhra Pradesh (Figure) including-- mapping of all PLHIV eligible for transition to DTG by sub-district unit using epidemiological tools; engagement with all stakeholders for preparation of transition plan; proactive outreach of PLHIV for transition to DTG through digital modalities such as phone follow-ups, text messages and interactive voice response systems; teleconsultation sessions; and physical camps for PLHIV at decentralized and remote locations who couldn't reach the ART sites due to restricted mobility.

In addition, we prepared job-aids and education material on DTG for ART staff and PLHIV, ensured drug supply chain and monitored the progress of transition daily.



Lessons learned: During the surge period (April-June 2021), 80,553 of 186,170 PLHIV receiving ART (43%) were transitioned to DTG-based regimens, of which 49,405 (61.3%) PLHIV reached ART clinics for transition subsequent to the

digital outreach; 19,718 (24.5%) were transitioned through teleconsultation modalities; and 11,430 (14.2%) through decentralized camps.

Conclusions/Next steps: Transition to DTG-based regimen was feasible amidst the peak of COVID-19 through the sequential and coordinated approach, including use of digital and telehealth platforms, for a sustained treatment continuity. Further, telehealth models have potential to reach the PLHIV residing in remote locations and provide them appropriate management, thereby enhancing health equity. Sustaining and scaling up telehealth care models for HIV service delivery could ensure enhanced access to services while maintaining continuity to care and treatment for PLHIV.

MOPEE20

A Quality Improvement Collaborative improves viral load testing coverage in Western Province, Zambia

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Background: Zambia has made great strides towards attaining 95-95-95. Population-based HIV/AIDS Impact Assessment (ZAMPHIA, 2021) data demonstrates that 88.7% of adults living with HIV were aware of their status, among adults who knew their status, 98% were on ART and among these individuals, 96.3% were virally suppressed (VLS). Important geographic variations in VLS were noted with Western Province (WP) having 87.9% VLS. Improving viral load coverage (VLC) with early identification of unsuppressed VL is critical for preventing HIV transmission and achieving epidemic control.

Methods: In collaboration with ICAP Columbia University and CDC Zambia, the Zambia MoH led the design and implementation of a quality improvement collaborative (QIC) to improve VLC at 18 high priority health facilities in 10 districts across WP from January- August 2022. Indicators were collected at baseline and throughout implementation. The MoH and ICAP provided training on QI methods and ART adherence counseling skills for 35 health care workers followed by monthly supervision and two quarterly learning sessions. Each QIC team used QI methods to conduct rapid tests of change; and analyzed monthly progress using run charts. QI teams tested interventions including assigning a VL focal person at each clinic, VL media campaigns, community based VL sampling, VL data reviews, and reduction in lab to clinic turn-around time. This quasi-experimental, descriptive study



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provides analysis of outcomes using summary statistics and demonstrates progress on a run chart before, during and after the QIC implementation.

Results: Preliminary data demonstrates VLC improved from **76.1%** at baseline (November 2021) to **85.4%** in August 2022, and **89.6%** in October 2022 (post intervention). There was substantial shift above the baseline median after May 2022 (4 months of implementation) and progress is sustained.



Conclusions: The QIC approach led to important improvements in VL coverage at 18 sites in WP. Continued monitoring will assess sustainability following the QIC.

MOPEE21

Lessons Learned from the introduction of advanced HIV disease package of care in Nigeria

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Background: In Nigeria, 32% of PLHIV who received CD4 tests in 2018 had Advanced HIV Disease (AHD), this population had the highest mortality. Despite this, a package of care for AHD (AHD PoC) was not clearly defined in-country. This abstract outlines the process and lessons learned from introducing the AHD PoC in Nigeria.

Description: The Nigeria MOH constituted a working group in 2019 to develop and oversee implementation of the AHD PoC in-country. The first phase of implementation involved 28 facilities across 4 high-burden states that account for 31% of national HIV burden (Lagos, Akwa-Ibom, Rivers, Anambra). In 2020, National guidelines, training materials, and reporting tools were reviewed to include the AHD PoC. Healthcare-worker (HCW) capacity was built to implement AHD PoC. Commodities were

distributed and facility implementation commenced in February 2021. Newly identified PLHIV were screened for AHD. Those with AHD were screened for Tuberculosis and Cryptococcal-Meningitis (CM), followed by rapid ART initiation and intensive adherence support.

Lessons learned: By September 2022, 13,795 new PLHIV were identified; 85.4% (11,781) received CD4 tests, of which 46.6% (5,487) had CD4 <200cell/mm³. Of the 5,487 AHD clients, 77.9% (4,277) were screened for TB using TB LF-LAM, 34.1% (1,458) were positive, of which 67.8% (989) started TB treatment. The screening coverage for blood cryptococcal antigen (CrAg) using CrAg LFA was 83.4% (4,576), 2.3% (106) were positive. Only 35.8% (38) of blood CrAg-positive clients received a CSF CrAg test, 23.7% (9) were CSF positive, of which 66.7% (6) started CM treatment. Poor access to adjunct commodities contributed to observed gaps in TB LF-LAM and CSF CrAg testing.

Programming for CrAg and TB LF-LAM tests should consider adjunct commodities vital to close gaps observed across the cascade, particularly lumbar-puncture packs for CSF CrAg and urine cups for TB LF-LAM. Considering HCW capacity gaps for lumbar puncture (LP) at some facilities, a hub-and-spoke model will be ideal for scale-up, and LP referral mechanisms should be strengthened.

Conclusions/Next steps: Implementing the AHD PoC increased TB and CM case-finding among PLHIV, and could potentially reduce mortality associated with AHD.

MOPEE22

Community Retail Pharmacy Drug Distribution Points (CRPDDPs) to provide a convenient, cost-saving, client-preferred model for pick-up of antiretrovirals in Uganda

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Background: In Uganda median waiting time to access ART services is 170 minutes, and 39.4% of surveyed ROCs were unsatisfied with service efficiency. In order to make ART services more efficient and person-centered, Ministry of Health (MOH) set a target that 80% of ROCs be enrolled in less intensive models (LIMs) of Differentiated Service Delivery (DSD), but by September 2021, only 56.0% (735,864) were in LIMs.

MOH collaborated with Africa Resource Centre (ARC) to establish the Community Retail Pharmacy Drug Distribution Point (CRPDDP) to improve convenience to ROCs and reduce health facility (HF) congestion.

Description: Stable ROCs are enrolled and attached to a convenient pharmacy through the national electronic medical records platform (UgandaEMR/OpenMRS). At the time of dispensing, trained pharmacy staff provide ROCs with 3-or-6-month ARV packs for free, and the phar-

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macy receives \$0.54 (UGX 2,000) per ROC dispensing, paid by implementing partners. This public-private partnership builds on an initial pilot to provide person-centered services to ROCs by leveraging existing resources in the health system.

As of January 2023, 104 pharmacies across Uganda are providing refills to over 40,000 ROCs from 61 high-traffic health facilities, with a 2023 target of over 150 health facilities, 200 pharmacies, and 150,000 ROCs.

Lessons learned: Preliminary results of a nationwide survey of 403 ROCs (55.8% female) show that 99.8% would recommend the program to a friend. Waiting time was under 20 minutes for 97% (compared to 3 hours at the HF), and 92.4% reported being treated "respectfully".

National implementation requires a focus on defining critical service processes and focusing on ROC awareness. Electronic records systems for enrolment, stock movement, dispensing, and monitoring must be interoperable. "High touch" interaction with all stakeholders is required to ensure that delays in implementation are addressed in a timely manner.

Conclusions/Next steps: The pharmacy pick-up model can be implemented at scale if it is designed to fit the health system and coordinated effectively with service providers and ROCs. The low-cost, person-centered, and scalable CRPDDP model make it ideally suited for adoption. MOH is scaling up the model nationwide and integration of more services (like PrEP, family planning, NCDs) is being explored.

MOPEE23

Smartphone- enabled video directly observed therapy to improve viral suppression among unsuppressed children and adolescents in Kenya

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Background: Video directly observed therapy (vDOT) has been used as an acceptable, cost-effective, client-centered intervention for tuberculosis management. vDOT targeting children and adolescents not achieving viral suppression (VS) [<1000 copies/ml] was piloted in 128 sites in Kenya. We evaluated utilization and re-suppression rates of clients enrolled in vDOT.

Methods: A retrospective review of data from 223 (out of 470) virally unsuppressed clients aged between 0-19 years on antiretroviral therapy (ART) using the NimeCONFIRM vDOT application for at least 12 weeks between February 2021 and October 2022 at 73 facilities were conducted. Clients stopped using the application upon achieving VS. VS was assessed after at least 12 weeks of follow-up through self-care (user) or Healthcare worker (HCW)-assisted recording and upload of vDOT. Using a multi-

variable Fine-Gray sub distribution hazard (SH) model we assessed demographic and clinical determinants of VS presenting adjusted sub distribution hazard ratios (aSHR) and 95% confidence interval (CI). Participants were censored on loss to follow-up, death, and transfers.

Results: Most users were aged 10-14 years (84 [37.7%]) and 15-19 years (79 [35.4%]). Only 19 (8.5%) were on self-care vDOT. Median time on follow up was 19.36 weeks (interquartile range [IQR]: 16.50 – 23.07), median number of videos uploaded were 126 (IQR: 96 – 197), and with 75% (IQR: 60% – 85%) vDOT adherence.

About half, 108 (48.4%), were active, 39 (17.5%) had achieved VS, and 76 (34.1%) discontinued. Cumulative incidence of VS was 22.1%. Results show higher incidence of VS among children aged 5-9 years compared to 0-4 years, aSHR = 3.12 (95% CI: 1.03 – 9.39) and those on selfcare compared to healthcare worker led option, aSHR = 2.51 (95% CI: 1.95 – 3.24). Similarly, there was higher incidence of VS for those with guardians and siblings as caregivers compared to grandparents; aSHR = 1.28 (95% CI: 1.11- 1.48), and aSHR = 2. 83 (95% CI: 1.83 - 4.37), respectively.

Conclusions: Achieving VS using vDOT was significantly associated with age, selfcare option, and type of caregiver. Findings suggest vDOT as an additional tool to support unsuppressed children and adolescents to achieve more equitable health outcomes.

MOPEE24

Tracking the effect of paediatric dolutegravir (pDTG) on viral load suppression in a large population cohort of children on ART in Malawi

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Background: Sub-Saharan Africa is home to nearly 90% of all children living with HIV (CLHIV). Overall paediatric HIV incidence declined by 54% from 2010 to 2020 globally, mainly due to the increased provision of antiretroviral therapy to pregnant and breastfeeding women living with HIV [1].

Despite progress in reducing HIV incidence in children, the region remains behind in reaching the 95-95-95 UNAIDS fast-track targets. Viral load suppression (VLS) is critical to treatment success and reducing child morbidity and mortality to accelerate progress towards ending AIDS. According to UNAIDS, only 40% of CLHIV had attained VLS, compared to 67% of adults in 2021 [2].

The 2015/16 MPHIA survey [3] reported that one in three children who had a viral load test had not achieved VLS. Malawi has slightly above 1 million people living with HIV with 15% being children under the age of 14. The country has made strides to achieve UNAIDS fast-track targets with a performance of 88%:98%:97% among the 15+ cohort (MPHIA 2020/21). In 2021, ART Coverage in children was at 78% with all of them taking either LPV/r or NVP based regimens.



Description: We conducted a review of client-level data over a 12-month period to track the rates of VLS for children who had been taking pDTG-based ART.

We reviewed national program data that was collected from client records in over 800 health facilities to compare the rates of VLS prior to introduction of pDTG in 2021 to 12-month post transition of all children to pDTG-based ART.

Lessons learned: pDTG rollout was initiated in July 2021 when national paediatric VLS was at 55%. By the end of a 12-month period, suppression rose to 73.5% which translates to 18.5% jump in 12 months.

Similarly, the proportion of children with viraemia of >1,000 copies/mL had also decreased from about 27% to 16% in these 12 months.

Conclusions/Next steps: The effect of pDTG on VLS is evident regardless of other associated factors such as adherence. National HIV programs need to finalize transitioning of all paediatric ART cohorts to pDTG while monitoring outcomes and other associated factors to achieve optimal VLS in children.

1. <https://www.unaids.org/en/resources/fact-sheet>
2. https://www.unaids.org/sites/default/files/media_asset/JC3032_AIDS_Data_book_2021_En.pdf
3. <https://phia.icap.columbia.edu/countries/malawi/>

MOPEE25

Barriers and facilitators to the implementation of Cabotegravir + Rilpivirine long-acting injectable HIV treatment among healthcare providers: baseline qualitative findings from the ILANA study

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Background: This study explores the early experiences of barriers and facilitators to the implementation of Cabotegravir + Rilpivirine long-acting injectable HIV treatment (CAB+RPV LA) among healthcare providers (HCPs) participating in the ILANA implementation study.

Methods: ILANA is examining the acceptability and feasibility of implementation of CAB+RPV LA in clinics and community settings. From August to November 2022, semi-structured baseline interviews were conducted with HCPs from six HIV clinics in the UK across Brighton, Liverpool, and London participating in ILANA. The interviews were analysed using reflexive thematic analysis.

Results: Thirteen HCPs were interviewed, including doctors, nurses, and pharmacists. All participants felt that CAB+RPV LA would offer substantial benefits for their service users, including: removal of daily reminder of their HIV status; reduced pill fatigue; and increased privacy about treatment use.

Initial barriers to implementation included: HCP anxieties about switching service user participants to a new regimen; the additional burden created by CAB+RPV LA delivery on clinical resources and time; and lack of clarity about novel delivery in community settings.

Facilitators included: ongoing, open, and accessible communication with service user participants; high acceptability of CAB+RPV LA to service user participants once initiated; and the adoption of tools and strategies to aid implementation. The latter included: establishing working groups; virtual screening and results management apps; a range of staff information resources; dedicated staff time for CAB+RPV LA provision; and flexibility in appointment scheduling.

Conclusions: HCPs had initial anxieties about CAB+RPV LA but these were mostly assuaged when treatment commenced and service user participants found it highly acceptable. Enabling ongoing, open, and accessible communication with trusted staff members was a key facilitator in reassuring service user participants and managing expectations around treatment. While the implementation of CAB+RPV LA has increased the demand on clinical resources and time, HCPs have found tools and strategies to manage this, and feel positive about the benefits of CAB+RPV LA for service users. HCPs felt more hesitant about delivery of CAB+RPV LA in community settings, and increased information and planning is required to facilitate community roll-out.

MOPEE26

Optimizing the clinic flow process for integration of cabotegravir + rilpivirine long-acting into routine care: findings from Cabotegravir And Rilpivirine Implementation Study in European Locations (CARISEL)

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Background: CARISEL is a hybrid implementation-effectiveness study examining the processes for optimizing implementation of CAB+RPV LA for the treatment of HIV-1 in virologically suppressed adults.


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Methods: Quantitative and qualitative data regarding clinic processes were collected from 62 staff study participants (SSPs) from 18 sites across Belgium, France, Germany, the Netherlands, and Spain at Months 1, 5, and 12. Clinic processes used in CARISEL to implement CAB+RPV LA were summarized in three distinct phases: pre-appointment, during appointment, and after clinic visit.

Results: Pre-appointment processes included sending appointment reminders, preparation of paperwork, and arranging medication pick-up process with the pharmacy (Figure).

Medication collection processes differed; some SSPs (24%) reported patient participants collected CAB+RPV LA during clinic visits, while others (19%) had staff collect it from the pharmacy prior to visits. Some sites in Germany and France were unique as prescriptions were given to the patient during the previous clinic visit to allow for pick-up prior to their next appointment (discussed by 19% of SSPs). Clinic appointment process flows were similar across countries (example flows shown in Figure): patients consulted with a nurse or doctor, medication was brought to room temperature, injection was administered, and patient was monitored for 10 min.

Some clinics scheduled future appointments at the start of the clinic visit, while some scheduled them after injection administration. Post-visit tasks included laboratory work and cleaning up workspace. Over 50% reported spending 20 min or less with patients at visits. Most (76%) spent 20 min or less per week ensuring appointment attendance. The majority (68%) found time spent in clinic for patient appointments very to extremely acceptable.



Figure.

Conclusions: Process flows varied slightly, yet there were many common components across clinics and countries. CARISEL data suggest implementation processes were incorporated into routine care and were acceptable compared with other HIV routine appointments in European clinics.

MOPEE27

Robot-based assessment: a novel tool to objectively quantify the impact of HIV on aging

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Background: About 37 million people worldwide live with HIV. As they age, there is a growing concern over the decline in cognitive and physical function, which impacts everyday functioning; this prevalence ranges from 50% to 80% of population.

These impairments tend to be prominent in people with chronic HIV than those without and may be due to a combination of aging and the effect of the virus on the brain. There is a lack of objective assessment tools that can predict early motor, cognitive, and activity functional decline. We propose using a rehabilitation robotics approach to understand the impact of HIV on functional decline in older adults.

Objective: To assess how a robot tool can objectively predict clinical assessment scores for motor and cognitive domains in people aging with HIV.

Methods: This study was conducted at the University of Pennsylvania and involved 10 male participants (5 HIV+, 5 HIV-: matched on age, gender, and education level).

Participants underwent an evaluation of motor and cognitive performance using standard neuropsychology tools and performed a 30-minute robot-based task with the upper limb based on the traditional Corsi block spatial span task.

Results: HIV+ participants were more cognitively impaired overall, in executive function and more physically impaired in gross and fine hand function (Table 1).

Participants/ Test	Mean Age	MOCA Score	Color Trails 2	Dominant Grooved Pegboard	Box and blocks	Spatial Span Dominant
Controls	57.80 ± 6.61	28.60 ± 2.07	53.07 ± 11.06	63.97 ± 12.81	67.00 ± 10.46	4.59 ± 0.87
HIV	60.60 ± 5.55	24.00 ± 3.00	101.33 ± 42.85	78.79 ± 18.67	57.07 ± 11.57	3.68 ± 0.62

Table 1.

Robot assessment indicates that persons with HIV+ were less likely to remember and move accurately as the number of block sequences increased from 3 to 7 (Figure 1).

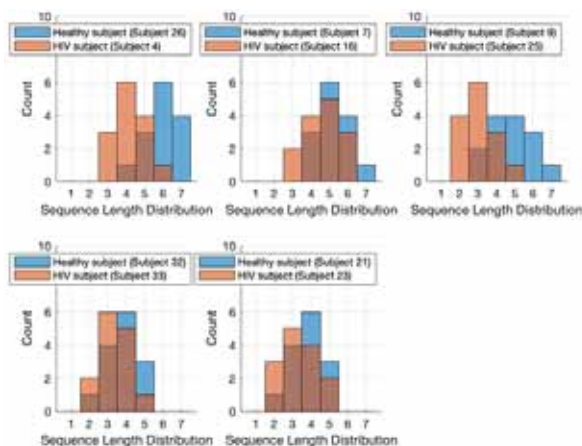


Figure 1. All paired subjects, dominant hand.

Conclusions: Robot-based assessment approaches show promise in quantifying cognitive and motor impairment in Chronic HIV and have the potential to provide a better understanding of how HIV specifically impacts the progression of functional decline.

MOPEE28

Improving viral load suppression among children aged 0-14 years through community ART distribution in rural Uganda: lessons from Anyeke HCIV

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Background: Ministry of Health Uganda has a goal of achieving HIV viral load suppression of 95% by 2030. Children's dependence on others for HIV care often leads to ART non-adherence and viral non-suppression and thus an impediment to achieving the goal. Viral load suppression for the 0-14-year children was as low as 79% by June 2022 at Anyeke HCIV. The children often missed their facility appointments thus missed opportunities for ART, viral load monitoring and other services. Long distances to the facility, expensive transport costs, multiple care takers and absence of community ART delivery were major barriers to care.

Description: Children were profiled based on age and address. Groups of 3-6 children based on age and proximity by address formed. These were meaningfully attached to a counsellor and community health worker (CHW) positively living with HIV for follow up. Clinic preparations a day before to the scheduled community visits at preferred venues.

This preparation consisted pre-clinic file retrieval, service gap identification tags of masking tape on the retrieved files using the service layering package and pre-filing of viral load forms. Clear role assignment for attending staff team who used a checklist to assemble required commodities. Weighing scales carried for weight-based ART dosing. Intensified Adherence Counselling was done

at the community. When community visit was missed, a counsellor and CHW proceeded for a home visit. Weekly update and review of the children's audit tool supported performance monitoring.

Lessons learned: Viral load suppression improved from 79% in June 2022, 81% in September to 94% in December 2022 for children 0-14 years at Anyeke HCIV due to community service delivery model of care.

Proper service layering at the community is possible with proper preparation and clear role assignment. The aim of improving access to services is easily achieved with frequent contacts, supported disclosure as well as home visits to handle adherence barriers.

Conclusions/Next steps: Viral load suppression can be achieved using community service delivery models of care in low income settings. Community ART service delivery once adopted and scaled can be a game changer to Pediatric HIV management.

TUPEE01

Sustainable financing of key population HIV programs in Asia: findings from a 4 country baseline assessment by the SKPA-2 program

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Background: The Sustainability of HIV Services for Key Populations in South-East Asia (SKPA)-2 program is a three-year (July 2022 to June 2025) program funded by the Global Fund in Bhutan, Mongolia, the Philippines and Sri Lanka. Between July to December 2022, a team of independent regional and national consultants conducted a rapid baseline assessment to understand the extent to which the four countries are prepared to provide domestic financial and programmatic support for HIV service delivery for key populations.

Description: Data collection tools including structured key informant interview guides and an online "sustainability pulse check" survey, were developed covering SKPA-2 objectives (financial sustainability, strategic information, programmatic sustainability and human rights



and gender). Key informant interviews were conducted during October–November 2022 with over 136 individuals, while 60 stakeholders completed the online survey. These stakeholders were broadly categorized into four groups: key populations, government, non-governmental organizations, and multi-lateral (UN) agencies.

Lessons learned: Only 5% of survey respondents saw their government as being able to afford to expand key population HIV services without reliance on external donors in the next three years. At the same time 35% of respondents saw key populations as 'readily' able to access PrEP in their country, compared to 40% for HIV self-testing. Slightly over a quarter (28%) of respondents thought their country has a functioning referral system to legal services for human rights violations linked to HIV service access.

The bottlenecks identified in survey data and by key informants are similar across countries, indicating the twin challenges for sustainable HIV responses of increasing domestic resource commitments alongside expanding access to targeted key population services. A partnership approach that recognizes key population-led service provision and values the voice of key populations is needed to efficiently address these gaps.

Conclusions/Next steps: The assessment will help governments and community advocates generate concrete actions that can be used for evidence-based planning and advocacy. Increasing efficiencies while investing in the right mix of high impact services, including those led by key population service providers, will be needed to reach the 95–95–95 targets in the face of declining external donor support.

TUPEE02

Out-of-pocket payments in accessing antiretroviral treatment among People Living with HIV (PLHIV) in Indonesia

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Background: Indonesia's National Health Insurance program introduced in 2014 and the National HIV Program of the Ministry of Health (MoH), provides comprehensive coverage for HIV services. However, due to a lack of coordination, there were still out-of-pocket (OOP) payments by people living with HIV (PLHIV) who accessed ARV treatments. The reported OOP includes payments for diagnostic tests, drugs, and administrative fees.

To understand better and to develop policy options for

achieving Triple 95 by 2020, we conducted an analysis of factors associated with OOP payments among JKN members based on our survey in 2022.

Methods: We conducted a survey of JKN members who had utilized HIV services in 16 municipalities in Indonesia. A total of 561 PLHIV participated in the survey from April–August 2022. We applied multivariate logistic regression to determine the factors associated with OOP payments in accessing ARV treatment.

Results: Descriptive statistics indicated that 45% of respondents reported paying OOP when they accessed healthcare providers to get ARV treatment. PLHIV who accessed ARV outside of their residence were almost three times more likely to pay OOP than their counterparts who accessed ARV in the same location of their residence (OR=2.8; 95% CI= 1.8–4.6).

Furthermore, those who reported travelling more than 30 minutes to the healthcare providers were more likely to pay OOP compared to those who said otherwise (OR=1.6; 95% CI = 1.2–2.3). Meanwhile, those who experienced internalized stigma were twice more likely to pay OOP than those who reported otherwise (OR=1.9; 95% CI = 1.3–2.8). Finally, those who visited hospitals were 1.4 more likely to pay OOP than those who visited primary health care (PHC) providers (OR=1.4; 95% CI = 1.0–2.1).

Conclusions: We found that almost half of the PLHIV surveyed had OOP payments when visiting healthcare providers. Several factors associated with OOP payments are the location of healthcare providers, internalized stigma (self-stigma), and the type of health healthcare providers (p-value < 0.05).

These findings should be communicated effectively to policymakers in ensuring the triple 95 targets of HIV intervention in Indonesia.



TUPEE03

Achieving sustainability of Unitaid investment in HIV self-testing through demand-side subsidy financing: successes and lessons learnt from STAR-Nigeria partnerships with private pharmacies

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Background: The Unitaid HIV self-testing in Africa (STAR) project, implemented by Jhpiego in Nigeria in collaboration with the Ministry of Health and key stakeholders distributed 318,750 oral and blood-based HIV Self-testing (HIVST) kits through 5 distribution models between 2020-2022. A demand side financing pilot, addressing barriers of high commodity cost and poor demand, to increase access and uptake of HIVST through private sector pharmacies as a sustainable model of HIVST was implemented between November 2021 and October 2022.

We aimed to demonstrate that implementation of demand side subsidy financing would lead to sustainable HIVST market through private pharmacies in Nigeria.

Description: Demand side financing (DSF) was implemented between November 2021-October 2022 as a strategy to scale and sustain HIVST through the private sector in Nigeria. We mapped 166 private retail pharmacies across four Nigerian states, trained pharmacists on HIVST detailing, and provided simplified digital reporting tools and promotional materials. We used the "buy 1 get 3 free" model to stimulate demand and gradually transferred costs to end users through 3 cost transfer phases at agreed end-user profit margins. Consumers (walk-in, online referrals, referrals by community-based organizations) redeemed paper- or digital vouchers to receive HIVST kits. The cascade of voucher redemption, demand for HIVST and investment made by private pharmacies were tracked.

Lessons learned: A total of 2,920 HIVST kits (USD\$10,000 value) were purchased by 166 pharmacies within 3 months of first and second cost transfers. Voucher redemption dropped initially from 91% in the free phase to 60% in the first and then increased to 72% in the second cost transfer phases. 85% of pharmacies invested at least USD\$10-50. Of the 12,718 kits distributed across the three phases, community referrals, walk-in and online referrals accounted for 75%, 21.3% and 3.4% of HIVST uptake respectively.

Additional investment of USD\$32,000 have been made by pharmacies in scale-up states, via pooled procurement by the Association of Community Pharmacists of Nigeria, after DSF pilot.

Conclusions/Next steps: The DSF initiative was effective in sustaining market for fee-based HIVST in Nigeria. The successful pilot has been expanded country-wide through the governance structure of the "Local Pharmacy Distribution Network".

TUPEE04

The cost and intermediate cost-effectiveness of delivering U=U messaging to increase HIV testing among South African men

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Background: South African men have lower HIV testing uptake than their female counterparts, leading to lower antiretroviral treatment (ART) uptake and higher HIV related mortality. A recent cluster randomised trial in a high HIV prevalence area in Cape Town showed that relaying the "undetectable equals untransmittable" (U=U) message to South African men was effective in increasing their HIV testing uptake compared to standard testing invitations.

We conducted an economic analysis based on this trial to inform decision-making for implementing U=U messaging in routine HIV care.

Methods: We analysed the mean cost of the U=U intervention as well as its incremental cost-effectiveness over the control arm. Costs were estimated based on trial expenditure data, analysed from the provider perspective



in 2020 ZAR and converted to US\$ using March 2020 exchange rates. Joint trial costs were allocated to each trial arm based on participant volume or days of operation; capital costs, including the creation of the U=U message via human-centred design workshops, were annualised over 8 years. In a second scenario, trial resource use was adjusted for potential implementation in routine care.

Results: Peer promoters delivered 504 U=U invitations over seven intervention days and 544 standard invitations over five control days in March 2020. The average trial cost was \$5.40 per U=U message delivered (\$2.35 after adjustment for routine implementation), \$388.47 (\$168.99)/ person testing HIV-positive, and \$906.44 (\$394.31)/ person initiating ART. Within trial costs, staff, overhead and research costs were the largest cost items, accounting for 20-30% of total costs each.

After routine implementation adjustment, message creation via human-centred design workshops, personnel (peer promoters, research staff) and supplies costs were the largest cost items. Cost of U=U messaging per person confirmed HIV-positive and initiating ART was lower than conventional HIV testing messaging and at the lower end of cost ranges of HIV self-test distribution models targeted at men (\$62-\$7,936/ person confirmed positive and \$117-\$8,198/ person initiating ART) established in previous work.

Conclusions: Delivering tailored U=U messaging can increase HIV testing and ART uptake among men, while saving costs over standard untargeted HIV testing messaging and a number of HIV self-test distribution models.

TUPEE05

Supervising rural community health workers (CHW) increases children's perinatal survival, with outcomes related to timing and quality of CHW's perinatal home visits

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Background: Lacking sufficient professional health providers, CHW are increasingly deployed globally to provide perinatal home visits to mothers/infants. While efficacy of CHWs is repeatedly found in randomized trials, health systems often fail to provide sufficient training, supervision and monitoring of CHW and CHW are often found ineffective in large system implementation.

Methods: All government CHW (N=43) in 8 rural South African clinics were randomized by clinic to receive: 1) Standard Supervision (SS; n=392 mothers/infants); or 2) Accountable Supervision (AS; n=423). Perinatal outcomes were

repeatedly monitored at six points from pregnancy to 2 years post birth. CHW were Black, xhosa-speaking mothers with a high school or less than high school education, typically employed by the government for 12 years. Random regressions examined child outcomes over 2 years, associated with the timing and frequency of home visits, and supervisors' ratings of CHW qualities.

Results: Mothers reported only 7-9% of CHW in SS made any home visits during any follow-up period; 62%-77% of AC CHW visited an average of 14 times.

Among the AS condition, almost all pregnant women were visited, 140 home visits were made within 2 days post-birth, more than 475 visits within the first week post-birth, and 483 in the first three months, with similar rates at 6, 15, and 24 months post-birth.

Perinatal mortality in the first six months of life was reduced by 50% in the AS compared to the SS (5% vs 2.3%, $p < 0.013$), however, 13 other outcomes did not demonstrate a benefit over two years.

Random regressions controlling for timing of home visits and the quality of the CHW's visits were related to child outcomes over time.

Conclusions: Introducing supervision results in short-term survival benefits, but long-term outcomes appear associated with the timing and quality of CHW's visits. Staff recruitment strategies (e.g., choosing local role models as CHW) are likely as critical as supervision strategies to improve child and maternal outcomes.

TUPEE06

Adapting and reorienting a patient reported outcome measure (PROM) consensus study to achieve more culturally diverse perspectives from HIV peer and clinical settings: a reflective case study in HIV research

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Background: Patient Reported Outcome Measures (PROMs) are tools that can measure quality of life for people with HIV, and support person-led care. An online Delphi consensus study was undertaken with PLHIV peer, community, clinical and research settings to achieve consensus on a recommended set of PROMs in Australia.

This paper describes the adaptation and reorientation of the study part way through to better incorporate diverse perspectives of people with HIV from culturally and linguistically diverse backgrounds and women.

Methods: Following feedback that the methodology had created a barriers for culturally and linguistically diverse groups to participate in the development of a PROM outcome set, nine participants were purposively sampled from within a first round Delphi consensus survey and invited for interview.



Participants were those who had raised feedback, or who were PLHIV peer support workers, clinicians working with people from culturally and linguistically diverse backgrounds, or women with HIV.

Participants were asked to discuss the aspects of care most important to include in the PROMs, and aspects of survey and outcome set accessibility to increase diversity of participants in the study.

Two researchers analysed and reviewed the data, identifying themes and discussing conflicting statements.

Results: Three themes were defined:

1. The need to recognise diversity within the HIV community (i.e., challenging assumptions about the HIV community, language and culture),
2. Exploring specific aspects and understandings of quality of life and social outcomes that matter (i.e., particularly psychological wellbeing and stigma), and;
3. Measuring patient outcomes appropriately (i.e., practitioner training to support measurement and patient understanding, and environmental factors important to the implementation process).

A limitation identified through the research was that the availability of PROMs that have been developed and validated for PLHIV from diverse backgrounds.

Conclusions: This research provides a case study for how to balance the need for consensus and diversity for PLHIV using adaptive methods in a Delphi consensus process, such as qualitative interviews.

Studies can be reoriented to ensure that the process actively seeks out views from culturally and linguistically diverse contexts to create a minimum set of recommended PROMs that are suitable across the diverse range of PLHIV.

TUPEE07

Agreement of and discussion with clients about Undetectable equals Untransmissible (U=U) among General Practitioners in Australia

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Background: The message of Undetectable equals Untransmissible (U=U) is important to reduce HIV stigma. However, it is unclear whether this message is being disseminated by health professionals to clients living with HIV and to other patients during a sexual health consult. We examined Australian general practitioner (GP)'s agreement of and discussion with clients about U=U.

Methods: We distributed an online survey through GP networks from April to October 2022: eligibility was a GP working within Australia. Logistic regression analyses were used to identify variables associated with: 1) agreement of U=U; and 2) discussing U=U.

Results: Of 703 surveys, 407 were included in the final analysis. Mean age was 39.7 years (standard deviation: 8.4), most were female (70.5%, n=287), and 40% (n=161) had extra training with sexual health. Most GPs (74.2%, n=302) agreed with U=U but only 33.9% (n=138) had ever discussed U=U with their clients (Figure 1).

Key barriers to discussing U=U were lack of relevant client presentations (48.7%), lack of understanding about U=U (39.9%), and difficulty identifying those who would benefit from the U=U message (6.6%). Agreement with U=U was associated with greater odds of discussing U=U (Adjusted odds ratio (AOR) 4.75, 95% confidence interval(CI): 2.33-9.68), younger age (AOR 0.96 per additional year of age, 95%CI: 0.94-0.99), and extra training in sexual health (AOR 1.96, 95%CI:1.11-3.45). Discussing U=U was associated with younger age (AOR 0.97, 95%CI: 0.94-1), extra training with sexual health (AOR 1.93, 95%CI 1.17-3.17), and negatively associated with working in Metropolitan or Suburban area (AOR 0.45, 95%CI: 0.24-0.86).

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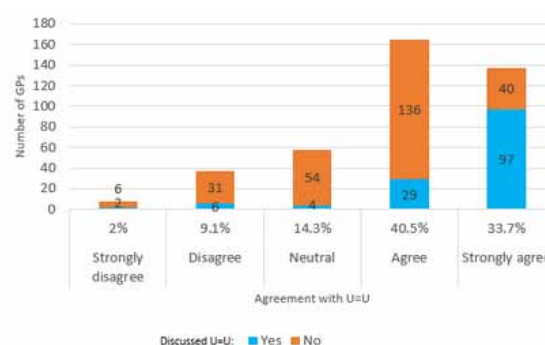


Figure 1. Proportion of general practitioners who ever discussed about U=U according to their agreement with U=U*

*People living with HIV who have been taking ART (antiretroviral therapy) regularly enough to achieve an undetectable viral load, cannot sexually transmit the virus to others?

Conclusions: Most GPs agreed with U=U, but most had not discussed U=U with their clients. Concerningly, 1 in 4 GPs disagreed with U=U, suggesting that further qualitative research to understand this finding and implementation research to promote U=U among Australian GPs is urgently needed.



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TUPEE08

Efficacy of a multi-level pilot intervention to reduce discrimination faced by MSM and transgender women in public hospitals in India: findings from a pre-/post-test quasi-experimental trial among healthcare workers

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Background: Reducing stigma and discrimination faced by men who have sex with men (MSM) and transgender women (TGW) in healthcare settings is key to improving health outcomes. We tested the efficacy of a theory-informed, multi-level pilot intervention ('Harmony') among 98 healthcare workers (HCWs) to reduce sexual orientation and gender identity (SOGI)-related stigma and discrimination faced by MSM and TGW in two public hospitals.

Methods: We used a one-group pre- and post-test quasi-experimental design. The intervention contained group-level (a half-day workshop) and individual-level (4 videos) components. Using multi-level modelling, we compared knowledge, attitudes, and comfort level among HCWs across three timepoints: pre-intervention, post-intervention and follow-up.

Client surveys were conducted among 400 MSM/TGW attending the intervention hospitals, before and after the intervention among HCWs. Generalised estimating equations (GEE) assessed service users' satisfaction with hospital services, discrimination experiences and positive interactions with HCWs.

Results: Significant changes were observed in primary outcomes: 30% increase in positive attitude scores (incidence rate ratio [IRR]=1.30, 95% CI 1.13-1.49); and 23% increase in the proportion of HCWs reporting being comfortable in providing care to MSM/TGW (IRR=1.23, 95% CI 0.03-1.68). Similarly, there was a significant improvement in secondary outcomes (scores): support for non-discriminatory hospital policies (IRR=1.08, 95% CI 1.004-1.15), the importance of asking SOGI questions in clinical history (IRR=1.17, 95% CI 1.06-1.29), and perceived self-efficacy in providing clinical care (IRR=1.13, 95% CI 1.01-1.27).

Service users' data provided corroborative evidence for intervention efficacy: e.g., 14% increase in the proportion of MSM reporting overall satisfaction with hospital services, and 6% and 15% increase in the scores of positive interactions with HCWs in the combined sample of MSM/TGW and TGW, respectively.

Conclusions: The Harmony intervention showed evidence for improving positive attitudes, comfort level and understanding of the healthcare issues of MSM/TGW among HCWs, and warrants large-scale implementation research.

TUPEE09

Managing pediatric and adolescent treatment failure among children and adolescents living with HIV in seven sub-Saharan African countries

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Background: Children and adolescents living with HIV (CALHIV) with treatment failure (TF) experience prolonged viremia and delayed transition to optimal regimens. The New Horizons Collaborative (NH) is a multisectoral partnership to donate Darunavir/ritonavir (DRV/r) and Etravirine (ETR) for treatment of children with TF and to improve outcomes in CALHIV.

The objective of this analysis is to describe the TF management cascade among CALHIV in NH-supported countries.

Methods: Data from Cameroon, Eswatini, Kenya, Lesotho, Nigeria, Uganda and Zambia were obtained from national reports during the annual NH workshop in October 2022. Descriptive data were extracted from Ministry of Health guided presentations on the TF management cascade for CALHIV.

Results: Most CALHIV with TF received enhanced adherence counseling and had viral resuppression rates ranging from 42.1% (Cameroon) to 87.6% (Eswatini) (Figure 1).

	# of CALHIV failing PI or DTG based ART	# of CALHIV re-suppressed after EAC	# of CALHIV who remain suppressed after EAC	# of CALHIV approved for CRT	# of CRT samples obtained	# of CRT results received	# of CALHIV selected to switch to DRV/r-based ART	# of CALHIV switched to DRV/r-based ART	# of CALHIV re-suppressed at national/regional TMO
Cameroon	152	64	59	59	33	23	8	7	0
	(42.1%)	(42.1%)	(57.9%)	(57.9%)	(55.9%)	(70.0%)	(34.7%)	(87.5%)	(0.0%)
Eswatini	217	190	307	8	8	8	0	0	0
	(87.6%)	(9.2%)	(30.0%)	(100%)	(100%)	(100%)	(0.0%)	(0.0%)	(0.0%)
Kenya	2,258	1,547	712	100	N/A	64	14	14	114
	(68.1%)	(31.5%)	(75.3%)	(100%)		(58.8%)	(21.9%)	(100%)	(50.0%)
Lesotho	155	108	0	0	1	1	0	0	5
	(69.7%)	(32.3%)	(0.0%)	(0.0%)	(100%)	(100%)	(0.0%)	(0.0%)	(18.0%)
Nigeria	575	0	0	0	0	0	1	0	318
	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(1.7%)	(0.0%)	(55.3%)
Uganda	2,300	1,306	1,014	1,022	611	52	41	41	302
	(54.9%)	(45.1%)	(95.2%)	(98.8%)	(54.0%)	(15.8%)	(7.8%)	(7.8%)	(13.8%)
Zambia	307	205	127	N/A	N/A	19	19	0	N/A
	(67.1%)	(34.1%)	(38.1%)			(22.2%)	(100%)		
Total	6,245	3,587	2,596	1,087	651	424	94	73	438
	(57.6%)	(33.1%)	(32.8%)	(80.0%)	(80.1%)	(75.1%)	(75.1%)	(75.1%)	(30.9%)

¹Seven clients in Eswatini were transferred or had treatment interruption in this time period. ART = antiretroviral treatment; CALHIV = children and adolescents living with HIV; CRT = drug resistance testing; DTG = dolutegravir; EAC = enhanced adherence counseling; PI = protease-inhibitor; TMO = treatment monitoring group; N/A = Not Available.

Figure 1. Pediatric treatment failure cascade for children and adolescents aged 0-24 in seven countries, January - October 2022.



A significant proportion of CALHIV with continued viremia was referred to technical working groups (TWGs) for review and drug resistance testing (DRT) approval. Uganda (95.2%) and Cameroon (67.0%) had the highest rates of DRT approved, although in both countries, less than 60% of approved DRT samples were collected.

DRT challenges included high client fees, low laboratories DRT capacity, and long turnaround time for results.

TF cases discussed at the national/regional TWGs varied widely by country. The highest numbers of CALHIV transitioned to DRV/r antiretroviral treatment were reported from Uganda, where national tracking system and decentralized TF management is implemented among CL-HIV.

Conclusions: We observed high variability in the TF management among CALHIV by country and ongoing challenges with accessing DRT. NH continues supporting countries with decentralizing TF management and improving DRT access.

TUPEE10

Maximising voluntary medical male circumcision (VMMC) outputs through the utilisation of the the 'Roving team concept'

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Background: The VMMC program was adopted by the Zimbabwean government because there is overwhelming evidence that male circumcision reduces heterosexual transmission of HIV by 60% among other benefits. ZiCHIRE as one of the PEPFAR implementing partners is responsible for 7 districts.

Shortage of VMMC staff due to competing priorities and high staff attrition rate among Ministry of Health workers continues to be a huge challenge which requires urgent attention in order to achieve one of the set objectives, to strengthen VMMC services to ensure they are accessible, affordable and effective enough to meet both scale-up and maintenance phase targets.

As ZiCHIRE we had to come up with an innovation, the Roving team concept to address this problem.

Description: ZiCHIRE employed nurse circumcisers who were then deployed to the various VMMC sites in the districts to augment the existing work force. Each team of nurse circumcisers known as the Roving team moves from one site to the other depending on the staff requirements and workload. The aim of the Roving team concept is to always ensure availability of VMMC staff so that clients get high quality services timeously and minimize adverse events related to work overload. The role of roving teams includes service delivery, demand creation, program quality, strategic information and financing.

Lessons learned: The Roving team concept increased VMMC outputs from a 60% to 85%, boosted the confidence and morale of MOH teams, improved data quality,

and clients' satisfaction due to availability of clinicians in the various sites supported by ZiCHIRE.

In addition, roving team members who participated in demand creation activities reduced the workload for the district health communications unit and helped in the dissemination of key VMMC messages to prospective clients.

However, a multiple of challenges were encountered in the operationalisation of this intervention such as rejection by existing MOH teams who thought this would reduce their allowances.

Conclusions/Next steps: The roving team concept is an important innovation that has helped the ZAZIC consortium and the Ministry of health to achieve set targets in the previous country operational plans.

TUPEE11

Reproductive coercion, viral suppression, and integrated sexual and reproductive health services among women living with HIV in 11 countries

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Background: Women living with HIV (WLHIV) experience coercive practices in healthcare settings threatening independent reproductive decision-making. Integration of high-quality, rights-based HIV and sexual and reproductive health (SRH) programs may prevent coercive practices and improve treatment delivery for WLHIV, although data remain limited.

We examined the relationship between reproductive coercion and viral load suppression (VLS) among WLHIV in the context of 11 country-level integrated HIV/SRH programs.

Methods: Data from the People Living with HIV (PLHIV) Stigma Index 2.0 study were pooled from 11 countries across Eastern Europe, Central Asia and Sub-Saharan Africa. Study implementation was led by networks of PLHIV in partnership with GNP+, the ICW, and UNAIDS (2020-2022).


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Interviewer-administered questionnaires captured socio-behavioral measures for 10449 cisgender 18+ year-old WLHIV. Reproductive coercion was categorized based on coercive experiences relating to sterilization; contraception/family planning; and pregnancy/feeding practices. Antiretroviral use and past-year VLS were self-reported. Country-level scores of HIV/SRH integration were compiled from the SRHR and HIV Linkages Index. Stratified hierarchical log-binomial regression models were used to assess associations between coercive reproductive practices and VLS.

Results: A total of 1111 (10.6%) WLHIV reported reproductive coercion, including coercive practices related to sterilization (n=44;0.42%), contraception/family planning (n=548;5.2%), and pregnancy/feeding practices (n=830;7.9%). Experiences of reproductive coercion were similar by HIV/SRH integration score. Nearly all women (n=9626;94.2%) had ever initiated antiretrovirals, of whom 5421(55.4%) reported VLS in the last year. Past experience of reproductive coercion was associated with a significant overall decrease in VLS (aPR 0.47, 95%CI 0.35-0.64) with limited differences across country-level HIV/SRH integration scores.

	Unadjusted PR (95% CI)	Adjusted PR (95% CI) ^c
Overall		
Ever experienced reproductive coercion	0.56 (0.48, 0.69)	0.47 (0.35, 0.64)
No experience of reproductive coercion	Ref.	Ref.
Stratified by HIV and SRHR linkage score ^b		
Moderate HIV and SRHR linkage		
Ever experienced reproductive coercion	0.63 (0.53, 0.75)	0.50 (0.36, 0.70)
No experience of reproductive coercion	Ref.	Ref.
Limited HIV and SRHR linkage		
Ever experienced reproductive coercion	0.49 (0.34, 0.70)	0.46 (0.27, 0.77)
No experience of reproductive coercion	Ref.	Ref.

a Defined as having ever experienced coercive practices related to sterilization, contraception/family planning, and pregnancy/feeding practices.
b Defined by whether a country has an HIV strategy with integrated SRHR components as reported by the SRHR and HIV Linkages Index. Scores were compiled using UNFPA and IPPF coding and dichotomized at the mean.
c Models adjusted for a minimally sufficient set of covariates: age, education level, unable to meet basic needs in the last year, number of children living in household, in an intimate or sexual relationship.

Table. Prevalence ratios (PR) and 95% confidence intervals (CI) for the association of reproductive coercion and viral suppression among 10449 women living with HIV in Angola, Benin, Burkina Faso, Cote D'Ivoire, Ghana, Kenya, Kyrgyzstan, Nigeria, Lesotho, Russia and Togo.^a

Conclusions: Reproductive coercion was common in this multi-country analysis, reflecting ongoing challenges to the delivery of effective and rights-affirming SRH services for WLHIV and ultimately worsening individual HIV treatment outcomes and threatening HIV epidemic control. Decreasing implementation gaps between broad country-level integration policies and real-world SRH programs are needed to reduce HIV-related stigmas, strengthen quality SRH services, and improve accountability for human rights violations of WLHIV.

TUPEE12

Scaling-up cervical cancer prevention: Catholic Relief Services (CRS) Epidemic Control 90-90-90 (EpiC 3-90) project in Zambia

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Background: Zambia recorded an estimated 13,831 new cancer cases in 2020 with cervical cancer accounting for 22.9% (3,161). Women Living with HIV (WLHIV) are at six times more risk than HIV-negative women. This increased risk has necessitated integrating cervical cancer prevention into routine HIV services.

To improve the uptake of cervical cancer screening services during the peak of the COVID-19 pandemic, we embarked on scaling-up both static, and mobile screening points from 2020 to 2021.

Methods: We started scaling-up cervical cancer prevention services in June 2020. Health facilities with the highest number of WLHIV were considered for the establishment of new static sites. Outreach services were provided in all supported districts targeting health facilities that did not have static clinics.

Working with the Ministry of Health, we established 20 static screening sites and trained 70 providers to support the implementation of cervical cancer prevention services.

We present our findings from October 2019 to September 2021.

Results: The average number of WLHIV screened for cervical cancer increased from 245 per month (October 2019 – May 2020) to 477 (June – September 2020), indicating 94.2% improvement (Pr(|T| > |t|) = 0.0135). By September 2020, we screened 68% (n=4,101) of the 2020 target of WLHIV. In 2021, following the expansion of cervical cancer screening services, we recorded a four-fold increase in the number of WLHIV from 4,101 to 16,352 which represented 84% achievement against the 19,549 target of 2020. Overall, we reached 20,453 WLHIV with cervical cancer prevention services during the two-year reporting period.



Figure 1. Cervical cancer screening performance against targets (2020 and 2021).



Conclusions: Safe cervical cancer prevention services during the COVID-19 pandemic in WLHIV may be provided through a coordinated approach. This is an essential service in high cervical cancer burden settings like Zambia.

TUPEE13

Effect of economic strengthening on treatment outcome among people living with HIV

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Background: In resource-constrained settings, poor economic circumstances may pose a significant challenge to the success of antiretroviral treatment (ART) outcomes. Economic strengthening is when a group of 10-25 people save together and take loans from savings either to support household needs or to generate income.

We aimed to assess the effect of economic strengthening on HIV care and treatment outcomes among people living with HIV in Addis Ababa, Ethiopia.

Methods: An institutional-based retrospective cohort study design was conducted on 273 people living with HIV/AIDS in public health facilities of Addis Ababa, followed from June 2021 to November 2022. Study participants who were active and on follow-up during this study period were selected using a systematic random sampling technique. Sociodemographic, treatment, clinical, adherence, economic strengthening status and viral load data were extracted from electronic medical records, entered and analyzed with SPSS 26. Multivariate logistic regression analysis was conducted to test the main hypothesis at a 95% CI with $P < 0.05$.

Results: The mean age of the respondents was 40 years with a standard deviation of 8 years. Eighty-seven percent of the study participants were successful in achieving viral suppression (80.30% vs 94.80%) Economic strengthening was also associated with higher odds of viral load suppression (less than 50 copies/ml) with (AOR 4.52, 95% CI 1.90-10.80 $p < 0.001$). Moreover, economic strengthening was also associated with higher odds of ART adherence with (AOR 4.89, 95% CI 1.64-14.29, $p < 0.001$).

Conclusions: Economic strengthening is associated with good adherence to HIV treatment and viral load suppression. Intervention research is needed to determine the extent to which economic strengthening is causally associated with improved HIV treatment outcomes and to identify the most effective policies and programs to improve economic status and health.

TUPEE14

Going beyond the soundbites: establishing a mental health integration guidance for key populations programme in Kenya as a best practice for Africa

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Background: In Kenya, Key populations (KPs) who include transgender people, men who have sex with men, people who inject drugs, and female sex workers continue to face stigma and discrimination which affects their mental and physical health outcomes. More than 30% of counties in Kenya have no programmes for mental health and 40% have no mental health policy. The COVID-19 pandemic worsened the situation, with cases of maladaptive coping mechanisms reported among KPs with no response, heightening the urgency to provide national guidance to address mental health for KPs in Kenya.

Description: In 2021, the National AIDS and STI Control Programme (NASCOP) in partnership with IAVI supported 1 virtual consultative meeting with 50 stakeholders from the Key and Vulnerable Populations Technical Working Group (KVP TWG) including researchers, implementers, and donors to prioritize the integration of mental health services into the Key and vulnerable Populations (KVP) program. A writing meeting was organized, and 20 technical experts and community representatives developed the draft guidance.

To ensure the integration of mental health services a trainer of trainers was then conducted with 26 participants from 10 NASCOP priority counties in Kenya. Learnings from the training provided feedback for the finalization and validation of the national guidance by the KVP TWG.

Lessons learned: Through the consultative meetings, writing, and validation process the KP community was actively involved in informing the process and providing relevant data, case studies, and information. It emerged that the participatory processes for the development and the joint training gave greater insights, credibility, and acceptability of the national guidance and enriched the learning outcomes respectively. Kenya was the first country to develop a guidance document on mental health for KVP spearheaded by the government.

Developing this guidance was enhanced by the multisectoral approach adopted during its development.

Conclusions/Next steps: There is a need to ensure the use and continued participatory approaches in the implementation of the National guidance on integrating mental health into KVP programming in Kenya and the



roll-out of mental health training across the country, to reduce maladaptive coping mechanisms among KPs, and expand this best practice to other populations and countries.

TUPEE15

Family planning experiences of young women with and without HIV in Zimbabwe: a case for integrated HIV and sexual and reproductive health services

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Background: Young people have high unmet sexual and reproductive health needs. Evidence shows this need is higher for those living with HIV. We explored the family planning experiences and preferences of young women with and without HIV accessing a community-based integrated HIV and SRH intervention for young people aged 16–24 years, evaluated through a cluster randomised trial in Zimbabwe (CHIEDZA).

Methods: Weekly services (HIV testing and care combined with family planning, STI and menstrual health management, condoms, and health counselling) were delivered in intervention communities over 30 months from 2019–2022. A mixed methods study investigated uptake, including type, of family planning within CHIEDZA by HIV status. In-depth interviews with young women who had ever used contraceptives and were living with HIV (n=12), and without HIV (n=15) were thematically analysed to understand experiences and preferences.

Results: Of 27,462 women who accessed CHIEDZA, 1355 (4.9%) were living with HIV. Young women with HIV aged 16–19 were more likely to access family planning services than those without [OR 1.91 95%CI 1.52–2.39], while there was no difference by HIV status among those aged ≥20. Those with HIV were more likely to take up the injectable as their contraceptive choice (24.0% vs 17.9%).

Regardless of HIV status, young women valued the opportunity to access non-judgemental support which encouraged their confidence, literacy, and engagement with family planning.

Those who had been accessing HIV care at health facilities struggled to access family planning. Part of this struggle was inadequate information and counselling about the interactions between some ART regimens and hormonal contraceptives. Some of those who did not receive HIV care within CHIEDZA chose to access family planning care, alongside ART adherence support while continuing

to access ART at their local clinic. Those living with HIV reported a contraceptive preference for injectables to reduce pill burden.

Conclusions: Offering family planning within HIV programmes is more likely to address the unmet SRH needs that young women living with HIV face. It may improve efficiency, make care more person-centred and provide a further opportunity to address concerns about drug interactions and support for addressing wider challenges with adherence to oral HIV treatment.

TUPEE16

Psychiatrists' role in ending the HIV epidemic: a mixed-methods investigation of knowledge, perceived barriers to implementation, and training needs to support pre-exposure prophylaxis (PrEP) prescription by psychiatrists

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Background: Patients living with mental illnesses experience disproportionately high HIV incidence and prevalence, while simultaneously experiencing numerous barriers to care. Psychiatrists are mental health providers and gateways for additional healthcare for many patients with mental illness but investigations of knowledge and practice barriers regarding biomedical HIV prevention methods, like pre-exposure prophylaxis (PrEP), are absent from the literature.

Methods: We conducted a mixed-methods, pilot study of psychiatrists practicing in the 50 U.S. counties accounting for 50% of new HIV diagnoses about knowledge, practice barriers, and training needs regarding PrEP prescription for patients with mental illness and HIV risk-factors.

Results: Overall, 77 psychiatrists participated. A majority (96.3%) were aware of PrEP and 24.7% had prescribed PrEP to a patient. We found that 68.4% believed psychiatrists should be PrEP prescribers, and 47.3% were interested in prescribing PrEP. The most common barriers to prescribing PrEP were limited knowledge (77.9%), the belief that PrEP prescription was outside the scope of psychiatric practice (51.9%), and concerns about managing follow-up care (57.1%). Only 31.5% reported receiving training about PrEP but 66.2% were interested in receiving training about PrEP prescription and management. From qualitative data, several themes were identified, which complimented quantitative findings:

1. The need to minimize logistical barriers to PrEP prescription for patients with mental illness and HIV risk-factors;
2. Collaborative practice between psychiatrists and primary care clinicians to facilitate PrEP prescription for patients seeking psychiatric care;



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3. Limited PrEP knowledge and a need for training to facilitate PrEP prescription by psychiatrists;
4. Importance of integration of PrEP prescription into existing psychiatric practice workflows to facilitate uptake; and
5. Differing opinions on whether PrEP prescription falls within the scope of psychiatric practice.

Conclusions: Reducing HIV among patients with mental illness through PrEP requires interdisciplinary, coordinated approaches to minimize barriers to care for this hard-to-reach patient population. Psychiatrists practicing in high-HIV incidence areas were largely interested in prescribing PrEP, but need additional training with a specific focus on practical management and integration with existing clinical workflows.

These findings suggest psychiatrists may be an untapped resource for improving PrEP prescription and reducing HIV among patients with mental illness.

TUPEE17

FADE OUT HIV: results of an educational intervention allying Black community barbers, their clients and community clinicians

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Background: Black and Brown individuals in the US are disproportionately affected by HIV. In 2018, they accounted for 13% of the population but 42% of new HIV diagnoses with Black men accounting for 31% of new diagnoses. Fade Out HIV addressed these gaps by establishing alliances between healthcare providers and barbershops serving the Black and Brown community in Los Angeles. Barbershops have been recognized as effective venues for delivering health care interventions. In fact, several programs are ongoing.

Barbers see themselves as "counselors," developing long and trusted relationships with their clients. Based on this, an educational grant was secured to develop this program.

Description: Fade Out HIV delivered education to barbers in the Black and Brown communities, their clients, and community clinicians. The initiative started at a barber convention (BarberCon LA). Staff, faculty, and barber influencers introduced the initiative, encouraged enrollment, and educated on HIV prevention and care. Connections from BarberCon facilitated follow-up at local barbershops.

Following BarberCon, staff and barber influencers visited 15 barbershops to kick-off the Fade Out HIV initiative, providing information about the risk of HIV and the role barbers can play in prevention.

Staff delivered client education materials and coupons for free haircuts to encourage clients to get tested by community clinicians. Clinician education was targeted to providers serving the community and included a review of HIV and PrEP treatments, monitoring, and tips on overcoming barriers to screening and prevention.

The initiative included social media campaigns for barbers, their clients, and clinicians that achieved 57,000 views/plays.

Lessons learned: Initially, this program was developed for NYC, but was moved due to COVID. Despite training and tools, barbers were inconsistent/sometimes reluctant to discuss HIV with clients. The partners pivoted and found a local healthcare center to offer onsite HIV rapid testing along with free haircuts.

Overall, the initiative was very successful educating 385 barbers and 297 clinicians leading to 308 HIV tests and improved clinician, barber and client knowledge.

Conclusions/Next steps: Based on the success of this pilot program, faculty, supporters, and participants were encouraged about the reach and impact. Our next steps are to expand the initiative to other US cities.

TUPEE18

Mental health and pre-exposure prophylaxis (PrEP) service integration in Vietnam: an important opportunity to boost PrEP adherence, continuation and service quality

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Background: Mental health (MH) issues may limit key populations' (KP) uptake of and continuation on pre-exposure prophylaxis (PrEP) and reduce overall quality of life. The USAID/PATH STEPS Project integrated MH screening, assessment, and treatment at five KP-led one-stop shop clinics as part of an effort to advance comprehensive and person-centered PrEP services.

Description: PrEP users at five OSS clinics are screened for MH using an online form or provider-led tools including the DASS21, AUDIT-C and Functioning Suicide Risk screening, and ASSIST. Clients are triaged based on their screening results and offered counseling for any MH conditions identified.

Clients with mild- and moderate-level MH conditions are counselled in-clinic and receive psychoeducation support. Clients with severe-level MH conditions are counselled and referred to expert psychiatric care, while continuing to receive counseling, PrEP, and other services at the clin-


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ics. During follow-up visits, PrEP clients are re-screened and supported with ongoing management of their MH conditions. PrEP behavior change campaigns incorporate information on MH to enhance awareness and service uptake among new and current PrEP users.

Lessons learned: From January–December 2022, 6,298 PrEP clients received MH screening, of whom 10.6% presented with a MH condition (7.3%, 7.0%, and 4.6% presenting clinical symptoms of stress, anxiety, and depression, respectively). MH morbidity was higher among partners of people living with HIV (18.9%) and transgender people (16.7%) compared to female sex workers (10.8%) and men who have sex with men (9.7%).

PrEP clients with MH conditions were 50% more likely to drop out of PrEP after three months compared to those without MH conditions (OR = 1.5, $p < 0.001$, 95%CI 1.2–1.8). Of 667 PrEP clients with MH conditions, 235 (48.7%) received follow-up care at least once; of these, 78.7% exhibited a significant reduction in the severity of their MH symptoms when re-screened during follow-up.

Conclusions/Next steps: We found significant association between MH morbidity and reduced PrEP continuation, indicating that integrative MH and HIV services may play an essential role in improving PrEP outcomes. Further scale-up of MH services within public and private PrEP sites will be undertaken to support greater quality of PrEP services and AIDS elimination by 2030.

TUPEE19

First electronic viral load assisted ordering and reporting application: increased data interoperability to improve viral load testing and monitoring in Lao PDR

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Background: Lack of interoperability between GeneXpert and the DHIS2-based national health information system may delay clinical decisions and compromise quality of HIV care. The first electronic Viral Load Assisted Ordering-Reporting (VLAO) application was developed across central, provincial, district, and hospital levels to efficiently integrate viral load (VL) orders and testing results from GeneXpert machines into DHIS2 in 2021.

Methods: VLAO, a web-based application that allows data exchange with DHIS2 in real-time, was implemented in 18 facilities nationwide in Lao PDR from January to December 2022. The application allowed clinics to submit lab orders, link samples using barcodes in DHIS2, provide VL real-time results, send automatic unsuppressed VL result notifications, and track clients in need of a VL test. A

mixed methods approach analyzing stakeholder surveys and quantitative analysis of laboratory results and turnaround times from sample collection to electronic reporting was conducted. The Wilcoxon-Mann-Whitney test was used to assess differences in turnaround times.

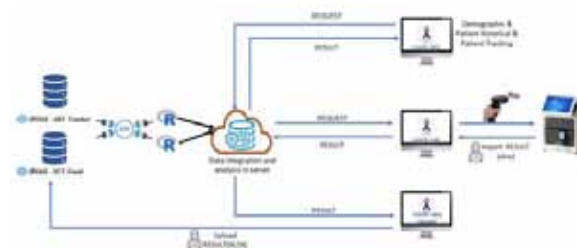


Figure. VLAO Application workflow.

Results: Median turnaround time from VL sample processing to reporting decreased from 19 (interquartile range (IQR): 8–29) days before VLAO implementation to 3 (IQR: 1–5) days in December 2022 ($p = 0.05$). VL testing coverage increased from 68% in January to 86% in December. A survey of providers revealed reduced workload and manual matching of test results from labs and clients in DHIS2. Data quality monitoring increased reliability and accuracy of data for analysis and upload to cloud-based servers. Limitations included insufficient computer and internet access at rural facilities.

Conclusions: VLAO reduced and simplified processes for ordering and reporting VL results in DHIS2. By ensuring data accuracy and completeness within DHIS2, providers and public health officials can make timely clinical decisions, allocate resources to sub-populations and geographical areas with low levels of VL coverage and suppression, and improve clinical management of HIV in Lao PDR.



TUPEE20

Mapping the digital health ecosystem in Africa in the context of endemic infectious and non-communicable diseases: a cross-national analysis of 54 countries

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Background: Investments in digital health technologies may support Africa achieve United Nations (UN) Sustainable Development Goal for Health by 2030. We aimed to characterize and map digital health ecosystems of all 54 countries in Africa in the context of endemic infectious and non-communicable diseases (ID and NCD).

We performed a cross-national ecological analysis of the digital health ecosystem across Africa using 20-year data from the World Bank, UN Economic Commission for Africa, World Health Organization, and Joint UN Programme on HIV/AIDS.

Methods: Spearman's rank correlation coefficient was used to evaluate ecological correlations between exposure (technology characteristics) and outcome (IDs and NCDs incidence/mortality) variables. Weighted linear combination model was used as the decision rule, combining disease burden, technology access, and economy, to explain, rank, and map digital health ecosystem of a given country.

Results: The 20-year trend showed that technology characteristics have been steadily growing in Africa, including internet access, mobile cellular and fixed broadband subscriptions, high-technology manufacturing, GDP per capita, and adult literacy.

While many were overwhelmed by a double burden of IDs and NCDs. Negative correlations exist between technology characteristics and IDs, such as fixed broadband

subscription and incidence of tuberculosis and malaria, or GDP per capita and incidence of tuberculosis and malaria.

Highest-priority countries for implementation of digital health were South Africa, Nigeria, and Tanzania for HIV; Nigeria, South Africa, and Democratic Republic of the Congo (DROC) for tuberculosis; DROC, Nigeria, and Uganda for malaria; and Egypt, Nigeria, and Ethiopia for endemic NCDs including diabetes, cardiovascular disease, respiratory diseases, and malignancies.

Conclusions: Digital health investments in Africa, including clinical utility trials, require preliminary analysis of the enabling environments to bring about sustainable health and economic returns. Equally, African countries with a high burden of endemic diseases but lacking digital infrastructure should be prioritized for economic development not to worsen existing inequities.

Though infrastructure developments alongside digital health remain on the shoulders of African governments, global health initiatives can cultivate digital health substantially by bridging knowledge and investment gaps, both through technology transfer for local production and negotiation of prices for large-scale deployment of the most impactful digital health solutions.

TUPEE21

No data no more: a tool to end the exclusion of trans and gender-diverse people in HIV research

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Background: Finally, the world has begun to recognize transgender and gender-diverse (TGD) people as a key population in the global HIV response. The limited estimates we have suggest that global HIV incidence is 66 times higher for transgender women, 7 times higher for transgender men, and unknown for gender nonbinary people relative to cisgender people. Most agree that TGD people face a disproportionate burden of HIV, yet still, the refrain of "no data" echoes when it comes to TGD representation in HIV research and public health interventions. At IAS 2021, AVAC released the "No Data No More Manifesto to Align HIV Prevention Research with Trans and Gender Diverse Realities."

This manifesto lays out concrete visions for a future of HIV research that is TGD-responsive. In 2023, we are releasing an expansion of the Manifesto known as the TGD-Inclusion Scorecard—an evaluation tool to ensure TGD inclusion in all HIV clinical trials—and to manifest the vision of the No Data No More Manifesto.

Description: We undertook a project to synthesize the Manifesto's visions into a series of scoreable indicators (Scorecard) of TGD representation in HIV clinical trials. We then pilot-tested the Scorecard, assessing 41 milestone


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HIV studies that took place from 1991-2023. Source documents for this assessment included study protocols, study publications, and study records on clinicaltrials.gov.

Lessons learned: Only 12 out of the 41 studies in our analysis included TGD people. From 1991-2006, there was no TGD representation in milestone HIV trials. Out of the 171,062 participants in the 38 completed studies, less than 1% were TGD (n=1,340). Among the TGD participants that were included, 94% were transgender women; transgender men and gender nonbinary participants represented only 3% of TGD participants, respectively. Only 6 studies reported the gender of participants in primary publications, and research systems to support TGD enrollment are underutilized.

Conclusions/Next steps: Findings from our analysis confirm that TGD people remain grossly underrepresented in HIV research. Next steps include availing our Scorecard tool to HIV researchers around the world.

We implore researchers to utilize our Scorecard evaluation tool proactively as study design guide to urgently end the inexcusable exclusion of TGD people.

TUPEE22

The progress and utility of HIV case-based surveillance in Kenya for public health response, 2014-2022

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Background: HIV case-based surveillance (CBS) is a person-centric system that provides timely data across the HIV cascade – from prevention, testing, and treatment to longer-term health care and outcomes. The CBS system has individual-level robust data for sentinel events-driven public health response (PHR), thereby achieving the complete data collection cycle and use for improving treatment outcomes. We present the Kenyan experiences, 2014 to date, and the system's utility for PHR.

Description: In Kenya, CBS pilot activities were started in 2014-15 in two counties, followed by a proof of concept in 2016-17. Since 2018, the national data warehouse (NDW) data have been used for CBS after an extraction, loading, and transformation (ETL) process. By 2021, data from 40/47 counties accounting for ~95% (1,107,173) of PLHIV currently on treatment were part of the CBS system.

Reporting rates to NDW are estimated to be 89% (figure). To support CBS, county and health facility staff are routinely trained through an interactive eLearning platform, and CBS implementation is monitored through quarterly progress review meetings.

Lessons learned: Case-level data are used to generate individual-level PHR reports identifying every client needing attention, e.g., diagnosed but not linked to care, not virally suppressed, and shared with the facilities for timely decision-making. CBS data are extracted from NDW and analyzed for scientific dissemination, addressing key epidemiologic questions and identifying areas for programmatic strengthening and focus.

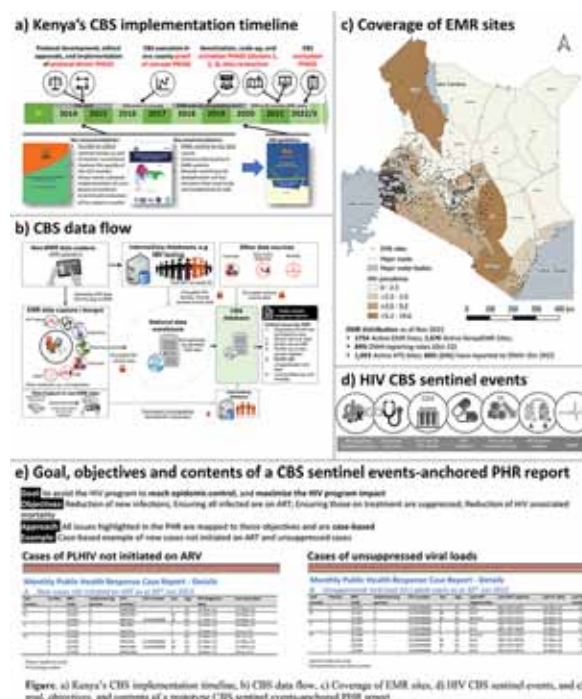


Figure. a) Kenya's CBS implementation timeline. b) CBS data flow. c) Coverage of EMR sites. d) HIV CBS sentinel events. e) goal, objectives and contents of a prototype CBS sentinel events-anchored PHR report.

Conclusions/Next steps: The high coverage of PLHIV in EMRs provides rich data for informing CBS sentinel events-anchored PHR in Kenya. The PHR reports have revolutionized the utility of CBS and accelerated its buy-in in Kenya. To the best of our knowledge, Kenya is the first sub-Saharan African country to implement the complete cycle of CBS, including PHR as a feedback loop to the facilities and improving services to PLHIV. To strengthen the CBS system, an evaluation is currently underway.



TUPEE23

A pilot study of Paediatric Dolutegravir (pDTG) automation using technology to improve adherence among children living with HIV in Akwa-Ibom State

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Background: Weight based antiretroviral therapy (ART) administration is the gold standard for optimizing treatment in children living with HIV (CLHIV). It ensures that children are not under or over dosed while administering ARVs. In community-based differentiated service delivery models, checking children's weight before placing them on ARVs can be challenging as functional weighing scales are not readily available.

This study measured consistency of estimated weight-based ART optimization through digital automation using the mobile technology in comparison to the actual weight obtained through a weighing scale.

Methods: The Center for Clinical Care and Clinical Research (CCCRN) implementing USAID- funded Integrated Child Health and Social Service Award (ICHSSA) devised an innovative digital automation called "pDTG Optimizer" hosted on the CHILD Monitor app that operates both off and online. The pDTG Optimizer uses date of birth of CLHIV to auto calculate estimated weight and display appropriate ARV regimen based on weight. The app is downloaded and installed on Community Case Workers(CCWs) phone and use to monitor children's adherence on ARVs. Before roll out, CCWs were trained on its use, conducted a pilot study in 7 high volume facilities selected from different context to compare actual weight and estimated weight ARV dosing for a total of 95 CLHIV (0 – 7 years) who were expected to pick up drugs within three months of the study period. Analysis was conducted by Excel and SPSS.

Results: A total of 87 CLHIV participated in the study of 93 Children who were expected for ARV pick up. Mean age was 3.5 years (1 – 7 years), mean for actual weight for participants – 14.8kg (7.2-49Kg) standard deviation- 5.18, mean for estimated weight – 20.9kg (7.2 – 49kg) standard deviation -7.38.

Generally, compared to the standard (actual weight) we recorded a 72.4% concordance for the estimated weight. Highest concordance was recorded in the under 2 years (78.9%) while the least were seen in the 5-7 years (50%).

Conclusions: Data from Child Monitor is scalable compared to conventional weighing scales, this point to the fact that programs can explore leveraging on the technology for ART adherence tracking in resource limited setting.

TUPEE24

Favorable outcomes of Option B+ strategy despite COVID-19 restrictions: retrospective cohort study in Zambézia Province, Mozambique (2019-2021)

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Background: In response to the COVID-19 pandemic, the Ministry of Health of Mozambique installed mitigation measures in April 2020, including expansion of differentiated models of care (DMC). Quarterly dispensation (QD) for pregnant women (PW) was implemented April-August 2020.

We herein describe trends of pre-pandemic (April2019-March2020) and within-pandemic (April2020-March2021) maternal and infant HIV outcomes.

Methods: Aggregated routine data from 173 health facilities in Zambézia Province for PW initiating ART and their HIV-exposed infants (HEI) were used.

Outcomes included: proportion of PW retained in care 3- and 6-months post-ART initiation, early infant diagnosis (EID) coverage, and proportion of positive tests among HEI by 9 months of age.

Generalized linear mixed-effect models were used to compare trends pre- and within-COVID-19.

Results: The odds of PW being retained at 3-months decreased significantly to 56.6% in April 2020 (OR 0.57 [95%CI:0.44-0.74], p<0.001). During COVID-19 period, the odds of being retained at 3-months increased ~3.9% per month (OR 0.57 [95%CI:1.06-1.10], p<0.001). The odds of PW being retained at 6-months increased (OR 2.16 [95%CI:1.50-3.10], p<0.001) within-pandemic.

Although the odds decreased within-pandemic (OR 0.91 [95%CI:0.88-0.93], p<0.001), 6-month retention proportion remained higher than the pre-pandemic period. EID coverage experienced an increase immediately after April 2020 (OR 1.94 [95%CI:1.26-2.98], p=0.003) and had a sustained effect, with odds of HEI undergoing EID increasing ~4.7% per month.

There were no significant differences in proportion of HEI testing positive, decreasing 2.7% per month, over time regardless of period (Figure).

Conclusions: In Zambézia Province, the pandemic and associated restrictions did not adversely impact maternal retention in care, EID coverage or EID positivity rates among PW and their HEI. Despite transient reductions in

early retention, rapid expansion of DMC including QD for PW, introduced in response to COVID-19 pandemic, appeared to have a favorable impact on mother and child outcomes.

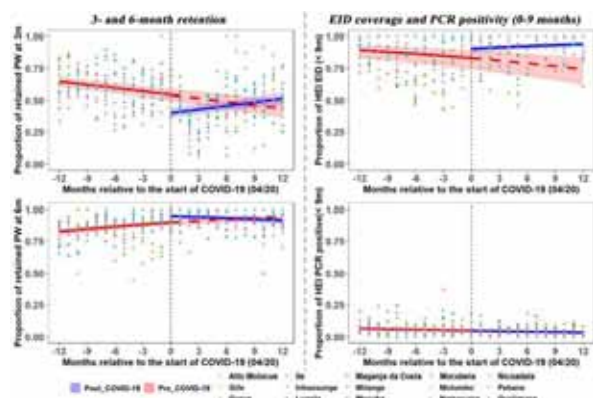


Figure.

TUPEE25

Using HIV platform to improve COVID-19 vaccination uptake through a combination intervention approaches in Eastern Province, Zambia

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Background: The COVID-19 pandemic is a public health issue affecting all sectors globally. The first cases were reported on March 18, 2020, in Zambia, and the country had recorded four outbreaks as of December 2021. These outbreaks were partly attributed to low vaccination coverage among eligible people. As of November 19, 2021, only 7.4 % of the eligible population was fully vaccinated in Zambia, and another 4.6% received the first dose. In the same period, Eastern Province vaccinated 176,537 (18%) of its 973,790 target. Though the vaccine has proven effective in averting severe forms of COVID-19 and mortality, many people remain reluctant to receive it. Thus, in December 2021, the FHI 360-led, PEPFAR-funded technical assistance project through the CDC supported the Eastern Province Health Office (EPHO) to implement a combination intervention approach to surge COVID-19 vaccination with 100,000 persons aged 18 years and older as the provincial target by the end of 2021.

Description: A total of 600 facility and community-based teams were oriented on COVID-19 sensitization messaging, 250 health care workers and 70 data entry clerks were trained in data management. Conducted 14 stakeholder

engagement meetings in chiefdoms with traditional leaders (chiefs and village headmen) on the importance of vaccination. Conducted live interactive community radio programs to address COVID-19 vaccination-associated myths and misconceptions.

Lessons learned: From April to November 2021, 176,537 (58%) people were vaccinated against a target of 300,000. In December 2021 alone (surge period), 117,630 (117%) persons were vaccinated against a target of 100,000 people. The surge achievements were fivefold the 21,935 monthly average vaccinations before the surge.

Results also showed significant differences in vaccine uptake by sex (p value=0.001, CI=95%). Distribution by sex showed more females (62%) vaccinated than males (38%), while preference by vaccine type showed that most people received Johnson & Johnson (160,314; 90.8%), followed by AstraZeneca (16,192; 9.2%) and Sinopharm (31; 0.02%).

Conclusions/Next steps: The intervention improved stakeholders' involvement, facility and community teams' coordination, supply chain, logistics, and data management. If scaled up and coupled with accountability and leveraging of HIV program resources, this approach has the potential to increase COVID-19 vaccination coverage.

TUPEE26

Exploring the impact of the COVID pandemic on sexual health services in community health centers across the US

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Background: The COVID-19 pandemic of 2020 had a significant impact on the sexual health infrastructure of the US. Community health centers (CHCs), which serve those in highest need, faced challenges providing routine primary care services like sexual health screening, routine PrEP care and treatment for sexually transmitted infections (STIs).

Description: Using a database collective of electronic health records (EHR) data, we explored the impact of the pandemic on sexual health services for a population of individuals attending CHCs across the U.S. by developing surveillance tools to track resilience of services. A collective of partners extracted data from 4 different EHR systems using a common data dictionary and a set of business requirement parameters.

There were over 400,000 unique people in the database. The extraction timeframe spanned January 2019 – February 2021. We built several dashboard surveillance tools using monthly counts to track the volume of services and outcomes.

We built a graphic with the number of unique monthly people being screened for bacterial STIs, as well the number of positive test results, including HIV test results.



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Lessons learned: The pandemic had a clear impact on services in CHCs. The average count of bacterial STI and HIV-positive tests and results reduced by more than 80% from its monthly average pre-pandemic (Figure 1). The PrEP cohort pre-pandemic was reduced by about 10% in the year following the onset of the COVID-19 pandemic (data not shown). Significant informatics and data extraction challenges limited our ability to explore data in more detail and greater accuracy.



Conclusions/Next steps: Surveillance tools were beneficial to assess CHCs resilience of services following the pandemic. Overall, it took health centers more than 12-months to resume sexual health services to about 95% of the pre-pandemic volume. Overcoming data infrastructure and governance challenges will be essential to ensure the viability and relevance of this type of tool.

itized, and teams assigned to optimize outcomes. Teams were provided with IIT listings and logistics support to follow-up clients and return them B2C. Monitoring of individual performance was used to assess outcomes and implement improvements.

Lessons learned: Follow-up was attempted over one month for 56% (n=636) of the 1,126 clients confirmed to have IIT. Attempts were successful for 74% (n=473). Of those, 35% (n=164) were reconnected to treatment, 31% (n=146) were identified as silent transfers, 10% (n=47) died, 19% (n=90) were tracked but did not return to care, and 5% (n=26) opted-out of ART. A total of 26% (n=163) lacked clear physical addresses in clinic records, changed their phone numbers, or used false names, which made them impossible to follow-up.

Given the success of this initial intervention and the number of clients still requiring follow-up, enhancing B2C by extending the implementation period and/or increasing the number of follow-up teams was needed.

Conclusions/Next steps: Though only 1-month, this health-facility-owned, peer-driven B2C surge activity was effective in returning disengaged PLHIV to treatment. Regular B2C surges can be used by programs to complement routine follow-up and active case management. Qualitative analysis exploring reasons for treatment cessation can be used to complement surges and improve understanding of barriers.

TUPEE27

Lessons learnt from an HIV continuity-of-treatment surge initiative to alleviate the effect Of COVID-19 pandemic on HIV care in National Capital District, Papua New Guinea

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Background: By 2020, 89% of the estimated 55,000 people living with HIV (PLHIV) in Papua New Guinea (PNG) were on antiretroviral therapy (ART), although the effectiveness of therapy was reduced by interruptions in treatment (IIT) and recycling in care. Attrition was aggravated by COVID-19 related restrictions on travel and HIV service delivery. In September 2021, the USAID HIV Support in PNG project implemented a back-to-care (B2C) surge activity to trace and return clients who had IIT after starting ART in 11 clinics of the National Capital District.

Description: A list of PLHIV who had started ART but discontinued as of September 30, 2020, was generated from facility electronic medical records. In collaboration with ART clinic staff, the project team reviewed client files to verify attendance status. FHI 360, in collaboration with the PNG network for PLHIV (IGAT HOPE), developed clinic-specific follow-up plans. Using geospatial information extracted from electronic records, specific areas were prior-



E-poster abstracts

Track A: Basic science

HIV virology

EPA0001

Understanding the viral and host transmission fitness factors associated with different modes of HIV-1 subtype B transmission

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Background: HIV-risk groups include heterosexual individuals (HET), men-who-have-sex-with-men (MSM), people who inject drugs (PWID) and people who received contaminated blood transfusions (CBT). When HIV-1 is transmitted, typically only a single clone, or in rare cases, a small number of HIV-1 clones establish the new infection, creating a transmission bottleneck for the virus. The viral clone that establishes infection is called the transmitted/founder (T/F) virus. Specific traits that permit successful transmission have not been well characterized.

Methods: *In vitro* competitions on human genital tissues followed by deep sequencing were performed to determine transmission fitness between T/F viruses from different transmission routes. Subsequently, phenotypic assays were used to analyze the contribution of select factors (for example, entry speed and receptor binding efficiency) to transmission fitness.

Results: Competitions on human cervical tissues suggested that tissues favored T/F viruses and glycosylation might play a role in the process. In control competitions directly on susceptible cell lines, T/F viruses from HET and MSM group often outcompeted T/F viruses from PWID group in T helper type 1 (Th1) cells, while viruses from HET and PWID groups dominated infection in Th17 cells.

T/F viruses showed different phenotypic characteristics between different transmission routes and from chronic viruses. T/F viruses from HET group required more stringent cellular co-receptor conformations to enter susceptible cells compared to others.

Furthermore, T/F viruses also exhibited more rapid cell entry than chronic viruses.

However, there is no significant difference of envelope expression level across all T/F virus groups and chronic viruses, which indicates that differences between T/F and chronic viruses in this study are more likely to be based on envelope structure or glycosylation patterns/levels.

Conclusions: This project will establish the key viral phenotypes contributing to successful virus transmission to inform the design of a robust anti-HIV vaccine. Mean-

while, the drug sensitivity against T/F viruses from different transmission routes provided by this project will help the improvement of personalized antiretroviral treatment regimens.

EPA0002

Preexisting and postbaseline resistance analyses in pooled pediatric studies of emtricitabine/tenofovir alafenamide (F/TAF)-based antiretroviral therapy (ART)

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Background: Emtricitabine/tenofovir alafenamide (F/TAF) is a guideline-recommended NRTI backbone for HIV treatment in children. F/TAF is coformulated with cobicistat-boosted elvitegravir (E/C/F/TAF) or bictegravir (B/F/TAF) as complete regimens. Here we present pooled analyses of baseline resistance and long-term follow-up data from four studies evaluating safety and efficacy of F/TAF-based ART in pediatric populations.

Methods: Participants were treatment-naïve (TN) or virologically suppressed (VS), aged 2 to <18 years, and received B/F/TAF, E/C/F/TAF or F/TAF+third agent. Baseline resistance was assessed by RNA or DNA HIV-1 genotyping and/or historical genotype. Postbaseline HIV-1 genotyping/phenotyping was performed for participants with HIV-1 RNA >200 (B/F/TAF) or >400 copies/mL (E/C/F/TAF, F/TAF+third agent) at confirmed virologic failure or last visit. Outcomes were determined by HIV-1 RNA at last on-treatment visit.

Results: Overall, 341 participants were enrolled and treated (122 B/F/TAF, 179 E/C/F/TAF, 40 F/TAF+third agent). Median (IQR) age was 12 (9, 15) years; 15% were TN (50 E/C/F/TAF). Baseline genotypic data were available for 100% (50/50) of TN and 28% (82/291) of VS participants; 39% (132/341) had protease/reverse transcriptase data and 35% (121/341) had integrase data. In total, 30% (39/132) had ≥1 preexisting primary resistance substitution (31 B/F/TAF, 8 E/C/F/TAF; *Table*). Median (IQR) treatment duration was 157 (104, 202) weeks; 95% (323/341) had virologic suppression at last visit, including 92% (36/39) with and 95% (88/93) without preexisting resistance. Altogether, 9% (32/341) met the criteria for postbaseline testing (9 B/F/TAF, 19 E/C/F/TAF, 4 F/TAF+third agent). There was no treatment-emergent resistance to B/F/TAF or E/C/F/TAF. Study drug resistance was detected in four participants without baseline data receiving F/TAF+efavirenz: all had NNRTI resistance and two



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had K65R, one with M184V. All four switched third agents; three achieved virologic resuppression (including two with K65R+/-M184V).

Baseline category	Pooled pediatric participants, % (n/n with data)	HIV-1 RNA <50 copies/mL at last visit, % (n/n with resistance)	P-value (Fisher exact test)
No baseline resistance	70 (93/132)	95 (88/93)	0.69
Any baseline resistance	30 (39/132)	92 (36/39)	
NRTI resistance	15 (20/132)	90 (18/20)	NA
z1 TAMs	10 (13/132)	92 (12/13)	
M184V/I	9 (12/132)	83 (10/12)	
NNRTI resistance	20 (27/132)	83 (25/27)	
PI resistance	7 (9/132)	100 (9/9)	
INSTI resistance	4 (5/121)	80 (4/5)	

ART, antiretroviral therapy; F/TAF, emtricitabine/tenofovir alafenamide; INSTI, integrase strand transfer inhibitor; NA, not applicable; NNRTI, non-nucleoside reverse transcriptase inhibitor; NRTI, nucleoside reverse transcriptase inhibitor; PI, protease inhibitor; TAM, Tumor Associated Mutation.

Table. Pre-existing resistance in pediatric studies of F/TAF-based ART and virologic suppression at last on-treatment visit.

Conclusions: High levels of virologic suppression through 157 weeks of follow-up, regardless of preexisting resistance, demonstrate the efficacy of F/TAF-based ART in children.

EPA0003

Wide diversity in SIV production occurs at the single cell level

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Background: Studies of intravaginal SIV inoculation have shown that the clone size of individual transmitted virions may vary by up to 1000-fold in plasma virus (Deleage et al., Science Advances 2019). However, it is unclear where in the process of initial infection, local, and systemic spread this clonotype size heterogeneity arose.

In this study, we utilize multiple in vivo and in vitro infection models to characterize the contribution of cellular heterogeneity and anatomical factors in the observed heterogeneity in clonotype size.

Methods: Barcoded SIV were used for intravenous inoculation of Rhesus macaques (n=4) as well as in vitro infection of primary cells and cell lines. The relative copy numbers of individual barcodes in early plasma virus or in culture supernatant were analysed using Illumina sequencing. In some in vitro studies single cycle viral replication was analysed by blocking infection with maraviroc and anti-CD4 antibody treatment at 6 hours and FTC treatment at 24 hours post inoculation.

Results: We compared the clonotype size distribution after intravaginal and intravenous inoculation to understand the contribution of anatomical barriers to clonal heterogeneity.

Intriguingly, we observed higher variability in clonotype size after intravenous inoculation (mean interquartile range 1.76 and 1.47 log₁₀ copies/ml, respectively), indicating an anatomical barrier at the site of infection is not the primary cause for clonotype size heterogeneity.

To further examine sources of heterogeneity we analysed in vitro clonotype size distribution after single round or multiple round infection of primary cells and cell lines.

Remarkably, even in the most controlled scenarios (single round infection of the SupT1-R5 cell line) we found very similar clonotype size distribution to that observed in vivo (day 2 mean interquartile ranges of 1.34 log₁₀ copies/ml), indicating that clonotype heterogeneity is established at the first round of replication.

Conclusions: Our comparison of multiple infection models indicates that clonotype heterogeneity is established during replication within the first infected cell and is the result of the stochastic differences in viral production by individual infected cells.

EPA0004

Characterization of Brazilian HIV-1 near full-length proviral genomes from people living with HIV under successful first-line antiretroviral therapy

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Background: Antiretroviral therapy (ART) has revolutionized HIV treatment, increasing quality and life expectancy of people living with HIV (PLWH). However, the expansion of treatment has resulted in an increase in antiretroviral resistant viruses, which can be an obstacle to maintenance of successful ART.

Thus, it is essential to understand the outcome of drug resistance mutations (DRM), including minority (low-frequency) variants, on treatment of PLWH with undetectable viral load.

This study analyzed the genetic composition of HIV near full-length genome (NFLG) from archived proviruses of PLWH under successful ART; determined the presence and frequency of DRM and determined the viral subtype.

Methods: Forty-six PLWH from Rio de Janeiro (RJ) and 40 from Rio Grande (RS) had their genomic DNA extracted from peripheral whole blood. HIV NFLG was PCR-amplified and ultradeep sequenced.

The presence and frequency of DRMs were analyzed in Geneious program. Phylogenetic analyses were performed using PhyML and SimPlot.

Results: All samples included in the study have been sequenced and 69 (80.2%) had the HIV NFLG determined. RJ and RS showed a predominance of HIV subtypes B (78.3%) and C (67.5%), respectively. Overall, 168 DRMs were found in 63 (73.3%) samples and 105 (62.5%) of them were minority variants.

Among the 168 DRMs, 68 (40.5%) were able to confer some degree of resistance to at least one drug in use by PLWH, yet no one showed signs of therapeutic failure.



Conclusions: Our study contributes to the understanding of the impact of DRMs on successful therapy and supports the sustainability of combinatorial ART, since all PLWH maintained their successful treatment despite the high prevalence of DRMs at low or high frequency.

EPA0005

HIV-1 Vpr drives a tissue residency-like phenotype during selective infection of resting memory T cells

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Background: HIV-1 establishes cellular and tissue reservoirs, both active and latent, that prevent cure with anti-retroviral therapy. Determining how HIV-1 shapes its niche to create a permissive environment is central to informing efforts to limit pathogenesis, disturb reservoirs and ultimately achieve cure.

A key roadblock in gaining molecular level understanding of this process is the requirement to mitogenically activate T cells in vitro in order to infect them with HIV-1, which dominates changes to gene and protein expression, obscuring T cell responses driven by the virus itself.

Thus, key features of the interaction between HIV-1 and host T cells remain poorly understood.

Methods: Here we co-cultured HIV-1 infected and uninfected primary human CD4⁺ T cells, allowing for highly-efficient cell-cell spread and infection of resting T cells, without the need for confounding in vitro T cell activation. By combining viral replication assays with approaches to define T cell phenotype (flow cytometry), transcriptional responses (qPCR and RNA-Seq) and functional T cell assays, we define how HIV-1 infection reprograms resting T cells.

Results: We show that cell-cell spread allows for productive HIV-1 infection and integration into resting memory T cells. Strikingly we find HIV-1 infection primes these resting CD4⁺ T cells to gain characteristics of tissue-resident memory T cells (T_{RM}), upregulating key T_{RM} surface markers and the transcription factor Blimp-1, and inducing a transcriptional programme overlapping the core T_{RM} transcriptional signature.

Using viral mutants we show that induction of the T_{RM}-like phenotype is driven by the HIV-1 accessory protein Vpr, requires Vpr packaging into virions and its manipulation of T cell signalling and Vpr-driven transcriptional reprogramming.

Conclusions: Tissue-resident memory T cells can persist long term in vivo. Our results suggest that HIV-1 persistence and the establishment of tissue reservoirs may be driven, in part, through direct viral induction of a T_{RM}-like phenotype via transcriptional reprogramming mediated by Vpr, providing an alternate model for a tissue-associated reservoir driven by the virus itself.

This work has important implications for understanding viral replication and persistence, and how HIV-1 reservoirs are established and maintained.

EPA0006

Rilpivirine-associated resistance mutations among virologically suppressed people living with HIV-1 in Botswana: implications for cabotegravir-rilpivirine use

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Background: Long-acting injectable cabotegravir/rilpivirine (CAB-RPV) is an alternative to oral antiretroviral therapy (ART) that is currently approved for people already on suppressive ART. Pre-existing RPV-associated resistance mutations have been found to predict HIV-1 virologic failure (VF) in those switching to CAB-RPV.

There is minimal data on the prevalence of RPV-associated resistance mutations in HIV-1 subtype C(HIV-1C) predominant regions.

Methods: We evaluated the prevalence of archived RPV-associated resistance mutations among people with HIV (PWH) who had previously enrolled in the Botswana Combination Prevention Project (BCPP, from 2013-2018) from across Botswana, and who had undetectable HIV RNA viral load (VL, <400 copies/mL) on ART.

We analysed existing near full-length HIV-1 pol sequences from proviral DNA for presence of RPV-associated resistance mutations, which were defined according to the 2022 IAS-USA drug resistance mutation list and Stanford HIV drug resistance database.

Results: Of 4748 PWH on ART enrolled in BCPP, 4739 (99.8%) had VL results, 4526 (96%) of whom had VL <400 copies/mL; 3620 (87%) of 4164 individuals with viral suppression and available ART information were on NNRTI-based (nevirapine or efavirenz) ART regimens. Of the 4526 PWH with viral suppression on ART, 962 (21.3%, 95% CI 20.1%-22.5%)



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had at least 1 archived RPV DRM. E138A was the most prevalent RPV-associated mutation overall (9.3%, 95% CI 8.4-10.1), followed by M230I (9%, 95% CI 8-9.7) and E138K (1.7%, 95% CI 1.3-2.1).

The rest of the mutations observed were below a prevalence of 1% (L100I, K101P, E138G, E138Q, Y181C, Y181I, Y188L and M230L). Common RPV-associated mutations patterns observed were E138A + M230I (0.8%), E138K + M230I (0.49%), E138K + G190E (0.4%), E138A + V179D (0.33%) and E138A + K101E (0.10%).

Conclusions: RPV-associated resistance mutations were present in 21.3% of PWH in Botswana with VL suppression while on predominantly first generation-NNRTI-based ART. E138A and M230I were the most prevalent RPV-associated mutations in this cohort predominated by HIV-1C.

Individuals harbouring HIV-1 variants with these mutations may be more likely to fail CAB-RPV, hence monitoring RPV-associated resistance mutations will be crucial for successful CAB-RPV treatment implementation in this setting.

EPA0007

Identification of a new HIV-1 BF1 intersubtype recombinant form circulating in Turkey, that has generated a secondary recombinant form with CRF56_cpx transmitted in Spain

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Background: In recent years, increasing HIV-1 clustering has been reported in many countries. Here we report that a BF1 recombinant cluster, originally identified by us in Spain, but comprising viruses mainly from Turkey, represents a new BF1 circulating recombinant form (CRF) and secondary recombinants of this CRF.

Methods: HIV-1 protease-reverse transcriptase (PR-RT) sequences were obtained after RT-PCR amplification from plasma RNA. Near full-length genome (NFLG) amplification of one virus was performed in 4 overlapping fragments. Similar database sequences were searched with BLAST. Phylogenetic analyses were performed via maximum likelihood. Recombinant structures were analyzed with bootscanning and phylogenetic trees of partial segments. The temporal and geographic origin of the newly identified CRF was estimated with a Bayesian coalescent method.

Results: In a HIV-1 molecular epidemiological survey in Spain, based on PR-RT sequences, we identified numerous clusters, one of which was a BF1 recombinant cluster comprising 5 individuals. After inclusion in phylogenetic

analyses of similar database sequences, it was found that the sequences of the mentioned BF1 cluster belonged to a larger cluster, comprising samples mostly from Turkey (n=84), but also from Belgium (n=3), Sweden (n=1), and United Kingdom (n=1), with 3 Spanish samples grouping in a subcluster. The Turkish sequences represented 32% HIV-1 PR-RT sequences available from Turkey at the Los Alamos HIV Sequence Database. Bootscan analyses revealed co-incident recombinant structures.

Analyses of NFLG sequences from the Belgian and Swedish samples, available at databases, revealed fully coincident BF1 structures, with 6 breakpoints. This allows to define a new CRF, provisionally designated CRF_BF1_TR.

Phylogenetic analyses of F1 subsubtype segments revealed a relation with the F1 Romanian-Angolese lineage. NFLG analysis of one virus of the Spanish subcluster identified a CRF_BF1_TR/CRF56_cpx recombinant genome. Bayesian analyses estimated CRF_BF1_TR origin in Turkey around 2005.

Conclusions: A new CRF_BF1 widely circulating in Turkey has been identified. This is the first BF1 CRF derived from the Romanian-Angolese F1 lineage (all others identified previously derive from the Brazilian F1 lineage).

The results also highlight the extraordinary recombinogenic potential of HIV-1, with secondary recombination of the Turkish CRF_BF1 with CRF56_cpx, that further derives from one CRF (CRF02_AG) and 2 subtypes (B and G).

EPA0008

Viral reservoir diversity in circulating PMBC and T cell subsets under suppressive ART

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Background: Even after extended periods of effective, suppressive immune control, HIV-1 continues to dynamically change and evolve in body compartments, suggesting persisting and continuously active viral reservoirs.

Methods: A longitudinal analysis of proviral Env sequences was performed by next-generation sequencing (NGS) in HIV-infected individuals from the Swiss-HIV-Cohort-Study right after diagnosis. HIV-1 proviral load, intracellular viral poly-A transcripts (pA) and Torque Teno Virus loads as independent marker were quantified by qPCR.

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PBMCs, sorted and cultured for 3 weeks for viral outgrowth, were monitored for viral reactivation by Tat-induced LTR-activation and HIV-1 protein expression by FACS. Single-genome sequencing (SGA) analysis of the 3' half of the HIV-genomes was carried out to assess re-activated viral RNA.

Results: Specimens from nine viremic SHCS-HIV individuals with detectable HIV-1 provirus in PBMCs (median: $231/10^6$ cells) and detectable HIV-1 polyA-RNA (median: $1129/10^6$ cells) were included. In 5/9 samples a high reservoir diversity persisted even for extended periods after therapy initiation, while 4/9 presented unique virus variants (241-1454 days). Lymphocyte counts ($p=0.0068$), CD4 ($p<0.0001$), and CD8 cells ($p=0.0487$) were lower in the population with high-diversity reservoirs, and as independent marker of immune reconstitution: Torque-Teno-Virus loads were higher.

In circulating T-cell subsets, predominantly TN (naïve) and TCM (central memory) T-cells harbored replication-competent HIV-1. In TTM (transitional memory) and TEM (effector memory) T-cells, most archived proviral sequences contained inactivating mutations and, at the same time, displayed a higher genetic diversity.

Conclusions: Our study demonstrates that less immune control, evidenced by low lymphocyte counts, makes it easier for the virus to replicate to high levels and further increase its genetic diversity. The main reservoirs for replication-competent, infectious virus include TN and TCM, with single or limited numbers of intact viral variants. A distinct, smaller contribution of archived HIV sequences stems from TTM and TEM, characterized by a higher viral variability. The latter potentially form the basis for an ongoing evolution of new viral variants during therapy. These findings provide insights into the dynamics of the viral reservoir in individuals early during infection near the start of therapy and may have important implications for a better understanding of HIV-1 transmission and in vivo evolution.

EPA0009

Development of an efficient method based on Nanopore technology for sequencing of HIV-1 near full-length genomes from plasma

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Background: HIV-1 shows high genetic diversity owing to elevated mutation and recombination rates. Due to the frequent generation of recombinant forms where multiple HIV-1 variants cocirculate, the genetic characterization of isolates requires analysis of near full-length genome (NFLG) sequences. Conventional methods for NFLG sequencing are time-consuming and labor-intensive. Therefore, the development of new methodologies

for molecular epidemiological studies is highly desirable. Here we describe a new method based on Nanopore technology.

Methods: HIV-1 NFLG genomes (8.9 kb) were amplified from plasma RNA through RT-PCR/nested PCR in two overlapping segments of 4.5 and 4.6 kb. One-tube RT-PCR was performed with Superscript III Reverse Transcriptase (Invitrogen) and Ranger mix (Bioline), and nested PCR with Ranger mix, using primers recognizing highly conserved fragments within HIV-1 group M. DNA libraries were purified with AMPure XP beads (Beckman Coulter) and were prepared following the protocol outlined by Oxford Nanopore Technologies (ONT), labelling the end-repaired DNA amplicons with the Native Barcoding Kit SQK-NBD114.24 (ONT) with subsequent loading into the R10.4.1 flow cell and sequencing with MinION Mk1B device.

Consensus sequences were obtained from the Nanopore sequencing data using a home-developed pipeline, and were phylogenetically analyzed via maximum likelihood, with analysis of recombination through bootscanning and phylogenetic trees of partial segments.

Results: Using serial dilutions of plasma-extracted RNA, we were able to amplify HIV-1 NFLGs with as few as 15 HIV-1 RNA copies per reaction. Using the described method, 22 NFLGs of subtypes A1, B, C, F1, and G, CRF02_AG, and of two new circulating recombinant forms (CRF_BC and CRF_BF1) were sequenced.

The consensus sequences obtained with the ONT method had >99% similarity to those obtained with Sanger sequencing, with sequences obtained with both methods clustering closely in phylogenetic trees.

In 4 NFLG from 2 new CRFs, analyses of recombination showed coincident mosaic structures with both sequencing methods. The turnaround time of the ONT protocol was 3 days.

Conclusions: We have developed a method for efficient HIV-1 NFLG amplification and sequencing based on Nanopore technology which allows for reliable determination of phylogenetic relationships, subtype classification, and analysis of mosaic structures. This method could be useful for HIV-1 molecular epidemiological surveillance studies.



HIV pathogenesis

EPA0010

HIV infects mesenchymal stem cells (MSC) and modulates adipocyte differentiation

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Background: Mesenchymal stem cells (MSC) can differentiate into adipocytes and osteoblasts in a process that can be altered in pathological conditions, such as HIV infection. The objective was to determine if HIV could infect MSCs and modulate their differentiation into adipocytes or osteoblasts.

Methods: To determine if these cells were susceptible to HIV infection, we evaluated the expression of the CD4 receptor and the CXCR4 and CCR5 co-receptors by flow cytometry in MSC. CCR5, through its natural ligands CCL3, CCL4, and CCL5, induces the recruitment and differentiation of adipocytes. CXCL12 is the ligand of CXCR4 and increases the sensitivity of adipocytes to insulin. Therefore, we decided to study the expression of CCR5, CXCR4, and CD4 at different times during the differentiation process.

Cells were exposed to HIV (NL43 (X4) y AD8 (R5)) at an MOI of 0.5 pg (p24). The presence of the proviral genome in the MSCs was determined by Alu-PCR.

To determine if HIV could modulate the differentiation of MSCs to adipocytes, cells were infected in the presence of differentiation medium (0.5mM3-Isobutyl-1-methylxanthine; 10ug/ml insulin; 0.01 dexamethasone uM) during 10 days. Lipid droplet formation was determined by confocal microscopy by staining with Bodipy 493/503.

Results: We show that MSC expresses CD4 and low levels of CXCR4 and CCR5. Assays of infection indicated that both viral tropisms were capable of infecting MSC. After 7 days, we observed that HIV modulated the differentiation of MSCs to adipocytes, observing differences between both viral tropisms; HIV-AD8 was able to stimulate adipocyte differentiation, giving rise to larger lipid droplets, while HIV-NL43 induced the formation of smaller adipocytes with perinuclear lipid droplets. At 10 days of differentiation, both HIV tropisms gave rise to larger lipid droplets than uninfected controls.

Our results indicated that CCR5 expression remained at the same levels throughout the differentiation process, while CXCR4 expression increased from day 7 of differentiation, which could explain the differences observed between both viral tropisms.

Conclusions: Together, our results indicate that HIV is capable to infect MSCs, preserving the presence of the proviral genome, and modulating the differentiation of these cells into adipocytes, presenting differences between the viral tropisms studied.

EPA0011

Nicotinamide mononucleotide impacts HIV-1 infection by modulating immune activation in T lymphocytes and humanized mice

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Background: HIV-1-associated immune activation drives CD4⁺ T cell depletion and the development of acquired immunodeficiency syndrome (AIDS). Since combination antiretroviral therapy (cART) does not correct residual immune activation in patients, we aim to determine the role of nicotinamide mononucleotide (NMN), the direct precursor of nicotinamide adenine dinucleotide (NAD) co-enzyme, on modulating CD4⁺ T cell during HIV-1 infection.

Methods: We examined the intracellular HIV-1 p24 protein, viral RNA or integrated DNA, as well as T cell activation markers, in HIV-infected primary CD4⁺ T cells, PMA-stimulated resting CD4⁺ T cells derived from individuals living with HIV and HIV-infected humanized mice. RNA-seq analysis was used for identifying the gene ontology of interest.

Results: In this study, we found that NMN treatment suppressed intracellular and secretory HIV-1 p24 production in HIV-infected primary CD4⁺ T cells. NMN did not affect CD4 and CCR5 expression significantly, but suppressed HIV-1 expression at the post-transcription stage. Under the NMN treatment, CD25⁺CD4⁺ T cells rather than CD25⁻CD4⁺ T cells preferentially decreased intracellular p24 level. NMN also inhibited the expression of late T cell activation markers including CD25 and HLA-DR consistently on reactivated resting CD4⁺ T cells derived from cART-treated individuals living with HIV. At the transcriptomic level, the CD25 downregulation by the NMN treatment was associated with some downregulated gene ontology


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pathways such as cell proliferation and activation. NMN treatment also reduced the proportion of proliferating p24-expressing CD4⁺ T cells which was positively correlating with activated CD25⁺ p24-expressing CD4⁺ T cells. Moreover, in HIV-infected humanized mice, we found significantly reconstituted CD4⁺ T cell frequency along with suppressive T cell hyperactivation and apoptosis after the combined NMN and cART treatment compared with cART alone.

Conclusions: Our results highlight the suppressive role of NMN in CD4⁺ T cell activation during HIV-1 infection. These findings warrant clinical investigation of NMN as a supplemental treatment in combination with cART in people living with HIV, especially those with persistent low CD4⁺ T cell count.

EPA0012

Dysregulated transcriptional signature of Th17-Polarized cells during chronic HIV Infection despite successful antiretroviral therapy compared to uninfected individuals

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Background: Th17 cells are rapidly depleted during HIV infection and contribute to viral persistence, whereas their frequencies and functions are not fully restored by antiretroviral therapy (ART). However, molecular mechanisms underlying these alterations are understudied.

Methods: RNA-sequencing (Illumina Technology) was performed in freshly FACS-sorted Th17 cells (CD4⁺CD25⁺CD45RA⁺CCR6⁺) from successfully ART-Treated (ST, n=6), elite controllers (EC, n=3) and uninfected controls (HD, n=5).

Results: Th17 cells from STs vs. HDs showed alterations in the TGF-β1/smad2-3 pathway, indicative of impairments in their generation and stability. Other pathways related to Th17 differentiation were downregulated in STs vs. HDs, including p38, PTEN, RUNX1, NFAT, and Notch.

Consistently, the RORC2 repressor NR1D1 was upregulated, while Semaphorin 4D, a RORC2 inducer, decreased in STs vs. HDs. Migration markers CCR9, α4β1, CXCR5 and CCR7 decreased in STs vs. HDs, indicating diminished migration potential towards the gut and inflammatory tissues. Metabolic alterations were observed in STs vs. HDs, comprising decreased expression of mitochondria genes, energy metabolism, and PI3K-AKT-mTOR pathway.

Furthermore, in STs, sphingolipids synthesis and amino acid transport were downregulated. In STs vs. HDs, decreased expression of transcription factors RUNX1, NFAT, and CREB, along with lower CDK6 expression and in-

creased expression of EED and TP53BP1, are associated with increased HIV persistence/latency. Downregulation of HIV restriction factors (BST2, SERINC3, RNF115, and RNF125) and HIV inhibitors (FOXO1/4, Wnt/β-catenin, Notch, and tetraspanins), along with increased expression of MRE11 and TRA2B, suggest higher Th17 cell's susceptibility/permissiveness to HIV infection in STs vs. HD donors.

Similarly to the ST group, Th17 cells in ECs showed decreased expression of Semaphorin 4D and downregulated PI3K-AKT-mTOR pathway. Decreased synthesis of sphingolipids and amino acid transport and higher expression of NR1D1 were also observed in Th17 cells from EC and ST vs. HD donors.

Furthermore, compared to HD donors, Th17 cells in ECs showed a unique metabolic profile related to an increase in the TCA cycle, fatty acid β-oxidation, cellular response to hypoxia, and decreased inositol phosphate metabolism.

Conclusions: Despite successful ART, the Th17 transcriptional signature revealed impaired differentiation, stability, migration, metabolism, and higher susceptibility to HIV infection.

EPA0013

Impact of chronic HIV Infection and Smoking on dynamics of pulmonary mucosal tissue resident CD8 T-cells and regulatory CD4 T-cells during antiretroviral therapy

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Background: People living with HIV (PLWH) continue to suffer from a high burden of infectious and non-infectious pulmonary diseases despite antiretroviral therapy (ART), which suggest that their lung immunity is not fully restored. The balance between effector and regulatory T-cells is essential for the maintenance of lung mucosal tissue integrity and immune defense. As such, excessive CD8 T-cell activation during HIV infection can contribute to pulmonary mucosal tissue damage.

Furthermore, tobacco smoking changes the lung environment and induces pulmonary inflammation and tissue fibrosis. Additionally, regulatory T-cells (Tregs) control CD8 tissue-resident memory (Trm) cell homeostasis.

Herein, we first validated CD8Trm and Non-Trm markers from animal models in the human lung, then, we characterized the effects of HIV and smoking on pulmonary cytotoxic CD8 T-cells and Tregs.

Methods: Bronchoalveolar lavage (BAL) fluid and matched blood were obtained from asymptomatic ART-treated smoking (n=4) or non-smoking (n=6) PLWH and seronegative controls (smokers: n=4; non-smokers: n=8).



Lymphocytes were isolated and CD8 and Treg subsets were characterized by multiparametric flow cytometry.

Results: Human lung CD8^{Trm} cells consisted of primarily CD69⁺ subsets expressing CD103 and/or CD49a. In line with previous mice studies, CD8^{Trm} were largely CXCR6⁺CXCR3⁺, while CD8 non-^{Trm} were largely CXCR6⁺CXCR3⁺. Levels of CX3CR1 and KLRG1 were highest in CD8 Non-^{Trm}. Most airway CD8 T-cells expressed Gzma/B but very little Perforin.

Both smoking and HIV infection were associated with an increase in total CD8 T-cells in BAL. HIV and smoking were associated with increased expression of Perforin and GzmB respectively. GzmA⁺ and GzmB⁺ CD8 T-cells showed higher expression of CD103 and CXCR6 in smokers and higher frequencies of CX3CR1⁺KLRG1⁺ and Ki67⁺ cells in PLWH. Pulmonary mucosal Tregs were mainly CD69⁺. In smokers, higher frequencies of total Tregs and Helios⁺Tregs were observed.

Conclusions: Smoking and HIV could promote cytotoxic CD8 T-cell retention in small airways through different mechanisms. While smoking likely increases recruitment and retention of CD8^{Trm} via CXCR6 and CD103 respectively, HIV is associated with CD8 non-^{Trm} recruitment via CX3CR1 from the periphery, which could contribute to increased tissue damage.

Lastly, smoking could promote local Treg differentiation, favoring increased levels of effector CD8^{Trm} in smokers.

EPA0014

Accelerated biological aging is associated with intestinal barrier permeability and microbial translocation during antiretroviral therapy suppressed HIV infection

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Background: HIV infection has been associated with accelerated biological aging even after suppressive antiretroviral therapy (ART); however, the underlying mechanisms are unclear and likely multifactorial. In the general population, a decrease in intestinal barrier integrity has been linked to accelerated biological aging by leading to microbial translocation that causes systemic inflammation.

However, the potential links between intestinal barrier integrity and biological aging during ART-suppressed HIV infection are unknown.

Methods: Colon biopsies and blood were collected from 25 HIV+ ART-suppressed individuals and 23 age, gender, and ethnicity-matched HIV-negative controls. The PBMCs' telomere length was quantified using high-throughput quantitative fluorescence in situ hybridization (HT-Q-FISH). Colon epithelial cadherin (E-cadherin) was quantified by immunofluorescence. Plasma markers of gut damage, microbial translocation, and inflammation were measured using multiplex arrays and ELISA.

Results: Despite similar chronological age (Fig. 1a), HIV+ ART-suppressed individuals exhibited an average of 474 bp shorter telomeres, higher cell percentages with shorter telomeres, and lower cell percentages with longer telomeres ($P<0.05$; Fig. 1b). E-cadherin (a tight junction protein and a marker of intestinal barrier integrity) levels were lower in the colon of HIV+ ART-suppressed individuals than controls (Fig. 1c; $P=0.036$). Consistently, markers of gut damage (Reg3A), bacterial translocation (LBP), fungal translocation (β -glucan), and inflammation/immune dysfunction were higher in the plasma of HIV+ ART-suppressed individuals than controls ($P<0.05$; Fig. 1d-e). Correlation network analysis (Fig. 1f) showed significant associations between lower intestinal barrier integrity, higher gut damage, higher microbial translocation, higher inflammation, and the higher percentage of short telomeres (a marker of biological aging; $P<0.05$).

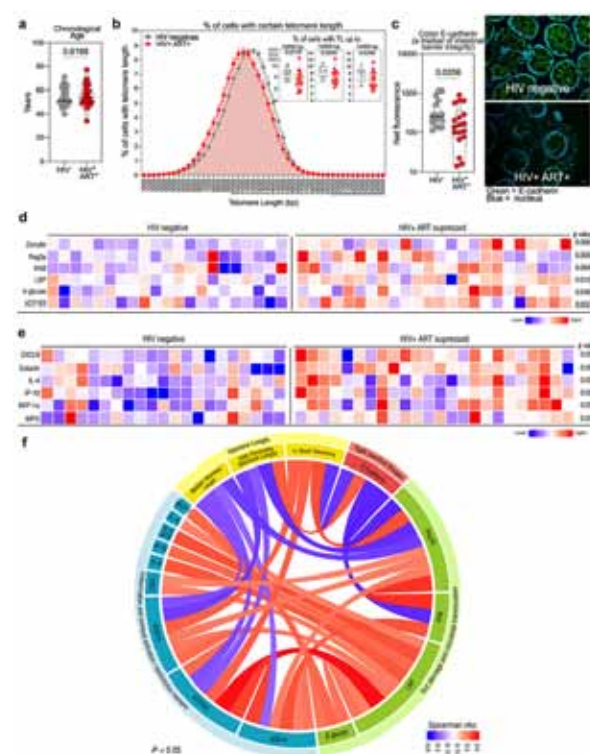


Fig. 1 a-f

Conclusions: Intestinal barrier permeability, gut damage, and microbial translocation are linked to accelerated biological aging during ART-suppressed HIV infection. Further studies are warranted to investigate the mechanistic links between intestinal barrier integrity and biological aging and the utility of using approaches to fortify the intestinal barrier to prevent aging-associated diseases during ART-suppressed HIV infection.



EPA0015

Simultaneous transcriptome and miRNome profiling of CD4+ T cells from elite controllers identify that miR-99b and miR-125a are implicated in viral replication in vitro

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Background: Elite controllers (EC) maintain viral loads below 50 cp/ml for long periods without antiretroviral therapy (ART) and represent a natural model for a functional HIV cure. Previous works describe miRNA expression profiles associated to EC.

Our objectives are to describe the miRNome and transcriptome of CD4+ T cells from ECs, to study its role in the regulation of gene expression and to assess miRNA antiviral activity in functional assays.

Methods: We performed miRNA-Seq and RNA-Seq in CD4+ T cells from EC (n=10, 60% males), non-treated (NT) people living with HIV (PLWH) (n=8, 87.5% males) and PLWH receiving ART (n=9, 77.8% males) recruited in the Spanish EC-RIS cohort. The reads were aligned to miRbase-v22 and human transcriptome (GRCh38). The pairs of differentially expressed miRNA-targets were represented using Tarbase-8.0, miRTarBase-v8 and Cytoscape, and they were functionally annotated with KOBAS. To assess miRNA downregulation effect in HIV-1 infection cycle, miRNA miR-CURY inhibitors (Qiagen) were transfected into CEM-NKR. CCR5 cells and later infected with the replication competent NL4-3 Ren HIV-1 clone.

Results: Two miRNAs were downregulated (FDR<0.05) in EC compared to PLWH receiving ART, miR-99b-5p (log2FoldChange(LFC)=-1.00) and miR-125a-5p (LFC=-0.76). In contrast, comparing NT and EC groups, ECs presents upregulation of miR-27a-5p (LFC=1.11) and downregulation of six miRNAs, including miR-99b-5p (LFC=-1.36) and miR-125a-5p (LFC=-0.97) among them.

Accordingly, we found upregulation in EC of miR-99b-5p targets (TIMP2, MAFB, MMP9, DUSP1, or CCL3), miR-125a-5p targets (LAMP1, CDKN1A, NBEAL2, BBC3, CSRN1P, SOD2) and targets from both miRNAs (THS1, DPM2, RSP2, FLNA).

Treatment with miRNA inhibitors in CEM cells reduced viral replication by 17.6% (p<0.05) when miR-99b-5p was downregulated whereas miR-125a-5p downregulation resulted in a 16.3% reduction in viral replication (p<0.01). The combined suppression of miR-99b-5p and miR-125a-5p decreased viral replication by 21.4% (p<0.001).

Conclusions: Both miR-99b-5p and miR-125a-5p were downregulated in EC compared to NT or ART. Accordingly, gene targets of these miRNAs were upregulated and participate in p53 signaling route and TNF pathway. The downregulation of these miRNAs in CEM.NKR.CCR5 cells

reduced the viral production of HIV pointing to a protective role of these miRNA in HIV infection in EC, which can be used to identify new therapeutic targets.

EPA0016

Elevated plasma galectin-9 among vertically infected youth with HIV on ART is associated with inflammation and cognitive performance

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Background: Perinatally infected adolescents with HIV are distinct from adults living with HIV in terms of rapid disease progression, increased viral burden and depletion of CD4 T cells. We previously showed that the levels of plasma and CSF Galectin-9 (Gal-9), a lectin immunomodulator, are elevated during adult HIV infection and this was compounded by age and HIV viremia.

Here we investigated the influence of Gal-9 in HIV disease indices among adolescents with perinatal HIV infection and sought to determine links to cognitive performance.

Methods: Blood was obtained from two independent cohorts of perinatally infected adolescents in the southern region in Asia.

Cohort I included adolescents with HIV (AWH) on suppressive ART (n=15), ART-naïve (n=15), and adolescents without HIV (AWOH; n=10) from India with median age of 10yrs. Cohort II from Myanmar included AWH on ART (n=54) and AWOH (n=22) with median age of 12yrs.

Cohort II also completed standardized cognitive tests adapted for cultural relevance. We measured plasma Gal-9 by immunoassay, inflammatory mediators by Luminex and T-cell activation based on HLA-DR and CD38 co-expression by flow cytometry. Data were analysed using Mann-Whitney t-tests and Spearman correlations.

Results: Gal-9 levels were found to be elevated in ART-treated AWH on ART when compared to AWOH in both cohorts (all p<0.05).

Higher Gal-9 levels correlated with increased levels of sCD14, IP-10, TNFα, MCP-1, IL-10 and measures of CD8 T cell activation (HLA-DR⁺CD38⁺). In Cohort 2 it was notable that in AWH higher Gal-9 levels correlated with higher



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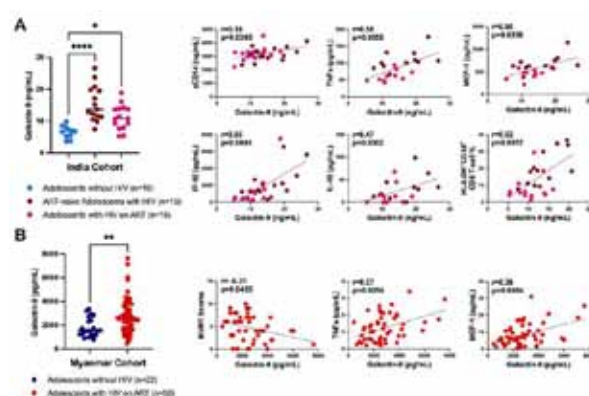
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TNFA and MCP-1 (all $p < 0.05$) and with lower cognitive performance on visual learning and memory test ($r = -0.31; p < 0.05$). [Fig.1]



Conclusions: Similar to adults, Gal-9 remains elevated among vertically infected youth with HIV receiving ART and correlated with persistent inflammation. The association with cognition suggests that Gal-9 may serve as a marker of neuroinflammation and brain injury in AWH.

EPA0017

Plasma derived extracellular vesicles modulate monocyte function in adults with HIV-related cognitive impairment

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Background: HIV-associated neurocognitive dysfunction persists despite suppressive antiretroviral therapy (ART). Extracellular vesicles (EVs) are emerging modulators of immunological responses and we have published that observations that EVs expressing monocyte activation and neuronal markers are related to the degree of cognitive impairment (CI) in people with HIV (PWH) on ART. Whether these EV changes observed in people with HIV (PWH) influence innate cellular function among those with CI remains unclear.

Methods: EVs were purified from blood derived from 58 PWH on suppressive ART with either cognitive impairment (CI, n=48) or normal cognition (NC, n=10) and 8 participants without HIV (PWOH) were isolated using differential centrifugation.

EVs were co-cultured with PBMCs from a single uninfected donor for 18 hours. Monocyte (mono) function was assessed for 8 cytokine responses and 13 surface chemo-

kines and myeloid differentiation markers by spectral flow cytometry. Furthermore, Mono migration capacity was assessed from 12 hour co-cultures prior to exposure to MCP-1 for 3 hours to allow chemotaxis in a subgroup of donors. Non-parametric statistical T tests were used.

Results: We found differential effects of EVs on multiple mono cytokine responses and cell surface receptors irrespective of HIV status. Levels of mono IL-18 were significantly lower after incubation with EVs derived from PWH compared to PWOH. B

ased on cognitive status, EVs from HIV-CI group significantly lower % of IL-18 mono responses and lower IFN- α and higher IL-10 responses on a per cell basis when compared to the NC group. No differences in Mono migration were observed across the groups.

Conclusions: These results suggest EVs can modulate mono function irrespective of HIV status. PWH with CI exhibited altered EV driven mono cytokine responses. Our data support interventions that target EVs to reverse or restore mono perturbations and limit neuropathology in PWH on ART.

EPA0018

HIV-induced mitochondrial ROS and cell death in hepatic stellate cells contribute to a profibrotic profileHIV-induced mitochondrial ROS and cell death in hepatic stellate cells contribute to a profibrotic profile

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Background: Hepatic stellate cells (HSC) are susceptible to HIV infection. Whether HIV is able to activate HSCs by damage-related stimuli to secrete excessive extracellular matrix, leading to collagen deposition, is undefined. Since the level of reactive oxygen species (ROS) increases sharply in activated HSCs and HIV exposure may trigger ROS early after viral exposure, our goal is to define the HIV role in propitiating a profibrotic profile by inducing ROS imbalance and cell death among HSC.

Methods: Both cell-free X4-tropic HIV (pNL43-GFP 100ng/ μ L p24 antigen) and HIV-infected T lymphocytes (HIV-GFP+ Jurkat cells labeled with violet proliferation dye, 5:1 ratio) were used to examine the LX-2's permissiveness to HIV replication.

Additionally, LX-2 were subjected to conditioned media (supernatant from HIV-infected T lymphocytes). Viral replication and HIV infection effectiveness were measured 3 days after exposure (dpe) using HIV-p24 antigen by ELISA in supernatants and GFP+ cells by flow cytometry, respectively. In LX-2, cell-death (PCD, Annexin-V/7AAD) and mitochondrial ROS (MitoSox™) levels were measured using flow cytometry, using staurosporine (1 μ M) and rotenone (10 μ M) as positive controls, respectively.



Collagen deposition in the extracellular matrix was determined by Sirius Red staining and spectrophotometric (O.D. 550nm) quantification. All experiments were carried out in triplicate.

Results: At 3 dpe, neither the cell-free virus nor the cell-to-cell contact challenge produced HIV progeny. Cell-to-cell contact with HIV-infected T-lymphocytes significantly enhanced necrosis (7AAD+ only) in LX-2 compared to control (1.4% vs. 2.0%; p 0.01).

However, no significant differences were observed early (Annexin-V+ only) and late apoptosis (Annexin-V+/7AAD+) (3.6% vs 3.2% and 2.4% vs 3.8% $p > 0.05$) respectively. This was also accompanied by a very early (2 hpe) increase in mitochondrial ROS generation (1.3% vs. 2.3%, p 0.01).

Additionally, the extracellular matrix of these cells revealed a 1.6x change in collagen deposition ($p = 0.01$). When LX-2 were exposed to conditioned media, these anomalies were not observed.

Conclusions: Although HSCs are susceptible but not permissive to HIV-X4 tropic infection, their cell-to-cell contact with HIV-infected T lymphocytes results in oxidative stress and enhanced cell death that favors an exacerbated deposition of extracellular matrix, ultimately resulting in a profibrotic profile.

EPA0019

Both HIV-1 expression and germinal center B cells reduce CXCR5 expression on T follicular helper cells

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Background: CD4+ T follicular helper cells (TFH) are important sources of HIV RNA (vRNA) in secondary lymphoid tissues during chronic untreated HIV-1. TFH express the follicular homing receptor, CXCR5, and its ligand CXCL13. The impact of HIV expression and/or germinal center B cells (GCB) on CXCR5 expression, and the distribution of vRNA+BCL6+PD-1+TFH in lymph nodes of PLWH are not well characterized.

We hypothesized that HIV expression and GCB reduce CXCR5 expression on TFH, and that some vRNA+TFH are located in extrafollicular sites in vivo.

Methods: TFH (7-AAD-CD3+CD8-CXCR5hiPD-1hi) and GCB (7-AAD-CD19+IgD-CD38+) were sorted from tonsils of individuals at low risk of HIV acquisition, spinoculated with X4-GFP reporter virus and cultured 3 days alone or with GCB ($n=11$). CXCL13 neutralizing antibody was added in a subset of experiments ($n=10$). CXCR5 median fluorescence intensity was measured.

Supernatant CXCL13 was quantified in a subset of experiments ($n=6$). ISH for vRNA and BCL6, and immunofluorescent antibody staining for PD1 and CD20 were performed on 10 μ m sections of inguinal lymph nodes (LN) from 6 antiretroviral-naïve PLWH. Slides were imaged, follicles

were defined as CD20+ regions, and the distribution of vRNA+ cells and vRNA+ TFH (BCL6+PD-1+) quantified. Statistical significance was determined using nonparametric Wilcoxon tests.

Results: In in vitro experiments, GFP+TFH expressed less CXCR5 than GFP-TFH when cultured alone ($p=0.002$) or with GCB ($p=0.002$). CXCR5 was further reduced on GFP+ cells in the presence of GCB ($p=0.04$). CXCL13 was elevated in cultures of TFH with GCB compared to TFH alone ($p=0.03$).

Addition of CXCL13 neutralizing antibody increased CXCR5 expression on GFP+TFH cultured alone ($p=0.002$) or with GCB ($p=0.002$), and ablated differences in CXCR5 expression associated with GCB ($p=0.23$). In LN, 221 (range, 9-134) vRNA+ PD-1+BCL6+TFH were detected and constituted 32% (range, 15-40%) of vRNA+ cells. Eight percent (range 0-23%) of PD-1+BCL6+TFH were located outside follicles and represented 7% (range 0-28%) of extrafollicular vRNA+ cells.

Conclusions: HIV expression and GCB reduced CXCR5 expression on TFH, the latter likely through a CXCL13 related mechanism. CXCR5 downregulation on TFH in follicles may facilitate immigration of TFH to extrafollicular regions and dissemination of these cells within secondary lymphoid tissues.

EPA0020

Heavily Treatment-Experienced (HTE) people living with HIV (PLWH) with vertical transmission and detectable viremia do not display increased peripheral inflammation markers: data from the Prestigio Registry

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Background: Ineffective viral control in Heavily Treatment-Experienced (HTE) fuels inflammation which may be increased in HTE with vertical transmission (VT), given that viral acquisition at birth may alter immune homeostasis. We investigated inflammation in HTE with and without VT, according to viral load (VL) status.

Methods: Matched cohort study including individuals of the Prestigio Registry with resistance to NRTIs, NNRTIs, PIs and INSTIs, with or without VT, VL <50 copies/mL or VL >200 copies/mL. GM-CSF, IFN- α , IFN- γ , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p70, IL-17A, TNF- α (Cytometric Bead Array) and sCD14 (ELISA) were determined.

Propensity score was used to match VT and no-VT for sex, HIV duration, CD4 nadir and VL at plasma sampling. Mann-Whitney test and Spearman's correlation were calculated.

Results: We evaluated 16 VT and 16 no-VT (Table); in each group, 8/16 had VL<50 copies/mL and 8/16 VL>200 copies/mL. VT were younger than no-VT ($p<0.0001$). VT and no-VT showed comparable cytokines, with the exception of lower IL-6 in VT (median=0.526 pg/mL, IQR=0-2.85) vs 2.198 pg/mL, IQR=0.94-6.17; $p=0.04$; 1A) and a trend to lower IL-10 ($p=0.08$). IL-6 did not differ between VT and no-VT, within viremia strata (1B-C), while a tendency to lower IL-10 was retained in viremic VT ($p=0.06$; Figure1, D). IL-6 correlated with age ($r=0.362$, $p=0.04$; 1E); no other correlations between cytokines and demographic/viro-immunologic parameters were found.

	VT (N=16)	no-VT (N=16)	p-value
Age at sampling, (years), median (IQR)	31 (27-33)	56 (54-59)	<0.0001
Sex female, [n (%)]	10 (62.5)	10 (62.5)	1.000
Time since HIV diagnosis, (years), median (IQR)	31 (27-33)	30 (25-32)	0.724
CD4+ nadir, (cells/mm ³), median (IQR)	90 (16-186)	127 (21-200)	0.745
CD4+ at sampling, (cells/mm ³), median (IQR)	394 (179-1011)	547 (149-770)	0.545
CD8+ at sampling, (cells/mm ³), median (IQR)	806 (571-1117)	672 (510-949)	0.406
HIV-RNA at sampling, [n (%)]			
<50 copies/mL	8 (50%)	8 (50%)	1.000
>200 copies/mL	8 (50%)	8 (50%)	

Table 1.

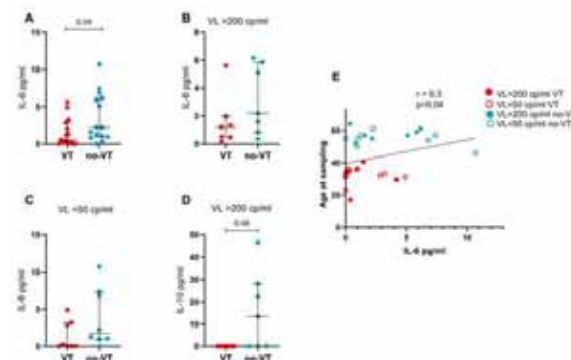


Figure 1.

Conclusions: HTE with VT feature comparable inflammation to that of HTE without VT, regardless of VL. The correlation between IL-6 and age suggests that age, rather than mode of transmission and viremia, drives inflammation in treated HIV.

EPA0021

Urethral microbiome of South African cis-gender men and transwomen with and without bacterial sexually transmitted infections

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Background: Anaerobic bacterial dysbiosis of the foreskin and urethral sexually transmitted infections (STIs) are independently associated with mucosal inflammation and increased risk of HIV acquisition.

Methods: Participants aged 18 to 45 in Cape Town, South Africa provided penile swabs prior to surgical penile circumcision. The V3-V4 segment of the bacterial 16S rRNA gene was sequenced using DNA extracted from urethral swabs to characterize bacterial communities in participants with and without a concomitant sexually transmitted infection (STI), diagnosed by a custom multiplex PCR assay. Absolute 16S copies were assayed from each swab by BactQuant qPCR.

Results: The median age of participants was 25 years old, and 79% reported being sexually active with a median of 3 lifetime sexual partners. STIs were diagnosed in 18 of the 85 participants with sequencing data, *Chlamydia trachomatis* (CT) in 16 participants.

Analyses of the within-participant and between-participant bacterial community diversities showed no differences by STI diagnosis.

Absolute 16S copy number also showed no difference between participants with or without an STI diagnosis. Differential abundance testing confirmed the increased relative abundance of CT in specimens from participants with positive PCR testing (10.5-fold higher, FDR-adjusted p-value 3.6×10^{-10}), and also showed an increase in *Acinetobacter* (8.6-fold higher, FDR-adjusted p-value 6.4×10^{-3}).

Conclusions: We found that detection of a bacterial STI was associated with minimal differences in the quantity, diversity, or composition of the penile urethral bacterial community. This suggests that CT cohabitates with the existing microbial community of the penile urethra rather than requiring or causing a disruption to establish an environmental niche.

Furthermore, we did not detect changes in microbial abundances to suggest that the increased inflammation and risk of HIV acquisition reported with CT infection

are mediated by associated changes in the urethral microbiome, implying they may result intrinsically from CT infection. Sequencing of larger numbers of STI positive samples is ongoing to confirm these findings.

EPA0022

Microbial dysbiosis is associated with peripheral inflammation in vertically infected youth with HIV on stable anti-retroviral therapy

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Background: Vertically HIV-infected children experience rapid disease progression and increased HIV replication compared to adults. Differences in microbial populations found within the gastrointestinal tract (gut) affects host immune regulation and significant shifts in these communities are observed during HIV infection and may influence health outcomes despite anti-retroviral therapy (ART).

We examined gut microbial communities within a cohort of youth with or without HIV in a socio-economically controlled setting in Myanmar and examined for relationships with markers of immune dysregulation.

Methods: A cross-sectional study design with perinatally HIV-infected adolescents on ART (AWH, n=9, median age 13 years) and without HIV (AWOH, n=6, median age 16 years) recruited from two orphanages in Yangon, Myanmar had plasma and stool collected.

Stool DNA underwent 16S ribosomal-RNA sequencing and bacterial relative abundance was quantified using Qiime2. 13 plasma biomarkers associated with inflammation (TNF- α , TNF receptor I, IL-6, galectin-9, CRP), myeloid activation/migration (sCD14, sCD163, neopterin, MCP-1), and endothelial activation (E-Selectin, P-Selectin) were measured by immunoassay. Analyses were assessed using Spearman correlation.

Results: In stool we identified an increase of *Veillonellas-Selenomonadales* and a trend towards a decrease in *Lachnospirales* abundances in AWH compared to AWOH ($p<0.001$ and 0.09).

High relative abundance of *Veillonellas-Selenomonadales* correlated with elevated IL-6, TNF α , and sCD14 (all $r>0.73$, $p<0.05$) levels in AWH but not in AWOH.

Furthermore, higher IL-6 levels correlated with low relative abundance of *Lachnospirales* ($r=-0.77$, $p=0.016$) and *Veillonellas-Selenomonadales* ($r=-0.67$, $p=0.050$) only in the AWH group.

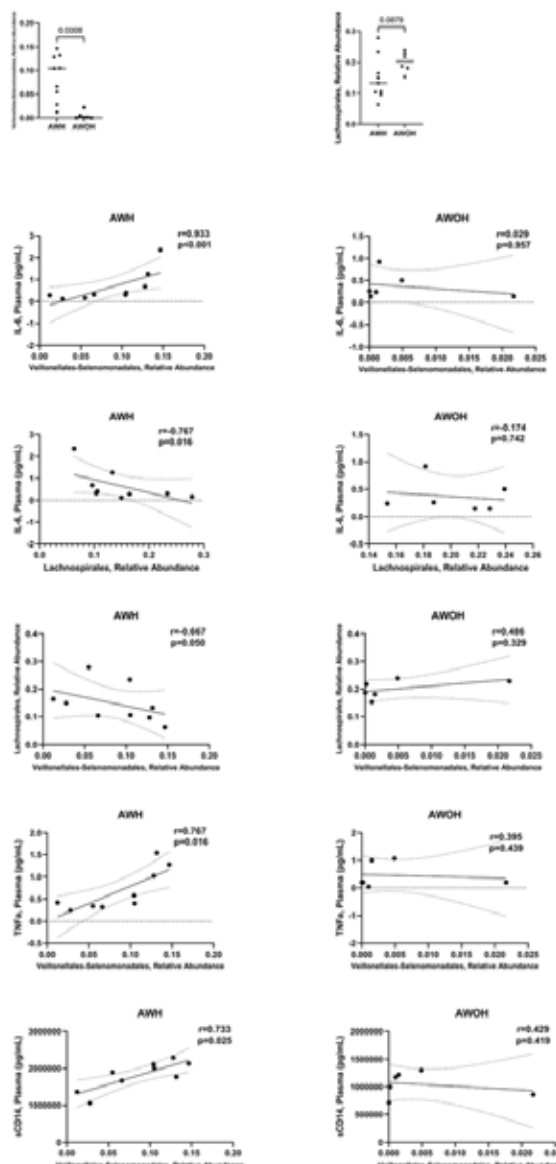


Figure.

Conclusions: From this pilot study, we report an expanded gut microbial population linked to persistent inflammation among youth with perinatal HIV, despite stable ART, in a controlled environment, potentially informing new mechanisms to direct interventions in AWH. Further investigation into these pathogens is warranted.



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EPA0023

Massive HIV infection abrogates osteoclastogenesis by influencing CCR5 and CD9 expression

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Background: Mature bone-resorbing osteoclasts (OC) and their precursors (macrophages) are structurally and functionally affected by HIV-influencing bone loss. The membrane CCR5 and tetraspanins play an essential role in bone-destructive conditions through the functional regulation of osteoclasts that could be altered directly by R5-tropic HIV infection.

Methods: Macrophages (OC precursors) were obtained in cell culture from human monocytes isolated from buffy coats and differentiated with M-CSF (30 ng/mL) for 6 days. Then, by adding RANKL (50 ng/mL) for 9 days mature OC were obtained. At 3 days of MDM differentiation, HIV infections (R5-tropic AD8, and BaL strains; pseudo-typed pNLAD8-VSV-G strain) were performed using two inoculums (high:1pg/cell vs. low:0.01pg/cell). HIV Infection efficiency and replication were assessed at 3, 6, 9, and 12 dpi by measuring intracellular p24-expressing cells (flow cytometry), and soluble p24 in cell supernatants (ELISA). Multinucleated tartrate-resistant acid phosphatase-positive cells with ≥3 nuclei were considered mature osteoclasts. Using flow cytometry in cells detached, cell-death (annexin-V/7-AAD) and CCR5/CD9 expression were measured. Bone resorption activity was measured by light microscopy on bovine cortical bone slices.

Results: An HIV replication peak was found earlier with the high inoculum (42-fold change from 3 to 6 dpi), whereas this peak (30-fold change) occurred between 6 and 9 dpi with the low inoculum. At 12 dpi, both inoculums depicted similar infection efficiency (p24-expressing cells: 57.7±12.8% vs. 46.0±10.6%) and cell-death level (11.9±4.7 vs. 8.6±3.3). High but not low HIV-inoculum abrogates markedly OC number (x200; control:37.2±12.4; HIV-low:32.3±13.3; HIV-high: 10.8±3.4). Besides, two CCR5-ligands (TAK-779, and recombinant-AD8-gp120), and HIV-VSV-G infections (R5-independent cell entry) significantly impaired osteoclastogenesis, as well. OC precursors and early OC challenged with high (but not low) HIV inoculum triggered a significant increase in membrane CCR5 (1056.0±97.6MFI) and CD9 expression (4196.0±277.2MFI). The number of osteoclasts formed on bone slices correlated directly with bone resorption (by examinations of the resorbed area). When HIV replication was inhibited using nevirapine (1 mM), osteoclastogenesis was recovered.

Conclusions: Osteoclasts differentiation is impaired by R5-tropic HIV strains when a massive replication and CCR5 blocking occurs in their precursors, altering both CCR5 and tetraspanin expression and its resorptive functions.

EPA0024

Impact of the synthetic opioid fentanyl on HIV replication in vitro

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Background: The illicit use of synthetic opioids such as fentanyl has led to a serious public health crisis in the US. People with opioid use disorder are more likely to contract infections such as HIV and viral hepatitis and experience more severe disease. While several drugs of abuse are known to enhance viral replication and to suppress immunologic responses, the effects of synthetic opioids on HIV pathogenesis have not been investigated thoroughly. Thus, we examined the impact of fentanyl on HIV-susceptible and HIV-infected cell types and chemokine receptor expression *in vitro*.

Methods: HIV susceptible cell lines (TZM-bl and U937) and HIV-infected lymphocyte cells (ACH-2, H9, and J-Lat GFP) were exposed to varying concentrations of fentanyl. Expression levels of the CXCR4 and CCR5 chemokine receptors were measured in cell lysates. HIV p24 antigen was quantified in culture supernatants by ELISA, and HIV proviral DNA was quantified in cells using SYBR real-time PCR targeting the *pol* gene. RNAseq was performed to characterize cellular gene regulation in the presence of fentanyl.

Results: Fentanyl enhanced significant expression of CXCR4 protein levels in ACH-2 and H9 cells and CCR5 in TZM and all HIV-infected lymphocyte cell lines in a dose-dependent manner. Fentanyl led to a non-significant decrease in CXCR4 and CCR5 protein levels in U937 cells. Fentanyl induced HIV p24 expression and proviral DNA levels in HIV-exposed TZM-bl cells, U937 cells, and several HIV-infected lymphocyte cell lines. Multiple genes associated with apoptosis, antiviral / interferon response, chemokine signaling, and NFκB signaling were differentially regulated by fentanyl.

Conclusions: These data demonstrate that the synthetic opioid fentanyl increases HIV replication and chemokine co-receptor expression in HIV-susceptible and HIV-infected lymphocyte cell lines, as well as different regulate genes relevant to HIV infection and disease progression. Increased virus levels also suggest that opioid use in vivo may increase the likelihood of transmission to others and accelerate disease progression.



EPA0025

Role of transcriptionally-active „defective“ HIV-1 proviruses in immunological non-responders: a case-control study

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Background: Despite being placed on suppressive antiretroviral therapy (ART), HIV-positive immunological non-responders (INRs) fail to recover their CD4⁺ T-cell count and have increased T-cell activation and inflammation compared to immunological responders (IRs). The involvement of “defective” HIV-1 proviruses in immune activation has recently been suggested.

In the present study, we investigated the potential contribution of transcriptionally-competent “defective” HIV-1 proviruses to poor immune recovery observed in INRs.

Methods: 26 INRs (CD4 <250 cells/ μ L, pVL<50 for on average 2.7 yrs) and 25 IRs (CD4 \geq 250 cells/ μ L, pVL<50 for on average 3.9 yrs) on ART were studied. Age, sex, ART regimen and years of ART were matched between the two groups. Activation phenotypes of T-cells were analyzed by 8-color flow cytometry. Levels of HIV-DNA and cell-associated (CA) HIV-RNA were determined by a quantitative PCR/RT-PCR for the Psi-LTR region. Sequences of HIV-DNA (n=677) and CA HIV-RNA (n=209) were assessed by 5'LTR-to-3'LTR single-genome amplification and direct sequencing. Differences in HIV-1 quasispecies profiles of INRs and IRs were assessed by proportion of near full-length intact HIV-1 and number of viral protein-coding regions.

Results: INRs had higher %CD4⁺HLA-DR(+) (23.0 vs. 12.5, p<0.01) and %CD8⁺HLA-DR(+) (41.5 vs. 32.0, p=0.04). Levels of HIV-DNA were similar between INRs and IRs (median 1827 vs. 1575 copies/million CD4⁺, p=0.84). In contrast, levels of CA HIV-RNA were higher in the INR-group (median 1593 vs. 580 copies/million CD4⁺, p=0.03). Proportions of near full-length intact HIV-1 proviruses in INRs and IRs were 5.1% and 5.9%, respectively. No full-length HIV-RNA transcripts were detected in either group, suggesting that ongoing HIV replication is an unlikely explanation for the poor CD4⁺ recovery. All HIV-RNA transcripts were in novel unspliced forms and frequently encoded for Gag and Nef. These transcripts were expressed in similar proportions in INRs and IRs (50% vs. 32% for Gag; 27% vs. 24% for Nef).

Conclusions: Levels of sub-genomic HIV-RNA transcripts were higher in the INRs than the IRs, suggesting a possible role for biologically-active “defective” proviruses in the INRs. Further work in studying whether or not these levels are correlated with the observed increases in CD4⁺ and CD8⁺ T-cell activation is warranted.

EPA0026

Frequencies of CD4⁺ and CD8⁺ T cells immune activation are reduced in PLWH after 5 years of antiretroviral therapy

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Background: Chronic immune activation represents one of the main determinants of a senescent immune phenotype in people living with HIV-1 (PLWH). To address the effectiveness of antiretroviral therapy (ART) in reducing chronic CD4⁺ and CD8⁺ T cells immune activation, an observational study comparing peripheral blood immune activation status between ART-naïve, less than 5 years and more than 5 years ART-treated PLWH was conducted.

Methods: Peripheral blood mononuclear cells (PBMC) were collected from ART-naïve (n=14), less than 5 years (n=13) and more than 5 years (n=26) ART-treated PLWH recruited at the Department of Public Health and Infectious Diseases of “Sapienza” University of Rome (Italy) and Immunophenotype and activation levels were evaluated by multiparameter flow cytometry on CD4⁺ and CD8⁺ T cell subsets [naïve, central memory (TCM) and effector memory (TEM)] by the following anti-human monoclonal antibodies: CD3-PerCP, CD4-APC-Vio770, CD8-FITC, CD45RO-PE-Vio770, CD27-VioBlue, CD38-APC, and HLA-DR-PE. Statistical analyses were performed using Prism and p<0.05 were statistically significant.

Results: Frequencies of CD4⁺ naïve and CD8⁺ naïve T cells expressing CD38, HLA-DR or both markers were similar between the three groups. PLWH treated for more than 5 years exhibited lower frequencies of CD38⁺ (p = 0.0074 and 0.0021) and CD38⁺ HLA-DR⁺ CD4⁺ TCM and TEM cells (p = 0.0152 and p = 0.0002, respectively), CD38⁺ CD8⁺ TCM cells (p = 0.0358), CD38⁺ HLA-DR⁺ CD8⁺ TCM and TEM cells (p = 0.0068 and p = 0.0026, respectively) as compared to ART-naïve PLWH.

Moreover, PLWH ART-treated for less than 5 years had increased levels of CD38⁺ (p = 0.0058) and CD38⁺ HLA-DR⁺ CD4⁺ TEM cells (p = 0.0018) compared to PLWH treated for more than 5 years.

By contrast, no differences in the percentages of the other T cell subsets (HLA-DR⁺ CD4⁺ TCM and TEM cells, CD38⁺ HLA-DR⁺ and HLA-DR⁺ CD8⁺ TCM cells, HLA-DR⁺ CD8⁺ TEM cells) were recorded among the three groups.

Conclusions: These findings suggest the efficacy of ART in reducing the immune activation levels of distinct CD4⁺ and CD8⁺ T cell subsets in PLWH after 5 years of ART.



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**EPA0027****miRNAs regulated by reproductive hormones and pregnancy target the HIV interactome**

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States

Background: Innate immunity predictors of HIV risk are modulated by levels of progesterone (P4) and β -estradiol (E2) and by pregnancy and lactation status. The epigenetic mechanisms, including post-transcriptional regulation by small non-coding (micro) RNAs, underlying these associations are unknown.

Methods: We utilized longitudinal serum specimens collected in 3-month intervals from 162 women who became pregnant during follow-up in a large prospective study of hormonal contraception and HIV acquisition in Uganda and Zimbabwe.

We used the EdgeSeq platform coupled with Illumina sequencing to obtain the global miRNA transcriptome before, during and after pregnancy. miRNAs levels were voom-transformed and normalized in the linear regression modelling R package limma to log2 counts per million.

We used paired analysis in limma to identify differentially expressed miRNAs that distinguished pregnancy from pre-conception or breastfeeding following pregnancy, with batch and country as covariates.

We tested association of hormonally regulated miRNAs with Box-Cox-transformed levels of P4, E2, and sex-hormone binding globulin (SHBG) in limma with country, batch, pregnancy/breastfeeding, and age as covariates. P-values were corrected using the Benjamini-Hochberg false discovery rate (FDR) and significant at $p < 0.05$.

We used DIANA TarBase v8 to identify experimentally validated gene targets of pregnancy/hormone regulated miRNAs and overlapped those with the HIV interactome genes. We tested these overlapped genes for enrichment in Gene Ontology (GO) biological process (BP) and in BioCarta pathways using clusterProfiler.

Results: 793 miRNAs were differentially expressed with $FDR < 0.1$ at the transition from pre-conception to pregnancy and 31 - from pregnancy to breastfeeding. We identified 223 HIV interactome genes under reproductive cycle epigenetic control, including targets of miRNAs differentially expressed in pregnancy (217), and regulated by SHBG (218), P4 (167) and E2 (32). Pregnancy-upregulated miRNAs targeted the ENV and VIF interactome conveying suppression of HIV replication (IGFR2), reactivation (AHR),

and latency (PSMD1). Pregnancy-downregulated miRNA indicated upregulation of HIV resistance genes, e.g. RAC2 and SUN2. Among the top represented pathways of the HIV interactome epigenetically suppressed by P4-upregulated miRNAs was ERAD, with most of its genes also implicated in SARS CoV2 pathogenesis.

Conclusions: Global miRNA transcriptome analysis identified hormone-regulated targets of vulnerability and resistance to viral acquisition.

EPA0028**Identification of SIV infected mast cells in early sites of viral rebound**

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Background: Combination antiretroviral therapeutics, suppressing viremia does not prevent the premature development of comorbidities that are reminiscent of aging such as cardiovascular disease, atherosclerosis, frailty, neurocognitive disease.

Methods: Utilizing a radiolabelled-Fab2 probe to SIV, we are able to detect early foci of viral rebound during the eclipse phase (before viremia) after analytical therapy interruption (ATI) utilizing PET/CT. With the premise that the early foci of rebound reflect certain characteristics of the reservoir of viral persistence, we have analyzed the SIV infected cells in the region of a rebound foci (Rebound Zone) and unexpectedly observed SIV infected cells with a myeloid cell morphology and no infected CD4 T Cells.

Results: We have recently identified this undefined population as mast cells, which are present at increased density within the identified Rebound Zones. We have rediscovered the HIV/SIV infection of mast cells that was initially reported by 4 groups between 2000-2009. We were able to utilize primary human mast cells derived from skin or the peritoneal lavage of a humanized mast cell mouse model. Mast cells in both models expressed CD4 and CCR5 and were able to support the replication of HIV BaL and ADA. HIV replication was blocked with antiretrovirals as expected.

Next, we examined the Rebound Zone containing tissue from multiple animals necropsied 4, 5, 7, and 10 days post ATI utilizing multiple markers of mast cells (Tryptase, FcεR1, CD117). We were able to identify SIV infected mast cells in all the rebound animals.

Conclusions: This rediscovery of HIV infection of MCs in culture and validation of the infection of MCs in a rhesus macaque early reservoir model reveal a potentially ac-



tive role of mast cells during HIV/SIV infection. Mast cells play key functions in innate and adaptive immunity and facilitate the execution of the immune and inflammatory responses and the process of tissue repair and healing their infection by SIV/HIV could have a consequential role in HIV pathogenesis.

The unique characteristics of MCs to self-renew (proliferate), regulate epithelial and endothelial barrier function, and influence systemic inflammation make them a critical focus of research to gain unique perspectives and understanding of persistence.

Host immune responses, vaccines and immunotherapies

EPA0029

Early initiation of anti-retroviral therapy restores some but not all perturbations of natural killer cell functions and phenotypes in early HIV-1 infected men who have sex with men

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Background: NK cells play a crucial role in regulating HIV-1 infection and replication, and this regulation of HIV-1 infection and replication may determine the disease outcome. Antiretroviral therapy (ART) effectively restores CD4⁺ T cell counts and suppresses HIV-1 viral loads to undetectable levels in circulation. However, it is unclear whether or not the perturbations on NK cells are fully recovered. We hypothesized that early initiation of ART restores NK cell perturbations due to HIV-1 infection. We, therefore, sought to understand the phenotypic and functional changes that may occur to NK cells in early HIV-1 infection and whether early initiation of ART restores these possible changes.

Methods: We longitudinally evaluated NK cell functional and phenotypic changes in early HIV-1 infected Men who have Sex with Men (MSM) in Nairobi, Kenya, and who were recently initiated on ART. Blood samples were obtained fortnightly for three visits post seroconversion. Baseline blood samples collected in the SIVET study before seroconversion were also analyzed. Frozen PBMCs were thawed and stimulated overnight with K562 cell line, IL-2 and IL-15 and stained with antibodies to evaluate NK cell phenotype, activation, and functionality.

Results: Compared to the pre-seroconversion time point, there were no changes in the total NK cell frequencies across the time points. We observed significant reduc-

tions in NK cell production of IFN- γ , expression of CD69, and NK cell inhibitory receptor siglec7. However, there were significant increases in NK cell degranulation and expression of cell exhaustion marker PD-1.

Most of these changes were restored to near the pre-seroconversion level around 30 days post-ART initiation. The reduction in expression of the siglec7 receptor was, however, not restored.

Conclusions: The impairment of NK functionalities in early HIV-1 infection may enhance disease progression. This could be one way in which HIV-1 escapes the immune system. However, these impairments seem to be restored a few weeks after ART supporting the test and treat strategy.

Evaluating the mechanisms by which HIV-1 impairs NK cell effector functions would inform designing an effective HIV-1 vaccine boosting innate immunity.

EPA0030

Mitochondrial HSP₆₀ ensures optimal energy-dependent immunity in antiviral T-cells

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Background: Immunometabolism, which refers to the crosstalk between immunology and cellular metabolism, has provided new promising therapeutic venues for treating HIV-1. Our laboratory has shown that antiviral T-cell functions in PLWH (people living with HIV) were mediated through autophagy-dependent energy production and could be a target to boost protective immunity in these individuals.

Furthermore, Autophagy provides different sources of nutrients (lipids and amino acids for CD8 and CD4 T-cells, respectively) to ensure optimal energy production.

However, it remains critical, mechanistically speaking, to have a complete picture of how antiviral T-cells use nutrients and metabolic enzymes.

Here, we aimed to assess the role of mitochondrial heat shock protein 60 (HSP60) in memory T energy production and effector function.

Methods: We assessed the expression levels and mitochondrial localization of HSP60 within T-cells (CD4 and CD8) following their cellular activation by multiparametric and imaging Flow Cytometry (Aim 1). Blockade of HSP60 within memory T-cells by gene silencing was followed by evaluating expression levels of metabolic enzymes and mitochondrial energy production using western blotting and Seahorse metabolic analyzer, respectively (Aim 2). Finally, evaluating the effector function of T-cells after HSP60 gene silencing by multiparametric Flow Cytometry (Aim 3).



Results: The results show an increase in mitochondrial HSP60 expression in an HSF-1-dependent manner within memory T cells following cell activation. We found that mitochondrial HSP60 was critical to ensure optimal energy production by stabilizing the expression of several enzymes and nutrient transporters, which were involved in lipid and glutamine catabolism.

Finally, our data vouched for our ability to rescue the energy-dependent antiviral immunity of T-cells when HSP60 expression is impaired with alpha-ketoglutarate supplementation.

Conclusions: Overall, our study demonstrates a new molecular and metabolic mechanism involving the vital role of HSP60 in providing the energy required in Memory T cells against Viruses which could be a novel therapeutic tool for PLWH.

In addition, we also show that alpha-ketoglutarate supplementation may be beneficial for boosting T-cell immunity against viruses including HIV-1.

EPA0031

Genetic signatures of HIV-infected CD4⁺ T cells that survive interactions with NK cells

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Background: *In vitro* experiments in which HIV-infected CD4⁺ T cells are co-cultured with natural killer (NK) cells yield incomplete elimination of the infected cells.

We therefore hypothesize that cell-intrinsic pathways in CD4⁺ T cells are differentially regulated in HIV-infected cells to mediate resistance to NK cell-mediated killing.

Methods: Mock-infected and HIV-89.6-infected CD4⁺ T cells from 6 donors were co-cultured overnight +/- autologous NK cells. Following co-culture, cells were stained for the surface exposed HIV envelope protein using fluorescently conjugated HIV antibodies. Fluorescence activated cell sorting was then used to isolate infected and uninfected cells, followed by bulk RNA-sequencing. Transcripts from infected and uninfected cells co-cultured overnight with versus without NK cells were compared.

Results: RNA-seq analysis of CD4⁺ T cells that survived co-culture with NK cells revealed dozens of differentially expressed genes in infected, but not uninfected cells. This included upregulation of interferon-stimulated genes, including PD-L1 (padj=310⁻⁶), and NF-kB-related genes. Additional upregulated genes in the surviving infected cells included c-Fos (padj=1.910⁻⁵), c-Jun (padj=4.910⁻⁸), and cathepsin L (padj=5.910⁻³).

Conclusions: NF-kB genes that are downregulated in infected cells, potentially through Vpu activity, are normalized in survived infected cells. This may be due to NK cell targeting of Vpu-mediated HLA-C-downregulation.

Deconvolution of relative contributions of specific genes/proteins to target cell resistance will reveal novel targets for the development of therapeutics to eliminate the HIV reservoir.

EPA0032

Autophagy and the acyl-coA-binding protein influence immune function in people living with HIV

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Background: Through degradation of cytosolic structure, autophagy allows the establishment and maintenance of efficient anti-HIV T-cell responses, owing to the production of IL-21 by CD4 T-cells. Cytosolic acyl-coA-binding protein (ACBP) binds to activated fatty acid and favors autophagy. However, when ACBP is secreted in the extracellular milieu, autophagy is inhibited, and appetite increased.

To assess the role of ACBP in people living with HIV (PLWH) receiving antiretroviral therapy (ART), we assessed intra and extracellular ACBP levels and their link with metabolic and immune functions as well as autophagy.

Methods: ELISA were used to quantify ACBP and cytokines levels in 50 long-term ART-treated PLWH and 30 controls without HIV. Intracellular ACBP and autophagy marker LC3II levels were assessed by flow cytometry in PBMC. Metabolomic analyses were performed on serum samples by GC-MS. *In vitro* assays were performed on PBMC from donors without HIV.

Results: ACBP levels were higher in ART-treated PLWH compared to controls (medians 127.5 vs 78.1 ng/mL, p=0.03), independently of age and sex. Intracellular ACBP was detected in all leukocytes in both groups, and intracellular ACBP levels in T-cells and monocytes correlated inversely with plasma levels (r=-0.9, p=0.02 and r=-0.9, p=0.08 respectively). Intracellular levels of ACBP and LC3II were associated, in both T-cells and monocytes.

In ART-treated PLWH, plasma ACBP levels were neither associated with CD4 nor CD8 T-cell counts, but correlated



with pro-inflammatory cytokines (IFN α 2, IFN γ , IL1 β) and homeostatic factors (IL7 and IL15) ($r > 0.3$, $p < 0.05$ for all comparisons).

Plasma ACBP levels were inversely associated with plasma IL-21 levels ($r = -0.54$, $p < 0.01$). PLWH with high plasma ACBP had two-fold higher levels of glutamic acid ($p = 0.02$) and tended to have higher levels of α -ketoglutarate ($p = 0.09$) in their serum. *In vitro* addition of recombinant ACBP to culture medium for 24h decreased LC3II intracellular levels and the percentage of IL-21 producing CD4 T-cells after PMA-ionomycin stimulation.

Conclusions: Higher plasma levels of ACBP in ART-treated PLWH were associated with inflammation and markers of T-cell dysfunction. Circulating ACBP weakens anti-HIV T-cell functions, possibly through the inhibition of IL-21 production. The ACBP pathway might constitute a target for increasing autophagy and improving anti-HIV T-cell responses.

EPA0033

Epistatic interaction of host immune factors modulates disease outcome following HIV infection

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Background: A strong predictor of outcome following HIV-1 infection is the carriage of specific alleles of the human leucocyte antigen (HLA) molecule that presents viral peptides (epitopes) to T cells, with residual variation in outcome measures attributed, in part, to viral adaptation to these responses. The endoplasmic reticulum aminopeptidases (ERAPs) trim viral peptide precursors to optimal lengths for peptide presentation and functional variants of the ERAPs can affect the repertoire of T cell epitopes presented by specific HLA alleles.

Here, we propose that variations in ERAP will be associated with changes in the viral targets of HLA-restricted T cell responses affecting HIV disease outcome measures and the adaptation profile of HIV.

Methods: Host (HLA, ERAP1 and 2) genotyping and HIV sequence data on 249 anti-retroviral therapy-naïve HIV-1-infected subjects from the Western Australian HIV cohort was utilised to investigate the effect of variations in HLA, ERAP1 and ERAP2 and their interactions on disease

outcome (set-point viral load) and HIV adaptation levels. All data analyses and statistical tests were performed using R Studio.

Results: We confirmed the known association of HLA-B*27 and HLA-B*57 with lower viral load ($P = 0.0002$) and higher CD4⁺ T cell count ($P = 0.0028$) and CD4⁺ T cell percentage ($P = 0.0052$) in this study cohort. We also identified a novel association between two ERAP2 single nucleotide polymorphisms (SNPs; rs2248374 and rs2549782 that are in strong linkage disequilibrium) with viral load (P adjusted = 0.0022 for both) and CD4⁺ T cell count and percentage (rs2248374 only; P adjusted = 0.0468).

There was a significant interaction between these ERAP2 SNPs (that define haplotype B) and viral adaptation (an indicator of HLA-restricted T cell immune pressure) on viral load ($P = 0.0091$).

Conclusions: Variations in ERAP2 appear to impact HLA-restricted anti-HIV T cell immune responses most likely by altering the peptide repertoire presented to T cells or the overall anti-viral immune response.

This study provides evidence that HIV disease outcome is, in part, a result of independent and interactive effects of immune-related host factors such as HLA and ERAP and viral factors including the autologous sequence.

EPA0034

Improvement of B cell responses by an HIV-1 amphiphilic polymer nanovaccine

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Background: The development of a safe and effective vaccine is critically needed to control the current devastating AIDS pandemic. One key barrier to develop HIV-1 vaccines is the challenge to improve the ability to induce broadly neutralizing antibodies (bnAbs). Thus, exploring innovative strategies to enhance neutralization breadth and potency elicited by HIV-1 vaccines will assist in developing next generation HIV-1 vaccines.

Methods: A novel HIV-1 envelope glycoprotein nanoparticle (Env/NP) vaccine was generated by embedding stable native-like Env trimers into the amphiphilic polymers, which was synthesized through the amidation reaction between the anhydride group on poly(maleic anhydride-ALT-1-octadecene) (PMHC₁₈) and the amino group on poly(ethylene glycol) (PEG). To evaluate the immunogenicity of Env/NP, we immunized New Zealand rabbits sub-



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cutaneously in three groups (Env with adjuvant AS03, Env/NP alone, and Env/NP with AS03) and collected blood after each immunization. To investigate the stability of Env/NP stored under different conditions, we immunized BALB/c mice with Env/NP immunogens which were stored at 4°C or -80°C for 2.5 months or lyophilized and then stored at room temperature for 2.5 months.

Results: The final Env/NP formed irregular spheres with diameters about 20 nm and significantly reduced the negative charge of Env trimers. Env/NP with AS03 induced about four-fold higher titers of HIV-1 Env specific binding Abs as well as 3.5-7 fold higher titers of nAbs than Env with AS03 or Env/NP alone in rabbits.

Moreover, the sera from rabbits immunized using Env/NP with or without AS03 could neutralize more tier 2 viruses (3 or 4) than the sera from rabbits immunized using Env with AS03 (only 1). Furthermore, Env/NP stored at 4°C for 2.5 months or lyophilized induced similar immune responses as it was stored at -80°C.

Conclusions: An HIV-1 Env/NP nanovaccine based on amphiphilic polymers can serve as an adjuvant to enhance immune responses, increase neutralization potency and breadth as well as be stable at different storage temperatures even after lyophilization.

EPA0035

HIV-infected macrophages express different NK ligands compared to HIV-infected T cells

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Background: HIV-infected macrophages form tissue reservoirs in people with HIV which persist despite anti-retroviral therapy. Natural killer (NK) cells may be useful effector cells for eliminating HIV-infected cells through both antibody dependent and independent cytotoxicity. NK recognition of HIV+ cells is influenced by the interaction between ligands on the target cells with activating/inhibitory receptors expressed on NK cells.

HIV replication kinetics and host viral restriction mechanisms differ between macrophages and T cells, which may influence the expression of ligands for NK receptors (e.g. human leukocyte antigens, HLA) and HIV antigens which influence NK recognition.

HIV accessory proteins also regulate the expression of factors involved in NK cell engagement but their effect in HIV-infected macrophages is less clear.

Methods: Monocyte-derived macrophages from HIV-seronegative blood donors were infected in vitro with HIV (BaL and AD8/Δnef/Δvpu) and synchronised using an HIV fusion inhibitor on day 3 post-infection. Productive infec-

tion (indicated by intracellular HIV p24 protein) and surface expression of HIV envelope (Env), CD4 and HLA molecules were quantified using flow cytometry at various times post-infection.

Results: HIV+ macrophages downregulated surface CD4 and classical (A+B+C) HLA molecules relative to bystander (p24-) cells after infection (p<0.02, days 3/7/10 vs day 0). HIV-induced downregulation of HLA-ABC and CD4 were partially restored by Δnef/Δvpu HIV in macrophages but not in T cells. HIV+ macrophages upregulated HLA-C and HLA-E expression (p<0.05, bystanders vs infected) but not T cells; this was irrespective of nef deficiency but was restored to bystander levels by Δvpu HIV.

Whilst HIV Env was detected on the surface of HIV+ macrophages after 3 days, expression plateaued between 7-10 days post-infection even though p24 expression continued to increase.

Conclusions: A proportion of HIV+ macrophages down-regulate HLA-A/B and can be opsonised by anti-Env antibodies, suggesting increased susceptibility to antibody-dependent NK cytotoxicity. However, specific upregulation of HLA-C/E on HIV+ macrophages may impair NK responses and/or influence the types of NK cells which recognise HIV+ macrophages.

These data indicate that HIV+ macrophages are a unique and dynamic reservoir that express a different array of NK ligands to HIV+ T cells, which may influence their ability to be targeted by subpopulations of NK cells.

EPA0036

Pomalidomide drives expansion of HIV-specific CD8+ T-cells by promoting transcriptional activity of E2F1 and PRMT3

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Background: HIV-specific CD8+ T-cells in chronic HIV infection have reduced cytolytic and proliferative capacities. Therapeutics that reinvigorate HIV-specific CD8+ T-cell responses are therefore highly relevant to HIV cure strategies. Pomalidomide is an immunomodulatory drug that has pleiotropic effects on multiple immune cells including production of IL-2. We investigated the capacity of pomalidomide to enhance HIV-specific CD8+ T-cell responses.

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Methods: PBMCs from ART-suppressed people living with HIV (PLHIV) were treated *ex vivo* with pomalidomide or DMSO control for 13 days in the presence of HIV immunodominant peptides, Gag (SL9, RK9, EI8) or Pol (IV9). HIV-specific CD8⁺ T-cell responses were evaluated using HIV peptide loaded-MHC-I tetramers. The frequency and cytotoxic profile of HIV-specific CD8⁺ T-cells were measured by intracellular staining for degranulation, granzymes, perforin and IFN γ by flow cytometry. Finally, sorted tetramer-positive CD8⁺ T-cells underwent bulk RNA-sequencing followed by transcriptomic analyses using KEGG pathway analysis and Reconstruction of Transcriptional regulatory Networks and analysis of regulons (RTN).

Results: In the presence of HIV peptides, pomalidomide significantly expanded both total and HIV-specific CD8⁺ T-cells, producing a 9.26-fold increase ($p=0.0156$) in HIV-specific CD8⁺ T-cell absolute numbers relative to DMSO. When restimulated with the cognate antigen, degranulation, and expression of granzymes, perforin and IFN γ in the degranulating tetramer positive cells were similar in PBMC treated with pomalidomide and DMSO.

Transcriptomic analyses demonstrated that pomalidomide-treated HIV-specific CD8⁺ T-cells clustered separately from DMSO-treated cells. Pomalidomide was associated with an upregulation of pathways involved in carbon metabolism, cell cycle and DNA replication in HIV-specific CD8⁺ T-cells, and strongly increased expression of MYB, a transcription factor implicated in CD8⁺ T-cell stemness, polyfunctionality and survival (5.36-fold $p=3.84E-20$). When analysed against a CD8⁺ T-cell 'core exhaustion profile', pomalidomide-treated HIV-specific CD8⁺ T-cells displayed less exhaustion than those treated with DMSO. RTN analysis identified E2F1 and PRMT3 as key regulators of the pomalidomide-associated responses in HIV-specific CD8⁺ T-cells. E2F1 and PRMT3 have been implicated in promoting proliferation, with E2F1 a cell cycle effector regulated by Ikaros.

Conclusions: We show that pomalidomide enhances HIV-specific CD8⁺ T-cell responses and provides a compelling justification for the investigation of pomalidomide as an immune-enhancing therapeutic agent as part of HIV cure approaches.

EPA0037

Zinc protein inhibitor SAMT-247 modulate immune response generated by ALVAC-based HIV vaccine candidate and improve the vaccine efficacy

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Background: The HIV epidemic remains unabated in sub-Saharan Africa, particularly in adolescent women who have limited access to antiretroviral therapy. The deletion of the Env V1 region of the DNA/ALVAC/gp120 vaccine regimen has improved vaccine efficacy compared to RV144 trial. Furthermore, the antiretroviral agent SAMT-247 formulated as vaginal gel has been shown to have an anti-HIV effect.

Here, we tested the hypothesis that the SAMT-247 microbicide targeting the HIV/SIV nucleocapsid protein in combination with DNA/ALVAC/gp120 Δ V1 vaccination would provide benefit and augment protection against SIVmac251 vaginal challenge.

Methods: Thirty-eight macaques were vaccinated with the Δ V1 DNA/ALVAC/gp120/alum vaccines, and 12 animals remained naive. All animals received up to 14 consecutive weekly intravaginal SIVmac251 challenges in the presence (20 vaccinated & 6 naive) of 0.8% SAMT-247 in HEC gel, or HEC gel only (18 vaccinated & 6 naive) dosed vaginally 4-hours before each challenge until infection was confirmed. Immunological assays such as ADCC, effero-cytosis, ELISA, immunohistochemistry, flowcytometry to measure cell frequencies and cytokine production, with an emphasis on immune responses correlating with vaccine efficacy.

Results: Vaccine alone decreased the risk of virus acquisition by 65% ($p=0.0074$). Strikingly, the vaccine+SAMT-247 combination afforded a 92.7% reduction in the risk of virus acquisition when compared to controls ($p<0.0001$). The vaccine+SAMT-247 combination differed significantly from the vaccine-only group ($p=0.006$;) and protected



from highly pathogenic SIVmac251 infection in 16 of 20 animals (80%). At the dose used, treatment with SAMT-247 alone did not significantly decrease risk of virus acquisition. Vaccine efficacy results from V2 antibody responses, recruitment of Nkp44 IL-17⁺ cells to mucosal sites and efferocytosis.

In vitro experiments suggested that the protective responses by vaccine such as ADCC, efferocytosis, IL-17⁺Nkp44⁺ responses, CCR5 $\alpha_4\beta_7$ Th1 and Th2 cell responses were augmented by the presence of SAMT-247.

Further data suggested that SAMT-247 mobilize cellular zinc, a master regulator of immunity, which might play an important role in the augmented vaccine efficacy.

Conclusions: SAMT-247 is safe and does not induce mucosal inflammation, suggesting that delivery methods aimed to maintain effective drug concentrations in the vaginal mucosa, such as a controlled release intravaginal ring, combined with the DNA/ALVAC/gp120/alum vaccine regimen, may result in durable protection against HIV.

EPA0038

Duration of antiretroviral therapy is a determinant of the frequency of NKG2C⁺CD57⁺ adaptive NK cells in persons living with cytomegalovirus and HIV infections

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Background: Of the people living with HIV (PLWH) enrolled in the Canadian HIV and Aging Cohort Study (CHACS), 94% were cytomegalovirus (CMV) co-infected. CMV drives the expansion of NKG2C⁺CD57⁺ Natural Killer cells with memory-like features. The frequency of adaptive NK (adapNK) cells did not differ in CMV⁺PLWH and CMV⁺HIV⁺ persons enrolled in the CHACS who were all >40 yrs of age.

In contrast, the frequency of adapNK cells was higher in CMV⁺PLWH enrolled in the Montreal Primary Infection (PI) cohort than in CMV⁺HIV⁺ persons who were <40 yrs of age. However, age and time on antiretroviral treatment (ART) are positively correlated in PLWH. We questioned whether age or time on-ART influenced adapNK cell frequency.

Methods: We evaluated the frequency of CD3⁺CD14⁺CD19⁺CD56^{dim}NKG2C⁺CD57⁺ adapNK cells in 3 groups of CMV⁺PLWH and 2 groups of CMV⁺HIV⁺ persons by multiparametric flow cytometry.

Groups	1 CMV ⁺ PLWH	2 CMV ⁺ HIV	3 CMV ⁺ PLWH	4 CMV ⁺ PLWH	5 CMV ⁺ HIV
Cohort/Age category	CHACS older	CHACS older	PI younger	PI older	younger
Age	55.7 (51.1,59.3)	57.7 (50.8,62.4)	33.2 (30.8,38.2)	54.1 (52.9,60.1)	31.5 (25.2,36.6)
ART duration	Long	None	Short	Short	None
Years on-ART	16.0 (8.6,19.1)		1.4 (1.0, 2.2)	1.94 (1.8,2.0)	
% adapNK cells	15.9 (5.8,39.4)	13.7 (3.7,33.9)	39.8 (18.8,58.2)	27.5 (18.8,52.85)	15.6 (2.5,33.3)

Table.

Results: AdapNK cell frequency did not differ significantly in older CMV⁺PLWH and CMV⁺HIV⁺ persons (group 1 versus 2). Younger CMV⁺PLWH had a higher frequency of adapNK cells than similarly aged CMV⁺HIV⁺ (group 3 versus 5 (p=0.003, Mann-Whitney). The CMV⁺PLWH in groups 1 and 4 were of similar age and significantly older than those in group 3. CMV⁺PLWH PI subjects in groups 3 and 4 were on-ART for a similar duration that was shorter than those in group 1.

The frequency of adapNK cells was similar in the two CMV⁺PLWH groups on ART for similar times despite their significant difference in age (group 3 and 4). This frequency was higher than in the CMV⁺PLWH CHACS subjects in group 1. Time on-ART was negatively correlated with adapNK cell frequency.

Conclusions: The absence of significant differences in the frequency of adapNK cells in older CMV⁺PLWH on-ART and untreated CMV⁺HIV⁺ CHACS participants (groups 1 and 2) and in groups 3 and 4 who differed in age but had a similar time on-ART, is consistent with a time on-ART dependent decline in the frequency of adapNK cells.

EPA0039

IL-15 treatment rescues perturbations to NK cell mitochondrial fitness and effector function driven by acute SIV infection

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Background: As one of the earliest responders to HIV infection, NK cells play a central role in blocking transmission and virus-dissemination. Unfortunately, their global functional and capacity to infiltrate tissues is compromised during infection, limiting their effector response.

The primary objective of this research was to determine how acute SIV infection impacted the metabolic fitness of NK cells, elucidate the relationship between fitness, function and trafficking to virus replication sites and whether the NK cell homeostatic cytokine IL-15 could rescue the perturbations driven by infection.


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Methods: Peripheral lymph nodes (PLN), PBMCs and spleen samples from SIV-naïve and infected rhesus macaques were used to analyze metabolic and functional profiles of NK cells. NK cells were supplemented with/without IL-15 and co-cultured with the classical NK cell targets, K562 cells.

Samples were analyzed for functional, lineage, activation, and nutrient transporter markers by multiparametric flow cytometry as well as MitoTracker Red CMXRos and MitoSOX, to measure mitochondrial membrane polarization ($\Delta\Psi_m$) and the presence of superoxides.

Results: Our results indicated that acute SIV infection increased the frequency of NK cells that displayed perturbed mitochondrial phenotypes (i.e., decreased $\Delta\Psi_m$ $p = 0.0003$ and higher superoxide accumulation $p = 0.0027$). This metabolic dysfunction was most evident in NK cells from PLN post-infection. Treatment with IL-15, reversed these phenomena in SIV+ samples, increasing $\Delta\Psi_m$ ($p < 0.0001$) and decreasing superoxide accumulation ($p = 0.0001$). CXCR5 expression, a B cell follicle trafficking marker, strongly correlated with $\Delta\Psi_m$ ($p = 0.0024$) indicating that expression may be tied to mitochondrial health. IL-15 also increased the expression of the amino-acid transporter CD98 ($p < 0.0001$), and decreased the frequency of CD56-CD16- NK cells ($p < 0.0001$). Functionally, NK cells with higher or rescued $\Delta\Psi_m$ produced stronger cytokine responses (TNF- α , IFN- γ , and MIP1-b).

Conclusions: These findings indicate that lentivirus infection induces systemic mitochondrial dysfunction in NK cells, a fundamental pathology undermining their ability to infiltrate tissues and respond to infection, and that IL-15 exposure reverses these phenomena.

These data highlight the importance of understanding and treating metabolic perturbations caused by infection and supports IL-15 as a candidate to augment NK cell-based HIV eradication treatments.

EPA0040

Ibalizumab and CD4 domain 2 exert an allosteric effect on HIV envelope binding to CD4 domain1

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Background: HIV infection of CD4⁺ T cells is mediated by a high affinity interaction between the HIV envelope (gp120/41) and the CD4 receptor. To date, Ibalizumab, a CD4 domain 2 (D2) mAb, is the only CD4 mAb widely used to treat people living with HIV. Ibalizumab does not block gp120 binding to CD4 but is believed to interfere with post-binding events (figure 1).

gp120 binds to CD4 domain 1 (D1), while ibalizumab binds to CD4 domain 2 (D2). There appears to be no direct contact between D1 and D2, and ibalizumab does not interact with the gp120 binding site in D1. In this study we inves-

tigated unrecognized properties of the CD4 receptor that may impact mechanisms by which Ibalizumab blocks HIV entry into CD4⁺ cells.

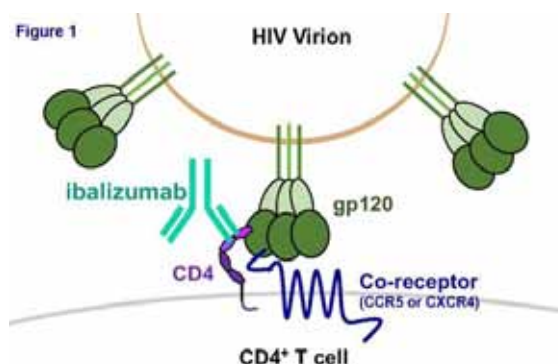


Figure 1.

Methods: Our studies relied upon mass photometry, surface plasmon resonance and flow-cytometry to characterize the impact of ibalizumab on gp120 binding to CD4.

Results: Results from three independent techniques, mass photometry, SPR, and flow-cytometry provide evidence of unexpected cross-talk between CD4 domains 1 and 2. Mutations in the CD4 binding site in D1 significantly enhance ibalizumab binding to D2. Although ibalizumab does not compete with gp120, preincubation with CD4 inhibits gp120 binding. Cross-talk is bidirectional. Mutations in CD4 D2 impact gp120 binding to CD4 D1. We further show that CD4 D2 may impact gp120 CD4 interactions in ways that were not previously recognized.

Conclusions: We identified a new way in which CD4 D2, and drugs that target this domain, can impact the HIV envelope binding to its principal receptor. These observations may assist in the further development of HIV entry inhibitors.

**EPA0041****Effect on time of SIV_{mac251} acquisition by passive administration of monoclonal antibodies recognizing SIV V2 in either the CH59-like coil/helical or the b-sheet conformations**

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Background: The primary correlate of reduced risk in the RV144 Phase III trial was the level of IgG binding to the V1/V2 variable loops of gp120 scaffolded on gp70. V2 contains cryptic RDK and LDI/V binding motifs for the gut-homing host $\alpha_4\beta_7$ integrin receptor.

Further insight on the role of anti-V2 binding, non-neutralizing antibodies has been provided by the recent demonstration that V2 binding to $\alpha_4\beta_7$ on CD4⁺ T-cells co-stimulates CD4⁺ cells and, by upregulating CCR5 expression, facilitates HIV/SIV infection.

Methods: NCI05 and NCI09 were cloned from a vaccinated macaque that resisted 22 low-dose intrarectal challenges of SIV_{mac251} for over a year, both targeting an overlapping, conformationally dynamic epitope in SIV-envelope V2.

We characterized the ability of NCI05 and NCI09 to mediate ADCP, trogocytosis, antibody-dependent cellular cytotoxicity (ADCC), and inhibition of gp120 costimulation of CD4⁺ T cells.

We treated two groups of 9 macaques each with NCI05 or NCI09 at a dose of 20 mg/kg, beginning at four days prior to the first SIV_{mac251} challenge. Levels and effector functions of V2 mAbs were assessed in plasma rectal secretions and correlated with time of SIV acquisition.

Results: Here, we show that NCI05 recognizes a CH59-like coil/helical epitope whereas NCI09 recognizes a b-hairpin linear epitope. *In vitro*, NCI05 and, to a lesser extent, NCI09 mediate the killing of SIV infected cells in a CD4-dependent manner. Compared to NCI05, NCI09 mediates higher ADCC titers to gp120-coated cells, as well as higher lev-

els of trogocytosis, a monocyte function that contributes to immune evasion. Strikingly, mucosal levels of NCI05 strongly correlated with a decreased risk of SIV_{mac251} acquisition and there was a similar trend for ADCC mediated by plasma samples from NCI05-treated animals.

Conclusions: Passive administration of NCI05 or NCI09 to macaques did not affect the risk of SIV_{mac251} acquisition compared to controls, demonstrating that these anti-V2 antibodies alone are not protective.

However, NCI05 but not NCI09 mucosal levels strongly correlated with delayed SIV_{mac251} acquisition, and functional and structural data suggest that NCI05 targets a transient state of the viral spike apex that is partially opened, as compared to its prefusion conformation.

EPA0042**Identification and characterization of HIV-1-specific CD8⁺ T cells in highly HIV-1 exposed but uninfected MsM in Vietnam**

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Background: Several studies reported that HIV-1-specific cytotoxic T lymphocytes (CTLs) were detected in a part of individuals called highly exposed seronegative (HESN) individuals who remained uninfected despite repeated exposures to HIV-1. However, it is unknown whether these T cells can recognize HIV-1-infected cells and contribute to prevention of HIV-1 infection.

Methods: We analyzed HIV-1-specific T cells among HESN men who are sex with men (MSM) in Vietnam where the subtype AE is epidemic. We recruited 249 seronegative MSM and analyzed T cell responses to overlapping 17-mer peptides spanning the consensus sequences of Nef, Gag and Pol proteins among HIV-1 subtype A/E in Vietnam.

We stimulated PBMCs from these individuals with 281 overlapping HIV-1 peptides and tested the responses of the cultured cells to these peptides after 3 weeks culture by performing ICS assay. Responses of HIV-1-specific T cells to HIV-1-infected cells were tested by using target cells infected with HIV-1 subtype AE clone derived from a Vietnamese.

Results: Responses of CD8⁺ T cells to five 17-mer peptides were detected in 5 of 249 individuals. We attempted to identify T cell epitopes recognized by these T cells using truncated peptides of these 17-mers as well as HLA restriction of the responses. Three HIV-1 epitopes, HLA-A*02:01-restricted Nef, HLA-B*15:02-restricted Gag, and HLA-B*58:01-restricted Pol epitopes, were identified in 3 individuals.


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To clarify the ability of these T cells to recognize HIV-1-infected cells, we analyzed CD8⁺ T cell responses to target cells infected with HIV-1 subtype AE clone. HLA-B*15:02-restricted GagHL9-specific CD8⁺ T cells effectively recognized HIV-1 infected cells. These results indicated that HIV-1-specific T cells in HESN individuals can recognize HIV-1-infected cells.

Conclusions: The present study demonstrated that HIV-1-specific CD8⁺ T cells were detected in approximately 2 % of HESN individuals in Vietnam. Some of them effectively could recognize HIV-1-infected cells. Further study is expected to clarify the role of these T cells in HIV-1 protection.

EPA0043

Favourable transcriptomic signature of HIV-specific CD8 T cells in response to single anti-PD1 dose in people with HIV on ART and cancer

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Background: In people with HIV (PWH), immune dysfunction persists with elevated expression of the exhaustion marker programmed death (PD-1) despite suppressive antiretroviral therapy (ART). Anti-PD1 in people with cancer can reinvigorate exhausted tumor-specific T cells through the proliferative burst of exhausted effector T cells (TEX) that originate exclusively from T precursor exhausted (TPEX) cells. There is high interest in whether anti-PD1 can also drive recovery of HIV-specific T-cell cytolytic function in PWH.

Methods: PWH on ART with cancer were enrolled in the AIDS Malignancy Consortium (AMC)-095 Study and received anti-PD1 (nivolumab) every 3 weeks. Blood was collected prior to and following the first, fourth and subsequent infusions. In a subset of 8 participants, we sorted HIV-tetramer⁺ CD8 T-cells and performed single cell RNA sequencing using the Chromium 10X platform.

We analysed antigen-specific cytokine production using intracellular cytokine staining (ICS) following incubation with gag and nef peptides.

Results: Following the first dose of anti-PD1, we observed a significant increase in the frequency of Tex cells ($p=0.028$) in 3 out of 8 participants. In these three participants, central memory T- cells (TCM) showed differentially expressed genes (DEG) associated with molecular pathways of the HIV-1 viral cycle, type I interferon signaling and cytokine response.

We identified HIV specific TCRs through their TCR beta chain and found that among TCM, expanded clonotypes compared to non-expanded clonotypes displayed differential expression of genes with effector-like functions, while hallmarks of memory were downregulated.

The expanded clonotypes accumulated only in the 3 participants with an increase in TEX and were not associated with increased production of antiviral cytokines. There was minimal additional impact on the transcriptome following subsequent doses of anti-PD1.

Conclusions: A distinct and favorable transcriptional response to anti-PD1 is seen within HIV- antigen specific CD8 T-cells in PWH on ART.

This response was evident in a subset of participants following the initial dose of anti-PD1 with no further enhancement after subsequent infusions.

Collectively, this shows that HIV-specific T-cell exhaustion can be perturbed using therapeutic blockade of PD1.

EPA0044

CX3CR1⁺ macrophages as guardians of the intestinal barrier: lessons learnt from non-human primates exposed to SIV or SARS CoV-2

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Background: Maintenance of gut homeostasis is critical to efficient immune responses and is dependent on a population of *lamina propria* (LP) resident macrophages (M ϕ) expressing the fractalkine receptor CX3CR1, which play a pivotal role in the maintenance of the intestinal epithelial barrier, microbial translocation and the host response to microbiota changes.

Humans exposed to HIV-1 and Cynomolgus macaques (CMs) exposed to SIV show highly persistent immune activation and inflammation in their gut, which are strong predictors of disease progression and are prevalent despite antiretroviral therapy.

Moreover, people diagnosed with COVID-19 also presented with symptoms of gastrointestinal (GI) disruption like diarrhea, vomiting and nausea; along with detectable rectal viral load and various long-term sequelae like intes-



tinal dysbiosis. Thus, understanding the immune response to SIV and SARS CoV-2 in the GI tract is crucial to develop strategies targeted towards improving host outcomes.

Methods: Hypothesizing that the loss of intestinal CX3CR1⁺ Mø homeostasis contributes to the sustained immune activation seen during SIV or SARS CoV-2 exposure, we analyzed the frequency, phenotype and functionality of colonic Møs expressing CX3CR1 in the following cohorts of CMs: 12 controls, 12 chronically SIV_{mac251}-exposed (SIV+), and 11 animals examined either at acute (7-9 days, n=5) or at the resolved phase (43 days, n=6) post exposure to SARS CoV-2.

Results: The control colons had a predominant population of mature tissue-resident CD64⁺CD14⁺CD11c⁺CX3CR1^{high} Mø. In SIV+ CMs, we observed a significant accumulation of CD14⁺, CD11c⁺, CX3CR1^{low} pro-inflammatory Mø, along with the upregulation of soluble inflammation markers like calprotectin and fractalkine.

Meanwhile, in CMs exposed to SARS CoV-2, colonic CX3CR1^{low} Møs accumulated in the acute phase and correlated with an increase in the intestinal fatty acid binding protein (iFABP) levels, with a concomitant reversal to the CX3CR1^{high} Mø population observed in the resolved phase. However, this reversal seems to be defective with a significant reduction in total Mø frequency at resolution, accompanied by high levels of soluble CD14, fractalkine and calprotectin.

Conclusions: Our results suggest that the maintenance of macrophage homeostasis is vital to the preservation of the GI barrier and the short and long-term response to viral exposures, be it with HIV-1 or SARS CoV-2.

EPA0045

Longitudinal humoral and celular immune responses to mRNA SARS-CoV-2 vaccination in adolescents living with HIV

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Background: Children and adolescents living with HIV (ALHIV) might be at risk of severe COVID-19 and candidates for booster vaccines doses. Data on immunogenicity and durability of SARS-CoV-2 vaccines in ALHIV are scarce. More knowledge is needed on the immune response and their protection correlate against SARS-CoV-2 variants. Our aim was to assess the longitudinal evolution of humoral-cellular responses after mRNA vaccination in ALHIV.

Methods: A prospective observational study was performed after mRNA vaccination. Samples were drawn 3-8 weeks (T1) and 6 months (T2) after second dose of mRNA

vaccines in 26 ALHIV and compared to 20 healthy Spanish controls. Humoral response was assessed by SARS-CoV-2 antibodies (chemiluminescent microparticle immunoassay: Alinity® Quant assay-Abbott) detecting IgG against S1 spike protein (≥50 U/mL reactive). T Cell response was measured by IGRA (Euroimmun) of S1 peptide-stimulated T-cells in whole blood (≥200 mIU/ml reactive).

Results: Twenty-six ALHIV (16 female, 25 perinatally-transmission, 14 Spanish origin) were included from 5 hospitals in Madrid, after mRNA vaccination (89% 2 doses) (10 Moderna, 16 Pfizer/BioNTech), between August 2021-March 2022. Median age was 17 (ALHIV) and 15.5 years (controls) (p:0.04). Median baseline CD4 count/nadir were 698/345 cells/ul. All on integrase inhibitors (24 undetectable viral load) ART regimen. 47% ALHIV and 44% controls had documented COVID-19 between T1-T2. All subjects elicited reactive humoral and cellular immune responses. ALHIV had lower anti-Spike titers at T1 (median:14662) than controls (31854)(p:0.018), but not at T2 (11275, controls 10917; p:0.32). IGRA titers were lower in ALHIV (median:1689) than controls (1873) at T1 (p:0.004), but not at T2 (2078, controls 2114; p:0.4). By logistic regression no differences were observed regarding vaccine type, COVID-19 infection between T1-T2 or HIV status.

Conclusions: ALHIV elicit an appropriate humoral and cellular immune response that is maintained at 6 months after mRNA vaccination. Although ALHIV appears to mount a short-term lower quantitative immune response, in the setting of ongoing SARS-CoV-2 infections, the degree of protection at 6 months appears to be similar to healthy controls. Larger and more prolonged studies are needed to determine the need for additional doses of SARS-CoV-2 in ALHIV and the immune correlates for protection.

EPA0046

Immunogenicity of conjugate meningococcal ACWY-TT vaccine in adolescents living with HIV

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Background: Adolescents living with HIV (ALHIV) are at increased risk of meningococcal infection. Conjugate meningococcal vaccines are recommended, but no studies have been conducted on the immunogenicity of MenACWY-TT in ALHIV and a two dose booster schedule might be needed. Aim: to assess MenACWY-TT vaccine response in ALHIV.

Methods: Prospective study conducted in ALHIV in Madrid with the administration of 2 doses of MenACWY-TT(2 months apart) and the assesment of serum bactericidal

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antibodies (SBA) assays using rabbit complement. Sera were scheduled to be assessed at baseline, one month and 10 months after second dose. A threshold of hSBA titres of $>1:8$ against C, W-135 and Y groups was considered protective.

Vaccine response was defined as a postvaccination SBA titre of $>1:32$ in initially seronegative subjects ($<1:8$) and a 4-fold increase in titre from pre- to post-vaccination in initially seropositive subjects ($>1:8$). Most adolescents had been previously immunized with a primary series of MenC-conjugate-vaccine in the first year of life.

Results: Twenty-nine adolescents living with HIV were included (17 females (58.6%), median age 16.6 years (IQR 11.4–21.6), 22 (75.8%) perinatally HIV-acquired). At baseline, all on ART, 27 (93%) presented undetectable viral load, median CD4+count was 902 cells/ml (645 – 1070).

Overall, 7 (24.1%), 9 (31%) and 8 (27.6%) subjects had protective antibodies against capsular groups C, W-135 and Y, respectively, at baseline.

One month postvaccination, 25 (86.2%), 26 (89%) and 25 (86.2%) adolescents showed vaccine response for C, W-135 and Y serogroup. Most of them, 21 (72.4%) showed vaccine response to all vaccine serogroups.

After one year, among 24 adolescents who maintained follow-up, 17 (70.8%) had protective antibodies against C capsular group and 23 (95.8%) against W-135 and Y groups. There were no significant differences on viral load, CD4+ count or CDC-classification among adolescents who presented vaccine response (or not), neither among those who maintain (or not) protective antibodies after one year.

Conclusions: Adolescents living with HIV with good immuno-virological status achieve appropriate antibody-mediated protection against serogroups C, W-135 and Y after 2 booster doses of Men ACWY-TT. At 12 months, more than two-thirds of adolescents presented protective antibodies, being this percentage higher for W-135 and Y groups than for C capsular group.

EPA0047

Cryo-EM analysis provide structural insights for broad HIV-1 neutralization by a heavy chain matured antibody from an Indian pediatric elite-neutralizer

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Background: The structural information of HIV-1 broadly neutralizing antibodies (bnAbs) are currently being used to guide rational vaccine design. The functional and structural features of HIV-1 bnAbs from adults are known

whereas there is a paucity of such information on bnAbs identified from children living with chronic HIV. We previously reported the discovery of a singular pediatric HIV-1 bnAb AIIMS-P01, from an Indian pediatric elite-neutralizer AIIMS_330.

This study aimed to delineate the structure and functional characteristics of AIIMS-P01 matured lineage member(s) to understand the effect of somatic hypermutation in pediatric HIV-1 bnAbs and to provide structural information for vaccine design.

Methods: Herein, we first performed the deep sequencing of total B cells isolated from the peripheral blood mononuclear cells of AIIMS_330 samples collected during 2015–2018 at AIIMS hospital, New Delhi, India. The sequence analysis led to the identification of a heavy chain matured AIIMS-P01 lineage members.

One of the AIIMS-P01 lineage member 44m was further characterized to determine its HIV-1 binding and neutralization potential followed by structural analysis by Cryo-EM in complex with BG505.SOSIP trimer.

Results: In comparison to its wild-type AIIMS-P01 bnAb, 44m exhibited moderately higher level of somatic hypermutations (SHM) of 15.2%. 44m neutralized 79% of HIV-1 heterologous viruses tested, with a geometric mean IC50 titer of 0.36 μ g/ml. The cryoEM structure of 44m Fab in complex with fully-cleaved glycosylated native-like BG505.SOSIP envelope trimer at 4.4 Å resolution revealed that 44m targets the V3-glycan N332-supersite and GDIR motif to neutralize HIV-1 with improved potency and breadth.

Conclusions: Our results showed that broad HIV-1 neutralisation potential exhibited by 44m, is plausibly attributed by a matured heavy chain as compared to that of wild-type AIIMS-P01 bnAb.

This study advances our understanding on the evolution of pediatric HIV-1 bnAbs. The structural basis of broad HIV-1 neutralization by 44m may be useful blueprint for vaccine design in future.

Further studies in this direction are required to be conducted to understand the antigenic triggers in children living with chronic HIV that can elicit bnAbs targeting other HIV-1 bnAb epitopes which in turn can provide simpler blueprint to guide HIV-1 vaccine design.

**EPA0048****Feasibility of iNKT cells as an immunotherapeutic HIV cure intervention**

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Background: Innovative approaches are needed to achieve a functional HIV cure. Invariant-natural-killer T-cells (iNKTs) are an innate-like T-cell subset that express an invariant T-cell receptor which are not restricted to polymorphic HLA and therefore may provide an allogenic or "off the shelf" immunotherapy.

Understanding the anatomical distribution and the potential for HIV infection of iNKTs is essential to assess the feasibility of their use in HIV.

Methods: Peripheral Blood Mononuclear Cells (PBMCs) were collected from people with HIV (PWH) and controls. Colonic tissue from controls undergoing bowel resection was digested into a single cell suspension using collagenase. Flow cytometry was used to assess the expression of TCR Vα24-Jα18, TCR Vβ11, CD3, CD45 & CXCR5. iNKTs were expanded and used for in vitro infection by HIV_{BAL}. p24 was measured by Flow Cytometry and ELISA.

Results: The frequency of iNKTs in PBMCs as a proportion of CD45+CD3+ single cells (n=43) varied widely by donor (mean 0.08%; SD 0.13%; range 0.01-0.68%).

The median frequency of iNKTs in PBMC was similar in PWH (n=33; median 0.04%) compared to controls (n=10; median 0.02%, P=0.25). iNKT cells were more frequent in colon tissue (n=7; median 0.31%) compared to peripheral blood (n=43; median 0.03%, P<0.0001).

Median CD4 expression on iNKTs was 43% on PBMCs and 27% in colon, with increased CXCR5 in tissue. In vitro infection of expanded iNKTs demonstrates p24 positive iNKT cell populations primarily in the CD8 negative iNKTs but not in CD8+ iNKTs (Figure 1).

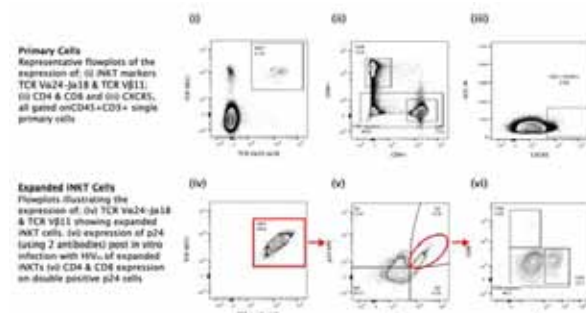


Figure 1.

Conclusions: iNKTs are present at higher frequencies in the HIV reservoir of the gut with expression of markers which facilitate access to the germinal centre.

However, CD8 negative iNKT are potential targets for HIV infection. These data suggest that CD8+ iNKT cells are a potential immunotherapeutic agent.

EPA0049**HIV vaccine candidate efficacy mediated by epigenetic changes in CD14⁺ cells and cAMP-dependent efferocytosis**

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Background: The DNA/ALVAC-SIV/gp120 vaccine significantly decreased the risk of SIV_{mac251} acquisition. CD14⁺ monocytes and the Antibody-dependent cellular cytotoxicity to the V2 (V2-ADCC) of SIV were correlated with reduced risk of acquisition, indicating the central role of innate response in mounting an effective response to vaccination.

We hypothesized that in-depth understanding of the innate and adaptive responses to vaccination will elucidate mechanisms of protection and will allow to increase vaccine efficacy.

Methods: To test this hypothesis, we integrated different analyses conducted in two separate macaque studies to elucidate how the innate and adaptive responses cooperate in reducing the risk of SIV_{mac251} acquisition. Animals were immunized with the DNA/ALVAC-SIV/gp120 based-vaccines and exposed to SIV_{mac251}.

Analyses of samples collected from vaccinated macaques included canonical assays (ADCC, cell analysis by flowcytometry and CD14⁺ efferocytosis) together with multi-omics (RNA- and ATAC-sequencing).

Results: The study of the vaccine-induced changes of transcriptome and the epigenetic landscape of CD14⁺ cells showed that epigenetic reprogramming of enhancer region surrounding *CREB1* gene was associated with reduced risk of acquisition and V2-ADCC.

Additionally, we found that, efferocytosis, a cyclic AMP (cAMP)-dependent process of CD14⁺ monocytes that clear engulfed apoptotic cells, is a novel correlate of reduced risk of SIV_{mac251} acquisition that complements V2-ADCC. The study of CD4⁺ T-cells responses elicited by vaccination identified that the frequency of CD4⁺ T-cells expressing the chemokine receptor CXCR3⁺ is a correlate of decreased risk of acquisition and that these cells could migrate in the mucosa where they lower the susceptibility to infection.

Additionally, these cells were associated with the V2-ADCC and the increased accessibility to *CREB1* gene identified in the CD14⁺ cells, suggesting the ability of vaccine-induced innate and adaptive responses to influence each other.

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The study of the vaccine-induced changes of transcriptome and the epigenetic landscape of CD3⁺ cells identified 35 genes whose expressions and accessibility were either decreased or increased in the animals with delayed acquisition.

Conclusions: All together these data suggest that epigenetic reprogramming in immune cells, and their effect on V2-ADCC and efferocytosis, contribute to vaccine efficacy by decreasing inflammation and maintaining tissue homeostasis, and therefore counteract the SIV acquisition.

EPA0050

Post-treatment controllers exhibit distinct CD8⁺ T cell features before and after ART interruption

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Background: Rare individuals, termed HIV post-treatment controllers (PTCs), can exhibit prolonged periods of viral control upon ART withdrawal, but the mechanisms by which this occurs remain poorly understood.

In this study, we assessed whether PTCs exhibit unique T-cell properties.

Methods: A 40-parameter CyTOF panel was developed to characterize the differentiation, activation, and other phenotypic features of T cells. The panel was applied to PBMCs collected on ART and prior to treatment interruption from clinically matched PTC (n=20) and non-controller (NC) participants (n=32).

In addition, post-interruption specimens were analyzed to characterize differential features between PTCs and NCs off ART. CyTOF datasets were gated on T cells, and clustered and mixed effects models were used to identify associations with PTC/NC status.

Results: By implementing cluster-resolution optimization, we identified nine distinct T cell clusters. Prior to ART interruption, one cluster was significantly less abundant in subsequent PTCs than NCs. This cluster consisted of memory CD8⁺ T cells expressing high levels of PD1 and TIGIT, suggesting immune exhaustion.

After ART interruption, a separate cluster comprised predominantly of activated CD8⁺ Temra cells expressing high levels of the pro-survival factor BIRC5 significantly increased in abundance in PTCs, while it exhibited the opposite pattern in NCs.

We also found post-ART that NCs harbored a larger proportion of a cluster that was comprised of CD4-CD8- T cells expressing high levels of Tfh marker CXCR5 and activation marker CD30, both previously shown to be increased on HIV-infected cells.

Conclusions: Our data suggest that prior to interrupting ART, people who subsequently control HIV exhibit lower frequencies of exhausted CD8⁺ T cells, which may enable these individuals to better control HIV replication upon ART cessation. After ART interruption, a population of activated CD8⁺ Temra expressing BIRC5 expands in PTCs but not NCs; theoretically, these cells might persist longer and be able to maintain more direct virus control.

Post-ATI viremia in NCs is associated with a population of CD4-CD8- T cells expressing antigens associated with HIV-infected cells; ongoing work seeks to determine whether these cells are productively-infected with HIV.

EPA0051

Specific immunological response after administration of anti-meningococcal quadrivalent conjugate vaccine MENVEO® in a population of vertically HIV-infected children, adolescents and young adults

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Background: It is recommended that PLWH aged ≥2 months should routinely receive meningococcal conjugate vaccine. However, HIV-subjects, because of immune abnormalities, may undergo impaired vaccine response. Our study aims to assess humoral and cell-mediated immune responses after the administration of a quadrivalent meningococcal conjugate vaccine Menveo® (MenAC-WY-CRM, GlaxoSmithKline Vaccines) in HIV-infected young patients.

Methods: We carried out a controlled, non-randomized, observational and prospectively study, involving 27 HIV-infected patients aged 9–30 years, reporting vertically-transmitted HIV infection and followed at the Pediatric Infective Disease Clinic of Luigi Sacco Hospital, Milan.

All patients enrolled were on ART, and 25 out of 27 presented optimal immunological and viral response. Each subject received the vaccine Menveo (0,5 ml i.m.).

MenACWY-specific Ab titer, viral load, and CD4⁺ T cells count were measured at baseline (T0), T3, T6 and T12 months post vaccination. MenACWY-specific cell-mediated immune responses were evaluated at the same time points.

Results: Menveo induced seroconversion in 26 out of 27 subjects. We divided our cohort in different subgroups: Responders (R), reporting seroconversion at T3, Highly-



Responders (HR) with a high Ab titer at T0, and Non-Responders (NR). The administration of the vaccine induced MenACWY-specific immunological memory mainly in R and HRs: CD4+ (at T12) and CD8+ (at T3 and T12) T Central Memory. MenACWY-specific TNF α -, IFN γ - CD8+ T cells and IL2-secreting CD4+ T cells were increased in Rs and HRs at T3 and T6.

However, at T12, this effect was slightly decreased. In the NR group, terminally-differentiated CD4+ and CD8+ T cells were the only parameters modified.

Conclusions: The administration of Menveo® vaccine induced a valid antibody-mediated protection in both the R and HR subgroups. We observed the development of a stable T cell-mediated immune memory that lasted robustly up to one year since vaccination in most of the subjects analyzed. Furthermore, we observed increased CD8+ CTL functions specifically in Rs and HRs, with significant increases of TNF α and IFN γ secretion.

The lack of Menveo-specific immune response, observed in the NR subject, is associated with a low compliance to the therapy and high viremia. Our data indicate that alternate immunization schedules need to be considered in ART-non-responder patients.

EPA0052

Costimulation with MAdCAM and retinoic acid generates the formation of gut tissue resident memory CD8 T cells that express E-cadherin

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Background: Tissue resident memory cells (T_{RM}s) function as a first line of defense against invading pathogens. Although they hold the potential to play an important role in preventing HIV acquisition, they are difficult to study. Sampling these cells is difficult, and there is no established method to generate them in vitro.

The two principal markers of T_{RM}s are CD69 and CD103 (in the form of $\alpha_E\beta_7$). We have established a system to generate CD8+ T_{RM}s in vitro.

Methods: Primary CD8+ T cells isolated from healthy donors were costimulated with a panel of non-canonical costimulatory ligands including CD80, CD86, MAdCAM and VCAM to generate memory CD8+ T cells with distinct differentiation patterns. Retinoic acid (RA) and TGF- β were also employed. Gene expression profiling (RNAseq), cytokine profiling (Luminex) and multi-parameter flow cytometry were employed to characterize differentiated cells. We employed FRET (FLIM) imaging to evaluate CD103 association with E-cadherin.

Results: Among the different costimulatory ligands we evaluated, MAdCAM and anti CD28, when combined with RA and TGF- β , both generated CD8+ cells that expressed CD69, CD103, CCR9 and $\alpha_E\beta_7$, indicating T_{RM}s with a gut

homing phenotype. Transcriptional profiling by RNAseq provided further evidence that these cells adopted a T_{RM}-like phenotype. Of note, a subset of these cells also expressed E-cadherin, the natural ligand of CD103. The presence of E-cadherin suggests the upregulation of an inhibitory ligand as a regulatory mechanism.

Conclusions: This study provides a novel way to generate CD8+ T_{RM}s from primary peripheral blood CD8+ T cells. MAdCAM, when combined with RA and TGF- β generated cells with a phenotype consistent with gut homing. Up-regulation of E-cadherin suggested a novel regulatory mechanism for T_{RM} residency. These findings can provide new ways to evaluate immune-based mechanisms to prevent HIV acquisition.

Understanding and targeting persistent HIV reservoirs

EPA0053

Identification of novel PTPN1/PTPN2 inhibitors to target latent HIV reservoirs

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Background: 3-Hydroxy-1,2,3-Benzotriazin-4(3H)-one (HODHBt) is a latency reversal agent (LRA) that enhanced γ c-cytokine signaling by increasing phosphorylation and transcriptional activity of STAT5. We have shown that HODHBt increases IL-2 and IL-15 activation of STAT5, promoting reactivation from latency in a primary cell model and cells isolated from people living with HIV. Furthermore, we have shown that HODHBt enhances IL-15 mediated NK and CD8T cell effector function.

Recently, we used cellular-thermal shift assay followed with mass-spectrometry (CETSA-MS) to uncover the HODHBt target. We have found that HODHBt binds and inhibits the catalytic domain of the phosphatases PTPN1 and PTPN2. In spite of the positive properties of this class of compounds towards developing HIV cure approaches, their activity in the high micromolar range hinders further pharmacological development.

In here, we aimed to identify novel inhibitors and/or novel scaffold molecules targeting PTPN1/PTPN2 that could be further developed towards HIV cure strategies

Methods: We used an *in vitro* fluorogenic enzymatic assay to screen for compounds that inhibit PTPN1 and PTPN2. We tested 52 HODHBt derivatives and 94 known phosphatase inhibitors. Those with higher activity than HODHBt were then tested for their ability to enhance IL-2 mediated STAT5 transcriptional activation in the HEK-Blue IL-2 cell line.


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Results: From the 146 tested compounds, we have identified one HODHBt derivative and two phosphatase inhibitors with enhanced activity relative to our lead compound HODHBt. These compounds inhibit both PTPN1 and PTPN2 *in vitro* and have increased activity to enhance STAT5 transcriptional activity compared to HODHBt in the low micromolar range.

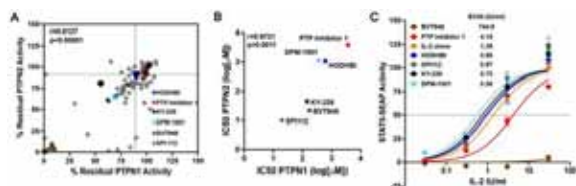


Figure. Identification of novel phosphatase inhibitors to target PTPN1 and PTPN2.

Conclusions: In conclusion, we have identified novel PTPN1/PTPN2 inhibitors with improved pharmacological capabilities that our lead compound HODHBt. Further medicinal chemistry and validation in *ex vivo* and *in vivo* models of HIV latency is currently underway.

EPA0054

P400/Tip60 chromatin remodeling complex in HIV transcription and latency establishment

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Background: Current HIV cure approaches, such as the block-and-lock and shock-and-kill strategies, depend on a complete understanding of the regulation of HIV transcription and the surrounding chromatin environment. There are ~320 chromatin regulatory factors (CRFs) that alter chromatin structure in a complex process, and characterization of chromatin regulators' roles in HIV transcription will potentiate development of multiangled approaches towards HIV transcriptional regulation.

Methods: We performed a pooled RNAi screen utilizing shRNAs embedded in a microRNA backbone (shRNAmirs) to probe all human CRFs simultaneously in the J-Lat 10.6 HIV latency model. Following hit identification, we validated the role of EP400 complex (TIP60/NuA4 complex) in various latency models by a combination of knockdown, overexpression, and mutational studies. The binding of the EP400 complex on HIV DNA were analyzed by native ChIP-PCR, and ChIP-seq and RNA-seq were used to characterize genome-wide EP400 complex transcriptional regulation.

Results: EP400 was identified in our pooled RNAi screen as a key regulator of HIV latency. RNAi of EP400 and the other components of the EP400 complex (DMAP1, BRD8, KAT5, EPC1, TRRAP) led to significant HIV reactivation, suggesting this complex is involved in maintaining transcriptional silencing of HIV provirus. RNA-seq analysis revealed that

HIV transcripts were the highest and most significantly upregulated genes upon EP400 and DMAP1 RNAi. A dual colour HIV vector (HIVGKO) was used to segregate active and latent HIV infected cells. A significantly larger proportion of integrated cells were found to be actively transcribing HIV, while a smaller proportion was latent upon EP400 complex RNAi, suggesting that EP400 complex regulates HIV latency establishment. EP400 complex associates with the proviral DNA with a peak at the HIV 5'LTR, suggesting this complex may regulate HIV transcription directly.

Interestingly, there was a high degree of concordance between RNAPII, EP400 and DMAP1 binding genome-wide by ChIP-seq, suggesting this complex might directly associate with and regulate RNAPII. This result is supported by Co-IP studies revealing an association of EP400 complex with RNAPII.

Conclusions: EP400 complex plays a previously unappreciated important role in silencing HIV transcription, it appears to act directly at the HIV LTR to negatively regulate HIV transcription.

EPA0055

Developing an ultrasensitive assay to quantify HIV-1 envelope protein in different matrixes

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Background: Recent advances have enabled the discovery, characterization, and commercial development of broadly neutralizing antibodies (bNAbs), a promising immunotherapy in HIV-1 treatment and/or cure research. One important mechanism of action of antibodies is their ability to opsonize and tag infected cells for antibody-dependent cellular cytotoxicity or phagocytosis (ADCC/ADCP) by immune effector cells.

Although the role for ADCC in protection from and control of HIV-1 infection has been demonstrated, bNAb mediated clearance of infected cells during analytic treatment interruption (ATI) has not been clearly shown to date, likely from lack of Env protein expression during suppressive ART.

Inadequate knowledge about the level of viral protein expression during HIV latency prevents effective use of therapeutics to target latent reservoirs. The ability to detect low level Env protein expression in cells will fill this gap.

Methods: Using the Quanterix SP-X platform, we have developed a homebrew assay to detect and quantify envelope protein in diverse matrixes. This is an assay that can be modified in-house to use any two sets antibodies and therefore is customizable.

Results: First, with an assay reproducibility of R²>0.99, we successfully detected monomeric YU-2 gp120 at LODs of 45-70fg/mL using a 3BNC117/10-1074 capture and detector antibody pair.



Next, we tested our ability to detect trimeric envelope spike on 2 pseudoviruses with neutralization sensitive and resistant IC80s to 10-1074. As expected, Env on the neutralization resistant pseudovirus was undetected. Finally, we evaluated detection of Env in cell lysates of ex vivo CD4⁺T cells infected with an infectious molecular clone expressing YU-2 Env or mutant YU-2 Env resistant to 10-1074. Infected cells were lysed in NETN lysis buffer, evaluated for Env expression and the IV signal normalized to the p24 levels in the lysates. We detected HIV Env protein in wild-type virus infected cells, but not in the resistant virus infected CD4T cells.

Conclusions: This assay will be an additional molecular tool which can be used to determine the expression of Env within the latent reservoir.

Importantly, the binding phenotype matches the neutralization sensitivity of the detector bNAb. This assay will provide more insight into the effectiveness of latency reversal agents.

EPA0056

HIV proviral reactivation is impaired in effector memory CD4⁺ T cells by immunometabolic reprogramming with dasatinib

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Background: We evaluated the use of dasatinib as latency promoting agent (LPA) by reducing the metabolic activity of viable CD4 cells to interfere with HIV reservoir replenishment.

Methods: CD4 from PLWH and healthy donors were isolated and provirus was reactivated \pm dasatinib 75nM 72h. Phosphoproteome was analyzed by LC-MS/MS. Mitochondrial ATP was quantified every 24h. Phosphoglucose-2 (PGM2), pyruvate kinase M1/2 (PKM), aldolase (ALDOA), glyceraldehyde-3-phosphate dehydrogenase (GAPDH) activities were analyzed by ELISA.

Fluorescent glucose analog 2-NBDG uptake, GLUT-1 expression, T-cell memory subpopulations distribution, and T-cell viability were determined by flow cytometry.

Results:

1. Dasatinib decreased proviral reactivation 2.47-fold ($p=0.0469$) in CD4 from PLWH.
2. Dasatinib modified phosphorylation of >130 proteins involved in metabolic pathways: energy metabolism, glycolysis/glyconeogenesis, inositol-phosphate metabolism, fatty-acid synthesis.
3. Dasatinib interfered with phosphorylation of 4 essential enzymes that belong to irreversible steps of glycolysis and tricarboxylic acid (TCA): PKM (-4.63 ; $p=0.002$), PGM2 (-1.74 ; $p=0.020$), ACS2 (Acyl-CoA Synthetase Short Chain Family Member 2) (-3.48 ; $p=0.031$), and ACACA (Acetyl-CoA Carboxylase Alpha) (-3.06 ; $p=0.017$).
4. Three proteins from reversible steps of glycolytic pathway showed increased phosphorylated status after dasatinib treatment: Aldolase ($+4.34$; $p=0.040$), GAPDH ($+2.76$; $p=0.033$), and Enolase-1 (ENO1) ($+1.94$; $p=0.014$).
5. Dasatinib decreased the activity of GAPDH (3.15-fold; $p=0.0379$) and ALDOA (4.70-fold; $p=0.0416$); PKM and PGM2 enzymatic activity was unmodified.
6. Dasatinib reduced 2.1-fold ($p=0.0112$) mitochondrial ATP in viable CD4 cells in correlation with reduced susceptibility to provirus reactivation.
7. Dasatinib interfered with GLUT-1 expression (Figure 1) and glucose uptake in all CD4 memory subpopulations, including TEM and TEMRA. NK remained metabolically active.
8. PLWH on ART and dasatinib showed reduced CD4 TEM and TEMRA subpopulations with decreased metabolic activity.

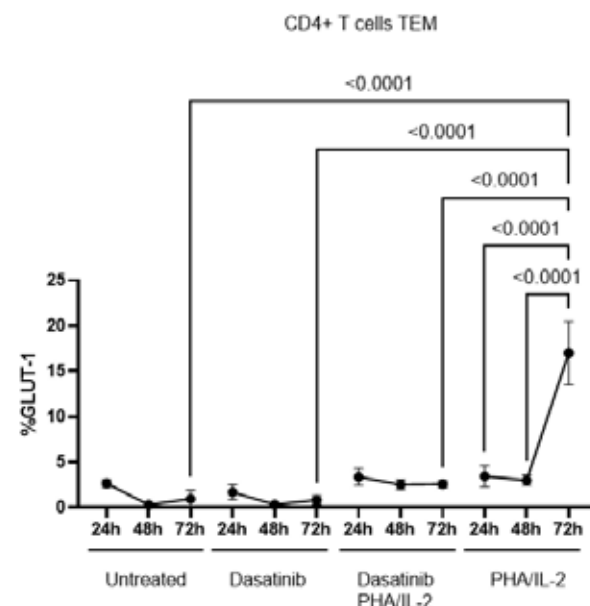


Figure 1.

Conclusions: Dasatinib acts as LPA by inducing resting state in viable CD4 cells with stalled glycolysis and mitochondrial ATP synthesis, impeding both HIV infection and reservoir reactivation, while NK cells remained unaffected. Treatment with dasatinib and ART may silence the viral reservoir as a block&lock strategy.



EPA0057

Mauritian cynomolgus macaques are a unique model of post-treatment control of SIV replication

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Background: Maintaining control of HIV replication without antiretroviral treatment (ART) is the goal of a functional HIV cure. The underlying virologic and immunologic mechanisms of post-treatment control (PTC) are poorly understood. SIV+ rhesus macaques rarely become PTCs, hindering this research.

We discovered that SIV+ Mauritian cynomolgus macaques (MCMs) that started receiving ART at two weeks post-SIV infection frequently become PTCs. This serendipitous discovery occurred when evaluating if a therapeutic vaccine could prolong viral rebound.

Methods: We infected 8 MCMs intravenously with a high dose of barcoded SIVmac239M. We started treating the animals with ART at two weeks post-infection to minimize the size of viral reservoirs while initiating antiviral immune responses. None of the animals expressed MHC alleles associated with spontaneous SIV control. Four animals received the therapeutic vaccine regimen, while four did not. We suspended ART after ~eight months and measured SIV plasma viremia. After stopping ART, we intravenously challenged animals with SIVmac239, and then all animals were depleted of CD8a+ cells after SIVmac239 challenge.

Results: Remarkably, 7 of 8 MCMs either had undetectable or low level (<1e4 copies/ml) transient viremia for six months after stopping ART, independent of the vaccine regimen. Plasma viremia was largely unaffected by SIVmac239 rechallenge.

After receiving the CD8a-depleting antibody, all eight animals developed high levels of SIV plasma viremia (>5e5 copies/ml), demonstrating that SIV PTC was mediated by CD8a+ cells.

We performed intact proviral DNA assays from 14 days after infection to estimate the viral reservoir. We found that the number of cells with intact proviral SIV DNA during acute infection was ~1 log smaller than in similarly infected SIV+ rhesus macaques.

Conclusions: We find that SIV+ MCMs can develop PTC that does not depend on host MHC genetics. Two features contributed to PTC in MCMs:

1. A small number of cells containing intact proviral DNA during acute infection and;
2. The presence of antiviral CD8a+ cells capable of suppressing SIV replication after ART cessation.

We suggest that SIV+ MCMs are a unique model of PTC to understand the immune-mediated mechanisms of post-ART control of SIV/HIV replication.

EPA0058

Impact of IL-15 neutralization on neuropathogenesis in acute HIV/SIV infection

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Background: Immune responses mounted in the CNS during acute HIV/SIV infection are insufficient to prevent viral seeding and reservoir establishment. The pleiotropic cytokine IL-15 plays a crucial role in anti-viral immune response by stimulating NK and CD8+ T cells to control HIV/SIV infection.

However, the effects of IL-15 on the CNS are largely unknown. Experimental neutralization of IL-15, leading to the depletion of NK and T cells, could significantly influence the viral pathogenesis in the brain, alter reservoir formation, and clarify the role of IL-15 in lentivirus disease.

We comprehensively evaluated brain immune and inflammatory responses to acute SIV infection with and without IL-15 neutralization in a nonhuman primate model.

Methods: Rhesus macaques (*Macaca mulatta*) were administered two doses of rhesusized monoclonal antibodies against IL-15 (anti-mRh-IL-15) at days -21 and -7 prior to challenge with SIVmac239X (day 0) and necropsied at 7 and 14 days post-infection (dpi). Peripheral and brain viral load were quantified by qPCR and RNAscope.

Sequencing analysis of viral clones were obtained from several brain regions and compared to those in blood and peripheral lymph nodes. CNS histopathology were analyzed by immunohistochemistry in combination with in situ hybridization. Transcriptomic analyses were performed on brain tissue.

Results: While anti-mRh-IL-15 treatment depleted NK cells from blood and increased virus replication, there was no significant differences in the quantities of SIV RNA or DNA in the brain on either 7 and 14 dpi. Barcoded virus detected in the blood and brain showed clonal expansion restricted to anatomical brain regions.

For brain resident cells, peripheral neutralization of IL-15 resulted in increased microglial activation with infection. While blood T cells were unaltered with IL-15 neutralization, CD8+ T cells decreased in brain, which may have led to an altered balance of local pro- and anti-inflammatory responses, where significantly fewer microglia cells expressed the proinflammatory cytokine - IL-6, and higher numbers of macrophages expressed the anti-inflammatory cytokine- TGF- β , and decreased M2 macrophage gene pathway activation.

Conclusions: IL-15 neutralization altered CNS immune and inflammatory responses to acute SIV infection by



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decreasing CD8⁺ T cells and resulting in a tissue environment favoring anti-inflammation, which could overall support the establishment of viral reservoir.

EPA0059

Effect of sex and HCV on microRNA profile as a biomarker of HIV viral reservoir

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Background: Identifying reliable and non-invasive biomarkers of the HIV reservoir size, a major barrier to functional HIV cure, is crucial. MicroRNAs are key regulatory molecules that play a relevant role in HIV expression, latency and reactivation. HCV acquisition is common in PLWH, modifying both the host expression profile of microRNAs and the functional phenotype of the immune system. We aim to identify microRNAs as biomarkers of HIV reservoir, considering factors such as HCV coinfection and sex.

Methods: We massively sequenced the microRNA profile of PBMCs from 119 PLWH recruited from 5 Public hospitals from Madrid, Spain:

- i. 36 PLWH never exposed by HCV;
- ii. 36 PLWH who spontaneously eradicated HCV;
- iii. 47 PLWH chronically infected with HCV.

Nested Alu-LTR-PCR was used to measure HIV-reservoir size in resting CD4⁺ T cells. A linear regression model was applied to study the association of microRNAs with the reservoir size, considering HCV exposure and sex.

For those microRNAs involved in significant associations with reservoir size (p-value < 0.05 and arithmetic mean ratio AMR >1.1 or <0.9) pathway enrichment analysis was performed to identify their target routes.

Results: All PLWH showed similar characteristics (mean age =49.83 years, 55% male). 26 microRNAs were associated with HIV reservoir in rCD4⁺ T cells in all PLWH. Pathway enrichment analysis showed potential target routes for these microRNAs such as fatty acid metabolism, prion diseases, and cancer development. After analyzing PLWH by HCV exposure, we identified different microRNA profiles associated to reservoir size in each HIV group.

In addition, we found that sex significantly influences the reservoir size of non HCV exposed PLWH, where women showed significantly smaller levels (AMR=0.3; p=0.041)

than men. Analysis by sex showed different microRNAs associated with reservoir size among sexes, where men showed higher SDE miRNAs. Each of the association analysis pointed to miR-29, which has been previously characterized interacting with HIV.

Conclusions: HCV exposure and sex deeply influence the association of PBMCs-derived miRNAs with HIV reservoir. miR-29 isoforms could act as a generic biomarker of reservoir size in PLWH regardless of HCV co-infection and sex as it directly interacts with the HIV genome.

EPA0060

Distinct detection of intact and defective proviruses for people living with HIV subtype B and C

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Background: To increase equity in HIV cure strategies it is important to study the dynamics and size of the intact and defective reservoir of the dominant HIV-1 subtype C. Monitoring the impact of cure interventions demands an assay that offers sensitive and specific quantification of large numbers of clinical samples and can be implemented in resource limited settings. We adapted the Intact Proviral DNA Assay (IPDA) for the detection of HIV-1 subtype B and C.

Methods: Primers and probes were strategically positioned at conserved regions of packaging signal (psi) and envelope (env) for both subtypes. DNA G-blocks and clinical isolates were used to test the efficacy of the primers. Various annealing temperatures were explored to address the impact of HIV sequence variability. Reconstruction experiments were performed with PBMCs to determine the limit of blank (LoB) and dilution series of G-blocks to determine the limit of detection (LoD).

Results: Comparable efficacy in detection of both subtypes was found for the primers and probes tested on G-blocks and clinical isolates. The LoB of intact DNA was 0 copies, and LoD 6 copies with >95% certainty at 60°C, quantification of 2-5 copies had a certainty of 83%-93% (n≥40). Comparable LoBs and LoDs were observed for detection of 5'-defective and 3'-defective DNA.

Lowering the annealing temperature from 60°C to 55°C resulted in a minor increase of defective LoB but improved detection of samples with polymorphisms.

Mixture experiments with intact and defective DNA demonstrated correct quantification when the mixture contained 5% intact in the background of defective DNA.

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Conclusions: This robust pan-subtype B-C IPDA enables detection of intact and defective DNA with >95% certainty when at least 7 DNA copies are present at an annealing temperature of 60°C. Lowering the annealing temperature to 55°C might be helpful, depending on the desired specificity of the study.

As the number of intact DNA copies decreases after start of treatment, it is important to note that 2-5 copies can still be quantified with >80% certainty. Thus, the pan-subtype B-C IPDA is an ideal candidate to monitor the impact of cure-interventions in (large-scale) clinical studies.

EPA0061

Young adults with perinatally-acquired HIV from Argentina present differential IPDA-determined HIV reservoir composition and immune phenotype: distinctive strategies needed for HIV cure?

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Background: Overall data on young adults with perinatally-acquired HIV (p-HIVYA) is scarce. We have previously reported that p-HIVYA exhibited lower frequencies of PD-1+ T-cells, and higher rates of naïve CD4 T-cells (n-CD4TC) compared to people with HIV (PWH, non-perinatally-acquired). Here, we aimed to perform a deeper characterization of their immune phenotype and HIV-reservoir composition.

Methods: Total, intact and defective proviral (TP, IP and DP) HIV-DNA/1M CD4TC were measured by IPDA in 16 p-HIVYA (20-30-years-old) and 27 PWH: 12 age-paired controls (AC) and 14 time from HIV-diagnosis paired controls (TDC). All participants were Argentinians enrolled between April-2019/December-2022; all on suppressive ART. Immune phenotype (differentiation, exhaustion, activation, PTK-7 and Ki-67 expression) was evaluated by flow cytometry. Data was analyzed using Kruskal-Wallis, Mann-Whitney, and Spearman-correlation tests.

Results: Non-significant lower frequencies of TP- and IP-DNA were observed in p-HIVYA compared to AC and TDC. Lower IP-DNA/CD4TC ratios were observed in p-HIVYA compared to AC (p=0.007). Furthermore, lower IP-DNA/n-CD4TC ratios were found in p-HIVYA compared to AC (p=0.031) and TDC (p=0.006).

In addition to the previously reported increased nCD4TC proportion and decreased PD-1 expression, lower frequencies of effector- and transitional-memory and ter-

минал-effector CD4TC were found in p-HIVYA compared to AC (p=0.035, p=0.008, p=0.028) and TDC (p=0.001, p=0.018, p=0.004), respectively. No differences were found in Ki-67 and PTK-7 expression.

n-CD4TC negatively correlated with set-point viral load logarithm [log₁₀(sVL)] in the cohort as a whole (r=-0.411; p=0.026). Also, log₁₀(sVL) directly and inversely correlated with percentages of DP-DNA and IP-DNA (r=±0.709; p=0.018), respectively, in p-HIVYA but not in AC and TDC.

Furthermore, Ki-67+CD4TC inversely correlated with TP-DNA in p-HIVYA (r=-0.809; p=0.021).

Conclusions: As expected, p-HIVYA presented greater reservoirs in association with higher sVL. The higher n-CD4TC frequency observed in p-HIVYA cannot be explained by elevated present thymic activity (PTK-7 expression).

This disbalance could have been generated early in life and persists during adulthood. Lower IP-DNA/n-CD4TC ratio suggests that n-CD4TC may not serve as a main viral reservoir in p-HIVYA.

These findings suggest that acquiring HIV perinatally may imply different challenges for reaching a cure.

EPA0062

Viral rebound dynamics in SHIV-infected infant macaques are predicted by distinct immunovirologic features measured before and after one year of antiretroviral therapy

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Background: Ethical considerations and clinical unknowns make ART interruption challenging in children with perinatal HIV who participate in cure-related studies.

Uncovering predictors of time to viral rebound (TTR) and post-treatment control (PTC) of viremia following ART cessation in a pediatric preclinical model may inform trials testing novel cure interventions in children.

Methods: We performed staggered ART initiation in 30 infant rhesus macaques (RMs) orally infected with SHIV.C.CH505 followed by analytical treatment interruption (ATI) after 52 weeks.

Cox proportional-hazards model with LASSO regularization was used to identify and rank parameters predicting TTR and Leave-One-Out Cross Validation (LOOCV) deviance was applied to selected variables.

Penalized multinomial regression and RNA-Sequencing were used to investigate rebound phenotypes.



Results: Rebound occurred in 26/30 infants within 7-98d of ATI, with TTR significantly delayed in the Early ART group vs Intermediate and Late ART groups (median 84d, 18d, and 17d post-ATI, respectively; $p < 0.001$).

Through multivariate regression modeling of 82 potential biomarkers, we constructed a predictor inclusion rank table where peak viremia pre-ART best described TTR, with increased predictive strength through successive inclusion of six additional variables in blood, lymph nodes, and rectal tissue pre-ART or pre-ATI.

Over 32 weeks of ATI, we observed sustained viremia ($n=7$), PTC ($n=18$), and no-rebound ($n=5$). With sustained viremia as the reference group, the odds of PTC increased by 31% for each unit increase in Ki67+CD8+TEM cells in lymph nodes pre-ATI.

Transcriptomic analysis of CD4+ T-cells pre-ATI from 18 Mamu*A01- infants showed heme metabolism and IFN γ response pathways to be upregulated in the 5 non-rebounders compared to RMs with sustained viremia or PTC. A restricted analysis of the Early ART group (3 rebounders and 4 non-rebounders) also implicated TGF β pathway genes in the no-rebound phenotype.

Conclusions: This investigation into biomarkers to predict viral rebound dynamics, conducted for the first time in the pediatric setting, demonstrates that plasma viral load pre-ART is the primary determinant of TTR, confirming the importance of early treatment.

We also identified Ki67+CD8+TEM cells in lymph nodes pre-ATI as a biomarker of PTC in infant RMs and revealed key roles played by TGF β and IFN γ in lack of rebound.

EPA0063

Meta-analysis of 5'-Leader defective proviruses persisting in people on ART

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Background: Proviruses with defects in the 5'-Leader (5'-L) are found in virtually all people on ART, represent 5-10% of the proviral landscape, and are often detected in expanded clones, including those contributing to residual viremia. However, how these defects are formed and how they can affect proviral persistence is poorly understood.

Methods: We compiled a dataset of proviruses with 5'-L deletions from previous studies and newly generated sequences. We investigated the distribution of deletions, the impact of the primers used, and which functional RNA secondary structures are involved.

Finally, we investigated whether repeated elements and polymeric regions could contribute to the formation of these deletions.

Results: We retrieved more than 1500 sequences from 12 studies. After quality control and removal of clonal sequences, we obtained a final dataset of 574 unique provi-

rases. Deletions had a significantly asymmetrical distribution that peaked at the major splicing donor site (MSD). Although different PCR methods did not impact the deletion size and 3' end positions, the location of forward primers affected 5' end distribution of deletions, suggesting that current assays fail to detect proviruses with deletions extending further into the 5'-L. The most frequently affected discrete structure was the MSD (91%), followed by the dimerization initiation signal (71%), and the packaging signal (61%). The IPDA would correctly exclude as defective 100% of these deletions.

Interestingly, ~45% of the proviruses retained an intact gag ORF, potentially contributing to the expression of antigens and viral particles. The analysis of deletion junctions identified 64 deletions with microhomology and 85 with polymeric regions.

However, both features had a minor role in explaining the genesis of deletions compared to the proximity to the 5'-L secondary RNA structure. Of note, we found one insertion-in-deletion pattern with a Lys3a-tRNA sequence, caused by RT during plus-strand priming.

Conclusions: This is the first large meta-analysis of proviruses with 5' Leader small deletions. We show that primer design can affect the characterization of the proviral landscape. Although non-infectious, almost half of proviruses can express Gag.

Finally, the highly structured 5'-L RNA likely drives these deletions at the end of minus-strand cDNA synthesis.

EPA0064

Adaptation of the intact proviral DNA assay to the QIAcuity digital PCR platform

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Background: Quantification of intact proviruses is a critical measurement in HIV cure studies both *in vitro* and *in vivo*. The widely adopted 'Intact Proviral DNA Assay' (IPDA) was originally validated using Bio-Rad's droplet digital PCR system (ddPCR). This system has limited multiplexing capability (2-channel), is labor- and time intensive. Qia-gen's QIAcuity digital PCR platform (dPCR) is a fully automated system which partitions samples into nanowells rather than droplets. The self-contained instrument primes, thermocycles, and optically detects fluorescence of each sample with up to 5-plex capability, requiring minimal sample preparation thereby reducing hands-on time and error. In this study we adapted the IPDA assay to the QIAcuity platform and assessed its performance relative to ddPCR.

Methods: Full-length HIV plasmids containing 5' and 3' deletions were used as controls for quantification. Intra- and inter assay variability was assessed using genomic



DNA (gDNA) isolated from Jlat10.6 cells. Full-length HIV plasmid and Jlat10.6 gDNA with an assay input ranging between 10^4 to 1 HIV copies were used to investigate the sensitivity of the IPDA on the QIAcuity platform.

Comparison to the ddPCR IPDA was determined using gDNA isolated from CD4 T cells from people with HIV on ART (n=11). *Ex vivo* samples were assayed using 500ng DNA input in quadruplicate wells for the HIV assay, 25ng DNA was loaded into the RPP30 assay to determine cell number and DNA shearing.

Results: Based on plasmid controls the QIAcuity could differentiate between defective and intact proviruses and could accurately quantify intact proviruses down to single HIV copy input. The intraplate and interplate variability was within acceptable ranges (%CV at or below 10).

When comparing the two assays in *ex vivo* CD4 T cells from people with HIV on ART we observed no significant difference in the quantification of intact ($r=0.93$; $p<0.001$); 5' defective ($r=0.7$; $p=0.04$); and 3' defective proviruses ($r=0.96$; $p<0.001$).

Conclusions: We demonstrate that the QIAcuity dPCR platform enables sensitive and accurate quantification of likely genetically-intact proviruses similar to the IPDA assay.

This flexible system will allow for an expansion of detection of up to 5 targets enabling a more comprehensive analysis of intact and potentially replication-competent proviruses.

EPA0065

The frontal lobe is a major reservoir of intact HIV proviral DNA in the brain despite viral suppression with ART

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Background: Currently no scalable cure for HIV exists due to the presence of long-lived and stable viral reservoirs in blood and tissue sites throughout the body that are not eradicated by treatment with antiretroviral therapy (ART). We recently demonstrated the first evidence of an intact, potentially replication competent HIV reservoir in the frontal lobe of people with HIV (PWH) who were duly suppressed with ART.

Here we provide the first characterization of the HIV intact and detective reservoir throughout multiple regions in the brain.

Methods: Total, intact and defective HIV proviral DNA was quantified in matched fresh frozen autopsy frontal lobe, cerebellum and basal ganglia brain tissue from viremic or ART-suppressed PWH or HIV-seronegative controls by droplet digital PCR approaches including the intact proviral DNA assay (IPDA).

Results: HIV *pol* DNA was detected in all brain tissues tested from PWH and levels were similar between virally suppressed (n=16) vs viremic PWH (n=24), demonstrating the widespread presence of HIV proviral DNA in the brain that is not influenced by long-term ART treatment. Frontal lobe tissue contained higher levels of HIV *pol* DNA relative to either cerebellum ($P<0.05$) or basal ganglia ($p<0.06$).

Further assessment of HIV proviral DNA in CNS tissues demonstrated that a higher proportion of ART-sup-



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pressed PWH harbored intact proviral DNA in frontal lobe tissue (6/8 PWH) relative to matched cerebellum (3/8 PWH) and basal ganglia tissue (2/8 PWH).

Conclusions: Here we provide the first characterisation of intact and defective HIV proviral DNA across multiple regions of the brain. These data demonstrate that the frontal lobe is a major site of intact potentially replication competent HIV proviral DNA in the brain which persists despite ART treatment.

EPA0066

CTL epitopes from structurally important HIV proteins are identified in rebound HIV

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Background: During an analytic treatment interruption (ATI), the elimination of HIV-infected cells by HIV-specific cytotoxic CD8 T-cells (CTLs) is required to control viral infection. However, unless treatment is initiated during acute infection, the HIV reservoir becomes dominated by CTL escape variants resistant to the immune response. Therefore, we applied a novel **IM**munoinformatics **A**nalysis **P**ipeline (IMAP) to identify CTL epitopes within structurally important HIV protein regions that avoid CTL immune escape mutations.

Methods: Employing the IMAP, we generated 8-14 mer overlapping peptides containing amino acid residues (aa) essential for HIV Gag, Pol, Vif, Vpr, and Env protein structure and function. We excluded the peptides containing CTL escape mutations and those found within <85% of global HIV-1 subtypes/recombinants.

Using the Immune Epitope Database and NetMHCpan analysis tools, we selected the peptides that are predicted to be immunogenic and are binders to the most prevalent HLA-I alleles. These peptides were compared to the five protein regions extracted from HIV-RNA sequences of five participants who underwent multiple ATIs.

Results: We selected 128 peptides from the Gag, Pol, Vif, Vpr, and Env proteins. These peptides were identified within the protein regions containing aa that form many physicochemical interactions with other residues. These peptides had 0-3 aa variations at 0-2 sites which were not associated with HLA-I anchoring or CTL immune escape. We found that 85-98% of viral sequences derived from worldwide HIV-1 subtypes/recombinants contained our selected peptides. The Gag-, Pol-, Vif-, and Env-derived peptides were predicted to bind to multiple HLA-A/B/C alleles, resulting in 88-97% worldwide population cover-

age. For the Vpr-peptides, despite the prediction that these peptides bind to multiple HLA-I alleles, population coverage was 58%. Importantly, the selected peptides, including the aa variant forms, were found within 97-100% of plasma-derived HIV-RNA sequences from five participants who had three successive ATIs.

Conclusions: Applying the IMAP, we selected novel HIV peptides within structurally essential regions of five HIV proteins. These peptides were genetically conserved and lacked known CTL escape mutations.

Notably, the peptides were identified within ATI-derived plasma HIV-RNA sequences, indicating that these peptides as a pool are highly promising for eliciting a CTL immune response during treatment interruption.

EPA0067

The cellular factor UHRF1 silences HIV-1 transcription in infected myeloid reservoirs

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Background: There is increasing evidence for the physiological relevance of myeloid HIV-1 reservoirs such as brain microglia (the main central nervous system (CNS) reservoir) and urethral macrophages. However, the molecular mechanisms of HIV-1 gene expression in myeloid infected cells are still poorly understood and understudied. We have previously reported that UHRF1 is a new epigenetic repressor of the latent HIV-1 promoter in T lymphocytes (Verdikt R. *et al.*, 2022, eBioMedicine).

Here, we demonstrated that UHRF1 also plays an important role in HIV-1 latency by silencing viral transcription in infected cells of myeloid origin.

Methods: Electrophoretic mobility shift Assay, ChIP-qPCR, RNA interference, p24 ELISA, use of infected human primary Monocytes-derived Macrophages (MaM) and microglial cells (the CNS resident macrophages) and HIV-1-infected microglia-containing human 3D cerebral organoids.

Results: Using the HIV-1 latently-infected monocytic cell line THP89GFP as a myeloid model system for HIV-1 infection, we demonstrated that UHRF1 was recruited *in vivo* to the 5'LTR promoter and that the recruitment of UHRF1 was strongly decreased after HIV reactivation with TNFa. Genetic downregulation of UHRF1 by RNA interference induced an increase in HIV gene expression accompanied by decreased recruitments of DNMT1, G9a and HDAC1 to the viral promoter, thereby demonstrating the role of UHRF1 in HIV-1 transcriptional silencing in myeloid cells. Moreover, pharmacological inhibition of UHRF1 by the green tea polyphenol EGCG (EpiGalloCatechin-3-Gallate) caused an increase in HIV-1 transcription. We are currently studying the role of UHRF1 in infected human primary


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Monocytes-derived Macrophages (M ϕ M) and microglial cells (the CNS resident macrophages), as well as in HIV-1-infected microglia-containing human 3D cerebral organoids.

Conclusions: We thus demonstrated that UHRF1 is involved in HIV-1 latency in cells of myeloid origin, in addition to cells of T-lymphoid origin. Considering the role of UHRF1 in HIV-1 silencing in the two main reservoirs of virus, our findings reinforce the relevance of UHRF1 as an attractive therapeutic target for anti-HIV-1 cure strategies.

EPA0068

Long-term protection against HIV infection after discontinuation treatment with ponatinib for 1 year

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Background: PLWH on ART and dasatinib show reduced reservoir size resistant to reactivation. We evaluated if treatment with ponatinib for 1 year may protect CD4 from HIV infection and if this protection was maintained during treatment-free remission (TFR).

Methods: 12 participants with chronic myeloid leukemia (CML) of NCT04043676 were recruited. They were on treatment with imatinib for 14 (IQR 5.25-15.75) before discontinuation and then received 1 year-consolidation treatment with ponatinib 15mg/day.

Blood samples were collected before starting ponatinib, after 1 year-treatment, and 3, 6 and 12 months after discontinuation. PBMCs were infected with NL4-3_wt 72h. HIV-p24, pSAMHD1, CD4 memory and cytotoxic cell populations were analyzed by flow cytometry. PBMCs antiviral activity was evaluated by measuring caspase-3 activity in NL4.3_wt-infected TZM-bl cells.

Results:

1. 8 participants (66.6%) did not relapse from CML 12 months after ponatinib interruption (Non-relapsed); 4 participants (33.3%) relapsed after 5.5 months (IQR 4.25-6.75) of ponatinib interruption (Relapsed).
2. CD4 were susceptible to HIV infection in all participants while treatment with imatinib; 1 year-treatment with ponatinib reduced 5.75-fold HIV infection (Figure 1)

and this protection was maintained 6 (p=0.0313) and 12 months (p=0.0313) during TFR in Non-relapsed, which correlated with pSAMHD1 interference.

3. After CML relapse and imatinib reintroduction, all CD4 memory subpopulations regained susceptibility to HIV replication, including TEM (>3.79-fold;p=0.0485) and TEMRA (>4.93-fold;p=0.0317).

4. Antiviral cytotoxicity increased 4.22-fold (p=0.0156) in PBMCs from Non-relapsed after 1-year of ponatinib and remained enhanced for 12 months of TFR.

5. NK cells increased 1.86-fold (p=0.0061) after 1-year on TFR in Non-relapsed, with 3.51-fold (p=0.0476) increased degranulation capacity.

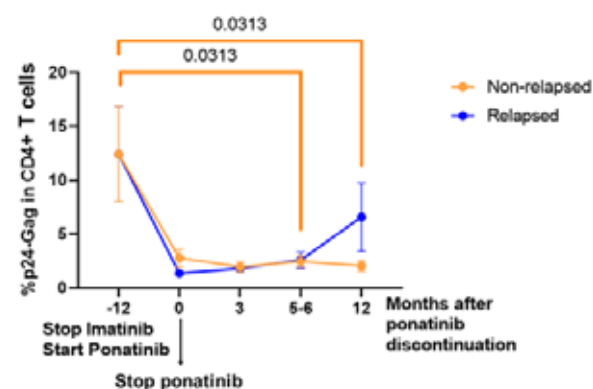


Figure. 1

Conclusions: One-year treatment with ponatinib preserved SAMHD1 in CD4 and induced sustained cytotoxic effect, impeding HIV infection and reservoir formation. Antiviral protection was maintained 12 months during TFR in correlation with sustained antileukemic response. Short-term intensification treatment with dasatinib or ponatinib could be used for HIV cure strategies.

EPA0069

A case of persistent low-level viremia during ART fueled by a clonally expanded provirus with a 3 base deletion in HIV's major splice donor site

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Background: Historically, persistent low-level viremia (pLLV) during ART has been attributed to incomplete anti-retroviral adherence or *de novo* emergence of drug resistance, but recent evidence indicates that it can originate from the reservoir.

We investigated the potential reservoir origin of plasma virus in an individual with pLLV.



Methods: The participant, who acquired a recombinant HIV strain primarily comprising subtype A-like regions, was diagnosed with HIV in 2003 and initiated ART in October 2006.

With the exception of two "blips", pVL was suppressed until February 2020, after which all 30 subsequent pVL were detectable (between 50-709 copies/ml) despite receiving four active drug classes. No adherence concerns were noted and the presence of drug in plasma was confirmed by mass spectrometry.

We integrated sequencing, phylogenetics, and the intact proviral DNA assay (IPDA) to elucidate the reservoir origin of pLLV by analyzing historical longitudinal plasma samples alongside a PBMC sample collected in December 2022.

Results: Drug resistance genotyping of 12 plasma samples from February 2021-December 2022 during the pLLV revealed an essentially clonal population with no resistance mutations, that was distinct from prior genotypes performed in 2003, 2005 and 2013. Bulk sequencing of 5' and *gp41* regions confirmed that the pLLV was clonal with occasional limited diversity.

To date, 188 near full-length proviruses have been single-genome-sequenced. Of these, 8 were classified as genetically intact by the bioinformatics pipeline (the remaining 180 were defective, where 3' deletions were the most common defect). Four of these intact proviruses were genetically identical and exactly matched the pLLV sequence across all query regions.

Both the pLLV and matching proviruses had a unique 3 base deletion in the major splice donor site that all other plasma and proviral sequences lacked. This deletion, which may render this provirus defective, will allow us to design a custom IPDA probe to specifically quantify its within-host abundance. Reconstruction of within-host HIV evolutionary history from pre-ART plasma to infer pLLV age and lineage origin is also underway.

Conclusions: Our observations provide additional evidence that clonally-expanded reservoir cells harboring deletions within HIV's major splice donor site can fuel persistent low-level viremia during ART.

EPA0070

Myeloid production of GDF15 influences HIV reservoir size in ART-treated people living with HIV

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Background: Growth differentiation factor-15 (GDF15) is an atypical member of the transforming growth factor- β family. Circulating GDF15 levels increase with mitochondrial stress, age, cardiovascular diseases, cancer and severe COVID-19.

We assessed whether plasma GDF15 levels were associated with inflammation markers and HIV reservoir size in people living with HIV (PLWH) taking antiretroviral therapy (ART).

Methods: Plasma and peripheral blood mononuclear cells (PBMCs) were obtained from 55 ART-treated PLWH and 30 people without HIV with similar age as controls. Plasma levels of GDF15 and validated markers of inflammation were quantified by ELISA. HIV reservoir size was estimated by measuring integrated HIV DNA by nested-qPCR in sorted CD4 T-cells. Intracellular levels of GDF15 were assessed by flow cytometry. In vitro assays were performed on PBMC or sorted CD4 T-cells.

Results: PLWH were on ART for a median of 14.5 years and had undetectable viremia. Median age of PLWH and controls was 54 and 53 years, respectively. Plasma GDF15 levels were higher in PLWH ($p < 0.0001$) and correlated with age ($r = 0.4$, $p < 0.01$). In ART-treated PLWH, GDF15 levels were not associated with CD4 count, CD4/CD8 ratio, weight, gut permeability, nor inflammatory markers. GDF15 levels were associated with levels of the non-AIDS comorbidity marker suPAR ($r = 0.68$, $p < 0.0001$). GDF15 levels were also strongly associated with integrated HIV DNA levels in CD4 T-cells ($r = 0.49$, $p < 0.001$) independently of age, sex, and CD4 count. GDF15 was only found in monocytes, but not in T-, B- or NK-cells or dendritic cells. Intracellular levels of GDF15 correlated strongly with plasma levels ($r = 0.9$, $p < 0.01$). *In vitro*, addition of recombinant GDF15 to culture medium increased TNF- α expression in CD4 T-cells as observed by RNA-sequencing and RT-ddPCR.

In preliminary experiments, addition of recombinant GDF15 to previously HIV-infected CD4 T-cells increased infected cell survival by 2-fold after 5 days of culture.

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Conclusions: GDF15 levels were higher in ART-treated PLWH compared to controls and were associated with risk of non-AIDS comorbidities and HIV reservoir size, independently of classical inflammatory markers. Myeloid production of GDF15 might directly influence infected CD4 T-cell survival and represent a potential target for HIV cure strategies.

EPA0071

NK cell-mediated viral control of SIV in sooty mangabey lymph nodes

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Background: Despite long-term combination antiretroviral therapy (cART), viral reservoir elimination in humans infected with HIV-1 remains elusive, due to the presence of latently infected cells and their sequestration in immunologic sanctuaries. During infections with HIV-1 and SIV of macaque species, CD4⁺ TFH cells in B cell follicles (BCF) of lymph nodes (LN) are a major reservoir for latent virus that remain largely inaccessible to CD8⁺ T cell-mediated killing.

In prior work, we have demonstrated that BCFs in the SIV natural host African Green Monkey are generally virus free, and in vivo depletion of NK cells induces elevated plasma viremia and recrudescence of viral foci in lymph nodes. The goal of this study was to determine whether NK cell-mediated clearance of virus replication in LNs is a

conserved feature of nonpathogenic SIV infection by analyzing NK cell depletion and viral dynamics in another SIV natural host, sooty mangabeys.

Methods: We depleted NK cells from eight chronically SIVsmm infected sooty mangabeys by administration of recombinant anti-IL-15 (clone M111, 20 mg/kg, i.v.) and monitored plasma viral loads. NK cell function in blood and lymph nodes was assessed by flow cytometry and single-cell RNA-Seq.

Results: Efficient depletion of NK cells was observed by 14 days post-infusion. Plasma levels of SIVsmm increased significantly from a mean of 2.06×10^5 copies/ml prior to depletion to 7.74×10^5 copies/ml at seven weeks post NK cell depletion ($p < 0.0001$ by linear trend test). A significant increase in cell-associated SIV RNA was observed in the LNs at day 42 post-infusion.

To assess NK cell function, we sorted subpopulations of NK cells from LN based on CD16, CXCR5 and NKG2A expression and conducted single-cell RNA-Seq. Strikingly, within the CXCR5⁺ NKG2A⁺ population, we observed elevated expression of perforin, granzyme, and restriction factors.

Conclusions: This study demonstrated for the first time that NK cells contribute to control of viral replication in LNs of sooty mangabeys. This function of NK cells appears to be a general feature of nonpathogenic SIV infections. These findings further warrant the investigation of NK cell-based immunotherapies as part of cure and vaccine strategies for HIV-1.

EPA0072

Characterisation of HIV latency and reactivation in human macrophages

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Background: HIV-infected macrophages persist in people with HIV in tissue such as the brain, gut and lung despite suppressive antiretroviral therapy and can contribute to viral rebound when therapy is stopped. What governs the establishment and reactivation of latent HIV infection in different types of tissue macrophages is poorly understood, but essential to inform HIV elimination strategies which adequately target this reservoir.

Methods: An *in vitro* model of HIV latency in human macrophages was utilised, where primary human serum-derived monocyte-derived macrophages (MDM), GM-CSF-derived alveolar like-macrophages (AlvMDM) or multiple cytokine-differentiated monocyte-derived microglia were infected with a GFP-HIV reporter virus.

Non-productively infected cells were FACS sorted and latency reactivation quantified longitudinally using fluorescence microscopy.



The impact of stimulation with M1 (TNF + IFN γ) and M2 (IL-4) polarising cytokines was assessed. HIV-infected MDM from 3 donors were further analysed using single cell transcriptomics.

Results: MDM and AlvMDM harboured comparable levels of latent HIV and exhibited a similar rate of spontaneous reactivation (+0.27 vs 0.15% cells/day respectively, $p=0.3$). Modulation of macrophage phenotype using M2 polarising conditions enhanced HIV reactivation in both MDM and AlvMDM ($p=0.02$ and 0.01 respectively), whilst M1 polarising conditions inhibited reactivation in MDM ($p=0.03$). HIV reactivation from non-productively infected microglial cells trended lower than for MDM ($p=0.06$). Single cell transcriptomic analysis of non-productively infected (GFP-) MDM revealed substantial numbers of cells (>10%) expressing HIV transcripts, indicating latent HIV infection. Productively HIV-infected MDM were distinguished with 20 differentially expressed host genes. Unique cellular markers identifying latently infected macrophages were not identified.

Conclusions: Tissue-specific macrophage sub-populations may differ in their ability to harbour reactivatable latent HIV reservoirs. The ability of polarising cytokines to modulate HIV reactivation suggests local tissue microenvironments may influence latency in macrophages, but also indicates the potential for macrophage reservoirs to be reactivated by exogenous stimulation as part of shock and kill cure approaches.

Unique data from single cell analysis of latently infected macrophages indicates a substantial proportion of macrophages can harbour latent HIV infection but remain phenotypically 'silent' and evade immune recognition. Productively-infected macrophages displayed a distinct gene signature, which may identify targets for novel therapeutics targeting the productive HIV macrophage reservoir.

EPA0073

Developing triplex forming oligonucleotides as a 'block and lock' strategy for an HIV cure

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Background: The main barrier to an HIV cure is the persistence of long lived and proliferating latently infected T cells. Virus can integrate in the host genome, stay tran-

scriptionally silenced, and re-emerge upon reactivation of transcription. Triplex formation oligonucleotides(TFO) are single stranded DNA that can bind in the major groove of duplex DNA with high specificity and affinity.

We hypothesized that TFO can bind to the integrated provirus and inhibit viral transcription leading to a 'block and lock' strategy for an HIV cure.

Methods: We designed multiple TFOs targeting HIV *gag* ($n=3$), *env* ($n=4$) and to GFP ($n=4$). TFOs were delivered by lipofectamine or a novel nanoparticle to HEK 293T transfected with plasmids expressing *gag*, *env*, green-fluorescent-protein (GFP) and full length HIV NL-4.3.

TFO impact on full length proviral transcription was assessed by incubating supernatant with the reporter TZM-bl cell line which contains an integrated HIV LTR, a portion of *gag* and the luciferase gene and quantification of cell associated unspliced HIV RNA by RT-qPCR. TFO activity on integrated provirus was assessed by transfection of TFOs and subsequent stimulation of TZM-bls.

Results: In the plasmid transfection system, GFP-specific TFOs inhibited GFP expression (mean \pm SEM inhibition for 2uM GFP-TFO2 was $96.8\pm0.45\%$, $p<0.001$) and HIV-specific TFOs inhibited either HIV *gag*(reduction with 4 uM HIV-TFO7, $67.26\pm9.19\%$, $p=0.03$) or HIV *env* expression (reduction of *env* expression ranging from 75 to 88%).

In HIV NL-4.3 transfected cells, 2uM HIV TFO4 potently reduced the infectivity of supernatant by $97\pm0.59\%$ ($p<0.001$) and reduced unspliced HIV RNA 400 ± 35.02 fold ($p=0.03$) consistent with the TFO inhibiting transcription initiation. Inhibition of HIV gene expression was achieved by both lipofectamine and nanoparticle delivery of TFO.

In TZMBL cells, transfection of four different TFOs by lipofectamine had no effect on either basal or induced HIV transcription.

Conclusions: TFOs can potentially inhibit HIV gene expression, however we were unable to demonstrate inhibition of transcription from an integrated provirus. This may be due to the lack of nuclear penetration by TFOs or target inaccessibility due to the chromatin environment.

Further work to address these limitations is underway. TFOs present a novel HIV 'block and lock' option to limit HIV transcription.



EPA0074

Assessment of monovalent and bivalent SMAC mimetics to both shock and kill the HIV reservoir

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Background: Latently infected CD4+ T-cells are primed for survival due to the over-expression of factors that regulate apoptosis such as inhibitors of apoptosis proteins (IAPs). This may explain why 'shock and kill' efforts to date have largely failed. SMAC mimetics (SMACm) have been shown by others to increase binding of non-canonical NfκB (ncNfκB) complex to the HIV long terminal repeat and can potentially reverse HIV latency. SMACm can also inhibit IAPs leading to an increase in tumor necrosis factor alpha (TNF-α) mediated extrinsic apoptosis. We hypothesised that SMACm would increase death of latently infected cells in the presence of TNF-α.

Methods: We assessed bivalent (AZD5582, BV6 and Birinapant) and monovalent (GDC0152, GDC0197, xevinapant and LCL161) SMACm in the presence and absence of TNF-α (20ng/ml) in peripheral blood mononuclear cells (PBMC) and sorted CD4+ T-cells from uninfected donors and people with HIV (PWH) on antiretroviral therapy. Latency reversal was assessed using a cell line containing integrated HIV with a mutation in *env* and *vpr* and a green fluorescent protein (GFP) reporter (J-Lat clone 10.6). GFP expression and cell death using a live dead stain were quantified by flow cytometry. NFκB activation and cIAP1 degradation was measured by western blot.

Results: The bivalent compared to monovalent SMACm showed higher levels of GFP expression in J-Lat10.6 (100nM; mean±SEM GFP expression 1.3%±0.14% vs 6.0%±1.9% respectively, p=0.03) and induced greater cIAP1 degradation and induction of p52 from p100 cleavage in PBMC from uninfected donors. Both bivalent and monovalent SMACm demonstrated similar toxicity profiles in CD4+ T-cells isolated from uninfected PBMC (100nM; 8.5%±3.3% vs 9.9%±0.4% cell death, p=0.52). Addition of TNF-α to SMACm led to no difference in cell toxicity and cIAP1 degradation in CD4+T-cells from uninfected donors and PWH.

Conclusions: Bivalent compared to monovalent SMACm induce greater latency reversal and also cell death in cell lines but have similar levels of toxicity in primary cells. The additional of TNF-α did not increase cell death. Further work is continuing on the impact of these compounds on CD4+ T-cells from PWH on ART.

EPA0075

Synergistic effects of romidepsin with PI3K inhibitors in reducing the pool of HIV latently infected cells *ex vivo*

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Background: One strategy to eliminate latently infected CD4+ T-cells that persist in people living with HIV (PLWH) on suppressive antiretroviral therapy (ART) is to activate virus expression to induce immune-mediated clearance or virus induced cytolysis using latency reversing agents (LRAs). To date, evaluation of LRAs alone or in combination with antibodies or vaccination has not resulted in a substantial decrease in the frequency of infected cells or increased time to viral rebound once ART is stopped. Thus, additional strategies to kill reactivated cells are needed. Given phosphoinositide 3-kinases (PI3K) promote the survival of virus-infected cells, here we investigated whether PI3K inhibitors could be combined with LRAs to kill latently infected cells.

Methods: We assessed the effects of three different PI3K inhibitors (IPI-443, IPI-3063 and wortmannin) alone and in combination with LRAs (romidepsin, panobinostat, JQ1 and PMA/PHA as a positive control) to determine if these pro-apoptotic agents enhanced death of HIV-infected cells using CD4+ T-cells isolated from blood from n=6 PLWH on ART.

Results: We found that the histone deacetylase inhibitor romidepsin together with either IPI-443 or wortmannin PI3K inhibitor led to significant declines in the frequency of infected cells, measured as integrated HIV DNA (p=0.0312 in both cases). Both drug combinations were also synergistic (mean Bliss independence score 0.15 and 0.37, respectively).

Interestingly, we found that the PI3K inhibitors alone could reactivate cell-associated HIV RNA (mean fold change of 1.43, 2.32 and 1.81, for IPI-443, IPI-3063 and wortmannin, respectively).

Conclusions: Taken together, the data suggests that sensitisation of latently infected CD4+ T-cells with pro-apoptotic compounds combined with latency reversal to drive expression of viral pro-apoptotic proteins can enhance the clearance of latently infected cells.

The combination of romidepsin and select PI3K inhibitors could inhibit multiple cell survival pathways, ultimately leading to the production of ROS and an increase in pro-apoptotic molecules.



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**EPA0076****Tat diversity in intact versus defective proviral HIV-1 DNA genomes across viral subtypes**

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Background: Tat is a transcription trans-activator protein that binds to the TAR region of the HIV-1 promoter in the LTR region, and recruits positive transcription elongation factor b (P-TEFb) to the viral promoter to stimulate transcription elongation of HIV-1 genes and therefore plays a major role in virologic rebound during therapy cessation. Here, we examine Tat length and sequence diversity associated with genome-intact versus defective HIV-1 DNA genomes across viral subtypes.

Methods: Near-full-length HIV-1 DNA genomes (2107 sequences, HXB2 638-9632) were sequenced from 42 individuals living with HIV-1 subtype A1 (n=4), AE (n=2), B (n=15), D (n=9) and inter-subtype recombinants (n=12) via single genome amplification. Genomes were classified as intact or defective using HIVSeqinR software. HIV-1 *tat* exon 1 and 2 nucleotide sequences were extracted and translated into amino acids using an in-house adaptation of Gene Cutter in R-language.

Results: Of the 2107 HIV-1 proviral DNA genomes analyzed, 268 *tat* sequences from 30 donors were not associated with hypermutated nor truncated-genomes. Amino acid length polymorphisms ranged from 75 to 106 residues, where Tat amino acid length was associated with viral subtypes (Kruskal-Wallis $p=6.4 \times 10^{-12}$).

The 101-residue variant was the most common variant in both intact and defective genomes and was observed in 20/30 donors across subtypes A1, AE, B and recombinants, whereas subtype D exclusively harbored the 86-residue variant.

The 106-residue variant was found exclusively in intact, not defective, subtype B and B-recombinant genomes.

Of the 30 donors, three individuals had more than one Tat length variants within their intrahost intact genome pools.

Phylogenetic analysis showed intermingling of *tat* sequences of intact and defective genomes within each donor, suggesting a lack of selection.

In eight individuals on suppressive antiretroviral therapy who had >5 intact proviral genomes, within each person, Tat associated with intact proviral genomes were up to 8% different in amino acid identity relative to other intra-host variants.

Conclusions: Our results revealed that Tat associated with intact HIV-1 DNA proviral genomes displays polymorphisms within host, across hosts and across HIV-1 subtypes, which could be associated with varying likelihoods of viral transcription reactivation within and across hosts upon treatment interruption.

EPA0077**Upregulation of TCF1 improves the efficiency of latency reversing agents for HIV-1 transcriptional reactivation**

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Background: HIV-1 latently persisted in CD4⁺ T cells is the major barrier to cure people living with HIV. Since latency reversing agents (LRAs) tested in clinical trials showed only partial effects, it is critical to investigate factors that may improve the potency of LRAs.

Previous studies indicated that T-cell factor 4 (TCF4), one of members in the TCF/lymphoid-enhancer factor (LEF) family of transcription factors, inhibits HIV-1 transcription. The role of TCF1 in the same TCF/LEF family remains incompletely understood.

Methods: We investigated the expression of TCF1 in primary CD4⁺ T cells derived from healthy donors and ART-treated people living with HIV. The involvement of TCF1 in regulating HIV-1 latency reactivation was investigated in the T cell line model ACH2 latently infected with HIV-1.

Results: We found that the amount of TCF1 mRNA was significantly higher than that of TCF4 in purified primary CD4 T cells derived from healthy donors by RT-PCR.

Moreover, CD4⁺ central memory T cells displayed significantly higher expression of TCF1 compared with naive, effector memory, and CD45RA⁺ effector memory cells in healthy donors.

Critically, the amount of TCF1 expression was significantly decreased in both CD4⁺ naive and memory T cells derived from ART-treated people living with HIV comparing with healthy donors. Unlike TCF4, overexpression of TCF1 in ACH2 cells enhanced HIV-1 transcription compared with conventional ACH2 cells.

Moreover, overexpression of TCF1 in ACH2 promotes HIV-1 reactivation significantly by LRAs including the PKC agonist PMA and the BET inhibitor JQ1. 6-bromoindirubin-3'-oxime (6BIO), a potent inhibitor of Glycogen synthase kinase 3 β (Gsk-3 β), enhanced the expression of TCF1 in conventional ACH2 cells and consistently promoted the efficiency of PMA and JQ1.

Conclusions: Our results demonstrate that upregulated TCF1 may improve the efficiency of latency reversing agents for HIV-1 transcriptional reactivation.



EPA0078

Genetic diversity of HIV-1 long terminal repeat in proviral populations during long-term antiretroviral therapy

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Background: HIV proviral populations remain dynamic after long-term antiretroviral therapy (ART) but responsible mechanisms are uncertain. During ART, most proviruses are transcriptionally silent, and levels of expression from the HIV-promoter may contribute to the differential dynamics of intact and defective proviruses.

To investigate the effects of long-term ART on HIV promoter sequences, we characterized genetic variability of HIV-LTR in total, intact, and near-full length (NFL) defective proviruses prior to and during long-term ART

Methods: Peripheral blood lymphocytes from 11 participants were obtained prior to and during long-term ART (range 4-20y). Single genome sequences (SGS) of NFL proviruses (>7kb) were obtained by Illumina MiSeq and genetic intactness was determined by analysis of open reading frames and regulatory genes. The total proviral LTR population was obtained by SGS of the LTR alone (450bp).

We measured the genetic diversity by average pairwise distance (APD) and assessed population structure by phylogenetics and Slatkin-Maddison analyses. We predicted the promoter activity of LTR transcription factor binding sites (TFBS) based on the TRANSFAC database

Results: We obtained 0-50 intact, 2-46 NFL defective, and 10-36 LTR sequences/timepoint. No significant differences were detected in LTR genetic diversity (APD range: 0.83-2.17%) in total, intact, or NFL-defective proviruses prior to or during long-term ART.

From pretherapy to long-term ART, no changes in proviral population structures of intact were observed but significant changes were observed in 2/11 participants for NFL-defective and total proviruses.

LTR populations in intact and NFL-defective were, however, distinct from the total proviruses in 6/11 patients, either due to population shifts only at pretherapy (2/6 cases), only after long-term ART (3/6) or at both (1/6).

Differences in genetic variations in TFBS between NFL vs total proviruses were present in a minority of individuals, with changes in CCAAT-box binding (3/8 participants), NF-KappaB (3/11), CP2 and SP1 (2/11), Pit-1A and Oct-1 (1/11) sites.

Conclusions: HIV-LTR derived from NFL proviruses undergoes population shifts from total proviruses in the majority of participants observed both at pretherapy and after long-term ART.

These results suggest differential levels of host-specific pressure on the transcriptional activities of NFL and highly deleted proviruses and ART does not significantly contribute to this difference.

EPA0079

Delineating the role of transcription factor BRD9 in HIV-1 latency reactivation

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Background: AIDS remains incurable despite in search for treatment regimens in the past decades. The major obstacle is the HIV-1 latent reservoir in infected immune cells, especially in resting memory CD4+ T cells. The "Shock and Kill" strategy combines the administration of latency reversal agent (LRA) and anti-retroviral treatment (ART) to induce HIV-1 reactivation from infected cells and stimulate immune response against them.

Since current LRA treatments in clinical trials are suboptimal, drug screening for novel LRA remains a promising strategy to eliminate HIV-1 latent reservoirs.

This study therefore aims to reveal the potential of epigenetic drugs as new LRA specifically applicable in CD4+ T cells.

Methods: We first screened an epigenetic drug library consisting of 280 compounds using the latent HIV-1-infected T cell line model ACH2 and ranked the drugs according to their HIV-1 reactivation effects. Selected drug candidates were tested in different cell models to validate their functions. Measurements included qPCR, HIV-1 p24 ELISA and flow cytometry to identify the changes in HIV-1 production.

Gene knockout experiment was utilized to elucidate the ability of the target proteins of drug candidates in controlling HIV-1 gene expression.

ChIP-qPCR experiment was used for identifying the DNA-binding regions of target proteins to confirm their interactions with HIV-1 genome.

Results: We found that the inhibitor of transcription factor BRD9, namely I-BRD9, was an encouraging LRA candidate. BRD9 protein belongs to the BET protein family that consists of BRD4 protein that is known to mediate HIV-1 gene expression. I-BRD9 reactivated HIV-1 production not only in ACH2 T cells but also in infected resting memory CD4+ T cells and PBMC samples isolated from HIV-1 patients undergoing ART treatment.

Furthermore, knocking down BRD9 gene in ACH2 T cells increased HIV-1 production significantly. ChIP-qPCR experiment then demonstrated that BRD9 protein could bind to LTR and Gag gene region of HIV-1 genome, which integrated into host cellular genome, and it might regulate HIV-1 gene transcription via direct interaction.



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Conclusions: Our results demonstrated that I-BRD9 acted as a novel HIV-1 LRA in human CD4+ T cells and the transcription factor BRD9 could suppress HIV-1 gene transcription via direct interaction with HIV-1 genome.

EPA0080

Effect of combination latency reversing agents and bNAbs in SHIV-infected rhesus macaques on antiretroviral therapy

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Background: The combination of latency reversing agents (LRA) with antiretroviral therapy (ART) has been proposed as an HIV cure strategy. However, no therapy combination has demonstrated the capacity to clear latent HIV reservoirs.

This study assessed the impact of an LRA in combination with the broadly neutralizing antibody PGT121 on viral reservoirs in ART-suppressed rhesus macaques.

Methods: Eight macaques were infected with the bar-coded virus SHIVAD8E0M and underwent ART starting at 4 weeks post-infection (wpi). These ART-suppressed animals were divided into 2 groups at 49 wpi. The active arm (n=5) was dosed with AZD5582, then ctipavir prior to a 6-week ART interruption (ATI-1). At 80wpi, ART was re-initiated with a combination of AZD5582 and PGT121.

The control group received daily ART only. At 87 wpi, animals from both groups entered a 2nd ATI (ATI-2) for up to 11 weeks before necropsy. Changes in cellular and tissue viral reservoirs were evaluated using deep sequencing and quantitation methods, immunofluorescence and cell sorting.

Results: Plasma viral loads (pVL) were consistently <81 copies/ml while on ART in both groups. The active arm experienced viral rebound with detectable virus in plasma and cerebrospinal fluid during ATI-1; all animals showed a similar reservoir size in multiple tissues and organs at necropsy.

Viral DNA was detected in multiple regions of the brain, with low intact proviral reservoirs ranging between 75 and 374 intact proviruses/10⁶ cells in either temporal or parietal lobes, hippocampus, and/or hypothalamus in both groups. The active arm did not rebound during ATI-2, while all control animals rebounded within 6 weeks of ATI-2.

Conclusions: Sustained viral suppression after receiving AZD5582 and PGT121 suggests that PGT121 exposure prevented viral rebound. More data collection is ongoing and will provide further insights regarding cell types and anatomic sites that harbor reservoir.

These preliminary data also suggest that intact viruses in certain brain regions may serve as HIV reservoirs that could be challenging for eradication. Thus, future HIV cure strategies may need to include drugs that specifically target these resilient reservoirs.

EPA0081

Transient upregulation of CD4 increases permissibility of Vδ1 T cells to HIV-1 infection

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Background: The human gammadelta (γδ) T lymphocyte subset Vδ1 cells populate both peripheral blood and tissues with high rates of HIV replication such as lymph nodes (LNs). During early HIV infection peripheral Vδ1 cells expand.

Although the majority of γδ T cells do not express CD4, we previously demonstrated that other subsets upregulate CD4 following activation and becoming permissive to HIV infection. Therefore, we hypothesized that activated Vδ1 cells also upregulate CD4 expression increasing their permissibility to HIV entry and subsequent latent infection.

Methods: Peripheral blood mononuclear cells (PBMCs) were isolated from ART-suppressed people living with HIV (PLWH) and HIV-seronegative donors. LNs were obtained from the National Disease Research Interchange. A single cell suspension was obtained from LNs after mechanical disruption. Modulation of CD4, CCR5, and CXCR4 on circulating Vδ1 cells was assessed in time-course experiments by flow cytometry.

Separately, both PBMCs and LN cells were activated with 3 mg phytohemagglutinin and 100U/mL IL-2 for 72 hours prior to exposure to HIV variant JR-CSF for six days. In some cultures, CD4 was blocked using a monoclonal antibody prior to infection. HIV DNA was measured within Vδ1 cells and resting CD4 T cells from PLWH by droplet digital PCR (ddPCR).

Results: Vδ1 cells had a mean *ex vivo* expression of 5.6% CD4, 21.1% CCR5 and 93.7% CXCR4 compared to conventional CD4+ T cells which had mean CCR5 of 5.7% and CXCR4 of 86.9%. CD4 expression increased in Vδ1 T cells following activation, peaking at 5-6 days and declined thereafter. We found that both peripheral and tissue Vδ1 cells were permissive to infection *in vitro*. Infection was inhibited by the presence of αCD4. HIV *pol* DNA was detected in Vδ1 cells in ART-suppressed PLWH.

Conclusions: Our results indicate that HIV infection of Vδ1 T cells is CD4-dependent similar other T cell populations. Upregulation of CD4 within Vδ1 cells is transient following activation suggesting a potential window of opportunity where they are most susceptible to infection.

Successful infection of tissue and circulating Vδ1 cells *in vitro* and detection of HIV DNA *ex vivo* necessitates further investigation into their potential role as a latent viral reservoir.


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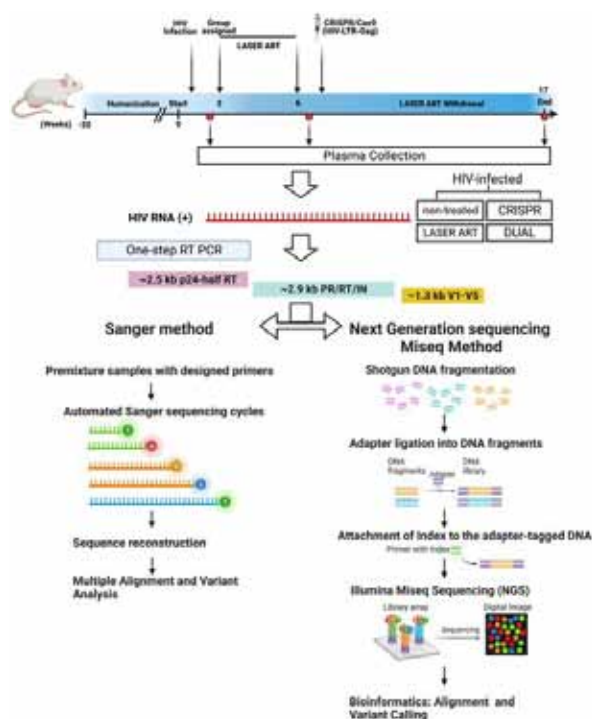
Molecular deep sequencing analysis of rebound viruses from antiretroviral drug and CRISPR-treated HIV-infected humanized mice

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Background: The elimination of human immunodeficiency virus type-1 (HIV-1) was achieved from infected humanized mice following combination antiretroviral and CRISPR-Cas9 therapies. However, viral rebound was observed in more than two-thirds of dual-treated animals. Single-genome and next-generation sequencing (SGS and NGS) were deployed to determine the molecular signature of these viral variants.

Methods: Plasma-derived replication-competent viral RNA was collected before and after combinational antiretroviral therapy (cART is defined by dolutegravir, lamivudine, abacavir, and rilpivirine), and CRISPR/Cas9 targeting HIV-1-LTR-gag treatment. One-step reverse transcriptase polymerase chain reaction (PCR) was performed from humanized HIV-1 infected mice plasma as controls (untreated) or replicate animals treated with cART (-; CRISPR- treated; or both cART and CRISPR).



Results: Sequencing and bioinformatics analysis revealed low-frequency non-salient mutations across the untreated samples at different time-points confirming the existence of host selection pressure. The env region demonstrated the greatest evolution divergence compared to other viral regions in the same treatment group. Importantly, the longitudinal analysis showed that the treatment (ARV and/or CRISPR) was responsible for the new mutations/indels in the env region over the course of study. No CRISPR-mediated indels or nucleotide substitu-

tions were observed at or near the gRNA-targeted cleavage site. Using Stanford drug-resistance database and IAS Drug Resistance Mutation List, accessory mutations not belonging to any major drug-resistant mutations were found utilizing SGS, while both major and accessory mutations were detected by NGS in samples from cART and dual treatment groups.

Conclusions: Collectively NSG-humanized mice paralleled viral evolution previously identified in ART-treated patients living with HIV. We detected drug-resistant mutations in four out of eleven cART-treated samples using NGS at 2% high-sensitive threshold analysis, suggesting drug resistance-mediated escape mutants may have contributed to the viral rebound.

Additional mechanisms which may have contributed to the viral rebound in dual-treated samples remain under investigation.

Novel treatment and prevention strategies

EPA0083

Engineering macaque B cells for persistent anti-HIV broadly neutralizing antibodies production

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Background: Recent clinical trials conducted in people living with HIV (PLWH) have shown that the administration of anti-HIV broadly neutralizing antibodies (bNAbs) is safe, significantly decreases the plasma viremia and potentiates HIV-specific host immune responses. However, waning levels of injected bNAbs are frequently associated with viral rebound and bNAb resistance during analytical treatment interruption (ATI).

These challenges significantly hamper bNAbs potential. To address this issue, we are interested in applying CRISPR-based gene editing methods to permanently reprogram B cells to express one or more bNAbs from the endogenous immunoglobulin heavy chain (IGH) locus.

To facilitate rapid translation to PLWH, we have focused on studies in our well-established nonhuman primate (NHP) model of acquired HIV-1 and anti-HIV gene therapy. Here we present foundational NHP B cell manufacturing data that will be applied in upcoming NHP experiments.

Methods: Rhesus macaque B cells were isolated and activated in culture before *ex vivo* editing with IGH-directed CRISPR-Cas9 ribonucleoprotein and adeno-associated virus (AAV). CRISPR targeting promotes the insertion of AAV-delivered homology donor template encoding an



engineered VRC01 bNAb into an intronic region of the IGH locus, replacing the endogenous heavy chain expression. IGH editing efficiency and specific integration of VRC01 in the targeted locus were assessed by Inference of CRISPR Edits (ICE) and in-out PCR, respectively. Cell surface VRC01 expression was quantified by flow cytometry.

Results: CRISPR RNP edited the IGH locus in 80-90% of NHP B cells. These edits facilitated the insertion of our VRC01 donor sequence, which was confirmed by in-out PCR.

Five to eight days post-editing, flow cytometry assays identified up to 15% of NHP B cells expressing VRC01 bNAb at the cell surface. Our editing approach did not impact NHP B cell proliferation, consistent with successful expression and trafficking of the engineered VRC01 bNAb.

Conclusions: Our data demonstrate that NHP B cells can be efficiently engineered to express anti-HIV bNAbs. This ongoing study paves the way for further *in vivo* evaluation in our immunocompetent NHP model.

In addition to adoptive transfer of *ex vivo*-manufactured B-cells, we are developing *in vivo* editing approaches to accelerate efficacious, scalable and feasible B cell-based therapies for PLWH.

EPA0084

(5R)-5-Hydroxytriptolide inhibits immune activation in SIV-infected ART-treated rhesus macaques

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Background: Chronic immune activation significantly contributes to HIV pathogenesis and disease progression, while the available interventions are limited. Triptolide has been identified as the primary active ingredient of Tripterygium wilfordii Hook F (TwHF), which has shown promising clinical benefits in PLWH.

Here, we investigated the efficacy of (5R)-5-hydroxytriptolide (LLDT-8), a novel triptolide derivative, to reduce immune activation in rhesus macaques (RMs).

Methods: 8 RMs were infected with SIVmac239 and ART was initiated 14 weeks after infection. At the same time, RMs were randomly allocated to receive daily LLDT-8 (Shanghai Pharmaceuticals Holding Co., Ltd., Shanghai, China; 0.2 mg/kg, n= 4) or placebo (n= 4) in alliance with continuous ART. During the 24-week follow-up, T cell

subsets, SIV RNA, and SIV DNA were measured to monitor treatment efficacy. PBMCs were collected to conduct transcriptomic analyses by RNA-seq.

Results: Following SIV infection, the CD4⁺ T cell percentage significantly decreased from 26.2% (15.7, 39.9) to 6.5% (3.5, 9.5) and the co-expression of CD38 and HLA-DR on CD8⁺ T cells also increased from 1.4% (0, 5.8) to 14.4% (10.4, 21.5) of all RMs at 12 wpi. LLDT-8 treated RMs experienced a much faster-descending percentage of HLA-DR⁺CD38⁺CD8⁺ T cells than the placebo group (wk16-wk 12: LLDT-8, -9.5% vs. placebo, 1.5%; *P*= 0.029).

The RNA-seq results showed that LLDT-8 treatment significantly inhibited immune activation and proliferation-related pathways, including the E2F targets, the G2M checkpoint, and the mitotic spindle, the spermatogenesis, and the IFN- α response pathways.

The expression of *MKI67* was continuously differentially expressed at different time points throughout the LLDT-8 treatment, and significantly correlated to CD8⁺ T cell activation level (Pearson's *r*= 0.23, 95%CI 0.04-0.41, *P*= 0.017). These results were validated in human PBMCs, LLDT-8 significantly suppressed the expression of Ki-67, CD38, and HLA-DR on CD8⁺ T cells in a dose-dependent manner *in vitro*.

Conclusions: LLDT-8 treatment significantly inhibited CD8⁺ T cell activation in SIV-infected RMs and human PBMCs, providing a potential therapeutic option for PLWH.

EPA0085

Dual therapy of Interleukin-21 and anti- $\alpha\beta 7$ antibody administration during ART-treated SIV promotes immunological responses and ameliorates dysbiosis in rhesus macaques

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Background: Despite effective antiretroviral therapies (ART), a cure for HIV remains elusive, necessitating new therapeutic strategies. Further, intestinal epithelium damage, mucosal immune depletion, and HIV-associated dysbiosis contribute to chronic immune activation and


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resultant sequelae, even during ART. Both IL-21 and anti- $\alpha 4\beta 7$ administration modulate gut lymphocyte milieu improving mucosal barrier function, thus limiting inflammation and plasma viral loads (VLs). We hypothesized that combining these interventions would synergistically further improve outcomes.

Methods: Sixteen rhesus macaques (RMs) were inoculation with 300 TCID₅₀ SIVmac239. Six weeks post acquisition (p.a.), ART (TDF+FTC+DTG) was initiated and administered until interruption at week 72 p.a. (ATI). Starting week 64 p.a., the experimental group (n=7; one excluded for remaining viremic during ART) was administered seven rounds of 100 μ g/kg subcutaneous IL-21-IgFc weekly and 50 mg/kg intravenous anti- $\alpha 4\beta 7$ antibody every three weeks. Animals were sacrificed at week 92 p.a. VLs, intact proviral DNA assays in CD4⁺ T-cells, flow cytometry, and fecal 16S rRNA sequencing were performed longitudinally.

Results: All RMs rebounded after ATI. Controls experienced progressive increases in VL reaching pre-ART setpoints after day 100 ATI.

In contrast, and despite higher initial rebound, dual-treated RMs controlled viral replication better compared to pre-ART setpoints, with log₁₀ 2.2 copies/mL lower VLs by sacrifice (P<0.0001).

At endpoint, dual-treated RMs had log₁₀ 1.4 copies/mL lower VLs than controls. Reservoir size was not different between groups. Following ATI, controls experienced increases in PD-1 expression on CD4⁺ TCMs (P<0.0001), with no significant changes in dual-treated RMs. Notably, reservoir size at dual therapy baseline correlated with PD-1⁺ TCMs (P=0.04) and predicted VLs ATI (P=0.007).

Finally, dual therapy facilitated SIV-associated dysbiosis recovery (increased Firmicutes (P=0.001), decreased Spirochaetes (P=0.02), decreased Proteobacteria (P=0.02)) compared to controls (week 72 p.a.). *Roseburia* (a butyrate-producing Firmicute) abundance was predictive of PD-1⁺ TCMs after therapy (P=0.004) and subsequent viral loads (P=0.004).

Conclusions: We demonstrate that combining IL-21 and anti- $\alpha 4\beta 7$ treatments inhibits PD-1 expression on CD4⁺ TCMs, ameliorates dysbiosis, and limits VLs after ATI. These findings highlight the importance of targeting PD-1 and microbiome composition for improving immune responses against SIV and provide a roadmap for future mucosal immunotherapies in ongoing cure efforts.

EPA0086

Claissened Hexafluoro treatment ameliorates cognitive deficits in HIV associated neurocognitive disorders (HAND) mice and improves the underlying brain pathogenicity

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Background: Regardless of combined antiretroviral therapy (ART), mild HAND still commonly occur due to the incompetence of ART to eradicate brain HIV, and consequential persistent viral infection in the brain. Pathologically HAND appears to correlate with immune dysregulation, and ongoing presence of neurotoxic HIV proteins, which lead to progressively deteriorated neurocognitive function.

Eventually, more severe forms of neurocognitive impairment, such as dementia may take place, and, in aging people with HIV (PWH) comorbidities likely increase susceptibility to HAND and accelerate progression.

Therefore, adjunctive therapies need to be developed that reduce or eliminate brain HIV or limit cognitive impairment.

Methods: Honokiol is known to exhibit anti-inflammatory and neuro-protective effects. CH is a synthetic Honokiol analogue and was administered in a SCID HAND mouse model in order to determine its ability to reverse cognitive and pathological features of HAND.

Mice (n=24) were firstly intracerebrally inoculated with HIV-infected human monocyte derived macrophages (MDMs). Control group of mice (n=12) were injected with uninfected MDMs.

Then half of the HAND mice (n=12) were administered 3mg of CH intraperitoneally daily for 6 days, the other HAND mice were given saline. Cognition was assessed through object recognition testing (ORT) among three groups of mice before and after treatment.

Mice were sacrificed after 1 week of treatment and the severity of neuroinflammation, including astrogliosis (GFAP), dendritic arborization (MAP2), microgliosis (MHCI⁺/CD45⁺), was evaluated by both histopathology and flow cytometry.

Results: CH treatment reversed ORT abnormalities. Flow cytometry revealed that the percentage of activated astrocytes were significantly decreased in CH-treated HAND mice compared to untreated HAND mice. Densitometric analysis of MAP2 indicated that CH largely restored the



changes of neuronal dendritic arborization compared to untreated HAND mice. Also, CH promoted mouse mononuclear phagocyte infiltration into the CNS.

Conclusions: CH ameliorated brain histopathology in HAND mouse model, and elicited protection via reducing HIV-induced neuroinflammation.

Future investigations will focus on characterizing the molecular and immunological profiling of monocytes and microglia in this HAND mouse model.

HIV-associated viruses, co-infections and co-morbidities

EPA0087

Interactions between the local environmental factors within the female reproductive tract in physiological conditions and during *Chlamydia trachomatis* infection

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Background: Heterosexual transmission from male to female is the major route of sexually transmitted infections (STI) and occurs mainly via the female reproductive tract (FRT) mucosae. Environmental factors present within the FRT play a role in the control against pathogens. An increase inflammation is rather in favour of a high risk of STI acquisition.

To have a better understanding of the interaction between the local environmental factors within the FRT in physiological conditions and during a STI, we have conducted three *in vivo* studies in the female cynomolgus macaque model.

Methods: Firstly, we have studied the interplay between the vaginal microbiota and the local inflammation during the menstrual cycle. Secondly, the impact of vaginal microbiota manipulation on the inflammatory immune response and on *Chlamydia trachomatis* (CT) acquisition was analysed. Finally, semen being the main STI vector, we analysed the impact of seminal plasma (SP) and CT infection on the vaginal microbiota and inflammation. For all the studies, the menstrual cycle (progesterone measurement), cytokine production (blood and vaginal

fluids) by Luminex[®], neutrophil subpopulations (blood and vaginal cytobrushes) by flow cytometry and the vaginal microbiota (16S rRNA V3/V4 regions or full 16S) were analysed longitudinally.

Results: We characterized for the first time the main cervicovaginal neutrophil subpopulations and demonstrated that local innate markers and vaginal microbiota composition are influenced by hormonal cycle phases.

We highlighted an impact of the vaginal microbiota composition on the local and systemic immune responses induced by CT infection and a significant and persisting alteration of the vaginal microbiota upon antibiotics and CT infection/inoculation.

We have shown that a single SP inoculation induced a higher inflammatory profile, with an increase production of cytokines and neutrophil extracellular traps (NET), compared to repeated SP inoculations.

Furthermore, the immune responses to CT infection varied in the presence or absence of SP.

Conclusions: Our studies support the idea that strategies aiming at modulating the FRT inflammation could be effective to prevent adverse genital health outcomes such as STI acquisition. However, such strategies must remain efficient during semen exposition and during the entire menstrual cycle to have a significant effect on the genital health.

EPA0088

TB-associated microenvironment represents a barrier for HIV curative strategies

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Background: Tuberculosis (TB), the most frequent opportunistic co-infection in HIV-positive individuals, enhances the infectivity of each pathogen and worsens the clinical outcomes in persons living with HIV/TB. However, it is unclear how the TB-associated microenvironment affects HIV latency and the efficacy of CD8+ T-cells in eliminating HIV-infected cells. Therapeutically aspirated pleural effu-



sions from TB participants (TB-PE) can reflect the microenvironment found in human respiratory cavities impacted by TB infection.

Therefore, we investigated the effects of TB-PE on latently HIV-infected CD4+ T-cells and HIV-specific CD8+ T-cells.

Methods: For HIV latency studies, CD4+ T-cells from 4 healthy donors were infected with a dual-fluorescent reporter HIV in the presence or absence of TB-PE. The proportion of latently and productively HIV-infected cells was quantified by flow cytometry.

To test whether TB-PE affects HIV latency reversal, CD4+ T-cells from two HIV-positive donors on antiretroviral therapy were exposed to PMA with or without TB-PE. Levels of HIV reactivation were determined by quantifying unspliced HIV-RNA expression by qRT-PCR. The effector CD8+ T-cell response from 3 HIV-positive participants was assessed by measuring intracellular effector cytokine (IFN- γ /TNF- α) production and degranulation (CD107a/b) after stimulation with HIV-peptides in the presence or absence of TB-PE.

In addition, the impact of TB-PE on the transcriptomic profile of CD8+ T-cells was characterized by RNAseq in cells from 3 healthy donors. Differential gene expression analysis was performed to investigate the cellular pathways modulated by TB-PE.

Results: The incubation with TB-PE significantly increased the proportion of latently HIV-infected cells ($p=0.012$). In addition, PMA-induced latency reversal was inhibited by TB-PE in CD4+ T-cells ($p<0.001$). Moreover, the expression of IFN- γ , TNF- α and CD107a/b in HIV-specific CD8+ T-cells was significantly diminished by TB-PE ($p<0.05$).

In addition, cellular pathways involved in T-cell activation, and inflammatory response were downmodulated by TB-PE in CD8+ T-cells ($p<0.01$).

Conclusions: We observed that the presence of TB-PE negatively impacts latency reversal in CD4+ T-cells. Moreover, the effector functionality of HIV-specific CD8+ T-cells was impaired. Importantly, our results suggest that the TB-associated microenvironment may pose a challenge to HIV curative strategies, such as shock and kill, which rely on latency reversal and CD8+ T-cell-mediated clearance in persons living with HIV/TB.

EPA0089

Support vector machine classification modeling identifies composite biomarkers predictive of non-AIDS events in people with HIV on suppressive anti-retroviral therapy

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Background: People with HIV (PWH) experience an increased risk of non-AIDS events (NAEs), including cancer and cardiovascular disease, despite effective antiretroviral drug therapy (ART), partly driven by chronic inflammation and immune activation. While select immune biomarkers are predictive of NAEs in PWH, composite panels may provide a more effective and accurate means for monitoring adverse outcomes.

Using a support vector machine (SVM) learning approach and a nested case-control study from the AIDS Clinical Trials Group ALLRT cohort, we aimed to identify composite predictors for NAEs.

Methods: Study participants were evaluated at baseline (pre-ART), one-year post-ART at viral suppression, and immediately preceding an event. NAEs (cases), include myocardial infarction/stroke, malignancy, serious bacterial infection, and non-accidental death. Controls were matched for age (median 45 years), sex (84% male), pre-ART CD4+ T-cell count (median 213 cells/mm³), and ART regimen at 48 weeks.

Parameters for model generation included age, sex, pre-ART CD4 count, and 49 plasma biomarkers associated with inflammation, myeloid/lymphocyte activation, coagulopathy, or microbial translocation.

Recursive Feature Elimination identified model parameters which carried significant power to classify cases/controls. SVM classification models were used to predict NAEs and area under the curve of the receiver characteristic (AUC-ROC) measured model accuracy. To reduce data noise, outlier values were adjusted and age range for cases was restricted (30-50 years). 3-fold cross validation was conducted to reduce the risk of overfitting.

Results: SVM modeling did not demonstrate case-control classification at baseline. However, a classification model consisting of 4-1BBL (lymphocyte activation) and CD163 (myeloid activation) identified NAEs with high accuracy one-year post-ART (AUC=0.96, $p<0.0001$).

At pre-event, classification model exhibited decreased accuracy (AUC=0.75, $p=0.0127$) with highest model contributions being 4-1BBL, indoleamine-2,3-deoxygenase 1, VISTA (lymphocyte activation), and D-dimer (coagulopathy).



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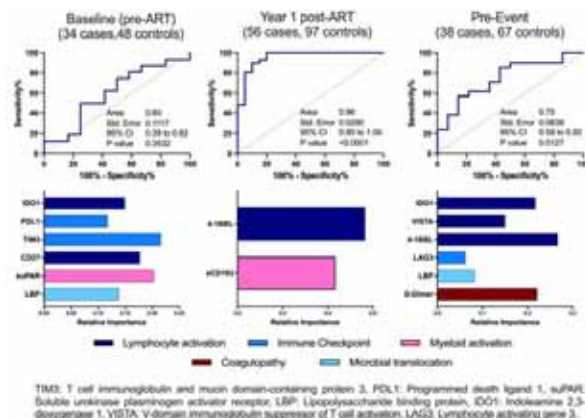
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Conclusions: We identified composite models that accurately classified PWH on ART that experienced adverse events, which could lead to improved monitoring of disease progression.

EPA0090

Impact of HCV clearance on metabolism biomarkers in people living with HIV

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Background: Co-infection with hepatitis C virus (HCV) and human immunodeficiency virus (HIV) alter lipid and glucose metabolism mediated by cytokines release. Our aim was to assess the evolution in metabolic plasma markers of people living with HIV (PLHV) after HCV elimination either spontaneously or with direct active antivirals (DAAs).

Methods: Multicenter prospective study of 116 HIV patients from four Public Spanish Hospitals in Madrid Autonomous Community. Samples were processed at the National Center for Microbiology, Institute of Health Carlos III, Madrid (Spain);

- HCV chronically infected patients (CHR) HIV+/HCV+= 45;
- Spontaneous clarifiers (SC) HIV+/HCV-=36; and;
- HIV control group, HIV+=35.

HCV-exposed patients were all studied at baseline and 48 weeks after achieving sustained virological response (SVR). Plasma levels of 15 metabolic biomarkers were measured by Multiplex Immunoassays. Differences between

groups were evaluated by generalized linear mixed model (GLMMs) for longitudinal series or generalized linear model (GLMs) for non-paired comparisons.

Results: The main metabolic characteristics of the study population are summarized in Table 1. At baseline, CHR patients showed higher levels of adiponectin (aAMR (IC95%) = 1.29 (1.06-1.57) p=0.014), NGAL (aAMR = 1.57(1.08-2.29); p=0.021), and sICAM-1 (aAMR = 3.45(1.86-6.40); p<0.001), than the control group.

After achieving SVR, the CHR group showed a significant decrease in the 3 cytokines that were increased at baseline: adiponectin (aAMR = 0,54 (0,40 - 0,74); p<0.001), NGAL (aAMR = 0,41 (0,21 - 0,77) and sICAM (aAMR = 0,17 (0,06 - 0,44). In contrast, there was an increase in cortisol levels (aAMR = 1.71 (1.31-2.22), p<0.001).

After the end of the follow-up CHR showed normalization of all measured markers that were increased at baseline. Any changes were observed in the same follow-up period for the SC group.

Conclusions: Chronically coinfecting HIV+/HCV+ patients showed altered levels in lipid and glucose metabolism compared to HIV monoinfected subjects and spontaneous clearers. The elimination of chronic HCV infection by DAAs normalized the lipid and glucose metabolism profile except for cortisol that remains increased after reaching RSV compared to levels observed in the HIV group. Spontaneous clarification of HCV did not modify metabolism biomarkers in these patients.

EPA0091

Faster disease progression and increased viral replication among HIV-TB co-infected individuals via *Mycobacterium tuberculosis* mediated modulation of host intrinsic anti-viral factors

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Background: *Mycobacterium tuberculosis* infection in HIV-1 infected individuals enhances HIV-1 viral loads, HIV diversity and also changes the cytokine /chemokine levels, resulting in rapid HIV disease progression and mortality, despite higher CD4 T-cell counts. Many speculations, yet the exact mechanisms are yet not known. The host intrinsic anti-viral factors act directly at different stages of HIV virus life cycle. These factors including APOBEC3G, TRIM5, BST2 and SAMHD1 are interferon inducible and various studies have highlighted their role in HIV infection. We hypothesised that the *M. tuberculosis* mediated immune activation and viral diversity modulate the expression of intrinsic factors as well as the host-viral interactions among HIV-TB co-infected individuals.

Methods: The differential gene as well as protein expression levels of host intrinsic anti-viral factors was evaluated among therapy naïve patients including HIV (n=22),



HIV-TB co-infected (n=22) and TB infected (n=19) cohorts using qRT-PCR and western blotting respectively and correlated with disease progression.

RNA sequencing analysis was carried out for further elucidation of associated pathways. The characterisation of viral *vif* and *vpu* genes was also carried out to understand the host-viral interactions among co-infected individuals.

Results: The gene expression of APOBEC3A, APOBEC3H, and BST2 was significantly up-regulated ($p < 0.0001$) among HIV-TB co-infected patients compared to only HIV or TB infected individuals. A positive correlation with IFN- γ expression in HIV-TB co-infected individuals was observed.

The protein expression of SAMHD1 and BST2 was significantly down-regulated in HIV-TB co-infected individuals indicating the modulation of SAMHD1 and BST2 at post-translational level. The RNA sequencing analysis further confirmed the differential gene expression among HIV-TB co-infected and mono-infected individuals in various innate immune pathways associated directly or indirectly with intrinsic anti-viral factors.

The enhanced APOBEC3A levels and higher number of G-A hypermutations in viral genes of co-infected patients further suggests the role of MTB in HIV viral diversity and hence disease progression.

Conclusions: The study suggests the role of MTB mediated modulation of different intrinsic antiviral factors among HIV-TB co-infected individuals that potentiates the accelerated disease progression.

The findings further indicate the possibility of novel therapeutic strategies targeting host-intrinsic anti-viral factors for better management of co-infected individuals.

EPA0092

In vitro modelling to monitor pathogenic implications of viral co-infections

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Background: Concurrent infection with two or more pathogens is common and can seriously affect the course of each infection from its own natural history. Co-infecting pathogens may antagonize or facilitate each other—for example, by altering cross-protective host immune responses—modulating host disease outcomes and microbe transmission relative to a single infection. However, experimental testing of co-infection models is extremely limited. Herein, we propose two different *in vitro* co-infection models to assess HIV-1/SARS-CoV-2, and RSV/SARS-CoV-2 immune and viral evolution.

Methods: HIV-1/SARS-CoV-2 co-infection model: PBMCs from 10 healthy volunteers were infected with 1ng HIV-1_{BoL}/1×10⁶ cells and subsequently co-cultured with Calu-3 cells pre-seeded in the bottom side of a transwell. After 24 hours, Calu-3 cells were challenged with SARS-CoV-2 (MOI= 0.015). Ninety-6 hours post-HIV-1 infection, PBMCs and Calu-3 supernatants were harvested for viral load quantification (RT-qPCR) and proteomic analysis (Multiplex Cytokine ELISA).

RSV/SARS-CoV-2 co-infection model: 0.7×10⁵ A549-ACE2 expressing cells were co-infected with RSV and SARS-CoV-2 (MOI=0.01). SARS-CoV-2 and RSV replication was determined 72 hours post infection by RT-qPCR and immune-fluorescent analyses. Type-I interferon release (ELISA) was evaluated on cell culture supernatants.

In both models, immune and anti-viral gene expression was assessed on cells (RT-qPCR). All the experiments were performed in the BSL3 facility.

Results: In the HIV-1/SARS-CoV-2 model, SARS-CoV-2 replication in Calu-3 cells was significantly reduced when exposed to HIV-pre-infected PBMCs. IL-10 expression and production were significantly higher in the co-infected condition, in both Calu-3 and PBMCs. The upregulation of IL-10 was associated to higher STAT3 expression levels. RSV/SARS-CoV-2 co-infection was characterized by an increased replication rate of both viruses compared to single infection, mainly for RSV ($p < 0.001$).

Notably, it was accompanied by a significant rise in the expression of ACE2 ($p < 0.01$) and the main Interferon Stimulated Genes (ISG) (single SARS-CoV-2 vs co-infection: MX2 $p < 0.001$; single RSV vs co-infection: MX1 $p < 0.05$; MX2 < 0.01 ; IFITM3 < 0.05 ; IFN β < 0.05). These results were confirmed by analyzing IFN β release in supernatants.

Conclusions: The HIV-1/SARS-CoV-2 and RSV/SARS-CoV-2 co-infection models display a unique and specific viral and molecular fingerprint. Co-infection models may represent an attractive cost/effective approach to mimic both viral dynamics and host immune responses providing readily-measurable targets predictive of co-infection progression.

EPA0093

HIV infection enhances EBV replication and EBV-associated tumorigenesis *in vivo*

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Background: Although the incidence of AIDS-associated malignancies has declined, the prevalence of certain types of EBV-associated cancers in people living with HIV (PLWH) has increased.

A clear understanding of how HIV co-infection affects EBV replication and EBV-associated tumorigenesis *in vivo* would accelerate the development of novel therapeutics to reduce EBV-associated cancers.



Methods: First, we established a humanized mouse model of HIV/EBV co-infection. Humanized mice were generated by transplantation of human CD34+ hematopoietic stem cells into irradiated immunodeficient mice. Mice were exposed to EBV then injected intravenously with HIV. Mice exposed only to EBV served as controls. HIV and EBV infection were monitored longitudinally in blood with real-time PCR. The levels of T cells, T cell activation, and memory T cells were also measured in the blood of mice with flow cytometry. At necropsy, tumor incidence and EBV-DNA, T cell, T cell activation, and memory T cell levels in blood and tissues were analyzed.

Results: HIV-RNA was detected in the plasma of all mice exposed to HIV. While no significant difference in EBV acquisition was observed between groups ($P=0.5007$), as demonstrated in PLWH, we observed higher EBV-DNA levels in the blood of EBV/HIV co-infected mice. Peak cell-free and cell-associated EBV-DNA levels were 15-fold ($P=0.0082$) and 5-fold ($P=0.0350$) higher respectively. EBV infection resulted in CD8 T cell expansion, activation, and acquisition of memory phenotype in the blood EBV/HIV co-infected mice and controls.

At necropsy, significantly higher levels of EBV-DNA were observed in the blood ($P=0.0022$), spleen ($P=0.0047$), lymph nodes ($P=0.0140$), bone marrow ($P=0.0350$), liver ($P=0.0082$), and lung ($P=0.0221$) of EBV/HIV co-infected mice.

The levels of activated CD8⁺ T cells were significantly higher in the blood ($P=0.0087$), spleen ($P=0.0221$), liver ($P=0.0140$), and lung ($P=0.0047$) of EBV/HIV co-infected mice.

Macroscopic tumors were observed in all (7/7) EBV/HIV co-infected mice but in only 57% (4/7) of controls. Tumors were also located in more distinct body sites in EBV/HIV co-infected mice compared to controls ($P=0.0023$).

Conclusions: Collectively, these results demonstrate a direct effect of HIV co-infection on EBV replication and pathogenesis *in vivo*. They provide an *in vivo* model that can be used for the study of other HIV co-infections.

SARS-CoV-2 virology, pathogenesis, and host immune responses, vaccines and immunotherapies

EPA0094

A panel of RBD-specific broadly neutralizing antibodies against SARS-CoV-2 variants

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Background: SARS-CoV-2 has developed into multiple variants, including Alpha, Beta, Gamma, Delta, Lambda and Omicron. Compared to the WT isolate, the Alpha, Delta and Omicron propagated faster, and the Beta, Gamma and Omicron variants showed stronger neutralization resistance to neutralizing antibodies and vaccine-immunized sera.

As a result, developing novel drugs, vaccines or neutralizing antibodies to prevent or treat COVID-19 is vital to completely contain the emergence and prevalence of SARS-CoV-2 variants.

Methods: In this study, single receptor binding domain (RBD)-specific memory B cells were sorted by flow cytometry from one COVID-19 convalescent and paired V_H/V_L regions were acquired by RT-PCR. Then paired V_H and V_L PCR products were cloned into the corresponding expression vectors respectively and antibodies were produced by co-transfecting paired heavy chain and light chain vectors into 293F cells. Antibodies were purified from the supernatant using protein A column in five days.

Furthermore, the neutralizing activity of these antibodies against multiple pseudotyped SARS-CoV-2 variants were evaluated.

Results: We identified five potent RBD-specific neutralizing antibodies (ZHC8, ZHC11, ZHD2, ZHD7 and ZHD11) that neutralized SARS-CoV-2 WT, Gamma (P.1), Alpha (B.1.1.7), Beta (B.1.351), Kappa (B.1.617.1) and Delta (B.1.617.2), with IC_{50} values below 0.3 μ g/mL.

Particularly, three of them (ZHC11, ZHD2 and ZHD7) presented broadly neutralizing activity against Omicron (B.1.1.529) and BA.2 with IC_{50} values below 0.2 μ g/mL. However, it seems that BA.4 escapes the neutralization of these three antibodies.

Antibody ID	Neutralizing activity against variants (IC_{50} , μ g/mL)								
	WT	P.1	B.1.1.7	B.1.351	B.1.617.1	B.1.617.2	B.1.1.529	BA.2	BA.4
ZHC8	0.027	0.015	0.022	0.044	0.147	0.034	NA	NA	NA
ZHC11	0.063	0.027	0.079	0.054	0.225	0.027	0.024	0.062	>0.667
ZHD2	0.007	0.002	0.009	0.004	0.014	0.005	0.045	0.199	>0.667
ZHD7	0.006	0.003	0.011	0.005	0.020	0.008	0.025	0.104	>0.667
ZHD11	0.020	0.015	0.037	0.038	0.037	0.021	0.351	NA	NA

Table.

NA: Not assessed.



Conclusions: In conclusion, we have got broadly neutralizing antibodies against multiple SARS-CoV-2 variants. These antibodies will provide candidate for promising cocktail therapy as well as valuable information for vaccine design to treat or prevent SARS-CoV-2 transmission.

EPA0095

Fc-modified HIV-1 broadly neutralizing monoclonal antibody, VRC01LS, shows enhanced biodistribution in human genital and rectal mucosal tissue compared to VRC01

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Background: The Antibody Mediated Prevention studies demonstrated that infusion of a broadly neutralizing monoclonal antibody (mAb), VRC01, could prevent HIV-1 acquisition in humans. Follow-up analyses suggested that serum mAb concentrations 200-fold above the *in vitro* neutralization titer are needed for 90% prevention efficacy against sensitive circulating strains.

Thus, a combination of mAbs with greater neutralization potency-breadth profiles and extended half-life are critical. Importantly, infused mAbs must reach mucosal areas to block the earliest steps of sexually transmitted HIV-1 infection, before extensive viral replication and reservoir establishment occurs.

Methods: We examined biodistribution, concentration and localization of VRC01 and a variant with enhanced FcRn binding, VRC01LS, in healthy cisgendered adults (12 male, 14 female), followed for 1-52 weeks post-intravenous mAb administration. Participants donated blood serum, cervicovaginal and rectal secretions, semen, as well as cervical, vaginal, and rectal biopsies.

We measured mAb concentrations in the samples using idiotype antibody 5C9 via ultra-sensitive Singulex technology. We assessed sub-anatomical localization of the mAbs in mucosal biopsies by immunohistochemistry.

Results: A single 30mg/kg infusion of VRC01 or VRC01LS was well tolerated. In rectal and cervicovaginal tissues, both localized primarily in the lamina propria and stroma, with low and variable epithelial distribution.

At 1-2 weeks post-infusion, VRC01LS levels were at least ~3-4 times higher than VRC01 in blood serum, rectal, vaginal and cervical tissue and remained higher throughout the study. VRC01LS half-life in serum and tissues was 3-fold higher (60-68 days) than VRC01 (20-27 days). We did not observe enhanced bioaccumulation of VRC01LS in rectal secretions, cervicovaginal secretions or semen. No differences were observed between VRC01 and VRC01LS in terms of penetration into tissues, as a percentage of blood levels. At 5-6 weeks, the penetration of both mAbs into rectal tissue was 8-16% of that in blood, into cervical and vaginal tissue was 22-28%, and <2% penetrated into rectal secretions and seminal plasma.

Conclusions: These results demonstrate benefits of VRC01LS for durable mAb distribution at HIV-1 exposure sites. Both monoclonals reach the lamina propria where most HIV target cells lie. More potent, LS-modified broadly neutralizing mAbs could be a promising, long-acting component for preventing sexually transmitted HIV-1.

EPA0096

COVID-19 vaccination uptake among adolescents and young people living with HIV in Kenya, 2021-2022

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Background: People living with HIV (PLHIV) are at increased risk of morbidity and mortality due to infection by SARS-CoV-2, virus that causes COVID-19. COVID-19 vaccines are both safe and effective in preventing SARS-CoV-2 infection and deaths in PLHIV. Kenya was among early adopters of COVID-19 vaccination in Africa in March 2021.

As of September 2022, 34% of adults of ages 18 years and above in Kenya are fully vaccinated and 8% were partially vaccinated. Vaccination among PLHIV is lower than the general population.

We evaluated COVID-19 vaccine uptake among adolescents and young people living with HIV (AYPLHIV), 15-24 years old during June 2021 and May 2022.

Methods: We analysed data from 1,550 facilities using electronic medical records reported to the national data warehouse from 40 counties. AYPLHIV were defined as those aged between 15-24 years while 25+ years were defined as adults living with HIV. Vaccine uptake was defined as those who had received 1 or 2 doses; fully vaccinated were those who received 1 dose of Johnson and Johnson vaccine or 2 doses of the other vaccines. Outcome variables of interest were uptake of vaccination and completion of the recommended vaccine doses.



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We compared outcome measures for AYPLHIV, and adults living with HIV and tested for the difference using chi-square tests.

Results: A total of 1,000,100 records reported from 40 counties were included in the analysis. Overall, 74,120 (7.4%) were AYPLHIV. Vaccine uptake among AYPLHIV was 11.2% (8,284/74,120) compared to 22.7% (210,109/925,980) among adults ($p < 0.001$). AYPLHIV were less likely to be fully vaccinated (7.3%) than adults PLHIV (17.7%) ($p < 0.001$).

Vaccine uptake among male AYPLHIV (9.0% [2,411]) was significantly lower compared to female AYPLHIV 12.4% [5,873] ($p < 0.001$). Vaccine uptake among AYPLHIV varied by geography.

Four counties had the vaccine uptake of $> 20\%$ namely, Nyeri (29%), Siaya (21%), Homa bay (21%) and Kirinyaga (21%).

Counties with high AYP vaccine uptake had a similarly higher vaccine uptake among adults living with HIV.

Conclusions: AYPLHIV have low COVID-19 vaccine uptake and completion of the recommended vaccine doses. Greater advocacy, education, and care navigation could increase COVID-19 vaccine access and uptake among AYPLHIV.

EPA0097

Comparison of immunogenicity and neutralizing antibody response of CoronaVac (Sinovac) and Vaxzevria (AstraZeneca) between people living with HIV with $CD4 \leq 200/\mu L$ and $CD4 > 200$ cells/ μL

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Background: SARS-CoV-2 infection in people who living with HIV (PLWH) is associated with worse outcome. The emergency authorized of COVID-19 vaccines are globally used; therefore, vaccination in PLWH with low CD4 T cell count demonstrated the lower immunogenicity. Heterozygous administration of COVID-19 vaccine triggers higher immunogenicity. Moreover, the immune response of heterozygous vaccine in PLWH is unknown.

Our study aims to compare the immune response of CoronaVac (Sinovac) and Vaxzevria (AstraZeneca) between PLWH with $CD4 \leq 200$ cells/ μL and $CD4 > 200$ cells/ μL .

Methods: A prospective cohort study was conducted to compare the immunogenicity and neutralizing antibody (nAb) of CoronaVac and Vaxzevria between PLWH with $CD4 \leq 200$ cells/ μL (low CD4 group) and $CD4 > 200$ cells/ μL (high CD4 group).

All of the participants received antiretroviral therapy and had undetectable HIV viral load. The anti-RBD IgG level and percentage of nAb inhibition were analyzed at 2 weeks and 12 weeks after complete vaccination.

Results: Thirty participants were included. 15 participants in low CD4 group had a median age of 47 (IQR 33, 55) years and mean CD4 of 139 (IQR 129, 149.5). While 15 participants with high CD4 group had a median age of 47 (IQR 43.5, 50.5) years and mean CD4 of 575 (IQR 476.5, 681).

At 2 weeks and 12 weeks after vaccination in low CD4 group, the median anti-RBD-IgG was 159 IU/ml (IQR 35.8, 492) and 143 IU/ml (IQR 77.3, 344.5), while nAb was 71% (IQR 49.4, 92.9) and decrease to 47.2% (42.3, 85), respectively.

In contrast to high CD4 group, the median anti-RBD-IgG was 273 IU/ml (IQR 154, 791) and 294 IU/ml (IQR 140, 551.5) while nAb was 89.3% (IQR 72.4, 93.8) and relatively stable of 81.6% (61.8, 86.9), respectively.

However, the anti-RBD IgG level and percentage of nAb inhibition were not statistically significant between two groups.

Conclusions: Immune response to heterozygous vaccination with CoronaVac-Vaxzevria between PLWH with $CD4 \leq 200$ cells/ μL and $CD4 > 200$ cells/ μL were not different.

Although, the decline of nAb was observed at 12 weeks after immunization in PLWH with $CD4 \leq 200$ cells/ μL . Therefore, adding a booster dose of COVID-19 vaccine is suggested.

EPA0098

Heterogeneity in neutralizing antibody responses following COVID-19 vaccination in Japanese people living with HIV

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Background: Although People Living with HIV (PLWH) could be at a relatively higher risk of suboptimal immune responses to COVID-19 vaccination, vaccine immunogenicity remains undercharacterized.

Here, in a cohort of PLWH on antiretroviral therapy (ART), we investigated antibody responses to SARS-CoV-2 and variants of concern (VOCs) following primary and booster COVID-19 vaccination.

Methods: We recruited 82 PLWH, with a median age of 48 (IQR, 40-56) years and $CD4^+$ count of 470 (IQR, 314-643) cells/ μL , in Fukuoka and Hiroshima, Japan. Participants had received 2 or 3 doses of either mRNA-1273 (Moderna) or BNT162b2 (Pfizer) mRNA vaccines 2-3 months before plasma was obtained. Plasma IgG was purified by protein A resin and neutralizing activity quantified by SARS-CoV-2 wildtype and VOC spike protein pseudotyped on a lentiviral reporter assay system.

Results: We confirmed that IgG purification could preclude inhibitory activity by non-antibody factors, including residual ART. Following primary vaccination, Neutral-


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izing antibody (NAb) potency against wildtype spike was quantitatively detected in 75 (91%) IgG samples at a median IC_{50} of 44.5 (IQR, 27.4– 92.4) μ g/mL. Given NAb potency negatively correlated with age in multivariate analysis ($r=0.33$, $p=0.01$), but not with other host factors, we disaggregated the participants into younger (≤ 48 yrs, $n=42$) and older (> 48 yrs, $n=40$) age groups.

Interestingly, in the younger age group, NAb potency positively correlated with subnormal CD4+ count (≤ 500 cells/ μ L) ($r=-0.63$, $p=0.02$), in contrast with the older age group ($r=0.04$, $p=0.84$).

Similarly, NAb potency negatively correlated with the inflammation biomarker, hs-CRP, in the younger ($r=0.44$, $p=0.01$), but not older ($r=0.09$, $p=0.64$) age group. In a subset of 18 (22%) participants who had received booster vaccination, NAb potency against wildtype, Delta, and Omicron BA.1 and BA.2 subvariants was enhanced >7 -fold ($p<0.001$) except in 2 participants.

Finally, NAb potency against wildtype spike following primary vaccination predicted VOC cross-neutralization post-booster vaccination ($r>0.6$, $p<0.01$).

Conclusions: Our data suggest heterogeneous immune correlates of COVID-19 vaccine immunogenicity in different age groups, peripheral inflammatory, and CD4+ recovery states, hence underscoring the importance of disaggregating cohorts of PLWH by clinical and immune recovery parameters.

EPA0099

No impact of HIV status on COVID-19 vaccine responses in Botswana

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Background: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) binding antibody titers have been shown to positively correlate with neutralizing antibodies in neutralization assays and have good utility in quantifying immune protection against SARS-CoV-2.

We assessed levels of antibodies post-vaccination using a quantitative binding antibodies analysis in a cross-sectional cohort in Botswana.

Methods: We measured binding antibody responses to SARS-CoV-2 spike (Anti-S) in adults with at least 14 days post-full doses of primary series vaccination with either Oxford/AstraZeneca (Vaxzevria), Johnson & Johnson (Jcovden), Pfizer/BioNTech or Sinovac (CoronaVac), using the Elecsys Anti-SARS-CoV-2 S quantitative immunoassay. We compared log Anti-S responses using multivariable linear regression, analysis of variance (ANOVA) and Student t-tests.

Results: Overall, 1013 participants were enrolled with a median age of 38 years (Q_1 , Q_3 : 31,47), mostly female (78%) and 31% were people with HIV. A total of 438, 450 and 125 participants were within the <3 months, 3 to <6 months and ≥ 6 months post-vaccination, respectively.

Overall, vaccine responses decline over time and there were statistically significant differences observed between vaccine products. Sinovac had the lowest mean responses across all time points.

Significant lower mean Anti-S levels for AstraZeneca ($p=0.004$) and Sinovac ($p=0.049$) were recorded after 3–6 months as compared to <3 months, and no statistically significant change for Pfizer/BioNTech and Johnson & Johnson (Jcovden) vaccine (Fig1A). Anti-S titres were higher in participants with a history of natural SARS-CoV-2 infection and COVID-19 vaccination (either before, after the first or second dose) as compared to those with no history of previous infection. Anti-S responses did not differ by HIV status ($p=0.35$, Fig1B) and age ($p=0.8$).

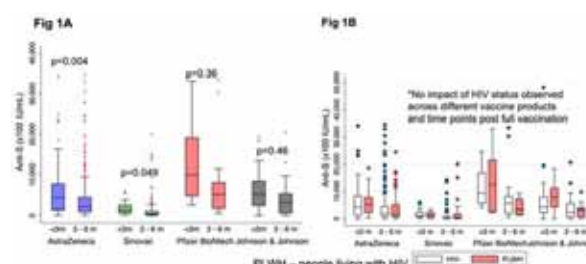


Figure 1. Anti-Spike Antibody Response A. Overall and B. by HIV status.

Conclusions: SARS-COV-2 Anti-S responses vary by vaccine product but did not differ by HIV status. History of natural infection SARS-CoV-2 infection and COVID-19 vaccination was associated with higher levels of Anti-S responses.



EPA0100

Serum level of Macrophage migration Inhibitory Factor (MIF) is elevated during acute COVID-19 but not associated with severity, in donors from a biobank from Buenos Aires, Argentina

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Background: MIF is a proinflammatory cytokine, fundamental to innate immunity. Elevated MIF plasma levels have been reported in acute and chronic viral infections, such as influenza and HIV. MIF also promotes the expression of inflammatory cytokines such as TNF- α , IFN- γ , IL-2, IL-6 e IL-8.

Here, we aimed to test whether MIF is also elevated during the acute phase of COVID-19, and whether it has a role in shaping the cytokine response to this virus.

Methods: Serum samples were obtained from 135 individuals with COVID-19 diagnosis that donated blood to the Argentinean Biobank of Infectious Diseases, Buenos Aires, Argentina. CCL2/5, CXCL8/9/10, TNF α , IFN γ e IL-2/4/6/10/17A were evaluated using the Human chemokine and the Human Th1/Th2/Th17 kits (from BD) and MIF was evaluated by ELISA (Biolegend).

Individuals were classified into acute (Ac; <15 days since symptom onset, DSO, N=40), early convalescent (EC; 15-60 DSO; N=62) and late convalescent (LC; >60 DSO; N=33); and mild or severe depending on whether they had pneumonia or required respiratory assistance. Data was analysed using Mann-Whitney, Kruskal-Wallis and Spearman correlation tests.

Results: Age (median=41 years) and sex (female-to-male ratio=0.93) did not differ significantly between the groups. Ac and EC samples had significantly higher MIF serum levels than LC (p=0.0003 and p=0.0024, respectively).

The same differences were observed when comparing only mild Ac and EC versus LC (p=0.0074 and p=0.0333, respectively) or severe Ac, EC versus LC, although the latter differences were not significant.

When comparing MIF levels between mild or severe presentation intra-group (i.e. mild Ac versus severe Ac, etc), no statistically significant differences were observed.

Surprisingly, in severe Ac COVID19, serum MIF levels inversely correlated with CCL2 and CXCL8 (r=-0.490, p=0.0331 and r=-0.495, p=0.0313, respectively), as opposed to mild convalescent COVID19, where MIF directly correlated with CXCL-9, CXCL-10, TNF and IL-2 (r=0.361, p=0.0029; r=0.267, p=0.0305; r=0.237, p=0.049; r=0.249, p=0.042).

Conclusions: Our results suggest that MIF is elevated during acute COVID19 together with other cytokines that participate in the cytokine storm that contributes to SARS-CoV-2 pathogenesis. However, at least in this cohort, it was not associated with a more severe clinical outcome limiting its use as biomarker or therapeutic target.

EPA0101

UV-C radiation induces disulphide bond cleavage in SARS-CoV-2 spike protein reducing its binding to ACE2 on host cells

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Background: The main focus of this project is to study the role of UV-C induced irradiation in SARS-CoV-2 Spike protein modifications, so as to employ this technology in order to identify the molecular mechanisms and domains that are crucial in making pathogens more susceptible to this wavelength. The first step is to understand which are the dynamics of UV-C (273 nm) efficacy in viral inhibition: the two components (intensity and exposure time) could have different roles in the efficacy of the 4mJ/cm² dose. Next questions are:

- Can UV-C also exert its antimicrobial effect by directly damaging viral proteins?
- Is it possible to predict whether alterations in structural domains may have consequences in maintaining protein structure/function?
- Is there a correlation between SARS-CoV-2 inhibition by UV-C exposure and its ability to infect cells?

Methods: Following UV-C (273 nm) viral inhibitory dose assessment (4mJ/cm²) through an *in vitro* SARS-CoV-2 infection assay, we performed an in-depth analysis on UV-treated/untreated (UV⁺/UV⁻) S protein by means of mass spectrometry (MS), computational analyses and surface plasmon resonance (SPR).

Results: We document that UV-C antiviral effect is dependent on the total irradiation dose alone, regardless of the time required to provide such dose. Among the UV⁺ altered peptides identified by MS, we focused on a



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sequence located in a conserved structural region within the S2 subunit where UV-C irradiation causes the oxidation of one of the two cysteines, disrupting the disulphide bond.

Computational analysis revealed that this disulphide bond breakage generates a long-distance correlation motion in the S1 subunit containing the RBD domain. Accordingly, SPR analysis demonstrated that UV⁺ S binds ACE2 with a significantly lower affinity compared to UV⁻ S protein.

Conclusions: This multidisciplinary approach pinpoints, for the first time, the S2 domain of the S protein as the putative target for the virucidal effect of UV-C, underlining its potential as a therapeutic target to prevent SARS-CoV-2 infection.

The workflow employed in this study could be used to screen viral molecular domains, resulting in a precise molecular fingerprint while providing new insights to adequately address future epidemics.

EPA0102

Persistent immune alterations in individuals with Long-COVID during a 6-months period

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Background: Long-COVID shows undefined underlying mechanisms such as sustained inflammatory response likely caused by SARS-CoV-2 persistence or to the development of autoimmune-like processes.

In this study, we monitored during 6 months the immune response of a Spanish cohort of individuals who showed signs and symptoms compatible with Long-COVID, in comparison with individuals who fully recovered from infection.

Methods: Prospective, observational, longitudinal study with 33 individuals with persistent symptoms of COVID-19 for 49 weeks post-infection (9 individuals were hospital-

ized during COVID-19). 20 individuals who recovered completely in the first 12 weeks after infection were controls. Peripheral blood samples and clinical data were collected at baseline and after 6 months. Antibody-dependent (ADCC) and direct cytotoxic activity (DCC) were measured against rituximab-coated Raji cells and Vero E6 cells infected with pseudo-typed SARS-CoV-2, respectively. Release of IFN γ , TNF α , and Granzyme B (GZB) was measured in response to SARS-CoV-2 peptides pool. PBMCs were analysed phenotypically by flow cytometry.

Results:

1. Median age of Long-COVID participants was 45 years (IQR 39.5-49.5) and most of them were female (91%). Median age of recovered individuals was 46 years (IQR 29.75-54.75), 90% were female.
2. CD4 from Long-COVID significantly decreased in the 6-months period (1.2-fold; $p=0.0405$), while CD8 remained increased during this time and they produced 1.2-fold ($p=0.0342$) more GZB than CD8 from recovered.
3. NK cells were also increased in Long-COVID but with reduced degranulation capacity (-1.5-fold; $p=0.0330$).
4. Tregs remained significantly increased (3.5-fold; $p=0.0028$) in individuals with Long-COVID after 6 months.
5. ADCC was significantly reduced (1.4-fold; $p=0.0440$) in Long-COVID who were hospitalized, while no significant changes were observed in DCC.

Conclusions: Individuals with Long-COVID showed persistently high populations of Tregs and reduced CD4 during a 6-months period, as well as increased cytotoxic populations with reduced antiviral capacity.

More studies are necessary to develop immunotherapies able to restore normal levels of immunity that may reduce Long-COVID symptoms.

EPA0103

Humoral immune responses to ancestral SARS-CoV-2 wild type and variant strains following COVID-19 vaccination in people with HIV

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Background: People with HIV (PWHIV) have reduced humoral responses to multiple vaccines compared with controls. Moreover, SARS-CoV-2 variants of concern (VoC) have the potential to evade immunity provided by ancestral COVID-19 vaccines.



We sought to describe humoral immunity to ancestral SARS-CoV-2 and multiple VoCs in PWHIV after 2 and 3-doses of COVID-19 vaccine.

Methods: We prospectively recruited PWHIV receiving antiretroviral therapy, and collected blood samples before commencing vaccination, at 1- and 6-months after the second dose, and 1-month after the 3rd vaccine dose. We measured SARS-CoV-2 receptor binding domain (RBD) and nucleocapsid IgG responses by an ELISA (microg/mL) and neutralising antibodies (nAb) against ancestral SARS-CoV-2 virus, Delta, and Omicron (BA.2, and BA.4/5) variants in a pseudovirus assay expressed as the dilution of plasma required to inhibit 50% viral entry (ID50)

Results: We enrolled 22 PWHIV (95% male, median age 50.6 [IQR 43.4-58.9]) on antiretroviral therapy. Eleven received mRNA vaccines for their primary and first booster doses. The median concentration of RBD-specific IgG was 21.7 (IQR 4.6-38.2) microg/mL after two, and 61.2 (IQR 54.7-83.3) microg/mL after three doses of COVID-19 vaccine. Recipients of two mRNA vaccine doses had higher concentration of RBD-specific IgG (39.9 microg/mL, IQR 17.1-44.2) than those receiving adenoviral-vector vaccines (16.8 microg/mL, IQR 9.7-23.6). While ancestral COVID-19 vaccines generate robust nAb responses to wild type and Delta variants, nAb titres to BA.2, and BA.4/5 were reduced.



Figure: Neutralisation responses to Wildtype, Delta, BA.2 and BA.4/5 in PWHIV following dose two and three COVID-19 vaccines.

Conclusions: PWHIV on antiretroviral therapy mount serological responses to COVID-19 vaccines, which increase after a third dose. Neutralisation of contemporary COVID-19 variants is reduced compared with wildtype and Delta strains, following ancestral vaccination. More data are needed to better understand the role of additional booster doses, particularly with bivalent COVID-19 vaccines, to enhance humoral immunity to circulating COVID-19 strains.

EPA0104

Comparable cellular response between people living with HIV and healthy donors against SARS-CoV-2 six months after receiving two doses of currently approved COVID-19 vaccines

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Background: The immune response to COVID-19 vaccine in PLWH may be affected by low CD4 count and immune exhaustion. Most studies are focused on the humoral responses but not on the cellular response.

This is a longitudinal study to evaluate the cellular responses elicited by PLWH after six months of receiving the complete vaccination schedule against SARS-CoV-2.

Methods: Blood samples of 23 PLWH and 16 healthy donors (HD) were collected before receiving the first vaccine dose and then 4-6 weeks and 6 months after two doses of COMIRNATY or Spikevax, or one dose of Ad26.COV2-S. Direct cellular cytotoxicity (DCC) was analyzed by measuring caspase-3 activity in pseudotyped SARS-CoV-2-infected VeroE6 cells after co-culture with PBMCs.

Antibody-dependent cellular cytotoxicity (ADCC) was analyzed by measuring annexin V levels in rituximab-coated Raji cells. Cell subpopulations were analyzed by flow cytometry.

Results:

1. CD4 count in PLWH was 864 (IQR 631-1035) cells/mm³ and CD4/CD8 ratio was 0.97 (IQR 0.69-1.2).
2. DCC against SARS-CoV-2 was increased 3.45-fold (p=0.0361) in PLWH before vaccination, in comparison with HD. After 6 months of receiving the second dose, DCC decreased 9.6-fold (p=0.0313) in HD and 2.4-fold (p=0.1475) in PLWH, but it was 5.25-fold higher in PLWH (p=0.0028).
3. ADCC response decreased 2.49-fold (p=0.0156) in HD but remained unchanged in PLWH.
4. CD8 count was increased 1.42-fold (p=0.0330) in PLWH before vaccination and this level was maintained after vaccination. CD8 degranulation capacity increased 1.3-fold (p=0.0408) one month after vaccination in PLWH but remained unchanged in HD.


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5. CD3+CD8-TCR $\gamma\delta$ + subpopulation increased 2.41-fold ($p=0.0011$) in PLWH one month after vaccination but it decreased to similar levels between both groups six months after vaccination.

6. NK levels decreased 9.16-fold ($p=0.0156$) in HD and 3.66-fold ($p=0.0020$) in PLWH six months after vaccination; no differences were found in NKT cells.

7. Six HD (36.5%) and three PLWH (13.0%) had breakthrough infections that did not require hospitalization.

Conclusions: Cellular responses from PLWH after receiving the complete schedule of COVID-19 vaccines were comparable or even better than those developed by HD, mostly based on increased levels of CD8 and NK cells. This cytotoxic activity showed a progressive reduction six months after receiving the second dose of COVID-19 vaccine.

EPA0105

High levels of soluble endothelial cell protein C receptor in plasma of individuals with Long-COVID proves the role of endothelial dysfunction in the persistence of COVID-19

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Background: Individuals with Long-COVID show persistent inflammatory responses that are compatible with autoimmune-like processes triggered by SARS-CoV-2 acquisition. However, the presence of the virus is usually undetectable, indicating that other factors such as the endothelial dysfunction and/or the loss of integrity in the intestinal mucosa may be causing this syndrome.

This study was aimed to determine if the presence of markers for bacterial translocation and endothelial and/or intestinal mucosa damage may be related to the persistence of Long-COVID.

Methods: Prospective, observational, transversal study with 32 individuals with persistent symptoms of COVID-19 for 49 weeks post-acquisition (3 individuals were hospitalized during COVID-19).

32 individuals who recovered completely in the first 12 weeks after acquisition were used as controls. Residual SARS-CoV-2 viremia was determined by RT-qPCR. Levels of lipopolysaccharide (LPS), lipopolysaccharide-binding protein (LBP), occludin, fatty acid-binding protein 2 (FABP2),

tissue-type plasminogen activator (TPA), and soluble endothelial cell protein C receptor (sEPCR) were determined by ELISA (Abcam) in the plasma of the participants.

Results:

1. Median age of Long-COVID participants was 49 years (IQR 45.0-52.5) and most of them were female (97%). Median age of recovered individuals was 49 years (IQR 37.5-59.0), 69% were female.

2. No detectable viremia was detected in any participant.

3. Plasma levels of sEPCR, which increases during endothelium activation, were enhanced 3.9-fold ($p<0.0001$) in individuals with Long-COVID who were non-hospitalized during COVID-19.

However, sEPCR was undetectable in individuals with Long-COVID symptoms who were hospitalized during COVID-19, indicating that this marker could differentiate between Long-COVID and COVID-19 sequelae. 4) Levels of LPS, LBP, occludin, FABP2, and TPA were similar in individuals with Long-COVID and recovered.

Conclusions: No direct signs of intestinal mucosa damage were observed in plasma of individuals with Long-COVID. However, high levels of sEPCR were observed, in the absence of detectable viremia and negative nasopharyngeal RT-qPCR, in individuals who were non-hospitalized during COVID-19 and show signs and symptoms compatible with Long-COVID.

High levels of sEPCR have been related with thromboinflammatory processes and pulmonary findings during COVID-19 but this is the first report of EPCR persistence during Long-COVID.

EPA0106

Characterization of SARS-CoV-2 diagnostic and subgenomic RNA viral dynamics and seroconversion via Bayesian hierarchical modeling

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Background: While SARS-CoV-2 viral load (VL) measured by diagnostic RT-PCR tracks viral RNA, the detection of subgenomic RNAs (sgRNA) may more accurately identify viral replication.

Understanding both types of viral dynamics and their relationship to immunizing antibodies is crucial for devising better therapeutic and prevention strategies for COVID-19.

Methods: A Bayesian hierarchical model was developed to jointly estimate the diagnostic and sgRNA VL trajectories and rate and timing of seroconversion for a sub-cohort of the COVID-19 PEP Study, a randomized trial conducted in the US between March and August 2020.



Participants self-collected daily mid-turbinate swabs for 14 days and some provided dried blood spot (DBS) samples on day 1, 14 and 28. Swabs were tested for SARS-CoV-2 RNA via RT-PCR and samples with detectable diagnostic RNA were further tested for sgRNA. DBS samples were tested for IgG anti-spike antibodies. 80 participants had sustained viral shedding with at least 2 positive sgRNA samples and were included in this analysis.

Results: On average, the diagnostic VL reached a peak of 8.0 (95% credible interval, CI: [7.8, 8.1]) log₁₀ copies/ml after 3.8 (95% CI: [3.2, 4.7]) days and then cleared after 10.5 (95% CI: [10.1, 10.9]) days. The sgRNA VL reached a peak of 6.0 (95% CI: [5.9, 6.2]) log₁₀ copies/ml approximately 0.6 (95% CI: [0.3, 0.8]) day after the peak diagnostic VL and then cleared after only 5.7 (95% CI: [5.3, 6.1]) days. The estimated infectious period was 10.1 days (95% CI: [9.4, 11.0]).

The overall seroconversion rate was 75.0% (95% CI: [62.5%, 85.0%]) and the peak diagnostic VL was positively associated with seroconversion (odds ratio = 1.24, 95% CI: [1.00, 1.54], for every 10-fold increase in diagnostic peak VL). When seroconverted, the mean time from infection to seroconversion was 14.4 days (95% CI: [12.5, 16.6]).

Conclusions: In this cohort, SARS-CoV-2 viral dynamics were characterized by a rapid rise to reach viral peak and subsequent slower decline.

On average, viral replication terminated after 10 days while SARS-CoV-2 RNA was detectable in respiratory samples for 14 days. Anti-spike IgG seroconversion was positively associated with VL, and the average time of seroconversion since infection was 14 days.

Methods: To assess this issue, by using iPSC-derived-human brain organoids (HBO) we evaluated: the expression of SARS-CoV-2 main receptors: ACE2, CD147, NRP1, Furin, TMPRSS2 (qPCR, IF); their infectability by SARS-CoV-2 over-time (QPCR, TCID₅₀, IF); and the effect of SARS-CoV-2-infection and S exposure on HBO transcriptome (qPCR) and secretome (Multiplex ELISA).

Results: All the main SARS-CoV-2 receptors are expressed by HBO with lower NRP1 levels compared to CD147 and ACE2. By analyzing viral N1 and N2 gene sequence over time, infectability of VeroE6 cells by SARS-CoV-2 infected HBO supernatants, and nucleocapsid expression by IF we confirmed that HBO may be productively infected by the virus.

Furthermore, SARS-CoV-2 infection was accompanied by the activation of apoptotic and stress pathways (caspase3, caspase8, Bcl2, S100B), inflammatory process (CCL2, NLRP3) Interferon Stimulated Genes (IFITM1, IFITM3, STAT1, NFkB) and antigen presentation pathway (ERAP1, ERAP2, HLA-A, TAP).

Notably, the trend of the different targets was comparable following SARS-CoV-2 infection and S-stimulation.

Conclusions: These results confirm that SARS-CoV-2 infect HBO probably by binding CD147 and ACE2 receptors and indicate that the exposure to the S protein can affect their homeostasis and exert neurotoxic effects presumably driving the so called long-COVID symptoms.

EPA0107

SARS-CoV-2 infection and Spike protein exposure alter iPSC-derived human brain organoid homeostasis

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Background: COVID-19 typically causes respiratory disorders, but several COVID-19 patients (30-60%) manifest also a wide range of neurological conditions, advocating for detrimental effects of SARS-CoV-2 or Spike (S) protein on the central nervous system.

However, the molecular mechanisms responsible for these dysfunctions as well as the potential neurotropism of SARS-CoV-2, are still under investigation.

Course of HIV disease

EPB0108

A description of the characteristics and causes of HIV related in-patient mortalities at two tertiary children's hospitals in Zambia for the period January – December 2021

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Background: Zambia has made significant progress in improving the ART coverage for children living with HIV (51% in 2016 to 71 in 2022), however, the number of new acquired HIV and HIV related mortalities among children seems to have plateaued over time (after a significant decline from 24,000 in 2010 to 19,000 in 2019). Some of the reasons include delayed diagnosis of HIV and sub-optimal ARV initiations in hospital care.

The aim of the study was to describe the characteristics associated with HIV related in-patient mortalities among paediatric deaths.

Methods: All available mortality case files of children that satisfied the criteria for inclusion were selected from the only two children's hospitals in Zambia. The primary inclusion criterion was mortality cases between January and December 2021 with documented evidence of HIV or exposure to HIV.

We identified and selected 148 cases from 770 reviewed files. Relevant data were abstracted from the case files and uploaded to an online database hosted on the RED-CAP platform. The data were cleaned and analyzed using Microsoft Excel and R programming language. A 5% significance level was assumed for statistical analysis and descriptive statistics were generated.

Results: There was an equal sex distribution of the 148 case files reviewed and of these approximately 59.5% were HIV exposed. About 53.4% of the exposed children did not receive ARV's for PMTCT. An estimated 40.5% of the sample were confirmed HIV positive with up to 28% of these not started on ART. The median age at admission was 10 months (IQR 17). Approximately 33.8% and 33.1% experienced mixed breastfeeding and breastfeeding only practices, respectively. Respiratory diseases were the major cause of death (58.1%) followed by infectious (or parasitic) diseases with about 10.1%.

Conclusions: Most HIV in-hospital related mortalities occurred in children aged less than 24 months and slightly below half had not received either ART or PMTCT. The ma-

jority of deaths in the sample were caused by respiratory diseases. There is need to strengthen early diagnosis and rapid initiation of ART to prevent deaths in children in the two tertiary hospitals.

EPB0109

Factors associated to AIDS deaths among people living with HIV/AIDS on antiretroviral therapy between 2019 and 2021 in Brazil: a retrospective study of programmatic data

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Background: Since the beginning of the AIDS epidemic, 371,744 deaths from HIV/AIDS were reported in Brazil. Despite the advances achieved by the Brazilian government in adopting and incorporating best care practices for PLWHA, such as the adoption of treatment for all, increased antiretroviral coverage, multi-month dispensation, and rapid ART initiation. Reduction of mortality due to HIV/AIDS remains a challenge, considering the country's continental dimensions and substantial differences related to access of PLWHA to health services.

Our study aimed to assess demographic and clinical factors associated to AIDS deaths among PLWHA on ART, between 2019 and 2021, in Brazil.

Methods: We linked programmatic data from the national ART, viral load (VL), CD4 exams, and AIDS mortality information systems from the Ministry of Health of Brazil. PLWHA on ART, from 01/01/2019 and 12/31/2021, aged ≥18yo, were included in this study.

We estimated AIDS deaths rates stratified by demographic characteristics and clinical conditions (ART regimen, CD4, and VL). Univariable and multivariable logistic regression models were performed to access the likelihood of dying from AIDS according to the analyzed characteristics and conditions.

Variable	n	%	OR (95% CI)	p-value
Sex				
Male	100	67.6	1.0	
Female	48	32.4	1.1 (0.7-1.8)	0.70
Age (years)				
18-24	10	6.8	1.0	
25-34	20	13.5	1.5 (0.6-3.8)	0.45
35-44	30	20.3	1.8 (0.8-4.0)	0.20
45-54	40	26.9	2.2 (1.0-4.8)	0.04
55-64	30	20.3	2.5 (1.1-5.4)	0.02
65+	18	12.1	3.1 (1.4-6.8)	0.00
Time since ART initiation (months)				
0-12	10	6.8	1.0	
13-24	20	13.5	1.2 (0.5-2.8)	0.70
25-36	30	20.3	1.4 (0.6-3.1)	0.45
37-48	40	26.9	1.6 (0.7-3.5)	0.25
49-60	30	20.3	1.8 (0.8-4.0)	0.15
61+	18	12.1	2.1 (0.9-4.8)	0.07
CD4 count (cells/mm ³)				
>500	10	6.8	1.0	
350-499	20	13.5	1.5 (0.6-3.8)	0.45
200-349	30	20.3	1.8 (0.8-4.0)	0.20
50-199	40	26.9	2.2 (1.0-4.8)	0.04
<50	30	20.3	2.5 (1.1-5.4)	0.02
VL (copies/mL)				
<100	10	6.8	1.0	
100-1000	20	13.5	1.2 (0.5-2.8)	0.70
>1000	30	20.3	1.4 (0.6-3.1)	0.45
ART regimen				
First-line	100	67.6	1.0	
Second-line	48	32.4	1.1 (0.7-1.8)	0.70

Results: In the multivariable analysis, factors that increased the odds for AIDS mortality were: older age (aOR:3.86; CI95%:3.46-4.31), living in the southern re-



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gion (aOR:1.49; CI95%:1.39-1.61), 1-2 years on ART (aOR:1.14; CI95%:1.04-1.26), CD4<100 (aOR:10.9; CI%:10.1-11.77), and HIV-VL≥1000 (aOR:10.9; CI%:1.58-1.69).

Conclusions: Data showed the importance of adopting effective strategies for facilitating and prioritizing access to health services, especially for people with advanced HIV disease and those newly initiating ART, considering other associated factors such as age and region of residence.

Diagnostic and monitoring tools

EPB0110

Support systems for HIV self-testing: a global scoping review

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Background: HIV self-testing (HIVST) is a safe and accurate way to increase access to and uptake of testing, particularly amongst key populations. Supporting the use of self-tests and onward linkage to appropriate prevention and care following HIVST remains a critical part of successful implementation.

To understand the current landscape of systems and tools supporting HIVST usage and linkage, we aimed to qualitatively synthesise the available global data on HIVST support systems.

Methods: We conducted a scoping review following the PRISMA guidance and searched five databases between January 2000 and March 2022. Included studies reported on one or more systems supporting: HIVST usage, interpretation of results, or linkage to follow-up services. We used thematic analysis to inductively identify themes.

Results: We screened 14,385 articles and included 316 for analysis, including 109 (34%) randomised controlled trials. Many included key/priority populations such as men who have sex with men (n=96, 30%), female sex workers (n=24, 8%) and pregnant people (n=20, 6%). Most were conducted in Africa (n=176, 56%).

Across 280 (89%) articles, 640 systems supporting self-test use were reported, most commonly: pictorial instructions (n=120, 19%), in-person demonstrations (n=100, 16%) and

in-person assistance (n=86, 13%). Digital tools included smartphone apps (n=11, 2%) and online video conferencing (n=11, 2%). Across 137 (43%) articles, 198 systems explicitly supporting result interpretation were reported, most commonly pictorial instructions (n=65, 33%). Smartphone-based automated results readers (n=7, 4%) have been used in the USA, China, and South Africa.

Across 265 (84%) articles, 1,137 post-test linkage support systems were reported, most commonly: in-person referrals/counselling (n=145, 13%), written referrals/counselling (n=80, 7%) and phone helplines staffed by professionals (n=71, 6%).

Less common linkage systems included home visits (n=35, 3%) and live video counselling (n=23, 2%). Bluetooth technology (n=15, 1%) has been used in the USA to remotely notify counsellors of HIVST kit opening.

Conclusions: Globally, systems supporting HIVST utilise a range of methods, including static media, and digital and in-person engagement. Whilst in-person and printed approaches are relatively common, emerging digital tools are rarer and should be further explored.

The effectiveness of support systems remains to be determined, especially with consideration of individual preferences and local contexts.

EPB0111

Independent analytical evaluation of the COBAS® 5800 system for HIV-1 quantitative and HIV-1/HIV-2 qualitative nucleic acid tests

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Background: Roche Diagnostics recently announced that the COBAS® AmpliPrep/COBAS® TaqMan (CAP/CTM) system, widely used across low-and middle-income countries, will be phased out by early 2024 and replaced by the Roche cobas® 5800 System (c5800). The analytical performance of the c5800 for HIV-1 Quantitative Nucleic Acid Test for viral load (VL) using plasma and HIV-1/HIV-2 qualitative testing using dried blood spots (DBS) was independently evaluated for implementation consideration in the President's Emergency Plan for AIDS Relief (PEPFAR)-supported countries.

Methods: Analytical evaluations of the cobas® HIV-1 Quantitative Test and the cobas® HIV-1/HIV-2 Qualitative Nucleic Acid Test were conducted. HIV-negative plasma or whole blood samples were spiked with WHO 4th HIV-1 International Standard, 2nd HIV-2 International Standard, or cultured virus. Testing was performed using the HIV-1 Quantitative or HIV-1/HIV-2 Qualitative Nucleic Acid Test workflow.

Analytical performances, including precision, linearity, subtype detection, and cross-contamination, were evaluated. For the qualitative assay, reproducibility, cross-

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contamination, and subtype coverage for HIV-1 A, B, C, D, CRF02-AG, and HIV-2 were determined. For both assays, the limit of detection (LOD) was calculated using PROBIT analysis, and error rates were assessed.

Results: The LOD for the HIV-1 Quantitative Test was 37.1 copies/mL, the LODs for HIV-1/HIV-2 Qualitative Test were 299 copies/mL and 1425 copies/mL for HIV-1 and HIV-2, respectively.

Testing of forty or fifty replicates of HIV-1 plasma or HIV-1/HIV-2 DBS samples over five days, by two testers with different reagent lots, showed 100% reproducibility. The five major HIV-1 subtypes evaluated were all detected.

No cross-contamination was detected. The error rate was 0% for HIV-1 Quantitative Test from 435 tests and 0.48% for the HIV-1/HIV-2 Qualitative Test from 415 tests. The correlation between the nominal and actual VL concentration of five subtypes was extremely high with the R^2 correlation coefficients were all 0.996 or higher.

Conclusions: We report here the first independent evaluation for HIV-1 Quantitative and HIV-1/HIV-2 Qualitative workflows on the new c5800. The manufacturer's claims were verified. The c5800 combines the capacity to conduct HIV-1 VL and HIV infection with differentiation of HIV-1 and HIV-2, which will prove to be a useful tool in HIV diagnosis and treatment monitoring.

EPB0112

Development of a low-cost ART resistance test for Nigeria's HIV population

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Background: Dolutegravir is associated with improved ART outcomes. Despite data suggesting that acquired drug resistance does not undermine efficacy of dolutegravir-ART, additional studies are needed to further evaluate the effects of extensive pre-existing nucleos(t)ide resistance on DTG-ART across subtypes. OLA-Simple is an easy-to-use oligonucleotide ligation assay (OLA), guided by interactive software that reports ART-resistant mutations as colored lines on lateral flow strips. OLA-Simple was validated in subtypes A, B, C, D, and AE, showing higher sensitivity than Sanger sequencing and compared favorably to next-generation sequencing. To expand OLA-Simple use in AG/G subtypes, we designed and tested OLA-Simple probes for a Nigerian cohort.

Methods: OLA-Simple probe sequences were designed to detect M41L, K65R, L74V/I, Y115F, K103N, Y181C, M184V, G190A, and T215F/Y based on 380 *pol* sequences from Nigerian adults' plasma from 2007-2012 with HIV-1 subtypes prevalent in West Africa including CRF02 ($n=20$), G-prime ($n=16$), G ($n=7$), A ($n=7$), CRF06 ($n=3$), C ($n=2$), and D ($n=1$). OLA conditions were optimized to detect minority frequency (10-15%) variants in each person's quasispecies, both in the plate-based OLA and OLA-Simple kit formats.

Optimized probes and plate-based OLA conditions were used to blindly analyze 56 archived RNA at 504 codons, and results were compared to Sanger sequencing.

Results: RT-PCR for OLA-Simple successfully amplified 55/56 with plasma HIV RNA between 140-8250 copies/reaction (median: 660). The one that failed had 265 copies/reaction (CRF06 subtype). Of the remaining 495 codons, 13 failed ligation (2.6%, 95%CI:1.4-4.5), 183 had drug-resistance genotypes, and 299 were wild-type.

Compared to Sanger sequencing, OLA had 93% (95%CI:91-95) concordance with 170 and 292 drug-resistant and wild-type codons, respectively. OLA detected additional 18 drug-resistant codons classified as wild-type by Sanger, presumably below Sanger's limit-of-detection.

Conversely, 2 (1.2%, 95%CI:0.1-0.4) drug-resistant mutant codons detected by Sanger were not detected by OLA due to their weak amplification, potentially due to prolonged storage of RNA. Discordant results are being evaluated by next-generation sequencing.

Conclusions: OLA-Simple was adaptable for multiple HIV subtypes, including AG/G. Our next steps include the evaluation of these probes on currently circulating specimens on-site in Nigeria as well as designing OLA probes to detect dolutegravir resistance.

EPB0113

Assessment of the performance of the plasma separation card (PSC) for HIV viral load monitoring in South Africa

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Background: Viral load (VL) monitoring is a critical component of clinical management of clients on antiretroviral therapy. Newer innovations are necessary in settings where logistics around plasma monitoring are challenging.

We assessed the performance of a plasma separation card (PSC) during routine patient care for VL monitoring in clinical settings.



Methods: We employed a multi-site, cross-sectional evaluation of a PSC on blood specimens collected from all consenting adult (>18 years) and assenting young (<18 years) healthcare clients living with HIV attending ten primary healthcare clinics in Ekurhuleni and Bojanala Districts, South Africa. Ethylenediaminetetraacetic acid (EDTA) anti-coagulated venous samples and PSCs made using capillary blood were collected on site. Plasma VLs were tested at three routine National Health Laboratory Services (NHLS) referral laboratories using standard of care assays.

PSCs were tested at the NHLS, Johannesburg using the COBAS® AmpliPrep/COBAS® TaqMan®. We described sample characteristics and used McNemar tests to assess the differences in agreement between the EDTA- and PSC plasma-samples.

Significance was determined at 5%. The usability of PSC associated tasks such as blood spotting, PSC preparation and analysis was assessed by collecting data on a six-point Likert-scale from healthcare and laboratory staff.

Results: We enrolled 538 healthcare clients, majority of whom were adults [n=515, 95.7% (95% CI:93.7%-97.1%)] and female [n=345, 64.4% (95% CI:60.0%-68.1%)].

Overall, 536 paired PSC- and EDTA-plasma samples were sent for viral load testing of which 503 pairs were tested. Overall, sample failure was reported in 106 [21.1% (95% CI:17.7%-24.9%)] samples. Concordance between the paired PSC- and EDTA-plasma samples was reported for 436 (86.7% (95% CI:83.4%-89.4%)) samples.

Analysis of 503-paired samples at 1,000 copies/ml threshold yielded an overall sensitivity of 87.5% (95% CI:73.2%-95.8%) and specificity of 99.3% (95% CI:97.9%-99.8%).

On the Likert-scale, healthcare staff scored most tasks above 40% ("neutral") whereas laboratory staff rated all the tasks in the pre-analytic workflow assessment as above 80% (agree).

Conclusions: There was concordance of VL counts between PSC- and EDTA-plasma samples. PSC usability by healthcare workers was less favourable. For scale-up of PSC for VL monitoring in clinical settings, addressing the challenges related to its usability is necessary to achieve the UNAIDS third 95 target in South Africa.

EPB0114

Comparing pill counts and patient self-reports with DBS tenofovir concentrations as ART adherence measurements and predictors of virologic suppression and HIV drug resistance in young people failing ART in Zimbabwe

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Background: Monitoring ART adherence presents a challenge in adolescents. There is need to explore options for effective methods to determine their levels of adherence. We sought to determine adherence levels in adolescents and young adults (on a tenofovir-containing regimen) failing ART as measured by self-reports, pill counts and DBS tenofovir concentrations.

We compared levels agreement among the methods and determined the ability of each method to predict virological suppression and HIV drug resistance mutations (HIV-DRMs).

Methods: We conducted a cohort study involving 107 adolescents and young adults aged 10-24 years failing ART with viral load >400copies/ml at enrolment. Pill count (PC) records, self-reports (SR) and DBS tenofovir concentrations (done by liquid chromatography with tandem mass spectrometry, LC-MS/MS) were used to determine adherence in this group in Harare.

The latter was used as the reference method with a cut-off of 64ng/ml. Determination of drug levels was also performed to rule out inadequate viral response due to low cumulative drug exposure despite high adherence (>90%).

Longitudinal analysis was performed to determine the correlation of viral loads (VL) with adherence. The Kappa (k) coefficient was used to evaluate the level of agreement among the three methods.

Results: Mean age-at-enrolment was 17.8 years (SD± 3) with 51% participants being male. Mean duration with known HIV diagnosis was 7.3years (SD ±3.4). Mean age-at-ART-initiation was 11.8 years (SD± 3.7).

Poor level of agreement was found between PC records and DBS tenofovir concentrations (k=-0.115). Moderate agreement was found between DBS and SR methods (k=0.0557).

Slight agreement was found between PC and SR methods (k=0.0078). Adherence was dependent on age-at-HIV-diagnosis (p=0.0184) and age-at-ART-initiation (p=0.0265).

Participants who were adherent were six times more likely to be suppressed at end point than their non-adherent counterparts (OR=5.7 CI 2.1 - 16.5, p<0.0001).

Low adherence was associated presence of HIVDRMs; those who were non-adherent were 3 times more likely to have HIVDRMs (OR=3.4 CI 1.0 -13.7, p=0.03).



Conclusions: Self-reported adherence and pill counts exhibited poor agreement with the reference method used (DBS tenofovir levels) and are thus not effective methods of predicting virological suppression in this population. Low adherence is associated with presence of HIVDRMs.

EPB0115

HIV-1 Low level viremia predicts virological failure in first-line and second-line ART experienced individuals in India

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Background: HIV-1 plasma viral load (pVL) is the key indicator to monitor the response to combination antiretroviral therapy. pVL of <1000 copies/mL is considered as the threshold for virological suppression (VS) by national (India) and WHO guideline. A subset of people who have attained VS experience low-level viremia (LLV- pVL 40-999 copies/mL); its overall impact on clinical outcome is largely unknown.

Methods: We conducted a longitudinal retrospective analysis of 3498 participants visiting YRGCARE, Chennai, India between 2013-2018. The participants were on ART for ≥6 months with ≥2 pVL measurements.

We stratified results for those with pVL <1000 copies/mL as follows: Fully suppressed (FS) – pVL <40 copies/mL, LLV-I – pVL 40-199 copies/mL, LLV-II – pVL 200-399 copies/mL, and LLV-III-pVL 400-999 copies/mL.

The primary outcome of the study was virological failure (VF) – pVL >1000 copies/mL. Multivariable Cox regression estimated was used to find the association with VF.

Results: The median age was 44 years (IQR 38-50 years), 60% were male, 2574 (73.6%) were on 1st-line, 865 (24.7%) were on 2nd-line, and 59 (1.7%) were on both (BL). The median follow-up duration was 111.28 weeks (IQR 63.4-169.9 weeks). There were 2965 FS (84.8%) and 533 (15.2%) LLV, which includes 225 LLV-I, 130 LLV-II, and 178 LLV-III. 360 of 533 LLV had multiple LLV episodes.

During the follow-up, 343 (9.8%) experienced VF, with 217 (6.2%) having it after LLV (41% of LLV) and 126 (3.6%) having it after FS (4.3% of FS). When compared to suppressed, LLV had a greater risk of VF (HR 12.7; 95% CI 10.2-15.9). 1st-line participants had a higher incidence of VF (HR 15.8, 95% CI 11.4-21.9) than 2nd-line (HR 5.6, 95% CI 4.1- 7.7). LLV-III had the highest risk of VF [(HR 22.856, 95% CI 15.204-34.359) vs. (HR 8.186, 95% CI 5.564-12.043)], followed by LLV-II [(HR 13.375; 95% CI 8.327-21.483) vs. (HR 6.261; 95% CI 4.044-9.695)] and LLV-I [(HR 12.976; 95% CI 7.974-21.118) vs. (HR 4.158; 95% CI 2.826-6.119)] in 1st-line vs. 2nd-line respectively.

Conclusions: LLV was associated for higher risk of VF. Close monitoring of individuals experiencing LLV may help in early identification of VF, thus preventing drug resistance.

EPB0116

Introduction of near point of care testing platform for early infant HIV diagnosis in Nigeria

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Background: In Nigeria, only 27% of HIV-exposed infants (HEI) received early infant diagnosis (EID) by 2 months of age in 2021. The median turnaround time (TAT) of laboratory results ranged from 28 - 60 days. Multi-disease testing using a polyvalent near point-of-care (POC) testing platform provides new opportunities for reducing the TAT for EID.

This analysis describes the use of GeneXpert platform to improve the efficiency of EID in Akwa Ibom and Taraba States, Nigeria.

Description: The USAID-funded Reaching Impact Saturation and Epidemic Control (RISE) project used GeneXpert machines (previously only used for TB diagnosis) for EID. In collaboration with relevant stakeholders, we selected 8 GeneXpert sites across Akwa Ibom (2), and Taraba (6) States, and networked 83 other facilities using the hub and spoke approach.

RISE trained and mentored laboratory personnel to test dried blood spot (DBS) specimens using GeneXpert at sites, and monitored TAT and return of results weekly.

We analyzed data from 83 spokes health facilities and 8 GeneXpert hub sites before (July to September 2022) and after (October to December 2022) the intervention.

Lessons learned: Before the intervention 165 DBS samples [(51%(84/165) (<2 months), 49%(81/165) (2-12 months)] were received at 2 molecular laboratories with 64% results returned, and a median TAT of 40 days. Post-intervention, 506 DBS samples [(60%(305/506) (<2 months), 40%(201/506) (2-12 months)] were received at 8 GeneXpert sites with 88%(446/506) results returned; median TAT of 2 days. There was a 24% increase in the proportion of results returned and a 95.2% reduction in TAT. EID uptake increased by 21.9% at < 2 months (67.9%(57/84) before and 89.8%(274/305) post-intervention).

All results were returned to the caregivers (100%); the positivity was 5.3% (3/57) for <2 months and 2.1% (1/48) for 2-12 months before the intervention and 2.9% (8/274) for <2 months and 5.8% (10/172) for 2-12 months after the intervention. The linkage to treatment was 100% before (n=4) and after the intervention (n=18).

Conclusions/Next steps: The implementation of near POC EID using the GeneXpert increased access to EID, improved early case identification, and reduced TAT.



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**EPB0117****Low-level viremia as a risk factor for virologic failure in children and adolescents living with HIV**K.P. McKenzie^{1,2,3}, W. Olomi⁴, M. Chodota¹, A. Kayabu⁵¹Baylor College of Medicine Children's Foundation - Tanzania, Mbeya, United Republic of Tanzania ²Baylor College of Medicine, Houston, United States, ³Baylor International Pediatric AIDS Initiative (BIPAI) at Texas Children's Hospital, Houston, United States, ⁴NIMR-Mbeya Medical Research Centre (MMRC), Mbeya, United Republic of Tanzania ⁵Baylor College of Medicine Children's Foundation - Tanzania, Mwanza, United Republic of Tanzania**Background:** Current guidelines in the majority of developing countries use a viral load (VL) cutoff of 1000 copies/mL to define virologic failure (VF). However, research increasingly demonstrates that VL from 50-999 copies/mL or "low-level viremia" (LLV) is a risk factor for future VF.**Methods:** A retrospective chart review was performed using the health records from the Baylor College of Medicine Children's Foundation - Tanzania sites in Mbeya and Mwanza. CALHIV up to the age of 19 years who had been on antiretroviral therapy (ART) for ≥6 months (by July 2021) were included in the analysis.

Participants were followed longitudinally for at least two subsequent VLs after an initial undetectable VL (<50 copies/mL). VF was defined as ≥1000 copies/mL.

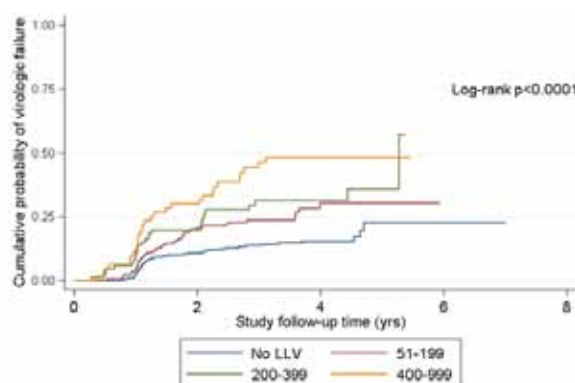
Results: A total of 670 CALHIV were included in the outcome analysis. LLV occurred in 47.5% (318/670) and of those, 52.5% (167/318) had VL 50-199 copies/mL, 27.4% (87/318) had 200-399 copies/mL, and 20.1% (64/318) had 400-999 copies/mL. The Kaplan-Meier plot (figure) shows higher risk of failure with higher LLV category ($p < 0.0001$). When looking at predictors of VF, a Cox proportional hazard model showed that there was an increased risk of VF with higher LLV when compared to <50 copies/mL: adjusted hazard ratio (AHR) 1.73 with 50-199 copies/mL (95%CI: 1.14-2.62, $p = 0.01$), AHR 2.19 with 200-399 copies/mL (95%CI: 1.36-3.51, $p = 0.001$), and AHR 3.34 with 400-999 copies/mL (95%CI: 2.09-5.36, $p < 0.0001$).On multivariable analysis, age of 10-14 years ($p = 0.03$) and immunosuppression, moderate ($p = 0.008$) or severe ($p = 0.009$), were associated with VF.

Figure. Kaplan Meier plot of cumulative probability for virologic failure by level of LLV.

Conclusions: LLV was associated with increased risk of VF with higher levels LLV corresponding to higher risk. Age 10-14 years and immunosuppression were also associated with increased risk of VF.**EPB0118****Development of a clinical prediction tool to estimate mortality within one year from antiretroviral therapy initiation in children and adolescents living with HIV to guide differentiated service delivery**A. Kay^{1,2}, S. Dlamini², T. Steffy^{1,3}, J. Bacha^{1,4}, P. Amuge⁵, A. Munthali⁶, A. Msekandiana⁶, B. Lukhele⁷, A. Kekitiinwa^{1,5}, L. Thahane^{1,3}, L. Mwita^{1,8}, H.L. Kirchner^{1,9}, A. Mandalakas^{1,10}
¹Baylor College of Medicine, Houston, United States, ²Baylor Children's Foundation-Eswatini, Mbabane, Eswatini, ³Baylor Children's Foundation-Lesotho, Maseru, Lesotho, ⁴Baylor Children's Foundation-Tanzania, Mbeya, Tanzania, United Republic of, ⁵Baylor Children's Foundation-Uganda, Kampala, Uganda, ⁶Baylor Children's Foundation-Malawi, Lilongwe, Malawi, ⁷University of Alabama at Birmingham, Birmingham, United States, ⁸Baylor Children's Foundation-Tanzania, Mwanza, Tanzania, United Republic of, ⁹Geisinger, Danville, United States, ¹⁰Research Center Borstel, Sülzburg, Germany**Background:** Differentiated service delivery for children and adolescents living with HIV (CALHIV) can improve targeted resource utilization for this vulnerable population; however, there are no clinical prediction tools focused on this group. To address this gap, we have developed a clinical prediction tool that may be used to guide the care of this vulnerable population.**Methods:** Data was evaluated using electronic medical records of CALHIV, aged 0-19 years, enrolled as clients at a Baylor Center of Excellence in Eswatini, Malawi, Lesotho, Tanzania, or Uganda between 2005 and 2020. Data for clinical prediction, including anthropometric values, physical examination, antiretroviral therapy (ART), WHO stage, and laboratory tests, were captured at ART initiation, then was split into a training and test set. Missing data was imputed using multiple imputation with chained equations. Backward stepwise variable selection and logistic regression were performed to develop predictive models for mortality within one year of ART initiation.

Predictive probabilities of one year mortality were generated and compared to true outcomes in the training set and then evaluated in the test set against the criteria for WHO advanced disease.

Results: The study population included 15,120 CALHIV. Predictive variables included: age, CD4 percent, white blood cell count, hemoglobin, platelets, and body mass index (BMI) z-score as continuous variables, and WHO Stage and edema on exam, as categorical variables. Missingness ranged from 0% for age to 32% for platelets. The area under the curve (AUC) of the predictive model was 0.847 (95% CI: 0.83-0.86) in the training set and 0.838



(95% CI: 0.82-0.86) in the test set, as compared to 0.626 (95% CI: 0.62-0.63) for the WHO HIV advanced disease criteria in both the training and test sets. When a threshold for sensitivity was set at 90% for the model, the specificity remained quite high at 53% against 26% for the WHO advanced disease criteria.

Conclusions: This study evaluated a large, multinational clinical population to develop a clinical prediction tool for CALHIV. The model more accurately predicted clinical outcomes than the WHO HIV advanced disease criteria and has the potential to improve differentiated service delivery for children entering HIV care in high-burden settings.

EPB0119

Detection of acute HIV infection on pooled Cobas plasma separation card (PSC) samples using Cepheid GeneXpert HIV-1 qualitative assay

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Background: The Increasing daily average of HIV diagnosis in the Philippines remains to be a threat to the country's realization of the UNAIDS 95-95-95 goal. To bridge the gap between exposure and seroconversion in persons with HIV, early detection on Cobas plasma separation card (PSC) using qualitative assays for detecting HIV – RNA must be considered. To scale up HIV screening and testing, pooled testing on PSC using qualitative assays must also be explored.

This study aims to validate the diagnostic performance of PSC in our setting and determine the optimal pooling size of PSC samples that would retain the acceptable 95% analytical sensitivity in low viral load detection, applicable in resource-limited Philippine settings. This will impact early detection and prompt initiation of treatment and preventive interventions.

Description: HIV/AIDS in the Philippines is concentrated in NCR, Region IV-A, and Region III based on 2022 HIV/AIDS and ART Registry. From January-November 2022, out of 13,791 reported cases, 9,387 (68%) are from male-to-male sexual contact. Rapid HIV diagnostic algorithm (rHIVda) is currently the confirmatory test for HIV which requires series of blood collections. The use of blood spots will offer logistical advantages in terms of the collection, storage, and transportation of samples.

Moreover, the validation of a pooling strategy on PSC in the GeneXpert platform and its conventional use in our setting will reduce the cost of the test and reduction in manpower needed to run the tests.

Lessons learned: No issues were encountered with the use of the currently available GeneXpert machines in running the tests. Pools of 5 samples retained the acceptable 95% analytical sensitivity maximizing the benefit of pooled testing in a resource-limited Philippines setting.

Conclusions/Next steps: Demonstrating the diagnostic

performance of Cobas PSC samples on Cepheid GeneXpert HIV-1 Qualitative assay, we provide scientific evidence for its adoption in the Philippines. The pooling strategy with optimal pool size of 5 offers cost-savings in resource-limited settings as in the Philippines.

This innovative approach in the early detection of HIV, particularly during the acute phase is a potential solution to the current problems facing the need for an effective and efficient diagnostic tool.

EPB0120

Can HIV low level viremia predict future anti-retroviral treatment failure? A retrospective cohort analysis from Zambia

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Background: HIV RNA viral load (VL) remains the most reliable marker to assess HIV treatment success to date. The Zambia HIV guideline define viral load suppression as any VL test result of below 1000 copies/ml and all HIV clients on Antiretroviral Treatment for at least 6 months with VL above 1000 copies/ml should be enrolled on enhanced adherence counselling (EAC). Studies suggest that low-level viremia (LLV) was associated with increased risk of treatment failure. We hypothesized that clients who develop unsuppressed VL above 1000 copies/ml could have had a progressive increase in their VLs from previous tests. Identifying HIV clients with LLV in Lusaka could help take proactive steps in preventing treatment failure.

Methods: We extracted data from electronic medical records of clients on ART for at least 6 months with at least one VL result documented between April 2018 and January 2022 in Lusaka. We conducted retrospective cohort analysis to determine what proportion of clients with latest VL above 1000 copies had recorded LLV - defined as VL copies/ml between 60 and 999 - on their previous VL lab tests. Logistic regression model was used to measure association between LLV and demographic characteristics of clients.

Results: 8610 records showed a VL >1000 copies on the last VL test; 4836 (56.1%) were female. 2707 (31.4%) had at least one previous VL on file of which 1498 (55.3%) were male, 1761 (65%) aged between 20 and 44 years and 2169 (80%) on ART for more than 24 months. 732 (27.0%) of patients with VL > 1000 copies had a LLV in the past.

The odds of having a VL above 1000 amongst those with past LLV was 3.4 times higher than those with no LLV [aOR 3.41 (3.12, 3.72), p<0.00]. Males patients had an odd of 1.3 (aOR 1.34 - 1.4; p<0.00) compared to females.

Conclusions: Our analysis revealed that LLV is associated with risk of future raised viral load above 1000 copies. Males with LLV are at higher risk of failing treatment. It would be justifiable to provide enhanced adherence counseling to all clients with VL between 60 and 999 copies to prevent occurrence of viral mutation and treatment failure.



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EPB0121

The value of National Xpert MTB/RIF Ultra trace results in context of new molecular diagnostics: more questions than answers?

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Background: South Africa implemented GeneXpert (Cepheid) technology nationally in 2011 using the Xpert MTB/RIF cartridge as a smear replacement strategy for tuberculosis (TB) disease. Transition to Xpert MTB/RIF Ultra in 2017 increased MTB detection rates by ~2%. Early in 2023, the WHO included other molecular tests for TB: viz cobas® MTB&MTB RIF/INH (Roche) and BDMAX™ MDR-TB (Becton Dickinson). Both technologies test for rifampicin and isoniazid. The Xpert Ultra is the most sensitive, although only reports Rifampicin resistance. This low level sensitivity is reported as "trace" detection of *Mycobacterium tuberculosis* complex (*M.tb*) DNA. Geographic information system (GIS) mapped national Ultra "trace" results were explored to inform appropriate implementation of additional diagnostic platforms.

Methods: Aggregated Ultra laboratory test results, reporting *M.tb* detection and "trace", stored within the National Health Laboratory Service's central data warehouse (January 2021-December 2022) were analysed to municipality level and merged with local municipality GIS shapefiles. The spatial distribution patterns of the indicators across municipalities were determined using Moran's I and Getis Ord (Gi) statistic.

Results: A total 2,121,271 tests were performed in 12 months, of which 182,449 (8.6%) reported *M.tb* and 27,473 (1.3%) reported "trace". Significant "trace hot spots" (within "*M.tb* hot spots"), (Moran's I =0.31, Z-score of 7.27, and p-value <0.001), were reported in 10 (of 13) municipalities within the Northern Cape, 8 (of 23) within the Western Cape and 5 (of 6) within the North West provinces.

An additional cluster of "trace hot spots" not within "*M.tb* hot spots" was identified in Mpumalanga province, spanning four municipalities (Figure 1).

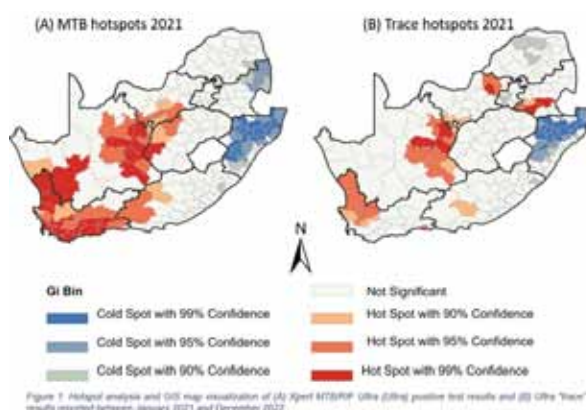


Figure 1.

Conclusions: Spatial heterogeneity of "trace" is evident in South Africa, and does not always overlay high disease burden municipalities. This could indicate direction of change in disease or the need for more granular surveillance, but does indicate areas where less sensitive molecular diagnostics may fail to identify trace amounts of *M.tb* DNA.

EPB0122

Concordance of self-reported and point-of-care biomarkers of alcohol use measures among older adults with HIV from low- and middle-income countries, the Sentinel Research Network of IeDEA

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Background: Measuring alcohol use is challenging within HIV care services, particularly in low resource settings. Self-reported measurements of alcohol use are rapid and inexpensive yet highly susceptible to mismeasurement. Understanding the use of point-of-care (POC) urine biomarkers and their concordance with self-report will inform strategies for alcohol use measurement among older people with HIV (PWH) in low- and middle-income countries.

Methods: We analyzed cross-sectional data from the International epidemiology Database to Evaluate AIDS (IeDEA) Sentinel Research Network (SRN) cohort of PWH aged ≥40 years from HIV clinics within the Asia-Pacific, Central/Latin America, and Africa regions. We assessed concordance of self-reported alcohol use and POC urine ethylglucuronide (uETG) testing (alcohol detectable up to prior 5 days).

We examined the associations between self-reported alcohol measures and uETG using mixed-effect logistic regression controlling for age and sex (fixed) and clinic site (random). We fitted 5 models of uETG positivity: alcohol use frequency, number of drinks on typical day, binge



drinking frequency, unhealthy alcohol use (AUDIT-C ≥ 3 for women, ≥ 4 for men), and possible alcohol use disorder (AUDIT ≥ 13 for women, ≥ 15 for men).

Results: Of the 2059 participants, 46% (n=945) were men, 52% (n=1,067) reported drinking alcohol, and 20% (n=406) reported unhealthy drinking. A total of 251 participants (12%) tested uEtG positive, with 140 (56%) reporting unhealthy drinking and 111 (44%) not reporting unhealthy drinking. Concordance of self-reported unhealthy alcohol use and uEtG was 82% (kappa=0.32) with differences by sex (women: 87%; kappa=0.29; men: 75%; kappa=0.17). In multivariate models, all measures of self-reported alcohol use were associated with positive uEtG.

Conclusions: Though lower among men when compared to women, the overall concordance between self-reported alcohol use and urine POC biomarker was moderate. Alternative biomarkers with longer detection windows should be used to validate and potentially augment self-reported measures.

Further approaches for incorporating objective biomarkers should be explored for both epidemiologic and interventional efforts addressing alcohol use among PWH in low resource settings.

EPB0123

Improving the diagnosis of HIV in hospitalized infants: lessons learned from the EMPIRICAL trial

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Background: WHO recommendations for infant HIV diagnosis in high-burden settings include routine provider-initiated testing and counseling (PITC) for breastfeeding



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mothers, and early infant diagnosis (EID) virologic testing for newly-identified HIV-exposed infants (HEI) or those with findings suggestive of HIV. On inpatient wards, HIV diagnosis is urgent given advanced disease presentation. Yet many African hospitals have implementation shortfalls due to limited resources for PITC, delays in receiving EID results, and underuse of presumptive diagnosis. The EMPIRICAL trial (#NCT03915366), which is enrolling infants with severe pneumonia and confirmed HIV, has worked to strengthen diagnostic practices at 22 recruiting hospitals across six African countries, with implementation experience that addresses these PITC/EID challenges.

Methods: HIV testing results for infants hospitalized with pneumonia and their mothers were extracted from screening logs and the trial database. Operational information detailing PITC/EID practices at each site was collected via questionnaire.

Results: Interim data after implementation of a revised, more detailed screening log (Nov. 2021-Dec. 2022) reveal that 2,673 mothers had rapid antibody tests performed, of whom 193 (7.2%) were newly HIV-positive, and 95 (49.2%) of their infants subsequently tested HIV-positive. From recruitment onset in March 2020 through December 2022, 390 HIV-positive infants were recruited, of whom 276 (70.8%) were newly diagnosed with point-of-care EID (PoC-EID) during hospitalization.

In questionnaire feedback from 19 hospitals, 18 (94.7%) reported needing counselors, often employed by partners, for timely testing of all admissions. Six sites in Mozambique (31.6%) routinely repeat PITC for breastfeeding women who tested negative in the preceding three months, diagnosing three new cases with this approach in 2022. All sites stressed the importance of PoC-EID, as turn-around-times for conventional DNA-PCRs frequently exceed 4 weeks.

Conclusions: In settings with medium-high HIV prevalence and high rates of seroconversion during breastfeeding, PITC for mothers of hospitalized infants is crucial, and dedicated counselors help improve testing coverage. Repeat PITC should be considered regardless of the time since last maternal test in the context of severe infant illness. PoC-EID expansion plans should prioritize access for pediatric wards either with on-site machines or sample referral networks to facilitate rapid diagnoses, timely opportunistic infection treatment, and prompt linkage to antiretroviral therapy.

EPB0124

Severe mpox (monkeypox) among people living with HIV in Peru: a clinical case series of hospitalized cases, 2022

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Background: In the current 2022 mpox (monkeypox) outbreak, more than 3,700 cases have been identified in Peru, 55% of which were reported to be among people living with HIV (PLHIV). Although most cases experienced mild-to-moderate disease with relatively good clinical outcomes, PLHIV with advanced HIV disease (AHD) may be at increased risk of severe mpox-associated morbidity and mortality due to immunosuppression.

Methods: We conducted a descriptive clinical case series of patients hospitalized for mpox care between July and December 2022 in a tertiary hospital in Lima, Peru. We included adults (>18 years) with reactive PCR to monkeypox virus. Epidemiological, clinical, and laboratory data were collected from medical chart reviews and described along the HIV care continuum. AHD (CD4 count <200 cells/mm³) and viral suppression (viral load <1,000 copies/mL) were only reported for patients with laboratory data.

Results: Records from 36 hospitalized patients for complicated mpox were included. Patients were mostly gay, bisexual, or other men who have sex with men (33/36, 92%) and aged 31 (18-52) years. Reasons for hospitalization included secondary bacterial infection (81%, 29/36), proctitis (36%, 13/36), balanitis/orchepididymitis (14%, 5/36), necrosis of skin lesion (8%, 3/36), and generalized rash (6%, 2/36); the median length of stay was 9 (6-14) and up to 74 days. Thirty-one patients (86%) were PLHIV, and seven (23%) were newly diagnosed during hospitalization.

Of those who were aware of their HIV status, 88% (21/24) had received HIV care in the preceding year, and 83% (20/24) were on antiretroviral treatment (ART). Of those on ART, 70% (14/20) were virally suppressed. Fifteen PLHIV (48%) did not have CD4 counts since last year; the median value was 347 (111-493) cells/mm³, and 38% (6/16) had AHD. Three patients (8%) died due to severe mpox presentations, all PLHIV with AHD.

Conclusions: The severity of mpox-associated complications among immunocompromised PLHIV suggests mpox may act as an opportunistic infection. Effective access to HIV prevention and care is urgently needed to reduce the harms associated with mpox outbreaks in key populations.



EPB0125

Factors associated with non-viral load suppression in Togo

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Background: Progress has been made toward reaching viral load suppression (VLS) by institutionalizing viral load (VL) testing in the USAID-funded #EAWA project in Togo (82% VLS in 2019 to 93% in 2022). Understanding which characteristics are associated with non-VLS can help health care workers target their efforts toward individuals who are less likely to achieve VLS.

Methods: For this cross-sectional study, we extracted client (≥ 18 years) and site data from #EAWA's E-tracker for clients with documented VL results between January and November 2022.

We calculated differences in proportions and means by the chi-square test and Student's t-test, respectively, and odds ratios to estimate the strength of associations. P-values of <0.05 were considered significant.

Results: Our analyses included 2,424 clients (67% female, 33% male). The average age of those without VLS was 40 years vs. 41 years for those with VLS ($p<0.05$). Among those without VLS, the average age was 40 years among females and 43 years among males ($p<0.001$).

Clients without VLS were more likely to be from public clinics vs. organization-run clinics (38.1% vs. 25.5%, $p<0.001$), from the general population vs. key populations (33.2% vs. 22.5%, $p<0.05$), younger (18–35 years) vs. older (35+) (34.0% vs. 28.0%, $p<0.05$), less than one year on ART vs. more (36.3% vs. 29.1%, $p<0.05$), having interrupted treatment ≥ 3 months vs. less (38.2% vs. 27.9%, $p<0.001$), and not receiving therapeutic education (32.4% vs. 27.0%, $p<0.05$).

Multiple logistic analyses showed that non-VLS was associated with public clinic (OR=1.8, 95% confidence interval [CI]=1.4–2.2, $p<0.001$), general population (OR=1.8, CI=1.2–2.7, $p<0.05$), younger age (OR=1.24, CI=1.01–1.52, $p<0.05$), and interrupted treatment ≥ 3 months (OR=1.48, CI=1.17–1.87, $p<0.05$).

Conclusions: These analyses, the first for Togo show certain client and site level factors are associated with not achieving VLS. Clinics run by associations have more HIV-specialized care providers than public clinics. Key populations may be more likely to attend these clinics and receive more targeted care.

If care providers pay special attention to younger clients and those who have interrupted treatment, clients may have better VL outcomes. Operational modifications may lead Togo to reach its 95% VLS goal.

EPB0126

Establishing a CrAg referral testing program to expand screening for Cryptococcal Meningitis in Lesotho

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Background: Cryptococcal Meningitis (CM) is one of the leading causes of death among people living with Advanced HIV Disease (AHD). Guidance from World Health Organization (WHO) in 2017 recommends utilizing cryptococcal antigen (CrAg) screening to detect early infection for CM among clients with confirmed AHD. As a result of this guidance, the Lesotho Ministry of Health included CrAg screening for AHD clients in the 2020 HIV Clinical Guidelines and kicked off AHD implementation at 18 Phase I pilot sites in 2021.

Following this implementation. Lesotho expanded access to CrAg screening through an active referral screening program in 2022 for sites without access to AHD commodities. We documented the impact of this referral program on CrAg uptake and utilization rates in Lesotho.

Methods: The CrAg referral screening program utilized the already established HIV sample transport network to send blood samples for CrAg screening from sites without AHD commodities to one of the 18 AHD pilot sites in Lesotho. We collected data on CrAg screening rates through the Labs Management Information System (LMIS) for January 2021 to June 2022. Indicators included the number of CrAg tests performed and the percentage of eligible AHD clients who received a CrAg test.

Results: Access to CrAg screening for AHD clients in Lesotho increased by an average of 46% annually since the referral program was initiated, with an average of 320 AHD clients receiving CrAg screening per quarter in 2021 compared to 466 in 2022. In addition, average CrAg screening rates remained high following the implementation of the referral program, with 98% of eligible AHD clients receiving a CrAg test in H1 2022. Key enablers to the success of this program included routine supportive supervision visits, providing sites with documentation on CrAg screening algorithms and job aids, and effective utilization of the LMIS to monitor uptake and prevent stockouts.

Conclusions: The CrAg referral program has been pivotal to expanding access to CM screening for AHD clients in Lesotho and National HIV and CM programs can learn from Lesotho's experience when devising national CM screening strategies, a key component in the global effort to end CM deaths by 2030.



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Effects of direct-acting antiviral therapy on immunologic and hepatic markers among people with HIV/HCV coinfections

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Background: Direct-acting antiviral (DAA) treatment of hepatitis C (HCV) reduces liver-related mortality, but longitudinal effects of DAAs on immunologic and hepatic markers are not well-characterized among people coinfected with HIV/HCV in the United States (U.S.).

Methods: The HIV Outpatient Study (HOPS) is an ongoing longitudinal cohort study of persons with HIV at 8 U.S. clinics. Among persons prescribed DAAs and those of comparable age-, sex- and race/ethnicity and Fibrosis-4 (Fib-4) profiles who remained DAA-naïve, we contrasted DAA effect on longitudinal trends of immunologic and hepatic markers using generalized linear mixed models (GLM) during years 2010-2020. Cox regression models were fit to evaluate DAA effect on development of advanced fibrosis (Fib-4 score >3.25).

Results: Of 347 persons coinfected with HIV/HCV, 153 (44.1%) were prescribed DAAs during a median of 2.78 (IQR: 1.16,4.18) years of observation. In GLM, CD4 count, and Fib-4 increased faster among DAA-treated than DAA-naïve group (all $p < 0.001$), while CD4%, CD8%, and CD4/CD8 ratio did not differ (all $p > 0.30$) (Table).

Markers ¹	DAA treated (n=153)			DAA naïve (n=194)			Linear trajectory ²
	Pre DAA ³	Post DAA ⁴	Post vs. Pre ⁵	Pre-Pseudo ⁶	Post-Pseudo ⁶	Post vs. Pre ⁵	
CD4%	60.8 (59.9, 61.6)	61.5 (60.6, 62.4)	0.7 (0.1, 1.3)	60.8 (59.9, 61.6)	61.5 (60.6, 62.4)	0.7 (0.1, 1.3)	0.02 (0.00, 0.04)
CD8%	11.0 (10.8, 11.2)	11.1 (10.9, 11.3)	0.1 (0.1, 0.2)	11.0 (10.8, 11.2)	11.1 (10.9, 11.3)	0.1 (0.1, 0.2)	0.75 (0.35, 1.15)
CD4/CD8 (ratio)	5.4 (5.3, 5.5)	5.5 (5.4, 5.6)	0.1 (0.0, 0.2)	5.4 (5.3, 5.5)	5.5 (5.4, 5.6)	0.1 (0.0, 0.2)	0.01 (0.00, 0.02)
ALT (mu/L)	17.1 (16.4, 17.8)	16.9 (16.2, 17.6)	-0.2 (0.1, 0.3)	17.1 (16.4, 17.8)	16.9 (16.2, 17.6)	-0.2 (0.1, 0.3)	-7.86 (-15.39, -0.33)
ACT (mu/L)	1.4 (1.3, 1.5)	1.4 (1.3, 1.5)	0.0 (0.0, 0.0)	1.4 (1.3, 1.5)	1.4 (1.3, 1.5)	0.0 (0.0, 0.0)	0.99 (-0.40, 2.39)
Platelets (count/cu)	161 (155, 167)	162 (156, 168)	1 (0.1, 2.1)	161 (155, 167)	162 (156, 168)	1 (0.1, 2.1)	0.99 (0.00, 1.98)
Fib-4	0.98 (0.95, 1.01)	0.98 (0.95, 1.01)	0.00 (0.00, 0.00)	0.98 (0.95, 1.01)	0.98 (0.95, 1.01)	0.00 (0.00, 0.00)	-0.26 (-0.41, -0.11)
HIV VL (<200 copies/mL) ⁷	41.36 (40.45, 42.27)	41.36 (40.45, 42.27)	0.00 (0.00, 0.00)	41.36 (40.45, 42.27)	41.36 (40.45, 42.27)	0.00 (0.00, 0.00)	0.02 (-0.16, 0.20)
HCV vs. (lower/high) ⁸	0.02 (0.00, 0.04)	0.02 (0.00, 0.04)	0.00 (0.00, 0.00)	0.02 (0.00, 0.04)	0.02 (0.00, 0.04)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)

Note:

1. Slope estimates (95% Confidence Interval) represent annual rate of change in marker values per year using all lab results between 1/1/2011 and 12/31/2020.
2. Pre DAA indicates prior to DAA prescription date for DAA-treated group.
3. Post DAA indicates after DAA prescription date for DAA-treated group.
4. Pre vs. Post indicates changes after DAA prescription date for DAA-treated or DAA-naïve group.
5. Pre-Pseudo indicates after propensity score matched Fib-4 data for DAA-naïve group.
6. Post-Pseudo indicates after propensity score matched Fib-4 data for DAA-naïve group.
7. Treated vs Naïve represents difference between Pre vs. Post for DAA-treated and Pre vs. Post for DAA-naïve group.
8. Logistic regression for probability of HIV viral load >100 copies/mL.
9. Logistic regression for probability of HCV viral load being greater than the lower range value.

Table. General linear mixed model estimated marker linear trajectory adjusted for age, sex and race/ethnicity variables.

In multivariable analysis, DAA treatment was associated with more rapid decline in alanine aminotransferase of -7.86 (-15.39, -0.33) $\mu\text{L}/(\mu\text{L} \times \text{year})$ [mean (95% confidence interval)] and faster increase in platelets of 6.99 (2.89, 11.09) counts/ $(\mu\text{L} \times \text{year})$, while changes in aspartate aminotransferase were comparable between two groups.

Additionally, Fib-4 decreased for the DAA-treated at -0.26 (-0.41, -0.11) per year, and did not change for the DAA-naïve group 0.02 (-0.16, 0.20) (Table).

DAA-treatment was also associated with lower rates of progressing to Fib-4 >3.25 (adjusted hazard ratio = 0.49, $p < 0.01$).

Conclusions: Among persons co-infected with HIV/HCV who were treated with DAAs in the U.S., we found comparable changes in immunologic markers and substantial improvements in hepatic markers over 4 years post-DAA treatment, highlighting the importance of DAA treatment among such persons to preserve health and prevent advanced liver fibrosis.

EPB0128

Implementation of HCV treatments among people living with HIV/HCV in Washington, DC

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Background: Direct-acting antiviral (DAA) therapies have made HCV easily treatable, preventing HCV-related morbidity and mortality. However, assessments of HCV treatment implementation among people living with HIV are limited in the post-DAA era.

Methods: Using data from the District of Columbia (DC) Cohort, a longitudinal cohort of people living with HIV receiving care at 14 sites, we identified participants with detectable HCV RNA. We examined HCV therapy in the pre-DAA (2011-2013) versus post-DAA (2014-2022) era as well as factors influencing sustained virologic response (SVR). SVR was defined as an undetectable HCV RNA within 6 months of DAA or 12 months of non-DAA initiation. Multi-variable logistic regression was used to determine factors associated with HCV treatment or SVR.

Results: 919 individuals living with HIV/HCV were identified from 11,774 participants. Only 66% of individuals living with HIV/HCV received HCV treatment, of whom, 84% had available follow-up HCV RNA. 92% of those treated received DAA. 77% achieved SVR.

After adjusting for race, age, and viral suppression (VS; HIV RNA <200 copies/mL), HCV treatment was associated with older age (aOR 1.24; 95% CI 1.06-1.46) and VS (aOR 2.53; 95% CI 1.79-3.59).


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Among those treated, SVR was inversely associated with CD4 <200 (aOR 0.47; 95% CI 0.24-0.94) after adjustment for age, site, race, and pre-HCV cancer diagnosis. In the post-DAA era, people living with HIV/HCV were more likely to have evidence of HCV treatment (aOR 1.74; 95% CI 1.22-2.48). However, HCV treatment in the post-DAA era was not associated with SVR.

	OR (95% CI)	P-value	aOR (95% CI)	P-value
HCV Treatment¹				
Age per 10-year increase	1.24 (1.08-1.43)	0.0017	1.24 (1.05-1.46)	0.0093
Post-DAA (2014-2022) vs. Pre-DAA (2011-2013)	2.03 (1.49-2.75)	<0.0001	1.76 (1.23-2.51)	0.0018
HIV RNA <200 copies/mL vs. ≥200 copies/mL	2.51 (1.78-3.54)	<0.0001	2.52 (1.77-3.58)	<0.0001
CD4 <200 vs. CD4 ≥200	0.71 (0.45-1.12)	0.1368		
SVR Achievement²				
Post-DAA (2014-2022) vs. Pre-DAA (2011-2013)	1.18 (0.72-1.93)	0.5178		
HIV RNA <200 copies/mL vs. ≥200 copies/mL	0.93 (0.52-1.67)	0.8127		
CD4 <200 vs. CD4 ≥200	0.47 (0.24-0.93)	0.0299	0.47 (0.24-0.94)	0.0333

1: Multivariable model effects (aOR) were also adjusted for race. (n=848)

2: Multivariable model effects (aOR) were also adjusted for age at HCV, site of care (hospital v. community), race, any cancer diagnosis prior to HCV. (n=493)

Table 1. Factors associated with HCV treatment and achievement of SVR among PWH in the DC Cohort.

Conclusions: Among DC Cohort participants, markers of HIV treatment adherence (VS, CD4) were associated with access to HCV treatment and SVR. Gaps remain in successful HIV/HCV treatment despite receipt of HIV care. Interventions are needed to address access to HCV treatments for people living with HIV as well as facilitate treatment adherence for those at risk for unsuccessful treatment.

EPB0129

Role of low-risk HPV PCR in screening for HSIL lesions and anal cancer in men who have sex with men (MSM) living with HIV (MSM-LWHIV)

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Background: Anal squamous cell carcinoma (ASCC) is one of the most frequent non-AIDS-defining neoplasia in PLWHIV, mainly in MSM, and it has been associated with chronic infection by human papilloma virus (HPV).

Main: Analyze the value of low-risk HPV PCR in screening for "high-grade squamous intraepithelial lesions and anal cancer" (HSIL-plus).

Secondary objectives: To analyze the rate of patients with LSIL (AIN1) who progress to HSIL-plus and the factors associated with this progression.

Methods: This is a prospective, longitudinal study that consecutively included 493 MSM-LWHIV between May 2010 and December 2021, followed up 43 months (IQR:12-76).

At the baseline visit clinical-epidemiological, and analytical variables related to HIV were included, and anal cytology was performed to study the detection and genotyping of HPV (Linear Array HPV Genotyping Test) and cytological study using the "thin-layer technique" [Thin Prep 2000 processor (Hologic)], and high-resolution anoscopy (HRA) with the Carl Zeiss 150fc® colposcope, (Carl Zeiss, Oberkochen, Germany).

Follow-up visits were made based on the HRA results (in case of normal result or AIN1, annually; in case of HSIL-plus the HRA was carried out at the end of the treatment) during the which the HIV infection was reassessed, sexual behavior, and HPV infection.

Results: The subjects included were 36y, 23.1% had CD4 nadir <200 cells/uL. 15% had received the quadrivalent HPV vaccine >5 years ago. Mono-infection due to low-risk HPV genotypes in patients with normal cytology ruled out HSIL plus in 100% of cases (S 100%, E 91.9%, PPV 2.9% and NPV 100%). The rate of patients who progressed from LSIL to HSIL plus was 4.7% at a median time of 12 months (IQR:12-12).

Risk factors for progression from LSIL to HSIL-plus during follow-up were acquisition of high-risk HPV genotypes (HR:4.15; IC 95%:1.14-15.03), low-risk HPV genotypes [(HR:3.68 IC95%:1.04-12.94), in particular genotype 6 (HR:4.47, IC95%:1.34-14.91)] and history of AIDS (HR:5.81, 95%CI:1.78-18.92).

Conclusions: Anal mono-infection with low-risk HPV genotypes in MSM-LWHIV with normal cytology is not associated with precursor lesions or ASCC. The rate of progression from LSIL to HSIL-plus was less than 5%, which was related to the acquisition of high and low risk HPV genotypes (specifically 6) and a history of AIDS.

EPB0130

Integration of human papillomavirus-based cervical cancer screening into HIV care for women living with HIV in Ethiopia

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Background: In Ethiopia, cervical cancer (CxCa) is the second most reported cancer (13%) among women aged 15-49 years old. However, the 2018 HIV impact assessment report showed that only 16% of women living with HIV (WLHIV) had access to CxCa screening services. To address this gap, CDC Ethiopia introduced WHO's "screen, triage



and treat" approach using human papillomavirus (HPV) testing for WLHIV followed by visual inspection with acetic acid (VIA) screening if HPV positive. We describe Ethiopia's experience and lessons learned in implementing the program.

Description: CDC in collaboration with the Ministry of Health of Ethiopia developed policy and program documents including CxCa screening guidelines and training materials. Requestion forms for laboratory testing were prepared and the electronic medical record (EMR) system was revised to integrate HPV testing into the existing HIV service database.

The initiative was introduced at 70 health facilities (HFs) providing HIV services and 15 HIV viral load testing laboratories in five regions. The HFs collect and send vaginal/cervical samples to the laboratories through a referral system. We retrospectively analyzed EMR data collected as part of routine HIV services delivery from Apr 2021 to Sept 2022.

Lessons learned: Of 14,739 samples collected and sent to laboratories, only 13,516 (92%) were tested and results were returned to HFs due to conflict in Amhara region. The average result turnaround time (TAT) was 15-days. The proportion of self-sampling and clinician sampling was 53% and 47%, respectively. Among results returned, the HPV positivity rate was 28% (3,798). All HPV positives were contacted and asked to return for screening using VIA, of which 89% (3,394) returned and had VIA screening. The proportion of WLHIV with pre-cancerous lesions was 19% (648) among HPV positives who had VIA screening; of those 95% (618) were treated with either cryotherapy, thermal ablation, or loop electrosurgical excision procedure.

Conclusions/Next steps: Integration of "screen, triage and treat approach" into HIV services was feasible and resulted in high treatment uptake, suggesting it could improve access to CxCa services in resource-limited settings. Future efforts could consider reducing TAT and ensuring VIA screening to triage women after a positive HPV test.

EPB0131

CD4+ T cell recovery in HIV/HCV co-infected patients following HCV treatment

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Background: An estimated 12-30% of people living with HIV do not demonstrate robust CD4+ T cell recovery despite durable viral suppression on ART. HCV co-infection has been identified as a risk for impaired CD4+ recovery and this may be driven by HCV-mediated liver fibrosis. As HCV direct acting antiviral therapy (DAA) may partially reverse liver fibrosis, sustained HCV virologic response (SVR) may hypothetically lead to improved CD4+ T cell recovery.

Our objective was to assess the effect of HCV DAA -induced SVR on CD4 recovery among HCV/HIV co-infected patients, including immunological non responders (INR).

Methods: Subjects ≥18 years seen from 2015 - 2019 at the UMB outpatient HIV/HCV program, and who were treated with DAA and achieved an SVR were included. Pre-DAA CD4 counts were included only after sustained HIV viral suppression (<200 cpm for ≥2 years) and HIV viral suppression was maintained for the entire period of the study. Descriptive statistics were used to illustrate baseline characteristics. Segmented regression of interrupted time series analysis was used to evaluate changes in median CD4 count in the pre-DAA period (36 mo) vs post-DAA period (36 mo).

Results: 156 patients of whom 68% were male and 90% were African American were included. The mean age at DAA initiation was 56.5 years. Mean duration of HIV suppression prior to first pre-DAA CD4 assessment was 3.8 years. In the full cohort median CD4 counts increased by 15% (p=0.002, Figure 1) in the 6 month period following DAA initiation, whereafter CD4 counts decreased 2.7% per 6 month period (p=0.004). Among the 13 patients who qualified as INR, there was no immediate effect on median CD4 in the first 6 months after DAA initiation.

However, thereafter there was a sustained effect on CD4 increase (median CD4 increasing by approximately 4.1% per 6-month time interval (p=0.02). 54% of INR were able to achieve a post-DAA CD4 count of >350 cells/mm³.

Conclusions: Successful DAA therapy induced a modest immediate CD4 immunologic reconstitution among this cohort of HIV/HCV co-infected patients though this effect waned with time. By contrast, among INR, achieving HCV SVR led to more slowly gained but sustained CD4 count recovery.

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Background: Tuberculosis (TB) and cryptococcal meningitis (CM) account for over a third of AIDS-related deaths among people living with HIV (PLHIV). These opportunistic infections (OIs) are common among PLHIV with advanced HIV disease (AHD). We aimed to determine the magnitude of these OIs and associated outcomes among people newly diagnosed with AHD in routine healthcare in Tanzania.

Methods: We conducted a prospective cohort assessment involving newly diagnosed PLHIV with AHD, i.e. CD4 count of <200 cells/mm³ or WHO stage 3/4, across four regions of Tanzania. Upon enrollment in HIV care, clients were investigated for TB and Cryptococcal infection (CI). PLHIV diagnosed with TB/CI started treatment per the national guidelines. All PLHIV were initiated on anti-retroviral therapy (ART) and followed up for at least one year.

Our main outcomes were a TB/CI diagnosis among people newly diagnosed with AHD and their status at one-year follow-up i.e. the proportion who died, got lost-to-follow-up (no-show for >30 days since the last appointment) or had virologic failure (≥1000 copies/mL). Data were analyzed using SPSS v26.0.

Results: We identified 13,994 (19.9%) PLHIV with AHD among the 70,302 newly diagnosed PLHIV between October 2020 to September 2021 across the four regions. At diagnosis, the median age was 37.0 [IQR 16] years, with 594 (4.2%) aged <15 years and 8,183 (58.5%) females. Of these, 9.4% (1,314/ 13,994) were diagnosed with TB and 14.1% (442/ 3,125) screened positive for CI.

At the one-year follow-up, 5,172 (36.9%) had either died (n =1,354), got LTFU (n =311) or had virologic failure (n =3,507). A total of 10,869 (77.7%) PLHIV were not investigated for CI due to limited access to CI screening at that time and 1,574 (11.2%) had missing status at 1 year due to clinic transfer (n =1,292) or other reasons (n=282).

Conclusions: Despite after five years of implementing the treat-all policy, the magnitude of AHD at HIV diagnosis remains substantial in a fifth of all newly diagnosed PLHIV. AHD continues to be associated with increased risks of OIs and poor outcomes. There is a need to strengthen the clinical monitoring and management of OIs among PLHIV with AHD.

EPB0133

The impact of HIV on mortality and recurrence of rifampicin-resistant tuberculosis after successful treatment with second-line regimens: a retrospective cohort study in South Africa

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Background: The HIV epidemic continues to drive the global tuberculosis epidemic, including multi-drug/rifampicin-resistant tuberculosis (MDR/RR-TB). While TB can be cured, people living with HIV (PLHIV) have increased risk of recurrent TB, but there are limited data on recurrence after successful MDR/RR-TB treatment. High TB and/or MDR/RR-TB recurrence would erode already limited treatment success and add to the already high burdens associated with MDR/RR-TB.

Methods: To assess mortality and recurrent TB after successful MDR/RR-TB treatment, individuals who initiated second-line MDR/RR-TB treatment between 2008-2016 with a successful treatment outcome and known HIV status from two South-African districts (rural and urban) were included. Follow-up data sources included: medical/laboratory records, TB registers, healthcare utilization and deaths data. Cohort follow-up was from the end of successful treatment until TB recurrence or death (censored at date last known to be alive). Time to event analyses were used.

Results: The cohort included 595 and 836 individuals from the included districts (total=1431); 1066 (74%) were PLHIV, 740 (52%) female with median age 34 years (IQR 27-41). Overall, 1098 (77%) were recorded as cured; remainder treatment completed. 114 (8%) successfully completed treatment for MDR-TB with resistance to fluoroquinolones and/or second-line injectables (preXDR/XDR-TB). The median follow-up after treatment ended was 4.4 years. Cumulative post-treatment success mortality was 3.2%, 5.3% and 7.4% at 12, 24 and 36 months. HIV was not associated with increased mortality (HR 0.9, 95%CI 0.6-1.4), rather male sex (HR 1.5, 1.0-2.1) and older age were significant predictors.

Cumulative TB recurrence was 4.2%, 8.9% and 11.4% at 12, 24 and 36 months, while MDR/RR-TB recurrence was 1.1%, 1.9% and 2.6% respectively. Among the 40 MDR/RR-TB re-





currences, 13 (33%) subsequently died. HIV was the only factor associated with TB recurrence (HR 1.6, 1.1-1.9), but was not significant for recurrent MDR/RR-TB (HR 1.6, 0.6-4.8). MDR/RR-TB recurrence was associated with initial preXDR/XDR (versus MDR-TB, HR 8.9, 1.0-81) and with treatment completion (versus cure, HR 2.7, 1.3-5.5).

Conclusions: High TB and MDR/RR-TB recurrence were seen overall and among PLHIV. These data highlight the need for greater attention to post-treatment care and person-centred support, particularly as shorter, all oral MDR/RR-TB regimens are scaled up.

EPB0134

Integrase inhibitor-based antiretroviral treatment does not increase the risk of TB-IRIS in people with HIV treated for tuberculosis: findings from the Reflate TB2 randomized trial

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Background: Antiretroviral therapy (ART) initiation in people living with HIV (PWHIV) treated for tuberculosis (TB) may be complicated due to the occurrence of tuberculosis-associated immune reconstitution inflammatory syndrome (TB-IRIS). Integrase inhibitors (INSTIs), by providing a faster HIV-RNA decline than efavirenz, could increase the risk for this complication. We sought to assess incidence and determinants of TB-IRIS in PWHIV with TB on raltegravir or efavirenz-based ART.

Methods: We conducted a secondary analysis of the ANRS 12300 Reflate TB 2 multicenter, phase 3 trial, that randomized ART-naïve PWHIV on standard TB treatment,

to receive raltegravir or efavirenz-based ART. TB-IRIS was defined according to the International Network for the Study of HIV-associated IRIS (INSHI) criteria.

Incidence rates (IR) were estimated by 100 persons-year (PY), stratified Kaplan-Meier curves (log-rank test) and cox regression models were used to assess determinants of TB-IRIS.

Results: Of 460 trial participants, 453 participants from Brazil, Côte d'Ivoire, Mozambique and Vietnam were included in this analysis. Median age 35 years (IQR: 29-43), 40% female, 69% pulmonary TB only, median CD4 102 (IQR 38-239) cells/μL and median HIV RNA 5.5 (IQR 5.0-5.8) log₁₀ copies/mL. Overall, 48 participants developed TB-IRIS (IR = 24.2/100 PY), 19 cases in the raltegravir arm and 29 in the efavirenz arm (log-rank test: p=0.123) (Figure). Factors associated with TB-IRIS were: CD4 count ≤100 cells/μL, HIV RNA ≥500,000 copies/mL, extra-pulmonary/disseminated TB (Table).

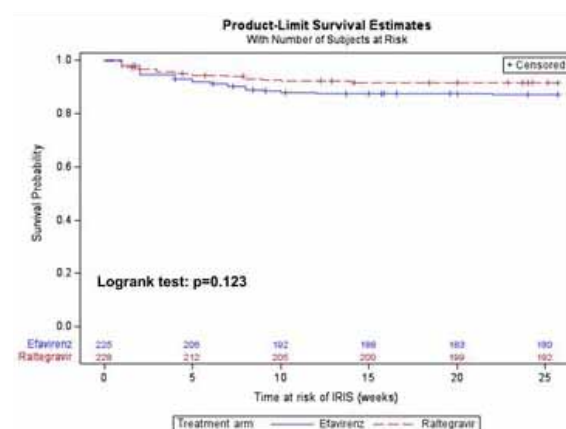


Figure. Stratified Kaplan-Meier curves for TB-IRIS-free survival probabilities by ART treatment (raltegravir arm versus efavirenz arm)

	cHR	95% CI	aHR	95%CI
Country				
Ivory Coast	1			
Brazil	1.19	0.44-3.26		
Mozambique	0.47	0.18-1.19		
Vietnam	1.97	1.02-3.81		
CD4 (cells/mm3)				
CD4 >100	1		1	
CD4 ≤100	3.17	1.65-6.16	2.48	1.27-4.84
HIV VL (copies/mL)				
VL ≥ 500 000	1		1	
VL < 500 000	0.27	0.15-0.50	0.34	0.19-0.63
TB diagnosis at enrollment				
Pulmonary only	1			
Extrapulmonary/disseminated	2.22	1.25-3.93	2.17	1.23-3.85

VL: viral load; cHR: crude hazard ratio; aHR: adjusted hazard ratio; CI: confidence interval
ART treatment was not included in the cox regression models due to violation of proportional hazards assumption.

Table. Factors associated with TB-IRIS incidence.

Conclusions: INSTI-based ART did not increase TB-IRIS risk. Low CD4 counts, high HIV RNA and extrapulmonary/disseminated TB were risk factors for TB-IRIS.

EPB0135

Standard biopsy with high-resolution anoscopy could miss potentially precancerous lesions

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Background: Screening with high-resolution anoscopy (HRA) is the standard approach to anal cancer in high-risk populations. Generally, lesions suspected of being high-grade squamous intraepithelial lesions (HSIL) are biopsied and subsequent intervention such as electrocautery is performed if the lesions were anal intraepithelial neoplasia (AIN) grade 2 or 3.

However, relapse after the intervention was a clinical problem. We performed sextant biopsies to explore the reasons for recurrence regardless of abnormal findings under HRA.

Methods: Individuals were screened with both an anal pap smear and high-risk HPV genotype and those with any positive screening results were included. In the procedure, the HRA provider visually predicted whether the lesion was HSIL or not before the biopsy, and then the provider performed sextant biopsies to collect at least six samples in all directions regardless of abnormal findings. Statistics compared visually predicted and biopsy-proven lesions on a per-lesion or per-person basis.

For each lesion, whether the visually predicted HSIL was consistent with the tissue biopsy result was assessed. On the other hand, it was whether all visually predicted HSILs or non-HSILs were inconsistent with the biopsy results of at least six samples in an individual was assessed.

In this study, an HRA provider who predicted lesions completed a certified HRA course offered by the International Anal Neoplasia Society and experienced 100 person/year.

Results: A total of 112 individuals with 673 lesions were analyzed from June 2021 to September 2022. The mean age was 48 years (interquartile range 41-54), all were MSM, and 86.6% were HIV-positive. The prevalence of HSIL was 81.3%(91/112) for individuals and 43.5%(293/673) for lesions. The rate of AIN grade 3 was 46.4%(52/112) for individuals and 16.6%(117/673) for lesions.

The concordance rate between the predicted lesions and biopsy-proven results was 55.0%(371/674). The rate of the biopsy-proven HSIL that was predicted as LSIL was 36.5%(107/293) for each lesion and 19.8%(18/73) for each individual.

Conclusions: Approximately one in five HSIL cases were considered low-risk lesions based on their appearance. In conventional HRA-guided biopsy, the provider may not biopsy lesions that were not suspicious. These potentially undiagnosed lesions may explain the cause of recurrence after therapeutic intervention.

EPB0136

Dynamics of cellular senescence markers after HCV elimination spontaneously or by DAAs in people living with HIV

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Background: We described that people living with HIV (PLWHIV) co-infected with HCV showed increased levels of oxidative stress (OS) and biomarkers related to the Senescence-Associated Secretory Phenotype (SASP).

Our aim was to assess the long-term evolution of senescence after HCV elimination spontaneously or by direct-acting antivirals (DAAs) in PLWHIV.

Methods: Multicenter longitudinal study (48 weeks) of 70 PLWHIV: 23 with active HCV-chronic acquisition (HIV-CHC) before and after HCV elimination with DAAs, 12 spontaneous clarifiers (HIV-SC), and 35 controls (HIV).

OS biomarkers were quantified at DNA, lipid, protein and nitrate levels, total antioxidant capacity and glutathione enzyme. The SASP was characterized by Multiplex Immunoassay and the replicative senescence was assessed by relative telomere length by qPCR.

Differences in senescence markers were evaluated by generalized mixed linear models [adjusted Mean Ratio (aMR)]. P values were adjusted by false discovery rate (q-value) using Benjamin-Hochberg correction with a cut-off point of 0.1.

Results: The median age was 50 and 47% were female. After follow-up, the SC group reduced lipid peroxidation levels (q=0.008).

Although eight SASP markers significantly increased during follow-up (Fig. 1A), they showed a significant reduction in the most prominent markers (IL-1 β , IL-2, IL-6) compared to the HIV group (Fig. 1B).

Elimination of CHC by DAAs reduced OS mainly at the level of GSSG (q=0.008) and nitrates (q=0.032). Regarding SASP, IL-13 levels decreased (q=0.078) but Gro- α and Rantes increased after treatment (q=0.065) (Fig. 1A).

Overall, they achieved a similar senescence profile to the HIV group, except for Gro- α (q=0.019) and FGF-2 (q=0.008) (Fig. 1B)



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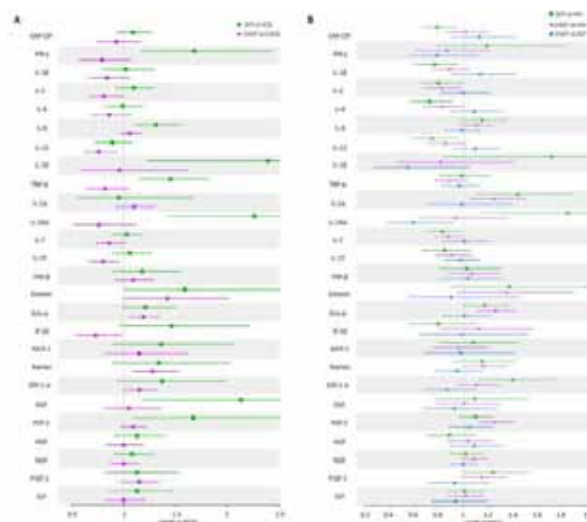


Figure 1.

Conclusions: As clearance time increases in HIV-SC individuals, they showed a greater reduction in OS and SASP markers than that observed in the HIV group, suggesting a better control of HIV-derived senescence. The elimination of CHC acquisition by DAAs partially improves the senescence profile by restoring OS levels and reducing SASP markers to levels observed in the HIV group.

EPB0137

Clinical presentation and outcomes of HIV-associated opportunistic central nervous system infections in the Indonesian national referral hospital: a prospective study

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Background: Central nervous system (CNS) infections are an underrecognized cause of morbidity and mortality in HIV-infected patients, particularly in low- and middle-income countries.

We describe the clinical characteristics and outcomes of HIV-infected adults with a CNS infection in Jakarta, Indonesia.

Methods: We analysed data from a longitudinal cohort at the national reference hospital, enrolled between April 2019-September 2021. We used Cox and logistic regression to estimate in-hospital and 6-month mortality.

Results: Among 531 patients who presented with a suspected CNS infection, a CNS infection was clinically diagnosed in 340 (64%), of whom (184, 54%) were HIV-positive (76.1% male, median age 36 [IQR30-43] years, median CD4 count 37 [IQR16-125] cells/mL).

Forty-three (23.4%) patients were newly HIV-diagnosed, and of those with known HIV, only 46.8% (66/141) were receiving antiretroviral therapy. The median time from symptom onset to hospital presentation was 30 (IQR10-60) days. Cerebral toxoplasmosis was most frequent (66, 35.8%), followed by neurosyphilis (37, 20.1%), tuberculous meningitis (TBM; 35, 19%), and cryptococcal meningitis (CM; 16, 8.7%).

Disregarding asymptomatic neurosyphilis cases (n=40), in-hospital mortality was 24.5% for HIV-positives (36/147) and 22.9% for HIV-negatives (35/153) (p=0.7), and 6-month mortality was 46.5% for HIV-positives (59/127) and 42.9% for HIV-negatives (54/126) (p=0.5). In-hospital and 6-month mortality was highest for TBM (40% and 45.7%, respectively).

In multivariable Cox analysis, in HIV-positive patients, in-hospital mortality was inversely associated with lower CSF/serum glucose ratio at presentation (hazard ratio [HR] 0.04 [95%CI0.0-0.9]), whereas 6-month mortality was associated with fever (HR2.4 [1.1-4.9]), lower CSF/serum glucose ratio (HR0.1 [0.01-0.9]), and severe hyponatremia (<125 mmol/L; HR3.2 [1.1-9.5]) at presentation.

After adjusting for confounders, HIV-infection was found to double the risk of in-hospital death (odds ratio 2.1 [1.0-4.1]) and 6-month death (odds ratio 1.9 [1.0-3.4]) (p=0.04 each), compared with HIV-negative patients.

Conclusions: Most patients with a CNS infection presented late and with severe HIV-induced immunodeficiency. HIV-infection doubled the risk of early as well as long-term death. In high-burden tuberculosis countries including Indonesia, TBM remains an important cause of mortality. Our data underline the need to strengthen care cascades for HIV-positive populations at high-risk of CNS infections.



EPB0138

One-dose versus accelerated two-dose schedule for booster HAV vaccination among people living with HIV after primary HAV vaccination

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Background: People living with HIV (PLWH) are known to have inferior responses to hepatitis A virus (HAV) vaccinations as well as reduced durability of immune protection after HAV vaccination.

Currently, for PLWH who have no responses to their primary HAV vaccination or those had sero-reversion after successful primary HAV vaccination, it is unclear how should they be boosted or revaccinated.

Methods: In this open-labelled, randomized trial, PLWH who tested negative for anti-HAV antibodies >4 weeks after had received a standard adult primary HAV vaccination were included. Enrolled participants were randomized to receive either one dose (the one-dose group) of booster HAV vaccine or accelerated two doses of HAV vaccines, given four weeks apart (the two-dose group). The participants were further sub-classified as the "non-responders" (who had no response to the primary vaccination) and "sero-reverters" (who lost anti-HAV antibodies after primary vaccination).

Results: In the 153 PLWH included (77 in the one-dose group and 76 in the two-dose group), the overall serological responses rate at four weeks after completing the designated booster vaccination schedule was 79.2% in the one-dose group, which was similar to the 82.9% in the two-dose group ($p=0.56$). The response rate remained similar at week 24 (one-dose vs. two-dose, 79.2% vs. 85.5%, $p=0.31$). At week 48, the proportion of participants remained positive for anti-HAV IgG decrease slightly in both groups, but the difference remained statistically insignificant (one-dose vs. two-dose, 71.4% vs. 80.2%, $p=0.20$). However, the titer of anti-HAV antibodies were consistently higher in the two-dose group as compared to the one-dose group. In subgroup analysis, the "non-responders" were more likely to generation a positive response after two doses of HAV boosters, as compared with those in the one-dose group (68.4% vs. 44.1%, $p=0.038$). Serological responses rates and the titers of anti-HAV antibodies were compared.

Conclusions: An accelerated two dose booster HAV vaccination given four weeks apart had similar serological responses as single dose booster among PLWH who were anti-HAV negative after primary HAV vaccination. Two-dose vaccination schedule could generate higher level of anti-HAV antibodies and were more likely to elicit serological responses among PLWH who had poor response to the primary vaccination.

EPB0139

Association between high-risk human papillomavirus infections and cervical cytology results among women living with HIV in Kenya

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Background: Cervical cancer is caused by high-risk human papillomavirus (HR-HPV) and women living with HIV (WLHIV) are disproportionately affected by cervical cancer. There are limited data on the association between HR-HPV and cervical cytology in Kenya, particularly among WLHIV who are at higher risk of developing cervical cancer.

We determined the prevalence of HR-HPV infections and their association with cervical cytology findings among Kenyan WLHIV.

Methods: We conducted a cross-sectional study among WLHIV attending Kenyatta National Hospital (KNH, Kenya's national referral hospital) for HIV care and treatment. Cervical cytology was performed by KNH medical providers per standard of care.

Study nurses collected a cervical sample with a cytobrush for HPV genotyping using Gene Xpert® assays and HPV Genotypes 14 Real-TM Quant™ V67-100 FRT kits. Multivariable logistic models were used to evaluate the associa-



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tion between the cytological result (normal vs. abnormal) and HR-HPV, adjusting for the duration of antiretroviral therapy (ART), CD4 count, and behavioral factors.

Results: Overall, 647 WLHIV enrolled in the study. The mean age of participants was 42.8 years (SD 8.7). All participants were on ART; 7% were initiated on ART in ≤ 12 months and 8.8% were not virally suppressed (>1000 copies/mL). The prevalence of any HR-HPV was 34.6%; 29.4% had a vaccine-preventable HR-HPV strain. The most common HR-HPV was HPV-52 (13.4%), followed by HPV16 (9.9%), and 56 (9.6%).

Half of the participants with abnormal cervical cytology had atypical squamous cells of undetermined significance while 17% had high-grade squamous intraepithelial lesions. There were higher odds of abnormal cervical cytology in women >35 years ($aOR=7.27$, 95% CI, 1.48-35.74) than in younger women. There were higher odds of abnormal cervical cytology associated with multiple HR-HPV ($aOR=0.16$, 95% CI, 0.07-0.37).

Conclusions: Over a third of WLHIV enrolled in this study at Kenya's national referral hospital had HR-HPV. There was a strong association between abnormal cervical cytology and the presence of multiple HR-HPV and older age. Cervical cancer programs for WLHIV could consider incorporating HR-HPV screening to identify women most likely to benefit from more intensive monitoring and assessment.

EPB0140

High prevalence of latent tuberculosis infection among people living with HIV in Thailand, 2022

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Background: A 2019 meta-analysis reported that 25% of the global population had latent tuberculosis infection (LTBI). Despite the Thai national HIV guidelines recommending tuberculosis preventive treatment (TPT) in newly diagnosed PLWH with CD4 <200 cells/mm³, those exposed to TB, or those who tested positive for LTBI, only 0.4% of PLWH received TPT in 2019. We assessed the prevalence of LTBI among PLWH in Bangkok using Interferon-Gamma Release Assay (IGRA) to inform policy decisions.

Methods: Since March 2022, the Thai Ministry of Public Health and PEPFAR Thailand implemented LTBI screening among PLWH using IGRA (T-SPOT.TB) in five hospitals with high HIV burden in Bangkok. Eligible clients included those with documented positive HIV test results, chest X-Ray, and IGRA test results without a history of TPT or TB treatment. Data from Thailand's HIV/TPT database during March – November 2022 was analyzed using multivariate analysis to identify factors associated with positive IGRA results.

Results: Of 888 PLWH who received IGRA screening, 20.4% (181/888) tested positive. The median age was 38 years; 612 (68.9%) were male, 667 (75.1%) were Thai, and 642 (72.3%) were ART naïve. Of 872 PLWH with CD4 results, about 20% tested positive across all CD4 categories, except those with CD4 <50 cells/mm³, in which 5.6% (1/18) tested positive. Factors associated with positive IGRA results included PLWH in the 30-44 (AOR: 2.06, 95%CI 1.24-3.52) and 45-59 (AOR: 2.44, 95%CI 1.35-4.50) age groups after adjusting for other variables. Nationality, CD4 count, gender, and ART history were not significantly associated with positive IGRA results.


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Characteristic	Overall N = 805 ¹	IGRA +ve N = 163	Univariate			Multivariate		
			OR ²	95% CI ²	p-value	OR ²	95% CI ²	p-value
Age group, n (%)								
0-29	201 (25.0%)	25 (15.3%)	-	Ref.	-	Ref.	-	-
30-44	331 (41.1%)	71 (43.6%)	1.92	1.19, 3.20	0.010	2.06	1.24, 3.52	0.006
45-59	249 (30.9%)	61 (37.4%)	2.28	1.39, 3.86	0.001	2.44	1.35, 4.50	0.004
≥60	24 (3.0%)	6 (3.7%)	2.35	0.79, 6.21	0.10	2.59	0.84, 7.22	0.079
General population³, n (%)	478 (59.4%)	105 (64.4%)	1.31	0.92, 1.87	0.14	1.02	0.67, 1.54	>0.9
CD4 Count at IGRA test, n (%)								
>350	563 (69.9%)	120 (73.6%)	-	Ref.	-	Ref.	-	-
0-50	18 (2.2%)	1 (0.6%)	0.22	0.01, 1.07	0.14	0.21	0.01, 1.06	0.13
51-100	18 (2.2%)	4 (2.5%)	1.05	0.29, 3.00	>0.9	1.17	0.32, 3.43	0.8
101-200	52 (6.5%)	11 (6.7%)	0.99	0.47, 1.92	>0.9	1.00	0.46, 1.99	>0.9
201-350	154 (19.1%)	27 (16.6%)	0.78	0.49, 1.23	0.3	0.82	0.51, 1.31	0.4
ARV Status, n (%)								
Naïve	627 (77.9%)	130 (79.8%)	-	Ref.	-	Ref.	-	-
Experience	178 (22.1%)	33 (20.2%)	0.87	0.56, 1.32	0.5	1.26	0.77, 2.05	0.4

¹ n (%),

² OR = Odds Ratio, CI = Confidence Interval,

³ General Population: PLWH who were not identified as men who have sex with men, transgender persons, people who inject drugs, sex workers, or pregnant women

Table 1: Characteristics of PLWH tested with IGRA and factors associated with LTBI, Bangkok, March – November 2022

Conclusions: High LTBI prevalence was found among higher age groups, and CD4 did not influence IGRA results except those with very low CD4. The feasibility of TPT implementation and cost-effectiveness of using IGRA for LTBI diagnosis in PLWH or provision of TPT to all PLWH requires further exploration.

EPB0141

Prevalence and associated risk factors of hepatotoxicity on tuberculosis prevention therapy in a Thai HIV cohort

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Background: Tuberculosis Preventive Therapy (TPT) is an important adjunctive strategy to control tuberculosis. Antituberculosis-treatment (ATT) induced liver injury is a common and serious adverse effect of TB-related treatment. However, there is still limited data on ATT-induced hepatotoxicity in Asian people living with HIV (PLWH). We aimed to investigate the prevalence and risk factors associated with ATT hepatotoxicity on TPT in a Thai PLWH cohort.

Methods: A retrospective analysis was conducted among PLWH on combination antiretroviral therapy who received ≥7 days of TPT between 1992-2022, in Bangkok, Thailand. The participants received either nine months of daily isoniazid (9H), three months of weekly rifampentine plus isoniazid (3HP) or one month of daily rifampentine plus isoniazid (1HP) for TPT. Hepatotoxicity was defined as elevated alanine (ALT) or aspartate transaminase (AST) of 3 times upper limit of normal range with clinical symptoms. Multivariable logistics regression was used to assess factors associated with hepatotoxicity.

Results: We included 851 PLWH on TPT in the analysis (median age, 31.7 [interquartile range (IQR) 26.2-39.5] years; 80.6% male; median CD4 count 380 [IQR 254-545] cells/mm³), 35.4% on efavirenz and 40.8% on dolutegravir. 72(8.5%) participants had hepatotoxicity: 24/272(8.8%) in 9H, 25/287(8.7%) in 3HP, and 23/292(7.8%) in 1HP groups and there was lowest incidence of elevated ALT/AST Grade 3/4 in 1HP group (4/30 cases) than another 2 regimens groups (13/30 cases in both).

Those with hepatotoxicity had significant higher AST or ALT levels at the time of TPT initiation than those without hepatotoxicity (median AST: 41.5 [29-81.5] vs 30 [21-44] U/L; median ALT: 32.5 [24-64] vs 25 [20-31] U/L).

In multivariable analysis, baseline hepatitis C virus co-infection (adjusted odds ratio [aOR] 2.3, 95%CI 1.07-2.41, $p = 0.003$), baseline AST levels level of >40 U/L at TPT initiation (aOR 5.7, 95%CI 2.96-10.98, $p < 0.001$) and efavirenz use at the time of TPT initiation (aOR 2.1, 95%CI 1.11-4.00, $p = 0.02$) were associated with hepatotoxicity in patients PLWH receiving TPT.

Conclusions: HCV coinfection, efavirenz use, and elevated baseline AST were significantly associated with antituberculosis treatment-induced liver injury. Physicians should carefully monitor PLWH with these risk factors for early signs of ATT-related hepatotoxicity when initiating TPT.

EPB0142

High prevalence of asymptomatic Sexually Transmitted Infections in men patients living with HIV

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Background: Sexually transmitted infections (STIs) occur frequently in men who have sex with men (MSM) living with HIV. Guidelines recommendations do not include



screening for asymptomatic people. The aim of the study was to identify the prevalence of asymptomatic STIs in men patients living with HIV (PLHIV).

Methods: A cross-sectional study was conducted in people with HIV infection at the Hospital de Infectología "La Raza" National Medical Center, from May to August 2022. An urethral sample was taken from PLHIV who were attended in the HIV clinic for men. Written informed consent was obtained from all participants before the sample was taken for the identification of 11 microorganisms. Detection was performed by PCR test for *Chlamydia trachomatis*, *Neisseria gonorrhea*, *Haemophilus ducreyi*, *Mycoplasma genitalium*, *Mycoplasma hominis*, *Treponema pallidum*, *Trichomonas vaginalis*, *Ureaplasma urealyticum*, *Ureaplasma parvum*, Herpes Simplex virus type 1 and 2. Participants were also asked to complete a questionnaire documenting behavioral characteristics or symptoms related to a possible STI infection (Braun STI screening ZPHI study). The data were measured in medians with inter-quartile ranges and the prevalence of detection of urethral microorganisms was presented as a percentage.

Results: We included 184 male naive treatment patients who started an antiretroviral regimen. Baseline characteristics were a median age of 26 years (IQR 22-31), CD4+ 274 cells count (IQR 183-380), and HIV-1 RNA viral load 4.36 log₁₀ (IQR 3.74 -4.83).

We detected at least one microorganism in 42 (22.8%) urethral samples; of these, *Ureaplasma urealyticum* was detected in 23 (55%), and *Mycoplasma genitalium* in 8 (20%), *Mycoplasma hominis* in 9 (21%), *Chlamydia trachomatis* in 3 (7.1%), *Treponema pallidum* 2 (4.7%), *Neisseria gonorrhoeae* in 2 (4.7%) and herpes simplex 2 in 1 (2.3%). In 5 (12%) patients, more than one microorganism was detected.

Conclusions: In PLHIV naive treatment and asymptomatic, urethral colonization with Mollicutes was high. The most frequently found microorganisms were *Ureaplasma urealyticum* and *Mycoplasma genitalium*.

The primary reason that gonorrhea and chlamydial infections are untreated is that infected people never have symptoms. Regular screening should be considered in PLHIV at least each 6 to 12 months.

EPB0143

Cryptococcal antigen (CrAg) screening a need of the hour for PLHIV of Eastern India

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Background: Cryptococcal meningitis is one of the leading cause of mortality in people living with HIV (PLHIV) with advanced disease. Although the national program recommends screening for CrAg in PLHIV with CD4 < 100/

μL, it has not been implemented in practice. There is also a dearth of information regarding the prevalence of Cryptococcal antigenemia in India. Thus this study was done to assess the prevalence of cryptococcal antigenemia among PLHIV with advanced disease.

Methods: This prospective study was done in a government funded ART (Antiretroviral treatment) centre in Varanasi between January 2021- March 2022. Serum CrAg (BIOSYNEX® CryptoPS) screening was done in newly diagnosed adult PLHIV with CD4 < 200/μL after informed consent. CSF CrAg testing was done in all PLHIV who were serum CrAg positive. Serum CrAg positive PLHIV were given preemptive treatment while CSF CrAg positive were treated for cryptococcal meningitis as per WHO recommendation. All participants were followed up till September 2022.

Results: Serum CrAg was positive in 20.8% (n=20) of the 96 eligible subjects screened (Table 1). 35% (n=7/20) of CrAg positive PLHIV had CD4 count between 100-199 cells/ μL. Among the serum CrAg positive PLHIV, 45 % (9/20) were positive for CSF cryptococcal antigen. None had symptoms of cryptococcal meningitis. Serum CrAg positivity was significantly associated with low CD4 count, poor clinical stage and Pneumocystis pneumonia (PCP). At the end of follow up, 2 PLHIV among the CrAg positive and 3 in CrAg negative group died. None of the deaths were due to cryptococcal disease.

Baseline Parameter	Serum CrAg Positive (N=20) Mean ± SD (%)	Serum CrAg Negative (N=76) Mean ± SD (%)	P value
Age years	40.45 ± 10.59	38.90 ± 10.97	0.718
Sex			
Male	14 (70%)	59 (77.6)	0.496
Female	6 (30%)	17 (22.4)	
CD4 cells/ μL	74.3 ± 55.44	118 ± 57.26	0.014
WHO stage 1 & 2	5 (25)	48 (63.2)	0.02
WHO stage 3 & 4	15 (75)	28 (36.8)	
Tuberculosis	13 (65)	48(63.1)	0.878
Pneumocystis pneumonia(PCP)	7 (35)	6(8.8)	0.02
Outcome at end of follow-up			
Alive	18(90)	73 (96)	0.102
Expired	2(10) (1 PCP & 1 Tuberculosis)	3(4) (due to Tuberculosis)	

Table 1: Baseline characteristics

Conclusions: High prevalence of cryptococcal antigenemia reiterates the need for CrAg screening among PLHIV of Eastern India. As 35% of our CrAg positive PLHIV had CD4 count between 100-199 / μL the cut off for screening should be increased to CD4 200/ μL instead of the recommended CD4 <100/ μL. Appropriate management of cryptococcal antigenemia and meningitis improves survival.

EPB0144

Differences in time to HCV treatment initiation following HCV diagnosis in the broad direct-acting antiviral era in five countries

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Background: Delays in treating hepatitis C virus (HCV) increase the risk of loss to care and onward transmission, jeopardising HCV elimination. We describe differences in treatment initiation following HCV diagnosis among people with HIV (PHIV) in five countries with high treatment uptake in the direct acting antiviral (DAA) era.

Methods: Data were from five of 11 cohorts from the International Collaboration on Hepatitis C Elimination in HIV Cohorts (InCHEHC), including data from Australia, France, the Netherlands, Switzerland and Spain. Individuals were eligible if first HCV diagnosed after DAAs became broadly available in their country. We used Kaplan-Meier methods to estimate the probability of treatment initiation by country. Follow-up started at HCV diagnosis (first positive RNA result), and ended at first treatment initiation, cohort administrative censoring date, loss to follow up, or end of 2019, whichever came first.

Results: Of 92,626 participants in the five cohorts, 1084 were first diagnosed with HCV after broad DAA access began. Overall, 404 (37%) initiated treatment during 1120 person-years of follow up. Time to treatment initiation was shortest in the Netherlands and longest in Australia (Figure 1).

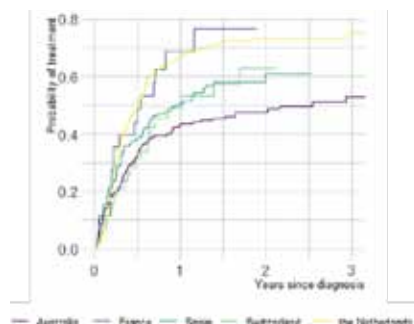


Figure 1. Time to treatment initiation since HCV diagnosis among 770 participants with first HCV RNA test after broad access to DAA therapies.

Six months and one year after diagnosis respectively, the probability of treatment initiation was 20% (95% CI: 16-24%) and 27% (95%CI: 22-31%) in Australia, and 39% (95%CI: 33-44%) and 52% (95% CI: 47-57%) in the Netherlands, with few participants treated more than one year after diagnosis (Figure 1).

Conclusions: Time to treatment initiation varies substantially between countries even among those with broad access to DAA and high treatment uptake. Those diagnosed during broad access to DAAs may be less engaged in care and therefore less likely to initiate treatment than previously treated participants. Policy differences between countries with respect to treatment of acute HCV and differences in HCV RNA testing may contribute to differences in treatment uptake.

EPB0145

The epidemiological profile of mpox cases in Rio de Janeiro, Brazil: changes over time during the 2022 outbreak

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Background: Mpox emerged as a public health emergency of international concern in May, 2022. By January 27, 2023, 85,382 cases were diagnosed globally;12.5% of them in Brazil. Understanding the mpox transmission dynamics in Brazil is relevant to prepare adequate responses at the country level.

This study aimed to analyze the characteristics of confirmed mpox cases and the pattern of community transmission in Rio de Janeiro according to time of diagnosis.

Methods: Prospective, observational cohort study of individuals with confirmed mpox followed at a major referral center in Rio de Janeiro, Brazil. We compared sociodemographic, clinical, and behavioral data among individuals diagnosed in two time periods:

1. June-August 2022 (first phase);
2. September-December 2022 (second phase).

Chi-squared or Fisher's tests for qualitative variables and Moods test for quantitative variables were used.

Results: Between June and December 2022, 416 participants had confirmed mpox, the majority between June and August 2022 (62.9%).

Overall, median age was 34 years (IQR:28-40), 91.9% were cisgender men (n=382/416), 62.3% self-declared as black or *pardo* (n=205/329), 87.4% were men who have sex with men (MSM) (n=326/373).

Compared to cases diagnosed during the first phase, the frequency of cases among women (cis and trans) increased during the second phase, whereas it declined



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among cisgender men and MSM. Reporting sex in the 30 days before symptoms initiation and the frequency of anogenital lesions remained stable across phases. Overall, disseminated exanthema was more frequent, but localized exanthema increased during the second phase (Table).

	June – August 2022 (n = 262)	September – December 2022 (n = 154)	Total (n = 416)	p-value
Median age (IQR)	33 (28,39)	35 (28,42)	34 (28,40)	0.25
Gender				
Cisgender men	252/262 (96.2%)	130/154 (84.4%)	382/416 (91.9%)	
Cisgender women	10/262 (3.8%)	13/154 (8.4%)	23/416 (5.5%)	<0.001
Transvesti or TGW	0 (0)	11/154 (7.2%)	11/416 (2.6%)	
MSM	215/232 (93%)	111/141 (79%)	326/416 (87%)	<0.001
Reported sex in the 30 days before starting symptoms	210/231 (91%)	127/144 (88%)	337/375 (90%)	0.40
Exanthema				
Localized	69/248 (28%)	60/149 (40%)	129 (32%)	0.01
Disseminated	179/248 (72%)	89/149 (60%)	269/397 (68%)	
Anogenital lesions	191/262 (73%)	115/154 (75%)	306 (74%)	0.69

Conclusions: The intersection of sexual networks seems to play an important role in mpox transmission dynamics during community spread, as shown by the largest number of MSM in the first phase and the increased number of cases in women diagnosed over time. The increased frequency of localized exanthema might be related to greater awareness of the array of clinical presentations among clinicians. Prompt mpox identification and diagnosis are essential to fully understand the dynamics of the mpox outbreak.

EPB0146

Clinical characteristics and outcome of toxoplasma encephalitis in HIV patients from Indonesian tertiary referral hospital

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Background: Toxoplasma encephalitis (TE) is the most common brain opportunistic infection in HIV patients with low CD4 T cell counts. The mortality remains high even though the diagnosis can be made earlier. This study aims to compare the clinical characteristics, CD4 T cells count, and treatment response based on the outcome of TE patients with HIV.

Methods: The prospective cohort study was conducted at a tertiary referral hospital in Jakarta, Indonesia between April 2019–September 2021. We include all HIV patients with TE diagnosis aged ≥18 years. The diagnosis of TE was made presumptively in HIV patients with CD4 <200, having neurological deficits (hemiparesis) with compatible brain imaging features.

The data collected were demographic characteristics, clinical presentations, CD4+ T cell counts, brain imaging, and treatment response. Patients' outcome was assessed at hospital discharge and six months follow-up.

Results: Of 66 patients, the mean age was 35.76 ± 9.38 years, and 68% were male. The clinical presentations were mainly headache (78.8%), hemiparesis (63.6%), altered consciousness (63%), and fever (37%). CD4+ T cell count was observed in 63 patients with a mean of 61.94 ± 83.32 cells/mL. The results of imaging showed that 37% of patients had brain herniation. At the end of the study, 22 (33%) patients died. Nine patients (13.6%) died at the hospital and 13 patients (19.7%) died at six months of follow-up. In the dead patients' group, fever and altered consciousness were tend more frequent (50% vs 32% and 68% vs 52%). The mortality was not affected by the pyrimethamine treatment.

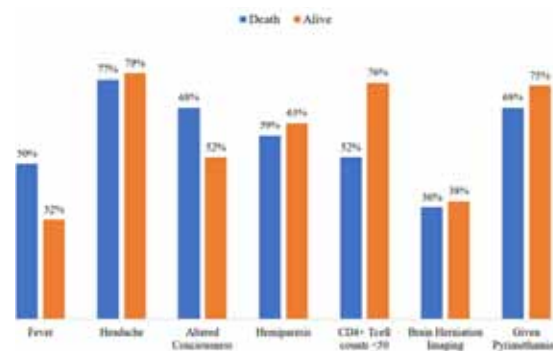


Figure 1. Clinical characteristics, CD4+ T-cell counts, brain imaging and pyrimethamine treatment were based on survival status at the end of the study.

Conclusions: In this study, headache, hemiparesis, and altered consciousness were the most common clinical presentation among TE in HIV patients. Half of the patients who died had a fever, altered consciousness, and low CD4+ T cell counts.



EPB0147

Efficacy and safety of different regimens in the treatment of HIV patients with latent tuberculosis infection: a systematic review and network meta-analysis of randomized controlled trials

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Background: Treatment of latent tuberculosis infection (LTBI) is effective in preventing progression to TB disease. This study aimed to synthesize available evidence on the efficacy, adherence, and safety of LTBI treatment in order to assist policymakers to design appropriate national treatment policies and treatment protocols.

Methods: The PRISMA statement extension for systematic reviews incorporating network meta-analysis (PRISMA-NMA) was used to review and report this research. Randomized controlled trials which compared the efficacy and safety of LTBI treatments were included.

A systematic literature search was done to identify relevant articles from online databases PubMed/ MEDLINE, Embase, and Cochrane Center for Clinical Trial database (CENTRAL). The network meta-analysis was done using R-studio Version 1.4.1103.

Results: In this review, 42 studies were included, which enrolled 52547 participants living with HIV. The incidence of TB among people living with HIV who have taken 3RHZ (RR 0.40 95% CI 0.23,0.69) as TPT was lower followed by 3RH (RR 0.56 95% CI 0.36,0.89) and 6H (RR 0.62 95% CI 0.45, 0.87). Patients' adherence to TPT was higher among patients who have taken 4R (RR1.38 95% CI 1.0,1.89) followed by 3RH (RR 1.34 95% CI 1.03,1.74) and 2RZ (RR 1.34 95% CI 1.02,1.75).

The proportion of subjects who permanently discontinued a study drug because of adverse event were higher in 3RZ (RR 9.31 95% CI 2.99,28.97), followed by 2RZ (RR7.12 95% CI 1.39, 36.57), and 3RH (RR 3.29 95% CI 1.11, 9.78). The risk of nausea and vomiting was higher among patients who have taken 3HP (RR 5.91 95% CI 2.30,15.20), followed by two months twice a week combination of HP (RR 3.51 95% CI 1.04,11.79).

Conclusions: From this review, it can be concluded that 3RHZ, 3RH, 6H has a significant impact on the reduction of TB incidence among PLWH. However, rifampicin combination either with isoniazide or pyrazinamide or both were significantly associated with adverse events which resulted permanent discontinuation.

Hence, in order to understand the efficacy and safety of TPT on children more study might needs to be done.

EPB0148

CMV co-infection and HIV disease control among children living with HIV in Canada

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Background: CMV co-infection among people living with HIV is associated with chronic inflammation and HIV disease progression, though data in pediatrics is limited.

The objective of this study was to determine the association between CMV viremia and HIV disease control, and to describe immunological (humoral and cell-mediated) markers of CMV control in children living with HIV (CLWH) who acquired HIV by perinatal transmission.

Methods: Sub-study of the prospective, multicenter Early Pediatric Initiation Canada Child Cure Cohort study (EPIC⁴). CLWH were followed every 3-6 months from 2014-2018. CMV serostatus (IgG) was determined at baseline (ArchitectTM CMIA) and end of study for those seronegative at baseline. CMV and HIV viral loads (VL) and lymphocyte subsets were quantified at every visit for those with IgG seropositivity. In CMV seropositive CLWH, CMV IgG avidity was quantified and CMV pp65-specific IFN-g responses were measured using ELISpot.

Results: 225 CLWH were enrolled; median baseline age was 13.9 years (IQR, 9.3-17.0 years), and median follow up was 32 months (IQR, 21-38). 192 (85.3%) were CMV seropositive at baseline (5 with documented congenital CMV infection). Thirty-four (17.7%) CMV seropositive CLWH were CMV viremic at least once during follow-up (VL range 85-1991 IU/mL). Though there was no difference in median age of cART initiation (3.7 vs 4.4 years, p=0.15) or incidence of treatment interruptions during follow-up (14.7% vs 8.2%, p=0.40) in CLWH with and without CMV viremia, those with CMV viremia were more likely to have at least one episode of detectable HIV VL during the follow-up period (64.7% vs 33.5%, p< 0.001), and to have lower CD4:CD8 ratio nadir during follow-up (0.68 vs. 0.83 p=0.043).

Those with CMV viremia had higher total CMV IgG titers (217 vs. 156 AU/mL, p<0.001) and avidity (87.9 vs. 85.6%, p=0.01), and lower though non-significant IFN-g responses (1601 vs. 2263 spot-forming units (SFU) per 10⁶ PBMC, p=0.20).

Conclusions: Among CLWH in Canada, CMV viremia is not rare and associated with HIV viremia and lower nadir CD4:CD8 ratio, higher CMV IgG titers and lower IFN-g responses. Further work is necessary to determine the potential role of CMV in HIV disease progression and chronic inflammation in CLWH.



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EPB0149

Integration of HCV treatment at district antiretroviral therapy clinics during COVID-19 pandemic: a success story from Viet Nam

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Background: Estimated 1 million people are living with hepatitis C virus (HCV) in Vietnam. Majority of them are people living with HIV (PLHIV) and people who inject drugs (PWID). Hepatitis C and B are the major causes of hepatocarcinoma and liver-related deaths in Vietnam.

However, access to HCV treatment remains limited for PLHIV and PWID. To address this, an initiative on integration and scale-up HCV treatment at district antiretroviral therapy (ART) clinics for PLHIV and PWID on methadone maintenance therapy (MMT) was implemented.

Description: Between April 2021 and August 2022, a total of 16,052 patients (4,492 PWID and 11,560 PLHIV) initiated HCV treatment with direct acting antivirals (DAAs) at 210 ART clinics in 38 provinces in Vietnam. Majority (84%) of these ART clinics were at district hospitals. Data on patient demographics, ART, MMT and HCV treatment were abstracted from a web-tool designed for HIV and HCV treatment patients. Cure rate was defined as undetectable of HCV RNA at 12 weeks or more (SVR12) after completion of HCV treatment.

Lessons learned: Of 16,052 patients (including 1415 compensated and 50 decompensated cirrhosis patients) received DAAs and 98.7% patients completed the treatment course. As of 30th November 2022, there were 4,785/15,784 (30.3%) patients had a second HCV RNA test at 12 weeks or more after the treatment completion and overall rate of SVR12 was 96.6%. No difference was found in SVR12 rates between district (96.7%), provincial (95.6%) and central (98.7%) level health facilities.

However, there was a significant proportion of patients (69.7%) who had completed treatment for at least 12 weeks but did not have second HCV RNA test. The major reasons for this were patients felt well and did not want to spend their time or money for the second HCV RNA test.

Conclusions/Next steps: The findings from this real-world data demonstrated the feasibility of integration of HCV treatment at district ART clinics which brings HCV treatment services closer to PLHIV and PWID.

The results will be served as strong evidence to advocate health insurance reimbursement for HCV treatment at district health facilities to ensure sustainability of HCV treatment in Viet Nam.

EPB0150

24 week efficacy and safety of efavirenz- and dolutegravir-based antiretroviral therapy with isoniazid and rifapentine for tuberculosis preventive therapy (1HP and 3HP) in Thai people living with HIV

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Background: Limited data inform evidence-based co-administration of DTG/TDF/3TC (TLD) with daily isoniazid (H) and rifapentine (P) for 1 month (1HP) or weekly HP for 3 months (3HP) for tuberculosis preventive therapy (TPT) in people living with HIV (PWH), particularly from Asia.

Methods: A randomized control trial of 1 HP or 3 HP for TPT among PWH in 15 HIV clinics in Thailand is ongoing study from 2019 to present. At the beginning, only EFV/TDF/FTC was allowed. After the A5372 study demonstrated high DTG plasma concentrations among Thai PWH, TLD once daily was initiated from March 2022 onward. We reported the 24 weeks efficacy and safety of TLD and EFV/TDF/FTC with either 1 HP or 3HP.

Results: Of 1070 participants analysed (59% male, median body weight 62.6 kg) , 804 (75%) took EFV/TDF/FTC and 266 (25%) received TLD; 546 (51%) participants received 1HP. Median ART duration prior to TPT was 1.2 (IQR:0.6-7.2) years; the majority of participants started TPT within 3



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months of TLD or EFV/TDF/FTC initiation (66%), especially in the TLD group (84%). At week 24, viral suppression (HIV VL ≤ 50 copies/mL) was high in both EFV/TDF/FTC (92.2% 1HP and 91% 3HP) and TLD (92.8% 1HP and 94.7% 3HP) (Figure 1).

Hepatotoxicity \geq grade 2, that was mainly asymptomatic and self-limited, developed in 8.8% of 1 HP and 6.4% 3HP groups. Only 0.4% and 0.2% of 1070 participants prematurely discontinued 1 HP and 3 HP, respectively, due to hepatotoxicity or hypersensitivity reactions. Only 0.8% TLD group participants prematurely discontinued TPT.

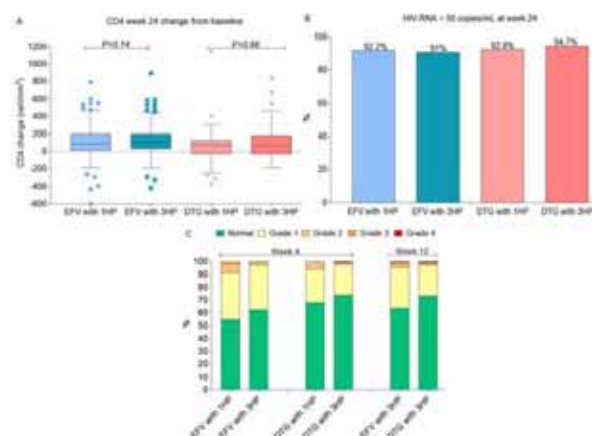


Figure. 1A-C represent median CD4 change, HIV VL suppression and grading of hepatotoxicity in each treatment group

Conclusions: Similar efficacy and safety was observed for PWH receiving dolutegravir and efavirenz based ART, co-administered with 1 HP or 3HP, suggesting once daily DTG doses are appropriate with 1 HP or 3 HP.

EPB0151

Hepatitis delta and liver disease among people living with hepatitis B in Senegal

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Background: Hepatitis delta virus (HDV) infection is the most severe form of viral hepatitis. However, its prevalence among persons living with hepatitis B virus (HBV)

infection in West Africa, and its impact on liver-related complications is ill defined. We tested a large urban HBV cohort in Senegal for the presence of HDV infection and evaluated its association with liver cirrhosis.

Methods: We included all HBsAg-positive individuals, with or without HIV co-infection, who presented between October 2019 and September 2022 to one of two referral infectious disease clinics in Dakar, Senegal.

All participants underwent clinical and virological assessments, as well as transient elastography (TE). We tested for anti-HDV antibodies using the Anti-HD Liaison XL test (DiaSorin, Belgium) on cryopreserved dried blood spots. Anti-HDV IgG-positive specimens were tested for the presence of HDV RNA using a sensitive RT-PCR of the end of HDV-Ag region of the genome, and genotypes were determined after sequencing. We used multivariable logistic regression to explore the association between HDV-positivity and liver fibrosis, defined as TE >7.0 kPa.

Results: Among 585 participants, median age was 32 years (interquartile range [IQR] 26-41), 274 (46.8%) were women and 94 (16%) had HIV-coinfection. Eleven (1.9%) participants had anti-HDV antibodies, of whom 8 (72.7%) showed active replication. HDV-5 genotype was found in 6 of 8 individuals, while the other two had HDV-1 and HDV-7. Compared to individuals with a negative HDV serology, those with anti-HDV antibodies were more likely to have an undetectable HBV viral load (81.8% vs. 35.3%) and liver fibrosis or cirrhosis (54.4% vs 9.8%). 5 of 8 (62.5%) individuals with detectable HDV-RNA had liver cirrhosis. In multivariable analyses, HDV-positivity (adjusted odds ratio 18.91, 95% confidence interval 3.61-99.04) and male sex (5.88, 2.63-13.15) were strong predictors of liver fibrosis. **Conclusions:** Although the prevalence of hepatitis delta was low in our large cohort of persons living with HBV in Dakar, those affected had a very high risk of presenting with liver cirrhosis. Efforts to improve HDV screening and management are urgently needed in West Africa.

**EPB0152****Hepatocellular carcinoma surveillance among people living with hepatitis B in Senegal: 1-year results of a prospective cohort study**

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Background: In West Africa, hepatitis B virus (HBV) infection is the most important risk factor for hepatocellular carcinoma (HCC). Although six-monthly ultrasound measurements are recommended to detect HCC at an early stage, few large-scale longitudinal studies exist to inform HCC surveillance strategies in sub-Saharan Africa.

Methods: We included antiviral treatment-naïve HBsAg-positive individuals presenting between October 2019 and September 2022 at one of two referral infectious disease clinics in Dakar, Senegal.

All participants underwent six-monthly virological assessments, transient elastography (TE) and abdominal ultrasound. In the presence of a liver lesion > 1cm on ultrasound, we performed a 4-phase CT-scan (4CT).

Results: Of 758 HBsAg-positive participants, 755 had an ultrasound measurement at enrolment. Their median age was 31 years (interquartile range [IQR] 25-39), 53% were men, 10.8% had a family history of HCC and 1.8% reported hazardous alcohol consumption. HBeAg was positive in 15/681 (2.2%) individuals, 202/755 (27%) had HBV DNA >2,000 IU/mL, and 87/755 (11.5%) had liver fibrosis or cirrhosis (TE >7 kPa).

On ultrasound at enrolment, 48/755 (6.4%) individuals had signs of cirrhosis, whereas 20/755 (2.7%) had a focal liver lesion. Of 10 patients with a lesion >1 cm, all had a 4CT, which confirmed 1 HCC, 5 liver hemangiomas, 2 biliary cysts, 1 focal nodular hyperplasia and 1 regenerative liver nodule.

In addition, 3 participants with signs of portal vein thrombosis had a 4CT performed, which confirmed the presence of an HCC. 83.2% of participants performed at least 1 additional ultrasound in the first 12 months of follow-up,

of whom 118 (18.8%) had initiated antiviral therapy. Five individuals had an incidental liver nodule <1 cm during follow-up and no incident HCC cases were found.

Conclusions: Our study highlights the feasibility of rolling out an HCC surveillance program in Senegal. Four (0.5%) participants had an HCC at an advanced stage at presentation and none during follow-up. Long-term surveillance is needed to understand the determinants of HBV-related HCC in West Africa.

EPB0153**Drug Resistant Tuberculosis (DR-TB) detection among new, previously treated TB cases, and people living with HIV in Western and Southern highlands, Tanzania**

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Background: Tuberculosis (TB) including drug resistant Tuberculosis (DR-TB) is a major public health concern. Worldwide 649,000 people were treated for multi-drug resistance (MDR) TB from 2018-2021; 43% of the global target (WHO Global TB report 2022). Findings from the TB Drug Resistance Survey in 2018 in Tanzania, showed that MDR/rifampicin resistance (RR) TB prevalence was 0.97% among new TB clients and 4.6% for previously treated cases. Furthermore, 448 (56%) cases were diagnosed against national target of 800 in 2018. The UNAIDS estimates that people living with HIV (PLHIV) have double the risk of developing DR-TB. The USAID Uhuru TB Local Organizations Network project is implemented in Katavi, Kigoma, Rukwa and Songwe regions with overall capacity of 27 GeneXpert machines. Use of GeneXpert machine in identifying DR-TB in previously treated and PLHIV is inevitable.

Description: Between October – November 2022, the project collected and reviewed the TB clients notified from October 2020 to September 2022 from 315 health facilities in the four project supported regions. Data were then extracted from the electronic Tuberculosis and Leprosy database (DHIS2-ETL) into Ms. Excel. Collected data was disaggregated by age, sex, history of treatment, diagnostic method, laboratory test results and HIV status. Analysis was done to get descriptive information on risk of MDR/RR TB.


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Lessons learned: A total of 9,416 TB cases were notified; 9,138 (97%) new and 278 (3%) previously treated. About 43% [3,972/9,138] of new TB clients were tested through GeneXpert, 56% [2,209/3,972] were MTB positive with 20 (0.9%) cases of RR TB. Among the previously treated TB clients, 75% (209/278) were tested using GeneXpert; 66% [138/209] were MTB positive and 15 (10.9%) RR TB. The proportion of RR was 10 times higher in previously treated TB clients than in new TB clients. The HIV co-infection among previously treated RR-TB clients is higher (16%) compared to new RR-TB clients (1.7%). The findings support that the risk of developing DR-TB is high among previously treated and PLHIV clients.

Conclusions/Next steps: Increasing proportion of presumptive TB cases and the access to molecular TB diagnosis for previously treated TB clients and PLHIV is an added advantage to detection of DR-TB cases.

EPB0154

Finding missing tuberculosis (TB) cases in Ugandan military health facilities through use of mobile digital X-ray services and technology (Mobile TB Clinics)

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Background: TB is the world's deadliest infectious disease, infecting about 10 million people and killing 1.5 million globally each year. Uganda is one of the 22 WHO TB high burden countries. The estimated incidence of TB in Uganda is about 223 daily, and mortality is about 30 per day. In Ugandan military bases, there is high potential of contracting TB due to overcrowded living conditions and substantially higher smoking rates. Despite implementing all routine TB case detection activities, DoD-Uganda URC project only achieved 42% of its annual TB case notification target by end of March 2022 (FY22Q2).

The major reason for this was limited investigative capacity, with only one facility having functional X-ray services and only 5 of 31 sites having onsite GeneXpert testing services. We describe the intervention used to improve TB case notification in Uganda military facilities.

Description: This was an interventional approach during program implementation. The project partnered with UPDF and Ministry of Health NTL to deploy mobile digital X-ray services to conduct mass TB screening and testing campaigns at 18 targeted military base health facilities.

The mobile digital X-ray technology uses computer assisted diagnosis for TB (CAD4TB) software and a grading system that improves presumption and diagnosis of TB cases.

Lessons learned: There was exponential increase in TB case detection from the previous quarterly average of 145 to 206 in April-June (Q3) and 236 in July-September 2022 (Q4) from 888 and 4,128 total clients screened respectively. This directly contributed to 13% (27) and 25% (59) of the total new TB cases identified during FY22 Q3 and Q4 respectively, and overall contributed to 12% (86/734) of the total TB cases identified during the year despite only being used in Q3 and Q4 of implementation.

Conclusions/Next steps: The use of mobile digital X-ray services is an effective approach for finding missing TB cases and their enrollment on treatment as part of the STOP TB initiative, especially in settings with limited investigative capacity like Ugandan military health facilities. This approach not only improves TB case detection but also raises awareness and demand for TB screening and management among health workers and the population.

EPB0155

Readiness for HCV care provision for men who have sex with men in seven countries

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Background: An estimated 58 million people have acquired chronic hepatitis C virus (HCV), and an estimated 1.5 million people newly acquire HCV annually. Although direct-acting antiviral regimens lead to sustained viral suppression (cure), the world is off-track to meet the World Health Organization (WHO) goal of eliminating HCV by 2030, particularly among key populations, including men who have sex with men (MSM).

Methods: An online survey was fielded among 1260 respondents across seven countries (Canada (160), France (171), Germany (113), Italy (203), Spain (209), United Kingdom (202), and the United States (202)) to gauge health-care providers' (HCP) HCV clinical management knowledge and preparedness. Practitioner specialties included general care (51%); nursing (20%), gastroenterology (10%), infectious diseases (9%), and hepatology (9%). Questions related to HCV care for MSM were analyzed.

Results: Globally 86% of HCPs reported that their practice provides services to MSM; and 78% reported that their practice had the expertise to provide medical services to MSM. However, only 53% of HCPs responded that they screen MSM for HCV in their practice. When asked about treatment of MSM 91% agreed/strongly agreed that MSM are treated the same as other clients in their practice.



However, only 57% reported that staff in their practice received sensitization training on provision of services to MSM; and 52% agreed/strongly agreed that stigma towards MSM is a barrier to accessing HCV care.

	Canada	France	Germany	Italy	Spain	UK	US
% HCPs that reported their practice provides services to MSM	99%	77%	95%	72%	90%	84%	81%
% HCPs that reported their practice has the expertise to provide medical services to MSM	77%	78%	76%	70%	77%	81%	88%
% HCPs that responded that they screen MSM for HCV in their practice	70%	62%	53%	42%	46%	38%	62%
% HCPs that agreed/strongly agreed MSM are treated the same as other clients in their practice	94%	94%	94%	88%	93%	88%	87%
% HCPs that reported staff in their practice receive sensitization training on provision of services to MSM	46%	50%	62%	56%	61%	56%	66%
% HCPs that agreed/strongly agreed that stigma towards MSM is a barrier to accessing HCV care	59%	48%	46%	48%	46%	53%	62%

Table 1: Responses to Questions on HCV clinical management for MSM

Conclusions: While most HCPs report that their practice provides and has the expertise to provide HCV services to MSM, it is possible that many MSM are being missed with service provision given the low levels of screening for HCV among MSM.

While most HCPs strongly agree or agree that treatment of MSM are equivalent to other clients, the unity breaks when it comes to low levels of sensitization training among staff and stigma experienced by MSM.

EPB0156

Decrease of Yellow Fever neutralizing antibody titers one year after vaccination is related to different NK cells repertoire in PLWH and non-HIV controls - ANRS12403

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Background: Yellow fever (YF) vaccine has been successfully used to control YF disease and prevent new outbreaks. The 17DD YF vaccine is considered a safe and highly effective vaccine in people living with HIV (PLWH), but the immunogenicity mechanisms are not completely understood. This study hypothesized that, despite HIV viral load (VL) suppression, PLWH could present reduced production and maintenance of YF-neutralizing antibodies (NABs) and that NK cells different repertoire could participate in this process.

Methods: This study was nested in a longitudinal study that investigated YF vaccine safety and immunogenicity in PLWH and non-HIV controls (CTRL). NK cells repertoire was evaluated in PLWH with baseline CD4⁺ T cell counts ≥ 200 cells/mm³ and suppressed VL (n=25), and in CTRL (n=16), by flow cytometry, at pre-vaccination (Day 0), and at three moments post-vaccination (Days 5, 30 and 365). YF vaccine immunogenicity was evaluated by Nab levels measured through a micro plaque reduction neutralization test (μ PRNT, cut-off $\geq 1:100$) at Days 30 and 365. For the analysis, all participants were grouped regardless HIV status and according to Nab titers at Day 365 as: low ($>1:100$ and $< 1:500$), moderate (≥ 500 and <1000) and high (≥ 1000).

Results: YF vaccine resulted in protective Nab titers at Day 30 in all participants, which decreased after one year, regardless of HIV status or CD4⁺ T cells counts. Interestingly, the frequencies of NKp30⁺ and NKG2A⁺ NK cells were significantly lower at D0 among the low Nabs participants, compared to individuals having moderate and high Nabs titers ($p<0,05$). Such lower frequencies were significant in all the moments, compared to the moderate Nabs participants ($p<0,05$).


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Conclusions: Although serological correlates of protection have not been established, higher YF NAb titers plausibly indicate longer protection against disease. Nkp30 is an important NK activation receptor while NKG2A is related to high responsive educated NK cells. Early activation of NK cells can engage pathways involving B cells response, which leads to humoral immunity against viruses (due to infections or vaccine).

Our results suggest that NK cell repertoire presented before vaccination could impact YF vaccine immunogenicity and long term duration of the NAb protection.

EPB0157

Health system strengthening approach improves national TB preventive therapy (TPT) coverage in Malawi

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Background: Malawi dispensed TB preventive therapy (TPT) among PLHIV on ART since 2016 using continuous isoniazid monotherapy (IPT) in selected high TB/HIV burden districts. 6% of those initiated developed pellagra, uptake stalled. By end 2019, 257,334 ART clients were initiated on IPT resulting in coverage of 29%.

From 2020, Malawi commenced short course TPT regimens of rifapentine and isoniazid (3HP) and 6 monthly isoniazid monotherapy (6H) and implemented strategic interventions to improve coverage from 29% to 95% by 2025. The abstract outlines approach implemented and TPT performance till 2021.

Description: The national HIV program used health system strengthening approach to improve TPT coverage. In July 2020, 3HP was recommended as preferred regimen for PLHIV newly initiating on ART due to budget constraints. 6H dispensed to those with 3HP contraindications and drug-drug interaction. Financial support from Global Fund and UNITAID earmarked for commodity procurement ensured staggered delivery to allow phased national scale up.

Skills development activities to have competent health-care workforce included training, developed wall/desk job aids and regular supportive supervision visits.

Screening and dispensing documentation used updated manual ART patient cards or updated electronic TPT module integrated in ART EMR and e-mastercard available in 79% of all ART facilities.

Lessons learned: TPT coverage among eligible PLHIV on ART in Malawi increased from baseline of 29% (2019) to 87% (2022). Absolute figures on graph show increasing trend in TPT initiations. 3,212 providers from 512 facilities across the country were trained on TPT administration. 8 cases with moderate flu-like syndromes were reported on 3HP, no pellagra and hepatotoxicity cases reported. None of the cases needed laboratory toxicity monitoring.



Figure. TPT uptake among eligible clients in Malawi.

Conclusions/Next steps: Use of health system strengthening approach has improved TPT uptake towards achievement of NSP target. The National HIV program should use quality improvement approach, differentiated TPT dispensing services and enhanced pharmacovigilance to increase TPT coverage and improve quality.

EPB0158

Incidence of occult hepatitis B virus among people living with HIV in Botswana

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Background: Hepatitis B surface antigen (HBsAg) is a routine diagnostic hepatitis B virus (HBV) marker. HBsAg-negative, HBV DNA-positive occult HBV (OBI) is often missed by this approach. OBI is transmissible, can cause liver disease, and is common among people with HIV (PWH). There are limited data on the natural progression of OBI due to limited longitudinal studies of OBI, therefore we determined the incidence and risk factors for OBI in PWH in Botswana.

Methods: Plasma samples from two longitudinal HIV natural disease progression studies at the Botswana Harvard AIDS Institute Partnership which followed participants for at least 24 months from 2004 to 2009 were used. Participants with available follow-up plasma samples were selected for HBsAg testing by enzyme-linked immunosorbent assay (ELISA). HBsAg negative samples were



screened for OBI using an in-house real-time polymerase chain reaction assay. We estimated OBI incidence with 95% confidence interval (CI). Risk factors for OBI were assessed using Cox proportional hazards regression analysis.

Results: At baseline, HBsAg prevalence was 2.1% (8/382), while OBI prevalence was 14.7% (11/75). A total of 90 participants were used in the OBI incidence estimates throughout the follow-up period. Ninety participants were utilized to estimate OBI incidence over the entire follow-up period. Approximately 80% (72/90) were female, and 59% (43/73) had positive anti-HBc serology.

Participants contributed 128.82 person-years to the study and were followed for a median of 1.02 years (IQR: 1.00–2.00). Cumulatively, there were 34 incident OBI cases, giving an incidence rate of 26.4/100 person-years (95% CI: 18.9 – 36.9). The median time to incident OBI was 372 days (IQR: 365 – 730). Incident cases had slightly lower median CD4+ T-cell count compared to participants without OBI ($p = 0.05$). Being male was independently associated with a significantly higher risk of OBI [adjusted Hazard Ratio (aHR) = 3.5 (95% CI: 1.62–7.46); $p = 0.001$]. Every unit increase in CD4 cell count was associated with a lower risk of incident OBI ($aHR = 0.41$; 95%CI: 0.19 – 0.89; $p = 0.02$).

Conclusions: There was a high OBI incidence in PWH in Botswana, especially in males and immunocompromised participants. OBI screening in PWH should be considered because of the risk of transmission and reactivation.

Co-morbidities

EPB0159

Changes in symptoms of depression and anxiety over time in a cohort of people with HIV initiating HIV care in Cameroon

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Background: Abrupt changes in one's physical health, such as receiving an HIV diagnosis, can have a substantial impact on one's mental health. While it is well known that people with HIV (PWH) are disproportionately affected by poor mental health, little is known about how mental health symptoms change over time as individuals navigate the complex process of initiating and remaining in HIV care.

Methods: We conducted structured interviews with 426 PWH aged 21+ who initiated HIV care in Cameroon between June 2019–March 2020. Follow-up interviews were conducted with 303 individuals between October 2020–September 2021.

We explored changes in depression (Patient Health Questionnaire-9) and anxiety symptoms (Generalized Anxiety Disorder-7) between these two visits and socio-demographic correlates of change using chi-squared tests. Symptom changes were categorized as either no to mild symptoms at both time points, persistent or worsening symptoms at follow-up, or improved symptoms at follow-up.

Results: A total of 129 individuals (42.6%) reported no to mild depression symptoms at both time points, 57 (18.8%) reported persistent or worsening symptoms between visits, and 117 (38.6%) reported improved symptoms.

A total of 125 individuals (41.3%) reported no to mild anxiety symptoms at both time points, 73 (24.1%) reported persistent or worsening symptoms at follow-up, and 104 (34.3%) reported improved symptoms.

Gender and household hunger were the only socio-demographic correlates explored that were significantly associated with depression or anxiety symptom changes.


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Men were most likely to report no to mild anxiety symptoms at both time points (51.3%) while women were most likely to report improved anxiety symptoms at follow-up (38.5%; $X^2=7.6$, $p=0.02$).

Those reporting little to no household hunger were most likely to report no to mild anxiety symptoms at both time points (45.8%) while those reporting moderate to severe household hunger were most likely to report persistent or worsening anxiety symptoms at follow-up (36%; $X^2=11.0$, $p<0.01$).

Conclusions: Over one-third of this group of individuals initiating HIV care in Cameroon reported improved mental health symptoms approximately one year after HIV care initiation. However, interventions are needed to support improved mental health in populations experiencing other forms of hardship such as household hunger.

EPB0160

Factors associated with depression and ART adherence among young people living with HIV in Lilongwe, Malawi: a mixed-methods analysis

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Background: Young people living with HIV (YPLHIV) face various challenges that render them vulnerable to mental health problems, including depression. Despite sundry efforts to improve mental health among YPLHIV, evidence shows that many suffer from depression. In Malawi there is limited literature on correlates of depression and how it affects ART adherence, among YPLHIV. We aim to establish the prevalence of depression and its correlates among YPLHIV in Lilongwe.

Methods: This was a cross-sectional mixed methods study using survey, in-depth interviews and health records reviews conducted at Lighthouse Trust -Martin Preuss Centre ART clinic in Lilongwe, Malawi from April 2021 to October 2022. A total of 303 YPLHIV aged 15-24 who were on ART for more than 6 months and 7 key informants (clinicians, nurses, psychosocial counsellors) providing care to the YPLHIV participated in the study. Client data was obtained from Patient Health Questionnaire 9 depression scale and Electronic Medical Records.

Bivariate analysis and multivariate logistic regression were conducted to determine the individual factors associated with depression and examine potential correlates of depression respectively. Thematic content analysis was used for qualitative data.

Results: Approximately 46% of the participants were male and 54% female. Majority (71%) were aged 20-24 and 29% were 15-19. About 23% of the YPLHIV had depression symptoms and most (79%) were ages 20-24 years. Approximately 22% had their viral load unsuppressed

and thus considered non-adherent. Most (67%) were from 20-24 age group. Source of income ($p = 0.003$), alcohol consumption ($p= 0.010$) and sexual behavior ($P = 0.014$) were associated with depression. YPLHIV with depression symptoms were 3.5 times ($p= 0.003$) more likely to be non-adherent to ART than those without depression.

Themes generated regarding associated factors with ART non-adherence were lack of basic needs, privacy, psychological trauma, incomplete disclosure, inadequate psychosocial support and knowledge deficit of ART providers.

Conclusions: Our study shows that depression is considerably high among YPLHIV in Malawi and linked to ART adherence. Strengthening provider mental health training and routinely screening YPLHIV for depression would help in early identification and management of depression thereby improving ART adherence.

EPB0161

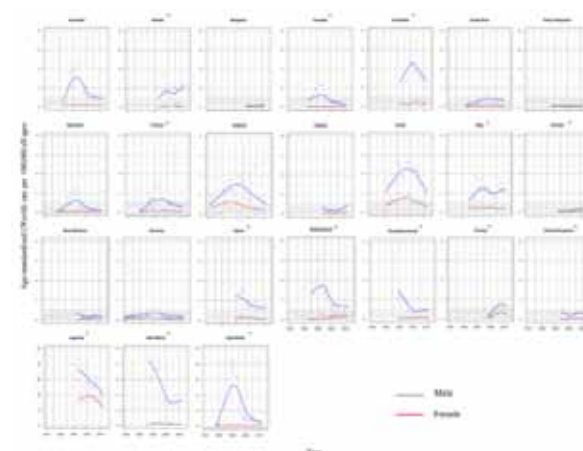
Global pattern and trends in Kaposi sarcoma incidence: a population-based study

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Background: Kaposi sarcoma (KS) is a rare antiproliferative tumor caused by Kaposi sarcoma-associated herpesvirus (KSHV) and is one of the most common cancers among people living with HIV.

Methods: GLOBOCAN Cancer Today database was used to extract the incidence and mortality estimates of KS from 185 countries and regions in 2020. The time trends in KS incidence were evaluated using the cancer registry data from Cancer Incidence in Five Continents (CI5) *plus*, requiring at least 15 consecutive years of data. Joinpoint regression was used to evaluate the average annual percentage change to quantify trends in KS's age-standardized incidence rate (ASIR).



Results: In 2020, the global estimated ASIR of KS was 0.39 (per 100000), with an estimated 34 270 newly diagnosed cases. An estimated 15086 KS deaths were reported, corresponding to an age-standardized mortality rate (ASMR) of 0.29 (per 100000). In 2020, Africa accounted for 73.0% of



the incidence and 86.6% of the deaths from KS worldwide. There was a significant correlation between the ASIR ($P<0.001$) or ASMR ($P<0.001$) and Human Development Index. The incidence of KS increased in both males and females in Turkey (AAPC 11.5, 95% CI 3.2 to 20.4; 6.4, -1.8 to 15.3) and in the Netherlands males (2.5, 1.1 to 3.9) from 1998 to 2012. The incidence of KS decreased in the USA White, Israel, Uganda, Costa Rica, Colombia, Canada, and Denmark in the same period.

Conclusions: KS is a relatively rare cancer worldwide but is endemic in some countries in Southern and Eastern Africa. While a decrease in the KS incidence was noted in many countries since the introduction of antiretroviral therapy (ART), the incidence has significantly increased in both sexes in Turkey and in males in the Netherlands. Monitoring KSHV in endemic regions and high-risk populations, improving HIV/AIDS care may contribute to the prevention of KS.

EPB0162

Global prevalence of diabetes mellitus among ART-naïve adults living with HIV: a systematic review and meta-analysis

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Background: It has been suggested that people living with HIV (PLWH) may have a higher prevalence of type 2 diabetes, attributable to the chronic inflammation caused by the virus, the effects of antiretroviral therapy (ART), and traditional diabetes risk factors. However, existing studies have mostly focused on PLWH on ART.

We estimated the global prevalence of diabetes among PLWH prior to any initiation of ART and compared the prevalence among the ART-naïve, ART-treated and HIV-negative subgroups. PROSPERO Registration: CRD42021226001.

Methods: We searched PubMed-MEDLINE, CINAHL, SCOPUS, Academic Search Premier, Africa-Wide Information and Africa-Journals Online to identify original articles reporting on diabetes prevalence among adult ART-naïve PLWH worldwide published before September 2022.

We included cross-sectional, cohort or case-control studies with baseline information on diabetes prevalence. Two authors independently screened, selected studies, extracted data, and conducted methodological quality assessments. The prevalence estimates were combined using random-effects meta-analysis with variance stabilization through arc-sine transformation.

Results: Seventy-four studies, published between 2005 and 2022, involving 149,322 ART-naïve PLWH with a mean/median age of 32 - 49.7 years, were included. The majority of studies, 39%, were from high-income countries. The pooled prevalence of diabetes was 5.0% (95%CI: 3.9 - 6.2; p-heterogeneity<0.0001).

Among the 47 studies that used the American Diabetes Association criteria (2010) and World Health Organization criteria (2011), the pooled prevalence was 4.0% (3.2 - 5.0; p-heterogeneity<0.0001).

Prevalence significantly differed by income level: High income: 10.2% (5.6 - 16.1), Lower-middle income: 5.6% (0.0 - 22.3), Low income: 3.4% (0.0 - 22.2), Upper-middle income: 2.1% (0.18 - 5.3); $p = 0.005$. There was no significant difference in diabetes prevalence by age, CD4 count, viral load and year of publication.

Among the 11 studies that reported estimates by ART and HIV status, the prevalence was 3.6% (1.1 - 7.2; p-heterogeneity<0.0001), 3.7% (1.4 - 6.9; p-heterogeneity<0.0001) and 5.5% (2.3 - 10.0; p-heterogeneity<0.0001) in the HIV negative, ART-naïve, and ART-treated subgroups respectively ($p=0.656$). There was no evidence of publication bias (all Egger test $p>0.0701$).

Conclusions: The prevalence of diabetes in the global ART-naïve population is lower than in the general population but remains substantial. The prevalence is not significantly different to that in ART-treated PLWH.

EPB0163

What are the predictors of change in multimorbidity among people with HIV? A longitudinal observational cohort study

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Background: Background: Multimorbidity is common among people with HIV (PWH), with numerous cross sectional studies demonstrating associations with older age and past immunosuppression. Little is known about the progression of multimorbidity, particularly in the setting of long-term access to antiretrovirals. This study aims to determine factors predictive of change in multimorbidity in PWH.

Methods: Methods: PWH who attended a regional HIV service were recruited to a consented observational cohort between 09/2016 to 03/2020. Demographic data, laboratory results and a Cumulative Illness Rating Scale score (CIRSs) were collected at enrolment and first clinical review of every subsequent year.

Change in CIRSs was calculated from enrolment to 02/2021. Associations with change were determined through univariate and multivariate linear regression.


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Results: Of 253 people, mean age was 57.4 (SD 10.9), 91.3% were male, and HIV was diagnosed a median of 22.16 (IQR 12.1 to 30.9) years prior. Length of time in the study was a median of 134 weeks (IQR 89.0 to 179.0), in which a mean CIRSS change of 1.21 (SD 2.60) was observed. Being older ($p<0.001$), a higher body mass index ($p=0.008$) and diabetes ($p=0.014$) were associated with an increase likelihood of worsening multimorbidity. PWH with a higher level of multimorbidity at baseline were less likely to worsen over time ($p<0.001$).

Conclusions: Conclusion: As diabetes and weight predict worsening multimorbidity, routine diabetes screening, and body mass index measurement are recommended. Person centred care including multimorbidity management with a focus on weight and diabetes has the potential to improve the overall health of PWH.

EPB0164

Sleep disorder diagnoses in people with versus without HIV infection in an integrated healthcare system

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Background: Poor sleep is commonly reported in people with HIV (PWH) and has been associated with poor health outcomes and lower quality of life. Few studies have evaluated the types of sleep disorders affecting PWH versus people without HIV (PWoH).

Methods: The study included individuals ≥ 18 -years-old who were members of Kaiser Permanente Northern California (an integrated U.S. healthcare system) during 7/1/2013-12/31/2021. PWH and PWoH were frequency-matched 1:20 by age, sex, race/ethnicity, and baseline year. Sleep disorder diagnoses were identified using electronic health records. Adjusted prevalence ratios (aPR) for sleep disorders at baseline by HIV status were calculated using modified Poisson regression, adjusting for demographics (age, sex, race/ethnicity), mental health (prior clinical depression or anxiety), prior alcohol or other substance use disorder, and body mass index. aPRs were calculated for all types of sleep disorders combined, then for sleep apnea and insomnia, the most common disorders.

Results: The study included 11,326 PWH and 223,678 matched PWoH (90.0% men, mean baseline age 47.7 years, 48.3% White, 19.9% Hispanic, 17.0% Black, 14.8% Other/unknown race/ethnicity). Compared with PWoH, PWH were more likely to have had a diagnosis of depression (37.8% vs.14.4%), anxiety (36.3% v. 20.1%), or substance use disorder (62.9% vs 46.3%), but were less likely to be obese

(20.7% vs. 30.4%). At baseline, 3,808 (33.6%) PWH and 46,534 (20.8%) PWoH had at least one prevalent sleep disorder. Insomnia was the most common disorder among PWH, and sleep apnea was the most common among PWoH (Table).

	With HIV N=11,326 n (%)	Without HIV N=223,678 n (%)
Insomnia	2,583 (22.81)	21,169 (9.46)
Sleep apnea	1,152 (10.17)	25,159 (11.25)
Other/Unspecified	900 (7.95)	9,698 (4.34)
Hypersomnia or parasomnia	68 (0.60)	853 (0.38)
Leg cramps, movement disorder-related	59 (0.52)	907 (0.41)
Circadian rhythm disorder	43 (0.38)	383 (0.17)
Substance use-related	21 (0.19)	96 (0.04)
Number of sleep disorders, range	0-5	0-6
No sleep disorder diagnosis	7,518 (66.38)	177,144 (79.20)

Table.

Overall, sleep disorders were significantly more common among PWH (vs. PWoH; aPR=1.32, 1.29-1.36). PWH were more likely to have insomnia (aPR=1.56, 1.51-1.62) but not sleep apnea (aPR=0.91, 0.86-0.96).

Conclusions: Multiple types of sleep disorders are more common among PWH. Examining risk factors for specific types of sleep disorders, and potential differences by HIV status, could inform preventive or treatment strategies among PWH.

EPB0165

Preventing weight gain for people with HIV on ART in South Africa: a qualitative interview study of perspectives and potential strategies

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Background: Obesity and diabetes are comorbidities of growing importance in people living with HIV (PLWH). Our aim was to assess perceptions of obesity among PLWH on dolutegravir (DTG)-based ART in rural South Africa and to elicit possible intervention targets to prevent weight gain and diabetes that could be incorporated into routine HIV care.

Methods: This study was conducted at the Africa Health Research Institute (AHRI), KwaZulu-Natal, South Africa. We recruited a subset of participants from the DISCO Study, a prospective observational cohort study of adults transitioning to DTG-based ART. We selectively recruited individuals with a BMI ≥ 30 kg/m². We conducted one-time, in-depth, semi-structured interviews in isiZulu, then audio-recorded, transcribed and translated these into English. The interview content, coding, and thematic analysis was guided by the Causal Continuum Model for Obesity in sub-Saharan Africa.

We assessed:



1. Self-perceptions of body size and the impact of HIV and its treatment on body size,
2. The perceived health threat of obesity,
3. Preferences for interventions to prevent obesity and diabetes (e.g. diet, physical activity, pharmacotherapy), and;
4. The role of social relationships in intervention design.

Results: Twenty-six participants were interviewed (Table 1). Preliminary thematic analysis revealed that, although large body size is associated with an increased risk of illness, above-average body size is viewed as "normal" and preferable to being thin. ART initiation was believed to have contributed to weight gain.

A pharmacological option to prevent weight gain was of interest if one could be identified without severe side effects. Interviewees preferred physical activity programs that were community-based and communal in nature.

Sex (N/%)	
Men	3 (12%)
Women	23 (88%)
Age (median/IQR, years)	41 (31-52)
Education (N/%)	
No formal education	1 (4%)
Primary	4 (15%)
Secondary	18 (69%)
Tertiary	3 (12%)
Body mass index (median + IQR)	33 (30-37)
Duration of dolutegravir use (median/IQR, months)	19 (17-20)

Table 1. Demographic and health characteristics of interview participants.

Conclusions: Many obese PLWH taking DTG-based ART in South Africa don't consider moderate levels of overweight to be a risk factor for poor health. If this awareness can be addressed, preferences for interventions include pharmaceutical options with minimal side effects and community-based physical activity programs.

EPB0166

Arterial stiffness and HIV: an analysis of sequential pulse wave velocity measurements in Tanzanian adults with and without HIV

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Background: Cardiovascular disease (CVD) is a growing cause of morbidity and mortality in people with HIV (PWH)(1). This may be related to accelerated arterial stiffness promoted by HIV. Pulse wave velocity (PWV) is a validated measure of arterial stiffness and predicts CVD(2).

Our objectives were to determine longitudinal trends in PWV and risk factors for elevated PWV in PWH vs HIV-uninfected controls.

Methods: This study was conducted in a previously described cohort of PWH and HIV-uninfected controls in Mwanza, Tanzania(3). PWH were enrolled at the time of HIV diagnosis. Consecutive PWV measurements were performed ≥ 180 days apart(4). Mixed effects linear regression models with time-varying co-variables were used to determine the association between risk factors and PWV.

Results: 707 participants were included in this analysis, including 333/707 (47%) PWH. 1414 total PWV measurements were included. Mean interval between measurements was 471 days, (SD 139, range 181-905).

PWV was significantly lower in PWH than HIV-uninfected controls (Figure 1).

In mixed-effects regression models controlled for systolic blood pressure (SBP) and age, PWV was significantly associated with HIV (-0.17, $p=0.022$), months since first PWV measurement (Coefficient: -0.01, $p<0.001$), age (0.08, $p<0.001$) male sex (-0.20, $p<0.001$), SBP (0.08, $p<0.001$), diastolic blood pressure (DBP) (0.05, $p<0.001$), and months on anti-retroviral therapy (ART) (-0.009, $p=0.021$). In a multivariate model including SBP, age, sex, and months since first PWV measurement, HIV remained significantly associated with decreased PWV (-0.17, $p=0.020$).

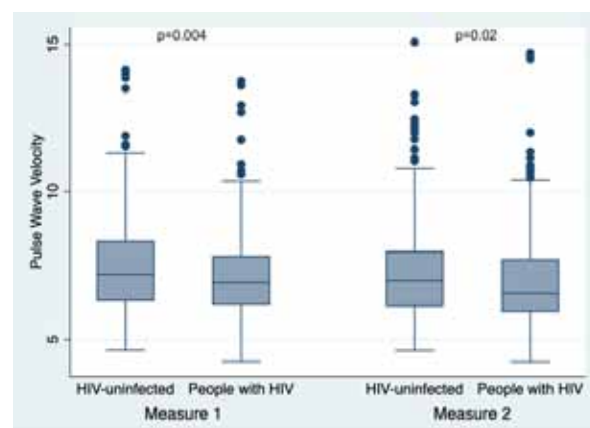


Figure 1: PWV measurements stratified by HIV-status ($n=1404$).

Conclusions: HIV was independently associated with decreased PWV compared to HIV-uninfected controls. Among PWH, time on ART was associated with decreased PWV. While most studies have reported increased arterial stiffness in PWH(5), some data suggest that arterial stiffness may be decreased with ART use(6-8).

Understanding the dynamics of arterial stiffness in PWH is critical to controlling the growing burden of CVD in this population.

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AHA Life's Essential 8 cardiovascular health metrics	Quantification of cardiovascular health metric	Score among PWH, out of 100 points – mean (standard deviation)	Score among general population*, out of 100 points – mean (standard error)
Nicotine exposure	100 points: never smoker 50 points: former smoker 0 points: current smoker (modified criteria)	55.1 (40.8)	69.2 (0.77)
Body mass index	BMI (kg/m ²): 100 points: < 25 70 points: 25.0-29.9 30 points: 30.0-34.9 15 points: 35.0-39.9 0 points: ≥ 40.0	71.3 (29.9)	57.5 (0.65)
Blood lipids	Non-HDL cholesterol (mg/dL): 100 points: < 130 60 points: 130-159 40 points: 160-189 20 points: 190-219 0 points: ≥ 220 (If drug-treated level, subtract 20 points)	70.5 (28.8)	67.4 (0.56)
Blood glucose	Hemoglobin A1c (%): 100 points: no history of diabetes and A1c < 5.7 60 points: no diabetes and A1c 5.7-6.4 40 points: diabetes with A1c < 7.0 30 points: diabetes with A1c 7.0-7.9 20 points: diabetes with A1c 8.0-8.9 10 points: diabetes with A1c 9.0-9.9 0 points: diabetes with A1c ≥ 10.0	81.7 (27.2)	78.4 (0.43)
Blood pressure	Systolic and diastolic blood pressure (mmHg): 100 points: <120/<80 75 points: 120-129/<80 50 points: 130-139 or 80-89 25 points: 140-159 or 90-99 0 points: ≥ 160 or ≥ 100 (subtract 20 points if treated level)	56.0 (32.1)	70.8 (0.45)
Average score		66.2 (16.5)	65.9 (0.41)

*Based on estimates from the National Health and Nutrition Examination Survey (NHANES) in the U.S. general population

Results: Among 2567 PWH, median age was 55 (interquartile range 48-61), 14% were female, 95% were on antiretroviral therapy, and median CD4 cell count was 530 cells/mm³. In this population eligible for primary prevention of ASCVD, 77% had undergone complete assessment of ASCVD risk factors. Half of PWH had intermediate-high estimated ASCVD risk. Risk factors for ASCVD were common (hypertension 69%, hyperlipidemia 48%, diabetes 16%, current smoking 28%). Of those with hypertension, 39% were on an anti-hypertensive. Among those eligible, 44% were on a statin. Mean LE8 CVH score (out of 100 points) was 55.1 for nicotine exposure, 71.3 for BMI, 70.4 for lipids, 81.2 for blood glucose, 56.0 for blood pressure, with an average score of 66.2 across the five metrics studied. PWH with Medicare insurance, Black PWH, and those with sleep apnea and chronic kidney disease had on average lower CVH scores; those with undetectable viral loads had higher CVH scores.**Conclusions:** PWH in this study of ambulatory HIV care in San Francisco demonstrate suboptimal cardiovascular health, especially in the areas of nicotine exposure and blood pressure control. We highlight opportunities for improving primary prevention of ASCVD among PWH.

EPB0168

Changes in weight after switching from ritonavir-boosted protease inhibitors to dolutegravir/tenofovir alafenamide/emtricitabine: results from a single arm, open-label, phase 3 clinical trial study (SPIRITED)

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Methods: Thai PLWH with plasma HIV RNA <50 copies/mL were switched from ritonavir-boosted lopinavir (LPV/r) or atazanavir (ATV/r) + ≥ 1 nucleoside reverse transcriptase inhibitor(s) to TAF/FTC/DTG in this 48-week, single arm, open-label, phase 3 clinical trial. Multivariate generalized estimating equations were employed to assess changes in weight, lipid profiles, and safety parameters after switching to TAF/FTC/DTG.

Results: Among 203 participants enrolled (median [IQR] age, 48.9 [38.7–54.4] years; 107 [52.7%] male; median body mass index [BMI], 22.7 [19.9–25.5] kg/m²; median antiretroviral therapy [ART] duration, 17.4 [10.3–21.5] years; 180 [88.7%] used tenofovir disoproxil fumarate [TDF] at baseline; 103 [50.7%] switched from LPV/r and 100 [49.3%] from ATV/r), 191/193 (99.0%) maintained viral suppression at week 48.

After adjusting for age, sex, ART duration, TDF used, and type of prior PI/r use, weight significantly increased from baseline at week 24 (1.7 kg; 95%CI 1.3 to 2.1, $p < 0.001$) and at week 48 (1.9 kg; 95%CI 1.5 to 2.4, $p < 0.001$) (Figure 1). No differences in weight changes were observed based on prior PI/r used.

Using the same adjustment variables, triglyceride decreased by -41.7 mg/dL (95%CI -58.2 to -25.3, $p < 0.001$) at week 24 and -47.5 mg/dL (95%CI -64.2 to -30.8, $p < 0.001$) at week 48; estimated glomerular filtration rate decreased by -9.7 mL/min/1.73m² (95%CI -12.5 to -6.8, $p < 0.001$) at week 24 and -7.5 mL/min/1.73m² (95%CI -10.4 to -4.6, $p < 0.001$) at week 48.

Conclusions: Significant weight gain increases, along with significant plasma triglyceride and eGFR decreases were evident in virologically suppressed Thai PLWH after switching from PI/r-based regimens to TAF/FTC/DTG.

EPB0169

Selected comorbidities and the risk of ART switch in the context of HIV-RNA suppressed to ≤ 50 copies/mL

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Background: Although HIV-associated mortality has been greatly reduced by ART, the incidence of deaths due to non-communicable diseases remains high in PLWH. Clinical decisions regarding whether to modify ART in the

context of a HIV-RNAs50 copies/mL may be guided by current ART and specific comorbidities.

Methods: Cross-sectional analysis of the risk of ART switch (RTS) in PLWH of the IcoNa cohort with a stable VL ≤ 50 copies/mL according to *a priori* chosen co-morbidities (i.e. obesity (OB, BMI >30), dyslipidaemia (DP), kidney disease (KD, eGFR <60) and diabetes mellitus (DM)).

During episodes of >6 months with VL ≤ 50 copies/mL participants could develop the event (if there was a ART switch) or be controls (if ART remained unchanged). Four separate GEE logistic regression models were fitted. Models were repeated after stratification by anchor drug class received and after restricting to the last episode.

Results: We included 9,212 PLWH who contributed 17,109 episodes. Median (IQR) age was 48 (39–56) years, 19% females, 47% MSM, 35% of foreign nationality with a median of 734 (541–954) CD4 count. The prevalence of the main exposures was: 11% OB, 74% DP, 11% KD and 6% DM. The Table shows adjusted OR of RTS.

In the analysis controlling for confounders, DP was associated with an increased (64% higher in exposed vs. unexposed) and OB with a decreased RTS (26% risk reduction). DM was associated with a reduced RTS but only in INSTI- or NNRTI-recipients. When restricting to most recent switches, DP was associated with a lower RTS.

Conclusions: In our cohort, ART management was modified by the presence of specific comorbidities. For participants with DM, a lower risk of switching was seen only with NNRTI or INSTI-based regimens. The reduced risk of switching in those with DP in recent years may be explained by the use of therapies which are perceived as lipid-friendly.

Factor	all episodes, all reasons and all anchor drugs					
	Unadjusted	P ^a	Adjusted ^b	P ^a	Adjusted ^c	P ^a
	Odds ratio (95% CI)		Odds ratio (95% CI)		Odds ratio (95% CI)	
Diabetes ^d (DM)						
Yes vs. No	0.37 (0.18, 0.77)	0.008	1.07 (0.50, 1.38)	0.430		
Dyslipidaemia ^e (DP)						
Yes vs. No	1.45 (1.13, 1.76)	0.004	1.64 (1.13, 2.34)	0.009		
eGFR ^f < 60 (KD)						
Yes vs. No	0.29 (0.13, 0.64)	0.002	0.40 (0.18, 0.83)	0.001	1.00 (0.78, 1.28)	0.972
BMI ^g (OB)						
≥ 30 vs. less 30	0.29 (0.13, 1.19)	0.098	0.74 (0.62, 0.88)	<0.001		

^aAdjusted as a clinical diagnosis or 2 consecutive fasting glucose ≥ 126 mg/dL or initiation of anti-diabetic therapy

^bAdjusted as initiation of lipid-lowering drug (statins) TCHOL/NEL ratio (> 4 for males and > 4.4 for females)

^cSeparate adjustments for each exposure

^dDiabetes: adjusted for age, dyslipidaemia, nationality, obesity, sex

^eDyslipidaemia: adjusted for age, alcohol use, nationality, obesity, sex

^feGFR: adjusted for "Age, alcohol use, diabetes, dyslipidaemia, obesity, sex, cancer, hypertension defined as currently receiving BP lowering drugs, CKD, previous history of HF, smoking

^gBMI: adjusted for "Age, alcohol use, diabetes, dyslipidaemia, obesity, sex, cancer, hypertension defined as currently receiving BP lowering drugs, CKD, previous history of HF, smoking

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EPB0170

Ambulatory blood pressure abnormalities and its determinants in people living with HIV and AIDS in an African setting

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Background: There is currently no data on ambulatory blood pressure (ABP) abnormalities and their determinants among People Living with HIV/AIDS (PLHA) in Cameroon. This study aimed to determine the proportion of PLHA with the non-dipping pattern, masked hypertension, nocturnal hypertension and white coat hypertension compared to an HIV seronegative group; to determine the factors associated with ABP profiles among PLHA, in the Buea Regional Hospital.

Methods: A hospital-based comparative cross-sectional study was carried out between January 8th, and August 8th, 2018. The study compared two groups: consecutively-selected HIV seronegatives individually matched for age and gender to HIV seropositives. 24-hour ABP measurements, sleep disturbances using the Pittsburgh Sleep quality index (PSQI) and the Epworth Sleepiness Scale (ESS), Clinic Blood Pressure (CBP), anthropometric measurements, and microalbuminuria were assessed. The data was analyzed using Epi info 7.2.2.2.1

Results: Of the 180 participants, 65.56% were females and the median age was 44 years. The average 24-hour systolic BP was lower in PLHA than the controls (117±15 vs 125±16, $p<0.001$). There was no significant difference in the proportion of systolic and diastolic non-dipping between PLHA and controls ($P = 0.370$ and 0.418 respectively).

The prevalence of masked, nocturnal and white coat hypertension was: 3%, 13%, and 9% respectively among PLHA compared to 11%, 24% and 4% in the control group ($p = 0.044$, $p = 0.152$ $p = 0.091$ respectively).

Insomnia (PSQI > 5) and daytime sleepiness (ESS > 10) were not associated with non-dipping in PLHA ($P = 0.729$, $P = 0.890$ respectively). In multivariate analysis, only ART duration > 5 years was independently associated with DBP non-dipping (aOR: 2.89, 95% CI: 1.02-8.22, $p = 0.046$).

Conclusions: Abnormal ABP measurement phenotypes were similar amongst PLHA and HIV-negative controls. Sleep disorders did not affect non-dipping BP among PLHA. ART use for more than 5 years was the only factor associated with diastolic non-dipping.

The prevalences of BP non-dipping, masked hypertension, nocturnal hypertension, white coat hypertension and sleep disorders are not as high as predicted among PLHA compared to the HIV-negative controls. general population. The findings of our study bring more arguments as to whether HIV/AIDS is an independent risk factor for abnormal blood pressure.

EPB0171

A pilot randomized controlled trial to improve depression and HIV care engagement among perinatal women with HIV in Malawi

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Background: Women with HIV (WHV) are at high risk for HIV care disengagement during the perinatal period. Perinatal depression (PND) affects 20-24% of WHV and creates barriers to HIV care engagement. To reduce these barriers, we adapted and enhanced The Friendship Bench (FB), an evidence-based counseling intervention, for WHV in Malawi to improve perinatal depression and HIV outcomes.

Methods: We enrolled 80 pregnant WHV with PND (defined as Self-Report Questionnaire ≥8) who were 18 years of age and 34 weeks gestation from August 2020-August 2021 in Lilongwe, Malawi. WHV were randomized 1:1 to the enhanced FB or Usual Care (UC) arm. Intervention participants received 4 individual prenatal sessions, 2 post-natal sessions, and 1 social-support session, delivered by trained and supervised counselors.

At 6-months post-delivery, we assessed feasibility, acceptability, fidelity, and preliminary efficacy of enhanced FB to improve PND and HIV care engagement. Feasibility and acceptability was assessed both quantitatively and qualitatively among a subset of 15 participants. Fidelity was assessed using a 10-item checklist in a subset counseling sessions.

We defined remission as 10 (threshold for depression) on the Edinburgh Postnatal Depression Scale (EPDS) at 6 months and a 50% reduction in EPDS score from base-



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line-6 months post-partum. We defined retention as 2 HIV visits 30 days apart between delivery and 6-months post-partum.

Results: 100% (15/15) of participants indicated high satisfaction with the intervention while 93% (14/15) deemed the intervention beneficial to their health. 83% (68/82) of counseling sessions met or exceeded the fidelity threshold. WHV in the intervention arm had improved PND remission 59% vs 36% [Risk Difference (95% Confidence Interval): 23% (2%,45%)], HIV care retention compared to the UC, 82% vs 69% [RD: 13% (95% CI: -6%, 32%)], and viral suppression, 96% vs 90% [RD: 7% (95% CI: -7%,20%)] at 6-months post-partum, compared to the UC arm. There was no difference in adverse events between arms.

Conclusions: Our results indicate a counseling-based intervention is feasible and acceptable to WHV with PND in Malawi and can be delivered with high fidelity. The enhanced FB may improve PND and HIV care engagement among WHV and should be evaluated in a larger randomized trial.

EPB0172

Early outcomes of successful integration of mental health screening into routine HIV care in Malawi

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Background: Mental health (MH) disorders are highly prevalent among people living with HIV (PLHIV) and can have negative impact on antiretroviral therapy (ART) outcomes. Malawi's Ministry of Health introduced MH screening in national HIV management guidelines in December 2021. We describe early experience with integrated MH screening at ART clinics that have scarce human resources and limited capacity of specialist MH units.

Description: Partners in Hope is a Malawian, Christian, non-governmental, medical organization and PEPFAR/USAID clinical implementing partner. We trained ART staff in 15 facilities to use the PHQ-9 (depression) and AUDIT (harmful alcohol use) screening instruments, developed MH registers for tracking screening results and referrals, and engaged existing MH referral units.

Based on screening results, ART clients received counseling by lay cadre staff (for mild disorders) or intensive counseling by trained psych-social counselors and referrals to specialist MH units (for moderate to severe disorders). From April through November 2022, we screened 3,607 ART

clients, only from priority groups defined as follows: returning to care after defaulting (50%); new ART initiation (38%); viral load ≥ 1000 copies/mL (12%). 59% were female and 14% were aged 12-19 years.

Screening coverage was 83% (3,607/4,356) among the 3 priority groups. Those in the two highest risk categories of PHQ-9-scores (1.9%; n=67) and AUDIT-scores (3.0%; n=107) were eligible for specialist review (Figure).

99% of these eligible individuals were referred to specialist MH units, which was on average 9.3 individuals/month/specialist MH unit.

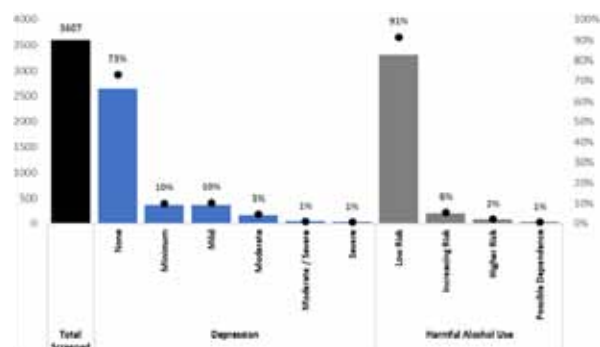


Figure. Categorized PHQ-9 (depression) and AUDIT (harmful alcohol use) screening outcomes at 15 ART clinics in Malawi, April-November 2022.

Lessons learned: Thorough preparation led to high MH screening coverage among ART priority groups in Malawi. The burden of cases requiring referral to specialist MH units was limited. In our setting, MH screening was feasible at ART clinics with PEPFAR support.

Conclusions/Next steps: Next steps include studying the impact of integrated MH screening on ART outcomes (retention; viral suppression) and scaling up integrated MH screening to all ART clinics.

**EPB0173****Antiretroviral treatment as a protective factor for dysplasia and HPV infection in people living with HIV (PLHIV)**

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Background: The risk of oropharyngeal HPV infection in PLHIV is higher than in the general population, as well as that of its complications, but at present, there are few data on this issue.

The main aim was to describe the prevalence and genotypes of HPV in oropharyngeal mucosa of PLWHIV, and related factors; and to compare it with infection and dysplasia in anal and female genital mucosa.

Methods: Prospective, cross-sectional study, which consecutively included PLHIV attended consecutively in outpatient specialized consultation. During the visit, clinical and analytical variables related to HIV were collected and exudates of the oropharyngeal mucosa were taken for the carrying out of PCR for HPV and other sexually transmitted infections; the samples of anal and female genital mucosa were included in liquid medium (ThinMayer Liquid) for detection and genotyping of HPV by polymerase chain reaction (Linear Array HPV Genotyping Test) and cytology by the thin layer technique (Thin Prep 2000 Processor (Hologic)).

Results: 300 PLHIV were included with a mean age of 45.1 years, 25.3% had a history of AIDS, 99.7% were taking ART and 1% were in virologic failure. 27.3% had received the complete HPV vaccine schedule. The prevalence of HPV infection in the oropharyngeal cavity was 13%, the most frequent genotype was 16 (2.3%); and none had dysplasia. 50% of the women had genital HPV infection, genotype-high risk 51 was the most prevalent (8.9%), 1.7% had CIN1. 82.6% had anal HPV infection, the most frequent genotypes were 44/55 (19.2%), 62/81 (19.2%), 16 (14.9%) and 68 (14.6%); 29.2% had LSIL(AIN1) and 1.7% HSIL (AIN2/3). Risk factors for having oral HPV infection were, simultaneous Treponema pallidum [4.02(1.06-15.24); 0.04], and history of HSIL or anal cancer (SCCA) [21.52(1.59-291.6); 0.02]; and as a protective factor, time on antiretroviral therapy (8.8 years vs. 7.4 years) [0.989 (0.98-0.99); 0.034].

Conclusions: The prevalence of HPV infection in oropharyngeal mucosa and dysplasia were lower than those found in anal and female genital tracts. Syphilis and precursor lesions and SCCA were surrogate markers of oropharyngeal HPV infection. Increased ART exposure provided protection against such infection.

EPB0174**Psychiatric multimorbidity among people with HIV aged ≥40 years in low- and middle-income countries in the Sentinel Research Network of IeDEA**

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Background: Mental and substance use disorders (MSD) are common among people with HIV (PWH) and have been associated with poor HIV care outcomes. Psychiatric multimorbidity, the presence of two or more co-occurring MSD, has been associated with greater psychiatric symptom severity and worse mental health treatment outcomes. Research into the prevalence of psychiatric multimorbidity among PWH in low- and middle-income countries (LMIC) remains limited.

Methods: We analyzed baseline data from the International epidemiology Databases to Evaluate AIDS (IeDEA) Sentinel Research Network (SRN), a cohort of PWH aged ≥40 years on antiretroviral therapy at eight HIV clinics within the Asia-Pacific, Latin America, and Central, East, Southern, and West Africa IeDEA regions. Baseline data were collected between October 2020 and September 2022.



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We documented the prevalence and co-occurrence of symptoms of moderate to severe depression (PHQ-9 ≥ 10), anxiety (GAD-7 ≥ 10), and post-traumatic stress disorder (PTSD) (PCL-5 ≥ 33), as well as hazardous alcohol use (AUDIT-C ≥ 3 for women, ≥ 4 for men) and hazardous drug use (ASSIST > 3 for cannabis, cocaine, amphetamines, inhalants, sedatives, hallucinogens, or opioids). Psychiatric multimorbidity was defined as the co-occurrence of symptoms of two or more disorders assessed.

Results: Among 2,074 participants, the median age was 50 (IQR: 45–56) years and 54% were female. The prevalence of symptoms of depression, anxiety, and PTSD was 15%, 10%, and 6%, respectively. The prevalence of hazardous alcohol use and hazardous drug use was 20% and 4%, respectively.

Overall, the prevalence of psychiatric multimorbidity was 12%. Among those with symptoms of at least one MSD, the prevalence of psychiatric multimorbidity was 35%. The prevalence of symptoms of psychiatric multimorbidity was as follows: hazardous alcohol use 29%, hazardous drug use 62%, depression 60%, anxiety 79%, and PTSD 89%.

Conclusions: In this cohort, psychiatric multimorbidity was common among PWH aged ≥ 40 across LMIC. Integration of MSD screening and treatment into HIV care should be prioritized. The effectiveness and implementation of transdiagnostic or multi-focus mental health treatment approaches in HIV care settings should be examined.

EPB0175

Sociodemographic and HIV care correlates of substance use and symptoms of mental disorders among PWH aged ≥ 40 years in low- and middle-income countries in the Sentinel Research Network of IeDEA

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Background: Symptoms of mental disorders and hazardous substance use (HSU) are common among people with HIV (PWH) and associated with poor HIV care outcomes. Research into common mental disorders (CMDs) and HSU among PWH in low- and middle-income countries (LMIC) remains limited.

Methods: We analyzed baseline data from the International epidemiology Databases to Evaluate AIDS (IeDEA) Sentinel Research Network cohort of PWH aged ≥ 40 years on ART at eight HIV clinics in Brazil, Côte d'Ivoire, India, Kenya, Mexico, Rwanda, Zambia, and Zimbabwe. We estimated the prevalence of hazardous alcohol use (HAU) (AUDIT-C ≥ 3 for women, ≥ 4 for men) and hazardous drug use (HDU) (ASSIST > 3 for cannabis, cocaine, amphetamines, inhalants, sedatives, hallucinogens, or opioids), as well as symptoms of depression (PHQ-9 ≥ 10), anxiety (GAD-7 ≥ 10), and post-traumatic stress disorder (PTSD) (PCL-5 ≥ 33). Log binomial models assessed the association between sociodemographic and HIV care characteristics and HSU and symptoms of CMDs.

Results: Of 2,074 participants, the prevalence of HAU and HDU was 20% and 4%, respectively (Table 1). The prevalence of HSU and symptoms of CMDs varied by sex, age, marital status, education, and income, as well as HIV care characteristics (Table 2).


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n (%)	Total (n=2074)	Men (n=956)	Women (n=1118)
Depression	304 (15)	109 (11)	195 (17)
Anxiety	215 (10)	92 (10)	123 (11)
PTSD	129 (6)	63 (7)	66 (6)
Hazardous alcohol use	409 (20)	257 (27)	152 (14)
Hazardous drug use	74 (4)	69 (7)	5 (0.4)

Table 1. Prevalence of HSU and symptoms of CMDs

The prevalence of depressive symptoms was higher among women than men (PR: 1.5, 95% CI:1.2-1.9) while the prevalence of HAU (PR: 0.5, 95% CI:0.4-0.6) and HDU (PR: 0.50, 95% CI:0.31-0.80) was lower among women than men.

Characteristic	Depression PR (95% CI)	Anxiety PR (95% CI)	PTSD PR (95% CI)	HAU PR (95% CI)	HDU PR (95% CI)
50+ years old (Ref: 40-49)	0.86 (0.70-1.05)	0.77 (0.60-0.99)	0.73 (0.52-1.02)	0.81 (0.68-0.97)	0.50 (0.31-0.80)
Female (Ref: Male)	1.51 (1.22-1.88)	1.14 (0.89-1.48)	0.90 (0.64-1.25)	0.51 (0.42-0.61)	0.06 (0.03-0.15)
Married/Partnered (Ref: Not married/ partnered)	0.55 (0.44-0.68)	0.59 (0.45-0.77)	0.47 (0.33-0.67)	0.97 (0.82-1.15)	0.70 (0.45-1.11)
≥Secondary education (ref: ≤Primary)	0.89 (0.72-1.10)	0.95 (0.73-1.23)	1.22 (0.86-1.74)	1.44 (1.19-1.74)	5.48 (2.64-11.35)
≥\$80 Monthly income (Ref: <80)	0.80 (0.65-0.99)	1.11 (0.85-1.45)	1.02 (0.73-1.44)	1.60 (1.22-2.09)	6.19 (2.86-13.42)
10+ years on ART (Ref: <10 years)	1.05 (0.85-1.30)	1.02 (0.78-1.31)	0.94 (0.67-1.31)	0.67 (0.56-0.80)	0.86 (0.55-1.36)
Never diagnosed with AIDS (Ref: Ever)	0.89 (0.72-1.09)	0.69 (0.54-0.89)	0.90 (0.64-1.27)	1.04 (0.86-1.24)	0.74 (0.47-1.16)

Table 2. Prevalence ratios of sociodemographic and HIV care characteristics with HSU and symptoms of CMDs

Conclusions: Routine screening and treatment for CMDs and HSU among PWH in LMICs are urgently needed, with particular relevance for groups more vulnerable to mental or substance use disorders.

EPB0176

Increase in ambient air pollution is associated with cardiovascular disease risk in youth with and without HIV in urban Uganda

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Background: Ambient air pollution is a major public health concern, particularly in Sub-Saharan Africa (SSA). Both air pollution and HIV are associated with increased cardiovascular disease (CVD) risk in adults, however, longitudinal data evaluating these associations in youth in SSA are limited.

Methods: A prospective observational cohort study was performed from 2017-2021 at the Joint Clinical Research Center in Uganda. Children with perinatally acquired HIV (PHIV) and children without HIV (HIV-) between 10-18 years of age with no known active infections and who lived in and around Kampala were included. PHIVs were on ART with HIV-1 RNA level ≤400 copies/mL. Ambient concentrations of PM_{2.5} were measured with a continuous central site monitoring using a Beta Attenuation Monitor or E-Samplers from the GeoHealth Hub at baseline and 96 weeks later. Carotid intima media thickness (IMT) and pulse wave velocity (PWV) were evaluated at baseline and 96 weeks. Groups were compared using unpaired t test and potential predictors of IMT and PWV were assessed using linear regression.

Results: Sixty-nine participants were evaluated at both timepoints (38 PHIV & 31 HIV-). At baseline, median (IQR) age was 13 years (11,14) and 46% were female. The overall median yearly PM_{2.5} exposure increased from 26 (25, 38) µg/m³ at baseline to 37 (37, 39, p = <0.001) µg/m³ at week 96. Change in yearly PM_{2.5} was significantly associated with increase in IMT over 96 weeks (β:0.007, 95%CI: [0.002, 0.01], p = 0.004), after adjusting for HIV status, age, socio-economic status (p≥0.4 for all) and sex (p=0.03). There was no association between PM_{2.5} and PWV (p>0.05).

Conclusions: In urban Uganda, adolescents are exposed to PM well over the WHO recommendation of an average of 5 µg/m³ or less per year. The levels of air pollution in the Kampala region increased by 1.4 times over a 2 year period, highlighting an urgent need to rapidly scale up air quality control measures.

This is further supported by our observation that increasing PM_{2.5} exposure over 2 years was associated with elevated CVD risk, irrespective of HIV status, suggesting air pollution may be a prominent driver of CVD risk in SSA.

EPB0177

The identification of intact HIV proviral DNA in human cerebrospinal fluid

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Background: The Central Nervous System (CNS) provides a sanctuary site for HIV-1 persistence, and HIV-1 RNA remains detectable in the cerebrospinal fluid (CSF) and brain tissues from people living with HIV-1 (PWH) despite peripheral virologic suppression with ART. Neu-



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rocognitive impairment (HIV-associated neurocognitive disorders;HAND), develops in roughly 45% of PWH. We sought to better understand the relationship between reservoir size of replication competent virus in CNS and the periphery and their relationship to severity of neurocognitive deficits in PWH.

Methods: Exclusion criteria: ART regimen, continuously virologically suppressed; no history of any neurologic disease known to affect memory (including stroke, malignancy involving the brain, traumatic brain injury, schizophrenia, and AIDS-related opportunistic infection of the CNS). A neuropsychological (NP) testing battery was administered that included nine tests used commonly in studies of cognition and HIV acquisition. Intact proviral DNA assay (IPDA) was performed to predict the frequency of replication competent virus in CSF and peripheral blood mononuclear cells (PBMC) from PWH (n=11).

Results: Intact proviral DNA (mean=6.31x10³ copies per million cells) persists in the CSF despite ART intervention (8/11 individual PWH were detected intact proviral DNA). We further compared the frequency of intact and defective proviruses in CSF versus PBMC. CSF contains significantly higher frequency of both intact (mean 2.69x10³ vs 2.76x10²) and defective (5' defective proviral copy numbers per million cells: mean 1.44x10⁶ vs 4.36x10³, p = 0.0228) [3' defective proviral copy numbers per million cells: mean 4.07x10⁶ vs 7.96x10³, p = 0.0228] proviruses throughout all individuals. Due to small sample size in this study, there was no strong correlation observed between cognitive impairment and viral reservoir in the CSF compartment. Cognition score in this pilot study indicated that both intact and defective reservoir size are associated with poor attention/working memory.

Conclusions: These data highlight that the CSF is a sanctuary site for the intact HIV-1 reservoir, which persists at significantly higher levels versus the periphery in our cohort.

investigations with a larger sample size are warranted to elucidate potential impact of intact and defective viral sequences on neurocognitive functions in various brain regions.

EPB0178

Group-based trajectory modelling to identify patterns and predictors of myocardial strain in people living with HIV: two-year longitudinal follow-up with speckle tracking echocardiography

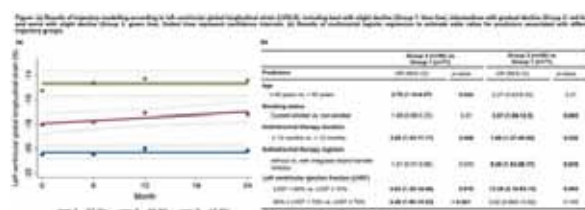
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Background: Subclinical myocardial dysfunction has been noticed in people living with HIV (PLHIV) and might contribute to the development of cardiovascular disease (CVD). This study aimed to assess the trend of myocardial strain change over time in PLHIV by using speckle tracking echocardiogram (STE) and investigate the predictors of subclinical myocardial dysfunction.

Methods: A prospective longitudinal cohort study was conducted in an HIV-designated medical center in southern Taiwan. CVD-free asymptomatic PLHIV were followed-up for two years, and data including traditional CVD risk factors and echocardiographic parameters were collected. The trend of myocardial strain change was analysed using a group-based trajectory model, and multinomial logistic regression was performed to identify the predictors among the groups.

Results: A total of 181 PLHIV (173 males, mean age 36.4 ± 11.4) were recruited and categorised into three distinct myocardial strain trajectories: best with slight decline (Group 1: 37.5%), intermedium with gradual decline (Group 2: 49.9%) and worst with slight decline (Group 3: 12.6%). The baseline left ventricular global longitudinal strain (LVGLS) of the groups were -20.5 ± 2.1%, -17.5 ± 2.4% and -15.2 ± 3.2% (p < 0.001), respectively.



Significant predictors associated with the group with gradual strain decline (Group 2) included age ≥ 40 years, antiretroviral therapy (ART) duration ≥ 12 months, and left ventricular ejection fraction (LVEF) < 70%.

The group of the worst strain (Group 3) was associated with current smoking, ART duration ≥ 12 months, LVEF < 60% and ART regimen with non-integrase strand transfer inhibitor.


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Conclusions: This is the first longitudinal cohort study using STE to monitor subclinical myocardial dysfunction in PLHIV. Our analyses suggest that age, baseline LVEF, smoking status, ART duration and regimen are crucial factors associated with the different trajectories of myocardial strain.

These findings help to understand the causes of subclinical myocardial dysfunction in PLHIV under ART and guide individualised preventative strategies and early intervention efforts.

EPB0179

Depressive symptoms and metabolic syndrome among people living with and without HIV in urban Zambia and Zimbabwe

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Background: Depressive symptoms have been shown to exacerbate the risk of metabolic syndrome (MetS) and vice-versa. Independently, MetS and depressive symptoms are known risk factors for cardiovascular diseases (CVDs), which are established leading causes of global mortality.

We sought to understand the prevalence of depression and MetS and their intersection among newly diagnosed people living with (PLWH) and without HIV (PLWOH) in urban Zambia and Zimbabwe.

Methods: We cross sectionally analysed characteristics at enrolment, of participants (≥30 years old) enrolled between August 2019 and January 2023 into a cohort study on non-communicable diseases in urban Zambia and Zimbabwe. Depressive symptoms were assessed using the patient health questionnaire (PHQ-9), with cut-off of 5 indicating at-least mild depressive symptoms.

MetS was defined using the International Diabetes Federation criteria, as presence of central obesity plus any two of: raised blood pressure, impaired fasting glucose, reduced high-density lipoprotein cholesterol and raised triglycerides.

We fitted a logistic regression model to assess the relationship between depressive symptoms and MetS, controlling for age, sex, HIV status, education level, socioeconomic status, drinking and smoking.

Results: Of the 972 participants, median age was 39 years (IQR; 34-46) and 556 (57%) were female. Among PLWH (471/972), median CD4 count was 225 cells/mm³ (IQR; 104-411) and median HIV viral load 27 970 copies/ml (IQR; 325-212 904). The prevalence of depressive symptoms was 35% (342/972, 95%CI; 32-38%), with significant differences by HIV status (31% (95%CI; 27-36) among PLWH and 39% (95%CI; 25-43) among PLWOH, p=0.01). MetS was diagnosed in 17% (95%CI; 13-20) of PLWH and 19% (95%CI; 16-23) of PLWOH, p=0.33. The co-occurrence of MetS and depressive symptoms was 6% (64/972, 95%CI; 5-8%), with no significant difference by HIV status (PLWH, 6% (95%CI; 4-8) vs PLWOH, 7% (95%CI; 5-10 p=0.30)).

After adjustments for potential confounders, we found no evidence of association between MetS and depressive symptoms (aOR 1.17, 95%CI; 0.8-1.7, p=0.79).

Conclusions: We show a high prevalence of depressive symptoms, MetS and their co-occurrence in both adult PLWH and PLWOH. Depressive symptoms were not associated with MetS. Screening for depressive symptoms and MetS as independent risk factors for CVDs in and outside the context of HIV is important.

EPB0180

Characteristics and management of ocular involvement in a large cohort of individuals with Mpox disease

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Background: Only sparse and poorly described monkeypox disease cases with ocular involvement have been reported and ophthalmological management remains unclear.

To describe the clinical spectrum of ocular involvement in a large unicentric cohort of patients with monkeypox disease and the preliminary results of a multidisciplinary unicentric therapeutic approach.

Methods: Patients with suspected monkeypox and ophthalmic manifestations attending the Hospital Clínic of Barcelona were prospectively followed. Standardized ophthalmological examination and monkeypox PCR testing of ocular swab samples were performed. A multidisciplinary (ophthalmologist, infectologist and pharmacologists) protocolized strategy for ocular treatment was designed.

Results: Nine (1%) of 880 patients had ocular manifestations including conjunctivitis (n=9), eyelid papules (n=5), corneal ulcers (n=4), conjunctival focal lesions (n=3), corneal stromal edema (n=2), endothelial edema (1/9), anterior uveitis (1/9) and preseptal cellulitis (n=1).



Real-time polymerase-chain reaction for monkeypox virus in ocular swab samples was positive in all patients. Five cases were considered ophthalmologically severe (55.5%) due to risk of potential loss of vision and were treated with tecovirimat. The treatment protocol was stratified according to potential complications of the affected ocular structures (eyelids, conjunctiva, cornea), prioritizing the indication for corticosteroids and/or tecovirimat in the severe cases. Favorable ophthalmologic and general outcomes were observed in all patients.

Conclusions: Monkeypox ocular involvement was uncommon but potentially severe. Virus was always detected in ocular samples. A protocolized treatment strategy including topical and systemic medications depending on the severity of eye involvement showed favorable responses without significant visual sequelae.

EPB0181

Self collected HPV samples can reliably be used in women living with HIV (WLHIV)

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Background: WLHIV have a higher risk of HPV and persistence that may lead to cervical cancer. Treatment of women with HAART has been shown to reduce the incidence of HPV among WLHIV.

The Cervical cancer Screening and Treatment algorithms study using HPV testing in Africa (CESTA) study sought to determine the proportion of HPV in WLHIV with HGSIL could be identified using VIA as triage.

Methods: We enrolled 400 women living with HIV (WLHIV), aged 25-54years of age, who were attending for HIV care at Wentworth hospital, Durban, between October 2019 until July 2020. Women had a self and clinician collected samples and were reviewed after 2 weeks for determination of need for treatment.

Those who had HPV, were further randomized into a 2 arms, in a 4:1 ratio.

Arm 1 was the triage arm, using VIA to determine those in need and are suitable for ablative treatment.

In Arm 2 all women who had HPV were subjected to treatment without VIA as a triage, provided they were eligible. In both arms, women who were deemed suitable for treatment were further randomised in a 1:1 ratio between cryotherapy and thermal ablative therapy. Biopsies were taken from all women in Arm 1.

Results:

- 247/399 (62%) had HPV, more picked up on self than clinician collected samples (48% versus 61%, $p < 0.05$).
- HPV 18/45 (11 – 14%) and with HPV 16 (9-13%) as singular or in combination were the predominant subtypes, however, the majority of women had a combination of other HR-HPV (28-34%).

- HAART duration (less than versus more than 2 yrs), was significantly associated with having HPV, with more women (72%) having HPV among those who used HAART for less than 2 yrs. Similarly, more women who had HPV were likely to have detectable viral load.
- 105 women were evaluable for VIA, (VIA positivity 83%),
- lesions of CIN2 + were more likely to have "ineligible" lesions on VIA ($p = 0.007$), and VIA had an overtreatment rate of 57%.

Conclusions: This study confirms that self-collected samples have a high sensitivity in picking up presence of HPV in the lower genital tract.

EPB0182

Anatomic distribution of HIV-infected cells in tissues after long term antiretroviral therapy

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Background: HIV persistence during combination antiretroviral therapy (cART) is the principal obstacle to cure in persons living with HIV (PLWH). Mechanisms contributing to persistence include clonal expansion of infected cells or poor ART penetration in various anatomical compartments are not well understood. Little is known regarding the distribution and the characteristics of intact and deleted proviruses in tissues.

We characterized the persistence of HIV-infected cells from autopsy donations of people undergoing autopsy after long term ART.

Methods: PLWH enrolled in HIV protocols at the NIH Clinical Center with suppressed HIV RNA on long term ART consented to research autopsy underwent post-mortem examination after expiration. Levels of HIV provirus in tissues obtained at autopsy were quantified using a single copy DNA PCR, Intact Proviral DNA Analysis (IPDA), and multiplexed HIV-LTR/*gag* digital droplet PCR assays. *Gag* proviral populations (1.1 kb) were obtained by single genome sequencing (SGS) and analyzed by average pairwise distance (APD) as a measure of genetic diversity and phylogenetics.

Results: Five PLWH (median age = 59.8) on > 4years of suppressive ART expired from comorbid illnesses (3 neoplasms, 1 cardiac disease, 1 infection) underwent autopsy within 3-48 hours. HIV-infected cells were widely distributed in tissues with the highest HIV-DNA levels in lymph node (240-410 copies/million cells), and lowest in brain (1-9 copies/million cells). Multiplexed LTR/*gag* quantification revealed diverse proviral populations structure with LTR:*gag* ratio ranging from 2.09-8.27 across tissues. IPDA noted extensive DNA shearing, exceeding 60-70% of total


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DNA, precluding the quantification of intact proviruses. Analyses of *gag* sequences suggested variable levels of hypermutated (6.2-44.4%) and identical proviruses (5.8-44.0%) across tissues. Analyses of unique sequences without hypermutations showed a low level of genetic diversity (APD=0.19%-0.9%) and intermingled proviral populations across tissues.

Conclusions: HIV proviruses are widely distributed in anatomic compartments with significant differential levels of identical, defective and hypermutated proviruses, suggesting the role of local immune responses in shaping the proviral landscape. IPDA analysis revealed human DNA is highly sheared within hours after expiration, complicating quantification of intact proviruses. Multiplexed LTR/*gag* quantification is a useful approach to characterize the proviral populations in this context.

EPB0183

Provider's perception, perceived needs, preferences, benefits, and challenges on the integration of NCDs services delivery with HIV services Rwanda

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Background: Expanded global access to antiretroviral therapy (ART) has turned Human Immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) into a manageable chronic disease. Gradually increasing in age poses an increased risk for NCDs to people living with HIV (PLWH). Intervention for the management of non-communicable diseases (NCDs) is needed to improve their quality of life. This study identified the provider's and stakeholders' perceptions on benefits, perceived challenges, and needs on the integration of NCDs services delivery with HIV services in Rwanda and explored the provider's and stakeholders' preferences and needs on the integration of NCDs services delivery with HIV services in Rwanda health facilities.

Methods: The study conducted for the period of 8 months from August 2021. A qualitative approach using Interpretive description and purposive sampling. Data collection was done using an interview guide to conduct in-depth interviews among healthcare providers, HIV and NCDs program implementors from central level, program partners, and civil society. Interviews were conducted in Kinyarwanda, transcribed, translated in English, and analyzed using Dedoose software. Thematic analysis was used. Ethical approval was sought and obtained and participants provided consent.

Results: A total number of 48 in-depth interviews were conducted. Four themes were identified including perception and preference for NCDs-service integration with HIV care services; benefits on the integration of NCDs-service with HIV care services; perceived challenges with NCDs services integration in HIV care and Perceived needs/plan for the integration of NCDs care in HIV services delivery. "We still have the problem of human resource, staff where you find staff which are trained on HIV are not the ones who are trained for NCDs implies that healthcare providers who are providing HIV service have a little knowledge on NCDs and those providing NCDs service have little knowledge on HIV." A civil society respondent

Conclusions: NCDs are a global burden and especially among PLWH the integration of NCDs management in HIV care is a vital need. Thus, the global community and health system should increase awareness of NCDs awareness and invest in healthcare providers' capacity building, infrastructure, and care which will facilitate the smooth provision of NCDs prevention and care to PLWH.

EPB0184

Obstructive sleep apnoea is associated with higher cardiometabolic risk among people living with HIV: a case for screening in Africa

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Background: Obstructive sleep apnea (OSA) is associated with an increased risk for cardiometabolic disease. HIV is an additional risk factor for OSA, even in younger people living with HIV (PLWH) and those without obesity. Despite the potential impact of OSA on quality of life and cardiometabolic health, there are limited data among PLWH in southern Africa where both HIV and obesity are at epidemic levels and cardiometabolic disease common. Understanding the extent of the problem is a critical first step towards developing appropriate interventions for less-resourced high HIV burden settings.

Methods: This is a cross-sectional, observational study of a well-characterised cohort of PLWH enrolled in the ADVANCE trial in South Africa. Between September 2021-November 2022, OSA risk was evaluated using the Berlin questionnaire, a screening tool with high specificity to detect OSA and comprised of 10 questions in three categories. Category one, high-risk was defined as persistent symptoms related to snoring; category two, high-risk was defined as persistent daytime sleepiness, drowsy driving, or both and category three, high-risk was defined as a history of hypertension or a body mass index (BMI) ≥ 30 kg/m². Overall OSA risk was defined as high-risk in at least two out of three categories. Demographic and known



cardiometabolic risk (CMR) markers were compared between participants at low-risk versus high-risk for OSA and a CMR risk score was calculated using BMI, waist circumference (WC), fasting glucose, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, triglycerides, and mean arterial blood pressure.

Results: Of the 170 individuals included in this analysis, mean age was 39.2 years, 61.8% were female, 31% had hypertension and 18.8% were high-risk for OSA. High-risk vs low-risk OSA participants had a higher BMI ($P<0.0001$), higher WC ($p=0.007$), higher hip circumference ($p=0.033$), and higher triglycerides ($p=0.011$). A higher CMR score was seen in those at high-risk OSA vs those at low risk of OSA ($p=0.026$) when adjusting for sex and age.

Conclusions: In a relatively young cohort of PLWH, obesity, and hypertension were common and risk for OSA was high. OSA is a modifiable risk factor for cardiometabolic disease, yet not currently screened for in routine HIV care.

EPB0185

Malnutrition in children living with HIV

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Background: WHO recommends that health care for children living with HIV should be accompanied by systematic assessment and management of their nutritional status. Pediatric HIV infection and malnutrition are major public health issues in sub-Saharan Africa, including Cameroon. This study was carried out to determine the prevalence of malnutrition in terms of stunting, wasting and underweight, assess biochemical indicators (haemoglobin) and immunological status amongst children living with HIV under 15 years of age followed up at the Bamenda Regional Hospital, Cameroon. Malnourished children are likely more immunodepressed compared to their non-malnourished counterpart was our hypothesis.

Methods: A cross-sectional study was conducted on 107 randomly selected children less than 15 years living with HIV and attending the AIDS clinic of the Bamenda Regional Hospital from February to April 2018. Socio-demographic data was obtained using a questionnaire. anthropometric measurements using stadiometer, scale balance, MUAC tape. Hemoglobin and CD4 levels using the hospital's laboratory. We used standard Z-scores and WHO guidelines. SPSS software version 24 for analysis. Statistical significance put at a P-value <0.05 .

Results: 107 children participated, 61.7% were females. 47.7% were aged 6 – 10 years., one of four children (25.2%) were immune-depressed (CD4 count <499 cells/UL), with 12.1% severely (CD4 count <250 cells/UL) and 13.1 moderately immune-depressed (250 – 499 cells/UL). Malnutrition depicted by underweight, stunting or wasting had a prevalence rate of 15%, 27% and 17% respectively. 40.3% were

anemic. A comparison of "normal" versus malnourished children revealed a relative drop in the immunological status (CD4 count) of the latter as follows; wasting-31%, stunting-13% and underweight-10%. This same pattern was also observed but to a lesser extent with respect to hemoglobin levels (wasting -14.7%, underweight-10.4% and stunting-5%).

Conclusions: From these results, one on three children were stunted. Four in ten children were anaemic. Also malnourished children have relatively lower immunologic status. One on three children that were wasted were immunodepressed. These results underscore the need for interventions that address malnutrition in children living with HIV such as; routine assessment for evidence of malnutrition, nutritional education and appropriate nutrient supplementation. It also indicates the need for further research to inform these interventions.

EPB0186

Prevalence and risk factors for renal insufficiency among adults living with HIV in Tanzania: results from a cross-sectional study

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Background: With improved survival, adults living with HIV (ALHIV) are increasingly likely to experience age- and HIV-related comorbidities such as kidney disease. Other risk factors for kidney disease including high blood pressure (BP), obesity, diabetes, and dyslipidemia are common among ALHIV. The objective of this study was to determine the prevalence of renal insufficiency and its associated risk factors among ALHIV.

Methods: We conducted a cross-sectional study among ALHIV ≥ 18 years on ART at six HIV clinics in Dar-es-Salaam, Tanzania between November 2020 and January 2021. We calculated the prevalence of renal insufficiency (defined as estimated glomerular filtration rate (eGFR) of <60 ml/min/ 1.73m^2) and applied multivariable (MV) logistic regression models to identify independent risk factors of renal insufficiency. Covariates significant at $p<0.2$ in the univariate analysis were included in MV models. We further examined the impact of age and its interaction with other important risk factors for renal insufficiency.

Results: 450 ALHIV on ART were included in the analysis [males 26%; median age 43 (IQR 18-72) years; on tenofovir


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containing ART 89%; HIV VL ≤ 50 copies/mL 88%], of these 34 (7.6%) had renal insufficiency. There was a higher prevalence of renal insufficiency among males (12%) vs. females (6%), $p=0.03$; ALHIV ≥ 50 (27%) vs <50 years (4%), $p<0.01$; and those with elevated [120-129/ <80 mmHg (6%)] and high [$\geq 130/80$ mmHg (15%)] vs. normal ($<120/80$ mmHg) blood pressure (BP) (4%), $p<0.01$. In MV analyses adjusting for age (≥ 50 / <50 years), male sex, BP (high/elevated/normal), health insurance coverage (yes/no), dyslipidemia (total cholesterol ≤ 5 / >5 mmol/L) HIV VL (≤ 50 / >50 copies/mL), only older age (aOR 6.53, 95%CI:4.2-10.2, $p<0.01$), and high but not elevated BP (aOR 2.38, 95%CI:1.2-5.0, $p=0.02$) were independently associated with renal insufficiency. The interaction term between age and BP was not significant ($p=0.95$).

Conclusions: The risk of renal insufficiency among ALHIV increased independently with both age and BP. Interventions targeting better BP control and screening for renal insufficiency among older ALHIV are critical to reduce morbidity and mortality related to kidney disease. Further research is needed to determine the synergy between known renal insufficiency risk factors among ALHIV on ART, over time.

Clinical complications of HIV and antiretroviral therapy

EPB0187

Hypertension among people living with HIV after starting or switching to DTG, EFV, or ATV/r-based ART at Newlands Clinic, Zimbabwe

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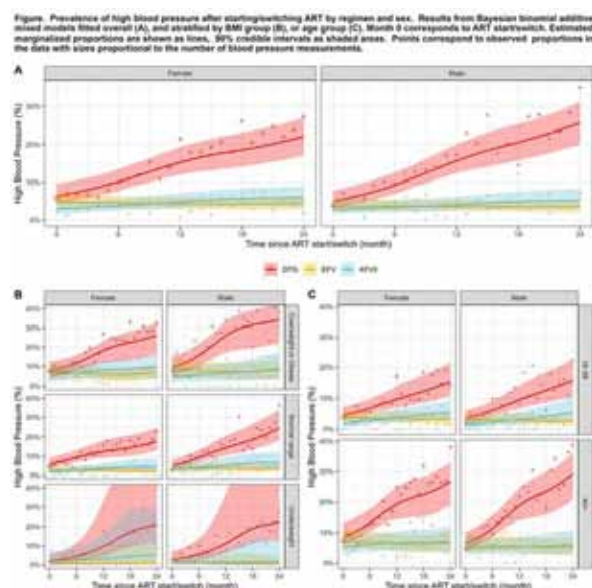
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Background: Dolutegravir (DTG)-based ART has been shown to be associated with weight gain. We previously confirmed this for people living with HIV (PLWH) attending Newlands Clinic in Harare, Zimbabwe. Since overweight and obesity are risk factors for hypertension, we aimed to compare blood pressure (bp) trends of PLWH on DTG-, efavirenz-(EFV), and ritonavir-boosted atazanavir-(ATV/r) based ART.

Methods: We included adult PLWH who started or switched to DTG-, EFV-, or ATV/r-based ART at Newlands Clinic 2008-2022 and extracted bp measurements for two

years after start/switch. We fitted Bayesian binomial additive mixed models to estimate prevalence trends for high bp (systolic pressure >140 mmHg or diastolic pressure >90 mmHg) and hypertension (two consecutive high bp measurements) after start/switch. We included ART regimen, sex and their interaction as fixed effects, a random intercept by person, and smoothed monthly trends by sex and regimen. We fitted models (A) overall and stratified by (B) BMI and (C) age.

Results: We analysed 35449 bp records from 4348 PLWH of whom 3181, 787 and 380 were starting/switching to DTG, EFV- and ATV/r, respectively. We found a substantial increase in the prevalence of high bp over 24 months for DTG, from 6.4% (90%-credible interval 4.4-9.6%) to 22.1% (17.1-27.0%) in females, and from 4.9% (3.3-7.6%) to 25.7% (20.0-31.2%) in males (Figure). This increase was observed in all BMI and age groups, but more pronounced in the elderly (≥ 40 years) and overweight or obese PLWH (BMI ≥ 25 kg/mm²). Prevalence of hypertension was generally lower than of high bp (approximately 15% after 2 years for DTG), but trends were similar. For EFV and ATV/r there was no evidence for an increase in high bp or hypertension after start/switch.



Conclusions: Contrary to EFV and ATV/r, DTG was associated with an increase in prevalence of high bp and hypertension. Routine monitoring of bp in PLWH on DTG is recommended.

**EPB0188****Epicardial adipose tissue thickness for cardiovascular risk prediction in PLWH. Bridging the gap?**

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Background: Metabolic dysregulation, inflammation and lipid disorders have been described in PLWH, which could be linked to higher cardiovascular risk. Epicardial adipose tissue is metabolically active and has been associated to inflammation, insulin resistance and coronary disease in the general population.

We aimed to assess whether epicardial adipose tissue thickness (EATT) correlates to clinical and biochemical markers of cardiovascular risk in PLWH.

Methods: Cross-sectional study that included PLWH >18-years-old and HIV-negative controls. BMI ≥ 30 and people with significant comorbidities were excluded. EATT was measured by doppler echocardiography on the right ventricle free wall from both parasternal long and short-axis views. Complete clinical examination and metabolic laboratory tests were performed. The research was conducted in Santa Fe (Argentina) between 2021-2022. A binary logistic regression was performed for multivariate analysis in order to identify variables that significantly predict insulin resistance, defined as a cut-off value of $>1,67$ for HOMA2-IR. For this analysis, HIV-status, age, sex and variables that were associated ($p < 0.05$) to insulin resistance in the bivariate analysis were included.

Results: 118 subjects (81 PLWH). 56,8% male sex. Median age 39,5 (IQR 21,0). The majority (99,2%) of Hispanic ethnicity. Median BMI 24,9 (IQR 21,0). 10-year cardiovascular risk (Framingham) was 2,81% (IQR 7,52). In PLWH, median CD4+ was 527 (IQR 360), 79,1% were undetectable, 100% were on HAART and 50% received Efavirenz.

No between-groups differences were found in BMI, total cholesterol, LDL-c, HDL-c, atherogenic index, fasting glucose or HOMA-IR. PLWH showed higher C-reactive protein (1,00 IQR 3,50 vs 0,590 IQR 3,70, $p=0,013$), D-dimer (0,190 IQR 0,090 vs 0,120 IQR 0,190, $p=0,005$) and EATT (4,10 \pm 0,971 vs 3,49 \pm 0,917, $p=0,007$). EATT significantly correlated to age ($p=0,004$, $Rho=0,333$) and waist-to-hip ratio ($p=0,047$, $r=0,277$), and in PLWH in particular, to HOMA2-IR ($p=0,023$, $Rho=0,420$) and D-dimer ($p=0,008$, $Rho 0,492$). In multivariate analysis, only EATT significantly predicted insulin resistance.

Conclusions: PLWH showed higher EATT as well as low-grade inflammatory markers compared to matched HIV-negative controls. In these people, EATT was associated

with insulin resistance and -potentially- a prothrombotic state. EATT could be a useful tool to bridge the gap in cardiovascular risk assessment in PLWH.

EPB0189**Reversibility of neuropsychiatric adverse events after switching to Darunavir/cobicistat or Doravirine in men on INSTI based regimen**

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Background: Integrase strand transfer inhibitors (INSTI) are associated with neuropsychiatric adverse events (NPAEs). Switching patients to other regimen could improve NPAEs symptoms.

The aim of this study was to evaluate improvements in NPAEs after switching INSTI based regimen to Darunavir/cobicistat (DRV/c) or Doravirine (DOR) based regimen.

Methods: We designed a single arm trial, at the Hospital de Infectología, "La Raza" National Medical Center since March 2021 to January 2023 in order to evaluate the reversibility of NPAEs detected with Patient Health Questionnaire (PHQ-9), sleep disturbances with Insomnia Severity Index (ISI) and Pittsburgh Sleep Quality Index (PSQI) and anxiety or depression with Hospital Anxiety and Depression Scale (HADS-A and HADS-D) in patients who started INSTI based regimen with Dolutegravir (DTG) or Bictegravir (BIC). NPAEs leading to INSTI discontinuation were considered when PHQ-9 ≥ 15 points, ISI ≥ 15 points, PSQI ≥ 8 and HADS-A or D ≥ 11 .

These patients were switched to DRV/c or DOR based regimen. Then we compared scales at the moment of switch 12 weeks later using the Wilcoxon signed-rank test.

Results: We included 890 treatment-naïve male patients who started antiretroviral therapy with INSTI based regimen, 542 (60.9%) with BIC and 348 (39.1%) with DTG. A total of 32 (3.6%) experienced NPAEs that lead to discontinuation, 20 (62.5%) from BIC and 12 (37.5%) from DTG.

Insomnia by ISI were 20 (62.5%), ISI median 19 (IQR 17-21); depression by PHQ-9 was found in 21 (65.6%) with 19 points (IQR 15-22) and anxiety by HADS-A was found in 12 (37.5%) with 12 points (IQR 11-14). Some patients had more than one NPAE that led to discontinuation; 20 (62.5%) and 12 (37.5%) were switched to DRV/c and DOR respectively.

After 12 weeks we observed significant improvements in PHQ-9, with a median of 5 points (IQR 2-12), $p=0.004$, ISI 7 points (IQR 4-12), $p=0.001$, HADS-A 7 points (IQR 6-9) $p=0.017$.


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Conclusions: NPAEs seem to be associated in patients on INSTI based regimen; these NPAEs improve after switching to DRV/c or DOR based regimen since the first 4 and 12 weeks. ISI, HADS, PSQI and PHQ-9 are quick, easy, and self-reported questionnaires to test on each visit.

EPB0190

eGFR change after transitioning to DTG-based ART at Newlands Clinic in Zimbabwe: a cohort study

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Background: Dolutegravir (DTG) has become the preferred antiretroviral therapy (ART) third drug for integrase strand transfer inhibitor naive clients initiating/switching ART in lower-middle-income countries. DTG causes benign serum creatinine (sCr) elevation without affecting glomerular filtration rate (GFR). sCr based estimated GFR (eGFR) equations consequently show a false decline. The magnitude of this decline remains unevaluated in African settings.

Methods: We analysed routine data from Newlands Clinic, Zimbabwe.

We abstracted sex, age and monthly eGFR (calculated using the CKD-EPI equation) for participants aged ≥18 years who transitioned from tenofovir+lamivudine+efavirenz to tenofovir+lamivudine+DTG (TLD) between 2019 and 2022.

For each participant we calculated eGFR changes compared to their baseline (date of transitioning) eGFR for all measurements available within 12 months prior- and 36 months post-baseline.

We aggregated data by A) month, and B) month, sex, and age group and calculated median changes in eGFR. We fitted weighted additive models to the aggregated data to estimate trends in median changes in eGFR A) overall, and B) by sex and age group.

Results: We included data for 3443 participants (66.2% female) with a median age of 44 years (IQR 35-50). The median baseline eGFR was 108 ml/min (IQR 96-121).

Overall, the predicted trend showed a decline in median eGFR plateauing approximately one-year post-switch (Figure).

Then, the estimated overall median decrease in eGFR was 18.1 ml/min (95% CI 17.1-19.1). Changes in eGFR did not differ substantially by age or sex, ranging from a median

decrease at one-year post-switch of 16.0 ml/min (95% CI 14.5-17.5) in females <30 years old to 20.1 (95% CI 19.0-21.2) in females aged 40-49 years.

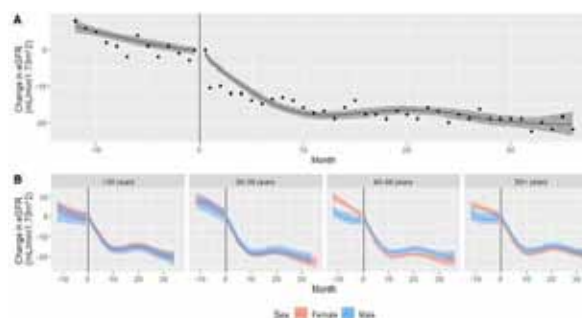


Figure. Overall observed (points) and estimated (curve) trend of median change in eGFR before and after transitioning from efavirenz to dolutegravir in combination with tenofovir and lamivudine among adults in Zimbabwe. B. Estimated trends of change in median eGFR before and after transitioning by age group (years) and sex.

Conclusions: In this cohort, median eGFR declined substantially after transitioning to TLD, plateauing after about 1 year. Clinicians with similar clients should be aware of this likely benign decline in eGFR when evaluating the renal function of clients on DTG.

EPB0191

Blood pressure among people living with HIV transitioning from efavirenz- to dolutegravir-based ART: a cohort study from Zimbabwe

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Background: Following the WHO recommendations in 2019, dolutegravir (DTG) replaced efavirenz as the preferred first-line third drug co-administered with tenofovir and lamivudine/emtricitabine. DTG has been associated with hypertension (HTN).

Methods: We abstracted blood pressure (BP), age, sex, and HTN diagnoses records from routinely collected data at Newlands Clinic, Harare, Zimbabwe. We included adult participants who routinely transitioned from tenofovir+lamivudine+efavirenz (TLE) to tenofovir+lamivudine+DTG (TLD). We aggregated data by month (from 12 months prior to 35 months after transitioning), HTN status and sex. For each aggregated data cell, we calculated median systolic and diastolic pressure



(SBP, DBP) among participants contributing BP measurements to the data cell. We then fitted separate additive models to describe trends in median SBP and DBP by sex and baseline HTN diagnosis.

Results: We analysed 57,970 BP records from 5,487 participants (3,648 [66.5%] female), and 1,023 (18.6%) had a diagnosis of HTN at baseline. Among the non-hypertensive at baseline, there was strong evidence for an increase in median SBP, which was more pronounced in males compared to females and some evidence for a slight increase in DBP as well (Figure).

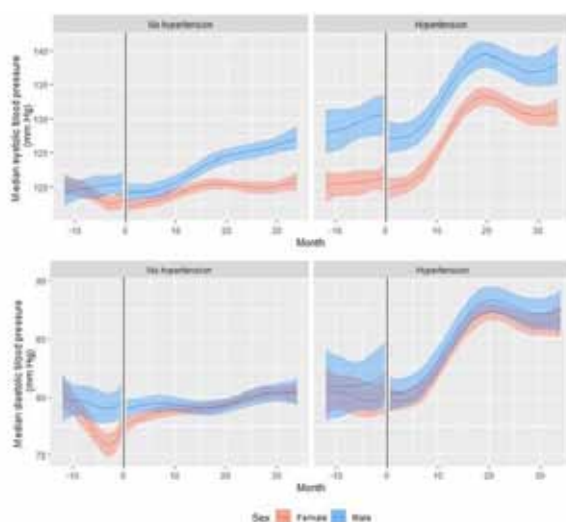


Figure: Estimated trends in the median systolic (top) and diastolic (bottom) blood pressure from 12 months prior to– until 35 months post-transitioning from tenofovir + lamivudine + efavirenz to tenofovir + lamivudine + dolutegravir among patients with and without hypertension at time of transitioning (Month 0).

Figure. Estimated trends in the median systolic (top) and diastolic (bottom) blood pressure from 12 months prior to– until 35 months post-transitioning from tenofovir + lamivudine + efavirenz to tenofovir + lamivudine + dolutegravir among patients with and without hypertension at time of transitioning (Month 0).

Among hypertensive participants, there was evidence for both increasing SBP and DBP, with similar estimated median DBP for both sexes, but higher SBP among males both before and after baseline. The increase in BP among hypertensive participants peaked at 18 months post baseline with an estimated median of 133 (95% CI 131–134) mmHg SBP and 87 (86–89) mm DBP in females and 139 (95% CI 137–141) mmHg SBP and 88 (87–89) mm DBP in males and plateaued thereafter.

Conclusions: Among non-hypertensive participants we observed smaller increase in SBP after transitioning from TLE to TLD and a larger increase in both SBP and DBP all hypertensive participants. Males and those with HTN on TLD could benefit from vigilant BP monitoring.

EPB0192

96-week update: change in weight and BMI associated with switching to bictegravir/emtricitabine/tenofovir alafenamide vs. a dolutegravir-based regimen among virologically suppressed adults living with HIV

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Background: Previously, we demonstrated that switching to a bictegravir (BIC) vs. DTG-based regimen (DBR) was associated with lower annualized weight gain of a similar magnitude post-switch at Week 48. Here, we report updated changes in weight and BMI through 96 weeks compared to 2 years prior to switch.

Methods: Data on demographics, clinical characteristics, weight, and BMI are collected from virologically suppressed adults switched to BIC/emtricitabine(F)/tenofovir alafenamide (TAF), DTG+ F/TAF, DTG/abacavir (ABC)/lamivudine (3TC), DTG/rilpivirine (RPV) and DTG/3TC 2 years prior to switch through 144 weeks post-switch. Linear spline models were fit to estimate and compare the trajectories of weight and BMI changes observed pre-and-post-switch.

Adjusted piecewise linear mixed-effects models were fit to examine factors associated with weight and BMI change pre-and-post-switch.

Results: Baseline demographic and clinical characteristics have been previously reported. 673 switched to BIC/F/TAF, 148 switched to DTG + F/TAF, 51 switched to DTG/ABC/3TC, 48 switched to DTG/RPV and 36 switched to DTG/3TC. At Week 96, switching to BIC/F/TAF vs. a DBR (grouped) was associated with lower annualized weight gain post-switch (-0.75 kg/year vs. -0.37 kg/year respectively, $p=0.336$). DTG/3TC switches continued to have the highest annualized weight gain (0.66 kg/year, 95% confidence interval [CI]: -0.6, 1.92), whereas DTG/RPV switches had the lowest annualized weight gain (-2.68 kg/year, 95% CI: -4.61, -0.73) post-switch at Week 96. DTG/RPV and BIC/F/TAF switches were the only groups with significantly lower annualized weight gain post-switch compared to pre-switch trajectories at Week 96.

Similar trends were observed for BMI changes. Baseline BMI<18.5 kg/m² was the only evaluated factor associated with significantly higher annualized weight gain post-switch, whereas multiple factors were associated with significantly lower annualized weight gain, but among them referral to the internal wellness clinic and baseline CD4⁺ T-cell count<200 cells/mm³ were associated with the lowest annualized weight gain post-switch.

Conclusions: At Week 96, switching to a BIC vs. DBR continued to be associated with lower annualized weight gain of a similar magnitude post-switch. Weight and BMI



changes stabilized for many groups at Week 96; however, switching to BIC/F/TAF and DTG/RPV was associated with significantly lower annualized weight gain post-switch.

EPB0193

CD4+ T lymphocyte recovery and cognitive function in women living with HIV

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Background: The rate of CD4+ T lymphocyte (CD4) recovery after antiretroviral therapy (ART) initiation can predict death and other morbidity; however, the effects on cognition in women living with HIV (WWH) are unknown.

Methods: WWH who initiated ART during Women's Inter-agency HIV Study enrollment were included. CD4 recovery slope was calculated using data obtained at semi-annual follow-up visits. Global cognitive function was determined using results from a 7 domain neuropsychological test battery.

Demographically adjusted T-scores were used to create domain scores and transformed into a clinical rating score which was used to determine global cognition at the last study visit. Multivariate logistic regression was used to examine the association of cognitive impairment with CD4 slope 2-years after ART initiation.

Results: Among 1,106 women with a median age of 50 [42.25, 55.00] at last cognitive assessment, the median baseline CD4 at ART initiation was 309.5 [176.50, 447.50]. Median CD4 recovery slope 2-years after ART initiation was 62.61 cells/ μ L/year [39.39, 90.34]. Global impairment

was identified in 30% (n=333) of WWH with a median of 11 follow-up visits [IQR 7, 25]. In adjusted analyses, CD4 slope 2 years after ART initiation was not associated with odds of later cognitive impairment in WWH aOR = 1.00 (95% CI 0.998, 1.005).

However, post-menopausal status aOR=1.54 (95% CI 1.13, 2.09), diabetes aOR= 1.79 (95% CI 1.30, 2.47), and baseline hepatitis c virus (HCV) aOR=3.15 (95% CI 1.91, 5.18) were associated with the development of later cognitive impairment. HIV suppression after ART initiation aOR 0.55=(95% CI 0.32, 0.92) and history of drug use were associated with decreased odds of cognitive impairment aOR=0.50 (95% CI 0.34, 0.75).

Conclusions: In this US cohort of WWH, CD4 recovery early after ART initiation was not associated with cognitive impairment. Initiation of ART remains critical to prevent cognitive decline.

Future studies may explore the effect of drug use and management of certain health conditions and the interaction with CD4 recovery on cognition.

EPB0194

Improving the safety of clients on antiretroviral therapy through Drug Use Evaluations (DUE) to manage adverse drug events at six ART sites in the Oromia region of Ethiopia

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Background: Antiretroviral therapy (ART) treatment guidelines in Ethiopia endorsed the phasing in of dolutegravir (DTG)-based regimens as the preferred first-line antiretroviral (ARV) drugs in February 2019. WHO (World Health Organization) recommends enhanced monitoring of toxicity during the transition to new ARVs.

However, the USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project identified limitations in the management of adverse drug events (ADEs).

Description: GHSC-PSM supported four hospitals and two health centers to conduct baseline drug use evaluation (DUE) through a review of 525 client charts in 2020 for clients on DTG-based regimens. This review was complemented by an exit interview conducted with 420 clients. A DTG ADE screening tool helped to proactively take history and screen ADEs from all clients on DTG. In 2022, post-intervention DUEs were conducted through a review of 215 charts in two health facilities out of the six ART sites with the baseline to measure progress.

Lessons learned: The baseline DUEs (n=525) on the review of the healthcare client charts indicated that ADEs were not detected and documented. However, the exit interviews (N=420) confirmed that a significant number had experienced ADEs, including 17 percent experienced headaches, 11 percent had insomnia, eight (8) percent faced



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nausea, eight (8) percent had tiredness, six (6) percent had allergic reactions, and two (2) percent had diarrhea. After multiple interventions by the project, ADEs were documented in the charts.

The post-intervention DUE conducted through a review of 215 charts indicated that the six ART sites detected 76 ADEs and reported just 29 of them to the national pharmacovigilance center.

Conclusions/Next steps: ADEs were missed by clinicians during visits for refills of ARVs. However, the study showed that conducting DUEs enabled healthcare professionals to be more vigilant in prescribing DTG and enabled ART sites to identify limitations in ADE detection and reporting.

EPB0195

Impact of GLP-1 receptor agonists on body weight in patients with type 2 diabetes and HIV

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Background: Integrase strand transfer inhibitor- (INSTI-) based regimens have been associated with clinically significant weight gain in patients with HIV (PWH). The mechanism of which is poorly understood but has been associated with INSTIs interference with estrogen-mediated metabolic pathways, impact on hormones regulating glucose and lipid metabolism, suppression of the melanocortin stimulating system, and reduction in insulin sensitivity.

Additionally, glucagon-like peptide-1 (GLP-1) may be depleted during HIV infection and may play a role in weight gain, however the impact of GLP-1 receptor agonists (GLP-1 RAs) on weight in PWH is unknown.

We evaluated the impact of GLP-1 RA on metabolic outcomes in patients with type-2 diabetes (T2DM) and HIV (DM+HIV) compared to T2DM without HIV (DM).

Methods: Retrospective cohort analysis of metabolic outcomes in DM+HIV compared to DM receiving GLP-1 RAs and receiving care at UC Health outpatient clinics from 08.31.2017 to 08.31.2022. Metabolic outcomes were assessed by matching patients 2:1 by gender, race/ethnicity, GLP-1 RA, and dose.

Results: In this analysis, 15 persons were included in the DM+HIV group compared to 30 persons in the DM group. The mean age was 57 years (± 8.5 years), 13% identified female, 52% were Black, 48% were White, and 46% had GLP-1 RA dose titrated up during the study period. The mean change in weight was -10.4 (± 12.47) kg in the DM+HIV group compared to -1.73 (± 8.45) kg in the DM group ($P = 0.0085$). The mean percentage difference in weight was -8% ($\pm 9.96\%$) in the DM+HIV group compared to -1.47% ($\pm 6.8\%$) in the DM group ($P = 0.013$). The rate of patients achiev-

ing $\geq 5\%$ weight loss was 60% (9/15) in the DM+HIV group compared to 33% (10/30) in the DM group ($P = 0.1158$). The mean percentage difference in hemoglobin A1c was -1.3% ($\pm 2.39\%$) in the DM+HIV group compared to -0.49% ($\pm 2\%$) in the DM group ($P = 0.2415$).

Conclusions: In this cohort, PWH and T2DM had significantly greater weight loss compared to people with T2DM alone. A larger study comparing metabolic outcomes in DM+HIV compared to DM receiving GLP-1 RAs is underway to confirm these results.

EPB0196

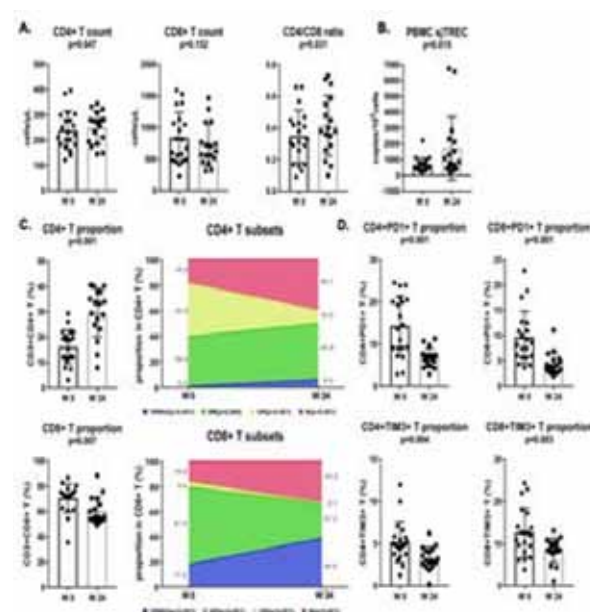
Thymosin $\alpha 1$ in restoring immune response in immunological nonresponders

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Background: The prognosis of immunological nonresponders (INRs) with HIV is inferior to that of immunological responders. However, no effective strategy is available to restore CD4+ T cell immune response in these individuals. We aimed to explore the safety and efficacy of thymosin $\alpha 1$ in reconstitution of immune response in INRs.

Methods: INRs with CD4+ T cell counts between 100 and 350 cells/ μ L were enrolled and received two-staged 1.6mg thymosin $\alpha 1$ subcutaneous injections for 24 weeks (Qd in the first 2 weeks and Biw in the subsequent 22 weeks) while continuing antiretroviral therapy (NCT04963712). CD4+, CD8+ T cell counts and CD4/CD8 T cell ratio in whole blood, the proportions of CD4+ T, CD8+ T cell subsets, the expression of PD-1 and Tim-3 on T cells and signal joint T cell receptor excision circles (sjTREC) were measured by flow cytometry and real-time PCR, respectively. The primary endpoint is CD4+ T cell counts at week 24.




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Results: A total of 20 participants were enrolled. They were mainly male (19/20), aged 48.1 (interquartile range: 40.5-57.0) years old, who had received antiretroviral therapy for 5.6 ± 2.8 years. No significant increase was observed in CD4+ T cell count after thymosin $\alpha 1$ treatment, while CD4/CD8 ratio increased significantly (Fig A).

Importantly, CD4+ T cell proportion, naive CD4+ T, naive CD8+ T cell proportion and sjTREC levels were markedly elevated at week 24 compared to that at baseline (Fig B/C). In contrast, the proportions of CD4+PD1+ T cells, CD4+TIM3+ T cells, CD8+PD1+ T cells and CD8+TIM3+ T cells decreased significantly (Fig D). HIV viral loads were stable during the study and no severe drug-associated adverse events were observed.

Conclusions: Thymosin $\alpha 1$ does not restore CD4+ T cell count. However, it increases thymus output, restores immune exhaustion and improves immunosenescence, which warrants larger clinical trials.

EPB0197

Metabolic syndrome among persons living with HIV on DTG based antiretroviral regimen: outcomes from a longitudinal cohort study in Ghana

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Background: Dolutegravir (DTG) based antiretroviral therapy has become the first line ART for most PLHIV in sub-Saharan Africa. Following increasing reports of DTG associated weight gain and hyperglycemia, these clients are likely to be at risk of metabolic syndrome (MetS).

This study sought to determine the risk of MetS among PLHIV.

Methods: Prospective multi-center observational cohort study among PLHIV in Ghana was conducted from September 2020 to August 2022. Clients with normal fasting blood glucose, HDL cholesterol, triglycerides, waist/hip ratio, BMI and blood pressure were followed for 18 months. MetS was defined as per WHO definition. Person-time and cumulative incidence rates were estimated using "stp-time" function in STATA. Cox proportional hazard model was employed.

Results: A total of 3195 PLHIV were recruited with 73% (2334/3195) being female. Mean age was 45.4 ± 11.8 years. Ten percent of clients were ART naïve before DTG initiation. Total person-months of DTG exposure was 52,113 with overall MetS incidence rate of 10.9 (95% CI: 10.0-11.8) per 1000 person-months. The MetS incidence rates at 3, 6 & 12 months were 331.4 (95% CI: 285.7-384.5), 228.0 (95% CI: 204.1 - 254.7) and 137.5 (95% CI: 125.7 - 150.4) per 1000 person-months respectively. MetS incidence was highest among >60 years (17.9 (95% CI: 14.9-21.7) per 1000 person-months).

MetS incidence rate among females (11.5 (95% CI: 10.5-12.6) per 1000 person-months) was higher than that among males (9.2 (95% CI: 7.8-10.9) per 1000 person-months) but not statistically significant.

Females had 1.4 (95% CI: 1.1 - 1.6) times higher risk of MetS compared to males. PLHIV already on ART before switch to DTG had 1.2 (95% CI: 0.9-1.5) times higher risk of MetS compared to ART naïve. Having a comorbidity at the time of DTG initiation was associated with 2.2 (95% CI: 1.9 - 2.4) times higher risk of MetS. PLHIV aged >60 years had 8.7 (95% CI: 1.9 - 2.4) times higher risk of MetS compared to those <25 years.

Conclusions: The cumulative incidence of MetS was 10.9 (95% CI: 10.0-11.8) per 1000 person-months. PLHIV who were female, had a comorbidity, aged >60 years and with a previous history of ARTs were at higher risk of MetS.

EPB0198

A patient with undiagnosed HIV presenting with hemophagocytic lymphohistiocytosis - the importance of routine HIV testing in hospitalized patients

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Background: Hemophagocytic lymphohistiocytosis (HLH) is a clinical syndrome marked by dysregulated macrophage-mediated cytokine secretion and a subsequent severe hyperinflammatory response; it can frequently mimic other systemic pro-inflammatory conditions, such as autoimmune conditions, hematological malignancies, and chronic infections. HIV infection is a known but rare cause for secondary HLH, a variant of HLH triggered by extrinsic sources.

Methods: Here, we present a case of a patient who was evaluated by the Infectious Disease Department at Elmhurst Hospital, Queens, New York in September 2022. The patient was a 79 year old Chinese immigrant with no significant past medical history who presented initially with significant altered mental status, SIRS criteria, and other symptoms consistent with bacterial sepsis of abdominal origin.

However, the patient had persistently negative infectious workup, including negative blood, urine, and CSF studies and unremarkable imaging studies. As his hospitalization progressed, his symptoms became refractory to broad-spectrum antibiotic therapy, and he became increasingly hypotensive and acidotic and required intubation.

Results: After HIV testing was recommended by the Infectious Disease Consultant, the patient was discovered to have AIDS with CD4 count 25 cells/mL (9%), with the time and method of initial HIV transmission unknown.

He was then found to meet criteria for HLH with the following five clinical criteria: fever, simultaneous thrombocytopenia and anemia, hypertriglyceridemia, hypofibrinogenemia, and elevated CD25 activity on assay, leading



to a diagnosis of secondary HLH triggered by AIDS. Despite prompt initiation of immunosuppressive therapy, the patient's condition continued to rapidly decline and he passed away within 2 days of diagnosis.

Conclusions: To our knowledge, this is the first documented case of secondary HLH triggered by AIDS presenting initially as sepsis. This case serves as a demonstration of the protean presentation of HIV/AIDS and how AIDS-triggered HLH can easily resemble sepsis.

It also serves as a reminder of the importance of routine HIV screening in patients receiving medical care, even in the absence of known risk factors. An earlier diagnosis of HIV may have changed the outcome for this patient.

EPB0199

Weight gain and lipid changes with switching from boosted protease inhibitor-based regimens to bicittegravir/tenofovir alafenamide/emtricitabine

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Background: Weight gain is reported with switches from boosted protease inhibitors (bPI) and tenofovir disoproxil fumarate (TDF) to integrase strand transfer inhibitors and tenofovir alafenamide (TAF). Data on metabolic consequences of this weight gain are limited from low and middle-income countries.

Methods: We analyzed changes in weight and lipids from enrollment to Week 48 among a cohort of virally-suppressed adult PLWH who were randomized to continue a second-line bPI-based regimen vs. switch to bicittegravir/TAF/emtricitabine (B/F/TAF) at GHESKIO in Haiti.

Results: 193 clients were randomized (bPI group: 96; B/F/TAF group: 97). At enrollment, 45% received ritonavir-boosted lopinavir and 55% received ritonavir-boosted atazanavir; 78% received TDF (remainder received abacavir or zidovudine), and all received lamivudine.

Median age was 49 (IQR: 42, 57), and 104 (54%) were female. Median weight at enrollment was 65.9 kg in bPI and 62.3 kg in B/F/TAF group ($p=0.1115$); median change in weight at 48 weeks was -1.0 kg (IQR: -2.9, 1.0) and 1.2 kg (IQR: -0.9, 3.5), respectively ($p<0.001$). Weight gain of $\geq 5\%$ at week 48 occurred in 13 (13.5%) in bPI and 29 (29.9%) in B/F/TAF group ($p=0.006$).

Changes from enrollment to week 48 in total, LDL, and HDL cholesterol were similar between the two groups (Table 1).

Within each group, there was no difference in change in LDL from enrollment to week 48 in those with $\geq 5\%$ vs. $<5\%$ weight gain (bPI: -11 [IQR: -33, 17] vs. -6 [IQR: -20, 7]; p -value=0.989; B/F/TAF: -5 [IQR: -25, 13] vs. -2 [IQR: -13, 17]; p -value=0.169).

	Boosted PI Group (n=96)	B/F/TAF Group (n=97)	p-value**
Total Cholesterol (mg/dl)			
Enrollment*	180 (155, 208)	182 (154, 209)	0.877
Change at Week 48*	-12 (-27, 7)	-8 (-29, 11)	0.985
LDL (mg/dl)			
Enrollment*	101 (75, 126)	102 (84, 132)	0.444
Change at Week 48*	-6 (-21, 9)	-2 (-16, 16)	0.123
HDL (mg/dl)			
Enrollment*	49 (42, 61)	48 (43, 60)	0.969
Change at Week 48*	-3 (-11, 5)	-2 (-10, 5)	0.942

*Median values with IQR; ** p-values were from the 2-sided Wilcoxon rank sum test to compare the two treatment groups

Table 1. Change in Lipids from Enrollment to Week 48 by Treatment Group.

Conclusions: Switching from a bPI regimen (largely with TDF) to B/F/TAF is associated with weight gain in Haiti. However, this weight gain does not appear to be associated with an increase in LDL. We will explore changes in CVD risk scores and additional measures of cardiometabolic dysfunction associated with weight gain in this population.

HIV and ageing

EPB0200

Lower prevalence of potential drug-drug interactions among people living with HIV in the era of integrase inhibitor-based antiretroviral therapy

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Background: Aging people living with HIV (PLWH) are at a higher risk for potential drug-drug interactions (PDDIs) due to an increased burden of co-morbidities and co-medications. Studies on the prevalence of PDDIs among PLWH in the era of integrase strand-transfer inhibitor (INSTI)-based antiretroviral therapy (ART) are limited.

Methods: This cross-sectional study included consecutive PLWH who had been on ART for at least 3 months at two designated hospitals for HIV care in Taiwan. Patients' demographics, HIV treatment history, and the presence of co-morbidities were recorded with REDCap electronic data capture tools.

All prescriptions, including ART and non-ART prescriptions, in the three months prior to the date of review were collected from the NHI-MediCloud System, and screened for red-label and amber-label PDDIs using the University of Liverpool HIV drug interactions database. Prevalence of PDDIs was compared with that in the literature review. Associated factors with DDIs were sought in multivariable analyses.

Results: From June 2021 to August 2022, 1007 PLWH were included. Their median age was 40 years (interquartile range [IQR], 33-49) and 96.2% were taking INSTI-based


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ART (16.9% boosted INSTI and 79.3% unboosted INSTI). The proportions of PLWH with ≥ 1 and ≥ 5 co-medications were 65.3% and 18.7%, respectively. Seven (0.7%) PLWH had red-label PDDIs and 163 (16.2%) had amber-label PDDIs, both of which were lower than those observed in historical control (1.4-7.0% with red-label PDDIs and 18.0-52.0% with amber-label PDDIs).

In multivariable analysis, the prevalence of PDDIs was higher in PLWH with an older age (aOR, per 1-year increase, 1.022, 95% confidence interval [CI] 1.004-1.040), increasing number of co-medications (aOR 1.097, 95% CI 1.002-1.201), use of boosted-INSTI-based ART (aOR 8.653, 95% CI 5.003-14.496), and concomitant medications in the alimentary tract and metabolism categories (aOR 11.058, 95% CI 6.648-18.394) and in the categories of antineoplastic and immunomodulating agents (aOR 14.733, 95% CI 1.274-174.016).

docs.google.com/document/d/10fe1J-0jLSG05HSUicWbg_DEo1rIMVqh/edit

Conclusions: In the INSTI era, prevalence of PDDIs declined but remained substantial. HIV care providers should be vigilant on screening and managing the PDDIs, especially in older PLWH, those with polypharmacy, those who are taking booster-containing ART, and those who are taking medications in specific categories.

EPB0201

Aging of brain network connectivity corresponds to cognitive impairment in persons with HIV

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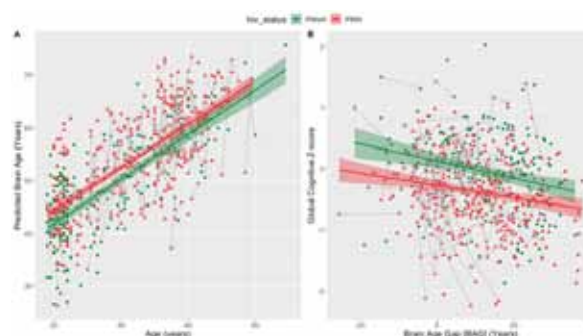
Background: Magnetic resonance imaging can detect brain pathology in persons with HIV (PWH), which can be quantified using the brain-age gap (BAG), the difference between chronological and phenotypic 'biological age.' However, it is unknown whether PWH undergo accelerated age-like changes in the functional connectivity of brain networks, assayed using resting-state functional MRI (rs-fMRI). Machine learning can generate normative connectivity-vs.-age models in persons without HIV (PWoH), which are then applied to PWH to test for serostatus effects.

We hypothesized that connectivity patterns in PWH resemble those of older PWoH (increased BAG) and that aging of brain connectivity correlates with neurocognitive function.

Methods: 419 PWH (age=45.1±15.4 yr.; 75% male; 69% undetectable viral load) and 213 PWoH (age=37.9±17.1 yr.; 50% male) were imaged between 2008 and 2022. rs-fMRI was performed on 3.0-Tesla Siemens scanners (repetition time/echo time=2200/27ms, voxels=3-4mm³). Functional connectivity matrices were calculated by correlating brain activity in 300 regions. A Gaussian process regression model was trained on a separate cohort of PWoH

(N=1001) to estimate BAG from connectivity matrices (Millar, 2022), then applied to the study cohort. Participants completed a 15-test neurocognitive battery, producing a global cognitive Z-score. Hypotheses were tested using mixed-effects linear regression models, with age and biological sex as covariates.

Results: The machine learning model estimated age with mean absolute error (MAE)=12.0 years (Pearson's $R=0.73$). PWH had a mean BAG 2.6 years greater than PWoH, with consistent elevation across the age range ($p=0.001$; *Panel A*). In both groups, greater BAG was associated with worse cognitive performance ($p<0.001$; *Panel B*).



Conclusions: In parallel with HIV-associated brain structural changes, brain network connectivity patterns in PWH resemble those in older PWoH, suggesting increased biological aging and highlighting a potentially useful imaging biomarker of neurocognitive function.

Reference: Millar PR, *et al.*; Predicting brain age from functional connectivity in symptomatic and preclinical Alzheimer disease. *Neuroimage*. 2022.

EPB0202

Measuring intrinsic capacity: a screening tool for integrated care in ageing people living with HIV

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Background: The World Health Organisation (WHO) Healthy Ageing model proposes measuring the construct of intrinsic capacity (IC) to monitor an individual's functional ability. Here, we explored the utility of this measure as a screening tool to assess age-associated functional decline in PLWH.

Methods: 155 PLWH under out-patient care in Universiti Malaya Medical Centre, Malaysia and 89 HIV-uninfected community controls aged 35 years and above were recruited. WHO's Integrated Care for Older People (ICOPE) framework was adapted to derive composite IC scores

(ranging 0-6) for each participant. One point was assigned for each deficit encompassing the five domains of cognition, sensory (hearing and vision), mobility, mood and vitality with higher scores denoting greater IC deficit. IC scores in PLWH (adjusted for age) were then correlated with assessments of disability, quality of life, loneliness, social isolation, self-rated health, mortality risks, polypathology and polypharmacy. Area under the receiver-operator-characteristic (AU-ROC) was calculated to predict frailty in PLWH.

Results: Median (interquartile range, IQR) age among PLWH and controls were 50 (42-56) and 50 (39-59) years, respectively. Majority were males (PLWH=83%, controls=56%) and all PLWH received antiretroviral therapy (ART). Overall, 21% of PLWH reported deficits in two or more domains compared to 10% among controls, $p=0.035$. IC scores correlated with chronological age in controls ($p=0.007$) but not in PLWH ($p=0.194$). Age-adjusted IC was significantly correlated with multiple patient-reported outcomes and clinical markers of aging in PLWH (Figure 1). IC scores demonstrated good ability to characterise frailty in PLWH (frailty phenotype AUC-ROC=0.871; frail scale, AUC-ROC=0.792).

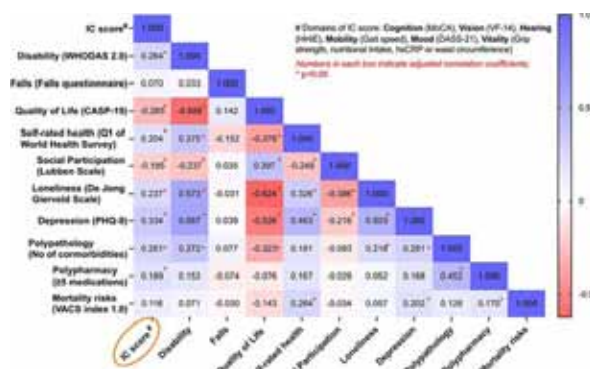


Figure 1. Age-adjusted correlations of intrinsic capacity score with health outcomes in PLWH.

Conclusions: Intrinsic capacity provided a good composite measure of the physical, mental and social functioning of PLWH on ART in Malaysia. It represents an opportunity to incorporate functional assessments into routine HIV care to complement chronic disease-based monitoring. The tool should be validated in larger cohorts of PLWH from diverse settings.

EPB0203

Frailty transition among older adults living with HIV in Thailand: a five-year prospective cohort study

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Background: We investigated frailty transition among well-suppressed people living with HIV (PWH) in a five-year follow-up Thai aging cohort.

Methods: A prospective cohort study was conducted among virologically suppressed PWH aged ≥ 50 years from an aging cohort in Bangkok, Thailand. Frailty phenotypes were assessed at baseline and at five years of follow-up. The frailty status was grouped as robust, pre-frail and frail using 5 criteria: weight loss, low physical activity, exhaustion, weak grip strength and slow gait speed. PWH who died before the end of five-year follow-up were classified as frail. A generalized estimating equation (GEE) model was performed to investigate risk factors associated with transition to more severe frailty stages.

Results: Overall, 181 PWH (62% male; median age of 54 (IQR, 52-59) years) completed baseline and follow-up frailty evaluations. 11 PWH died during 5 years; 4 were in robust stage at baseline. Frailty transition from baseline to year5 is shown in figure 1A. Among 14 PWH who were frail at baseline, 12 (85%) had reverse transitions to pre-frail or robust stage at year 5. Forty-five 45 (25%) had worsening frailty stage. Weak grip strength was the predominant frailty phenotype characteristic at year 5, while low physical activity was predominant at baseline (figure 1B).

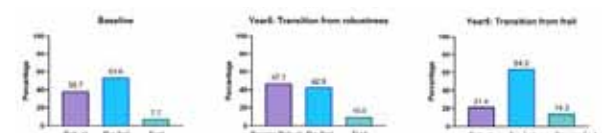


Figure 1A. Frailty transition from baseline to year 5.

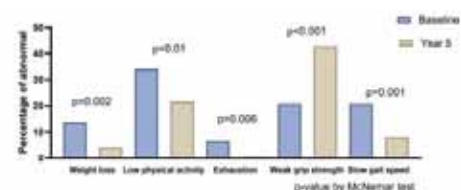


Figure 1B. Frailty phenotype compared between baseline and year 5.

In multivariable analysis, excessive alcohol consumption (adjusted odds ratio [OR]: 3.00, 95% confident Interval (CI): 1.37-6.55, $p=0.006$), longer duration of ART (OR 1.10, 95%CI:

1.02-1.18, $p=0.011$) and NNRTI regimen at baseline (OR 2.71, 95%CI: 1.35-5.44, $p=0.005$; compared to PI or INSTI) were associated with worsening of frailty stage.

Conclusions: Nearly a quarter of PWH had transitioned to a more severe frailty stage within 5 years. However, the majority of frail PLH at baseline showed improvements in severity, suggesting frailty can be reversible. More research is needed to investigate the mechanisms of frailty transition, including those which are potentially modifiable.

Antiretroviral therapies and clinical issues in adults

EPB0204

Incidence of infections across Islatravir clinical development programs

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Background: Islatravir (ISL) is a nucleoside reverse transcriptase translocation inhibitor (NRTTI) being studied for HIV-1 treatment and prevention. Decreases in total lymphocyte (TL) and CD4+ T-cell counts were observed in several ISL clinical trials.

We conducted an analysis to assess infections in all participants, and participants experiencing TL count reductions, across phase 3 ISL clinical trials.

Methods: Infection data from phase 3 clinical trials in the following treatment and prevention development programs were reviewed: doravirine (DOR)/ISL 100mg/0.75mg orally once daily for treatment of virologically suppressed adults with HIV-1 (P017 Group 1 and P018 [switch studies]); ISL 60mg orally once monthly for pre-exposure prophylaxis (PrEP) in adults at high risk for HIV-1 infection (P022 [cisgender women] and P024 [cisgender men and transgender women who have sex with men]).

The incidence of infections (based on adverse events of infections and infestations by system organ class $\geq 5\%$ in any study) in participants who received ISL vs comparator, and in participants with $\geq 30\%$ reductions in TL counts, were compared.

Results: In the 4 phase 3 clinical trials, the incidence rates for overall infections were similar in participants who received ISL vs comparator. COVID-19 was the most common infection in P017, P018, and P024; bacterial vaginosis was the most common infection in P022. Other common infections were chlamydial infections, gonococcal infections, nasopharyngitis, syphilis, vulvovaginal candidiasis, and upper respiratory tract infections (Table).

Infection rates in participants with a $\geq 30\%$ decrease in TL counts were generally comparable in ISL vs comparator groups in P017 and P018 (63/140 [45%] and 64/128 [50%], respectively, vs 25/47 [53.2%]), P022 (90/127 [70.9%] vs 52/78 [66.7%]), and P024 (48/79 [60.8%] vs 20/27 [74.1%]).

	Treatment P017 GP DOR/ISL 100mg/0.75mg QD	P018 DOR/ISL 100mg/0.75mg QD	P022 ISL 60mg QM	P024 ISL 60mg QM	P024 FTC/FTC 100mg/100mg QD
n (%)	140 (53.3)	128 (48.5)	140 (53.3)	140 (53.3)	140 (53.3)
Total infections and infestations	140 (53.3)	128 (48.5)	140 (53.3)	140 (53.3)	140 (53.3)
COVID-19	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Bacterial vaginosis	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Chlamydia	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Gonorrhea	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Herpes simplex	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
HSV-2	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
HSV-1	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Shingles	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Syphilis	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Tuberculosis	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
UTI	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)
Vaginitis	25 (18.0)	25 (19.5)	25 (18.0)	25 (18.0)	25 (18.0)

Table. Most common infections ($\geq 5\%$ in any study) reported in islatravir phase 3 treatment and prevention studies.

Conclusions: There was no observed increase in the incidence of infection in participants receiving ISL versus comparator for treatment or prevention of HIV-1.

EPB0205

The relationship between gender-affirming hormone therapy and tenofovir dried blood spot concentrations among transgender adults switching from tenofovir disoproxil fumarate/emtricitabine to tenofovir alafenamide/emtricitabine for pre-exposure prophylaxis

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Background: Previous data have demonstrated a lack of an effect of tenofovir-based pre-exposure prophylaxis (PrEP) on hormone concentrations among transgender (TG) individuals taking gender-affirming hormone therapies (GAHT). It is less clear if there is an effect of GAHT on tenofovir-diphosphate (TFV-DP) in dried blood spot (DBS) drug concentrations, especially when switching from tenofovir disoproxil fumarate/emtricitabine (TDF/FTC) to tenofovir alafenamide (TAF)/FTC for PrEP.

The objective of this study was to compare TFV-DP DBS concentrations between users and non-users of GAHT when switching from TDF/FTC to TAF/FTC for PrEP.

Methods: An observational cohort study was performed among a subset of TG individuals enrolled in a clinical trial evaluating switching from TDF/FTC to TAF/FTC for PrEP. Inclusion criteria were age ≥ 18 years old, TG identity, HIV-negative (4th generation), use of both TDF/FTC and TAF/FTC for ≥ 12 weeks, and availability of stored DBS samples for TFV-DP measurement while on both PrEP products. TFV-DP DBS concentrations were evaluated twice: once while on ≥ 12 weeks of TDF/FTC and after switching to TAF/FTC for ≥ 12 weeks. TFV-DP concentrations were compared between users and non-users of GAHT using the Mann-Whitney U test at each assessment.

Results: Among the 40 individuals included, median (interquartile range, IQR) age was 33.0 (28.3 – 39.5) years. Most (70%) were assigned male at birth. There were 29 (72.5%) individuals on GAHT. Median (IQR) TFV-DP concentrations while on TDF/FTC between users and non-users



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of GAHT were 1623 (1317 – 2227) and 1839 (1188 – 2098) fmol/punch, respectively ($p=0.79$). Similarly, there was no difference in TFV-DP concentrations between users and non-users of GAHT while on TAF/FTC: 2700 (2208 – 3617) vs 2638 (2159 – 3213) fmol/punches, $p=0.57$, respectively. The relationship between GAHT use and TFV DBS concentrations was not significantly modified by sex assigned at birth (see Table).

	Assigned Male at Birth			Assigned Female at Birth		
	GAHT (n=19)	No GAHT (n=9)	P-value	GAHT (n=10)	No GAHT (n=2)	P-value
Median (IQR) TFV-DP DBS concentration while on TDF/FTC, fmol/punch	1653 (1320 – 2245)	1839 (1131 – 2014)	0.66	1607 (796 – 2174)	1643 (1188 – 2098*)	1.00
*range due to sample size						
Median (IQR) TFV-DP DBS concentration while on TAF/FTC, fmol/punch	3223 (2349 – 4190)	2842 (2375 – 3474)	0.56	2528 (1202 – 2836)	1246 (266 – 2226*)	0.27
*range due to sample size						

Conclusions: In this sample of TG individuals switching from TDF/FTC to TAF/FTC for PrEP, there were no significant differences in TFV-DP DBS concentrations observed between users and non-users of GAHT.

EPB0206

HIV treatment outcomes after 10 years on ART in the TREAT Asia Observational Database (TAHOD) and Australian HIV Observational Database (AHOD)

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Background: An increasing number of people living with HIV (PLHIV) have been receiving antiretroviral therapy (ART) for many years. This study aimed to assess immunological and survival outcomes among PLHIV from Asia and Australia who have been on ART for at least a decade. **Methods:** PLHIV enrolled in TAHOD and AHOD, and on ART for at least 10 years, were included. Factors associated with CD4 cell counts during years 11 to 15 post ART

initiation were analysed using repeated measure linear regression. Survival after 10 years on ART was analysed using Fine and Gray competing risk regression.

Results: We included 4867 PLHIV from TAHOD and 2272 from AHOD. There were 3345 males (69%) in TAHOD, and 2110 (93%) in AHOD. The median lowest post-ART CD4 counts in the first decade was 178 cells/ μ L (IQR 92-287) for TAHOD and 250 cells/ μ L (IQR 140-374) for AHOD. Higher CD4 counts after 10 years were observed when the lowest CD4 levels were higher (101-200 cells/ μ L: difference= 35, 95%CI 18, 51; and >200 cells/ μ L: difference=125, 95%CI 107, 142) compared to CD4 \leq 50 cells/ μ L, and in those who had achieved CD4 \geq 500 cells/ μ L (achieved \geq 500 cells/ μ L then decreased to <500 cells/ μ L: difference=225, 95%CI 213, 236; and always \geq 500 cells/ μ L: difference=402, 95%CI 384, 420) compared to CD4 counts always <500 cells/ μ L in the previous decade. Prior PI-based regimen (difference=-17, 95%CI -33, -1) compared to no PI, and previous treatment interruptions (TI) of 14 days to 3 months and >6 months were associated with lower CD4 counts after 10 years (difference = -38, 95%CI -62, -15; and difference=-44, 95%CI -61, -27, respectively) compared to no TI.

Other factors associated with low CD4 counts were older age, higher viral load, hepatitis B/C co-infection, differing ART regimens, World Bank country income grouping and follow-up time. There was a total of 405 deaths (6%) after 10 years, with a mortality rate of 1.04 per 100 person-years. Controlling for confounders, females had better survival compared to males (sub-hazard ratio=0.65, 95%CI 0.46, 0.91).

Conclusions: Sustaining high CD4 levels and minimising TI have far-reaching benefits well beyond the first decade of ART.

EPB0207

Adverse pregnancy outcomes following dolutegravir transition among women delivering at surveillance sites in Eswatini

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Background: Dolutegravir (DTG) at conception was initially associated with neural tube defects (NTD) in the Botswana Tsepamo study; the association became nonsignificant with increased exposures. We conducted similar surveillance in Eswatini and describe overall birth outcomes in delivering women by HIV and antiretroviral therapy (ART) status.


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Methods: We surveilled deliveries across five government hospitals serving urban and rural populations in September 2021-September 2022. Routine data on HIV/ART status and pregnancy outcomes were collected from clinic records. Women delivering live/stillborn infants with birth defects were consented for interviews capturing detailed information and birth defect photographs; a medical geneticist conducted blinded review. We used Chi-square tests for comparison of infant outcome by maternal HIV/ART status.

Results: Among 24,830 deliveries, 82.3% (6,218/7,554) of HIV-positive women received DTG-based ART: 4,832 DTG preconception, 1,025 newly initiated on DTG during pregnancy, and 361 unknown regimen at conception but on DTG at delivery; 1,328 women were on non-DTG-based ART preconception (94.0% efavirenz). Major surface birth defects were identified in 0.4% of live/stillbirths with similar rates by HIV and ART status; 19 (17.9%) major birth defects were NTDs, with no difference between HIV-negative and HIV-positive women.

Compared to HIV-negative women, HIV-positive women were more likely to have a stillbirth (2.0% vs. 2.7%, respectively, $p<0.001$) and had slightly higher rates of low birth-weight (LBW) (11.8% vs. 13.2%, $p=0.004$) and preterm delivery (PTD) (10.3% vs. 11.7%, $p=0.001$).

There were no significant differences between HIV-positive women on DTG and non-DTG at conception for NTD ($p=0.62$), stillbirth ($p=0.19$), LBW ($p=0.35$), or PTD ($p=0.65$).

Women's HIV status and conception regimen	All deliveries (live/stillbirth)	Live births	All major birth defects (all deliveries)	NTD (all deliveries)	Stillbirths (among deliveries and miscarriages*)	LBW (<2500g among live births)	PTD (<37 weeks gestation among live births)
Total	24,830	24,263	106 (0.4)	19 (0.08)	593 (2.2)	2,966 (12.2)	2606 (10.7)
HIV-negative	17,270	16,915	74 (0.4)	13 (0.08)	369 (2.0)	2,000 (11.8)	1744 (10.3)
HIV-positive	7,554	7,348	32 (0.4)	6 (0.08)	223 (2.7)	966 (13.2)	862 (11.7)
DTG-based ART at conception	4,832	4,708	20 (0.4)	4 (0.08)	132 (2.6)	599 (12.7)	536 (11.4)
Non-DTG-based ART at conception	1,328	1,283	8 (0.6)	2 (0.16)	45 (3.2)	176 (13.7)	152 (11.8)
Unknown ART at conception	367	362	0	0	5 (0.8)	49 (13.5)	38 (10.5)
New on ART during pregnancy	1,027	988	4 (0.4)	0	39 (3.8)	142 (14.4)	136 (13.8)
Unknown HIV status	6	5	0	0	1 (2.0)	0	0

*Data available for 2,109 (82.4%) of 2,559 miscarriages. Of 2,109 miscarriages, 566 mothers were HIV-positive (7.0% miscarriages in 8,121 deliveries and miscarriages) and 1,500 HIV-negative (8.0% in 18,771 deliveries and miscarriages).

Table. Rate of birth outcomes by HIV and ART status, N (%).

Conclusions: With 80% of HIV-positive women receiving DTG-based ART (most at conception), HIV-positive women had slightly higher adverse pregnancy outcomes than HIV-negative women. There was no evidence that DTG preconception had an increased rate of any adverse outcome compared to non-DTG at conception.

EPB0208

Effect on weight changes upon discontinuation of dolutegravir from antiretroviral regimens among persons with HIV who experienced weight gain

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Background: Weight gain associated with dolutegravir (DTG) has been documented extensively. Among those experiencing weight gain, it is unclear if discontinuation of DTG results in weight loss.

The study objective was to describe the changes in weight while on DTG to changes in weight after discontinuing DTG.

Methods: A retrospective cohort study was performed among PWH (persons with HIV) in the North American AIDS Cohort Collaboration on Research and Design (NA-ACCORD) between 1/2010 - 12/2020. Inclusion criteria were: age ≥ 18 years, receipt of a DTG-containing regimen for ≥ 12 months followed by removing DTG from HIV regimen for ≥ 12 months, non-missing weight measurements, and any weight gain while on DTG.

The mean weights during the pre-(-12 to -6 months)/peri-(-3 to +3 months)/post-(+6 to +12 months) discontinuation periods were used for analysis. Wilcoxon signed rank test was used to compare median weight changes in PWH between pre-/peri- DTG removal and peri-/post- DTG removal. Comparisons of weight change by concomitant agents were performed using the Mann Whitney U test.

Results: Among the 176 PWH, mean (SD) age was 48.1 (12.1) years and 70% were male. Median (IQR) weight at time of DTG discontinuation was 85.4kg (74.2 - 99.9). Change in median (IQR) weight starting 12 months before discontinuing DTG to time of discontinuation was +2.7 (+1.3 - +4.8) kilograms compared to weight change after discontinuation +0.7 (-1.1 - +3), $p<0.001$.

There were no significant differences in weight change after discontinuing DTG between recipients of elvitegravir ($p=0.26$), protease inhibitors ($p=0.80$) and non-nucleoside reverse transcriptase inhibitors ($p=0.99$) in subsequent regimen. Median (IQR) change in weight after discontinuing DTG was not different between those with/without tenofovir alafenamide in the subsequent regimen (+0.7 [-1.0 -



+3.0] vs +0.8 [-2.3 – +3.5] kilograms, $p=0.88$). Similarly, no difference in median (IQR) weight change was observed in those with/without tenofovir disoproxil fumarate in subsequent regimen (+0.6 (-2.4 – +2.9) vs +0.7 (-1.1 – +3.1), $p=0.44$).

Conclusions: Rate of weight change was significantly different before/after discontinuation of DTG. Future studies needed to elucidate the effect of contributory factors such as CD4 restoration, underlying body size, optimal time and amount of weight resolution possible.

EPB0209

Real-world observational study in Europe on the effectiveness and safety of two-drug regimens containing an integrase inhibitor and reverse transcriptase inhibitor (COMBINE-2): week 96 stable switch population results

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Background: COMBINE-2, a multi-centre observational study, assessed effectiveness and safety of two-drug regimens (2-DR) of an integrase inhibitor (INI) and reverse transcriptase inhibitor in real-world clinical practice in UK, Spain, France, Belgium, Italy and Portugal.

Methods: Adult people with HIV (PWH) on 2-DR from 2014 onwards, were enrolled retrospectively or prospectively after appropriate consent. Viral suppression data after 96 weeks is reported here for stable-switch population. Viral failure is defined as two consecutive HIV RNA ≥ 50 copies/mL. Kaplan-Meier (KM) method was used to estimate the maintenance of viral suppression.

Results: 735 PWH were included (75.7% male, 66.9% white); 186 (25.3%) were on dolutegravir+rilpivirine [DTG+RPV] and 534 (72.7%) on dolutegravir+lamivudine [DTG+3TC]), 15 (2.0%) other 2-DR. At week 96, 696 (94.7%) remained on 2-DR.

Among the 186 PWH on DTG+RPV, 182 (KM estimate: 97.8%) maintained viral suppression Among the 534 PWH on DTG+3TC, 527 (97.7%) were maintained suppression after 96 weeks.

Among the 454 with resistance information, 446 (98.2%) maintained suppression after 96 weeks.

39 (5.3%) individuals had 47 drug-related AEs (Incidence rate per 100 patient-years [IR:3.4 [CI:2.5 – 4.5]), weight gain was most common (8 events). There were two drug-related SAEs (anxiety & depression; low mood), no deaths.

Baseline Characteristics at 2DR initiation	Stable-switch; Suppressed on previous treatment as defined by local guidelines N=735
Age, years, median (IQR)	54 (47-59)
Gender, n (%): Male; Female; Transgender	556 (75.7); 176 (24); 2 (0.3)
Ethnicity, n (%): White; Black; Other; Unknown	492 (66.9); 140 (19); 8 (1.1); 95 (12.9)
Duration of antiretroviral treatment (years): median (IQR)	10.2 (4.7-18.8)
Plasma VL log ₁₀ (cp/ml): median (IQR)	N=725, 1.3 (1.3-1.6)
CD4 count nadir and baseline count (cells/mm ³): N, median (IQR)	N=722, 250.5 (134-365)
Resistance mutations prior to switch – n (%) [NRTI; NNTRI; PI; INI]	N=509, 684 (534-920)
	227/454 (50.0)
	[105/454 (23.1); 91/454 (20.0); 147/454 (32.4); 9/454 (2.0)]

Table 1. Baseline characteristics of 2-DR stable-switch population.

Conclusions: This analysis demonstrated low discontinuation rate and high levels of virologic control over long term, demonstrating that DTG+RPV and DTG+3TC are effective and persistent regimen among virologically suppressed individuals in real world. Virological control among those with resistance mutations continued to be high.

EPB0210

Effectiveness and safety of bictegravir/emtricitabine/tenofovir alafenamide fixed-dose combination for the treatment of people living with HIV in Argentina: first interim report of the BICTARG cohort

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Background: Bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) fixed-dose combination (FDC) showed high rates of efficacy and good safety profile in clinical trials for people living with HIV (PLWH) as initial regimen (treatment naïve, TN) or switch strategy (treatment experienced, TE).

Real-world data for this FDC emerge from cohorts from high-income settings with no reports from resource-constrained settings, such as Latin America. Despite being recommended in Argentina, B/F/TAF is only available in the private health system.

Our institution is the main private HIV healthcare provider in the country with a population of almost 14000 active PLWH. We aim to describe the clinical use, effectiveness, and safety of B/F/TAF in a real-life clinical setting in Argentina.

Methods: The study design was an observational, retrospective open cohort study that examined TN and TE PLWH with a prescription of B/F/TAF from 10/2019 to 12/2021. Twenty-four and 48-week follow-up data were analyzed. Virological suppression at plasma HIV-1 RNA <200 and <50 copies/mL thresholds was assessed.

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Results: The study included 2671 PLWH: 315 TN (11.7%) and 2356 TE (88.2%). Baseline characteristics: median age (IQR) was 45 (37-53) years; 72.2% were male; 99.6% of Hispanic/Latin ethnicity. In TN group, median baseline viral load (VL, c/mL) and CD4 T-cell count (cells/mL) were: 39750 (7920-202000) and 329 (171-505); 34.9% had at least one comorbidity. For TE group, 89% had a baseline VL <50 and median CD4 T-cell count was 621 (436-843); 63.9% had comorbidities.

Predominant reasons for switch were simplification (54.8%) and toxicity prevention (24.1%). At 24-weeks, 99% and 99.7% of TN and TE continued on B/F/TAF, respectively. At 48-weeks, 99.3% and 99.5% of TN and TE were still on this therapy, respectively. Virological suppression rates (<200/<50 thresholds) for 24 and 48 weeks were 97.4/88% and 100/92% for TN; and 98.9/97% and 98.8/97% for TE, respectively.

Overall, prevalence of adverse events was <1% at 48 weeks, being the predominant weight gain. No virological failures were detected.

Conclusions: In PLWH on B/F/TAF FDC in Latin America, high levels of persistence and virological suppression were observed within one-year of follow-up. Adverse events were extremely infrequent and no cases of virological failure were documented.

EPB0211

Under-representation of women in HIV clinical trials: how can this still be happening?

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Background: 54% of people with HIV and 49% of new HIV diagnoses globally are women. Historically, women were significantly underrepresented in clinical trials resulting in insufficient safety and efficacy data. Barriers cited include lack of childcare, mistrust of medical systems, poor access to health care, non-compliance, and safety concerns in women of childbearing age.

Despite well evidenced physiological differences between men and women, clinical trials report outcomes as one homogenised group, meaning sex differences may be unreported and only emerge subsequently in real world data.

Here we investigate whether government strategies and third sector campaigns to include women in research have increased women's participation in clinical trials.

Description: We reviewed HIV phase 3 and 4 clinical drug trials registered, completed and with available results on ClinicalTrials.gov from 01/01/2018 to 01/01/2023 recruiting men and women. We collected data on interventions, region, eligibility criteria, participant numbers, ethnicity, and sex-related reporting.

Lessons learned: 25 Clinical trials were identified. Studies excluded were single sex (7), paediatric (1), non-drug (1) and non-HIV drug (3) trials leaving 13 studies: 7 evaluated INSTI regimens, 2 vaccines, 1 injectable ART and 2 DAAs. Studies were predominantly conducted in resource rich countries (11/13, 85%).

There were 3144 participants; 23% (735) cis women; 33% (1025) Black African/American. 12/13 (92%) trials requested exclusion of pregnant women with a requirement not to fall pregnant within the study period; 46% (6/13) further required women not to fall pregnant before and after the trials (range: 30 days prior to 6 weeks post). Median trial duration was two years. Exclusion of breastfeeding women and use of reliable contraception was required in 69% (9) and 61% (8) of trials respectively. Only one trial reported sex-disaggregated data and 4 commented on efficacy of interventions between sexes.

Conclusions/Next steps: Campaigns and policies have raised the profile of gender equality in research but not translated into proportionate representation of women in recent clinical trials. Women's participation in clinical trials remains low with persistent significant recruitment barriers and is not representative of the global HIV population.

More drastic measures including minimum proportion of women and mandatory reporting of sex-disaggregated data are urgently needed.

EPB0212

Implementation of long-acting cabotegravir and rilpivirine in vulnerable populations with complex needs: primary 48-week results of JABS

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Background: Long-acting cabotegravir plus rilpivirine is effective and safe HIV treatment in phase III randomised controlled clinical trials. Individuals in the wider community with risk factors for non-adherence who may benefit from this approach have been under-represented in registrational trials.

The injectable Antiretroviral feasibility Study (JABS) seeks to evaluate the effectiveness of long-acting regimens in a "real world" Australian setting, with inclusion of participants with complex medical needs and social vulnerability, including those with historical non-adherence or non-engagement who receive individualised adherence support through a multidisciplinary program (REACH) embedded within the clinical service.

Methods: JABS is a 48-week, single centre, single arm, open label study of long-acting cabotegravir 600mg plus rilpivirine 900mg maintenance therapy administered 2-monthly to adults with treated HIV-1. The primary endpoint is the proportion of attendances/delivery of injections within a seven-day dosing window over 12



months. Secondary and exploratory endpoints include proportions of missed/rescheduled appointments, use of oral bridging, discontinuations, virological failures, adverse events, multiple participant related outcomes and changes to service delivery.

Results: Sixty participants were enrolled by May 2022. Median age was 40 years (IQR 36–47); 15% (n=9) female at birth; 51% males and 89% females were born overseas. Complexity/vulnerability factors included social isolation (50%), mental health/AOD issues (30%), and financial instability (13%). Sixteen (27%) received enhanced support through REACH. Of 315 injection doses analysed to date, 97.8% injections were within prescribed windows. Seven doses given outside the dosing window were due to planned (n=4, all work-related) and unplanned (n=3) interruptions. Two oral bridging courses were required. There were 6 discontinuations, due to patient decision (n=3), CNS side-effects during oral lead-in (n=1), positive Hepatitis B serology (n=1), and drug interaction (n=1).

There were no virological failures or serious adverse events. Participant experience and service delivery outcomes are presented separately, and updated results will be presented with planned study completion in May 2023.

Conclusions: Adherence to 2 monthly intramuscular cabotegravir plus rilpivirine in an Australian clinic population is very high, including in those who access individualised adherence support. Real world efficacy and safety is comparable to phase III randomised clinical trials.

EPB0213

Effects of Atripla® and ethanol co-administration on rat caput epididymis tissues: a study on morphometry and androgen receptor immunoreactivity

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Background: High compliance antiretroviral drug formulations have often paralleled the uptake of an alcohol drinking lifestyle among male populations of Sub-Saharan African region with limited exploration on the combinational effects to reproductive health.

Therefore, this study investigates the in-vivo effects of the single-pill antiretroviral drug Atripla® and ethanol co-administration on androgen receptor immunoreactivity (AR-ir) of rat caput epididymis tissues.

Methods: Thirty-two adult male Sprague Dawley rats were randomly assigned into four groups of eight rats each. The control group received distilled water only (vehicle), while groups ATp, E and ATpE received Atripla® only, 6% ethanol only, both Atripla® and 6% ethanol respectively.

After ninety days treatment, the rats were euthanised and epididymides were harvested for histology. Atripla® was given at a dose of 27.5 mg/Kg via flavoured gelatine cubes while ethanol and vehicle were given *ad libitum*. Measurement of connective tissue area fraction, epididymal tubular diameter, area and epithelial height were conducted. Blood samples were collected to measure serum testosterone concentrations. Quantitative analysis of principal cell nuclei AR-ir was done using Image J® software.

Results: Inflammatory infiltrates, fibrosis and increased luminal debris were observed in treatment groups sections, with alterations being mild, moderate and severe in ATp, ATpE and E group respectively. Group E had significantly reduced epididymal tubular diameter and epithelial height values ($P<0.001$), while all morphometric values for ATp and ATpE groups were comparable to group C. Weak and significantly reduced AR-ir was observed in the tissues of all treatment groups compared to the study control group ($P<0.05$, ANOVA). Group E had the least AR-ir percentage value followed by EATp and ATp respectively. Changes in testosterone levels among the treatment groups were not significant.

Conclusions: This study shows that tissue alterations caused by Atripla® and ethanol co-administration are detrimental to epididymis function. However, the mild effects of Atripla® only treatment observed signal success of single-pill therapy in the mitigation of adverse effects. The possible ameliorative interaction of Atripla® and ethanol observed warrants further investigation.



EPB0214

Evaluation of prevention of parent to child transmission services available for pregnant women living with HIV in Larkana District, Sindh, Pakistan

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Background: The 2019 outbreak in children in Larkana, Pakistan revealed bridging between high risk groups and general population. Since then, there is a steady increase in new adult and paediatric HIV infections. We evaluated Prevention of Parent to Child Transmission (PPTCT) services available in Larkana District, Pakistan.

Description: We assessed 'on-site' capacity at 47 Peoples Primary Healthcare Initiative (PPHI)-run facilities providing maternal newborn and child health (MNCH) services in Larkana District using a questionnaire for facility personnel.

We also observed prospective patient flow and HIV/HBV/HCV testing trends for 1 month at two government-run PPTCT centers.

Lessons learned: Of 47 PPHI-run MNCH facilities, in Larkana district, 23 had Basic Health Unit (BHU) status, 6 BHU+ (24hour BHU services) and 18 were dispensaries[FM1] [VS2]. Most respondents were physicians (38%) or lady health visitor/midwives (40%).

Almost half had been in service for ≥ 5 years. HIV testing was offered at all clinics. PPTCT guidelines were available at 8 of 47 facilities. 31 facilities provided safe delivery and 6/16 correctly referred for safe delivery. 1 facility provided ART and 17/46 correctly referred. Formal training for HIV care and prevention had never been conducted by national or provincial program at 42/47 PPHI facilities. Only 9/31 (29%) centers providing safe delivery and 5/35 centers providing couples HIV testing and counselling (CHTC) had received training in previous two years.

At two government-run PPTCT facilities 2378 women sought antenatal care and 592 women delivered during one month. At one, 94-98% of women were offered testing for HIV, HBV and HCV, but only 7.5% were offered syphilis testing. At other, 46% of women were offered testing for HIV, HBV and HCV, and syphilis testing was similar (43%). Reasons for offering testing varied between both centers;

prior history of blood transfusion and surgery accounted for almost 100% testing decisions in one but for only 50% in other.

Conclusions/Next steps: A robust PPTCT strategy relevant to this concentrated, resource-constrained epidemic setting needs to be developed with validation of testing criteria (risk-assessment based or universal) deploying multiplex testing platforms (HIV/syphilis, HBV/HBC). Regular training and skill-building for providing comprehensive care to PWLHIV is urgently needed.

EPB0215

Evaluation of clinical outcomes of pregnant women living with HIV receiving prevention of parent to child transmission services in Larkana District Pakistan

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Background: Over the past two decades, Prevention of Parent To Child Transmission (PPTCT) services for pregnant women living with HIV (PWLHIV) in Larkana District Pakistan have concentrated on women with known HIV+ status.

We evaluated clinical outcomes in women who received PPTCT interventions during pregnancy in Larkana district from program inception in 2006 till December 2021.

Methods: We conducted a retrospective review of available medical records of PWLHIV registered for PPTCT during pregnancy between 2006 till December 2021 at 2 public sector hospitals. Files of HIV-exposed infants were also reviewed.

Results: Of a total of 359 PPTCT encounters during study period, medical records were available for 237 pregnant women. Most (87.9%) were illiterate, all were housewives and none reported being a key population member. Testing data of spouses was available for 78% and 60.9% of tested spouses were HIV positive. 75.1% of women had



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previous children (178/237) and 72 (40.4%) had at least one child who had died. Out of 117 women who were diagnosed with HIV from 2019 onwards, 45 (58.8%) had at least 1 child who died. Co-infections with HCV (10.7%) and HBV (3.8%) were common. A high proportion (51.5%) had anaemia (Hb<10.0gm/dl). Only 1.8% had viral load ≥ 1000 copies/ microliter at time of registration, but 83.9% had low grade viremia (50-1000 copies) with a not-zero risk of transmission.

94.5% of women registered for care within 14 days of diagnosis and 99.6% initiated ART at the registration visit. Infant prophylaxis was initiated 92.6% of HIV-exposed infants within 1 day of birth.

Of 223 HIV-exposed infant records reviewed, 43% had low birthweight (<2500g). HIV prevalence among fathers of HIV-exposed children was 57.5% (N=113 tested). HIV prevalence among siblings of HIV-exposed children was 8.8% (N=181 tested). HIV testing was completed in 67.9% of infants and among them, HIV prevalence was 7.6%.

Conclusions: A high proportion of PWLHIV with previous children had at least one child death. Maternal anaemia and co-infections (HBV and HCV) were common.

There was considerable lapse in follow-up testing of HIV-exposed infants. The HIV Care Program needs to address identified gaps in service delivery for PWLHIV urgently.

EPB0216

Participant-reported outcomes with long-acting lenacapavir-based regimens among heavily treatment-experienced people living with HIV in the CAPELLA clinical trial

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Background: Heavily treatment-experienced (HTE) people living with HIV (PLWH) and multidrug resistance have limited treatment options and often experience symptoms that negatively impact their health-related quality of life (HRQoL). Novel therapeutic options that have activity against resistant HIV, are more convenient, and require less frequent administration are needed for HTE PLWH. Lenacapavir is a first-in-class capsid inhibitor that can be administered subcutaneously (SC) twice a year.

In an ongoing Phase 2/3 study (CAPELLA; NCT04150068) of HTE PLWH with failing antiretroviral regimens, lenacapavir SC added to an optimized background regimen (OBR) led to high rates of virologic suppression and was generally well tolerated.

In this analysis, we describe participant-reported outcomes (PROs) from CAPELLA through week 52 (W52).

Methods: Scores from 5 validated instruments were collected at baseline and through W52: EuroQol-5 Dimensions-5 Levels (EQ-5D-5L) index, EQ-5D-5L visual analogue scale (VAS), Short Form-36 (SF-36), HIV Symptom Index

(HIV-SI), and Numeric Pain Rating Scale (NPRS). The safety analysis set, including all participants who received ≥ 1 dose of study drug, was used for all analyses.

Results: Up to 64 of 72 enrolled participants had data available through W52. Mean EQ-5D-5L index, EQ-5D-5L VAS, SF-36 physical component, and SF-36 mental component scores were 0.87, 81, 48.5, and 48.4, respectively, at baseline and 0.83, 86, 49.9, and 48.0 at W52. Scores remained relatively consistent over time (<7% change), with values near US population norms (0.851 for EQ-5D-5L index, 80.4 for EQ-ED-5L VAS, 50.0 for SF-36). For 15 of 20 HIV-related symptoms assessed via HIV-SI, fewer participants reported bothersome symptoms at W52 than at baseline. NPRS scores at the time of injection varied by individual, with mean scores of 3.9, 5.1, and 4.4 at first (W0), second (W26), and third injection (W52).

Conclusions: These PRO results demonstrate high, stable HRQoL over time, supporting the tolerability of SC lenacapavir plus OBR. The PRO results align with the favorable safety profile and low discontinuation rates of lenacapavir previously reported from the CAPELLA trial. These data, reflecting the perspectives of people treated, highlight the potential for lenacapavir plus OBR to decrease most HIV symptoms, without compromising HRQoL, for HTE PLWH.

EPB0217

The relationship between tenofovir urine and tenofovir diphosphate dried blood spot concentrations among transgender adults switching from tenofovir disoproxil fumarate/emtricitabine to tenofovir alafenamide/emtricitabine for HIV pre-exposure prophylaxis

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Background: Traditional methods of performing therapeutic drug monitoring (TDM) are invasive and not timely. A real-time, urine-based tenofovir (TFV) assay may overcome TDM issues and be a useful tool to measure adherence in individuals taking tenofovir-based PrEP. Among transgender (TG) persons, it is unclear if use of gender affirming hormone therapy (GAHT) among TG individuals alters the relationship between urine (u)TFV and TFV diphosphate (DP) dried blood spot (DBS) concentrations. Study objectives were to:

- Assess the correlation between uTFV and TFV-DP concentrations while taking tenofovir disoproxil fumarate/emtricitabine (TDF/FTC) and tenofovir alafenamide (TAF)/FTC and
- Determine if use of GAHT impacts this relationship among TG persons taking PrEP.



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Methods: A cohort study was performed among TG individuals enrolled in a clinical trial evaluating switching from TDF/FTC to TAF/FTC for PrEP. Inclusion criteria for this study were age ≥ 18 years old, TG identity, HIV negative (antigen/antibody test), use of both TDF/FTC and TAF/FTC for ≥ 12 weeks, and availability of stored urine and DBS samples for TFV-DP measurement while on both PrEP products. uTFV (UrSure) and TFV-DP (University of Colorado) concentrations were evaluated twice: once while on ≥ 12 weeks of TDF/FTC and once after switching to TAF/FTC for ≥ 12 weeks. The relationship between uTFV and TFV-DP concentrations was assessed using Pearson correlation coefficient.

Results: 37 individuals who met inclusion criteria. The median (interquartile range, IQR) age was 33.0 (28.5 – 39.0) years and two thirds were assigned male at birth. Seventy-three percent used GAHT. There was no significant correlation between uTFV and TFV-DP concentrations while taking TDF/FTC ($r^2=0.17$, 95% confidence interval, CI: -0.16 – 0.47, $p=0.31$). Conversely, uTFV and TFV-DP concentrations were significantly correlated when participants were taking TAF/FTC ($r^2=0.66$, 95% CI: 0.44 – 0.81, $p<0.001$). Significant correlations were observed for users and non-users of GAHT while taking TAF/FTC but not TDF/FTC (Table).

		Correlation coefficient (r^2)	95% Confidence Interval	P-value
On TDF/FTC	GAHT use	0.22	-0.17 – 0.56	0.27
	No GAHT use	-0.08	-0.67 – 0.58	0.83
On TAF/FTC	GAHT use	0.47	0.13 – 0.72	0.01
	No GAHT use	0.94	0.77 – 0.98	<0.001

Table.

Conclusions: Among TG individuals taking PrEP, uTFV measurement could be a useful adherence tool while taking TAF/FTC but not TDF/FTC, regardless of use of GAHT. This may be due, in part, to differences in saturation of renal elimination pathways.

EPB0218

Switching to dolutegravir/lamivudine (DTG/3TC) is non-inferior to continuing tenofovir alafenamide (TAF)-based regimens at Week 196: TANGO subgroup analyses

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Background: Switching to DTG/3TC from 3- or 4-drug TAF-based regimens showed durable high efficacy in virologically suppressed adults with HIV-1 through Week (W) 196 in the TANGO study. To further investigate DTG/3TC efficacy

in TANGO participants who switched to DTG/3TC on Day 1 and those who switched at W148, we present Snapshot virologic response by subgroup based on demographic and baseline disease characteristics and baseline third agent class.

Methods: TANGO is an open-label, multi-center, randomized, phase 3 study assessing efficacy and safety of switching to DTG/3TC vs continuing TAF-based regimens. Adults with HIV-1 RNA <50 c/mL on TAF-based regimens for >6 months without prior virologic failure or documented NRTI or INSTI resistance were eligible. Participants were stratified by baseline third agent class and randomized 1:1 to switch to DTG/3TC on Day 1 (early-switch [ES] group) or continue TAF-based regimens for 144 weeks. Participants who continued TAF-based regimens and maintained virologic suppression at W144 switched to DTG/3TC at W148 (late-switch [LS] group).

Results: At W196, TANGO included 369 ES group and 298 LS group participants treated with DTG/3TC for 196 and 48 weeks, respectively. Few ES participants (3/369 [$<1\%$]; 95% CI, 0.0%-1.7%) and 0/298 (95% CI, 0.0%-0.0%) LS participants had HIV-1 RNA ≥ 50 c/mL at W196 by Snapshot analysis (ITT-E). Overall ES group and LS group Snapshot virologic response rates were consistent with rates across their respective subgroups related to demographic characteristics, baseline disease characteristics, and baseline third agent class at W196 (Figure). Safety was consistent across subgroups within ES and LS groups. Confirmed virologic withdrawal criteria were met by 1/369 ($<1\%$) ES and no LS participants through W196, with no resistance observed.

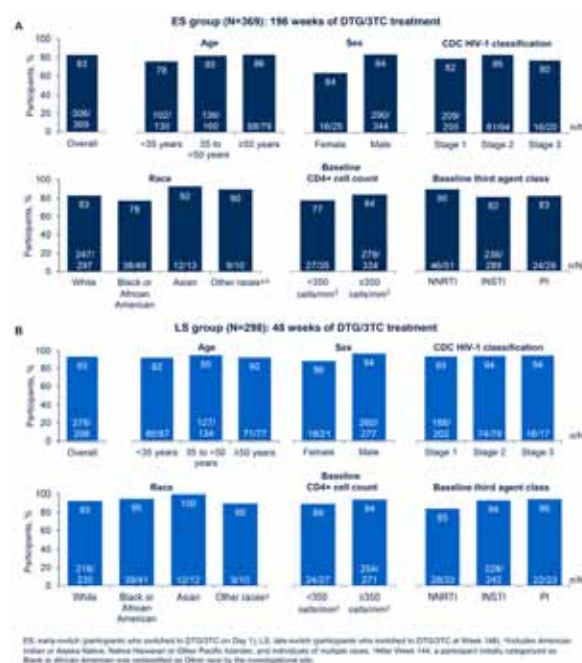


Figure. Proportion of participants in the (A) ES and (B) LS DTG/3TC groups with HIV-1 RNA <50 c/mL at week 196 overall and by subgroup (Snapshot, ITT-E).

Conclusions: These results support that switching to DTG/3TC from TAF-based regimens effectively maintains virologic suppression across different demographic and baseline characteristic subgroups at 48 and 196 weeks.



EPB0219

Islatravir (MK-8591) has no meaningful effect on the pharmacokinetics of atorvastatin and metformin following coadministration

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Background: Islatravir (ISL) is a deoxyadenosine analog reverse transcriptase inhibitor being studied for HIV-1 treatment. Because people living with HIV often have comorbidities such as dyslipidemia and/or type 2 diabetes mellitus, we investigated the effects of ISL coadministration on atorvastatin (ATV) and metformin (MET) pharmacokinetics (PK). Based on preclinical drug interaction data, no interaction was expected.

Methods: MK-8591-040 was a 2-period fixed-sequence, open-label, drug-drug interaction study of ISL on ATV and MET PK in healthy adult participants. In Period 1, participants were coadministered a single dose of ATV (20 mg) + MET (1000 mg). Following a 5-day minimum washout period, participants received ATV (20 mg) + MET (1000 mg) coadministered with a single oral dose of ISL (60 mg) in Period 2. Blood samples were collected up to 72 hours postdose in each period to characterize the plasma PK of ATV and MET. PK parameters assessed included area under the concentration-time curve from 0 hours to infinite time ($AUC_{0-\infty}$), maximal concentration (C_{max}), and trough concentration at 24 hours (C_{24}). Safety and tolerability were monitored throughout the study.

Results: Fourteen participants (n = 10 male, n = 4 female) aged 22-55 years were enrolled and completed the study. Atorvastatin and MET plasma PK profiles were generally similar after administration of ATV + MET with or without ISL. The geometric least-squares mean ratios (GMRs; 90% confidence interval [CI]; ATV + MET + ISL / ATV + MET) for ATV and MET PK parameters are summarized in the *Table*. Co-administration of a single oral dose of ISL with ATV + MET was generally well tolerated.

PK Parameter	ATV	MET
	ATV + MET + ISL / ATV + MET GMR (90% CI)	ATV + MET + ISL / ATV + MET GMR (90% CI)
$AUC_{0-\infty}$	1.04 (1.00, 1.10)	0.87 (0.79, 0.96)
C_{max}	0.86 (0.72, 1.04)	0.80 (0.70, 0.91)
C_{24}	1.01 (0.93, 1.10)	1.13 (1.00, 1.26)

Table. Summary Statistics of ATV and MET Plasma PK Parameters (n = 14)

Conclusions: Coadministration of ATV + MET with a single oral dose of ISL did not have a clinically meaningful effect on the PK profiles of either ATV or MET.

EPB0220

Probability of single tablet regimens BIC/FTC/TAF, E/C/F/TAF, RPV/FTC/TAF, DTG/RPV or DTG/ABC/3TC discontinuation at 18 months in real life settings in the ANRS-CO3 - AQUIVH-NA cohort

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Background: Single tablet regimens (STRs) have been associated with improved adherence to treatment for people living with HIV (PLWH) and now account for the vast majority of treatments in France. However, the probability of STRs discontinuation and virological failure (VF) in suppressed HIV RNA persons who start STRs in real life settings is unknown.

Methods: PLWH included in the French regional prospective cohort ANRS-CO3-AQUIVH-NA were included if they had a suppressed HIV RNA and CD4 count available when switching to one of the following regimens BIC/FTC/TAF, E/C/F/TAF, DTG/RPV, RPV/FTC/TAF or DTG/ABC/3TC at least once during their follow-up between 2018/01/01 and 2021/12/31.

Results: During the period, 2934 PLWH have received at least once STRs, which represent 3243 STRs different lines (299 PLWH add two or more STRs), 1182 BIC/FTC/TAF, 307 E/C/F/TAF, 413 DTG/RPV, 1147 RPV/FTC/TAF, 194 DTG/ABC/3TC regimens. Women represented 29% of PLWHA, ranging from 26% on BIC/FTC/TAF to 33.0% on DTG/ABC/3TC. Median age was 52.5 years ranging from 50.5 years on E/C/F/TAF and DTG/RPV to 55.9 years DTG/RPV; 17.9% were AIDS stage, ranging from 14.7% on RPV/FTC/TAF to 22.2% on DTG/ABC/3TC; 13.5% were sub-saharian African origin ranging from 8% on DTG/RPV to 16.2% on RPV/FTC/TAF. The median CD4 count was 702 cells/mm3 [IQR: 510-922].

At 18 months of follow-up, the cumulative probability (Aalen Johansen method) of STRs discontinuation was 19.5% overall [IQR: 18.1-21.0%], 16.9% [IQR: 13.0-21.1%] for DTG/



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RPV, 17.0% [IQR: 14.8–19.3%] for RPV/FTC/TAF, 17.8% [IQR: 15.4–20.2%] for BIC/FTC/TAF, 26.3% [IQR: 21.3–31.6%] for E/C/F/TAF, and 37.9% [IQR: 30.7–45.0%] for DTG/ABC/3TC.

The main reported causes of discontinuation were side-effects (33%), physician choice (21%) non-optimal treatment (18%) and person's choice (12%).

At 18 months, 3.3% [IQR: 2.6–4.0%] of PLWH had a cumulative probability of VF on STRs (two consecutive HIV RNA >50 cp/ml or one >1000 cp/ml), ranging from 2.3% [IQR: 1.5–3.4%] on RPV/FTC/TAF and 7.7% [IQR: 3.9–13.2%] on DTG/ABC/3TC.

Conclusions: The highest risk of discontinuation at M18 was observed on the E/C/F/TAF and DTG/ABC/3TC strategies. Virus-suppressed PLWH who switched to one of the STRs maintained virologic suppression with a low risk of VF observed in 3.3% of PLWH.

EPB0221

Cabotegravir + rilpivirine long-acting outcomes by sex at birth, age, race, and body mass index: a subgroup analysis of the Phase 3b SOLAR study

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Background: Cabotegravir + rilpivirine (CAB+RPV) is a complete long-acting (LA) every 2 months (Q2M) regimen for maintaining HIV-1 virologic suppression. The Phase 3b SOLAR study demonstrated noninferior efficacy of CAB+RPV LA Q2M vs. continuing daily oral bictegravir/emtricitabine/tenofovir alafenamide (BIC/FTC/TAF) at Month (M) 12, with 90% of switch participants preferring LA therapy.

We present outcomes within key subgroups who received CAB+RPV LA.

Methods: SOLAR is a Phase 3b, randomized (2:1), open-label, multicenter, noninferiority study assessing switching virologically suppressed adults to CAB+RPV LA Q2M vs. continuing daily BIC/FTC/TAF.

Data from participants receiving CAB+RPV LA were analyzed by sex at birth, age, race, and body mass index (BMI). Endpoints assessed at M12 included the proportion with plasma HIV-1 RNA ≥50 copies/mL and <50 copies/mL

(FDA Snapshot algorithm), incidence of confirmed virologic failure (CVF; two consecutive HIV-1 RNA ≥200 copies/mL), change from baseline in CD4⁺ cell counts, and three single-item questions exploring an individual's fear of disclosure, anxiety relating to adherence requirements, and daily reminder of their HIV status (FAD questions).

Results: Overall, 447 participants received CAB+RPV LA (modified intention-to-treat exposed population); 17% were female sex at birth, 19% were aged ≥50 years, 69% were White, 21% had a BMI ≥30 kg/m². At M12, rates of virologic non-response (HIV-1 RNA ≥50 copies/mL) and suppression (HIV-1 RNA <50 copies/mL) with CAB+RPV LA ranged 0–2% and 89–92%, respectively, across subgroups. Overall, 2/447 (<1%) participants had CVF (Table).

Changes from baseline in CD4⁺ cell counts were similar between subgroups. After 12 months on CAB+RPV LA, the proportion of participants reporting "never"/"rarely" for the three single-item FAD questions increased from baseline across all subgroups.

	Overall		Sex at birth				Age (years)							
	CAB+RPV LA (n=447)	BIC/FTC/TAF (n=337)	CAB+RPV LA		BIC/FTC/TAF		CAB+RPV LA		BIC/FTC/TAF		CAB+RPV LA		BIC/FTC/TAF	
Key inflammatory markers			Female (n=78)	Male (n=369)	Female (n=81)	Male (n=256)	<35 (n=162)	35–50 (n=172)	≥51 (n=113)	<35 (n=162)	35–50 (n=172)	≥51 (n=113)	<35 (n=162)	35–50 (n=172)
Baseline	169.9 (37.1)	169.4 (37.4)	171.6 (35.5)	167.6 (38.6)	177.4 (36.8)	166.4 (37.6)	157.9 (34.5)	166.2 (39.6)	171.9 (39.4)	166.5 (36.7)	167.9 (37.3)	173.3 (39.7)	167.9 (37.3)	173.3 (39.7)
Change at M12	34.4 (26.5)	32.2 (26.5)	34.9 (27.5)	32.6 (26.4)	33.1 (25.2)	34.1 (26.6)	15.1 (28.4)	32.6 (26.5)	34.1 (26.6)	34.1 (26.6)	34.1 (26.6)	34.1 (26.6)	34.1 (26.6)	34.1 (26.6)
Baseline	4.4 (2.8)	2.7 (2.7)	5.7 (2.5)	3.9 (2.5)	4.8 (2.5)	3.3 (2.5)	1.9 (2.5)	4.4 (2.7)	7.5 (2.5)	2.9 (2.5)	3.8 (2.5)	2.6 (2.5)	2.6 (2.5)	2.6 (2.5)
Change at M12	-4.9 (2.8)	9.5 (2.8)	-4.4 (2.8)	-2.2 (2.3)	-1.7 (2.7)	9.9 (2.8)	9.8 (2.8)	-1.9 (2.8)	-4.1 (2.8)	1.1 (2.8)	-2.2 (2.8)	8.6 (2.8)	8.6 (2.8)	8.6 (2.8)
Baseline	2.3 (2.4)	1.9 (2.3)	4.4 (2.8)	1.9 (2.3)	2.3 (2.3)	1.9 (2.3)	1.7 (2.3)	2.3 (2.3)	3.4 (2.3)	2.9 (2.3)	1.7 (2.3)	2.1 (2.3)	2.1 (2.3)	2.1 (2.3)
Change at M12	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)	1.9 (2.3)
Baseline	1.1 (2.4)	1.07 (2.37)	1.13 (2.46)	1.09 (2.36)	1.10 (2.36)	1.04 (2.32)	1.11 (2.47)	1.09 (2.34)	1.10 (2.35)	1.02 (2.46)	1.08 (2.34)	1.10 (2.37)	1.10 (2.37)	1.10 (2.37)
Change at M12	0.86 (2.25)	0.86 (2.19)	0.82 (2.22)	0.87 (2.25)	0.86 (2.25)	0.84 (2.19)	0.86 (2.22)	0.86 (2.19)	0.86 (2.19)	0.86 (2.19)	0.86 (2.19)	0.86 (2.19)	0.86 (2.19)	0.86 (2.19)
Baseline	1642 (481)	1622 (476)	1602 (486)	1642 (480)	1617 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)	1619 (480)
Change at M12	17 (56)	64 (54)	-69 (56)	32 (57)	168 (56)	64 (56)	-6 (56)	36 (57)	51 (56)	4 (57)	134 (56)	134 (56)	134 (56)	134 (56)
Baseline	721 (217)	707 (247)	673 (246)	738 (267)	708 (266)	689 (259)	683 (242)	688 (263)	707 (248)	708 (263)	708 (263)	708 (263)	708 (263)	708 (263)
Change at M12	-118 (219)	-168 (263)	-164 (262)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)	-168 (266)

Table. SOLAR Key Inflammation Marker Changes from baseline by Treatment Groups and Key Subgroups.

Conclusions: Switching to CAB+RPV LA Q2M from BIC/FTC/TAF was efficacious irrespective of sex at birth, age, race, or BMI, while also providing emotional well-being benefits, including alleviation from the fear of disclosure and anxiety surrounding adherence.

EPB0222

A Bayesian update on discontinuation of cabotegravir and rilpivirine using cohort data

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Background: Long-actig (LA) antiretroviral therapy with cabotegravir (CAB) and rilpivirine (RPV) has become available as a routine treatment option for many people with HIV (PWH). There is ongoing concern about discontinuation of CAB/RPV LA, e.g. due to injection site reactions, and virologic failure. Available data mainly derives from the two-monthly (Q8W) arm of the ATLAS-2M trial (n=522), where many participants had been carried over from ATLAS (n=195), possibly biasing results.



We aimed to perform a Bayesian update of the available information, using cohort data from a large single HIV center.

Methods: Posterior distributions of the probability of discontinuation and virologic failure were estimated using prior information from ATLAS-2M (Q8W only) and the likelihood for both events from data of PWH initiating two-monthly CAB/RPV LA between January and December 2021 at a single large HIV outpatient clinic, MVZ München am Goetheplatz, Germany.

Results: 94 virologically suppressed treatment experienced PWH with at least one injection of CAB/RPV were included for analysis, of which 17 (18.1 %) discontinued treatment before 48 weeks. In 1 (1.1 %) discontinuation was due to virologic failure with emerging resistance. The updated probability of discontinuation within 48 weeks after initiation of CAB/RPV resulted in an estimate of 8.7% (CI95 8.0; 9.5), while it was 1.6% (CI95 1.3; 1.9) for virologic failure.

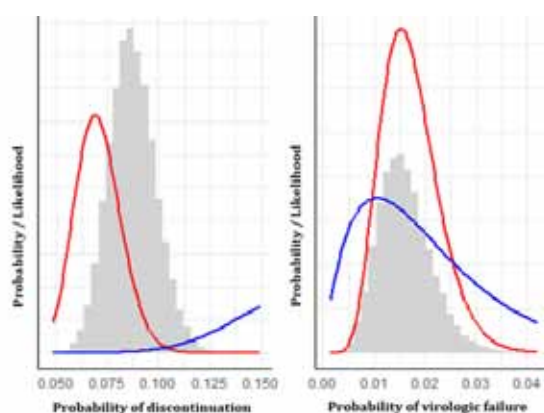


Figure 1: Density of the probability of discontinuation (left) and virologic failure (right), using a Bayesian update of clinical trial data. Red lines indicating the prior distribution of each of the two events, assuming an underlying beta-distribution, while blue lines indicating the likelihood function derived from the cohort data used for analysis. Histograms are illustrating the posterior distribution of the two events. Probabilities were re-scaled (factor 100) for better visualization.

Conclusions: The estimated probability of discontinuation of CAB/RPV LA (Q8W) was found to be about 8.7% (CI95 8.0; 9.5) when combining prior information from ATLAS-2M (6.9 % Q8W) with findings from real-life data (18.1 %). As the prior dominated the likelihood due to the higher number of participants, this estimate might be biased downwards. The updated probability of virologic failure was found to be about 1.6% (CI95 1.3; 1.9). More real-life data and tools for person selection are needed to establish the role of CAB/RPV LA.

EPB0223

Real-world utilization and effectiveness of long-acting cabotegravir+rilpivirine in the United States: Trio Cohort study

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Background: Cabotegravir+Rilpivirine (CAB+RPV) is the first FDA-approved long-acting (LA) injectable antiretroviral therapy (ART) indicated for the maintenance of virologic suppression (HIV-1 RNA <50 copies/mL) among ART-experienced people with HIV (PWH). CAB+RPV LA can be administered every month or every two months. This study assessed utilization and effectiveness of CAB+RPV LA in real world settings in the US.

Methods: Adult PWH who received ≥1 documented dose of CAB+RPV injections through September 2022 were identified using electronic medical records from Trio Health HIV Network. Results were stratified by baseline viral load (VL), defined as the most recently recorded VL prior to CAB+RPV injections (VL <50 or ≥50 copies/mL).

Results: 190 PWH who received ≥1 dose of CAB+RPV are included in this analysis. Of them, 189 (99.5%) were treatment-experienced (1 with unknown treatment history); 170 (89.5%) had VL <50 copies/mL at baseline (BL-suppressed), 15 (8%) VL ≥50 copies/mL (BL-viremic), and 5 (3%) unknown VL at baseline. Median follow-up between first dose of injections to analysis date was 5.5 months (IQR: 3.1, 8.2).

BL-suppressed individuals received median 2 injections and 162 (95%) remained on CAB+RPV at time of analysis. Of 49 BL-suppressed with ≥1 VL recorded after initial injections (follow-up VL), 47 (96%) had VL <200 copies/mL and 41 (84%) had VL <50 copies/mL. Of 166 BL-suppressed with baseline BMI, 60 (36%) had BMI ≥30; 17 (28%) individuals with high BMIs had follow-up VL with 15 (88%) having follow-up VL <200 copies/mL.

Among 15 BL-viremic individuals, 7 had follow-up VL (all <200 copies/mL, 3 (43%) <50 copies/mL). Of 14 BL-viremic with baseline BMI, 6 (43%) had BMI ≥30, of them 3 (50%) had follow-up VLs, all had <200 copies/mL.

n (%) unless specified	BL-suppressed <50 copies/mL n=170	BL-viremic (≥50 copies/mL) n=15
Male Gender	116 (68)	8 (53)
White Race	76 (45)	5 (33)
Median Age (IQR)	46 (36, 55)	38 (32, 44)
Median BMI kg/m ² (IQR)	28 (25, 32)	28 (26, 32)
Recorded VL post initial dose of CAB+RPV injection	49 (29)	7 (47)
Follow-up VL <50 copies/mL	41/49 (84)	3/7 (43)
Follow-up VL <200 copies/mL	47/49 (96)	7/7 (100)

Table. Characteristics of PWH with ≥1 CAB+RPV Injection by Baseline Viral Load


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Conclusions: These early data demonstrated high levels of virologic control suggesting that CAB+RPV was effective among virologically suppressed individuals. Future analyses with longer observation intervals will allow for understanding outcomes among viremic individuals and with different dosing schedules.

EPB0224

Association of oral lead-in and persistence on cabotegravir and rilpivirine long-acting in 'real-life'

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Background: Before the initiation of long-acting (LA) cabotegravir and rilpivirine (CAB/RPV), oral lead in (OLI) is an option, intending to rule out potential (systemic) side effects. The desire of people with HIV (PWH) to skip this phase is often in contrast to the wish of health care professionals to 'test' the drug in a short acting form before administering the first LA dose. This study aimed to add to the understanding of the relevance of OLI with regards to persistence on CAB/RPV.

Methods: Retrospective cohort study in PWH exposed to at least one dose of CAB/RPV orally (as OLI) and/or intramuscularly from January 2021 onwards. Persistence on CAB/RPV LA was compared between PWH, receiving at least one dose of CAB/RPV LA with or without OLI. Analysis was repeated after stratification for previous antiretroviral regimen (dolutegravir containing yes/no). Standard and modified log-rank tests (using Peto-Peto-Prentice weighing), were used to compare event-times in the overall and the early time on treatment, respectively.

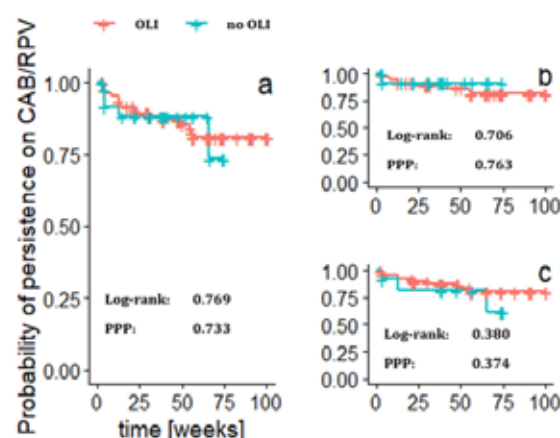


Figure 1. Survival curves for the entire study sample with exposure to at least one dose of long acting cabotegravir/rilpivirine (a), as well as for the strata of a previous dolutegravir containing (b) versus non-dolutegravir containing (c) antiretroviral therapy regimen. p-values are based on standard log-rank tests as well as using Peto-Peto-Prentice (PPP) weighing.

Results: 161 PWH were included into the analysis; 122 (75.8%) received OLI. While 8 (6.6 %) did not proceed to LA after OLI, in only one (0.8 %) a potential side effect was the reason. Times of persistence on CAB/RPV LA was not significantly different for PWH with and without OLI ($p=0.769$). Stratifying for ART prior to CAB/RPV yielded in similar results, whether the previous ART was dolutegravir containing ($p=0.706$, fig 1b) or not ($p=0.380$, fig 1c).

Conclusions: Rates of discontinuation during OLI was low and time of persistence on CAB/RPV LA was not significantly different between PWH with and without OLI. Therefore, if clinically necessary, its omission seems to be safe in general. Particularly in the subgroup of PWH without prior DTG-containing ART, the validity of our findings might be limited by low sample size.

EPB0225

A Site-driven CQI intervention improves advanced HIV disease screening coverage among newly diagnosed people living with HIV in Malawi

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Background: Universal ART has dramatically reduced mortality for people living with HIV (PLHIV), but advanced HIV disease (AHD) amongst those newly diagnosed continues to cause unacceptably high mortality. Malawi Ministry of Health (MoH) HIV care and treatment guidance emphasizes routine advanced HIV disease screening of all newly diagnosed PLHIV to help reduce mortality. Implementation of AHD screening in Malawi has been suboptimal with low rates of screening coverage. We conducted a brief, continuous quality improvement (CQI) intervention to improve AHD screening.

Methods: Fourteen high-volume health facilities were selected for site-led targeted CQI interventions with supervision by program leadership. The CQI was implemented at targeted sites (N=7) in February 2022 with others serving as controls (N=7). Introductory lectures reviewing AHD best practices were followed by site-level planning to identify and address implementation gaps. Exemplary interventions included optimizing clinic flow, clarifying provider roles, and addressing AHD testing commodity supply chain gaps. Impact on the number of newly diagnosed PLHIV screened for AHD was assessed using deidentified program data and the difference-in-differences (DD) method implemented via Tobit regressions incorporating district random-effects and year fixed-effects.

Results: Before CQI implementation, the proportion of people newly diagnosed with HIV completing AHD screening was significantly lower in intervention versus control sites (68 vs. 92%) ($p<0.001$) (Figure 1). After CQI implementa-



tion, AHD screening coverage improved at all sites, with a greater increase at target sites with the new proportions now similar (98% vs 99%). The DD estimate or the effect attributable to the CQI was +24 percentage points (95% CI=3.06, 45.2) ($p=0.025$).

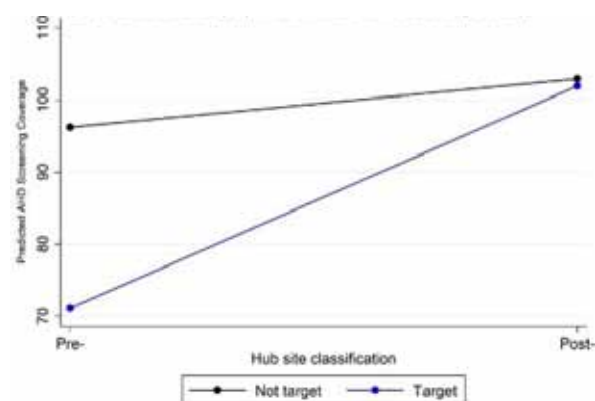


Figure 1. Effect of a quality improvement initiative on AHD screening coverage.

Conclusions: A site-led CQI intervention to address gaps in AHD screening resulted in a significant increase in coverage to near universal screening. Followup of outcomes for clients screened is ongoing. Continuous attention to CQI cycles is critical to ensure sustained AHD screening and that gaps are quickly identified and addressed.

EPB0226

Changes in weight and body mass index associated with dolutegravir- and non-dolutegravir-based antiretroviral treatment regimens: a longitudinal analysis

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Background: While limited, evidence of the effects of dolutegravir (DTG)-based antiretroviral therapy (ART) regimens suggests that they are associated with weight gain. This study aimed to compare weight gain and body mass

index (BMI) among patients on DTG- and non-DTG ART regimens in the Central Africa International epidemiology Databases to Evaluate AIDS cohort.

Methods: All ART-naïve adults (≥ 19 years) initiating ART between 2018 and 2020 at 21 HIV clinics in Burundi, Cameroon, Democratic Republic of Congo, Congo and Rwanda with a weight measure within 3 months of ART initiation and at 12 months (± 3 months) after ART initiation. Mean weight and BMI changes at 12 months after ART initiation, were computed. Linear regression models were used to estimate unadjusted and adjusted differences in weight and BMI associated with DTG use. Among patients with normal baseline BMI (18.5-24 kg/m²), predictors of >10% weight gain were determined using modified Poisson regression.

Results: Of 3,418 adults initiating ART, 1,116 initiated DTG regimens and 2,032 non-DTG regimens. Women comprised 61.5% of patients overall but only 49.6% of those on DTG. Mean age was 39 years among men (95%CI:38.3-39.4) and 35 years among women (95%CI: 34.9-35.9, $p<0.0001$). Mean weight at baseline was 59.1kg (95%CI: 58.3-59.8) and 60.1kg (95%CI: 59.6-60.7) among patients on DTG- and non-DTG regimens, respectively ($p=0.023$). Baseline BMI (22.5 kg/m²) did not differ by DTG use. Absolute changes in mean weight at 12 (± 3) months were +2.62kg (95%CI: 2.14-3.10) in DTG patients and +1.99kg (95%CI: 1.64-2.35) in non-DTG patients ($p=0.04$). BMI changes were +0.73kg/m² (95%CI: 0.62-0.84) and +0.97kg/m² (95%CI: 0.78-1.16), respectively ($p=0.03$). Among patients with normal baseline BMI, 18.8% had >10% increase in weight, with no difference by regimen type (α RR: 1.08; 95%CI: 0.81-1.44). Being female (α RR: 1.33 95%CI: 1.08-1.66), having advanced HIV disease (α RR: 1.82; 95%CI: 1.45-2.29) and ART initiation age ≥ 30 were associated with >10% weight gain.

Conclusions: While DTG regimens were associated with greater weight and BMI increases by 12 months, but was not associated with >10% weight increases among those with normal baseline BMI. Further research is necessary to assess longer-term DTG-associated weight gain and its clinical implications.

EPB0227

Factors associated with viral rebound among PLHIV who achieved viral suppression in Eswatini: a retrospective cohort study

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Background: In Eswatini, current understanding of the prevalence and variables related to viral rebound (VR) following viral suppression among people living with HIV (PLHIV) is limited by a lack of comprehensive research. VR can increase the risk of virologic failure and drug resistance, leading to long-term health consequences. The purpose of this study is to evaluate the factors associating to VR among PLHIV who achieved viral suppression in Eswatini.


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Methods: This retrospective cohort study used electronic medical records from 3 clinic-based cohorts in Eswatini spanning 2005-2022. VR was characterized by a viral load ≥ 1000 copies/mL after 2 consecutive viral load tests < 1000 copies/mL (15%, n=660). Sustained viral suppression (SVS) included PLHIV who achieved viral suppression without rebound while active at the clinic (68%, n=2885).

Participants with less than 2 tests or who did not demonstrate viral suppression (12%, n=513, 5%, n=213) were excluded. Analysis used SAS Chi-square and ANOVA with a significance level of 0.05.

Results: The total cohort (n=3,545) consisted of 1352 males (41.1%) and 2193 females (58.9%) with an average age of 27.0 years. ART adherence (X2 (5) = 82.28, $p < 0.001$), current age group (X2 (7) = 260.69, $p < 0.001$), and gender (X2 (1) = 19.96, $p < 0.001$) showed significant associations with VR.

The largest proportion of VR was observed in the 18-24 yrs age group (36.8%), while the largest group of SVS was observed in those aged 36-50 yrs (31.3%). One-way ANOVA revealed a statistically significant difference in age between PLHIV who experienced VR ($\mu = 22.64$) compared to SVS ($\mu = 31.39$) (F1, 3544 = 168.04, $p < .0001$).

Nearly half (49.2%) of the VR group had 95-105% adherence in their file compared to 64.6% in the SVS group. Females were more likely to demonstrate SVS (63.6%) than males (36.4%).

Conclusions: This study highlights the importance of age, gender, and adherence as significant factors associated with viral rebound among PLHIV in Eswatini.

The results suggest that future interventions should focus on efforts that are specific to improved adherence in younger male PLHIV, to enhance viral suppression and sustain life long ART in resource limited settings such as ours.

EPB0228

Towards colorimetric readout of a rapid enzymatic assay for measuring nucleotide analogs used in ART and PrEP

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Background: Measuring adherence to ART and PrEP can help to improve HIV treatment and prevention outcomes. We developed the REVerSe TRanscriptase Chain Termination (RESTRICKT), an enzymatic assay that semi-quantitatively measures nucleotide reverse transcriptase inhibitors (NRTIs) included in most ART and PrEP regimens. RESTRICKT currently measures DNA synthesis using a fluorescent dye which increases the cost of required instrumentation and may preclude use in low- and middle-income settings. Here we evaluated colorimetric detection with leucocystal violet (LCV) dye as an alternative approach suitable for minimally instrumented readout.

Methods: For RESTRICKT assays, we incubated reverse transcriptase enzyme (RT), nucleotides, DNA templates, and primers at 37°C for 30 minutes. LCV and PicoGreen® dye were added to provide colorimetric and fluorescent output respectively. We excluded RT from negative controls to evaluate baseline signal of ssDNA.

In previous clinical validation experiments, the concentration of single-stranded DNA (ssDNA) template was limited to < 2 nM. Thus, we synthesized dsDNA from 0.56 nM of ϕ X174 bacteriophage (5386 nt long) ssDNA in RESTRICKT assays. To evaluate the LCV colorimetric readout beyond this range, we tested 57 nM of ϕ X174 bacteriophage double-stranded DNA (dsDNA) standard.

Results: Fluorescent outputs of dsDNA products synthesized by RESTRICKT were 2.5-fold greater than "no synthesis" negative controls with significant distinction between the two groups ($p = 0.0002$, Figure 1A). However, there was no absorbance distinction between dsDNA and negative controls (Figure 1B).

The ϕ X174 bacteriophage dsDNA standard – 100X more concentrated than the DNA template used in RESTRICKT – produced significantly higher absorbance levels detectable both by the naked eye and the plate reader (Figure 1B).

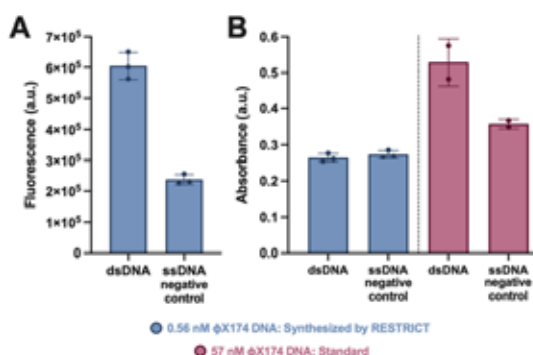


Figure 1.

Conclusions: DNA templates used in RESTRICKT are at inadequately low concentrations for detection by LCV. Ongoing work is focused on additional optimization and alternative colorimetric detection methods to provide rapid and minimally-instrumented colorimetric readout for the RESTRICKT assay.



EPB0229

High treatment continuity established among people with HIV devolved to Community Pharmacy Antiretroviral Refill Program (CPARP) in Southern Nigeria

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Background: In 2018, PEPFAR through USAID supported the implementation of a community pharmacy ART refill program (CPARP), a sustainable financing initiative, leveraging private pharmacists to serve as satellite pharmacies to public hospitals and provide ARV refills to recipients of care.

Our study aims to assess continuity in treatment outcomes for multi-cohort of people living with HIV (PLHIV) devolved to CPARP in Akwa Ibom state, Nigeria.

Description: Stable clients (at least 12 months on ART, viral load <1000 copies/ml) who presented for refills were introduced to the CPARP model. Those who were willing and able to pay were given a list of community pharmacies to choose from, signed a consent form and were entered into a devolvement register. Clients paid about (N1000 [$< \$3$] per refill visit) towards human resource and administrative costs, while ARVs are provided free.

The clients were on six-monthly refills and the community pharmacies were responsible for client tracking; requesting refill medications and documentation on a monthly basis. We analysed data for clients devolved to CPARP between January 2018 to December 2021 across 20 health facilities in Akwa Ibom State, Nigeria.

We determined the 12-month retention rate - proportion of those devolved and accessing their refills through the CPARP model. We defined optimal retention based on a priori expectation of a 95% PEPFAR threshold for retention. All analyses were conducted using SPSS vs 24, with a significant p-value < 0.05.

Lessons learned: A total of 3,590 PWH [males = 1,304; Females = 2,286] were devolved to the CPARP model (2017=415, 2018=383, 2019=242, 2020=511, 2021=2,039). Median age at devolvement was 38 years (IQR: 32-45 years) and average duration on ART was 4 years (2-7 years). Overall, 12-month retention rate was 95.6% (2017=91.4%, 2018=92.0%, 2019=95.3%, 2020=96.9%, 2021= 98.3%) [Log Rank (Mantel-Cox) test = 6.5; p-value=0.17]. Of the 132 client losses, only 3 voluntarily dropped out of the program (35 died, 34 interrupted treatment, 11 stopped treatment, 52 migrated to other locations).

Conclusions/Next steps: The CPARP model is a self-sustaining model for retaining clients on treatment. ART programs that are heavily reliant on donor funding should consider these models for adoption.

EPB0230

Comparison of long-acting lenacapavir Phase 2/3 regimen vs simplified regimen using population-PK analysis and simulation

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Background: Lenacapavir (LEN) is approved for multidrug resistant HIV-1 in combination with other antiretrovirals for heavily treatment-experienced (HTE) individuals. In the ongoing pivotal Phase 2/3 study, participants received oral LEN loading (600mg on Days 1 and 2; 300mg on Day 8) followed by 927mg SC Q6M starting from Day 15 (Phase 2/3 regimen).

This regimen and a more convenient, simplified regimen (927mg SC Q6M and 600mg PO on Days 1 and 2) were recently approved by the USFDA, steady-state pharmacokinetic (PK) data in HTE individuals are currently not available for the simplified regimen.

Our objective was to compare simulated steady-state LEN concentrations following administration of the Phase 2/3 and simplified regimens.

Methods: A previously developed 2-compartment population-PK model with 1st-order process for oral absorption, and parallel 1st-order and transit compartments for subcutaneous absorption and linear elimination was used to simulate LEN concentrations. Simulations were performed with both the Phase 2/3 and simplified regimens, and LEN exposure metrics were compared.

External validation was conducted using observed 6-month data for the simplified regimen in healthy participants (GS-US-200-5709, Cohort 2).

Results: Simulations suggested that the simplified regimen was comparable ($\pm 14\%$) to the Phase 2/3 regimen up to Week-26 (6 months) after first SC dose (Table 1).

Exposure metrics were identical at steady-state for both regimens. Steady-state was achieved by the 2nd SC dose with 1.2-fold accumulation for both regimens. External validation indicated that the model captured the simplified regimen data adequately (Figure 1).

Parameter	Phase 2/3 Regimen			Simplified Regimen	
	Mean (%CV)	Days 1-15	Day 15-End of Month 6	Day 1-End of Month 6	Steady State
C_{max}^1 , ng/mL	69.6 (56.0)	87 (71.8)	97.2 (70.3)	104 (59.7)	97.2 (70.3)
AUC _{0-24h} ¹ , h*ng/mL	15,600 (52.9)	250,000 (66.6)	300,000 (68.5)	257,000 (65.1)	300,000 (68.5)
C_{trough}^1 , ng/mL	35.9 (56.8)	32.7 (88)	36.2 (90.6)	32.7 (88)	36.2 (90.6)

AUC_{0-24h}¹, area under curve over dosing interval; C_{max}^1 , maximal concentration; C_{trough}^1 , trough concentration.

Table 1. Simulated Exposures of LEN in HTE Using Phase 2/3 Regimen and Simplified Regimen

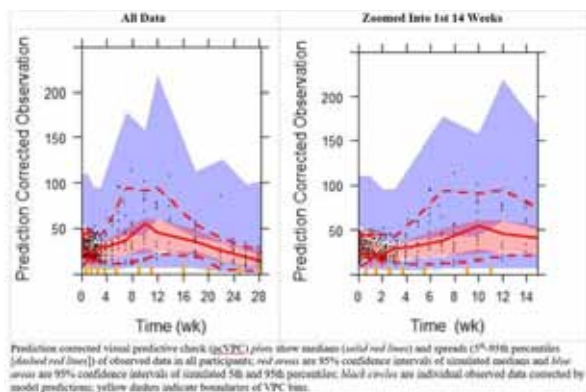


Figure 1. pcVPC of external validation of simplified posology LEN PK data from study GS-US-200-5709

Conclusions: Lenacapavir exposure metrics were comparable between Phase 2/3 and simplified regimens. These data support the use of the simplified regimen for ongoing LEN treatment and prevention studies.

EPB0231

Incidence and types of Adverse Drug Reactions to first-line antiretroviral therapy in Nigeria

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Background: Individuals react differently to medicines, and adverse drug reactions (ADR) can affect an individual's adherence to treatment.

The study aims to determine the rate, severity, types and timing of ADR among people on fixed-dose Tenofovir/Lamivudine/Dolutegravir antiretroviral regimen in Nigeria.

Description: This retrospective study involved people receiving a fixed dose of Tenofovir / Lamivudine /Dolutegravir (300mg / 300mg / 50mg) in 53 health facilities in Cross River State, Nigeria. Drug prescriptions were done in line with the national treatment guidelines.

Clients were routinely monitored and screened for ADR at every clinic encounter, and all identified ADRs were reported using a national reporting form. Data on the number, type, severity categories, dates of onset of ADR, and drug commencement were abstracted between June 2020 and August 2022.

Outcomes analyzed include ADR rate (proportion of those screened who experienced ADR), ADR severity (graded based on severity into mild, moderate, severe, and life-threatening), type (classified based on organ or system affected), and time to ADR (time between drug commencement and the onset of ADR, in days). Data were analyzed and summarized using frequencies on SPSS version 26.

Lessons learned: A total of 32,304 clients (M:10300, F:22004) were screened for ADR with a median age of 39 years [IQR 31-47] and 97.0% (n=31322) were adults. 233 clients (M:58, F:175) reported experiencing ADR (0.7% ADR rate), and 95.3% of them were adults (>15years).

ADR rate was higher in females (0.8%, 175/22004) than males (0.3%, 58/10300). The median time to ADR was 7 days [IQR 2-92 days]. There were 79 different types of ADRs (n=361) reported with 55.4% affecting the Central and Peripheral Nervous System, 14.1% with dermatologic symptoms, 12.7% with gastroenteric symptoms, 8.9% with systemic symptoms (e.g. body weakness, body pains, oedema, etc) and 8.9% with other organ affectations. 60.9% of ADRs were mild, 32.6% moderate, 6% severe and 0.4% life-threatening.

Conclusions/Next steps: ADRs are rare among clients receiving fixed-dose Tenofovir/Lamivudine/Dolutegravir and are usually life-threatening when it occurs. Active screening and close monitoring, especially within 92 days of commencing treatment are important in ensuring optimal treatment outcomes for clients.

EPB0232

Prevalence and predictors of persistent low-level HIV viraemia among people receiving Dolutegravir-based antiretroviral therapy in Southern Nigeria

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Background: Persistent low-level viraemia (pLLV) is a risk factor for virologic failure among people on antiretroviral therapy (ART). With the scale-up of Dolutegravir (DTG)-based regimen, this paper assesses the prevalence and predictors of persistent low-level viraemia among clients receiving DTG-based regimen in Nigeria.

Methods: This retrospective cohort study used routine program data from electronic medical records for persons receiving DTG-based regimen in 155 health facilities supported by PERFAR through USAID in Akwa Ibom and Cross Rivers States, Nigeria. Persons with low-level viraemia (LLV), i.e. plasma viral load (VL) between 51 and 999 copies/ml, received additional adherence support from trained case managers.

Demographic (age, sex) and clinical (duration on ART, viral suppression status, and service delivery models) data were extracted and reviewed. Clients on ART ≥6 months, with baseline viral load in September 2021, and two subsequent viral load results were included in the study.

The outcome analyzed was pLLV defined as two consecutive LLV results within the 12 months period. Descriptive statistics were used to summarize indices and multivariate logistic regression analysis was used to determine the predictors of pLLV using STATA ver.14 with significance set at .05.



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Results: The study included 140,587 PLHIV, 63.6% (n=89,434) being females, a median age of 37 years [31-45 years], and a median ART duration of 2 years [2-4 years]. The majority [n=125,619; 89.4%] were on differentiated service delivery models. The prevalence of LLV at the initial measure was 10.4% (n=14,665/140,587).

However, at repeat measure, the occurrence of persistent LLV was 0.6% (n=844/140,587). The majority of PLHIV with initial LLV [n = 13,002/14,665] attained undetectable VL level (≤ 50 copies/ml), and only 173/14,665 transitioned to Virologic Failure (VL ≥ 1000 copies/ml).

In multivariate analysis, increasing ART duration [coef. = 0.05; 95%CI: 0.03 – 0.07; $p < 0.001$] and being on no differentiated service delivery models [coef. = 0.38; 95%CI: 0.19 – 0.57; $p < 0.001$] had positive association with pLLV. However, there was no association between client age and pLLV occurrence.

Conclusions: pLLV was associated with longer ART duration and non-differentiation of ART services. This finding strengthens recommendations for frequent viral load monitoring and the benefits of intensive adherence support for clients with LLV.

EPB0233

Therapeutic monitoring of long-acting injectable rilpivirine using a rapid enzymatic assay

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Background: Long-acting injectable (LAI) antiretroviral (ARV) drugs can alleviate gaps in HIV treatment caused by insufficient daily pill adherence. Despite this advantage, significant inter-individual pharmacokinetic variability in phase 3 trials suggests a need for therapeutic monitoring. Objective ARV measurement typically performed using Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS) is arduous and expensive. Our group recently developed the REVerSe TRanscriptase Chain Termination (RESTRIC) enzymatic assay for rapid and inexpensive measurement of oral ARVs. RESTRIC measures reverse transcriptase (RT) inhibitors based on their inhibition of DNA synthesis.

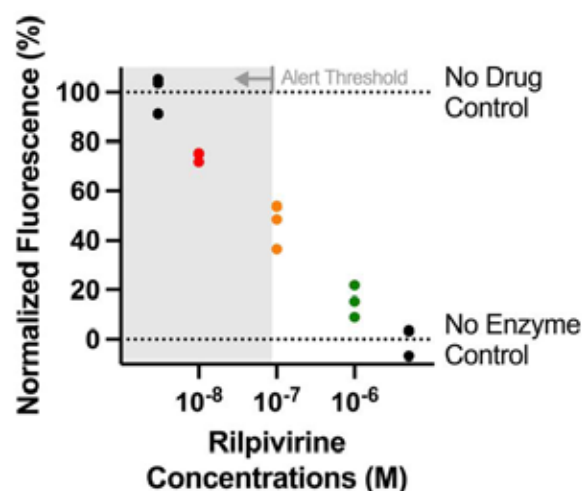
Here we demonstrate that RESTRIC can measure clinically relevant concentrations of LAI-rilpivirine used in HIV treatment.

Methods: We performed RESTRIC assays by incubating DNA templates, primers, nucleotides, and RT enzyme at 37°C for 30 min. We added PicoGreen® fluorescent dye to detect double-stranded DNA and measured inhibition of DNA synthesis at rilpivirine drug concentrations ranging from 10^{-6} M to 10^{-8} M since the alert threshold from the French Agency for Research on AIDS and Viral Hepatitis is 32 ng/mL (8.73×10^{-8} M). We normalized data using “no enzyme” controls and “no drug” controls.

Results: No DNA synthesis occurred in the “no enzyme” controls while no DNA inhibition occurred in the “no drug” controls. We observed distinguishable inhibition across rilpivirine concentrations (Fig.1) with a $26.0 \pm 4.6\%$ decrease from the “no drug” controls for 10^{-8} M ($p = 0.022$), $53.7 \pm 6.8\%$ decrease for 10^{-7} M ($p = 0.0015$) and an $84.7 \pm 5.8\%$ decrease for 10^{-6} M ($p = 0.0002$).

Therefore, we can distinguish between a “no drug” control and rilpivirine concentrations above and below the clinically relevant alert threshold (8.73×10^{-8} M).

Conclusions: The RESTRIC assay optimized for LAI-rilpivirine can distinguish clinically relevant concentrations in a dose-dependent manner. Rapid and accessible therapeutic monitoring would allow clinicians to evaluate inter-individual pharmacokinetic variability of LAI concentrations to improve HIV treatment outcomes.



EPB0234

Sustained viral load suppression among people living with HIV on Dolutegravir-based regimen in Southern Nigeria

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Background: Prior to the introduction of newer antiretroviral regimens viral suppression among individuals on antiretroviral therapy was suboptimal. In 2018, the transition to a newer Dolutegravir (DTG)-based regimen commenced for individuals on ART in Nigeria.

This study assesses long-term viral load outcomes of persons living with HIV (PLHIV) who transition to DTG-based regimen.

Description: This retrospective cohort study used routine program data from an electronic database of PLHIV (>15 years) receiving ART across 155 health facilities; with the


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support of PEPFAR through USAID in Akwa Ibom and Cross River State, Nigeria. Data for PLHIV who weighed above 30kg, were on first-line regimen, transitioned to DTG-based regimen as of June 2020, and had a viral load test done at transitioning and two (2) subsequent viral load tests at least 12-months apart, were abstracted.

Outcomes analyzed include - Sustained viral suppression (i.e. three consecutive VL result <1000copies/ml), sustained viral unsuppression (i.e. three consecutive VL result ≥1000copies/ml), and viral rebound (i.e. any unsuppressed VL ≥1000copies/ml after an initial viral suppression) as of June 2022. Frequencies were used to summarize indices.

Lessons learned: A total of 40,980 [Female = 28,295; Male = 12,685] persons >15years were transitioned as of June 2020 with median age of 37 years [IQR 30-45years]. Viral suppression was 86.8% at baseline (35,568/40,980), and 98.5% at 24months post-transitioning. 84.2% of persons had sustained viral suppression throughout the monitoring period, while 2.5% experienced viral rebound and 0.3% sustained viral unsuppression (Figure 1).



Figure 1: Long-term viral load outcomes in a large ART cohort in Nigeria, June 2020-June 2022. (n=40,980)

Conclusions/Next steps: Majority of clients transitioned to DTG-based regimen attained sustained viral suppression. However, there is a need to set-up adherence system to support PLHIV on DTG-based regimen because viral rebound and sustained viral unsuppression also occur.

Antiretroviral therapies and clinical issues in infants, children and adolescents

EPB0235

Weight change and metabolic assessment of virologically suppressed children with HIV aged ≥2 years and weighing 14 to <25 kg who received a TAF-containing regimen

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Background: Previous studies in adult and pediatric populations with HIV have indicated that antiretrovirals have different effects on weight and metabolic parameters. Tenofovir alafenamide (TAF) has a neutral effect on weight gain; however, its impact on weight has not been assessed in children aged <6 years. We explored the effect of switching to a TAF-based regimen on weight, height and lipid metabolism in virologically suppressed young children with HIV (aged ≥2 years).

Methods: This analysis included virologically suppressed children aged ≥2 years weighing 14 to <25 kg from two ongoing, open-label studies; participants received bictegravir/emtricitabine/TAF (B/F/TAF; NCT02881320) or elvitegravir/cobicistat/F/TAF (E/C/F/TAF; NCT01854775) for ≥48 weeks.

We evaluated demographics and changes in weight, height, body mass index (BMI) and lipid metabolism parameters.

Parameter, median (IQR)	Baseline [†] (n=49)	Change from baseline at Week 48 (n=49)
Weight Z-score	-0.56 (-1.52, -0.05)	0.26 (0.00, 0.51)
Height Z-score	-0.29 (-1.42, 0.19)	0.06 (-0.26, 0.37)
BMI Z-score	-0.68 (-1.53, 0.07)	0.31 (-0.32, 0.85)
BMI-for-age percentile	24.9 (6.3, 52.9)	4.1 (-4.8, 17.3)

Generated based on the year 2000 growth charts from the US Centers for Disease Control and Prevention website. [†]Includes all participants who received ≥1 dose of study drug; [†]Baseline value was the last available value collected on or prior to first dose of study drug

BMI, body mass index; IQR, interquartile range

Table 1. Weight, height and BMI parameters at baseline, and change from baseline at Week 48 (safety analysis set*; total population)



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Lipid metabolism parameters, median (IQR)			Lipid metabolism categories, [†] n (%)		
Parameter	Baseline, [‡] mg/dL (n=46)	Change from baseline at Week 48, mg/dL (n=43)	Category	Baseline [‡]	Week 48
Total cholesterol [§]	167 (155, 183)	-11 (-30, 7)	Acceptable	n=46 24 (52.2)	n=46 32 (69.6)
			Borderline high	15 (32.6)	10 (21.7)
			High	7 (15.2)	4 (8.7)
Low-density lipoprotein [§]	107 (93, 128)	-14 (-28, 1)	Acceptable	n=46 24 (52.2)	n=46 32 (69.6)
			Borderline high	11 (23.9)	8 (17.4)
			High	11 (23.9)	6 (13.0)
High-density lipoprotein	54 (47, 67)	-4 (-9, 4)	Low	n=46 2 (4.3)	n=46 7 (15.2)
			Borderline low	8 (17.4)	8 (17.4)
			Acceptable	36 (78.3)	31 (67.4)
Triglycerides [¶]	86 (62, 116)	-11 (-45, 16)	Acceptable	n=46 21 (45.7)	n=46 28 (60.9)
			Borderline high	8 (17.4)	9 (19.6)
			High	17 (37.0)	9 (19.6)

Only laboratory measurements under fasting status were summarized. Denominator for percentages was the number of participants in the safety analysis set with non-missing values at each given visit.

[†]Includes all participants who received ≥ 1 dose of study drug.

[‡]Based on the US Pediatric Guideline 'Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents.' Pediatrics 2011;128(Suppl. 5):S213-256;

[§]Baseline value was the last available value collected on or prior to first dose of study drug;

^{||}Acceptable: <170 mg/dL, borderline high: ≥ 170 to ≤ 199 mg/dL, high: ≥ 200 mg/dL;

[¶]Acceptable: <110 mg/dL, borderline high: ≥ 110 to ≤ 129 mg/dL, high: ≥ 130 mg/dL;

^{||}Low: <40 mg/dL, borderline low: ≥ 40 to ≤ 45 mg/dL, acceptable: >45 mg/dL;

[¶]Age at collection 0–9 years: acceptable: <75 mg/dL, borderline high: ≥ 75 to ≤ 99 mg/dL, high: ≥ 100 mg/dL, age at collection 10–19 years: acceptable: <90 mg/dL, borderline high: ≥ 90 to ≤ 129 mg/dL, high: ≥ 130 mg/dL

IQR, interquartile range

Table 2. Lipid metabolism parameters at baseline, change from baseline at Week 48 and lipid metabolism categories by visit (safety analysis set*; total population)

Results: The total population included 49 participants (B/F/TAF: n=22; E/C/F/TAF: n=27). Median (interquartile range) age was 6 (4, 7) years, 42.9% were male and 81.6% were Black. At Week 48, weight, height, and BMI Z-scores along with BMI-for-age percentile increased from baseline (Table 1).

Conclusions: At Week 48, the proportion of participants who were underweight decreased and the proportion who were normal weight increased; the proportion of participants who were overweight or obese remained stable. Overall, lipid metabolism parameters improved during 48 weeks of treatment. These changes are consistent with normal child development during this time-frame and support the use of TAF in this population.

EPB0236

Longitudinal lymphocyte dynamics in virologically suppressed children with HIV initiating single-tablet elvitegravir, cobicistat, emtricitabine and tenofovir alafenamide (E/C/F/TAF)

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Background: Lymphocyte counts fluctuate in young children, and several antiretroviral therapies have been associated with hematologic effects. We assessed lymphocyte dynamics in virologically suppressed children with HIV (age 2–<12 years) receiving elvitegravir, cobicistat, emtricitabine and tenofovir alafenamide (E/C/F/TAF) for 48 weeks.

Methods: This analysis included virologically suppressed children with HIV from Cohorts 2 and 3 (C2 and C3) of a Phase 2/3 open-label study (NCT01854775). Children in C2 (age 6–<12 years, weight ≥ 25 kg) and C3 (≥ 2 years, 14–<25 kg) received once-daily E/C/F/TAF for ≥ 48 weeks. Lymphocyte populations were analyzed by flow cytometry of whole blood, using anti-CD3, CD4, CD8, CD16, CD19 and CD56 panel of antibodies.

Results: Overall, 79 participants were enrolled. In C2 (n=52) and C3 (n=27), respectively, median (interquartile range [IQR]) age was 10 (9, 11) and 6 (4, 8) years, 42% and 37% were male, and 71% and 89% were Black. Median (IQR) absolute lymphocyte counts ($\times 10^3/\mu\text{L}$) at baseline in C2 and C3 were 2.31 (1.92, 2.78) and 2.96 (2.39, 3.82), respectively; these decreased during treatment (particularly in C3), with changes of -0.04 (-0.67, 0.29) and -0.52 (-1.16, -0.05) at Week 48. There were also small decreases in median (IQR) absolute CD4 T-cell counts (cells/ μL), with changes of -33 (-194, 80) and -187 (-370, 44) in C2 and C3, respectively, at Week 48. However, the relative proportion of CD4 T cells and the CD4/CD8 ratio remained stable during treatment. Changes in CD8 T-cell, B-cell and natural killer cell counts are shown in the Table.

Parameter, median (IQR)	Cohort 2, Age 6–<12 years and weight ≥ 25 kg				Cohort 3, Age ≥ 2 years and weight 14–<25 kg			
	Baseline (n=52)	Change from baseline, median (IQR)	Baseline (n=27)	Change from baseline, median (IQR)	Baseline (n=52)	Change from baseline, median (IQR)	Baseline (n=27)	Change from baseline, median (IQR)
Median lymphocyte count ($\times 10^3/\mu\text{L}$)	2.31 (1.92, 2.78)	-0.04 (-0.67, 0.29)	2.96 (2.39, 3.82)	-0.52 (-1.16, -0.05)	2.31 (1.92, 2.78)	-0.04 (-0.67, 0.29)	2.96 (2.39, 3.82)	-0.52 (-1.16, -0.05)
Median CD4 T-cell count (cells/ μL)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)
Median CD8 T-cell count (cells/ μL)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)
Median B-cell count (cells/ μL)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)
Median NK-cell count (cells/ μL)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)	1100 (800, 1400)	-33 (-194, 80)	1100 (800, 1400)	-187 (-370, 44)
Median CD4/CD8 ratio	1.10 (0.90, 1.30)	-0.04 (-0.67, 0.29)	1.10 (0.90, 1.30)	-0.52 (-1.16, -0.05)	1.10 (0.90, 1.30)	-0.04 (-0.67, 0.29)	1.10 (0.90, 1.30)	-0.52 (-1.16, -0.05)

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Conclusions: Minor fluctuations in absolute lymphocyte subpopulation counts were observed over 48 weeks of E/C/F/TAF. The decline in absolute CD4 T-cell counts mirrors known physiological fluctuations in young children, mainly observed in those aged <6 years. No clinically relevant effects of E/C/F/TAF on lymphocytes were identified in this population.

EPB0237

Viral suppression and retention in care of clients on multi-month dispensing

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Background: Multi-month dispensing (MMD) of Antiretroviral (ARV) strategy reduces monthly medication refill visits to either three- or six-months intervals depending on eligibility criteria. It minimizes barriers for clients and health-system levels, simultaneously improving health outcomes for clients. Baylor Mwanza COE adopted 3MMD strategy in August 2018.

This study aims to assess viral suppression and retention for children and adolescents living with HIV registered on 3MMD between August 2018 and June 2021.

Methods: Review of clinical charts of children and adolescents aged 5-19 years old registered on 3MMD was conducted between August 2018 and June 2021. Viral load (VL) results before 3MMD strategy and current VL within 12 months were recorded.

Moreover, data on type of caregiver, ARV regimen, home address, age, continuity in care and reasons for dropping out of 3MMD were recorded.

Results: Out of 210 clients on 3MMD, 116 (55.2 %) were females and 181 (86.2%) aged between 10-19 years old. Most clients, 198 (94%), were on Dolutegravir-based while 12 (6%) on Protease Inhibitors-based regimen. More than half, 129 (61%) of clients are cared for by mothers, 12 (6%) by fathers, and 69 (33%) had other guardians as primary caregivers.

Almost half of clients, 103 (49%), live within 10 kilometres(km) from COE; 89 (42%) within 11-30km, 12(6%) within 31-100km and only 6 (3%) more than 100km. On commencing 3MMD, 207 (99%) clients had VL below 50 copies/mL and 3 (1%) had VL of 55 copies/ml.

On assessment, majority of clients 197 (94%) maintained VL below 50 copies/mL and remained on 3MMD while 13 (6%) clients with an average age of 15 years old and on Dolutegravir-based regimen had VL above 50 copies/mL and exited 3MMD.

Out of 13 clients, 7(54%) were excluded in the first and 6(46%) in second year of 3MMD. Among them, 9 (69%) are cared for by mothers and 11 (85%) lived near COE.

Conclusions: Majority of clients on 3MMD were able to maintain viral suppression and retained in care despite minimal follow-up and living far away; further studies with larger cohort will give better description of pediatric MMD and inform stakeholders on this strategy.

EPB0238

Burden and associated factors of depression and anxiety among young Thai men who have sex with men at risk for and living with HIV

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Background: We aimed to assess prevalence and associated factors of depression and anxiety among Thai young men who have sex with men (YMSM) at risk for and living with HIV.

Methods: A cross-sectional study was conducted among YMSM (18-25 yrs) who were at risk for or living with HIV, and attended HIV clinic at a community clinic or tertiary hospital in Chiang Mai, Thailand. Patient Health Questionnaire 9-item (PHQ-9) and Generalized Anxiety Disorder 7-item scales (GAD-7) were used to screen for depression and anxiety, whereas post-traumatic stress disorder (PTSD) Checklist-Civilian Version (PCL-C) and Multidimensional Scale of Perceived Social Support (MSPSS) were performed to screen for PTSD and social support (low-to-medium support: score 1.0-5.0; high support: score 5.1-7.0), respectively.

Logistic regression analysis was conducted to identify factors associated with significant depressive symptoms (PHQ-9≥10 of 27) and anxiety symptoms (GAD-7≥10 of 21) among these populations.

Results: We enrolled 100 YMSM at risk for HIV (median age: 20 yrs) and 50 YMSM living with HIV (median age: 22 yrs). Among at-risk YMSM, 28% had moderate-to-high self-evaluated risk of HIV infection, and 24% were on pre-exposure prophylaxis.

Of YMSM living with HIV, all were clinically stable on cART, and 78% had viral load <20 copies/mL. The prevalence of significant depressive symptoms were 27% (95%CI: 19-37%) and 32% (95%CI: 20-47%) ($P=0.81$), and significant anxiety symptoms were 15% (95%CI: 9-24%) and 16% (95%CI: 7-29%) ($P=0.97$) for YMSM at risk for and living with HIV, respectively.



In multivariable logistic regressions, having significant anxiety symptoms (adjusted odds ratio[aOR]: 1.6; 95%CI: 1.2-2.2), and low-to-medium social support (aOR: 7.3; 95%CI: 1.1-50.4) were associated with significant depressive symptoms for at-risk YMSM, whereas higher PCL-C scores (aOR: 1.3; 95%CI: 1.1-1.6, per one score increased) was an associated factor for YMSM living with HIV.

Regarding significant anxiety symptoms, having significant depressive symptoms was the only associated factor for at-risk YMSM (aOR: 1.7; 95%CI: 1.2-2.4), and this factor showed a trend toward statistical significance for YMSM living with HIV (aOR: 1.6; 95%CI: 0.9-2.7).

Conclusions: Significant depressive and anxiety symptoms were prevalent among our Thai YMSM, both at risk for and living with HIV. An integrated mental health services are critically needed for these populations.

EPB0239

Outcomes of children living with HIV transitioned to Dolutegravir based antiretroviral therapy regimens in Midlands and Manicaland Provinces of Zimbabwe, 2022

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Background: Dolutegravir (DTG) is an anti-retroviral medicine proven to significantly reduce viral load (VL) among people living with HIV (PLHIV). Zimbabwe Health Interventions (ZHI) is supporting government to roll out DTG based regimens in children living with HIV (CLHIV) on anti-retroviral therapy (ART). Transition to DTG based regimens for children with weight below 20kgs was started in June 2021. There is paucity of data in Zimbabwe on VL suppression rates and clinical outcomes of CLHIV transitioned to DTG based regimens. We assessed outcomes of CLHIV before and after DTG transition in Manicaland and Midlands provinces between June and July 2022.

Methods: We conducted an analytic cross-sectional study focusing on client outcomes before and after DTG transition across 34 sites with at least 1000 ART clients. The study focused on client status before and after transition to a DTG regimen. All children on ART in these facilities were included. Client clinical charts were reviewed, and data were abstracted and captured into Kobo Toolbox. Data were analyzed using Stata 15 and study was covered by the Medical Research of Zimbabwe approved protocol (MRCZ/E/159).

Results: Data for 1,003 children were collected and 811 (80.9%) were initiated on a non-DTG based ART regimen when they started ART. Of the 811 children, 635 (72.3%)

were transitioned to a DTG based containing regimen. Of the 220 children who had a documented viral load below 1000 before DTG transition, 216 (98.1%) of them had a viral load remaining below 1000 and four had a viral load above 1000. Of the 56 children who had a viral load above 1000, 85% (48) had suppressed after transition to DTG based regimen and 8 remained unsuppressed.

Children who remained on a non-DTG containing regimen were 8 times more likely to have unsuppressed VL compared to those who switched to DTG (RR 7.86, 95% CI 2.4-25.2).

Conclusions: A significant proportion of children were transitioned to a DTG containing regimen and had better VL suppression compared to those on a non DTG regimen. We recommend transitioning all children to a DTG regimen to improve virological outcomes in children.

EPB0240

"I did not want them seeing me": Factors influencing antiretroviral treatment adherence during the adolescent period of young people with perinatal HIV in Thailand: a qualitative study

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Background: The varying rates of antiretroviral treatment adherence between 19-99% in adolescents living with HIV were reported globally. Young people with perinatal HIV (YPHIV) who survived and grew up into adulthood experienced adherence challenges that led to unsustainable but resumable virologic suppression. We explored factors influencing treatment adherence during adolescent years from real-life experiences of YPHIV.

Methods: A qualitative study was conducted from June to November 2022 in Chiang Mai, Thailand. Twenty YPHIV (8 females and 12 males, aged 21-29 years) were invited to share their adolescent experiences through in-depth interviews. Audio transcripts were analyzed using content analysis to identify the barriers and facilitators influencing treatment adherence.

Results: The study divided barriers and facilitators to treatment adherence in their adolescent period into the personal, community, and healthcare system levels. At the personal level, barriers to treatment adherence included hanging out with friends, sticking in the middle of work or entertainment, uncertain working hours, belief in their strength/ invincibility, unfavorable personal life situations, mental health difficulties, pill burden, and unbearable side effects of medications.

The facilitators were perceiving their health deterioration and revisiting opportunistic infections during virologic failure, being afraid of hospitalization and medical procedure-related suffering, and the wish to be healthy and move on.



At the family, friends, and community level, the most common barrier reported was fears of HIV disclosure when taking medications. While the facilitators included perceiving family support, the desire to prevent mother-to-child transmission, perceiving their own responsibility for kids, and determination to complete family without HIV transmission.

At the healthcare system level, extra medical care payment and transportation costs to the clinic were identified as barriers to adherence. The unfavorable service behaviors of healthcare providers were described as a part of their HIV care experiences which could be considered barriers or facilitators in different circumstances.

Conclusions: The main factors influencing adolescents' treatment adherence concentrate on various personal factors and fears of HIV disclosure. Understanding those existing factors would enable mindful health service delivery.

Our study supported the need to allocate more time for tailored individual counseling to maximize their adherence self-efficacy during the transitional period of young people's life.

EPB0241

HIV Rapid testing as a screening test for HIV-Exposed children on the OPPTIM Study in South Africa

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Background: HIV rapid testing (HRT) in children <18 months may reduce the number of polymerase chain reaction (PCR) tests required, if limited to children screening HRT positive. Persistence of maternal HIV antibodies in children beyond 18-months limits use of HRT for diagnosis. We describe sero-reversion at various time points in HIV-exposed, uninfected children.

Methods: Mother-child pairs were enrolled in the OPPTIM study at the child's 6, 10, or 14-week clinic visit between July 2018 and April 2019. At enrolment, 6-, 9-, 12-, 18-, 21- and 24 months, children were tested using three HRTs (Trinity Biotech Uni-Gold™, INSTI® and Abbott Determine™) and had a POC EID (Cepheid GeneXpert) test conducted using whole blood, by trained study staff.

Abbott Architect™ HIV ELISA assays were performed at 18-, 21-, and 24-months. HRT seropositivity is presented at each visit per test. Interrater agreement between tests was calculated using the Kappa (κ) statistic.

Results: In the study, 404 children were enrolled, 143 (35.4%), 201 (49.8%) and 60 (14.9%) at 6, 10 and 14 weeks, respectively. 216 (53.5%) male, 234 (57.9%) exclusively breast-feeding, 149 (36.9%) exclusively formula feeding, and the remainder mixed feeding. The Determine test remained positive in 50% of children at 12-months.

For the INSTI and Uni-Gold tests, only 23% and 28% (respectively) remained positive at 6-months and <7% by 9-months. None of the children tested PCR positive at any time point. Agreement between the INSTI and Uni-Gold HRTs was 93.7% (κ=0.84, p<0.001), across all time periods.

At 18-months, 3/24 children who tested positive on any HRT, were HIV ELISA positive; 18/21 HIV ELISA positives were HRT negative (κ=0.04, p<0.247). At 21- and 24-months, all HIV ELISA assays were negative among 8 HRT-positive children while 19 were HIV ELISA positive but HRT negative (κ=-0.04, p<0.681 and κ=-0.03, p<0.683, respectively). Attrition was high, only 59% in study at 18-months, 34% at 21-months, and 56% at 24-months.

Conclusions: Delayed seroreversion for HRT beyond 18 months is minimal using HRT, but HRT and HIV ELISA may result in false positive diagnoses and an HIV PCR should be conducted to confirm the diagnosis and avoid unnecessary treatment.

EPB0242

Adherence to antiretroviral therapy (ART), drug resistance, and their impact on evolving viral suppression among a long-term cohort of youth living with perinatal HIV infection in western Kenya

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Background: In African settings, youth living with HIV (YLWH) rarely have comprehensive antiretroviral therapy (ART) adherence monitoring or drug resistance (DR) testing. We longitudinally assessed ART adherence and its impact on viral outcomes among Kenyan YLWH.

Methods: YLWH ≤15 years on NNRTI-based 1st line ART were enrolled at the Academic Model Providing Access To Healthcare (AMPATH) in western Kenya. Adherence was monitored prospectively by caregiver-reported questionnaires, electronic dose monitors (MEMS) and NNRTI plasma drug levels at months 1 (M1) and 4 (M4), defined as:



1. Number of missed/late doses,
2. % MEMS openings,
3. MEMS interruptions ³48 hours,
4. Duration of maximum interruption, and;
5. Low/therapeutic/high plasma NNRTI levels.

DR was evaluated upon treatment failure (TF; viral load (VL) >1,000 copies/mL). TF was modeled with logistic regression (odds ratio (OR) and 95% confidence interval (CI) for each adherence measure, adjusted for age, CD4%, ART duration and sex). DR mutations (DRMs) were modeled with Poisson regression (rate ratio (RR) and CI). Interaction terms were examined if adherence effect on M4 TF differed by M1 TF status.

Results: At enrollment, 692 participants (51% female; median age 8.4 years) had median 2.6 years on ART. All were on nevirapine/efavirenz-based regimens, most combined with abacavir/lamivudine. Of 464 with M1 VLs, 143 (31%) had TF. Among those with M1 TF, 43% had TF at M4. Lower percent MEMS adherence was associated with TF (OR=0.69 per 1 unit z-score higher MEMS adherence, 95% CI=0.50-0.95), as was more enrollment non-adherence (OR=1.25 per 1 higher non-adherence, 95% CI=1.05-1.48). DRMs were detected in 93% of the 120/143 available M1 genotypes. The M1 DRM number was greater for those with shorter maximum treatment interruptions (log-10 transformed (RR)=0.63, CI=0.42-0.94), more ART years (Log-10 transformed RR=1.47, CI=1.15-1.89), and higher M1 log-10 VL (RR=1.21, CI=1.06-1.37).

Percent adherence by MEMS[®] had a significant, U-shaped relationship, with most DRMs at lower (<50%) adherence. Having therapeutic (RR=2.11, CI=1.45-3.08) or supra-therapeutic (RR=1.58, CI=1.11-2.27) vs. sub-therapeutic drug levels was associated with more DRMs.

Conclusions: Extensive non-adherence, associated with high TF and DR were seen in Kenyan youth with HIV, outcomes assumed - but seldom documented in this setting.

EPB0243

Underlying causes of death in children living with HIV in Tanzania

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Background: Children living with HIV account for 4% of the global HIV burden but 15% of AIDS-related deaths. The Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) established routine Pediatric mortality reviews to understand the underlying causes of deaths among children receiving antiretroviral therapy (ART) in Tanzania; a facility-level expert team reviews each death case and determines underlying causes of death. For home deaths a verbal autopsy is conducted. The aim of this study is to determine the commonest underlying causes of death in children on ART.

Methods: A longitudinal analysis of secondary data was conducted, using the national HIV database from 437 health care facilities across five EGPAF-supported regions in Tanzania. We included children aged 0-14 years who were in care by September 2021 and were followed through September 2022.

We defined underlying causes of death as recorded diagnoses in the database. More than one cause of death could be present for a child.

Results: A total of 6,019 children were in care by September 2021, and 845 were newly diagnosed during the study period, making a study population of 6,864 children. Overall, 3,501(51%) were female, and the majority 3,295 (48%) were 10-14 years of age. There were 102 deaths (1.5%) in children during this period among them 54 (53%) were female. A total of 53 (52%) occurred among those newly diagnosed. Most deaths (68%) were among children age <5 years. The most common underlying causes of death were severe acute malnutrition (43%), tuberculosis (27%)


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and pneumonia (11%). Severe acute malnutrition was the most common cause of death in both children who were on antiretroviral therapy (ART) for >12 months (53%) and <12 months (34%). Other causes of death were Septicaemia (10%), Diarrhoea (9%) accidents (7%), meningitis (2%) and unknown (8%).

Conclusions: Severe acute malnutrition was the most common underlying cause of death among children on ART. Pediatric HIV programs should consider nutritional intervention packages to prevent and treat malnutrition in children living with HIV.

EPB0244

Viral suppression in the era of transition to Dolutegravir-based therapy in Cameroon: children at high risk of virological failure

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Background: Transition to Dolutegravir (DTG)-based antiretroviral therapy (ART) may improve virological response (VR) in sub-Saharan Africa. Because VR may vary by age, understanding ART response across age-range may inform interventions on ART program.

Our objective was to compare VR between children, adolescents and adults in the Cameroonian context.

Methods: A comparative study was conducted from January 2021 to May 2022 amongst ART-experienced patients received at the Chantal BIYA International Reference Centre for HIV/AIDS prevention and management in Yaounde-Cameroon for plasma viral load (PVL) monitoring. PVL was measured on Abbott m2000RT-PCR as per manufacturer's instructions.

VR was defined as viral suppression (VL< 1000 copies/mL) and viral undetectability (VL< 50 copies/mL). Data were analyzed by SPSS v.20.0, with p< 0.05 considered as significant.

Results: A total of 9034 patients, 72.8% female, were enrolled (8565 adults, 227 adolescents, 222 children); 1618 were on NNRTI-based, 299 on PI-based, and 7118 on DTG based ART (82 children, 198 adolescents, 6824 adults). Median (IQR) duration on ART was 24 (12-72) months.

Overall, VS was 89.9% (95% CI: 89.2-90.5) and viral undetectability was 75.8% (95% CI 74.8-76.7). Following ART-regimen, VS on NNRTI-based, PI/r-based, and DTG-based therapy was respectively 86.5%, 60.2% and 91.8%, p<0.0001. Following ART-duration, VS was respectively 90.4% (M12), 87.8% (M24), 89.1% (M36), and 90.0% (≥ M48), p<0.0001. Following gender, VS was 91.0% (females) versus 87.1% (males), p<0.0001. Following age, VS was 65.2% (children), 74.4% (adolescents), and 90.9% (adults), p<0.0001.

Following multivariate analysis, predictors of VS were adults, females, TLD regimens, and cART duration >24 months (p<0.05).

Conclusions: In Cameroon, ART response indicates encouraging rates of VS (about 9/10) and viral undetectability (about 3/4), driven essentially by access to TLD-based regimens in the adult populations. However, ART response was very poor in children, underscoring the need for scaling-up pediatric DTG-based regimens.

EPB0245

A decade of care: long term outcomes of a paediatric HIV cohort

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Background: Data on long-term outcomes of children receiving antiretroviral therapy (ART) in sub-Saharan Africa are sparse. We describe 10-year outcomes of children commenced on ART.

Methods: We conducted a retrospective cohort study at Newlands Clinic, Zimbabwe. All children living with HIV aged <18 years at ART commencement until 31 December 2010 were included.

Sociodemographic and clinical data were abstracted from the clinic's electronic database. Descriptive statistics were used to explain study variables.

Results: We analysed records for 1028 young people, 534 (52%) females with a median age of nine years (IQR 5 – 13) at ART initiation. The median time to ART initiation was 74 days (IQR 37-177).

At baseline, 519 (50.5%) were either single or double orphans, 563 (55.4%) were diagnosed with WHO clinical stage 3 or 4, and 638 (62.1%) had anaemia. The majority were initiated on stavudine, or zidovudine combined with lamivudine and nevirapine (907, 88.3%).

At the time of analysis, 673 (65.5%) were still in care, 142 (13.8%) had died, 69 (6.7%) were lost to follow up, and 144 (14.0%) had transferred out. The median duration on ART was 12 years (IQR 8.8-13.7). Amongst those in care, 585 (86.9%) had HIV virologic suppression (<50 copies/mL) while 42 (6.2%) had a viral load >1000 copies/mL. During



follow up, 321 (31.2%) had at least one diagnosis of tuberculosis, the second most common opportunistic infection (OI) was recurrent pneumonia (198, 19%). Virologic suppression rates increased over time, see Figure 1.

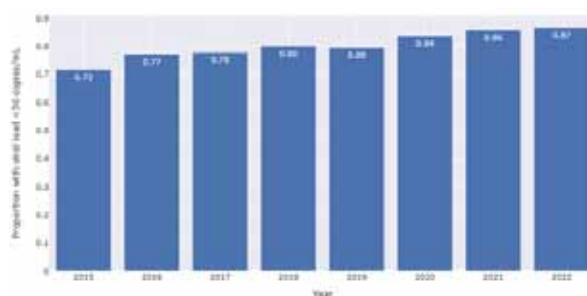


Figure. Proportion of patients with virologic suppression over time.

Conclusions: We show high rates of retention and virological suppression. Comprehensive care in a sub-Saharan African cohort of young people with advanced HIV disease and a high prevalence of OIs can result in good long-term outcomes. Further research is needed in evaluating HIV service delivery and differentiated care for YPLHIV.

EPB0246

Spanish cohort of HIV mother-infant pairs: current epidemiology and perinatal transmission (2020-2022)

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Background: HIV perinatal transmission rate has decreased in our setting to around 1%. Aims: to describe the current situation of pregnant women living with HIV (WLHIV) and their newborns and to assess HIV perinatal transmission in Spain.

Methods: WLHIV deliveries included in the Spanish Cohort of pregnant WLHIV and their children during 2020-2022 were analyzed.

Results: There were 344 WLHIV pregnancies registered in 61 public-hospitals in Spain: median age 32.8 years (IQR:28.7-37.5), 32.5% Spanish, 27.5% African, 22.8% Latin-America.

Overall, 73.7% women acquired HIV by sexual transmission and 20% by perinatal transmission. Most women (79.3%) were HIV-diagnosed before current pregnancy, 19.5% during pregnancy, 0.3% at delivery. The rates of WLHIV living with HBV and HCV were 7.8% and 4.9%. Gestational control was appropriate in 89.7% of pregnancies.

Overall, 98.3% WLHIV received ART during pregnancy, 89% achieved undetectable viral load (VL) at delivery. Delivery route was vaginal in 60.3%, 26.3% were elective Caesarean-sections and 13.1% urgent Caesarian-sections.

There were 354 newborns (10 twin pregnancies) identified: 53.2% male, 11% preterm-newborn (2.8% < 32 weeks of pregnancy) and 8.5% with low-birth-weight. 85.6% of the newborns received monotherapy prophylaxis with zidovudine and 9.8% triple therapy.

Only one child did not receive ART prophylaxis, and two received breastfeeding few days after birth, without perinatal HIV transmission. There were no HBV or HCV transmission. Three cases of intrauterine transmission were detected (0.85%; 95% CI 0.3-2%), with positive PCR at 48 hours of life.

Two mothers (from Spain and Guinea) were diagnosed at 35 and 36 weeks of gestation and received TDF/FTC/RAL, with detectable VL (18849 and 273 cp/ml) at delivery (elective Caesarean-section at week 38). The third woman was HIV-diagnosed at week 26, starting treatment with TDF/FTC/EFV but with poor adherence.

Despite elective Caesarean-section at week 38, with a VL of 95000 cp/ml at delivery, and triple ART postexposure prophylaxis the child acquired HIV.

Conclusions: Most WLHIV are immigrants, diagnosed before pregnancy and have good control of HIV during pregnancy in Spain. Even with the low current rate of HIV perinatal transmission (0.85%), there is a need to ensure that WLHIV have access to effective preventive measures to completely eliminate neonatal transmission.


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EPB0247

Uptake and outcomes of tenofovir alafenamide fumarate (TAF) –based therapy in children and young people living with HIV (CLWHIV) in the European Pregnancy and Paediatric Infections Cohort Collaboration (EPPICC)

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Background: TAF was originally approved in Europe for CLWHIV aged ≥6 years in 2016, initially as part of fixed-dose combinations (some approvals were extended to age ≥2 years in 2022). Data are limited on TAF uptake and outcomes in this population.

Methods: CLWHIV aged <18 years at HIV diagnosis and followed in 11 cohorts across Europe were included. Uptake of TAF, characteristics at TAF start and viral suppression (VS) (viral load (VL)<50c/ml) at 6, 12 and 18-months on TAF were described by treatment and VL status at TAF start.

Results: Of 3318 in follow-up since 2016, 670 (20%) ever received TAF; 56% were female; 95% perinatally acquired HIV or were aged <10 years at entry to HIV care; 36% from the UK, 26% Spain, 24% Italy, 15% elsewhere in Europe; median age at ART initiation was 3.5[IQR 0.6,8.8] years. At TAF start 11% were aged 5-11, 24% 12-17, 27% 18-23 and 20% ≥24 years. Half (48%) were on an INSTI-based regimen, 31% PI, 13% NNRTI, 7% other/multiple classes; 66% previously used TDF. Twenty-one (3%) were treatment naïve and 649 (97%) treatment-experienced, of whom 51% had VL<50, 24% were viremic (VL≥50) and 25% had unknown VL at TAF start. Those treatment-experienced and viremic, and those naïve, had the lowest CD4 counts (Table). Median duration on TAF was 1.2[0.6,2.0] years. At 6, 12 and 18-months on TAF, overall VS was >80% but was lower in those treatment-experienced and viremic at TAF start.

(Median [IQR])	Naïve, n=21	Treatment experienced, VL<50, n=330	Treatment experienced, VL≥50, n=157	Treatment experienced, VL unknown, n=162
Age (years)	14.8 [14.2,16.4]	17.1 [13.8,22.1]	17.7 [15.0,22.0]	20.1 [14.6,22.8]
CD4 count (n=19,273,147,47)	373 [211,660]	720 [575,951]	482 [299,670]	644 [468,898]
Log viral load (n=18,157)	4.2 [3.5,5.1]		3.4 [2.5,4.3]	

Table: Characteristics at start of TAF by treatment status and viral load

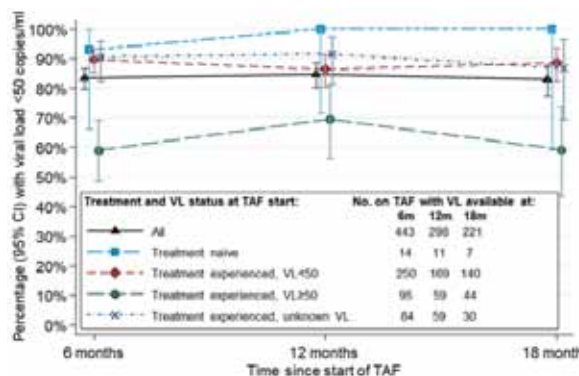


Figure. Viral suppression <50c/mL at 6, 12 and 18m on TAF by treatment status and viral load at TAF start.

Conclusions: CLWHIV who were virally suppressed at TAF start maintained good levels of suppression over follow-up, and two-thirds of those who were treatment-experienced and viremic at TAF start achieved viral suppression. Longer-term follow-up data are needed, particularly in younger children.

EPB0248

Young adults who acquired HIV perinatally have poorer viral suppression than those who acquired HIV later in life: a population survey in Zimbabwe

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Background: Young adults (aged 18-24 years) in Zimbabwe may have acquired HIV perinatally or horizontally. Perinatally acquired HIV is often diagnosed late and may lead to worse health outcomes compared to later acquisition.

We aimed to compare the demographic and clinical characteristics of young people who were diagnosed with HIV in childhood and adulthood, as a proxy for route of HIV acquisition (perinatal vs horizontal).

Methods: A cross-sectional representative population-based survey of young people aged 18-24 years was conducted in 3 provinces in Zimbabwe. Participants were asked their HIV status, the date of their HIV diagnosis if positive, and whether they had been diagnosed as a child. A dried blood spot was taken to measure HIV viral load. Multilevel mixed-effects generalized linear modelling was used to estimate the association between HIV acquisition time and viral non-suppression, defined as ≥1000 copies/ml.

Results: 17,682 participants (60.8% female) were enrolled of whom 12,003 (67.9%) knew their HIV status; 435 (3.6%) reported being HIV positive and 90.0% were taking ART. All but 6 reported their age at diagnosis: 196/429 (45.7%)



were diagnosed as children (median age of diagnosis 7 years (IQR 1-12)) and median diagnosis age in the remaining 233 participants was 21 years (IQR 19-24). 54/429 (12.6%) of those with HIV were underweight (BMI z-score <-2) with no difference by acquisition route.

A higher proportion of adult-diagnosed than child-diagnosed participants were female (91.4% vs 76.5%), had ever had sex (93.6% vs 61.5%), ever been married (60.1% vs 19.4%) and ever been pregnant (77.5% of women vs 39.3%). Over half (53.9%) of participants diagnosed in childhood had viral non-suppression compared to 39.2% of those diagnosed as adults. After adjusting for sex, age, marital status and education, those diagnosed as children had higher odds of viral non-suppression (adjusted odds ratio=1.85, 95%CI 1.13-3.02, p=0.014).

Conclusions: Young adults who acquired HIV perinatally are at greater risk of viral non-suppression compared to their peers who acquired HIV in adulthood. Extending into adulthood, those with perinatally acquired HIV continue to have additional needs and worse outcomes.

EPB0249

Early ART and mental health outcomes by school-age and adolescent years of life: a longitudinal comparative study of HIV-exposed and community control adolescents from Uganda

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Background: The relevance of anti-retroviral therapy (ART) exposures in the gestational period and early childhood for mental health outcomes in late childhood and adolescence is unclear. Hence, we examine the hypothesis that *In-utero*/peripartum antiretroviral (IPA) exposure type is associated with mental health symptoms at 8 – 18 years old among 577 children perinatally HIV-infected (CPHIV), HIV exposed uninfected (CHEU) and HIV unexposed and uninfected (CHUU).

Methods: Per medical records, IPA exposure was categorized separately for CHEU and CPHIV as no IPA, single-dose nevirapine with/without zidovudine (sdNVP±AZT), sdNVP+AZT+Lamivudine (3TC), or combination ART (cART). Self-reported anxiety and depressive symptoms were evaluated at intake, 6- and 12- months follow-up with Behavioral Assessment System for Children .

Multivariable linear regression models estimated differences (b) with 95% confidence intervals (95% CI) for various IPA exposure-types vs. CHEU without IPA exposure.

Results: Depressive and anxiety symptoms were lower in CHUU relative to CHEU/CPHIV whereas both symptoms were similar for CPHIV vs. CHEU. Relative to CHEU with-

out IPA exposure, CHEU with sdNVP±AZT exposure had elevated anxiety (b =0.51, 95%CI:[0.06, 0.96]) and depressive symptoms (b =0.48, 95%CI:[0.07, 0.89]).

Likewise, CHEU with sdNVP+AZT+3TC exposure had higher anxiety (b=0.45, 95%CI: [0.03, 0.86]) and depressive symptoms (b =0.72, 95% CI: [0.27, 1.17]) vs. CHEU without IPA exposure. Depressive/anxiety symptoms were similar for CHEU/CPHIV exposed to peripartum cART (b =0.12 to 0.60, 95% CI: [-0.41, 1.30]) and for CHUU (b =-0.04 to 0.08, 95% CI: [-0.24, 0.29]) vs. CHEU without IPA exposure.

Conclusions: Among CHEU, peripartum sdNVP±AZT and sdNVP+AZT+3TC exposure predicted clinically important elevations in anxiety and depressive symptoms at 8 – 18 years old. We found no evidence that cART exposure was associated with mental health symptoms at 8 – 18 years old.

These results underscore the importance of monitoring mental health trajectory of HIV-affected children to identify vulnerable children and inform mental health interventions, if warranted.

EPB0250

Efficacy and safety of dolutegravir/lamivudine (DTG/3TC) in antiretroviral therapy (ART)-naïve adolescents living with HIV-1: DANCE study Week 96 results

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Background: DTG/3TC is an effective, well-tolerated initial ART regimen globally recommended for adults with HIV-1, but data are scarce for equivalent use in adolescents. We present efficacy and safety of DTG/3TC in ART-naïve adolescents with HIV-1 through Week (W) 96.

Methods: DANCE is an ongoing phase 3b, single-arm, multi-center, open-label study evaluating once-daily, fixed-dose combination DTG/3TC (50 mg/300 mg) as initial ART for adolescents aged ≥12 to <18 years and weighing ≥25 kg, with HIV-1 RNA 1000 to ≤500,000 c/mL. The previously reported primary endpoint assessed proportions achieving HIV-1 RNA <50 c/mL (Snapshot, ITT-E) at W48. Secondary endpoints assessed proportions with HIV-1 RNA <50 c/mL (Snapshot, ITT-E), safety, and tolerability at W96. Participants meeting confirmed virologic withdrawal (CVW) criteria (consecutive HIV-1 RNA measurements ≥200 c/mL) underwent viral resistance testing.

Results: Of 32 enrolled participants, 66% were male, 59% were Asian, and 41% were Black; median age was 17 years. At W96, 22/32 (69%; 95% CI, 50%-84%) participants had HIV-1 RNA <50 c/mL (Snapshot, ITT-E). W96 virology data


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were absent for 7 participants due to GCP-related site closure and imputed as treatment failures (Snapshot, ITT-E). In W96 sensitivity analyses excluding data from these 7 participants, 22/25 (88%; 95% CI, 69%-97%) achieved HIV-1 RNA <50 c/mL. Median (Q1-Q3) CD4+ cell count increased from baseline (371.5 [270.0-507.5] cells/mm³) to W96 (682.0 [499.0-863.0] cells/mm³). One participant had CVW at W72; no findings of treatment-emergent mutations were observed through W96.

Overall, 29/32 (91%) participants experienced AEs through W96, with 27/32 (84%) participants having a maximum grade 1 or 2 AE. AEs leading to withdrawal were grade 2 depression and suicidal ideation (n=1) and grade 3 glomerular filtration rate decrease (the only drug-related AE; n=1). Four SAEs were reported in 3/32 (9%) participants (anal abscess, orchitis, and post-operative complication after vulvovaginal wart removal in participant with vulvovaginal warts SAE); none were drug-related.

Conclusions: DTG/3TC was well-tolerated, demonstrated high efficacy, and had a high barrier to resistance in ART-naïve adolescents with HIV-1 through W96.

These results and well-established data in adults support DTG/3TC as a first-line ART treatment option in adolescents to achieve and maintain virologic suppression.

EPB0251

Improved viral load suppression with transition to pediatric dolutegravir among ART-experienced children in Kenya and Cote d'Ivoire

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Background: Access to safer and more efficacious and tolerable antiretroviral therapy (ART) is recommended for children and adolescents living with HIV (CALHIV). We evaluated viral load (VL) suppression at baseline and subsequent VL outcomes in a cohort of ART-experienced children who transitioned to dolutegravir (DTG)-based ART in Kenya and Cote d'Ivoire (CDI).

Methods: This was an observational prospective cohort study of ART-experienced CALHIV who transitioned to DTG-based regimens. CALHIV 0-14 years, weighing 3-20 kilograms, were enrolled in 12 randomly selected facilities in CDI and Kenya, November 2021-May 2022 and followed for 12 months. Study facilities were randomly selected using probability proportional to size. Demographic data were collected, and VL testing were completed at baseline, 6 and 12 months.

The national guidelines on use of antiretroviral drugs for treating and preventing HIV recommend VL monitoring at baseline, 6 and 12 months for CALHIV who are optimized on DTG-based regimen. Data were summarized using frequencies and proportions, as well as median and interquartile ranges.

Results: Overall, 676 CALHIV initiated pediatric DTG with a median age of 9 (IQR: 6-12) years were enrolled into the study. A total of 355 (52.5%) were female, and 639 (83.3%) were living with biological parents. About three quarters (73.2%, 494/676) of the CALHIV were on a protease inhibitor-based regimen prior to DTG initiation. Median duration on ART regimen prior to DTG transition was 59 (IQR: 32, 84) months. Baseline VL uptake was 494/676 (83.3%). The uptake dropped to, 50% at 6 months and 74% at 12 months.

Compared to a VL suppression of 80.6% [95% Confidence Interval (CI): 77.4%, 83.9%] at baseline, overall suppression was 87.7% [95% CI: 83.6%, 91.7%] at 6 months (p=0.013), and 89.6% [95% CI: 85.8%, 93.5%] at 12 months (p=0.002) post-DTG transition. There was no statistically significant difference in the viral load suppression at 6 and 12 months post-DTG transition (p=0.486).

Conclusions: While there remain challenges with viral load uptake and testing at time of transition to optimized regimen and follow up for CALHIV, there is improved VL suppression with DTG transition.

EPB0252

Improved virologic suppression in children living with HIV under the age of 5 in Tanzania after the initiation of a viremia clinic and pediatric dolutegravir

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Background: Children living with HIV (CLHIV) below the age of 5 years (<5) often have worse treatment outcomes and lower rates of virologic suppression (VS) than older children. Some pediatric centers have utilized resources to address possible barriers to VS including socioeconomic factors, stigma, poor peer or parental support, medication tolerability, etc.

Methods: Data was extracted from December 2021 to November 2022 to investigate the outcomes of an interdepartmental Viremia Clinic started in February 2022 to improve clinic VS. The study included active clients at the Baylor College of Medicine Children's Foundation - Tanzania clinic in Mbeya who had their viral load (VL) measured within the previous 12 months and had been on antiretroviral therapy (ART) for ≥6 months. Per national guidelines, the first-line ART regimen for children <20kg was abacavir-lamivudine-lopinavir/ritonavir (ABC-3TC-



LPV/r) and dolutegravir (DTG) 50mg could be used if ≥ 20 kg. Due to drug stock-outs, only LPV/r granules were available for most of the study period. Widespread use of pediatric DTG (dispersible tabs) began around August 2022.

Results: VS in <5 was 80.9%(18/94) in December 2021 while the overall clinic suppression rate was 92.4%(1296/1402). Compared to ages ≥ 5 years, <5 VS was significantly lower ($p<0.0001$). <5 VS reached a nadir of 76.8%(76/99) before rising to 92.2%(94/102) by November 2022, surpassing the overall clinic VS of 91.7%(1239/1351) (see figure).

In April 2022, the percentage of those failing who were <5 reached a maximum of 20.8%(21/101) but then fell to 7.1%(8/112) by November 2022.

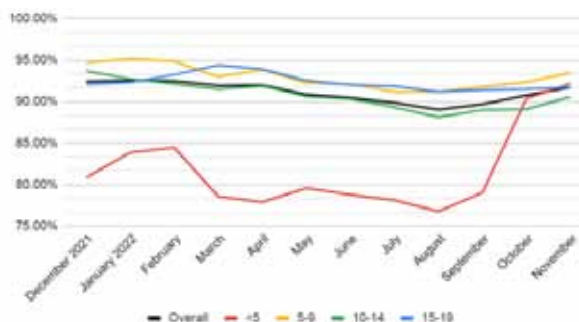


Figure. Virologic suppression rates by age group.

Conclusions: Despite historical challenges in <5 , we saw sustained improvements in VS rates that improved after the initiation of a Viremia Clinic and pediatric DTG. Moreover, clinic-wide rates of VS have begun to improve, though less dramatically than in <5 .

EPB0253

Integrase inhibitor use in children living with HIV in Europe & Thailand over the last decade (2010-2020): uptake and virological response

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Background: Integrase inhibitors (INSTIs) were approved for paediatric use from 2013 and are preferred anchor drugs for children living with HIV (CLWHIV). We assessed INSTI uptake and virological response in CLWHIV in real-world settings across Europe and Thailand between 2010-2020.

Methods: CLWHIV aged <18 years in the European Pregnancy and Paediatric Infections Cohort Collaboration at start of each calendar year were included in repeated cross-sectional analyses to describe trends in anchor drug class over time.

Characteristics at INSTI start, and proportion virally suppressed (VS) <50 copies/mL at 12 and 24-months after drug start, were described by treatment and viral load status at INSTI start.

Results: Of 7,835 CLWHIV included, the proportion taking INSTI increased from 0% in 2010 to 1% in 2015 and 22% in 2020. Uptake was highest in Western Europe, with 50% on INSTI by 2020 compared to $\leq 11\%$ in other regions (Eastern & Central Europe, Russia).

Among 1,674 CLWHIV ever taking INSTI, 65%(1,085) took dolutegravir, 32%(532) raltegravir, 11%(176) elvitegravir and 1%(18) bictegravir. 53% were female, median age at INSTI start was 13 years [IQR 10,15]. 23% on raltegravir were <6 years compared to $\leq 2\%$ on other INSTIs.

At drug start, the proportion naïve, treatment-experienced and VS, treatment-experienced and viremic (≥ 50 copies/mL) were: 9%, 46% and 26% for dolutegravir, 8%, 22%, 43% for raltegravir, 3%, 58% and 22% for elvitegravir and 11%, 33% and 28% for bictegravir, respectively; the remainder were treatment-experienced with missing viral load. At 12 and 24-months after INSTI start, the proportion VS was highest among those treatment-expe-

rienced and VS at drug start (>85%) and lowest among those treatment-experienced and viremic (<60%), across INSTI drugs (Figure).

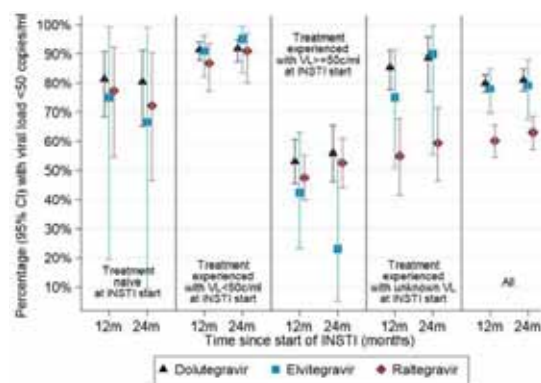


Figure. Viral suppression at 12 and 24 months after INSTI start, by drug (dolutegravir, elvitegravir and raltegravir) and viral load (VL) status at drug start (insufficient numbers on bictegravir).

Conclusions: Even by 2020 INSTI access in children living in Eastern/Central Europe and Russia, was poor. Among children with comparable treatment history at INSTI start, VL suppression was similar across the INSTI drugs.

EPB0254

Effectiveness of caregiver mentor directly observed treatment and support model on viral load suppression among children and adolescents living with HIV in Uganda

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Background: Viral load non-suppression remains a challenge among children and adolescents. Those with detectable viral load receive intensive adherence counseling (IAC) but with non-compliance and a low re-suppression rate (23%). Caregivers sometimes fail to attend these sessions due to environmental, personal, psychological, financial, and child-related challenges. Directly observed therapy (DOT) has shown great improvement in treatment outcomes through improving literacy and supporting drug administration challenges using a peer-to-peer approach. We assessed the effectiveness of the caregiver DOTs model on viral load suppression in Uganda.

Methods: We conducted a mixed methods implementation effectiveness Type 2 study among caregivers at Kasaala HCIII, Kiganda HCIV, Kiboga, Mityana, and Mubende Hospital in Central Uganda from June to December 2022. We identified caregivers of unsuppressed children and adolescents (2-15years) and paired them with caregivers of those suppressed from the same area within a radius of 2 kilometers on a ratio of 1:5-7. We trained those with suppressed children and adolescents

as mentors in providing treatment literacy, and directly observing daily treatment. They conducted Dots for a period of 60-90 days and provided linkage to livelihood support. We analyzed the viral load results after the third IAC and those who were still unsuppressed were checked for Drug resistance.

Results: A total of 30 caregivers of 49 unsuppressed children were enrolled on the study. The average age of the children was 8.8(±3.8) Years 20 males and 29 females. Of which 77.1% were on 1st Line, 20.8% were on 2nd Line, and 77.6% were on DTG-based regimen. The mentors identified lack of information, negligence, low treatment literacy, and lack of a supportive environment at home as the major factors for non-suppression.

After the DOTs intervention, 28 (57.1%) had non-detectable viral load, 18 (36.7%) suppressed with viral load < 200 copies, 1 lost to follow-up, and 2 had unsuppressed viral load and confirmed having Drug-resistant.

Conclusions: Caregiver DOTs can effectively support caregivers of non-suppressing children and adolescents to improve treatment outcomes through improving literacy and supporting drug administration. Therefore, there is a need to support caregiver mentors to provide peer-to-peer support at the household which reduces the burden on the overloaded health facilities.

EPB0255

High Prevalence of low level viremia among infants initiated on antiretroviral drugs following Mother to Child Transmission of HIV

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Background: With the elimination of mother to child transmission of HIV campaigns, the number of transmissions among new born babies has greatly reduced. However, it is imperative that those who sero-convert achieve complete and sustained viral suppression.

We assessed the prevalence of low level viremia among infants initiated on antiretroviral therapy (ART) over a period of two years in a Ugandan cohort.

Methods: The Drug Resistance Testing among Infants at Baseline study (DRIBS) is currently ongoing at Joint Clinical Research Centre in Uganda. We enrolled infants who started treatment following a confirmed positive Early Infant Diagnosis (EID) Test. Infants were followed for two years. Baseline CD4 and viral load (VL) were done. Response to therapy monitoring using viral load was done. Intensified Adherence Counseling (IAC) and HIV drug resistance testing was done.

Results: Between June 2018 and October 2021, 100 infants were enrolled. 71% of the babies have completed. Non-HIV related deaths accounted for 4%. Median age at di-



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agnosis was 79 (IQR, 57.75;140.75) days with 4% diagnosed within 6 weeks after delivery. Median age at initiation of therapy was 110.5 (IQR, 87.0;162.0) days. Median baseline %CD4 was 26 (IQR, 18.75;32) with 9% of babies being severely immunosuppressed. Median baseline log viral load was 4.44 (IQR, 3.19;5.58). At six months, 35% and 60% had VL <50 and <1000copies/ml respectively.

At 12 months, 40% and 70% had VL <50 and <1000copies/ml respectively. At month 18, 45% and 66% had VL <50 and <1000copies/ml respectively.

The proportion of babies with low level viremia (50-999copies/ml) at months 6, 12, 18 was 25%, 30%, and 21% respectively. Post IAC VL revealed that of the 58% babies with VL <1000copies/ml, only 23% had <50copies/ml. Of note, was the high proportion of LLV (35%) following IAC. When compared with the mothers' post IAC VL, 42% mothers had <50copies/ml with only 11.5% LLV.

Conclusions: Viral suppression and complete viral suppression are achieved much slower in the pediatrics implying it might take longer in babies to achieve the third 95.

Furthermore, the higher prevalence of LLV in pediatrics compared to the mothers in the same cohort has important implications on response to therapy.

EPB0256

Dolutegravir in our youngest cohort: follow-up of genotype led antiretroviral optimization in unsuppressed children

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Background: In 2021, pediatric Dolutegravir 10 mg tablets (pDTG) became available to children living with HIV in Eswatini. Selection of nucleoside reverse transcriptase inhibitor (NRTI) backbone was genotype guided in clients with a detectable viral load (DVL) on a first-line Protease Inhibitor (PI) regimen.

Methods: This is a retrospective review of routine data for pediatric clients with VL >1,000 copies/mL on first-line, PI-based antiretroviral therapy (ART) that accessed genotypes before optimization. The National Reference Laboratory performed genotypes in Johannesburg and the Stanford HIVdb Program was used to calculate predicted activity of NRTIs. This abstract will share the most recent VL during the 18 months after optimization.

Results: Thirty clients on first line ABC-3TC-LPV/r (abacavir, lamivudine, lopinavir/ritonavir) with viral loads > 1,000 copies/mL were genotyped. Average age was 2.6 years (50% male, 50% female). Half (50%; 15/30) demonstrated drug pressure (through the presence of M184V(14) or T215S(1) alone) with no or low-level ABC resistance and were optimized to ABC-3TC-DTG.

Follow-up VL≤400 copies/mL in this cohort was 85% (11/13; 2 LTFU). Wild-type virus was observed in 37% (11/30). These clients were optimized to ABC-3TC-DTG, and subsequent VL ≤400 copies/mL was observed in 67% (6/9; 1 remains on PI).

The final 4 clients (13%; 4/30) had high level ABC resistance on genotype and were optimized to AZT-3TC-DTG. VL ≤400 copies/mL was observed in 75% (3/4), with the remaining 1 viral load <1000 copies/mL.

Overall VL suppression (≤400 copies/mL) was 77% (20/26) at an average of 5 months after pDTG initiation (1-13 months). No PI mutations were present in this cohort.

Conclusions: Our cohort demonstrates high re-suppression rates with the introduction of pDTG despite still struggling to reach national suppression targets. However, high level ABC resistance does exist in this young cohort, confirming that in resource limited settings without genotype guidance, some children are being placed on regimens that are not fully active.

It is unknown if this is a safe and durable strategy. Protease inhibitor mutations were not routinely identified, suggesting this class of drugs may still be useful in the future should they fail a DTG based regimen.

EPB0257

Viral load suppression in children living with HIV after pediatric dolutegravir optimization in Eswatini

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Background: In September 2021, Eswatini began optimizing children under 20kg to pediatric dolutegravir (pDTG)-based Antiretroviral Treatment (ART). All children on first line ART optimized either to ABC/3TC/DTG if viral load (VL) ≤400copies/mL; or if VL ≥1000copies/mL, genotype results were used to inform an optimized NRTI backbone with pDTG. All children with VL 401-999 went through adherence counseling. This is a description of early viral load outcomes for these children.

Methods: This is a retrospective review of routinely collected data from all children on first line ART optimized to pDTG based ART from August 2021 until January 2023 at Baylor College of Medicine Children's Foundation-Eswatini. Data were extracted from electronic medical records



and imported into STATA 17 for analysis. McNemar's Test using 95% confidence intervals ($p < 0.05$) was used to determine significance in viral suppression (≤ 400 copies/mL) before and after optimization.

Results: Since optimization, 369 children have accessed pDTG; 57 as new initiations and 312 through optimizations. Of the 57 newly initiated, 46% were (26/57) male and 54% (31/57) female with an average age of 17 months (0-83 months). The suppression rate for this group was 78% (21/27) at an average of 7 months post pDTG initiation (4-14 months).

Of the 312 children optimized to pDTG, 224 had VL results both before and after optimization. These children were 42% male (95/224) and 58% female (129/224) with an average age of 55 months (7-206 months). Before optimization, 95% were on ABC/3TC/LPV/r (212/224); after optimization, 97% were on ABC/3TC/DTG (219/224).

There was a significant increase in the VL suppression rate (89% pre-optimization to 95% post-optimization; $p < 0.05$) at an average of 7.6 months post pDTG optimization (0.03-16 months). Stratified by age in 12-month increments, suppression rates for all groups increased to $>90\%$ after optimization except for with children between 12-23 months who increased to only 77% (10/13).

Conclusions: Children have benefited from introduction of pDTG. All children have seen improved viral suppression, but the 12-23 months age group and new initiations still struggle to meet national targets. Pending viral load data will continue to be tracked and evidence generated will be shared over the coming years.

EPB0258

High acceptability and preference for pediatric dolutegravir 10mg among children living with HIV in Nigeria at 1- and 6-month follow up, an observational study

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Background: Nigeria is an early adopter country of the generic formulation of pediatric dolutegravir 10mg (pDTG) that became accessible in December 2020. This study aims to assess the acceptability and preference of pDTG among children living with HIV newly initiated or transitioned to the drug. Findings from the study was used to guide national scale-up.

Methods: Pediatric clients weighing $>3\text{kg}$ and $<20\text{kg}$ were enrolled between September and December 2021 in 7 sites across 7 state (Akwa-Ibom, Benue, Cross river, Lagos, Plateau, Rivers and Sokoto). Acceptability and experiences were assessed through surveys conducted with clients and their caregivers as respondents at 1 and 6 months following pDTG initiation using a structured questionnaire. Participants were asked about side effects, ease of administration, and regimen preferences. Data from 1- and 6-month follow-ups were analyzed for frequencies and trends.

Results: The study enrolled 180 clients and the mean age was 4.7 years, with 98% being treatment experienced. At month 1, 99% of the treatment experienced respondents prefer the pDTG-based regimen to their previous regimen, this increased to 100% at month 6. On ease of administration, at month 6, 99% and 100% of respondents respectively reported that pDTG tastes better and was easier to administer than previous regimen, compared to 99% and 96% respectively at month 1. 99% of respondents at both months 1 and 6 were satisfied or very satisfied with their pDTG regimen.

The most common side-effect reported at months 1 and 6 was increased appetite (25% and 43% respectively). 97% and 94% of respondents at months 1 and 6 respectively



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reported that the client either gained weight appropriately or had no change in weight. Hyperactivity was reported by 29% of participants at month 6.

Conclusions: There is a high acceptability and preference for pDTG compared to legacy regimens such as LPV/r, with improved taste and ease of administration.

Increased appetite was the most common side-effect reported.

With the favourable findings from the study to date, national HIV program has commenced scale-up of pDTG with emphasis on pharmacovigilance.

Further follow-up at 12 months will provide more evidence of pDTG's impact.

EPB0259

Outcomes from the Transitioning children to Optimal Regimens of Paediatric Dolutegravir (TORPEDO) study at 6 months in Benin, Nigeria, and Uganda

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Background: Following the successful global rollout of dolutegravir for antiretroviral treatment of adults and children over 20kg, a pediatric dolutegravir formulation (pDTG) became available in late 2021. This dispersible tablet is administered once daily, and with better taste and potency is expected to improve pediatric outcomes.

To inform the introduction of this optimal treatment for children living with HIV (CLWH), we systematically monitored health care workers' (HCWs) experiences prescribing pDTG as well as health outcomes of pDTG initiates.

Methods: TORPEDO is a mixed-methods, prospective cohort study of CLWH initiating pDTG at 19 pediatric HIV treatment sites in 3 countries with early access to pDTG: Benin (6 sites), Nigeria (7 sites), and Uganda (6 sites). 510 CLWH were enrolled from October 2021–June 2022. Six-months following introduction, individually administered surveys were collected from study facility HCWs. Surveys included questions on HCWs' experiences prescribing

pDTG. Viral load (VL) test results at baseline and 6 months following pDTG initiation were analyzed; undetectable VL was defined as <50 copies/mL and viremia was defined as greater than 1,000 copies/mL.

Results: 89 HCWs [54% physicians, 17% nurses, 11% clinical officers] were surveyed between April 2022–November 2022. Over 90% had more than 5 years health care experience, and almost 80% had more than 5 years of experience treating HIV. All respondents (100%) believed that clients preferred pDTG over previous drugs. Nearly all HCWs (n=86, 97%) observed better client adherence; 72 (81%) observed fewer side effects compared to lopinavir/ritonavir. 87 respondents (98%) reported increased confidence in prescribing pDTG; reasons for this included "better tolerated" as the most frequent response and "improved side effects or outcomes" as the second most frequent.

When asked to share observations on prescribing pDTG, almost three-quarters said "appropriate or better weight gain." At baseline, 69% of VL tests were "undetectable", and 16% had viremia (n=357); at 6-months, 85% were undetectable and 6% had viremia (n=310).

Conclusions: Improved tolerability and adherence as reported by prescribers of pDTG was supported by improved viral suppression amongst study participants. Further analysis of long-term client VL results, as well as weight and body-mass index trends, will provide more evidence of pDTG's impact.

EPB0260

HIV drug resistance trends among 251 treatment experienced children and young adults (0-24 years)

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Background: Treatment-experienced clients are failing antiretroviral therapy (ART) throughout Sub-Saharan Africa. The resulting HIV Drug resistance mutations (DRMs) present an urgent need for genotyping, and access to robust treatment options, to provide successful individualized lifelong treatment in our most vulnerable pediatric clients living with HIV.

This abstract looks at early resistance trends in our treatment experienced pediatric and young adult clients in Eswatini (0-24 years).

Methods: This is a retrospective review of electronic medical records and genotype results from Baylor Children's Foundation-Eswatini and referrals from other facilities in Eswatini. All genotypes are from treatment-experienced clients, 0-24 years old, with at least two detectable viral loads on Protease Inhibitor (PI) or Dolutegravir (DTG)-



based ART. Genotypes were done through the National Reference Laboratory in South Africa using dried blood spot (DBS) specimens in alignment with National Treatment Guidelines. Stanford HIVdb Program was used to calculate predicted activity of ART.

Results: Genotypes were performed in 251 clients between January 2014 and January 2023 (39% (99/251) female; 61% (152/251) male). Sixteen percent (40/251) showed intermediate level or higher resistance to LPV/r; 43% (17/40) of those also showed intermediate or higher resistance to DRV/r. Most common PI mutations were M46I (34), V82A (33), I74V (33). INSTI resistance testing was performed on 13 samples. Fifteen percent (2/13) had intermediate or high level DTG resistance due to the following mutations: E138AK(1), G140A(1), Q148R(1), R263K(1).

Intermediate or high resistance to Rilpivirine (RPV) was observed in 29% of genotypes (74/251) despite no clients being on non-nucleotide reverse transcriptase inhibitors (NNRTI) at the time of sample collection. Most common nucleotide reverse transcriptase inhibitor (NRTI) mutations were M184V (127), M41L (28), D67N (25), T215Y (25).

Conclusions: Trends in DRMs in Eswatini give insight into future effective ART for treatment-experienced clients and may inform national policies regarding sequencing of ART moving forward. Pediatric surveillance resistance testing is needed in Eswatini and the region to inform national ART optimization guidelines and advocacy for access to novel treatment options for our most vulnerable clients.

EPB0261

Implementation of a Quality Improvement collaborative of HIV status disclosure of Young People Living with HIV in Zimbabwe

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Background: Despite the progress made in HIV services, treatment and mental health outcomes of Adolescents and Young People Living with HIV (AYPLHIV) remain sub-optimal, of which non-disclosure to the AYPLHIV of their HIV status is a key factor.

To address this challenge, the Ministry of Health and Child Care (MoHCC) of Zimbabwe recommends that full disclosure be done before 10 years of age, yet Zvandiri programmatic data (May 2022) showed that 1,443/6,666 (22%) of AYPLHIV aged 10-14, and 389/9,149 (4%) of AYPLHIV aged 15-19 were not disclosed to. Zvandiri connects AYPLHIV with trained, mentored, peer counsellors. We utilised a Quality Improvement (QI) collaborative from April

to September 2022 to improve disclosure status among AYPLHIV across three selected districts (Hurungwe, Nkayi, and Goromonzi).

Description: As part of the QI collaborative, the Zvandiri District Team (ZDT) engaged Health Care Workers (HCW) and peer counsellors to elucidate the disclosure status of supported AYPLHIV. AYPLHIV who were not fully disclosed to were identified and followed up for disclosure support. The QI package included documentation of disclosure status in health care files, monthly caregiver support meetings and individual additional counselling, and HCW Initiated Opt-out Disclosure Sessions (HIODS).

Lessons learned: The disclosure rate increased from 959/1319 (73%) to 1266/1319 (96%) over six months as all AYPLHIV without full disclosure and their caregivers received the QI package of disclosure support. Of the 53 (Female:36, Male:17) AYPLHIV who did not receive full disclosure, 45/53 (85%; Female:30, Male:15) were aged 10-14 and 8/53 (15%; Female:6, Male:2) were aged 15 and above. Reasons for non-disclosure:

- 12/53 (23%) absent primary caregiver
- 26/53 (49%) caregiver unwilling to disclose
- 4/53 (8%) AYPLHIV with cognitive impairment
- 11/53 (21%) disclosure process ongoing

Conclusions/Next steps: The QI collaborative was successful in improving disclosure status among AYPLHIV, which is expected to improve retention in care, mental health status and overall treatment outcomes for the AYPLHIV. This initiative has demonstrated the importance of active follow up and documentation of disclosure status among AYPLHIV, in addition to caregiver counselling and HIODS. Primary caregivers working abroad posed a special challenge, as the secondary caregivers were hesitant to disclose in their absence.

EPB0262

Impact of a teen club model on improving HIV outcomes among adolescents in rural Neno district, Malawi: a retrospective cohort study

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Background: HIV which affects over one million people in Malawi, is a significant public health concern. The rate of improvement is slower among adolescents and young adults, despite significant progress toward attaining the 95-95-95 UNAIDS targets throughout the whole population of HIV-positive persons. For instance, retention and viral load suppression rates in adolescents aged is below 76%, while same rates reach 90% in adults.

As a result, differentiated teen club models were introduced in Malawi's in 2006 as part of the national strategy to build a strong national HIV program. In Neno district, teen club was introduced in 2013 with an aim of improv-



ing the clinical outcomes for this subpopulation. Our goal therefore is to compare the impact of the teen club model to the standard care on HIV treatment outcomes among ALHIV in Neno District.

Methods: Retrospective cohort study using routine patient data extracted from the electronic medical record system in Neno District. We enrolled 532 adolescents living with HIV (ALHIV), with 235 in teen clubs and 297 in the standard care, matched on age, sex and ART initiation year. Our primary outcome was attrition defined as a combination of treatment outcomes 'died', 'defaulted' and 'transferred out'. Multivariate Cox regression was used estimate the hazard ratios of the risk factors of attrition in care.

Results: Over a four-year follow-up period, ALHIV who participated in the teen club had a significantly higher likelihood of remaining in care than those who did not (HR=2.80; 95% CI: 1.46, 5.34). Teen clubs also increased the probability of measuring viral load and body mass index (BMI) but did not change the probability of viral load suppression. Age at ART initiation < 15 years (aHR=0.37; 95% CI: 0.17, 0.82) reduced the risk of attrition from HIV while underweight status (aHR=3.18; 95% CI: 1.71, 5.92) increased the risk of attrition after controlling for sex, WHO HIV staging, and teen club participation.

Conclusions: The teen club model has the potential to improve treatment outcomes among ALHIV. In addition to retaining adolescents in HIV care, greater attention is needed to treatment adherence and viral suppression in this special population.

Clinical issues specific to key populations

EPB0263

Single cell rna-seq analysis of persons with HIV and opioid use

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Background: The US is experiencing a major drug epidemic largely attributed to synthetic opioids including fentanyl. We previously reported that fentanyl enhanced replication of HBV, HCV, and HIV *in vitro*.

Here, we considered how illicit fentanyl use in persons with HIV impacted gene expression in peripheral blood mononuclear cells (PBMCs).

Methods: Whole blood was collected from adults with opioid use, as well as non-opioid using controls. Plasma samples were screened by Liquid Chromatography Mass Spectrometry for commonly abused drugs. Single cell barcoding and complementary DNA were performed using Chromium Next GEM Single Cell 5' Reagent Kits. Data were integrated and cell clusters identified using Seurat. Cell types were assigned by label transferred from an annotated reference dataset. Differentially expressed genes were identified using 1) log₂ fold-change ≥ 0.25, 2) at least 10% of cells expressing the gene in both compared groups of cells, and 3) Wilcoxon rank sum test Bonferroni-adjusted p value < 0.01.

Results: Single cell RNAseq data were obtained from 7 HIV positive / HCV negative, 8 HIV negative / HCV positive, and 12 HIV positive / HCV positive individuals, and one HIV negative / HCV negative individual, including 23 males and 5 females. Fentanyl was detected in 13 individuals. Other drugs of abuse also detected included cocaine (4), marijuana metabolite (10), and methamphetamine (3). An average of 13,745 cells were sequenced per individual. Cell frequencies were not different by opioid status for most cell types except NK cells (lower for opioid use; p = 0.027). Among HIV/HCV co-infected persons, differentially expressed genes during opioid use included:



1. MTRNR2L8 in CD4⁺ T cells,
2. MTRNR2L8, hemoglobin subunit B (HBB), and RPS4Y1 in CD8⁺ T cells,
3. MTRNR2L8, HBB, multiple interferon-stimulated genes, LY6E, LGALS2, XAF1, and APOBEC3A in monocytes, and;
4. MTRNR2L8, HBB, XAF1, and RPS4Y1 in B cells.

Conclusions: These findings suggest multiple pathways by which opioid use contributes to HIV pathogenesis. Rigorous characterization of the interactions among HIV, opioids, and host cells will improve clinical management paradigms for difficult-to-treat populations, facilitate public health policies given severely strained resources, and reveal additional pathways for novel target-specific therapeutic interventions.

EPB0264

Oropharyngeal presentation of mpox: a neglected entity?

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Background: Oropharyngeal manifestations were not initially reported in the case-definition of mpox. Pharynx involvement may mimic other diseases and lead to underdiagnosis. The aim of this study was to evaluate the prevalence of oropharyngeal mpox among clients from a single center in Buenos Aires, Argentina.

Methods: We analyzed medical records of clients diagnosed with mpox evaluated at a Buenos Aires clinical center focused on STIs from June 28 to December 22, 2022. We collected data on demographics, clinical presentation, concomitant STIs, and hospital admission. PCR in clinical samples was used to diagnose mpox. Data analysis was made with RStudio V2022.12.0+353.

Results: Forty-five clients (41 MSM, 4 TGW) with a median age of 33 years (IQR 28-40) were included. 8/45 (17%) were people living with HIV, 7 of them on antiretroviral therapy (ART) and virally suppressed; of those HIV-negative, 86% (32/37) were on PrEP. The most commonly reported symptoms were lymphadenopathy (84%), cutaneous lesions (84%), fever (57%), myalgias (48%), headache (45%), and arthralgias (13%). Anal lesions were observed in 37% of clients, oral lesions (ulcers, vesicles, and mucosal inflammation) in 31%, and pharyngitis in 22%. Syphilis was observed in 27% (10/37). Those with pharyngitis were more likely to have concomitant oral involvement ($p < 0.05$, Fisher test). Three clients presented oropharyngeal manifestation without rash or rectal involvement. In consequence, two of them had a delay in mpox diagnosis due to misdiagnosis of bacterial pharyngitis. One client with dysphagia required hospital admission.

Conclusions: The clinical occurrence of pharyngitis, especially when presenting as an isolated symptom, can lead to misinterpretation of the disease and delays in diag-

nosis. Although pharyngitis is a less frequent symptom of mpox, it should be considered for diagnosis in high-risk populations.

EPB0265

Evaluating the perceptions of PWID about long-acting MOUD, PrEP, and ART

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Background: To successfully achieve the Ending the HIV Epidemic goals, the United States must address HIV treatment and prevention in the context of the co-occurring opioid crisis. Long-acting, injectable forms of pre-exposure prophylaxis (LAI-PrEP) and antiretroviral therapy (LAI-ART) and extended-release medications for opioid use disorder (XR-MOUD) may potentially reduce treatment attrition. However, few studies have evaluated community receptiveness regarding LAI-PrEP, LAI-ART, and XR-MOUD among PWID.

Methods: We conducted a cross-sectional survey of adults with OUD and a history of injection drug use attending a NJ syringe exchange program (SEP) to assess their prior experiences with HIV treatment and prevention, OUD care, and knowledge, attitudes, and preferences regarding LAI.

Results: 178 participants were included in the analysis. 15 participants were persons living with HIV (PWH), 72 were high risk for HIV (HRH), and 91 were low risk for HIV (LRH). Though nearly 60% of participants had previously taken MOUD, knowledge of XR-MOUD formulations was low (40% PWH, 45.8% HRH, and 41.6% LRH, $p = \text{NS}$) and interest in XR-naltrexone (33.3% PWH, 27.8% HRH, 26.7% LRH, $p = \text{NS}$) and XR-buprenorphine (33.3% PWH, 18.3% HRH, 20.9% LRH, $p = \text{NS}$) was low.

General PrEP knowledge was high (59.1% HRH and 63.9% LRH, $p = \text{NS}$), but prior usage was low (11.1% HRH and 6.7% LRH, $p = \text{NS}$) and interest in LAI-PrEP was low (18.1% HRH and 21.1% $p = \text{NS}$). PWH had high awareness of LAI-ART (66.7%) and high interest in receiving either monthly or bimonthly LAI-ART (66.7%). There was a statistically significant difference in interest in receiving a form of LAI-antiviral ($p = 0.02$). Interest in integrated care was greater for PWH (69.2%), compared to the HRH (29.8%) or LRH (33.9%) ($p = 0.03$) groups. Preferred treatment locations varied; PWH preferred care in an HIV clinic (46.7%) or mobile clinic (26.7%) while both HRH (31%) and LRH (27.3%) preferred a SEP.

Conclusions: Our findings indicate increased education and outreach efforts tailored towards PWID are needed, especially ones focused on XR-MOUD and LAI-PrEP. Given the difference in treatment location preferences and interest in integrated treatment, a differentiated care model may be useful in reaching PWID with OUD and at-risk for HIV as compared to PWID with OUD and HIV.



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**EPB0266****Mpox knowledge, concern, willingness to change behaviour, and seek vaccination in Australia: results of a national cross-sectional survey**

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Background: Mid-2022 saw a global mpox outbreak affecting predominantly gay and bisexual men in non-endemic countries. Australia had never previously recorded mpox cases and there was no prior research on knowledge or attitudes to mpox. We therefore assessed knowledge and concern about mpox, acceptability of behavioural changes to reduce transmission risk, and willingness to be vaccinated.

Methods: A national, online survey was conducted August–September 2022 among gay, bisexual and queer-identifying men and non-binary people. We report descriptive statistics for survey measures. We used multivariate logistic regression to identify factors associated with vaccine willingness.

Results: Of 2287 participants, 95.7% identified as male and 82.8% were gay. 98.6% had heard about mpox and 64.4% were concerned about acquiring it. Most of the 2268 undiagnosed participants identified skin lesions (92.0%), skin rash (87.2%), and fever (72.6%) as potential symptoms, and prolonged and brief skin-to-skin contact as potential ways to acquire monkeypox virus (93.7% and 82.0%, respectively).

The most acceptable behavioural changes (prior to vaccination) were reducing or avoiding attendance at sex parties (65.9%) and sex-on-premises venues (66.4%), and having fewer sexual partners (64.6%). 14.2% of the sample had already received ≥1 dose of Modified Vaccinia Ankara vaccine.

Most unvaccinated and undiagnosed participants were willing to be vaccinated (1457/1733; 84.1%). Bisexual participants were less willing to be vaccinated than gay participants (aOR=0.63, 95%CI=0.41–0.96, $p=0.032$). Participants who were concerned/very concerned about acquiring mpox were much more willing to be vaccinated than unconcerned participants (aOR=5.18, 95%CI=3.36–7.99, $p<0.001$). Participants with greater numbers of recent male sexual partners (between 11–20) were also more willing to be vaccinated compared to those with fewer than 10 partners (aOR=1.85, 95%CI=1.02–3.37, $p=0.044$).

Other factors were not independently associated with vaccine willingness (e.g., residential location, education, HIV status/PrEP use, perceived likelihood of acquiring monkeypox virus, any recent condomless casual sex).

Conclusions: Most participants had heard of mpox and were familiar with the most common clinical symptoms and transmission routes. We found very high willingness to be vaccinated against mpox, however bisexual participants appeared less willing to be vaccinated, and this group might benefit from targeted education on the importance of vaccination.

EPB0267**Factors associated with viral load suppression amongst transgender people in South Africa**

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Background: Sustained viral load suppression (VLS) can improve quality of life amongst transgender people living with HIV (TPLHIV). However, transgender people continue to experience disparities along the HIV care continuum due to a myriad of psychosocial and socio-economic factors. Insights into factors that influence VLS are critical to determine targeted interventions for transgender health programmes. This analysis presents characteristics of TPLHIV accessing health services from USAID-funded dedicated transgender clinics in four South African districts and characterizes factors associated with VLS in this group.

Methods: We used routine programme data that were manually collected and recorded in REDCap between October 2021 and September 2022. We summarised client characteristics using descriptive statistics and conducted a multivariable logistic regression in Stata v16 to identify factors associated with VLS (<50 copies/mL) among TPLHIV ($p<0.05$).

Results: Among 889 TPLHIV who were eligible for a viral load test during the period of review, 773 (87%) underwent a viral load test. Amongst these, 90.4% were transgender women, 7.3% were gender non-conforming, and 2.3% were transgender men. The median age was 29 years, 72% were unemployed, and 8% reported experiencing physical and/or sexual violence in the last 12 months. At least 20% (153/773) had completed tertiary education and 86% (664/773) were treatment naïve at baseline. VLS was 59% (459/773) amongst those who had a viral load test done. The odds of VLS were higher amongst TPLHIV who were ART experienced (vs. those who were ART naïve; aOR =4.80, 95% CI: 1.80,12.79). Transgender people on a protease inhibitor-based regimen (vs. those on a dolutegravir-based regimen aOR=0.068, 95% CI: 0.008,0.57) and those who had experienced violence in the last 12 months (vs.


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those who had not; aOR=0.46, 95% CI: 0.23,0.86) were less likely to be suppressed. Although level of education was not statistically associated with VLS, our analysis demonstrated improved VLS with increasing education levels.

Conclusions: VLS remains a challenge amongst TPLHIV. Integrating HIV health services with programmes that address gender-based violence, offer educational opportunities, and provide enhanced adherence support could improve VLS in this vulnerable group. Moreover, the continued roll-out of dolutegravir in South Africa may provide benefits in achieving or maintaining VLS.

EPB0268

The role of substance use in structural heart disease among unsheltered and unstably housed women living with HIV

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Background: People living with HIV have increased risk of cardiovascular disease, but few studies focus on women. A recent report showed that, among women living with HIV (WLH), those with CD4+ counts<200 cells/mm³ had a higher prevalence of left ventricular hypertrophy. However, the impact of substance use on structural heart disease among WLH is less well established.

Methods: We recruited WLH from San Francisco shelters, meal programs and street encampments. Between 2016 and 2019, participants completed six monthly interviews, specimen collection, and one transthoracic echocardiogram. Electronic health records were reviewed to assess the most recent CD4+ count prior to the echocardiogram. We used multinomial logistic regression to assess associations between echocardiographic indices of cardiac hypertrophy (concentric hypertrophy, concentric remodeling and eccentric hypertrophy, each compared to "normal cardiovascular indices") and study factors, including cardiovascular risk factors, substance use, and HIV-specific factors (CD4+ count, viral load, HIV medication).

Results: Among 59 participants, the average age was 53 years and 70% were ethnic minority women. Just over 70% had elevated blood pressure (BP), 10% had diabetes and 10% reported a prior myocardial infarction. Toxicology-confirmed substance use included tobacco (63%), cannabis (52%), cocaine (51%), methamphetamine (29%), and alcohol (26%).

Adjusting for systolic BP and viral load, *concentric hypertrophy* was detected in 26% of participants. It was more prevalent in those who used cocaine (adjusted Relative Risk [aRR]=62.0, 95% CI: 5.07-759, p<0.01) and less prevalent in those who used cannabis (aRR=0.10, 95% CI: 0.01-0.81, p=0.03).

Concentric remodeling was detected in 40% of participants. It was also more prevalent in those who used cocaine (aRR=15.6, 95% CI: 1.76-138, p<0.01) and less prevalent in those who used cannabis (aRR=0.15, 95% CI: 0.02-0.97, p=0.04).

Eccentric hypertrophy was detected in 7% of participants. It was not significantly associated with factors studied here. CD4+ count was not significantly associated with these outcomes.

Conclusions: Among polysubstance-using WLH, cocaine use had a strong association with structural heart disease by echocardiography, while this finding was not demonstrated for other toxicology confirmed substance use or HIV-specific factors.

Whether cannabis use mitigates the impact of cocaine on structural heart disease among WLH merits further investigation.

EPB0269

Review of antiretroviral therapy coverage among prisoners living with HIV in 10 African countries

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Background: Achieving UNAIDS' vision of zero new HIV acquisition, zero discrimination, and zero AIDS-related deaths requires that everyone needing Antiretroviral therapy has timely access to life-saving medication and is aware of HIV prevention services. HIV prevalence in African correctional facilities is significantly higher than that of the general population. The HIV risk in these population increases through needle sharing, sexual violence, unprotected, unplanned sexual intercourse, and other risky behaviors.

This study assesses antiretroviral therapy coverage among prisoners in selected African countries.

Methods: We extracted data on antiretroviral therapy (ART) coverage among prisoners living with HIV in Africa from the UNAIDS database. The study covered the following African countries with available data: Burkina Faso, Cote D'Ivoire, Chad, Ghana, Togo, South Africa, Uganda, Zambia, Malawi, and Zimbabwe.

Data reported in this review were also obtained from different e-bibliographic, including PubMed PubMed Central, Google Scholar, Science Direct, and Research Gate. About 37 papers published from 2017 to 2021 met the inclusion criteria.

Key terms used in the search were "Antiretroviral therapy," "Prisons," "HIV treatment," "Correctional facilities," "HIV/AIDS medication," and "Key population."

Results: All ten countries have experienced an increase in ART coverage among prisoners living with HIV from 2017 to 2021, except for Cote D'Ivoire, having an 11.1% decrease. Ghana, Malawi, and Zambia have the highest ART coverage of 100% for their prisoners living with HIV, while Burkina Faso and Togo have the lowest ART coverage of 21.8% and 34.1%, respectively.



Countries selected in Southern Africa slightly have a higher coverage of ART among their prisoners living with HIV than other African regions.

Conclusions: There are glimpses of progress regarding ART coverage among prisoners living with HIV in the selected countries; however, we still have a long way to go in enhancing ART coverage among key populations to achieve UNAIDS 95-95-95 goal by 2030.

There is a need to design additional interventions and strategies to address the gaps and scale ART coverage among key populations in Africa.

Other strategies and therapies

EPB0270

Effects of oral cannabinoids on systemic inflammation and viral reservoirs in people with HIV on antiretroviral therapy: results of the CTNPT 028 clinical trial

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Background: Chronic HIV infection is characterized by persistent chronic inflammation despite antiretroviral therapy (ART). Cannabinoids are reported with anti-inflammatory properties and may represent a potential strategy to reduce systemic inflammation in people with HIV (PWH).

Methods: Ten PWH (median age: 57.5 years, 8 males) on ART were randomized ($n=5$ /group) to increasing doses of oral Δ^9 -tetrahydrocannabinol (THC): cannabidiol (CBD) combination (THC/CBD: 2.5/2.5 to 15/15mg daily) capsules or CBD-only (200 to 800mg daily) capsules, for 12 weeks. Blood specimens were prospectively analyzed before cannabinoid initiation and after the completion of cannabinoids treatment.

Hematology and biochemistry profiles were used to assess the safety of cannabinoids. Plasma levels of inflammatory markers IFN- γ , TNF- α , IL-1 β , IL-6, IL-8, and IP-10, and anti-inflammatory IL-10 were determined using a Luminox assay, and LPS, sCD14, sCD27, gut damage markers REG-3 α and I-FABP were quantified by ELISA.

Multi-color flow cytometry was used to immunophenotype T-cells. HIV DNA and cell-associated RNA (LTR-gag) were measured in blood CD4 T-cells and in cell pellets from semen by ultra-sensitive qPCR, and cell-free viral RNA was measured in semen supernatant.

Results: Eight individuals completed the study. Cannabinoids did not alter participants' hematology/biochemistry profiles. CD4 count and CD4/CD8 ratio were stable and viral load remained suppressed throughout the study. Cannabinoids significantly reduced plasma levels of the following inflammatory markers from initiation *versus* the end of the intervention: IFN- γ ($p=0.03$), TNF- α ($p=0.02$), IL-1 β ($p=0.02$), and REG-3 α ($p=0.04$).

In addition, cannabinoids also significantly reduced the frequency of PD1+ memory CD4 T-cells ($p=0.02$), CD28-CD57+ senescent CD4 and CD8 T-cells ($p=0.05$ and $p=0.04$, respectively) and CD39+ regulatory T-cells ($p=0.01$). There was no significant change in HIV DNA and RNA levels in blood or semen nor in other plasma inflammatory markers.

Conclusions: Cannabinoids reduced markers of systemic and gut inflammation, as well as senescence and exhaustion markers in T-cells in PWH, providing rationale for a larger clinical trial.

ART resistance

EPB0271

Assessment of transmitted drug resistance mutations to doravirine (MK-1439) in Argentina

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Background: Latin America (LATAM) has reported moderate to high levels of transmitted drug resistance in people living with HIV, mostly to NNRTIs. Doravirine (DOR) is a novel NNRTI that has shown non-inferior efficacy to DRV/r and EFV-based regimens in phase 3 trials and has a favorable safety and tolerability profile. DOR has a unique NNRTI resistance profile with antiviral potency against the most prevalent NNRTI-associated resistant viruses. To date, no data exist regarding the prevalence of DOR RAMS (Resistance Associated Mutations) in LATAM.

We describe the prevalence of DOR RAMS in genotypes from antiretroviral treatment (ART) naïve adults in two reference HIV clinics in Buenos Aires, Argentina.

Methods: Retrospective cross-sectional, non-interventional study, period 01/2017-09/2021. Baseline genotype samples requested as routine clinical practice from ART naïve people living with HIV were retrospectively analyzed for RAMS associated with resistance to DOR according to the ANRS algorithm.

Results: 1667 samples were analyzed: 81.2% corresponded to male sex persons, the median (IQR) of age was 34 (28-43) years; 9.9% had evidence of recent infection. Predominant route of infection was sexual (99.83 %); 52.6% were men who have sex with men. Median (IQR) HIV-1 viral load


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and CD4-T cell count were 50550 c/mL (15300-183500) and 363 cells/mL (212-532). Thirty-seven (2.2%) patients harbored mutations or a combination of mutations that, in accordance with the algorithm, would confer resistance to DOR (table 1). DOR was classified as "susceptible" and predicted to be efficacious in 98% of the samples.

	N (%)
Mutations associated with resistance	23 (1.37)
G190S	1 (0.05)
K103N + Y181C	3 (0.17)
K103N + P225H	6 (0.35)
L100I + K103N	2 (0.11)
V106M	1 (0.05)
Y188L	9 (0.51)
At least 4 of A98G, L100I, K101E, V106I, E138K, Y181C, Y181V, G190A or H221V, L100I, K103N, K103N + Y181C, K103N + P225H, F227C	1 (0.05)
Mutations associated with possible resistance*	14 (0.81)
E138K	1 (0.05)
G190A	2 (0.11)
H221V	2 (0.11)
K101E	3 (0.17)
V106I	1 (0.05)
Y181C	2 (0.11)
Y181V	3 (0.17)

*Mutations are listed individually, but a combination of two is required to confer possible resistance to doravirine.

Table 1.

Conclusions: In a sample of ART naïve population from Argentina, the prevalence of DOR RAMS was low (2.2%) which provides reassurance about the use of doravirine in the treatment of this population in Argentina.

EPB0272

Prevalence and dynamics of drug resistance during dolutegravir-containing treatment in a pediatric population living with HIV-1 (IMPAACT P1093)

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Background: A secondary objective of IMPAACT P1093, a phase I/II study of dolutegravir (DTG) and optimized background therapy (OBT) in children (4 weeks to <18 years) living with HIV-1 in nine countries in Africa, Americas, and Asia, is to assess changes in HIV-1 genotypes and phenotypes to DTG and OBT in children with/without intermittent viremia or treatment failure.

Methods: Plasma RNA from participants at enrollment and longitudinal specimens from intermittent viremias or protocol-defined virologic failures were genotyped for resistance, including minority variants, using a laboratory-developed PacBio assay. The prevalence and dynamics of DTG and OBT resistance were assessed using Stanford HIV Database with resistance to PIs, NRTIs, and NNRTIs defined by genotypic susceptibility scores (GSS) ≥ 30 and to DTG by GSS ≥ 10 . Phenotyping of participant-derived recombinant viruses was performed using our single-cycle reporter assay to determine the DTG 50%-effective concentration (EC₅₀) and EC₅₀ fold-change between baseline and later, on-treatment timepoints.

Results: Genotyping at enrollment was successful for 153/169 (90.5%) participants (12/181 specimens unavailable) with resistance detected to PIs (n=22; 14.4%), NRTIs (n=69; 45.1%), NNRTIs (n=73; 47.7%), but not to INSTIs (n=0), including M184V (n=59), L74V (n=16), and K70R (n=13). Intermittent viremia or confirmed failure occurred in 48/169 (28.4%) participants (median viral load: 5,055 copies/mL [IQR: 1,468-36,193 copies/mL]), with DTG-associated mutations detected in 11/48 (22.9% [12.0-37.3%]) (Table 1). Phenotypic analyses of four participants' genotypes confirmed reduced DTG susceptibility (Table 2). Resistance at enrollment was not associated with viremia or selection of DTG resistance.



Virologic Outcome During DTG-based ART	N=	Pre-DTG Genotype			History of Prior ARV Exposure at Entry	
		Wild-type	Drug Resistant	No Genotype	Naïve	Experienced
Viremia	49	12 (24.5%)	33 (67.3%) PI: 7 NRTI: 22 NNRTI: 22	4 (8.2%)	4 (8.2%)	45 (91.8%)
DTG Resistance G118R (n=6) Q148K (n=1) N155H (n=3) R263K (n=4)	11/49 (22.4%)	3 (27.3%)	8 (72.7%) PI: 1 NRTI: 6 NNRTI: 3	0	0	11 (100%)
No DTG Resistance	30/49 (61.2%)	8 (26.7%)	19 (63.3%) PI: 6 NRTI: 14 NNRTI: 14	3 (10%)	2 (6.7%)	29 (93.3%)
No Genotype	7/49 (16.3%)	1 (12.5%)	6 (75.0%) PI: 0 NRTI: 2 NNRTI: 5	1 (12.5%)	2 (25.0%)	6 (75.0%)
Suppressed	132	44 (33.3%)	66 (50.0%) PI: 16 NRTI: 46 NNRTI: 51	22 (16.7%)	13 (9.9%)	119 (90.1%)
Total	181	56	99	26*	17	164

*12 participants specimens unavailable; 14 participants' specimens did not amplify

Table 1: Summary of genotypic drug resistance detected by virologic outcome

Case	HIV-1 Subtype	Weeks of DTG Treatment	Major Integrase Mutations	Minor Integrase Mutations	Replication Capacity ^a	DTG EC ₅₀ (nM) ^b	Fold-Change ^c
1	C	0 32	None G118R	None L74I	80 35	1.7±0.29 19±6.1^d	11
2	CRF01_AE	0 20	None G118R	L74I T66I, L74I	95 29	1.8±0.03 38±3.1^d	21
3	B	162	S147G, R263K	E138T	55	12±3.9^e	5.0 ^f
4	B	51	G118R	E138K, V151I	71	19±2.4	8.4 ^f

^a Replication capacity expressed as the % of HIV-1NL4-3 titer

^b Mean 50% effective concentration ± standard deviation

^c Fold change in EC₅₀ value relative to the corresponding week-0 clone, unless otherwise indicated

^d Bold type indicates a significant difference compared to the EC₅₀ for the corresponding week-0 clone (p < 0.05, ANOVA with Tukey's multiple comparisons test)

^e Bold type indicates a significant difference compared to the EC₅₀ for HIV-1NL4-3 (p < 0.05, ANOVA with Tukey's multiple comparisons test)

^f Fold change relative to HIV-1NL4-3 (EC₅₀ for dolutegravir, 2.3 ± 0.70 nM)

Table 2: Preliminary findings of phenotypic analyses of DTG-resistant genotypes

Conclusions: Selected resistance to DTG was prevalent among participants with viremia, including as minority variants either alone or in addition to majority variants, but was not associated with resistance at enrollment.

EPB0273

Assessment of prevalence, patterns, and risk factors of HIV drug resistance among pregnant women living with HIV in Tanzania

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Background: By 2013, Tanzania adopted life-long antiretroviral (ART) policy for all pregnant and lactating women (LLAPLa/Option B+). The country scaled-up option B+ coverage to reach 93% of pregnant women by 2018. Despite this success, the emergence of HIV drug resistance (HIVDR) mutations may threaten the intervention.

Methods: We conducted a cross-sectional multistage cluster sampling assessment through health facilities on randomly selected ART naïve and experienced pregnant women with unsuppressed HIV viral load (≥1000 copies/ml) of all ages from April to September 2019.

Plasma samples were collected for HIV viral load and genotypic testing. Poisson regression models were used to determine risk factors. A two-sided p-value of <0.05 was considered statistically significant.

Results: A total of 1,002 pregnant women were genotyped and the HIVDR prevalence of all drug classes was 56%. HIVDR mutations affected 55% of Non -Nucleoside/ Nucleotide Reverse Transcriptase Inhibitors (NNRTI), 33% of Nucleoside Reverse Transcriptase Inhibitors (NRTI), and 2% of Protease Inhibitors (PI) class drugs.

Prevalence of HIV pretreatment drug resistance (PDR) was 27% and acquired drug resistance (ADR) was 79%. Factors significantly associated with increased risk of overall HIVDR were excessive drinking of alcohol [aRR=1.62, 95% CI: 1.02-2.59, p=0.0430]; having >1 sexual partner [aRR=2.82, 95% CI: 1.17-6.77, p=0.0204]; ever used tobacco [aRR=6.46, 95% CI: 1.42-29.38, p=0.0157]; HIV subtype URF_A1D [aRR=1.55, 95% CI: 1.15-2.1, p=0.0043]; vaginal discharge [aRR=1.18, 95% CI: 1.02-1.37, p=0.0302]; and prior ARV exposure [aRR=1.18, 95% CI: 1.04-1.33, p=0.0089].



Factors significantly associated with decreased risk were last condom use [aRR=0.35, 95% CI: 0.13-0.95, p=0.0385], being on second line regimen (LPV/r+TDF+FTC) [aRR=0.43, 95% CI: 0.22-0.86, p=0.0168]; and HIV subtype A [aRR=0.82, 95% CI: 0.69-0.97, p=0.0188].

Conclusions: HIVDR prevalence was high in our tested populations, and the mutations mostly affected the efficacy of NNRTI and NRTI class drugs. The ART-experienced pregnant women harbored a greater level of viral drug resistance mutations than ART naïve pregnant women. All ART experienced women who become pregnant with high HVL test result should be immediately tested for HIV-DR to avoid mother to child transmission.

EPB0274

Subtype A1, D, and recombinant HIV-1 natural polymorphisms associated with lenacapavir drug resistance in Mbarara, Uganda

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Background: Lenacapavir (LEN) belongs to a new class of HIV drugs called capsid inhibitors, which target viral Gag p24. LEN is effective in combination with other antiretrovirals (ART) for subtype B HIV-1 infections. However, less data is available for its activity in non-subtype-B HIV-1, which could harbor natural polymorphisms that may reduce LEN susceptibility.

Methods: The Uganda AIDS Rural Treatment Outcomes (UARTO) cohort enrolled ART-naïve adults in Mbarara, Uganda between 2002-2010 just prior to their initiation of ART. Participants were followed longitudinally until 2015. Archived plasma samples collected at any viremic time points pre- and post-ART-initiation were subjected to HIV-1 *gag* p24 Sanger sequencing, subtyped by RIP 3.0 and aligned using MUSCLE against reference sequence HXB2. Lenacapavir-associated resistance mutations were defined according to the 2022 IAS-USA drug resistance mutations list including L56I, M66I, Q67H, K70N/S/R, N74D/S, A105T and T107N. We also examined mutations reported in other studies including Q67K/N, K70H, N74H, A105S, and T107A/C.

Results: We obtained 741 HIV-1 *gag* sequences from 546 participants; 73% were from pre-treatment specimens. The median age was 34 (IQR 29-39), and 69% of participants were female. Median pre-treatment viral load and CD4 count were 5.2 log₁₀ copies/mL (IQR 3.7-5.7) and 127 cells/μL (IQR 64-196), respectively.

All went on to initiate ART with an NNRTI-containing regimen. Cohort viral subtype distribution was 51% A1, 4% C, 30% D, 1% G and 14% intersubtype-recombinants. HIV-1 natural polymorphisms associated with LEN resistance were observed in 6/546 participants (1%; 95% CI 0.4-2.4%): One of these individuals (infected with C/D recombinant HIV-1) had K70R at 6-month post-therapy, and five individuals (three infected with A1 and two D HIV-1), had T107A pre-ART. In one individual, T107A persisted up to 3 years during post-therapy-initiation follow-up. Phylogenetic analysis revealed that p24 sequences containing T107A did not cluster into unique monophyletic groups, suggesting independent mutation events as opposed to transmission clusters.

Conclusions: Among individuals in western Uganda living with subtype A1, D, and intersubtype recombinant HIV-1, we observed a 1% prevalence of natural viral polymorphisms associated with lenacapavir resistance. Our findings provide preliminary evidence that LEN is likely to be active against circulating HIV-1 viruses in this region.

EPB0275

Interpretation of doravirine resistance by algorithm in antiretroviral-naïve people with HIV in Haiti

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Background: We report the prevalence of resistance-associated mutations in reverse-transcriptase sequences among a sample of antiretroviral therapy (ART)-naïve persons at GHEKIO, in Port-au-Prince, Haiti, and the differences in susceptibility to doravirine (DOR) by algorithm. Pre-treatment non-nucleoside reverse transcriptase inhibitor (NNRTI) resistance mutations are common in Haiti due to high utilization of efavirenz (EFV)-containing regimens.

Methods: From September 2018 to July 2019, we conducted HIV genotypes for 365 ART-naïve people ≥15 years of age. DOR resistance was defined as low or intermediate (predicted ≥ 15 or ≥30-fold change in susceptibility, respectively) by Stanford algorithm version 9.1, or detection of DOR-specific major mutations as defined by the MSD*, French National Agency for AIDS Research version 32 (ANRS), and International AIDS Society-USA October 2019 (IAS-USA) algorithms (2, 3).



According to the MSD algorithm, primary mutations confer resistance to DOR by themselves; secondary mutations confer only a modest reduction (≤ 5 -fold) in isolation, but can confer a substantial reduction in combination with other substitutions; low-impact mutations have no impact in isolation but combinations of ≥ 5 can reduce DOR susceptibility. The only primary mutations that were included in all algorithms were V106A, Y188L, F227C, and M230L.

Results: The interpretations of the clinical significance of DOR resistance-associated mutations varied by algorithm (see Table 1). The prevalence of DOR resistance was Stanford: 6.6% (low-level) and 5.8% (intermediate-level); MSD: 1.9%; ANRS: 4.7%; IAS-USA: 1.1%. With MSD algorithm, 1.1% had ≥ 1 primary mutation (V106A: 0.3%; Y188L: 0.5%; M230L: 0.3%), 1.1% had ≥ 2 secondary mutations (V108I: 1.6%; H221Y: 2.2%; P225H: 1.4%), and 0.3% had ≥ 5 low-impact mutations.

Mutation	Stanford	MSD*	ANRS	IAS-USA
V106A, Y188L, F227C, M230L	X (score: 60)	X (primary)	X	X
F227V, Y318F	X (score: 60)	X (primary)		
G190E	X (score: 60)	X (secondary)	X	X
F227L	X (score: 60)	X (secondary)		X
F227I	X (score: 60)			
L234I	X (score: 45)	X (primary)		X
V106M	X (score: 30)	X (secondary)	X	X
G190Q	X (score: 30)	X (low impact)		
Y188F	X (score: 30)			
P225H	X (score: 20)	X (secondary)		X
Y181V	X (score: 20)	X (low impact)	X (low impact)	
G190S	X (score: 20)	X (low impact)	X	
Y181I	X (score: 20)	X (low impact)		
M230I	X (score: 15)	X (primary)		
A98G	X (score: 15)	X (secondary)	X (low impact)	
L100I, K101E	X (score: 15)	X (low impact)	X (low impact)	
A98G + F227C/L	X (score: 15)			
V106I	X (score: 10)	X (low impact)	X (low impact)	X
H221Y	X (score: 10)	X (secondary)	X (low impact)	
V108I, P236L	X (score: 10)	X (secondary)		
K101P, V179F	X (score: 10)	X (low impact)		
Y181C	X (score: 10)	X (low impact)	X (low impact)	
L100V, G190C/T/V	X (score: 10)			
K103N + P225H	X (score: 10)		X	
V108I + L234I; Y181C/I/V + G190A/C/S/T/V; Y181C/I/V + H221Y	X (score: 10)			
E138K	X (score: 5)	X (low impact)	X (low impact)	
Y188C/H	X (score: 5)	X (low impact)		X
K103N + Y181C	X (score: 5)		X	
V106I + Y181C; V106I + G190S; Y108I + Y181C; A98G + Y181C; K101E + G190A; K101E + G190S	X (score: 5)			
G190A		X (low impact)	X (low impact)	
V90I, K101H/N/R/S, I135T, E138A/G/Q/R, V179Q/T, V245E, K311R		X (low impact)		
V106T, F227R				X
K103N + L100I			X	
V106A + G190A; V106A + F227L; V106A + L234I				X
L100I + K103N + P225H	X (score: -10)			

Table 1. Clinically significant doravirine mutations, by Algorithm.

Conclusions: Despite some variability across algorithms, the predicted clinical impact of NNRTI mutations on DOR in a setting with high resistance to EFV among ART-naïve individuals is low. Further phenotypic and clinical data are needed to determine the clinical impact of single and combination mutations.

EPB0276

Pretreatment drug resistance and molecular epidemiology of HIV-1 across the Philippines

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Background: HIV/AIDS epidemic in the Philippines is the fastest growing in Asia with a 237% increase in new cases from 2010-2020. The Philippines is far from the 95-95-95 target set by UNAIDS. Treatment failure is a hindrance to this goal. One factor causing poor treatment response is HIV drug resistance (HIVDR). The WHO emphasized the role of nationally-representative surveillance data on pretreatment HIVDR to guide policies on first-line ART, PrEP, and PEP regimens.

This is the first study that aims to generate such data from various regions in Philippines. We estimated the frequencies of pretreatment HIVDR and described the molecular epidemiology of HIV-1 in the country.

Methods: A total of 252 plasma samples were collected from pretreatment individuals across nine geographical areas. We extracted HIV-RNA using QIAasympy DSP Virus/Pathogen Kit and measured viral load using *artus*[®] HI Virus-1 RT-PCR Kit. We amplified *Pol* region through PCR and sequenced amplicons using Illumina DNA Prep preparation on MiSeq and iSeq.

We generated consensus sequences using Geneious. Then, analyzed sequences using Stanford HIVdb for subtyping and HIVDR data.

Results: Twenty-seven percent were $<100,000$ copies/mL, 50% were 100,000-1,000,000, and 23% were $>1,000,000$ copies/mL.

Out of 250 with subtype data, 221 (88%) were CRF01_AE, 8% (21) B, and the remaining were other subtypes and CRFs.

Out of 249 with HIVDR data, one had intermediate resistance to Tenofovir and one had high-level resistance to Lamivudine. Five (2%) had high-level and three (5%) had intermediate resistance to Efavirenz. Four (2%) had high-level and one had intermediate resistance to Rilpivirine. Six (2%) had high-level and 14 (6%) intermediate, resistance to Nevirapine.

Phylogenetic analysis reveals likely transmission clusters within the island of Iloilo, and potential transmissions across land-accessible provinces surrounding Metro Manila.

Conclusions: High frequencies of resistance to NVP supports the recent change in first-line ART regimen to TDF + 3TC + DTG. However, increasing frequencies of EFV resistance should be a concern for the HIV-TB, pregnant, and women of childbearing age populations. The same applies for second-line drug RPV.



Lastly, we recommend implementation of interventions for the local transmission of HIV in Iloilo, and in Metro Manila and its nearby provinces.

SARS-CoV-2, COVID-19 and HIV

EPB0277

Impact of COVID-19 pandemic on HIV viral load testing in paediatric HIV clinics in the European Pregnancy and Paediatric Infections Cohort Collaboration (EPPICC)

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Background: The COVID-19 pandemic impacted HIV services globally, with clinics limiting in-person visits and prioritising those seen in person. In children and young people living with HIV (CLHIV) we explored trends in viral load (VL) testing and associated factors from 2015 to Sept 2020.

Methods: Data from 12 paediatric HIV cohorts in Europe were included. First, generalised estimating equations (GEE) were used to estimate VL testing rates and the proportion of results unsuppressed (VL \geq 200c/ml). Models assessed trends by calendar year for 2015–2020, and by month for 2019–2020. Second, using logistic regression we explored factors associated with having \geq 1 VL test in the first quarter of the pandemic (April–June 2020).

Results: Between 2015–2020, 4,659 CLHIV were in follow-up; 35% in Ukraine, 24% United Kingdom, 25% Russia, 16% elsewhere in Europe. Overall, VL test rates were stable from 2015–2019 ($p=0.250$) before declining in 2020 (Fig.A) with lowest rates in April (Fig.B). The proportion of unsuppressed VL tests decreased over time (Fig.C).

Among 1,784 CLHIV in care during April–June 2020, 54% were female, median age was 12.3[IQR 8.1,15.5] years. CLHIV who may be considered priority included those treatment naïve (0.8%) or who started ART within previous 12-months (6.9%), interrupted treatment (2.5%), had recent viremia (\geq 1 VL \geq 200c/ml in previous 12-months) (25.6%) or CD4 $<$ 200 at last visit (1.4%).

Overall, 22.3% had \geq 1 VL test between April–June 2020. In multivariable models, adjusting for cohort, age and sex, recent viremia (OR=2.1(1.5,2.8)), and starting ART in previous

12-months or ART naïve (OR=2.1(1.3,3.4), vs. on ART \geq 3 years) were associated with increased odds of having a VL; treatment interruptions had lower odds (OR=0.3(0.1,1.0)).

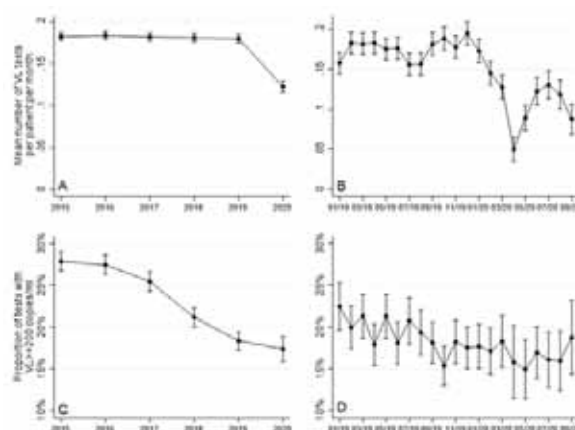


Figure. Estimated VL test rates averaged over calendar years (A) and by month (B) and proportion with VL $>$ 200c/ml by year (C) and month (D) (95% confidence intervals).

Conclusions: The pandemic had considerable impact on VL testing and there was evidence of prioritisation of tests for some groups. The proportion unsuppressed was declining pre-pandemic, further data are needed to assess if trends continue post-pandemic.

EPB0278

Recombinant Novel Coronavirus Vaccine (Adenovirus Type 5 Vector) (Ad5-nCoV) in persons living with HIV (PLWH): safety and immunogenicity analysis

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Background: PLWH are underrepresented in SARS-CoV-2 vaccine trials. We studied a primary scheme based on Ad5-nCoV vaccine (CanSino Biologics Inc./The Beijing Institute of Biotechnology).

The primary endpoint was to evaluate safety and immunogenicity of two doses of Ad5-nCoV in PLWH. ClinicalTrials.gov:NCT05005156



Oral abstracts



Poster exhibition



E-posters



Late-breaker abstracts



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Methods: Phase 2b trial. Participants received two doses of Ad5-nCoV vaccine (intramuscular, dosage 5×10^{10} vp) at days 0 and 56, were assessed for safety and immunogenicity through 52 weeks.

Safety analysis: solicited adverse events (SolAEs) within 7, unsolicited AEs within 28 days, serious adverse events (SAE), medically attended adverse events (MAAE) within 52 weeks. HIV viral load (HIV-VL), CD4, CD4/CD8 ratio were measured day 0, week 24, and week 52.

Immunogenicity analysis: geometric mean concentration (GMC) S-RBD IgG antibody, geometric mean titer (GMT) pseudo-virus neutralizing antibody (nAbs) at day 0, weeks 4, 12, 24 and 52.

Overall 52 weeks' safety analysis and 24-weeks result of humoral response, HIV-VL and CD4/CD8 ratio are presented.

Results: Between June 2021 -January 2022, 140 PLWH were vaccinated. Baseline: median age: 41, 79% male, 94% (<40 copies/mL), median CD4 cell count: 728 cells/ul; CD4/CD8 ratio:0.80. SolAEs incidence: 79.5 %, mostly grade 1 (drowsiness and site injection pain). Sixteen (11.3%) unsolicited AEs were reported, mainly asthenia. Seven SAEs occurred; none related to the vaccine. Two MAAEs possibly related to vaccination: fever and acute unilateral hearing loss. No new AIDS-defining illness. Confirmed COVID-19 cases :47 (incidence33.6%, 98% Grade 1-2).

At week 24, no changes at CD4 cells (median):686 cells/ul, CD4/CD8 ratio:0.85 were seen while 3 participants showed HIV-VL >200 copies/mL. Immunogenicity: RBD and nAbs increases were significant until week 12 with a reduction between week 12-24 ($p=0.52$) (see table 1- 2).

Table 1	Day 0 n=140	Week 4 n=136	Week 12 n=128	Week 24 n=100	p-value
Anti-RBD antibodies geometric mean concentration (GMC) (CI 95%) **	7.09 (5.85 - 8.60)	104.62 (77.13 - 141.92)	261.10 (210.14 - 324.43)	173.28 (119.27 - 251.74)	<0.01*
Anti-RBD antibodies Geometric mean increase (GMI) (CI 95%) ***	NA	14.63 (11.43- 18.71)	35.31 (27.99- 44.55)	22.31 (15.05- 33.09)	
Table 2	Day 0 n=140	Week 4 n=136	Week 12 n=128	Week 24 n=100	p-value
SARS-CoV-2 neutralizing antibodies, Geometric mean titers (GMT) (CI 95%) **	5.60 (4.91- 6.34)	15.98 (11.90- 21.45)	46.47 (36.22- 59.62)	36.20 (25.08- 52.24)	<0.01*
SARS-CoV-2 neutralizing antibodies, Geometric mean increase (GMI) (CI 95%)***	NA	2.85 (2.28- 3.56)	8.14 (6.65- 9.97)	6.20 (4.44-8.65)	

** GMCs/GMTs and CI 95% are presented. Comparison between visits were performed by Friedman test for paired data on a logarithmic scale. Post-hoc analysis (pairwise comparisons) was performed by Wilcoxon signed rank test with continuity correction, and Bonferroni's method for multiple comparison correction was applied.

***GMI (the geometric mean increase) was calculated as the geometric mean of the ratios of the titer of the visit to the baseline titer.

Conclusions: Ad5-nCoV vaccine was well tolerated in PLWH, without new HIV-related events reported. Ad5-nCoV vaccine showed a good safety and immunogenicity profile and a neutral effect on HIV surrogate markers.

EPB0279

Recombinant Novel Coronavirus Vaccine (Adenovirus Type 5 Vector) (Ad5-nCoV) in persons living with HIV (PLWH): Immunogenicity comparative analysis between one dose and two doses of Ad5-nCoV vaccine

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Background: PLWH are underrepresented in many SARS-CoV-2 vaccine trials. We conducted a study in this population based on Ad5-nCoV vaccine (CanSino Biologics Inc./ The Beijing Institute of Biotechnology).

The study was planned to compare one or two doses, aiming was to evaluate the immunogenicity response at each study arm. ClinicalTrials.gov: NCT05005156.

Methods: Phase 2b trial. Between June 2021- January 2022, participants were enrolled in Argentina. Groups were defined according to the randomized study design: group 1: placebo day 0/ Ad5-nCoV vaccine day 56 and; group 2: Ad5-nCoV days 0 and 56.

Analysis includes receptor-binding domain (RBD) and neutralizing antibodies (nAbs) results at day 0 (D0) and 84 (D84) after vaccination. Geometric mean concentration(GMC), geometric mean titers (GMT), geometric mean increase (GMI), seroconversion rate (proportion of participants with GMI ≥ 4 from baseline) were calculated. To compare groups and time, a mixed effects linear regression model was fit.

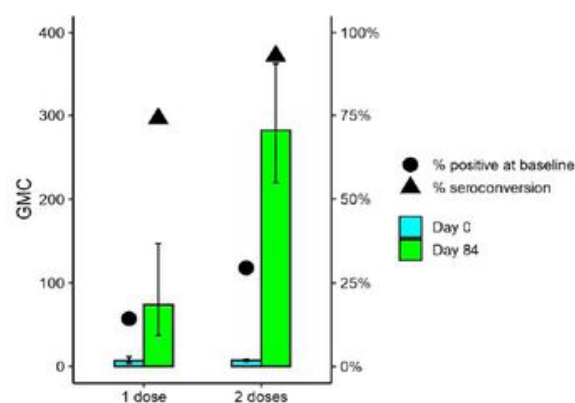


Figure 1. GMCs, percentage of positive subjects at baseline and seroconversion rate for RBD antibodies concentration per period.

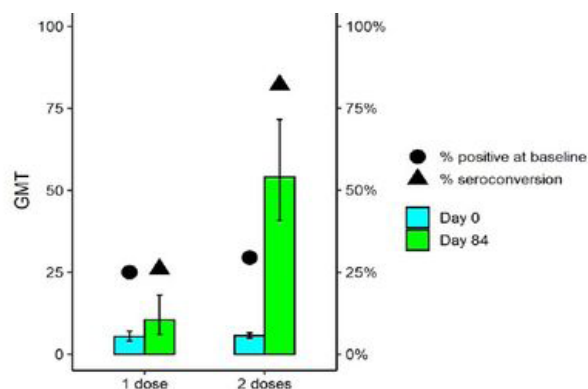


Figure 2. GMTs, percentage of positive subjects at baseline and seroconversion rate for SARS-CoV-2 neutralizing antibodies per period (nAbs).

Results: A total of 140 participants were included. Median age: 41 (IQR:31-48), 79% male, 94% virologically suppressed (<40 copies/mL), median CD4 cell count: 728 cells/ul (IQR:528-938). GMC-RBD antibodies at D0 and D84 6.63/73.5 group 1, and 7.1/282.4 group 2. (figure 1) GMI D84: 10.9 group 1 and 37.9 group 2. RBD seroconversion:74% and 93% group 1 and 2 respectively. GMT-nAbs at D0 and D84:5.3/10.4 group 1 and 5.6 / 54.1 group 2. (figure2) GMI D84: 1.9 group 1 and 9.4 group 2. The nAbs seroconversion at D84:26% (group 1) and 82.2% (group 2) Increase in RBD antibodies and nAbs was observed for both groups ($p < 0.01$). being higher for group 2 ($p < 0.01$).

Conclusions: The results of the first study with Ad-5 platform in PLWH suggest that a second dose administered 56 days apart improves humoral immunity against SARS-CoV-2 and could be immunologically beneficial for this population.

EPB0280

Assessing the Infection Prevention and Control Program during the COVID-19 era in the Health Facilities Participating in the COVIV (COVID/HIV) National Study in Mozambique, 2021-2022

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Background: The COVID-19 pandemic has had an important impact on healthcare services globally and in Mozambique. In June 2021, a cohort study ("COVID19-hIV") was initiated in three provinces in Mozambique, evaluating the COVID-19 pandemic's impact on people living with HIV, healthcare workers and on the healthcare system. It included assessments of health facility (HF) fidelity to the national infection prevention and control (IPC) program and preparedness for future COVID-19 outbreaks.

Methods: Between August 2021-November 2022, trained study staff performed serial assessments (with intervals of 2 to 8 months) of the preparedness and fidelity to IPC/COVID-19 guidelines at three selected urban HF in three provinces (Maputo City, Inhambane, Zambézia). The assessment tool, adapted from a Ministry of Health-approved checklist, included 12 sections from 4 key areas (general aspects, aspects per service, COVID prevention measures, material/waste management). Items of each area were graded according to the proportion of standards met (minimum recommended 80%). Descriptive analysis was done using Microsoft Excel.

Results: Eleven assessment rounds were completed. Adherence to IPC/COVID-19 standards ranged between 62.0% to 86.4%, with the highest score in the HF in Inhambane and the lowest in the Zambézia HF. All sites, except Zambezia, showed improvement over time (see Table). Improvement between the first and last rounds was primarily seen in the following assessment components: compliance with prevention measures among healthcare staff and management measures such as making available protective personal equipment, hygiene material and consumables, sterilization of used materials, infectious waste management and preparedness to manage persons with COVID-19.



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	Maputo City		Zambezia		Inhambane	
	Baseline (R1)	Endline (R4)	Baseline (R1)	Endline (R3)	Baseline (R1)	Endline (R4)
General aspects						
Human Resources (24 items)	83.3%	100.0%	95.8%	16.7%	87.5%	95.8%
Management (16 items)	63.6%	84.6%	68.8%	75.0%	75.0%	93.8%
Administrative aspects (18 items)	33.3%	33.3%	50.0%	33.3%	88.9%	100.0%
Environmental measures (9 items)	33.3%	100.0%	33.3%	33.3%	88.9%	100.0%
COVID-19 prevention measures						
COVID-19 outbreak preparedness (5 items)	100.0%	100.0%	40.0%	100.0%	40.0%	100.0%
Aspects per service area						
Outpatient clinic (5 items)	80.0%	80.0%	60.0%	60.0%	100.0%	100.0%
Inpatient ward (5 items)	60.0%	80.0%	60.0%	60.0%	0.0%	0.0%
Laboratory (10 items)	100.0%	90.0%	90.0%	80.0%	90.0%	90.0%
Material and waste management						
Removing personal protective equipment (3 items)						
Management of hospital linen (7 items)	100.0%	66.7%	0.0%	0.0%	66.7%	100.0%
Material processing and sterilization (7 items)	100.0%	71.4%	100.0%	100.0%	57.1%	100.0%
Waste management (7 items)	85.7%	71.4%	71.4%	85.7%	57.1%	85.7%
Average	72.3%	80.3%	61.7%	62.0%	65.0%	86.4%

Table: IPC assessment results per site.

Conclusions: The improvement in adherence to national IPC/COVID-19 guidelines observed in two of the three facilities participating in the COVIV study, reaching the minimal recommended standard over the evaluation period, suggesting an effort by the healthcare system to more successfully implement IPC guidelines including pandemic-related preparedness.

However, the varying levels of improvement observed indicates a need for site-specific monitoring and support for IPC implementing guidelines.

EPB0281

Sex and sexually transmitted diseases in time of COVID: sexual behavior and incidence of gonorrhea and chlamydia in an HIV observational cohort in Thailand

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Background: The Thai government's response to the COVID-19 pandemic included the implementation of social distancing such as limiting interprovincial travel and closure of entertainment venues.

We analyzed the effect of the COVID-19 pandemic on sexual practices and incidence rates (cases/1000 participants, IR) of gonorrhea, chlamydia in an acute HIV cohort in Bangkok, Thailand.

Methods: Participants of the RV254 Acute HIV cohort underwent regular assessments, including self-reported sexual practices and nucleic acid amplification assay for

gonorrhea and chlamydia annually. Self-reported number of insertive and receptive sexual partners were compared using t-test. Yearly incidence rates (IR) of gonorrhea and chlamydia during the COVID-19 pandemic (2020-2021) were compared with the yearly IR pre-pandemic (2019) using chi-square tests.

Results: Overall, 622 male participants (95% MSM), median age of 30 years, completed 2,795 visits between 2019 and 2021. The mean number of receptive partners in the past 6 months decreased from 1.69 in 2019 to 1.11 in 2020 ($P=0.0074$) and 0.99 in 2021 ($P=0.0024$). The mean number of insertive partners in past 6 months decreased from 1.27 in 2019 to 0.86 in 2020 ($P=0.12$) and 0.73 in 2021 ($P=0.0386$). The incidence of chlamydia decreased from 126.93 in 2019 to 83.33 in 2021, a 34% ($P=0.036$) decline. There was no significant change in the incidence of gonorrhea (34% and 40%, $P=0.111$ and 0.094 in 2020 and 2021).

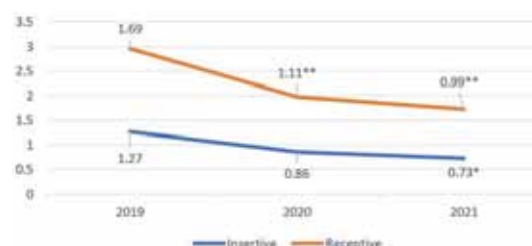
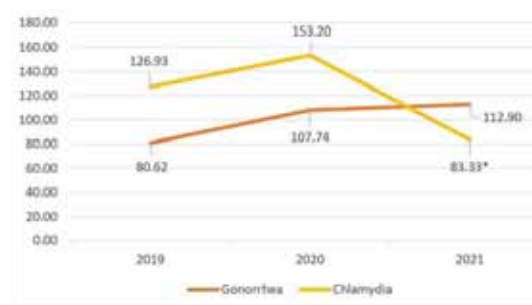


Figure 1a. Mean number of insertive and receptive partners.



Symbol Meaning

ns	$P > 0.05$
*	$P \leq 0.05$
**	$P \leq 0.01$
***	$P \leq 0.001$
****	$P \leq 0.0001$

Figure 1b. Gonorrhea and chlamydia incidence rate per 1000

Conclusions: Number of sexual partners significantly decreased among acute HIV cohort participants in Bangkok during the pandemic. However, not every STD showed decreasing incidence rate within the same period. HIV and sexual health programs must take into account other sexual/risk behaviors, beyond number of sexual partners, in order to deliver services tailored to various sexual life contexts of their clients.

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Background: People with HIV (PWH) have a higher risk for severe disease due to SARS-CoV-2 infection. There are few studies on the frequency of PASC in PWH, the associated factors, and its impact on quality of life.

We aim to analyze the frequency of PASC in PWH and its impact on quality of life among PWH in care at the HIV Clinic of a tertiary teaching Hospital (INCMNSZ).

Methods: All individuals seen at the HIV Clinic from November to December of 2022, with a history of acute COVID-19 from January 1, 2021, to August 31, 2022, were included. Data were collected from the electronic chart.

A validated questionnaire was conducted to collect data related to the episode of acute COVID-19 and PASC defined as the presence of persistent/new symptomatology or laboratory/radiological abnormalities 12 weeks after acute COVID-19 with no other cause in addition to an assessment of health-related quality of life using EuroQol-5D-5L (EQ-5D-5L) with values set for Mexican adult general population.

Results: 399 individuals were seen at the HIV clinic during the study period, 103 had acute COVID-19 and 80 agreed to participate. All 80 participants were on ART during the study period, and 29(36%) had PASC according to the definition. Fatigue was the most frequent symptom (72%), followed by anxiety (52%), insomnia (52%) and headache (48%). The percentage of individuals with CD4 cell counts <200cel/mm³ was similar between participants with PASC vs without PASC (17% vs 10%, p=0.48), and also the percentage of participants with three doses of SARS-CoV-2 vaccination (90% vs 92%, p=0.69, respectively).

Female (p=0.023), overweight/obesity (p=0.03) and the presence of ≥3 comorbidities (p=0.0049) were more likely to be present in the PASC group. Individuals with PASC had a negative impact on quality of life (p=0.0007) and lower overall health status (p=0.01). Absence of PASC was associated significantly with greater perception of maximum health status (p=0.0003).

Conclusions: In a highly vaccinated population of PWH, PASC was a common finding (36%). Associated factors were being female, having overweight/obesity, and the presence of 3 or more comorbidities. Lower quality of life was observed in those with PASC. Comparative studies with non-HIV population are needed.

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Background: The SARS-CoV-2 pandemic has exacerbated the challenges already faced by people living with HIV (PLWH). However, the mid-term impact of SARS-CoV-2 on the course of HIV infection remains uncertain.

Our aim was to assess the effect of SARS-CoV-2 infection in PLWH on plasma biomarkers related to coagulation pathways and cardiovascular disease.

Methods: Cross-sectional study of 95 PLWH under ART stratified by SARS-CoV-2 infection: a) 47 individuals sampled ≥ 1 month after the recovery (PLWH/SARSCoV2) and all of them reported symptoms; b) 48 pre-pandemic individuals without previous infection (PLWH). 12 weeks (median) elapsed between symptoms onset and sample collection. None of the individuals had been vaccinated against SARS-CoV-2.

We analysed 21 biomarkers related to inflammation, 9 biomarkers linked to coagulation pathways, 2 biomarkers associated with cardiovascular disease and the biomarkers Ferritin and D-Dimer on plasma by Procartaplex Multiplex Immunoassays. Differences between groups were analysed using a generalized linear model, adjusted by sex and etnia, and corrected by false discovery rate (FDR). Significant values were defined as aAMR≥1.2 and FDR<0.1.

Results: PLWH had a median age of 45 years, 81.9% were Caucasians, 80% were man with 9 years of HIV acquisition.

PLWH/SARSCoV2 group showed significantly higher values in the C-reactive protein, prothrombin, antithrombin and factors IX, XI, XII, XIII, protein S, and D-dimer levels, biomarkers related to coagulation pathways, and in natriuretic peptides and ferritin levels, biomarkers associated with cardiovascular disease (Figure).

In addition, the inflammatory biomarkers IL-4, IL8, IL12p70, IL13, IL17A MIP-1α, MIP-1β, IP-10 and TNF-β showed a significantly increased in the PLWH/SARSCoV2 group. However, PLWH/SARSCoV2 group showed lower levels of MCP-1 compared to PLWH (Figure).



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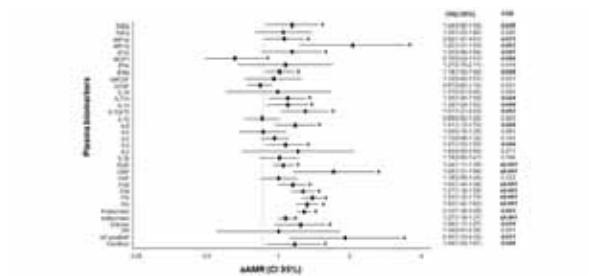


Figure.

Conclusions: Infection with SARS-CoV-2 in PLWH leads to significant alterations in biomarkers involved in coagulation pathways and cardiovascular disease at mid-term, which could accelerate premature dysfunction and associated complications at long-term.

EPB0284

Low CD4 T-cell count further attenuates immunogenicity of COVID-19 vaccines in people with HIV: a systematic review and meta-analysis

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Background: People with HIV (PWHIV) are at greater risk of morbidity and mortality following COVID-19 than the general population.

This systematic review and meta-analysis aims to explore the immunogenicity of COVID-19 vaccines in PWHIV compared to controls.

Methods: A systematic search of EMBASE, Medline and relevant conference databases until June 16th 2022, identified studies comparing immunogenicity (SARS-CoV-2 spike-IgG seroconversion, SARS-CoV-2 neutralising antibody responses, and SARS-CoV-2-specific T-cell responses) in PWHIV versus controls, and compared responses in PWHIV with low (<350 cells/ μ L) and high (>350 cells/ μ L) CD4 counts.

Meta-analysis of seroconversion and neutralisation responses was conducted.

Results: Twenty-seven studies were eligible, including 4,451 PWHIV and 5,984 controls. PWHIV were less likely to seroconvert following a primary vaccine schedule (RR 0.97, 95% CI 0.95-0.99), and less likely to elicit neutralising antibodies (RR 0.95, 95% CI 0.91-0.99). Participants with CD4 <350 were less likely to seroconvert when compared with PWHIV with CD4 >350 (RR 0.91, 95% CI 0.83-0.99). In PWHIV receipt of non-mRNA vaccines were associated with 14% reduction in seroconversion (RR 0.86, 95% CI 0.77-0.96) compared to receiving mRNA vaccines. Seven studies reported on T-cell responses.

Although measured outcomes were heterogeneous, four studies reported lower responses in PWHIV than controls.

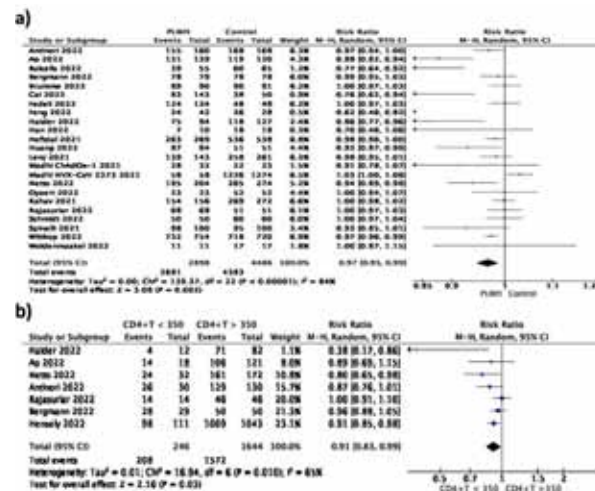


Figure 1. Forest plot comparing seroconversion response in a) PWHIV versus controls, and b) PWHIV with CD4 < 350 versus >350 cells/ μ L following dose two of any COVID-19 vaccine.

Conclusions: PWHIV experience reduced seroconversion and neutralization responses following a primary COVID-19 vaccination than controls. Non-mRNA vaccines and low CD4-count are associated with poorer responses. PWHIV should be prioritized for mRNA COVID-19 vaccines, especially with CD4 count <350 cells/ μ L.

Further studies are warranted to investigate vaccine boosting strategies in different CD4 T-cell count strata among PWHIV, and the role of contemporary bivalent vaccines.

EPB0285

Adaptation of HIV care, support and treatment (CST) services during COVID-19 pandemic in Indonesia

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Background: The COVID-19 pandemic has impacted healthcare systems in lower to middle income countries, including Indonesia. The simultaneous occurrence of COVID-19 and existing health problems, such as HIV, has strained healthcare systems and led to reduced access to care for non-COVID-19 related diseases.

Therefore, a study describing the capacity of healthcare workers and facilities in maintaining HIV services as well as perspective from PLHIV towards the readiness of HIV services implementation during the COVID-19 pandemic in Indonesia is needed.

Methods: A triangulation mixed method approach was employed in this study. Data was collected for five months from September 2022 to January 2023 and both quantitative and qualitative methods were utilized.

The study collected data from 32 health facilities across Jakarta, Banten, and West Java through an online cross-sectional survey, in-depth interviews with 41 health workers in charge of HIV services, and focus-group discussion with 104 PLHIV.


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Results: There are several primary challenges faced by PLHIV in accessing adequate HIV services during the pandemic, including their high risk to co-infection and socio-economic vulnerability. The shift in public health priorities from HIV CST services to COVID-19 response also led to overworked healthcare workers, reduced access to care due to closure of some facilities, and changes in operating hours. The education program (-25%), mobile voluntary counseling test (VCT) (-31%), and tracing for lost to follow up (-20%) all decreased significantly.

As such, new innovations are needed to address these challenges, such as: multi-month dispensing (88.79%), ART home-based delivery (53%), and technological-based innovations such as online tracing or web seminars as information and education media.

Conclusions: To mitigate these challenges, the study recommends strategies aimed at improving the delivery of essential services to PLHIV during the pandemic. This includes promoting and investing in telemedicine services, and adopting technologies to facilitate HIV service delivery and improve access to care.

It is also vital to foster partnerships between health facilities, communities, and other stakeholders to enhance comprehensive HIV services during and after the pandemic.

Lastly, the study advocates for increased funding and resources for the strengthening of health systems to ensure continuity of essential services during and after the pandemic.

EPB0286

Serological responses to primary course and booster SARS-CoV2 vaccination in people with HIV: the SCAPE-HIV study

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Background: Some people with HIV (PWH) display blunted serological responses to SARS-CoV-2 vaccination. Given the evolving pandemic/emergence of variants of concern (VOCs) it is important to address what factors/comorbidities influence these responses to develop optimal vaccination schedules to protect against disease.

Methods: SCAPE is a cross-sectional study of PWH attending our site between Apr 21-Nov 22. Analysis restricted to those who received two vaccine doses ≥ 15 days prior to study visit (median 93, max 480). Participants provided a blood sample for serology and completed a question-

naire (demographics, comorbidities, HIV history, COVID symptoms, confirmed SARS COV-2, vaccinations). Subset of 55 individuals were re-sampled >15 days after their third vaccine dose.

Results: 520 met eligibility/had data in window. 433(83.6%) male, 502(96.5%) virally suppressed on ART with median CD4 619 cells/mm³ (IQR 450-795). 296 (56.9%) received Astra-Zeneca and 207 (39.8%) Pfizer primary course. 516 (99.2%) had positive anti-spike (S) and 135 (26.0%) positive anti-nucleocapsid (N) antibody. 4/520 (0.8%) did not seroconvert (1 seroconverted after 3rd dose, 1 renal transplant, 1 immunodeficiency, 1 lymphoma). Of 481/520 with quantitative results available, median (IQR) anti-S titre was 1734 (IQR:488,>2500); 372 (77.3%) and 204 (42.4%) had titres >400 and >2500 respectively. Factors associated with anti-S titres shown in Table 1:

		Spike titre ≤ 400 (n=109)	Spike titre >400 (n=372)	P-value
Age	>60 years	48 (44.0%)	94 (25.3%)	<0.0001
White	Yes	84 (77.1%)	272 (73.1%)	0.41
Enough money to meet basic needs (vs. rarely/never)	Always/sometimes	103 (94.5%)	352 (94.6%)	0.96
Current CD4:CD8 ratio	Median (IQR)	0.93 (0.65, 1.21)	1.17 (0.79, 1.38)	0.57
Dual antiretroviral regimen	Yes	22 (20.2%)	93 (25.0%)	0.30
Reports prior COVID disease	Yes	5	27	0.33
Key worker during pandemic	Yes	18 (16.5%)	44 (11.2%)	0.31
Worked from home during pandemic	Yes	44 (40.4%)	165 (44.4%)	0.46
Household size	≥ 3 people	20 (20.8%)	43 (14.1%)	0.11

Among 55 individuals re-sampled after third mRNA vaccine, all (100%) had positive anti-S and 19/23(82.6%) had titre >2500 . 33/55(60%) had positive anti-N; 23/33 previously had a negative anti-N after two vaccine doses.

These results are in line with emergence of circulating VOCs (eg omicron/delta) with increased ability to evade immune responses after vaccination.

Conclusions: We observe high levels of seroconversion following primary vaccination course in context of well suppressed HIV. Suboptimal serological responses could be reflective of older age and/or comorbidities.

Further analysis is underway to define additional clinical parameters associated with attenuated responses and risk of breakthrough infection. By refining stratification we can identify vulnerable groups for monitoring, or tailored intervention strategies.

**EPB0287****COVID-19 breakthroughs among people with HIV in South Carolina**

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Background: The risk of breakthroughs in people with HIV (PWH) merits continued monitoring as the pandemic persists, immunity to the primary vaccine series wanes, boosters are widely recommended, and new variants emerge. This study aims to estimate the evolving rate and risk of breakthroughs among fully vaccinated PWH in South Carolina (SC).

Methods: This retrospective population-based cohort study used data from an integrated electronic health record (EHR) database in SC. Adult PWH who were fully vaccinated prior to March 30, 2022 were included. The breakthrough case was defined as a COVID-19 acquisition 14 days after an individual was fully vaccinated.

We analyzed the risk and associated factors of the outcome using Cox proportional hazard models in the overall population and also stratified by different variants of concern circulating in SC. Different COVID-19 vaccine types, prior history of COVID-19 acquisition, and HIV markers were assessed as risk factors for the outcome.

Results: Among 7,596 vaccinated PWH, the rate of breakthroughs was 119.0 cases per 1,000 person-years. In the overall population, taking the Moderna vaccine (Moderna vs Pfizer: adjusted Hazards Ratio [aHR]: 0.79; 95%CI: 0.66, 0.93) and receiving booster dose (aHR: 0.19; 95%CI: 0.15, 0.24) were associated with fewer breakthrough cases. Individuals who were vaccinated during Delta (aHR: 1.50; 95%CI: 1.25, 1.80) and Omicron (aHR: 2.86; 95%CI: 1.73, 4.73) dominant period were more likely to have breakthroughs than Alpha dominant period. When stratified the analysis by three periods, a dramatically increased trend of breakthrough rates was observed.

Across the three sequential subgroups, the protective effect of booster dose and prior history of COVID-19 acquisition were all diminished during the Omicron period. There was no association of breakthrough with viral suppression, but a higher CD4 count (>500 vs <200: aHR: 0.69; 95%CI: 0.50, 0.95) was associated with fewer breakthroughs among PWH.

Conclusions: As the pandemic evolved, the rate of breakthrough cases was much higher (during the Omicron period) than observations in previous studies.

Receipt of booster dose conferred further protection against breakthrough among PWH, but only restricted to before Omicron dominant period. PWH with pronounced immunodeficiency still has a higher risk for COVID-19 breakthroughs.

EPB0288**Influence of the COVID-19 pandemic in the rate of viral suppression of people living with HIV in Mexico under antiretroviral therapy**

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Background: COVID-19 pandemic has imposed several negative effects on public health including HIV diagnosis and treatment. In Mexico, most of the clinical care centers were closed, limiting the follow-up of people living with HIV (PLWH) on antiretroviral therapy (ART). Our objective was to determine the rate changes in HIV viral suppression during the pandemic lockdown.

Methods: Our laboratory performs viral load (VL) determinations for our institution (INCMNSZ) and nineteen states of the Mexican Republic (Externals), using the Abbott RealTime HIV-1 m2000 VL testing. We included all cases that have at least two VL determinations during the Pre-pandemic period (all year 2019 and the first quarter of 2020) and also during the Pandemic period (the last two quarters of 2020 and all 2021).

For analysis, individuals were divided between institutional and Externals; and between undetectable (all VL below the level of detection), and detectable (at least one determination over threshold).

Results: We analyzed a total of 19,020 cases, 1,812 INCMNSZ and 17,208 Externals; the global rate of undetectability increased during the Pandemic period in each population, from 80 to 86%, and 70 to 79%, respectively. At INCMNSZ, 1,565/1,812 (86%) were undetectable during the Pandemic period with the majority of these (86%) also undetectable in the Pre-pandemic; on the other hand, those that were detectable during the Pandemic were commonly detectable in the Pre-pandemic (56%). For the External cases, 13,638/17,208 (80%) were undetectable during the Pandemic, the majority already being undetectable during the Pre-pandemic (77%). Similarly to INCMNSZ, most of the External cases detectable during the Pandemic were already detectable before (60%).

Conclusions: Virological suppression in PLWH was not affected during the COVID-19 pandemic in Mexico, despite the different centers analyzed around the country. These results, related to several factors of the healthcare system and the people themselves (adherence), emphasize the capability of an adequate ART follow-up even in difficult scenarios.

Epidemiology of HIV

EPC0289

Perception and vaccine readiness towards monkeypox among men who have sex with men living with HIV in China: a cross-sectional study

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Background: Men who have sex with men (MSM) make up the majority of cases in the current monkeypox outbreak. We aimed to investigate the perception and vaccine readiness towards monkeypox among MSM living with HIV in China.

Methods: This cross-sectional online study was conducted August 10 to September 9, 2022. Participants responded to survey questions about their socio-demographic information, HIV status, sexual behaviors, monkeypox knowledge, and attitudes towards monkeypox vaccines.

Results: A total of 577 MSM living with HIV participated in the study. 37.6% expressed concerns about the monkeypox epidemic in China, 56.8% were willing to adopt monkeypox vaccination, and 20.8% followed information about monkeypox.

Men who had >4 sexual partners in the past 3 months (aOR=1.9 95% CI: 1.2-2.8), had close contact with >4 individuals in a day (3.1, 1.5-6.5), were worried about the monkeypox epidemic in China (1.6, 1.1-2.3), and believed that monkeypox vaccines are safe (6.6, 2.7-16.4) and effective (1.9, 1.1-3.3) for individuals living with HIV were more likely to be willing to adopt monkeypox vaccination.

Men with high school education or below (0.5, 0.3-0.9), sometimes (0.5, 0.3-0.8) and seldom or never (0.5, 0.3-0.9) followed information about monkeypox were less likely to be willing to adopt monkeypox vaccination.

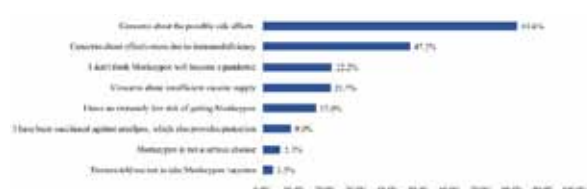


Figure 1. Reasons for unwillingness to vaccinate against monkeypox.

Conclusions: The ongoing monkeypox pandemic has not attracted widespread concerns among MSM living with HIV in China. Over half of MSM living with HIV were willing to adopt monkeypox vaccination. Efforts should be made

to raise awareness of the potential risk of monkeypox in this high-risk population. Public health strategies should fully address predictors of vaccination willingness.

EPC0290

Beyond the usual suspects: what really impacts quality of life among older people with HIV?

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Background: Improved life expectancy has led to an aging population of people living with HIV (PLHIV). Research on aging among PLHIV has focused on physical health and early onset morbidity, with less attention paid to psychosocial factors affecting quality of life (QoL). To inform programs to support healthy aging among PLHIV in Australia, we determined the association of QoL with a-priori identified experiences of older PLHIV considered modifiable through targeted interventions.

Methods: In an established national survey of the health and wellbeing of Australian PLHIV, participants aged 50+ years completed additional questions relevant to aging. QoL was measured using PozQoL, a validated multidimensional (health, psychological, social, functional) QoL tool (score range=1-5, higher score indicates better QoL). Using covariates selected by directed acyclic graphs, including self-reported comorbidities, general linear regression models indicated change in PozQoL score (reported as β) with past 12-month experience of:

1. Food insecurity;
2. Stigma;
3. Isolation from the HIV community; and;
4. Difficulties accessing non-HIV health services (compared to not having these experiences).

Results: Among 319 participants, median age was 59 years (IQR=54-65), most were male (90%), and identified as gay or bisexual (92%). Mean PozQoL scores were higher among PLHIV who were: older, more educated, lived in rural areas, in a relationship, employed, had higher income, and first diagnosed with HIV pre-cART availability in Australia. Experiences of food insecurity (21%), isolation from the HIV community (36%), stigma (48%) and difficulties accessing non-HIV health services (46%) were common. Overall PozQoL scores were lower among PLHIV who reported experiencing food insecurity ($\beta=0.49$; 95%CI=0.74-0.24), stigma ($\beta=0.53$; 95%CI=0.73-0.33), isolation from HIV community ($\beta=0.49$; 95%CI=0.70-0.29), and difficulty accessing non-HIV health services ($\beta=0.50$; 95%CI=0.71-0.30).



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Most participants (82%) reported at least one co-morbidity and 27% reported >3 co-morbidities; specific co-morbidities and cumulative number of co-morbidities were not associated with overall or domain-specific PozQol scores.

Conclusions: Findings suggest that HIV clinical and other support services should adopt person-centred approaches to supporting the wellbeing of older PLHIV, including integrating programs to support economic security and foster connections with community and broad health service networks.

EPC0291

Time to antiretroviral therapy initiation and its associated factors among people living with HIV: results from the Tanzania HIV Impact Survey 2016-2017

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Background: The universal test-and-treat (UTT) strategy for HIV was recommended by World Health Organization in 2015 and was adopted by Tanzania in October 2016. Baseline information on the length of time between HIV diagnosis and initiation on antiretroviral therapy (ART) is lacking, which is useful in the evaluation of UTT strategy progress.

To understand time to ART initiation before UTT implementation, we analyzed data from the Tanzania HIV Impact Survey (THIS) 2016-2017.

Methods: Our evaluation comprises 985 participants living with HIV (PLHIV) aged 15 years and older (figure 1). Participants self-reported HIV status and ART use during interview. In addition, confirmation of HIV status and detection of ART in blood was done in the laboratory.

A cox proportional hazard model was used to estimate demographics and sexual behaviors covariate effects on 'time to ART initiation' before UTT. Sampling weights and Jackknife variance estimation were included during the analysis. We estimated adjusted hazard ratios (aHR) with 95% confidence intervals (95%CI).

Results: Out of 1,070 confirmed PLHIV, 985 were included in the evaluation, whereby 88 PLHIV were diagnosed after UTT adoption and 897 before UTT adoption. Before UTT, the median time to ART initiation was 4 months (inter-quartile range [IQR] 3-7 months) compared to 1 month [IQR: 1-2] after. Prior to UTT, shorter time to ART initiation was associated with being an older adult (50+ years) [aHR

1.39, 95%CI 1.15-1.69] compared to adults 25-49 years and having primary education or higher [aHR 1.29, 95%CI 1.02-1.61] compared to having no formal education.

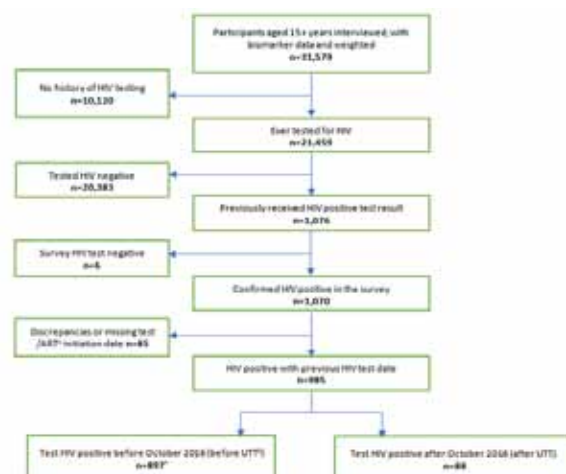


Figure 1. Flowchart of sample size for time to ART initiation analysis: Tanzania HIV Impact Survey 2016-2017.

ART = Antiretroviral Therapy

UTT = Universal Test and Treat

*Initiated in ART = 676 (75.4%) and not initiated on ART = 221 (24.6%) by survey interview date.

Conclusions: Prior to UTT strategy adoption, PLHIV experienced differential time to ART initiation, with those aged 25-49 years and never attended to school notably taking longer time. These findings provide a baseline for measuring the progress towards UTT in Tanzania once results from the ongoing THIS 2022-2023 becomes available.

EPC0292

Immune activation is associated with low level viremia and noninfectious comorbidities in people living with HIV

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Background: People living with HIV (PLWH) have higher rates of noninfectious comorbid diseases (NCDs) than do people without HIV. Previously, we found that low level viremia (LLV) was associated with increased risk of NCDs


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compared to viral suppression by antiretroviral therapy (ART). We hypothesized that immune activation associated with LLV may promote the development of NCDs.

Methods: At enrollment into the ongoing African Cohort Study, participants who were on ART for at least six months with a viral load <1,000 copies/mL were categorized as either undetectable or LLV (any detectable VL<1000 copies/mL). The interaction between viral load category and 13 biomarkers from a Luminex panel (R&D systems, Minneapolis, MN) were examined for any NCD and separately for hypercholesterolemia, hyperglycemia, elevated blood pressure, and renal insufficiency using modified Poisson regression with robust standard errors.

Results:

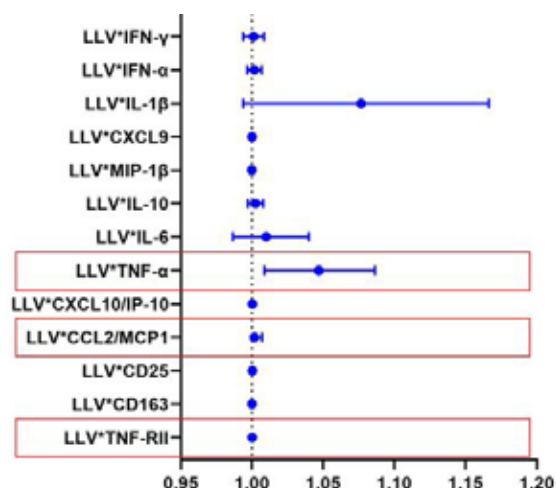


Figure 1. Coefficients and 95% confidence intervals for interaction between LLV and biomarker in the association with any NCD.

red box = $p < 0.05$

A total of 1,384 participants were included with 53% ($n=736$) having an undetectable viral load and 47% ($n=648$) LLV. Forty-two percent ($n=586$) had at least one NCD, which did not vary significantly by viral load category (42% undetectable vs 43% LLV, $p=0.77$). Biomarker concentrations were higher among participants with LLV and undetectable viral load for CD163 ($p=0.01$), TNF- α ($p<0.001$), IL-6 ($p=0.04$), CD25/IL-2R α ($p<0.001$), IL-1 β ($p=0.03$), CXCL9 ($p=0.002$), and lower concentration among LLV for CXCL10/IP-10 ($p<0.001$). Examining any NCD, there was a statistically significant interaction between LLV and TNF- α , CCL2/MCP-1, and TNF-RII (Figure 1).

Examining each NCD individually, there was a significant interaction between LLV and CCL2/MCP-1 for elevated blood pressure and hyperglycemia while the LLV and CD163 interaction was statistically significant in the association with hypercholesterolemia.

Conclusions: These findings elucidate a potential mechanism for the development of NCDs among individuals with LLV, primarily interacting with the TNF pathway which has well-established associations with the development cardiovascular disease. Therefore, aggressive management of LLV may positively impact NCDs in PLWH.

EPC0293

Very high HIV incidence among men who have sex with men (MSM) and transgender women (TGW) in Indonesia: a retrospective observational cohort study

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Background: There are no longitudinal HIV incidence data among men who have sex with men (MSM) and transgender women (TGW) in Indonesia. Pre-exposure prophylaxis (PrEP) use is very low and HIV treatment cascade outcomes are poor.

Methods: We conducted a retrospective cohort study using medical record data from five private/non-government clinics in Indonesia (Jakarta=1, Bali=4). We reviewed all HIV tests among self-reported MSM/TGW aged ≥ 18 years between 1-Jan-2018 to 31-Dec-2020 in Jakarta and 1-Jan-2017 to 31-Dec-2019 in Bali.

Those with an HIV-negative baseline test and ≥ 1 follow-up tests were included in the person-years (PY) at risk to determine HIV incidence and 95% confidence intervals (CI). Person-years at risk calculation started at first negative test until last recorded negative test or seroconversion. Multivariate Cox-regression was used to determine factors associated with HIV acquisition; we report adjusted Hazard Ratios (aHR) and 95%CI for these associations.

Results: Of 5,203 and 2,815 individuals in Jakarta and Bali, respectively, 3,998 and 2,119 were HIV-negative at baseline (HIV prevalence=23.2% and 21.9%). The longitudinal sample included 1,418 and 873 individuals with repeat tests (min-max=2-13 mean=3.71 SD=2.06 median=3 IQR=2-4).

About one-quarter were aged <25 years, 94% were MSM, and >60% had been tested for HIV previously. In Jakarta, there were 127 HIV incidences in 1354.5 PY, 9.39/100 PY (95%CI=7.89-11.17). In Bali, 71 incidences in 981.2 PY, 7.24/100 PY (95%CI=5.73-9.13).

Compared to those 18-24 years, incidence was lower in older patients (Jakarta - 30-39 years: aHR=0.58, 95%CI=0.35-0.96; 40+ years: aHR=0.34, 95%CI=0.14-0.80; Bali - 25-29 years: aHR=0.51, 95%CI=0.29-0.89; 30-39 years: aHR=0.35, 95%CI=0.19-0.65; 40+ years: aHR=0.11, 95%CI=0.03-0.48). In Jakarta, those with university education had lower incidence than those without (aHR=0.62,



95%CI=0.43-0.91). In Bali, those who were referred by outreach workers had higher incidence than those who self-presented (α HR=1.70, 95%CI=1.04-2.78).

Conclusions: In the first multi-provinces HIV incidence study in Indonesia among MSM/TGW, we observed very high incidence rates. In this setting of very low PrEP use, measures to encourage regular HIV testing and effective use of HIV prevention methods, including rapid PrEP scale-up and demand creation, are urgently needed. Greater local and international investment in HIV prevention and treatment in these populations must be prioritised to meet global AIDS elimination goals.

EPC0294

Food insecurity is associated with poor mental health among PLHIV in Togo, West Africa

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Background: Studies to evaluate the associations between food insecurity and mental health among people living with HIV (PLHIV) in West Africa are limited. This study was conducted to determine whether food insecurity is associated with depressive and/or anxiety symptoms among PLHIV in Togo, West Africa.

Methods: PLHIV ≥ 40 years old on ART ≥ 6 months were enrolled at the EVT Clinic, Lomé, Togo. The Household Food Insecurity Access Scale was used to measure food insecurity. Mild to severe depressive and anxiety symptoms were assessed using the Patient Health Questionnaire-9 (score ≥ 5) and Generalized Anxiety Disorder-7 (score ≥ 5) instruments, respectively. Logistic regression was used to identify factors associated with depressive and/or anxiety symptoms.

Results: Among the 300 participants enrolled, 222 (74.0%) were female. The median age was 51 years (IQR 47-57). More than half (54.5%) did not receive an education beyond primary school, and the majority (70.3%) earned $< 50,000$ FCFA (~ 83 USD) per month. The median CD4 count was 509 cells/mm³ (IQR 352-687) and 97.7% were virologically suppressed (< 1000 copies/mL).

The majority (73.0%) were food insecure (11% were mildly food insecure, 41% were moderately food insecure, and 21% were severely food insecure). Nearly half (48.5%) had depressive symptoms (35.0% suffered from mild depression, 10.7% from moderate depression, and 2.7% from

moderately severe depression), and 26.0% suffered from anxiety symptoms (20.7% from mild anxiety and 5.3% from moderate anxiety). The majority (52.8%) suffered from depressive and/or anxiety symptoms.

Moderate and severe food insecurity were associated with depressive symptoms (OR=1.79, 95%CI 1.001-3.20; OR=3.87, 95%CI 1.93-7.78, respectively) and anxiety symptoms (OR=2.41, 95%CI 1.13-5.11; OR=4.90, 95%CI 2.18-10.92, respectively).

Education beyond primary school was protective against both depressive symptoms (OR=0.54, 95%CI 0.34-0.85) and anxiety symptoms (OR=0.34, 95%CI 0.20-0.60). Sex, age, and income were not associated with depressive and/or anxiety symptoms.

In multivariable analysis, severe food insecurity was the strongest predictor of depressive symptoms (OR=3.74, 95%CI 1.85-7.56) and anxiety symptoms (OR=4.76, 95%CI 2.09-10.83).

Conclusions: Food insecurity is strongly associated with poor mental health among PLHIV in Togo. Future prospective studies to understand and address the causal links between food insecurity and mental health are warranted.

EPC0295

Trends in the proportion of recent injection drug use among men who have sex with men living with HIV in a multinational cohort study

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Background: HIV-diagnosed gay and other men who have sex with men (MSM) are a key risk group for hepatitis C acquisition (HCV), with injecting drug use (IDU) a known risk of transmission. Little is known about trends in IDU among MSM in countries with ongoing HCV transmission



among this group. Among MSM who are HIV/HCV-diagnosed, we aim to calculate annual proportions of recent IDU in six high-income countries.

Methods: Data were from the International Collaboration on Hepatitis C Elimination in HIV Cohorts, including data from Australia, Canada, France, Spain, the Netherlands, and Switzerland. Eligibility for this study required individuals to identify as MSM.

The proportion of IDU was the number of MSM reporting recent IDU (i.e., past 1-6 months) divided by the number of MSM with a study visit in a calendar year (2010-2019), stratified by HCV exposure and country.

HCV exposure was an HCV positive antibody or RNA test calculated at baseline (i.e., study enrolment or Jan 1, 2010, whichever was later) and each calendar year.

Results: Of 18,959 participants, 13,709 identified as MSM, of which 718 (5.2%) reported recent IDU between 2010-2019. Among participants HCV exposed (n=1817 at baseline), recent IDU was stable for Australia (n=333) at ~40%, Canada (n=415) at ~20%, France (n=197) at <5%, Spain (n=139) at ~4%, and Switzerland (n=560) at <10%. There was some evidence of a potential decrease in IDU in the Netherlands (n=173; 15% to 9%) but 95%CI were overlapping. Among participants HCV unexposed (n=11,892 at baseline), annual proportions were low, with some evidence of slight increases in France (n=1601), Spain (n=4514), and Switzerland (n=5604), from 0% to 1%, and the Netherlands (n=173) from 0% to 6%, although 95%CI were overlapping for most countries.

Conclusions: Annual proportions of recent IDU were stable among MSM who were HCV exposed, varying between countries, potentially due to differences in cohort design. Among those HCV unexposed, annual proportions of IDU were lower but may have increased, 2010-2019.

Findings indicate IDU remains a risk for potential HCV transmission in these cohorts, highlighting the importance of accessible harm reduction services and HCV testing, treatment, and prevention measures for MSM.

EPC0296

Correlates of HIV infection among Tanzanian young adults aged 15-24 years: evidence from the Tanzania HIV Impact Survey 2016-2017

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Background: Despite targeted prevention interventions, young adults aged 15-24 years in Tanzania experience disproportionate risk for HIV infection. While most prevention programs target adolescent girls and young women (AGYW), less is known about factors affecting young adults as the HIV epidemic continues to shift over time. This analysis examines correlates of HIV infection among young people in Tanzania.

Methods: This assessment used nationally representative data from 10,364 participants aged 15-24 years in the Tanzania HIV Impact Survey 2016-2017. HIV status is the primary outcome of interest in this assessment.

Firstly, HIV infection is described in the sample of young people. Secondly, log-binomial regression models were used to assess social, demographic, and sexual behavior correlates of HIV positive status among young adults.

Sampling weights to account for study design and non-response, and Jackknife variance estimation were included during the analysis. We estimated prevalence ratios (PR) with their corresponding 95% confidence intervals (95%CI).

Results: Among 10,364 participants aged 15-24 who were tested for HIV, HIV prevalence was 1.38% (CI: 1.14-1.66) with females (2.12%CI: 1.75-2.58) and males (0.63%CI: 0.40-0.99). From multivariable analysis, young adults aged 20-24 years were three times more likely to have HIV infection than those aged 15-19 years (aPR:3.03 95%CI 1.78-5.16).

Those with no education had increased likelihood of HIV infection compared to those who had secondary or higher education (aPR: 2.41 95%CI: 1.39-4.19).

Furthermore, respondents who reported engaging in sex for money were three times more likely to have HIV infection than their peers who did not engage in transaction sex (aPR: 3.06 95%CI: 1.65-5.66).

Conclusions: Our findings showed varied vulnerability of young people to HIV infection. HIV risk was markedly increased among the older age group, those with no education, and those engaging in transactional sex.

While some global efforts are on-going to reduce infection among adolescents and young adults including UNAIDS 2025 road map, continuously finding innovative



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ways to reach and engage young people on combination prevention methods remains an important tool in the HIV epidemic response in Tanzania.

EPC0297

A cluster of phylogenetically close strains to the highly virulent variant of HIV-1 subtype B circulating in the Netherlands was detected in Japan

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Background: A highly virulent variant of HIV-1 subtype B (VB variant) considered to induce high set-point viral load (VL) and rapid CD4 decline was reported in the Netherlands. In the present study, we examined whether HIV-1 strains phylogenetically close to the VB variant are circulating in Japan.

Methods: Nucleotide sequences in the protease and reverse transcriptase (PR-RT) coding regions (nt 2,253-3,269 in HXB2) from 9,735 people newly diagnosed with HIV-1 in 2003-2020 in the Japanese Drug Resistance HIV-1 Surveillance Network, and all publicly available 288,324 PR-RT sequences in GenBank as of 2022/08/31, including 15 VB variant sequences, were used for the analyses. Phylogenetic trees were inferred using FastTree 2.1. Genetic distances were calculated by TN93.

Results: Phylogenetic analysis of the VB variant and Japanese sequences revealed that 8 Japanese sequences were in the same cluster with the VB variant strains (local support value: LSV 98%), having a median genetic distance of 3.5% (range 2.6%-4.6%) to a representative VB variant (MT458931).

Then, to assess the phylogenetic relationship of the VB variant and available global sequences, we performed a phylogenetic analysis including the 15 VB variant sequences, the abovementioned 8 Japanese sequences, 14,210 randomly selected global sequences (5% of the entire GenBank), and 396 sequences with genetic distance <4% to MT458931 from the entire Genbank PR-RT. In the global phylogenetic tree, 26 sequences, including 15 VB variant sequences, 3 previously reported sequences from Poland and Belgium, and 8 Japanese sequences, belonged to the same cluster (LSV 99%).

The 8 individuals were all Japanese MSM diagnosed in 2009-2016, with a median VL of 51,000 copies/mL (IQR 33,575-98,250) and CD4 count of 255/ μ L (149-392) at diag-

nosis. Comparing the 8 individuals with other Japanese MSM living with HIV-1 subtype B (n=6,197, median VL: 69,000 [20,000-250,000], median CD4: 239 [78-384]), there were no significant differences in VL or CD4 count at diagnosis (age-adjusted regression).

Conclusions: Phylogenetic analysis of the PR-RT region identified a Japanese cluster that is phylogenetically close to the VB variant. Further analysis of host and viral factors could be the next issue to be addressed to elucidate the mechanism of difference in virulence.

EPC0298

Methods to establish accurate transmission cluster identification for HIV public health use

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Background: To achieve the UNAIDS 95/95/95 targets, a better understanding of the drivers of the HIV-1 epidemic with multifaceted approaches including accurate transmission cluster and outbreak identification are needed. However, viral sequences from different laboratories are derived from a variety of regions of the HIV-1 genome, which may affect phylogenetic clustering outputs. We assessed the accuracy of phylogenetics based on different HIV-1 genomic regions.

Methods: We used 190 subtype B and 403 subtype C near full-length genome sequences. The two sequence sets were divided into sub-genomic data sets covering *gag*, *pol*, and *env*, and *pol* was further sub-divided into *pr-rt*, *rt-int*, and *pr-rt-int*. Cluster analyses were performed using distance and maximum-likelihood methods by specifying varying node support and distance thresholds of 70-90% and 1.5-4.5% respectively. Tree topologies of full-length genomes were compared with sub-genomic regions using *v_measure* and *variation_info* to assess the goodness and similarity in cluster partitions and visualized via principal component analysis.

Results: Tree topologies differed for different genomic regions of both datasets. The full-length trees had the highest log-likelihoods (-165150.63 for subtype B and -555599.49 for subtype C) when compared to *gag*, *pol*, *env* of subtypes B and C respectively. The *pr-rt-int* trees also had higher log-likelihoods (-166423.16 for subtype B and -562903.76 for subtype C) when compared to *pr-rt* and *rt-int* of subtypes B and C respectively. However, the observed variation in topologies did not statistically affect the homogeneity of clustering (mean *v_measure*= 0.99) but had observed similarity in cluster partitions (mean *variation_info*= 2.3e-4). For both full-length and *pr-rt-int* trees, the approximately-unbiased (AU) test of topology was statistically significant (*p*AU=+1), indicating accep-



tance of those trees as representative of the true evolutionary tree. The clustering pattern was most stable across all sub-genomic regions (except *env*); 15/16 (94%) for subtype B and 20/23 (87%) for subtype C when using a genetic distance of 2.5%.

Conclusions: Using a genetic distance of 2.5% is most suitable for clustering analyses when using sequence data covering different sub-genomic regions. Notably, using the *pr-rt-int* region is sufficient for determining potential transmission clusters and can be used for near real-time HIV-1 cluster detection.

EPC0299

HIV incidence among key populations accessing free HIV testing under Universal Health Coverage in Thailand from 2008 to 2022

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Background: New HIV infections in Thailand are concentrated among key populations, mainly men who have sex with men (MSM), transgender women (TGW), sex workers (SW), and people who inject drugs (PWID). We studied HIV incidence among key populations and associated factors using our National Voluntary Counselling and Testing (VCT) Database which records HIV test results of Thai citizens who access free HIV testing twice a year under the country's Universal Health Coverage (UHC) system.

Methods: HIV testing data from the VCT Database were retrieved from key population individuals aged ≥15 years from 2008-2022. Baseline was defined as the date of first HIV test. HIV incidence rate was calculated by dividing the total number of confirmed HIV-positive cases by the total number of person-years of follow-up (PY). Kaplan-Meier graphs were used to estimate overall cumulative probability of HIV incidence. Cox regression analysis was performed to identify factors associated with HIV incidence and calculate the hazard ratios (HRs) and 95% confidence intervals (CIs).

Results: There were 76,393 (55%) MSM, 26,357 (19%) PWID, 31,920 (23%) SW, and 3,014 (2%) TGW. HIV testing increased from 12,655 in 2008-2013 to 42,484 in 2014-2016, and 82,547 in 2017-2022. HIV incidence rate was highest among TGW at 216.9 (95%CI 199.6-235.7), followed by MSM at 151.9 (95%CI

150.0-154.2), PWID at 21.6 (95%CI 20.8-22.4), and SW at 11.65 (95%CI 10.90-12.45) per 100 PY. Median (IQR) CD4 count at diagnosis was highest among MSM at 253 (86-415), followed by TGW at 239 (81-447), SW at 184 (54-401), and lowest in PWID at 113 (32-304) cells/mm³. Recent years of HIV testing decreased chance of HIV incidence; 2008-2010 as reference; aHR 0.41 for 2011-2013 (95%CI 0.38-0.44), 0.21 for 2014-2016 (95%CI 0.19-0.22), and 0.11 for 2017-2022 (95%CI 0.10-0.12).

Conclusions: Overall HIV incidence among key populations decreased over time. MSM and TGW had a higher incidence, although CD4 counts at diagnosis tended to be higher, than PWID and SW. HIV testing among key populations increased over time corresponding to the establishment of the "key population-led health services" in 2015. Thailand must ensure the sustainability of UHC and KPLHS to reach its ending AIDS goal.

EPC0300

Predictors of frailty transitions in persons aging with HIV (PAH) in Uganda: the HASA prospective cohort

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Background: The scale up of ART in sub-Saharan Africa (SSA) has resulted into increased life expectancy. Frailty is an aging-related syndrome, heightened by acquired HIV, marked by diminished physiologic reserve and vulnerability to stress, predictive of hospitalization or deaths. Elderly persons can easily transition from one state of frailty to another, thus we aimed to describe the frailty transitions and the risk factors of frailty in clients ≥60years in Kampala, Uganda during 1 year follow up.

Methods: We used the Markov multi-state model to estimate frailty transition probabilities in adults ≥ 60 years during 1 year of follow-up, the data that is so far collected. Four states of possible transition were considered: robust, pre-frail, frail, and death. Frailty was assessed using the physical frailty phenotype. Covariates were selected into the model based on their theoretical, clinical, and statistical relevance to a stable parsimonious model. We used the msm in R software to analyze the frailty transition intensities.

Results: We included 451 participants. At baseline, the median age was 64 years (IQR 60-68) 231 (51.2%) were males. The baseline CD4 count was 664(IQR 461-795) cells/mm³. Majority 412(91.8%) had viral load less than 50 copies/ml, and 130(28.8%) had ≥2 non-communicable diseases (NCDs).

Females were associated with a lower risk of transitioning from robust to pre-frail, pre-frail to robust compared to males (HR: 0.93(0.42-2.08), HR: 0.60(0.26-1.40) respectively. Females had an increased risk of transitioning from pre-frail to frail, pre-frail to death compared to males (HR: 1.78(0.66-4.82), (HR: 1.17(0.14-9.99) respectively. PAH with 2 or



more NCDs were more at risk of transitioning from robust to pre-frail, pre-frail to frail (HR: 1.28 CI (0.54-3.01), (HR: 2.74 (1.05-7.15) respectively. Pre-frail PAH with 2 or more NCDs were at a higher risk of death compare to those with 1 NCD (HR: 1.59 (0.22-11.7).

Conclusions: Gender and NCDs are risk factors associated with frailty transitions. Understanding the predictors of frailty transitions will help design of interventions that support transition into better frailty states.

EPC0301

Effectiveness of harm reduction interventions on HIV incidence among people who inject drugs in a conflict affected region of Myanmar, 2008-2020: analysis of a retrospective cohort dataset

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Background: Kachin in Myanmar is heavily affected by conflict. People who inject drugs (PWID) in Kachin have high HIV prevalence (>40%), but there is no data on incidence. We used HIV testing data from three harm reduction drop-in centres (DIC) in Kachin (2008-2020) to determine HIV incidence trends among PWID and associations with intervention uptake.

Methods: Individuals were HIV-tested at first DIC visit and periodically thereafter, during which demographic and risk behaviour data were collected. Two DIC provided opioid agonist therapy (OAT) from 2008. Monthly DIC-level needle/syringe provision (NSP) data was available for 2012-2020. Site-level 6-monthly NSP coverage was denoted low, high, or medium if it was below the lower quartile, above upper quartile, or between these quartiles of provision levels over 2012-2020, respectively. HIV incidence was estimated by linking subsequent test records for those initially HIV-negative. Associations with incidence were examined using Cox regression.

Results: Follow-up HIV testing data was available for 33.6% (2,227) PWID initially testing HIV-negative, with 444 incident HIV infections during 6,266.5 person-years (py) of follow-up. Overall HIV incidence was 7.1 per 100py (95%CI 6.5-7.8), which decreased from 19.3 (13.3-28.2) in 2008-11 to 5.2 per 100py (4.6-5.9) in 2017-20. After adjustment, recent (≤6weeks) injecting (aHR 1.74, 1.35-2.25) and needle sharing (aHR 2.00, 1.48-2.70) were associated with higher incidence. In a reduced dataset including data on OAT access and NSP coverage (2012-2020 for DIC providing OAT), being on OAT during follow-up was associated with reduced HIV incidence (aHR 0.36, 0.27-0.48, compared to never taking OAT) as was high NSP coverage (aHR 0.64, 0.48-0.84, compared to medium coverage). 6-monthly NSP coverage was inversely correlated with HIV incidence (Figure).

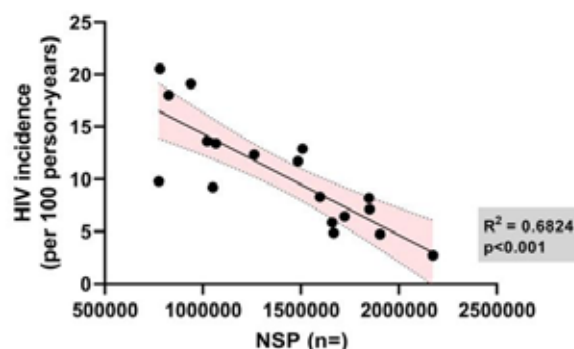


Figure. NSP and HIV incidence correlation.

Conclusions: Although HIV incidence is high among PWID in Kachin, findings underscore the substantial impact that OAT and NSP can have in challenging resource-poor conflict-affected settings, highlighting the importance of offering widespread provision.

EPC0302

Investigating the associations between drought, poverty, high-risk sexual behaviours, and HIV incidence in Sub-Saharan Africa: a cross-sectional study

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Background: Climate change is increasing the likelihood of drought in sub-Saharan Africa where HIV prevalence is high. It has been hypothesised that drought and other extreme weather events could increase levels of HIV transmission through various mediating mechanisms. We investigated potential mechanisms linking drought to poverty, poverty to increased sexual behaviours, and increased sexual behaviours to recent HIV acquisition in sub-Saharan Africa.

Methods: Nationally-representative Population-Based HIV Impact Assessment (PHIA) surveys were undertaken among people aged 15-59 during 2016 in Eswatini, Lesotho, Tanzania, Uganda, and Zambia. PHIA data were geospatially linked to Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) data for 2014-2016, with


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local droughts defined as cumulative rainfall between 2014-2016 being in <15th percentile of all 2-year periods over 1981-2016.

Multivariable logistic regression was used to examine the associations between:

- Drought and poverty 2 lowest wealth quintiles),
- Wealth quintiles and sexual behaviours (transactional sex, intergenerational sex, and high-risk sex [condomless sex with a non-permanent partner]), and;
- Sexual behaviours and recent HIV acquisition (measured using antigen avidity immunoassays).

Analyses a/b were stratified by urban/rural, and analyses b/c were stratified by age and gender. Results for each country were pooled using random-effects meta-analysis.

Results: Data were included on 102,081 people (51.6% female); 31.5% resided in areas affected by drought during 2014-2016. We found positive associations between experiencing drought and poverty in both rural and urban areas, and generally negative associations between wealth and increased sexual behaviours for women, but less so for men.

Transactional sex, in particular, was less common among wealthier than poorer women. Among women in each age group analysed, those reporting each sexual behaviour had higher odds of recent HIV acquisition, except for intergenerational sex among women aged 25-59.

Men of all ages reporting transactional sex had higher odds of recent HIV acquisition, and men aged 15-24 and 40-59 reporting high-risk sex also had increased odds of recent HIV.

Conclusions: Our findings suggest that droughts could potentially increase HIV transmission through increasing poverty and then sexual risk behaviours, possibly more so in women. Future analyses need to better understand this potential causal mechanism.

EPC0303

Past-year transactional sex associated with HIV and STIs among MSM in the U.S.: findings from the American Men's Internet Survey, 2017-2021

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Background: Cisgender men who have sex with men (MSM) engaged in transactional sex (TS) experience socio-structural vulnerabilities that may shape HIV risk. Few studies have estimated the prevalence or correlates of TS among MSM in the United States (U.S.).

Methods: Using 2017-2021 data from the American Men's Internet Survey, we summarized the prevalence of TS (past-year receipt of money or drugs for sex) and assessed differences in characteristics of MSM who did and did not report TS via chi-square tests. Modified Poisson regression with robust variance estimation was used to calculate prevalence ratios (PRs) associated with reporting TS for past-year sexually transmitted infection (STI), current HIV status and either antiretroviral use (if living with HIV) or pre-exposure prophylaxis (PrEP) use (if not living with HIV), adjusting for age, education, income, survey year, and healthcare engagement.

Results: Across 52,449 observations, TS prevalence was 3.67% (n=1,927). Across survey years, prevalence ranged from 3.01% in 2017 to 4.26% in 2020 overall and 6.41% in 2018 to 31.6% in 2021 among MSM living with HIV. In bivariate analyses (Table), TS was associated with younger age, non-Hispanic white race/ethnicity, urbanicity, lower income, past-year homelessness, being uninsured, condomless anal sex (CAS) and serodiscordant CAS, and illicit and injection drug use. In adjusted analyses, TS was associated with increased HIV (PR 1.50, 95% CI=1.32-1.71) and STI prevalence (PR 2.38, 95% CI=2.18-2.60) and lower antiretroviral use (PR 0.92, 95% CI=0.87-0.96). TS was not associated with PrEP use.

	No transactional sex (n=50,522)	Transactional sex (n=1,927)	Chi-square p-value
Age			<0.001
15-24	16262 (32.2%)	1033 (53.6%)	
25-29	8137 (16.1%)	319 (16.6%)	
30-39	7893 (15.6%)	262 (13.6%)	
40+	18190 (36.0%)	313 (16.2%)	
Race/Ethnicity			<0.001
Black, non-Hispanic	5337 (10.7%)	253 (13.4%)	
Hispanic	8038 (16.2%)	441 (23.4%)	
White, non-Hispanic	32472 (65.3%)	1004 (53.2%)	
Other or multiple races	3722 (7.5%)	186 (9.9%)	
Education			<0.001
High school diploma or lower	7,433 (14.7%)	399 (20.0%)	
Some college or technical degree	14752 (29.3%)	636 (33.2%)	
College degree or postgraduate education	24041 (48.0%)	528 (27.5%)	
Annual income			<0.001
\$0-\$19,999	5933 (11.2%)	479 (25.1%)	
\$20,000-\$39,999	8913 (17.9%)	430 (23.0%)	
\$40,000-\$74,999	12091 (24.0%)	344 (18.0%)	
\$75,000+	17919 (35.9%)	422 (22.1%)	
Past year homelessness¹	1375 (2.8%)	328 (17.3%)	<0.001
Insurance category²			<0.001
None	6541 (13.2%)	425 (22.3%)	
Private	31720 (65.4%)	833 (43.7%)	
Public	6802 (14.0%)	428 (22.5%)	
Urbanicity³			0.004
Urban	43,745 (88.5%)	1,792 (93.0%)	
Rural	4,692 (9.3%)	130 (6.7%)	
Condomless anal sex, past 12 months⁴	35293 (69.9%)	1830 (94.6%)	<0.001
Condomless anal sex with discordant partner, past 12 months⁴	12308 (24.4%)	892 (46.3%)	<0.001
Illicit drug use (any), past 12 months⁵	16713 (33.1%)	1346 (69.8%)	<0.001
Injection drug use, past 12 months⁵	496 (1.0%)	283 (14.7%)	<0.001

¹ "Yes" responses shown; ² Not shown; other/multiple insurance (7.1% among those with no TS history; 7.0% among those with TS history); ³ Based on the U.S. National Center for Health Statistics (NCHS) 2013 urban-rural classification scheme. Urban: large central metropolitan, large fringe metropolitan, medium metropolitan, small metropolitan. Rural: micropolitan, non-core (nonmetropolitan counties not in micropolitan statistical areas).

Table. Characteristics of cisgender MSM in the US by past-year transactional sex (n = 52,449).

Conclusions: Among 50,000+ cisgender U.S. MSM, structural and behavioral risks converge to reinforce HIV/STI disparities for those reporting TS. While sex work remains criminalized in the U.S., reaching MSM engaged in TS via interventions that not only address substance use and HIV care gaps, but also structural vulnerabilities including housing instability and poverty, is critical for ending the HIV epidemic.

**EPC0304****HIV acquisition among adolescent girls and young women 13-24 years in Wakiso district, Uganda**

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Background: Despite the HIV prevention strategy such as the Determined Resilient Aids-free Safe girl /woman (DREAMS) that targets AGYW aged 10-24 in Uganda, HIV infections still occur. We described HIV positivity rates among Adolescent girls and young women (AGYW) to inform HIV programming.

Methods: Data from a cross-sectional study was conducted from March 1st to September 30th, 2021, among Adolescent girls and young women (AGYW) of Wakiso district in the Population Health Surveillance cohort implemented by the Africa Medical and Behavioral Sciences Organization. HIV tests were conducted to establish HIV positivity rates. Semi-structured data was collected and variables such as age, marital status, education, occupation were included in the analysis.

At bivariate analysis, variables with $P < 0.20$ were included in the logistic regression model. A multivariable logistic regression was used to determine the predictors HIV acquisition.

Results: Of 433 HIV tests conducted, 3.2%(14/433) were positive. AGYW aged 20-24 had the highest positivity rate of 6%(11/183), followed by 15-19 years with HIV prevalence approximately 2% (3/183) and 13-14 years had zero HIV infection. AGYW whose occupation was agriculture had a higher HIV risk compared to those engaged in business, (AOR=5.6; 95% CI: 1.23, 25.62), $p = 0.026$. Age, education level, marital status and pregnancy were not associated with HIV acquisition.

Conclusions: Overall, HIV positivity rates increased with age and therefore, more efforts should focus on AGYW aged 20-24. However, among AGYW aged 13-14 had zero infections, therefore the Ugandan ministry of health should strengthen HIV prevention and scale-up testing among AGYW whose primary occupation is agriculture.

EPC0305**The MPOX/HIV co-infection data dashboard**

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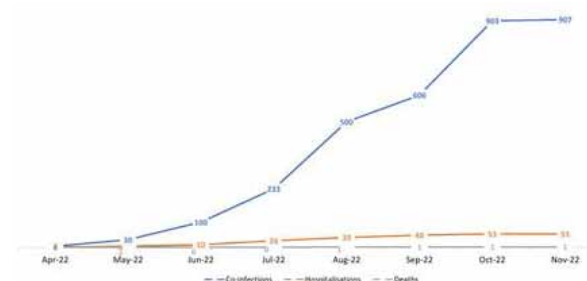
Background: People living with HIV (PLHIV) may have been affected disproportionately, 48% of persons reported to WHO were MPOX/HIV coinfectd. There were concerns PLHIV may be more likely to be hospitalised with a higher risk of death and this information was not specifically being documented contemporaneously.

As a rapid response to monitor this, the NEAT ID network set up a web-based dashboard collecting monthly data on MPOX/HIV co-infection, the number hospitalised and deaths from sites in Europe and Latin America. Aggregate data could be accessed on-line.

Methods: The Dashboard was opened in July 2022 to the network of NEAT ID Foundation of 150 sites in 20 countries in collaboration with EACS.. Participating sites were asked to back date entries to April 2022 and then submitted data on cases from July to November 2022. Data were from 31 global submitting sites 26 from 16 European countries and 5 in Latin America.

Data were collected cumulatively over time recording the number of cases of MPOX/HIV infection recorded, hospitalisations and deaths. The data were presented graphically on the NEAT ID website for public view.

Results: There were 907 persons with MPOX/HIV Co-infection reported from the network from April to end November 2022 with 53 (5.8%) Hospitalisations and 1 (1.1%) Death. The majority of persons were reported from Europe with 778 cases and 51 hospitalisations but no deaths. There were 129 persons reported from Latin America including 2 hospitalisations and the only death. There was a substantial increase in cases from June onwards with a flattening off by October.



Conclusions: The dashboard was helpful in that it was reassuring there was no signal during the evolution of the MPOX epidemic that hospitalisations or deaths were disproportionately occurring in the MPOX/HIV co-infected population over the 7 months of data reporting and was consistent with WHO global general population data.



EPC0306

Elevated homocysteine may mediate the association of HIV with subclinical coronary atherosclerosis among middle-aged adults

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Background: Elevated homocysteine may mediate the development of coronary atherosclerotic disease in middle-aged and older adults. It has been shown that people with HIV tend to have higher homocysteine concentrations than those without HIV. However, whether and how elevated homocysteine impacts HIV-associated subclinical coronary artery disease has not been reported. The key objective of this study was to examine whether and how elevated homocysteine influences HIV-associated coronary stenosis among middle-aged and older adults.

Methods: Between June 2004 and November 2019, 922 middle-aged adults, most of whom were black, with/without HIV in Baltimore, Maryland, United States, were enrolled in an observational study of the effects of HIV and other factors on subclinical coronary atherosclerosis. Those with HIV were recruited from the Johns Hopkins Adult HIV clinic. Those without HIV were recruited from the same neighborhoods where the majority of participants with HIV resided. The Committee on Human Research at the Johns Hopkins School of Medicine approved the study protocol.

Subclinical coronary atherosclerosis was confirmed with contrast-enhanced computed tomographic angiography. Of these 922, 707 with measured homocysteine were included in this study. mediation analysis was performed to examine whether and how elevated homocysteine mediated the association between HIV and subclinical coronary stenosis.

Results: Among the 707 study participants, 297 were female, 477 were living with HIV, and 313 had coronary stenosis. The mean age was 54.5 (± 8.9) years. After adjusting for cigarette smoking, glucose, HDL, LDL, depression, cocaine use and race, causal mediation analysis showed that the effect of HIV on coronary stenosis absent elevated homocysteine ($> 14 \mu\text{mol/L}$) was not significant ($p=0.13$), 35% of the HIV effect on coronary stenosis was attributed to the mediation of elevated homocysteine ($p=0.02$), and the proportion of total effect due to the interaction between HIV and elevated homocysteine was 64%.

Conclusions: This study suggested that one possible causal pathway through which HIV was associated with elevated homocysteine (mediator), and the mediator was associated with coronary stenosis. The mediator accounted for a substantial portion of the HIV effect, and the magnitude of the effect of HIV on coronary stenosis depended on the levels of homocysteine.

EPC0307

Trends towards micro-elimination of HIV transmission among gay and bisexual men in New South Wales (NSW)

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¹Kirby Institute, Sydney, Australia, ²Communicable Diseases Branch, Health Protection NSW, NSW Health, Sydney, Australia, ³Centre for Social Research in Health, UNSW, Sydney, Australia, ⁴Centre for Population Health, NSW Ministry of Health, Sydney, Australia, ⁵Sydney Sexual Health Centre, Sydney, Australia, ⁶School of Population Health, UNSW Sydney, Sydney, Australia, ⁷ACON, Sydney, Australia, ⁸Positive Life NSW, Sydney, Australia, ⁹NSW Multicultural HIV and Hepatitis Service, Sydney, Australia

Background: The NSW HIV Strategy 2021-2025 targets 'virtual elimination', which it defines as a 90% reduction in HIV infections relative to a 2008-2012 baseline. It also contains ambitious targets for increased HIV testing and PrEP-use in gay and bisexual men (GBM).

Methods: We examined trends in HIV notifications among GBM, and in "early-stage infections", defined as HIV likely acquired in the previous 12 months. Trends in HIV testing (previous 12 months) and PrEP use (previous six months) among GBM reporting condomless anal intercourse with casual partners (CLAIC) were examined in the Sydney Gay Community Periodic Survey (behavioural surveillance surveys) between 2008-2021.

We examined trends state-wide, and in 3 postcode-defined strata, based on estimated proportions of gay male residents in each postcode: $\geq 20\%$ gay (inner-city Sydney); 5-19% (inner-metropolitan); and $< 5\%$ (outer-metropolitan and remainder of NSW).

We assessed time trends in testing and PrEP within these postcode categories, and differences between postcode categories in 2021 were assessed using logistic regression.

Results: Compared to the baseline, annual notifications among GBM declined 49% overall (from the five-year mean of 267 between 2008-2012 to 136 in 2021), and by 85%, 46%, and 22% in $\geq 20\%$, 5-19% and $< 5\%$ postcodes, respectively. Early-stage HIV infections declined even more (70% overall; 138 to 42) and by 95%, 75% and 39% across postcode categories. During 2008-2021 annual HIV testing increased, both overall ($p<0.001$), and in each postcode category ($p<0.001$ in each).

In 2021, men in the $\geq 20\%$ postcodes had higher HIV testing (95%) than men in the $< 5\%$ postcodes (87%; $p=0.015$). Between 2015-2021 PrEP use also increased overall ($p<0.001$) and in each postcode category ($p<0.001$ in each). In 2021, men in the $\geq 20\%$ postcodes had higher PrEP use (83%) than men in the 5-19% and $< 5\%$ postcodes (71%; $p=0.021$, and 51%; $p<0.001$, respectively).



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Conclusions: HIV notifications among GBM in NSW have declined, and in inner-Sydney declines in recent infections have exceeded the Strategy target for virtual elimination of HIV transmission. This was reflected in prevention uptake, with higher testing and PrEP use among men in inner-Sydney. Achieving state-wide HIV elimination in GBM will require increased uptake of testing and PrEP among GBM outside inner-Sydney.

EPC0308

Active linkage to care outcomes in the Mozambique Population-based HIV Impact Assessment (INSIDA 2021)

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Background: The Mozambique Population-based HIV Impact Assessment was conducted in 2021/2022 to measure the impact of the national response to HIV among adults 15 years and older. Participants who tested HIV-positive during the survey and reported not being on antiretroviral therapy (ART), were offered active linkage to care (ALTC).

Methods: The contact information (phone number and address) of those consenting to ALTC was shared with provincial HIV managers within 7 days of completing data collection in the enumeration area. HIV managers coordinated linkage activities with health counselors from Health Facilities (HF) and community-based organizations (CBOs). Survey staff contacted the HIV managers to confirm the linkage outcome of each participant.

A spreadsheet was used to register the dates participants were tested, contacted and initiated on ART.

Results: Of the 14,488 individuals tested for HIV using the National Rapid Test algorithm, 2,038 positive participants were identified; of these, 744 participants were eligible for ALTC. Among the eligible participants, 709 (95.3%) provided consent to have their contact information shared for ALTC, and 660 (93.1%) were successfully contacted by health counselors. Participants that selected to be contacted only by visits were less likely to be successfully contacted (86.9%) when compared to those that chose to be contacted by either SMS or call (96.3%). Health counselors were unable to contact the remaining 49 (6.9%) participants due to imprecise address or outdated/inaccurate phone number collected during the survey. Of the participants that could be contacted, 618 (93.6%) were successfully initiated on ART and 42 (6.4%) did not visit the HF

after contact. Overall, 618 (83.1%) of participants eligible for ALTC initiated ART. The mean duration from household testing to initiation of treatment was approximately 30 days.

Conclusions: Linking household-based survey participants to HIV care and treatment has always been a challenge. However, INSIDA 2021 demonstrates that ALTC is feasible when conducted in close collaboration with existing health system processes and local (or community) partnerships. Survey ALTC could be improved by ensuring accurate contact information is collected during the survey interview, sensitizing the participant of the importance of providing a phone number, and by reducing the linkage time.

EPC0309

Population size estimation within a biobehavioral survey among people who inject drugs and men who have sex with men in the survey cities of the Kyrgyz Republic, 2021

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Background: The Kyrgyz Republic (KR) is a country with an HIV epidemic concentrated among key populations (KP). However, updated, high-quality population size estimates (PSE) for KP are lacking. Accurate KP PSE, particularly at a sub-national level, are necessary to design and evaluate programs and policies to prevent new HIV acquisitions and to monitor the dynamics of the epidemic. Incorporating empirical PSE methods within biobehavioral surveys may offer an efficient opportunity to generate valid PSEs for select populations.

Methods: Using respondent-driven sampling (RDS), a biobehavioral survey (BBS) was conducted among PWID in Bishkek, Karabalta, Karasuu, Osh, Tokmok, and Sokuluk and among MSM in Bishkek and Osh in 2021. The BBS incorporated multiple empirical PSE methods – successive sampling PSE (SS-PSE), unique object multiplier, 3-source capture – recapture (3-SCR) and service multiplier.

A Bayesian-based model was used to synthesize the various estimates to generate point estimates and plausibility bounds by location.

Results: The results of the PSE exercise suggest that Bishkek had 6,100 MSM, constituting 2.0% of the adult male population (plausibility bounds [PB], 1.7%-2.4%); Osh – 860 (1.0%; 0.8%-1.1%). The number of PWID was 4,100 (1.4%; PB,


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1.1%-1.6%) in Bishkek; 110 (1.1%; 0.7%-1.4%) in Kara-Balta; 380 (1.4%; 1.2%-1.63%) in Karasu; 1,150 (0.9%; 0.7%-1.2%) in Osh; 710 (1.3%; 1.0%-1.6%) in Sokuluk, and 220 (1.3%; 1.0%-1.6%) in Tokmok.

Conclusions: These updated estimates generally fell within the globally recognized ranges. The triangulation of survey and programmatic data over time along with use of synthesis models could help refine PSE and support the optimal allocation of limited resources and improve target-setting and program monitoring.

EPC0310

Mollicutes in people living with HIV/AIDS at a regional reference center for sexually transmitted infections in Southwest Bahia - Brazil

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Background: *Mollicutes* sp. are known to cause various infections in the urogenital tract and to act as HIV cofactors in developing AIDS. Thus, the present study aimed to identify the prevalence of *Mollicutes* sp. in People Living with HIV/AIDS (PLHIV) in a Reference Center for Sexually Transmitted Infections (STIs) in the southwest region of Bahia and correlate with the identified sociodemographic, behavioral, and clinical characteristics.

Methods: Cross-sectional study that included 67 HIV+ men and woman in follow-up. Urethral and cervical samples were collected. *Mollicutes* sp. detection was performed using qPCR. Data collection was obtained by an interview and clinical data by medical records at the health center. Poisson regression with robust variance was used to estimate the prevalence ratio (PR) and its 95% confidence interval. We conducted multivariate analysis by Poisson regression and considered a p-value <0.05 for statistical significance.

Results: A high prevalence of *Mollicutes* sp. infection (76.1%) was found in PLHIV: 11.9% had *Mycoplasma genitalium*, 37.3% *M. hominis*, 44.8% *Ureaplasma parvum* and 7.5% *U. urealyticum*. After the multivariate analysis, being female (PR=1.33, 95%CI= 1.01 - 1.76), non-black race/color (PR=1.29, 95%CI = 1.04 - 1.60) and co-infection with syphilis (PR=1.33, 95%CI= 1.01 - 1.74) were associated with a higher prevalence of *Mollicutes* sp.

Non-black race/color (RP=1.70, 95%CI= 1.08 - 2.70), age of first sexual intercourse up to 14 years (PR=1.87, 95%CI= 1.15 - 3.06), and having had up to 5 sexual partners in their lifetime (PR=1.68, 95%CI= 1.07 - 2.65) were associated with a higher prevalence of *Mycoplasma* spp.. Cytokine analysis revealed increased levels of IL-10 and IL-1 β in those infected with *Ureaplasma* spp.

Conclusions: These results showed a high prevalence of *Mollicutes* sp. in PLHIV. It is necessary to strengthen efforts to expand the screening protocol for STIs in this target

audience for emerging and asymptomatic microorganisms of the *Mollicutes* class and thus promote safer sexual practices.

EPC0311

Alcohol use and advanced HIV disease: population-based data from four sub-Saharan African countries

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Background: Alcohol use is common among people living with HIV (PLWH) and is associated with poorer medication adherence, drug effectiveness, and overall quality of life. However, alcohol use among people living with advanced HIV disease (i.e., a CD4 count <200 cp/mL) is not well characterized, particularly in sub-Saharan Africa (SSA) where alcohol use is growing. We assessed the association between alcohol use and advanced HIV disease among PLWH in four SSA countries.

Methods: We pooled data from the 2015-2017 Malawi, Tanzania, Zambia, and Zimbabwe Population-based HIV Impact Assessments, nationally representative household surveys. We assessed the prevalence of past month's alcohol use and the average number of drinks per drinking day. We used logistic regression to model associations between any alcohol use and advanced HIV disease, adjusting for age, education, country, urbanicity, wealth index, and antiretroviral treatment (ART) status. We weighted analyses for country-specific sampling designs.

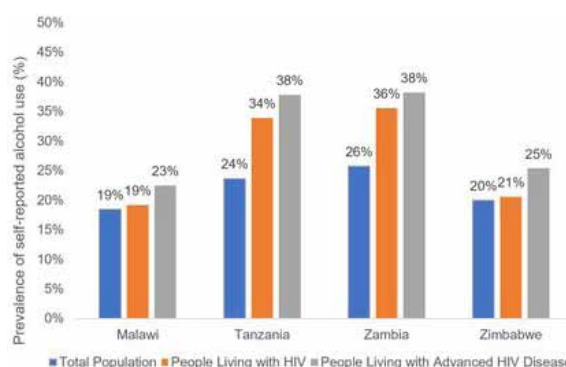


Figure. Prevalence of alcohol use among people living with HIV and advanced HIV disease across four sub-Saharan African countries.

Results: Among 9,907 PLWH, 15% (1,456/9,907) have advanced HIV disease. Most people living with advanced disease were from Tanzania (34%), were male (52%), were 40+ years (50%), completed primary school (50%), from a rural area (59%), had a second highest household wealth quintile (26%), and were not on ART (57%).



Compared to the overall population, prevalence of alcohol use was greater among all PLWH and even greater among people living with advanced HIV disease (Figure), 41% of whom reported 3-4 drinks per drinking day. Compared to PLWH without advanced HIV disease, people living with advanced HIV disease had greater odds of reporting alcohol use (adjusted odds ratio: 1.2; 95% Confidence Interval: 1.1-1.5).

Conclusions: Alcohol use was common among people living with advanced HIV disease in SSA, a similar pattern seen in high-income countries. With increasing consumption rates in SSA, clinical programs linking PLWH to care should integrate culturally-relevant alcohol services to mitigate this public health problem.

EPC0312

Success of key population program on HIV control among female sex workers in Rwanda

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Background: Globally, female sex workers represent a high-risk group for HIV with more than 40% of new infections. Since 2014 the national HIV program initiated the key population facility and community-based interventions, including the HIV and sexual transmitted infections testing, provision of condom, as well as education to HIV prevention and income generating. We present a 10-year trend in HIV prevalence among FSW.

Methods: Over the last decade, Rwanda Biomedical Centre conducted 3 editions of Integrated Behavioral and Biological Surveillance Survey (IBBSS) among FSW to assess changes in sexual behavior and the trend of HIV prevalence among FSW aged 15 years and above.

Demographic, behavioral and biological data were collected using interview questionnaire administration and blood draws. HIV testing was performed according to national algorithms among consenting FSW.

Trend analysis for proportions and test for proportion differences were performed using STATA v17. Chi-square statistic for both trends and proportion test were calculated, corresponding slope and p-values were presented.

Results: We included 5,057 FSW in the three studies: 1,338 in 2010, 1,978 in 2015 and 1,741 in 2019.

Overall, HIV prevalence among FSWs in Rwanda over the last ten years at each of the three-time points were 51.0% (95%CI:47.9-53.8) in 2010 46.8% (95%CI:43.5-50.1) in 2015 and 35.5% (95%CI:31.5-39.8) in 2019.

An overall decline slope of -3.4% (p-value; 0.001) in HIV prevalence among FSW is observed over the last ten years. A pairwise comparison of the two study periods shows a high decrease from 2015-2019: 2010 vs 2015 3.8% decline with p-value: 0.025 while from 2015 vs 2019, the decline was 11.3% with p-value; 0.001.

Conclusions: Declines in HIV prevalence among FSW is observed over the past decade, primary due to intensified

biomedical interventions HIV control among FSWs. We recommend the mainstay of interventions to control HIV among key population and to assess their impact.

EPC0313

Understanding gender differences in key HIV risk factors among people who inject drugs: systematic review and meta-analysis

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Background: Gender can play a key role in risk of HIV acquisition. Among people who inject drugs (PWID), women's agency to enact harm reduction measures or access interventions may be constrained by social and structural factors.

We aimed to assess gender differences in two key HIV risk factors among PWID: needle and syringe sharing and engagement with opioid agonist therapy (OAT).

Methods: We conducted a systematic review and random effects meta-analysis. We included studies published from 2012 onwards that presented sex- or gender-stratified findings. We did not assess how sex or gender was defined and no studies reported findings for transgender or gender-diverse people.

We accepted various definitions of "sharing" (e.g. receptive or distributive sharing). OAT engagement was defined as enrollment in OAT. Data could refer to any exposure period.

Results: Fifty-six studies with needle and syringe sharing data were analysed. Women reported higher levels of sharing in studies measuring the past 12-months (risk ratio [RR] 1.10, 95% confidence interval [CI] 1.05-1.16; 6 studies), 6-months (RR: 1.15; 95% CI 1.00-1.31; 16 studies) and 3-months (RR 1.47; 95% CI 1.26-1.70; 6 studies).

Weak evidence was observed for a difference in sharing over the lifetime (RR 1.07, 95% CI 0.98-1.17; 15 studies), and no evidence of a difference in past-month sharing (RR 1.04, 95% CI 0.84-1.29; 13 studies). Heterogeneity was low to moderate for all exposure periods. Only four studies presented gender-stratified data on OAT.

For lifetime (1 study) or "lifetime or current" OAT (2 studies), there was no evidence of a gender difference. One study of past 6-month OAT reported higher engagement among women relative to men (RR 1.62; 95% CI 1.42-1.86).

Conclusions: The strength of association between gender and needle and syringe sharing varied by exposure period but women were generally more likely to report sharing than men.

Few studies reported gender-specific data on OAT engagement. These two key indicators of HIV risk are variably defined and measured, complicating attempts to



synthesise data or determine public health implications or responses. A better understanding of how gender shapes HIV risk among PWID may inform intervention design and reduce HIV burden.

EPC0314

Global associations of key populations with HIV-1 recombinants: a systematic review, global survey, and individual participant data meta-analysis

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Background: Global HIV infections due to HIV-1 recombinants are increasing and impede prevention and treatment efforts. Key populations suffer most new HIV infections, but their role in the spread of HIV-1 recombinants is unknown.

We conducted a global analysis of the associations between key populations and HIV-1 recombinants.

Methods: We searched PubMed, EMBASE, CINAHL, and Global Health for HIV-1 subtyping studies published from 1/1/1990 to 31/12/2015. Unpublished data was collected through a global survey. We included studies with HIV-1 subtyping data of key populations collected during 1990-2015.

Key populations assessed were heterosexual people (HET), men who have sex with men (MSM), people who inject drugs (PWID), vertical transmissions (VERT), commercial sex workers (CSW), and transfusion-associated infections (BLOOD). Logistic regression was used to determine associations of key populations with HIV-1 recombinants. Subgroup analyses were performed for circulating recombinant forms (CRFs), unique recombinant forms (URFs), regions, and time periods.

Results: 885 datasets including 77,284 participants from 83 countries were included. Globally, PWID were associated with the greatest odds of recombinants and CRFs (OR 2.6 [95% CI 2.46-2.74] and 2.99 [2.83-3.16]), compared to HET. CSW were associated with increased odds of recombinants and URFs (1.59 [1.44-1.75] and 3.61 [3.15-4.13]). VERT and BLOOD were associated with decreased odds of recombinants (0.58 [0.54-0.63] and 0.43 [0.33-0.56]).

MSM were associated with increased odds of recombinants in 2010-2015 (1.43 [1.35-1.51]). Subgroup analyses supported our main findings.

Conclusions: As PWID, CSW, and MSM are associated with HIV-1 recombinants, increased preventative measures and HIV-1 molecular surveillance are crucial within these key populations.

EPC0315

Growing gender disparity in HIV infection in Africa: sources and policy implications

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Background: Historically, HIV incidence in Africa was concentrated among adolescent girls and young women, but as new cases decline with scale-up of HIV interventions, epidemic dynamics may shift by age and gender. No prior study has comprehensively investigated how sources of infection across age and gender have evolved.

Methods: We assessed HIV incidence and transmission flows among men and women 15-49 years from 2003 to 2018, using data from 9 survey rounds of the population-based Rakai Community Cohort Study in southern Uganda.

Incidence rates were calculated with non-parametric generalized additive Poisson models. HIV transmission events with direction of transmission were reconstructed from longitudinal HIV deep-sequence data.

Transmission flows by 1-year age band, gender and round were estimated with semi-parametric Poisson flow models constrained to incidence dynamics. The effectiveness of counterfactual interventions on incidence reduction was assessed on the reconstructed transmission flows.

Results: We observed 1,100 incidence events over 127,217 person-years and reconstructed 238 transmission events. Incidence decreased markedly to 0.34/100 person years (PY) [0.33-0.35] in men and significantly more slowly to 0.54/100 PY [0.52-0.56] in women in 2018 (Figure 1a).

The estimated proportion of male sources to infections increased from 58% [95 CI, 56-60%] in 2003 to 63% [60-65%] in 2018 (Figure 1b).

Age-specific transmission flows shifted, with the relative contribution of flows to women aged 25-34 years from men 0-6 years older doubling from 2003 to 2018, so that the highest burden in female incidence evolved from ages 20-24 in 2003 to ages 30-34 in 2018.

We observed considerably slower increases in population-level viral suppression in men than women. Counterfactual modelling analyses suggest closing the 1.5-fold gap in viral load suppression in men relative to women in 2018



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could have reduced incidence in women by 51% [49-53%] and brought female incidence rates on par with male incidence rates (Figure 1c).

Conclusions: This study documents substantial shifts in HIV transmission dynamics in an African epidemic with declining incidence. Intervention programmes must adapt accordingly, with greater focus on reducing incidence in older women and reaching and retaining men in care as a means of efficient epidemic control, closing growing gender disparities, and improving population health.

EPC0316

Increased risk of HIV acquisition among people who inject drugs who recently engaged in sex work or male-with-male sexual activity: a systematic review and meta-analysis

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Background: Among people who inject drugs (PWID), sharing of injecting equipment is an important route of HIV transmission. However, PWID comprise a diverse population who experience additional and overlapping HIV risk factors. We assessed whether PWID who have also engaged in recent (within previous year) sex work (PWID-SW) or who were male and recently engaged in male-with-male sexual activity (PWID-MSM) have increased risks of HIV acquisition.

Methods: In this systematic review and meta-analysis, we searched MEDLINE, Embase and PsycINFO databases for studies published between 01/01/2000 and 12/12/2021 which estimated HIV incidence among community PWID. We extracted unadjusted estimates comparing risks of HIV acquisition between PWID-SW and PWID who had not recently engaged in sex work did not engage in sex work recently (PWID non-SW) and between PWID-MSM and male PWID who did not engage in male-with-male sex recently (PWID non-MSM). We pooled data using random-effects meta-analysis.

Results: We included 15 studies, of which ten reported on sex work and eight reported on male-with-male sexual activity. Among included studies, eight were located in the Americas, three were located in South-East Asia and Europe, and one was located in the Western Pacific. Between 8%-46% of PWID were PWID-SW and between 1%-20% were PWID-MSM. PWID-SW had a 1.81-fold (relative risk [RR]:1.81, 95%CI:1.39-2.35) greater risk of HIV acquisition compared to PWID non-SW. PWID-MSM had a 2.56-fold (RR:2.56, 95%CI:1.27-5.17) greater risk of HIV acquisition relative to PWID non-MSM. Pooled estimates carried moderate between-study heterogeneity (Figure).

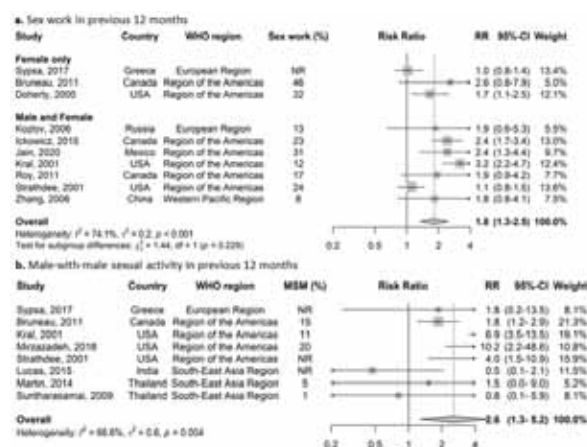


Figure. Association between (a) sex work in previous 12 months and (b) male-with-male sexual activity in previous 12 months and HIV acquisition among people who inject drugs.

Conclusions: Our study indicates that PWID who also engage in sex work or male-with-male sex have higher HIV risks compared to PWID who do not engage in these practices. Findings suggest that HIV interventions targeted towards PWID should expand to address these overlapping risk factors.

EPC0317

Mobile phone ownership and other factors associated with mental health among adolescents and young adults living with HIV in western Kenya

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Background: Globally, mobile phone ownership is increasingly widespread especially among adolescents and young adults however its implications on mental health is not well known.

This study investigated the relationship between mobile phone ownership and other factors on mental health among adolescents and young adults living with HIV (ALWH).

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Methods: A cross-sectional survey was conducted in 2021-2022 at three government facilities in Kisumu county. Validated social-demographic and psycho-social questionnaires were conducted to assess mental health symptoms (including depression PHQ-9 score ≥ 6 and anxiety, GAD-7 score ≥ 5) and potential risk factors. Odds ratio (OR) regression was performed to determine associations between risk factors and mental health.

Results: Of 880 ALWH (14-17 years 37%, female 67%) depression prevalence was 12.5% (95%CI 10.4-14.8), anxiety prevalence was 13.6 % (95%CI 11.5-16.0) and 55.7% (52.4-59.0) were mobile phone owners. ALWH mobile phone owners were more likely to be depressed (Crude OR (cOR)2.21;95%CI 1.42-3.43). ALWH who reported a family death (adjusted OR(aOR)1.71;95%CI 1.01-2.90), being bullied many or a few times (aOR 2.57;95%CI 1.17-5.60) and (aOR 2.46;95%CI 1.21-5.00), using alcohol (aOR 1.99;95%CI 1.11-3.58), low and very low food security (aOR 2.49;95%CI 1.16-5.31) and (aOR 3.77;95%CI 1.75-8.11), were more likely to be depressed among mobile phones owners.

Younger ALWH who own mobile phones were more likely to have anxiety (aOR)2.02;95%CI 1.33-3.06), whereas ALWH aged 18 to 24 years with phones (aOR 0.36;95%CI 0.16-0.83) were less likely to have anxiety. Additionally, being male (aOR 2.68 95%CI 1.30-5.50), being bullied many or a few times (aOR 2.43;95%CI 1.06-5.56) and (aOR 2.17;95%CI 1.05-4.49), using alcohol (aOR 1.88;95%CI 1.03-3.42), and very low food security (aOR 3.29;95%CI 1.58-6.85), were more likely to have anxiety among mobile phones owners.

Conclusions: Mobile phone ownership was identified as a risk factor for depression and anxiety, however not with anxiety among older ALWH. Being bullied, alcohol use, low food security, a family death, age and gender were associated with worse mental health among ALWH. Addressing factors associated with mental health symptoms are needed to improve clinical outcomes. More research is needed to gain a deeper understanding of the mobile phone and mental health association.

systematic HIV clinical monitoring and a confidential linkage was used to extract comprehensive antiretroviral therapy (ART) dispensation records.

We used cumulative link mixed-effects models to estimate the longitudinal relationship between periods of homelessness and progression through the HIV cascade of care.

Results: Between 2005 and 2019, 947 people living with HIV were enrolled in the ACCESS study and 304 (32.1%) reported being homeless at baseline. Homelessness was negatively associated with overall progression through the HIV cascade of care (Adjusted Partial Proportional Odds Ratio [APPO] = 0.56, 95% confidence interval [CI]: 0.49-0.63).

Homelessness was significantly associated with lower odds of progressing to each subsequent stage of the HIV care cascade, with the exception of initial linkage to care.

Conclusions: We observed that homelessness was a pervasive exposure and was associated with a 44% decrease in the odds of overall progression through the cascade. While homelessness was not significantly associated with linkage to care, homelessness was associated with a 35-53% decrease in the odds of receiving ART, being adherent to ART and achieving viral load suppression.

These associations were observed in multivariable models adjusted for a range of relevant demographic, behavioural and socio-structural covariates, including substance use behaviours such as injection drug use and heavy alcohol use that were also independently associated with decreased odds of HIV cascade of care progression.

These findings support calls for the integration of services to address intersecting challenges of HIV, substance use and homelessness among marginalized populations such as PWUD.

EPC0318

Experiencing homelessness and progression through the HIV cascade of care among people who use drugs

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Background: To investigate the longitudinal association between periods of homelessness and progression through the HIV cascade of care among people who use drugs (PWUD) with universal access to no-cost HIV treatment and care.

Methods: Data were analyzed from the ACCESS study, a prospective cohort study of PWUD living with HIV in Vancouver, Canada. At baseline and semi-annually thereafter, participants completed an interviewer administered questionnaire and provided venous blood samples for



EPC0319

Evaluation of cross-sectional HIV incidence recency testing in the evidence for contraceptive options and HIV outcomes (ECHO) trial

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Background: HIV-1 recent infection testing algorithms (RITAs) estimate population-level HIV incidence from cross-sectional blood sampling. RITAs are currently being used in PrEP trials to estimate background HIV incidence (bHIV). The ECHO Trial, which assessed HIV incidence among young African women randomized to different contraceptive methods, provides an opportunity to compare bHIV determined by a RITA to prospectively observed HIV incidence.

Methods: ECHO enrolled participants from Dec 2015 until Sep 2017. Women enrolled before 15 Apr 2017 from South African ECHO sites were eligible for the full 18 months of study follow-up and were selected for this analysis, while those enrolled for 12 to <18 months were excluded. Women who acquired HIV in ECHO were referred for initiation of antiretroviral therapy (ART). Observed HIV incidence was calculated at Month 18. Recency testing was performed using the Sedia HIV-1 Limiting Antigen Avidity Enzyme ImmunoAssay (LAG-EIA) using Month 18 visit samples, regardless of when HIV seroconversion occurred during study follow-up. Among these women, RITA-based HIV incidence was calculated using a viral load (VL) cutoff of 75 copies/mL, mean duration of recency infection of 149 days, and a false recency rate of 1.7%.

Results: Among 5768 women in ECHO, 4171 were eligible for 18 months of follow-up, among whom 285 acquired HIV and 256 had samples available for recency testing. Of the 256 samples, 55 were classified as recent, 92 were classified as long-term, and 109 had a VL <75 copies/mL, resulting in a bHIV calculation of 3.71 (95% CI 2.69-5.13) per 100 person years (PY). The observed HIV incidence for participants enrolled on or before 15 Apr 2017 was 4.77 (95% CI 4.24-5.35) per 100 PY.

Conclusions: A RITA utilizing the LAG-EIA assay generated a HIV incidence estimate that was comparable and correlated well with the prospectively observed HIV incidence among young South African women who acquired HIV at different time points during ECHO. These findings demonstrate the utility of a RITA for estimating HIV incidence in a population with circulating HIV subtype C with high access to ART, the result supports the use of RITAs to reliably estimate bHIV in HIV prevention studies in South Africa.

EPC0320

HIV in displacement: HIV prevalence, diagnosis, and viral suppression among adult Venezuelan migrants in Colombia

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Background: Global migration estimates have increased 82% from 1990 to 2020, not including recent conflicts. HIV surveillance among migrant populations is necessary for health programming but limited by logistical and ethical challenges. HIV surveillance was conducted among Venezuelan migrants in Colombia, which hosts the largest number of Venezuelan migrants, to inform HIV programming and treatment distribution plans.

Methods: Venezuelan migrants and resided in Colombia were sampled using RDS. Participants completed socio-behavioral surveys and rapid HIV screening with laboratory-based confirmatory testing, CD4 count, and viral load. Post-test counseling with integrated legal assistance was provided for participants with HIV for sustained access to treatment through the national system. Population prevalence estimates were weighted for RDS sampling.

Multinomial logistic regression was used to identify correlates of past and new HIV diagnosis compared to a negative HIV result. Penalized multivariable logistic regression analysis was used to identify correlates of viral suppression.

Results: Between July and December 2021, 6,221 participants enrolled. Participants had a median age of 32 years (IQR: 26-41); 65.2% female, 34.3% male, and 0.5% transgender or non-binary; and 71.1% had irregular immigration status. The prevalence of HIV infection was 0.8% (95% CI: 0.7-1.1), of which 38.0% had a previous diagnosis and 28.6% viral suppression. Key populations, partner living with HIV, use of humanitarian services, and condom use at last sexual intercourse were independently associated with prior HIV diagnoses.

Identifying as transgender or nonbinary, key populations, and syphilis infection were positively associated with new HIV diagnoses. Women are less likely to be recently diagnosed. People with irregular immigration status were less likely to have viral suppression (reference: regular status; aOR:0.3; 95% CI:0.1-0.8, p=0).



Conclusions: The HIV epidemic appears to be approaching a generalized stage, defined as $\geq 1\%$ prevalence, among Venezuelans in Colombia. HIV diagnosis may be improved through enhanced partner testing services, programs for key populations who are migrants, innovative testing strategies, and coordination with humanitarian programs. Legal aid and policy change can support early detection and treatment for migrants with irregular status.

Surveillance: Measuring the HIV epidemic

EPC0321

Use of recent HIV surveillance data to respond to ongoing HIV transmission in Malawi

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Background: Recent HIV infection surveillance helps determine whether newly diagnosed people living with HIV (PLHIV) were likely recently infected (<12 months) to identify potential geographic areas or subpopulations experiencing ongoing HIV transmission.

We describe the process and outcomes of the identification, investigation, and response to HIV transmission in Malawi.

Methods: Consenting newly diagnosed PLHIV in 251 health facilities underwent a recent infection testing algorithm (RITA) involving a rapid test for recent infection (RTRI) and viral load testing for all those RTRI-recent.

Facilities with potential ongoing HIV transmission were identified based on: meeting or exceeding numeric thresholds of RITA-recent infections by facility category, significant increases in RITA-recent infections compared to the prior 3 months, and a Poisson-based spatiotemporal statistic with SaTScan.

Facilities that met at least two of these thresholds were investigated. Interviews were conducted during hotspot investigations with health workers and stakeholders to identify possible drivers of ongoing HIV transmission. Interventions were designed and implemented to address HIV service gaps and potential contributors to HIV transmission.

Results: Out of the 251 facilities implementing recent infection surveillance, 15 (6.0%) met one of three hotspot definitions; four in Blantyre (1.6%) and five in Lilongwe (2.0%) were subsequently investigated. Potential barriers to HIV testing and prevention services identified by respondents included stigma faced by key populations seeking care and unavailability of pre-exposure prophylaxis, self-test kits, and condoms.

Risky behavior occurring in bars and "shebeens" (illegal drinking establishments), at parties, and during other cultural practices were also mentioned as possible contributors to transmission.

Since May 2022, interventions have been implemented to improve HIV testing and prevention, including the integration of targeted condom distribution with scaled-up index testing, and engagements with community and bar/shebeen owners to support moonlight testing and HIV services.

Conclusions: Tailored interventions may further reduce HIV new infections by identifying and targeting geographic areas and subpopulations experiencing ongoing transmission. Recent HIV surveillance and hotspot detection and response may provide opportunities to identify and address gaps in HIV services and socio-behavioral barriers for sustaining gains Malawi achieved in reaching epidemic control.

EPC0322

Risk factors for recent HIV infection among newly diagnosed HIV individuals aged ≥ 15 years in North Eastern Uganda

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Background: Despite Uganda making significant progress in the reduction of HIV prevalence among the adult population (15-49 years), 54,000 new infections occurred in 2021. To identify, track and respond to new recent HIV infections, Uganda started implementing HIV recent infection surveillance strategy in October 2019

Description: From May 2020 to December 2022, The Aids Support Organization through the support of the Center for Disease Control and Prevention initiated a surveillance program of new HIV infections among newly diagnosed HIV-positive individuals aged ≥ 15 years through HIV recency testing at 21 Health facilities in 14 districts of North Eastern Uganda. A sample of blood was drawn from the consented newly diagnosed HIV individuals and tested for HIV recent infection using Asante Rapid tests for Recent Infection (RTRI).

The clients who consented for recency provided an extra blood sample that was analyzed centrally. Clients with recent RTRI results and unsuppressed VL results (>1000 copies/ml) were classified as recent infections as per the RTRI testing algorithm.



Lessons learned: A total of 791 persons were offered re-cency testing, of these 60% were females (F), and 40% were males (M). 87% (688/791) tested positive for long-term infections 2.4% (19/791) tested negative and 11% (85) had recent infections, of the recent infections 59% (50/84) were female and 40.5% (34/84) were male with an overall ratio 1.5:1 of females to males with recent infection, highest among females of 20-24 old.

Recent infections were highest among; ages of 35-39 (9M and 6F) and 40-44 (7M and 8F), followed by ages 20-24 (4M and 10F), 30-34 (4M and 8F), 25-29 (5M and 5F), 50+ (3M and 6F), 15-19 (1M and 5F), and 45-49 (1M and 2F) (18%, 18%, 16%, 14%, 12%, 11%, 7%, and 4% respectively). All (791) of these clients were initiated on ART and offered partner notification services.

Conclusions/Next steps: Young Women are at a higher risk of recent HIV infection and thus it's key to scaling up targeted evidence-based HIV prevention interventions, such as PrEP use among these high-risk groups to decrease transmission rates.

We, therefore, recommend the integration of HIV recent infection testing in the routine HIV testing services at the facility and community across all facilities in order to achieve HIV epidemic control.

EPC0323

Review of HIV mortality surveillance methods

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Background: HIV mortality surveillance data allow countries to monitor trends in deaths among people living with HIV to assess the impact and progress of HIV prevention and treatment investments; and in combination with HIV incidence data, to measure HIV epidemic control. However, mortality surveillance systems are underdeveloped in most countries supported by the U.S President's Emergency Plan for AIDS Relief (PEPFAR). We conducted a review to describe various mortality surveillance methods used to fill data gaps.

Methods: We searched peer-reviewed literature using Medline and Google Scholar and grey literature using Google's search engine to identify methods for mortality surveillance using "HIV", "mortality", and "surveillance" as search terms. We only included studies in English from 1990 onwards. We collected information on the strengths, weaknesses, requirements of each method, and country examples.

Results: HIV mortality surveillance methods include routine death reporting to civil registration and vital statistics (CRVS) systems, verbal autopsies (VA), sample vital registration with VA, burial systems, and biomarker-based sentinel surveys (including minimally invasive tissue sampling and mortuary surveillance). CRVS is the gold standard and captures all deaths and causes of deaths

(CoD). Most PEPFAR countries do not have representative, reliable national CRVS systems. Malawi has recently started a sub-national electronic death reporting system. VAs can be conducted with the next of kin to determine CoD. However, VAs require trained interviewers, and either physician coded or automated assignment of CoD. VAs have been conducted in several countries including Uganda and South Africa. Blood and other samples collected from cadavers can be tested for HIV and other biomarkers, though this may require laboratory infrastructure. Kenya piloted mortuary surveillance in Nairobi in 2015 and replicated it in Kisumu in 2018.

Conclusions: In the absence of national CRVS systems, or while countries are implementing and strengthening their CRVS systems, other surveillance strategies can be implemented at the sub-national or sentinel level to fill the gaps in mortality data. Timely mortality data can inform HIV prevention, care, and treatment interventions and programs.

EPC0324

HIV diagnosis, treatment, and viral load suppression in adults in Mozambique: results from the 2021 population-based HIV impact assessment survey (INSIDA 2021)

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Background: Ending HIV as a public health threat by 2030 relies on closing gaps in HIV diagnosis, treatment, and viral load suppression (VLS).

Methods: INSIDA 2021, a nationally representative household survey conducted in 2021/2022, estimated the UNAIDS 95-95-95 targets (awareness of HIV-positive status; coverage of antiretroviral (ARV) therapy (ART) among those aware; and VLS among those on ART), ART coverage and VLS among all people living with HIV (PLHIV) aged 15 years and above. Participants were interviewed and tested using the national rapid HIV testing algorithm, followed by laboratory-based confirmation using Geenius HIV 1/2 Confirmatory Assay (Bio-Rad).

Individuals were defined as "aware" of their HIV-positive status by self-report or if they had ARV (atazanavir, lopinavir, efavirenz, dolutegravir) detected in their blood.



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Individuals were categorized as "on ART" by self-report or if they had ARV in their blood. VLS was defined as HIV RNA<1000 copies/milliliter in the blood. Analyses were weighted to account for the complex survey design.

Results: In total, 14,488 participants were tested. Among those who tested HIV-positive, 71.6% were aware of their status; among those aware, 96.4% were on ART; among those on ART, 89.4% had VLS. Among all PLHIV, 69.0% were on treatment. VLS among all PLHIV was 64.1% and varied from 44.5% among 15–24-year-olds to 75.2% among those aged 50+. Overall, women performed better in all indicators when compared to men (Table).

Indicator	Age group	Men (%)	Men (N)	Women (%)	Women (N)	Total (%)	Total (N)
1st 95: Aware of HIV+ status	15-24	45.3	53	56.4	191	53.8	244
	15+	68.5	641	73.3	1,392	71.6	2,033
2nd 95: Aware and on antiretroviral treatment	15-24	(100.0)	25	97.1	107	97.7	132
	15+	94.3	466	97.5	1,065	96.4	1,531
3rd 95: On ART and virally suppressed	15-24	(80.9)	25	78.6	103	79.1	128
	15+	87.6	442	90.4	1,040	89.4	1,482
Antiretroviral coverage among all PLHIV	15+	64.6	641	71.4	1,392	69.0	2,033
Viral load suppression among all PLHIV	15+	58.8	641	67.1	1,395	64.1	2,036

Table. UNAIDS conditional 95-95-95 conditional targets, ART coverage and VLS among PLHIV aged 15+ by age and sex, INSIDA 2021

Figures in parentheses indicate a cell size of less than 50 where point estimate may not be reliable.

Conclusions: Although Mozambique has reached the 95% treatment target among PLHIV who know their status, three in ten PLHIV are not yet on ART. Accelerating HIV case finding, linkage and VLS, and addressing the age and sex disparities along the cascade is essential.

EPC0325

A multicenter surveillance for advanced HIV disease among newly diagnosed key population groups living with HIV in Nigeria

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Background: Analyzing Advanced HIV Disease (AHD) among newly diagnosed PLHIV is very important because those with AHD (CD4 count < 200 cells/mm³) will have poor treatment outcomes with a higher mortality risk. In line with the Nigerian country-specific strategy for AHD, we analyzed CD4 results of newly diagnosed Key Population PLHIV.

Methods: We conducted CD4 test for newly diagnosed KP-PLHIV in 11 program states and analyzed the results after a 4-month period (April-July 2022). The different KP types were Men who have Sex with Men (MSM), Female Sex Workers (FSW), People Who Inject Drugs (PWID), Transgender Persons (TG), sexual partners (SP) of KPs, and People in Prisons (PiP). Using simple proportions, we estimate AHD rates by the different KP types. Pearson Chi-square of difference estimated if any significant difference exists among those with CD4 values less than 200. Difference in CD4 results by KP types was analyzed using ANOVA. Post Hoc test identified where the difference lies across KP types.

Results: Out of 5132 (FSW-1983, MSM-1307, PiP-43, PWID-887, SP-912) client-level data analyzed, 319 (6.21%) had CD4 cells less than 200 cells/ml (FSW – 85 (4.2%), MSM –1307 (4.2%), PiP – 12 (28%), PWID – 90 (10.2), SP – 77 (8.4%)).

Pearson Chi-Square of difference shows a significant difference in the values reported for the KP types with CD4 less than 200 cells/ml ($\chi^2 = 87.675$, $df = 4$, $p < 0.0005$, 95CI). ANOVA also shows a significant difference in the value of CD4 cells below 200 cells/ml among the different KP types ($f = 22.278$, $df = 4$, $p < 0.0005$).

Post-Hoc test shows that while results for FSW and MSM were not significantly different from each other ($p = 0.726$), they were significantly different from PiP ($p < 0.05$), PWID ($p < 0.05$), and Sexual partners of KPs ($p < 0.05$).

Conclusions: A significant level of AHD was reported among KP-PLHIV with PiP and PWIDs having the highest rates. There is a need to re-prioritize HIV resources to deliberately target these groups for prompt identification and treatment of AHD because a high AHD rate will have implications for HIV epidemic control if this results in rising HIV-related deaths.

EPC0326

Recent HIV diagnosis in Thai population at Anonymous Clinic, Thai Red Cross AIDS Research Centre, Bangkok, Thailand

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Background: Recent HIV diagnosis are used to monitor HIV incidence trends for description of epidemiology. The proportions of recent HIV diagnosis are essential data for HIV monitoring and prevention of transmission.

Methods: Positive samples of HIV serology from clients who attended at Anonymous Clinic, Thai Red Cross AIDS Research Centre, Bangkok, Thailand during January 2021 until 30 September 2022 were enrolled in Recent HIV Diagnosis Study. The Asante™ (HIV-1 Rapid Recency Assay) was used for detection of the participants with recent HIV diagnosis. Positive samples by Asante were then confirmed

by HIV-1 RNA viral load testing (HIV-VL). In the samples with more than 1,000 copies/mL of HIV-VL was considered as HIV recency. HIV genotype was performed in those samples with recent HIV diagnosis.

Results: A total of 322 participants were enrolled in this study. Among these, median ages (IQR) was 29 (25-35) years, 77.6% were male, and 74.2 % were men who have sex with men (MSM). Thirty-two participants (9.8%) were interpreted as recent HIV diagnosis by Asante and 28 participants (8.7%) were identified as recent HIV diagnosis. Among participants with recent HIV diagnosis, 85% were male with median ages (IQR) 28 (24-34) years, 64.2% were MSM and median HIV VL was log (IQR) was 5.33 (4.3-6.4) copies/mL. Nine participants with recent HIV diagnosis had mutations associated with reduced susceptibility to antiretroviral agent; 8 Reverse Transcriptase (RT) and one integrase-associated mutation (Figure 1).

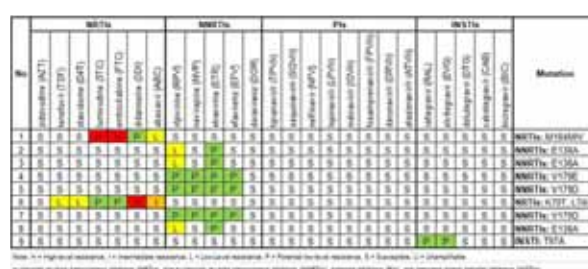


Figure 1. Genotypic ARV Resistance

Conclusions: The incidence of recent HIV diagnosis in this study was 8.7% indicating a high proportion of long-term disease in MSM population. The NNRTI-associated drug resistance mutations were common in recent HIV diagnosis. The strategies to improve early entry to HIV care are warranted in this high-risk population.

EPC0327

The impact of disclosing to patients that HIV resistance test results are used for HIV molecular surveillance

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Background: Fueled in part by the Ending the HIV Epidemic initiative, molecular surveillance (MS) is increasingly used to enhance HIV prevention efforts through cluster detection and response. Standard MS uses antiretroviral resistance testing (ARVRT) data obtained upon HIV treatment initiation.

However, disclosure and consent for MS use is not standard practice, which has sparked community and ethics concerns.

An argument against disclosure is that many people with HIV will refuse ARVRT and/or MS use of these data, undermining clinical care and public health efforts. We tested this argument in a large national survey among US men who have sex with men.

Methods: 2022 American Men's Internet Survey participants were randomized 1:1 to a Disclosure or Non-disclosure vignette. In the former, the doctor discloses MS use of ARVRT data at the time test is performed; in the latter, this is not initially disclosed, but the participant subsequently discovers MS use through a media story. We assessed ARVRT willingness at treatment initiation and after participants learned about MS in the Non-disclosure group.

Results: Among complete surveys collected September-December 2022 (N=1754 Disclosure, N=1827 Non-disclosure), 73.4% of respondents were white non-Hispanic and 67.7% age 40+ years. The majority was willing to have ARVRT: Disclosure 81.8% (n=1426) and initial Non-disclosure, 91.3% (n=1653; prevalence ratio [PR]=0.69; 95% confidence interval [CI]=0.64,0.75). There was a substantial drop in ARVRT willingness in the Non-disclosure group after learning about MS (66.6%; n=1205; PR=0.53; CI=0.50,0.56) resulting in significantly greater overall ARVRT willingness in the Disclosure group (PR=1.58; CI=1.43,1.73). The effect was similar among participants who self-reported HIV positive status: 84.7% [193/228] ARVRT willingness in the Disclosure group and 70.8% [170/240] in the non-Disclosure group after learning about MS (PR=1.60; CI=1.2,2.1).

Conclusions: Our data suggest most people with HIV initiating treatment for HIV would be willing to undergo ARVRT when MS uses are disclosed. Moreover, subsequent discovery of MS uses decreases ARVRT willingness. Efforts should be taken to explore ways of disclosing MS uses of ARVRT at the time it is performed, thereby resolving some of the ethical and community concerns regarding ME without undermining important HIV prevention efforts.


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Self-reported noncommunicable disease prevalence among older people living with HIV in Southern Africa

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Background: The increasing burden of noncommunicable disease (NCD) among older people living with HIV (OPLWH), and impact of long-term antiretroviral therapy is a concern in low-and middle-income countries (LMIC). However, population-level data describing NCDs and management of comorbidities among PLWH in high HIV burden, LMIC is lacking.

The goal of these analyses was to describe the self-reported prevalence of, and current medication use for, NCDs among OPLWH.

Methods: We used data from population-based HIV-focused household surveys in Botswana, Lesotho, Malawi, and Zimbabwe conducted between 2019-2021. Participants were tested for HIV using the national rapid test algorithms and asked if they ever were told by a doctor or health worker that they had: diabetes mellitus, hypertension, heart disease, renal disease, cancer, lung disease, or mental health conditions.

Country sample sizes analyzed ranged from 2,464 to 3,691. Analyses were restricted to those 50 years and older with an HIV+ test result. All estimates were weighted.

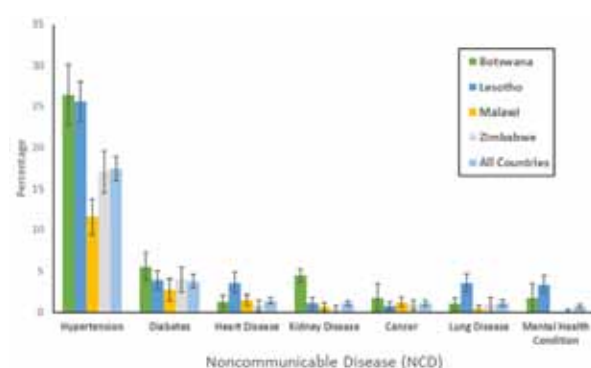


Figure. NCD prevalence by country: HIV+ participants ≥50 years. Population based HIV impact assessments 2019-2021.

Results: The most common NCD reported was hypertension (17.4%), followed by diabetes (3.8%). Overall, OPLWH in Lesotho and Botswana reported higher proportions of hypertension than Malawi and Zimbabwe [Figure]. Of those reporting ever having the condition, 70.6% reported taking medication for hypertension and 64.4% reported taking medication for diabetes across all four countries. More women than men reported currently taking medication for hypertension and diabetes. A low proportion (<2%) of individuals reported heart disease, kidney disease, cancer, lung disease, or mental health conditions.

Conclusions: The self-reported prevalence of hypertension and diabetes among OPLWH was higher than other NCDs, with lower treatment reported among men. The percentages of NCDs are based on self-report and may not represent the true prevalence of NCDs among OPLWH in these countries. Strengthening NCD surveillance as well as improving access and uptake of NCD-related services overall and as part of HIV service delivery is needed for OPLWH.

EPC0329

Development of a novel HIV genome sequencing assay for routine molecular epidemiology in Australia

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Background: Australia is aiming to end transmission of HIV by 2030. To achieve this, the National HIV/AIDS Strategy highlights the importance of high-quality and timely data to inform public health responses. Such data could be obtained through a nationwide molecular epidemiology surveillance system based on routine HIV whole-genome (or other long subgenomic region) sequencing. However, for successful implementation of such a program, a robust, time- and cost-effective method for routine long-region HIV sequencing must be developed and/or verified.

Methods: Primers for a novel tiling HIV PCR were designed to amplify near-full-length genomes in 10 overlapping segments of approximately 1kb. Primers were particularly designed for HIV subtypes B, CRF01_AE and C. Various primer sets were trialled on laboratory-adapted viruses and viraemic plasma samples across a range of viral loads and subtypes to determine if tiling PCR is a feasible strategy for routine HIV sequencing.

Results: All 10 HIV genome segments were successfully amplified in singleplex. Primers for all 10 segments were then trialled in multiplex on viraemic samples (n=9; 6x



B, 2x CRF01_AE, 1x C). After Oxford Nanopore sequencing, >50% of the expected region was recovered, with coverage highly variable between samples. Average read depth >20 was observed in >40% of expected sites, with sequencing failures particularly noted within the envelope region.

An optimised primer set targeting the 5' genome only (*gag-vpu*, 5358bp) resulted in amplification of 100% of the target region (n=8; 5x B, 2x CRF01_AE, 1x C), with average read depth >20 in all segments.

Compared to previously performed diagnostic sequencing, identical major resistance mutations were identified at the consensus level, except for one instance where a mutation was identified in *integrase*, which had not been targeted previously. The time from sample to result was <24 hours, at a cost of <\$100 AUD per sample.

Conclusions: These preliminary data show promising results for the development of a novel tiling PCR method for routine HIV sequencing for the purpose of health care and surveillance.

Future work will compare the assay to other sequencing methods to determine the advantages and disadvantages of each, prior to pilot deployment in public health settings.

EPC0330

Determination of causes of deaths by verbal autopsy methods among people living with HIV in Nigeria

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Background: In Nigeria, there is a dearth of information on the cause of death (COD) records among people living with HIV on ART treatment due to weak civil registration and vital statistics system, and low issuance of medical certificate of deaths. Cause of death information allows specific interventions to be designed to reduce mortality

effectively. A verbal autopsy-based HIV mortality surveillance (MS) system was established to generate computer-assigned COD for PLHIV. This analysis presents the pattern and distribution of COD obtained using verbal autopsy (VA) among PLHIV in facilities implementing MS.

Methods: MS system was introduced in 168 facilities across 18 states in Nigeria from August 2021 to September 2022 targeted at PLHIV on ART who died within six months. The 2016 World Health Organization Verbal Autopsy (VA) instrument was administered to 2,061 eligible and consenting primary caregivers/witnesses who were with the deceased in the period leading to death.

Outputs from the VA instruments were analyzed by SmartVA-Analyze to generate the cause of death based on the International Classification of Diseases Standards (Version 10). Descriptive analysis was conducted of assigned COD, disaggregated by sex, age, and viral suppression status of deceased clients.

Results: A total of 2,061 VA were conducted from August 2021 to September 2022, comprising of 1,091 (53%) female and 970 (47%) males. The median age group was 14-19 years with IQR 1-4 years and 20-24 years. The five most common causes of death (COD) contributing 85% of COD were AIDS (52%), malaria (21%), stroke (5%), road traffic accidents -RTA (4%), ischemic heart disease (3%) Figure 1. Other causes including diabetes, diarrhea, falls, TB etc. contributed 15%. Viral non-suppression was higher among clients who died of AIDS compared to non-AIDS COD.

Conclusions: While AIDS and Malaria constituted the two most common CODs, other diseases contributed to deaths among PLHIV as well. Ascertaining the COD among PLHIVs on ART is critical towards HIV epidemic control and implementing fit-for-purpose interventions to prevent avoidable deaths. To better harness the benefits of MS System, it can be scaled up to increase coverage.

EPC0331

Characterizing HIV-1 recent infection in Nigeria - who and where?

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Background: As Nigeria reaches HIV treatment saturation, achieving HIV epidemic control now depends largely on detecting and interrupting ongoing HIV transmission. Recent HIV infection surveillance in Nigeria uses a preliminary Rapid Test for Recent Infection (RTRI) and a confirmatory viral load test to identify and characterize new HIV infections for rapid response.

This paper presents the pattern and distribution of recent HIV infection in Nigeria.

Methods: De-identified client line list of HIV-1 Recent infections diagnosed between 1st March 2020 to 31st December 2022 in 474 facilities across 238 Local Government Areas (LGAs) in 34 States generated from the National Data Repository (NDR) was cleaned and analyzed for patterns and trends using Microsoft Excel 2019.

Results: A total of 5,661 (F: 3,253; M: 2,408) preliminary Recent infection cases were identified out of which 1,809 (F:1024, M:785) were confirmed Recent infection (with viral load ≥ 1000 copies/ml) between March 2020 and December 2022. 490 (27%) of the Recent infections are from key populations, while 1252 (69%) are from the general population, 67 (4%) are classified as others (No population type).

Young adults (age groups 20 – 24; 318, 25 – 29; 431, 30 – 34; 350, 35 – 39; 217) contributed to the confirmed Recent HIV infection more than other age groups (15 – 19; 118, 40 – 44; 171, 45 – 49; 103, 50+; 101). Lagos (30%; 541/1809), Rivers (14%; 255/1809), Enugu (8%; 148/1809), FCT (8%; 146/1809), Delta (6%; 110/1809), Kaduna (6%; 107/1809) and Benue (5%; 94/1809) are the leading states contributing to the confirmed Recent infection.

Conclusions: This study suggests that there is more data on ongoing HIV transmission in Lagos, Rivers, Enugu, FCT, Delta, Kaduna and Benue and this is driven more by females and young adults. Targeted interventions directed at these locations, age groups, and gender may improve the results of efforts toward epidemic control. Increasing

Recency surveillance coverage by scaling up to all sites offering HIV testing services is recommended as a critical measure in determining if our country is achieving epidemic control.

EPC0332

Quantifying missed TB diagnoses among people living with HIV in PEPFAR-supported countries

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Background: The President's Emergency Plan for AIDS Relief (PEPFAR) supports HIV care and treatment programs in over 50 countries. Although TB accounts for 30% of AIDS-related deaths, TB case detection in PEPFAR-supported countries remains suboptimal. We estimated the number of missed TB diagnoses among people living with HIV (PLWH) in PEPFAR-supported programs.

Methods: We used 2018–2021 TB/HIV data from PEPFAR, WHO, and UNAIDS; analyses were limited to 52 countries where all data sources were available. We calculated total missed diagnoses as the difference between WHO-estimated and notified TB/HIV cases. We then estimated PEPFAR's ART program coverage by dividing the number of PLWH receiving ART through PEPFAR-supported programs by the total number receiving ART according to UNAIDS. PEPFAR coverage was censored at 100%. We multiplied country-specific PEPFAR coverage proportions by the number of missed TB diagnoses and summed across countries to estimate missed diagnoses within PEPFAR-supported programs.

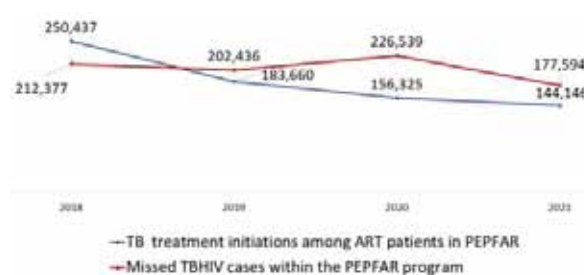


Figure 1. Estimated number of PLWH initiated on TB treatment and missed TB diagnoses among PLWH in PEPFAR-supported countries over time.

Results: In 2021, WHO estimated 605,696 incident TB/HIV cases across countries included in this analysis; 279,326 (46%) were undetected or unreported. PEPFAR-supported programs accounted for a median 71% of PLWH on ART nationally (range: <1–100%). By applying PEPFAR ART program coverage proportions, we estimate that 177,594 TB diagnoses were missed by PEPFAR-supported programs.



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Missed TB diagnoses have exceeded the number detected and treated in PEPFAR-supported programs for all years except 2018, spiking in 2020 but decreasing overall since 2018. (Figure 1).

Conclusions: Missed TB diagnoses among PLWH drive mortality and undermine TB prevention and care efforts. Adoption of more sensitive TB screening and diagnostics tools such as chest x-ray and molecular testing may improve TB diagnosis and reduce TB-related illnesses and deaths. This analysis provides useful reference points to inform TB detection target-setting as PEPFAR works to address these gaps and better integrate TB and HIV programs.

EPC0333

HIV prevalence among key populations in Nigeria: a 4-year trend analysis

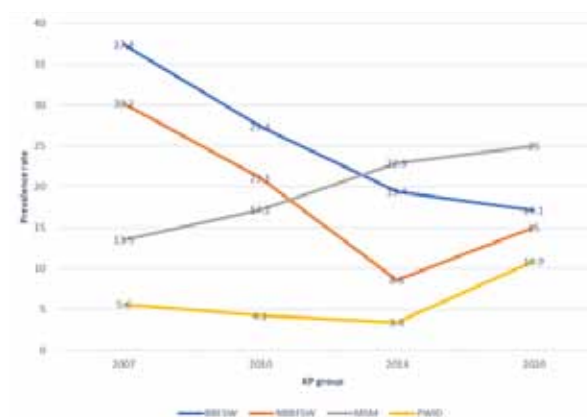
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Background: Nigeria has a mixed HIV epidemic. Monitoring the HIV epidemic and assessing the impact of HIV prevention interventions is very critical to achieving the goal of ending AIDS by 2030. With the HIV prevalence among the general population showing a decline from 3.4% in 2012 to 1.4% in 2018, there has been little evidence of the impact of these prevention interventions among the key populations (KPs) over the years.

Methods: We conducted a 4-year descriptive analysis of the trend in HIV Prevalence among key populations in Nigeria based on the data generated from four rounds of integrated biological and behavioral surveillance surveys (2007, 2010, 2014 and 2020) in the country. The study populations were female sex workers (FSW) including brothel-based female sex workers (BBFSW) and non-brothel-based female sex workers (NBBFSW), men who have sex with men (MSM) and people who inject drugs (PWID). A comparative analysis of the trend in HIV prevalence between 2007 and 2020 was done using excel.



Results: HIV prevalence among BBFSW showed a steady decline over the years from 37.4% in 2007 to 17.1% in 2020 while for NBBFSW, there was a decline from 2007 to 2014,

then a sharp increase from the 8.6% in 2014 to the 15% observed in 2020. PWID group had a marginal decline from 2007 till 2014 and then a significant increase (3.4% to 10.9%) from 2014 to 2020. The prevalence among the MSM group continuously increased from 13.5% in 2007 to 25% in 2020.

Conclusions: The HIV prevalence among MSM, PWID and NBBFSW is on the upward trend, while BBFSW showed a downward trend of prevalence. Determining factors associated with these findings is very critical to providing further evidence needed to make better HIV policies and design more effective programmatic interventions aimed at lowering the prevalence of HIV among KPs in the country.

EPC0334

Recent HIV outbreaks in Japan originated from late presenters: Implementation of molecular transmission network analysis

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Background: In Japan, approximately 30% of people living with HIV (PLHIV) remain undiagnosed. Such a late presenter may be a source of new acquisition in a local vulnerable population. We developed a search program for HIV nationwide clusters by sequence (SPHNCS), which can identify domestically transmitted clusters (dTCs) and warn of outbreaks by analyzing their network structures. Using SPHNCS, we investigated the warning cases of the outbreak during the COVID-19 pandemic in Japan.

Methods: We recruited 11,337 newly diagnosed cases of HIV-1 subtype B and CRF01_AE between 2003 and 2022 collected by the Japanese HIV Drug Resistance Surveillance Network and identified their dTCs affiliation using SPHNCS. We then extracted regional clusters flagged for outbreak occurrence by SPHNCS during 2020-2022 and analyzed their network structures and time trees using the SNA package in R and BEAST1, respectively.

Finally, we examined the relationship between network indices, CD4⁺ T-cell counts, viral loads, and number of acute cases in detected clusters.

Results: We found seven outbreak clusters with rapid growth of reported cases in a local population, confirmed by the chronological tree. Of these, two were independent dTCs that expanded rapidly in a locality only a few years after their identification.

These dTCs had a very dense network (density: 0.791-0.985), which dominated the acute cases compared to the outliers (OR=2.0, p=0.033 and OR=12.8, p<0.001). Others were subclusters of known widespread dTCs and tended


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to contain more acute cases (OR=3.8, $p=0.002$). Network graphs and chronological trees showed that these outbreaks were connected to a few members outside the outbreak with a long branch from their common ancestor.

Conclusions: Using SPHNCS, we identified two rapidly emerging dTCs and five local outbreak subclusters during the COVID-19 pandemic in Japan. Although we were unable to determine the origin of the former cases, the later cases were likely derived from late presenters in known HIV-1 lineages prevalent in Japan.

This suggests that detection of late presenters in a known population is important to prevent future increases in PL-HIV. Monitoring the dynamics of the transmission network can be used to identify a population in which outbreaks may occur.

EPC0335

Comparison of the accuracy of Bayesian spatiotemporal models using adjacency matrix and mobility matrix in predicting HIV epidemic trends: a simulation study

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Background: There is significant regional heterogeneity and correlation in the HIV epidemic. The Bayesian spatiotemporal model can provide more accurate estimation and prediction of HIV epidemic trend by combining the association between regions.

In previous studies, the adjacency matrix based on the geographical location was used in Bayesian spatiotemporal model (BA model). Population mobility is an important factor affecting the transmission and spread of HIV. Therefore, this study proposed a new Bayesian spatiotemporal model using mobility matrix based on the inter-regional population flow (BM model) to improve the model accuracy.

Methods: Based on the transmission mechanism of HIV, this study constructed a cross-regional agent-based model of HIV to simulate spatiotemporal data, and then used the simulated data to compare the accuracy of BM model with BA model. There were three types of spatial scale, including 20, 50 and 100 area units respectively. For each type, 10 sets of data were simulated, each with a length of 20 years. The data in the 1st, 10th and 20th years were used for estimation accuracy evaluation.

The data of the first 10 years was used for training, and the data of the last 10 years was used for prediction accuracy evaluation. DIC and RMSE were used as indicators for estimation/prediction evaluation respectively. The re-

sults were further demonstrated by using the real-world data—the HIV prevalence data in Sichuan-Chongqing regions of China from 2010 to 2019.

Results: The DIC values of the BM model were significantly lower than those of the BA model at the three spatial scales and the three time points. The RMSE values of the BM model at the three spatial scales were 69.89, 50.04 and 22.70 respectively, which were significantly lower than the RMSE of the BA model (92.80, 65.47 and 25.78 at the three spatial scales respectively). The models based on data from the Sichuan-Chongqing regions also showed the similar results.

Conclusions: Compared with the geographical location of space, the population mobility between regions can more accurately reflect the connection between regions. Therefore, the Bayesian spatiotemporal model based on mobility matrix can provide more accurate estimation and prediction in the HIV epidemic studies.

EPC0336

Progress towards the 95-95-95 UNAIDS targets – Zambia, 2016 to 2021

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Background: Zambia, which is experiencing a generalized HIV epidemic, adopted the UNAIDS 95/95/95 targets to diagnose 95% of all people living with HIV (PLHIV), treat with antiretroviral therapy (ART) 95% of diagnosed PLHIV, and virally suppress (i.e., HIV RNA <1,000 copies/ml) 95% of treated PLHIV by 2025. The Zambia Population-Based HIV Impact Assessment (ZAMPHIA) was conducted in 2021 and 2016 to measure progress toward these goals.

Methods: ZAMPHIA 2021 was a nationally representative cross-sectional survey of persons aged ≥15 years conducted in Zambia from May to December 2021. We estimated the UNAIDS 95/95/95 targets for Zambia. Zambia implemented a test and treat policy for HIV in 2016, so we compared 2021 results with ZAMPHIA 2016, restricting to the overlapping ages between surveys (i.e., 15-59 years). Findings were for those who participated in whole blood collection. All analyses were weighted and accounted for survey design.

Results: Out of 22,262 persons aged ≥15 years enrolled in the survey, 18,804 (84.5%) provided a blood specimen. In 2021, 88.7% PLHIV aged ≥15 years were aware of their HIV positive status, 98.0% of those were on ART, and 96.3% of those on ART were virally suppressed.



Compared to 2016, there was substantial progress toward the 95/95/95 targets for PLHIV aged 15-59 years in 2021 (Table). Younger PLHIV (i.e., 15-24 and 25-34 age groups) had lower HIV status awareness than older PLHIV. Additionally, there was notable variation in achievement identifying PLHIV (first 95) by province.

Category	ZAMBIA 2016			ZAMBIA 2021		
	1ST 95 (CI)	2ND 95 (CI)	3RD 95 (CI)	1ST 95 (CI)	2ND 95 (CI)	3RD 95 (CI)
Age						
15-24	46.5 (40.5-52.5)	43.3 (37.6-48.9)	73.8 (60.2-87.4)	72.8 (65.4-80.2)	68.4 (60.3-76.5)	83.0 (77.0-89.0)
25-34	65.4 (59.7-71.1)	79.8 (74.9-84.7)	86.1 (80.4-91.7)	83.4 (79.0-87.7)	87.2 (83.2-91.2)	94.9 (91.7-98.1)
35-49	79.4 (76.5-82.3)	86.4 (83.7-89.1)	88.9 (87.5-90.3)	92.7 (91.1-94.3)	94.9 (93.7-96.1)	96.0 (94.4-97.6)
50-59	81.9 (77.9-85.9)	84.7 (81.1-88.3)	86.7 (83.0-90.3)	91.1 (88.3-93.9)	94.5 (92.7-96.3)	96.0 (94.7-97.3)
Sex						
Female	73.0 (70.3-75.7)	86.5 (84.1-88.9)	90.2 (88.0-92.3)	88.0 (87.3-88.7)	94.8 (94.0-95.6)	96.0 (95.0-97.0)
Male	68.2 (65.3-71.0)	86.2 (84.5-87.9)	87.7 (84.5-90.9)	90.1 (87.0-93.2)	93.7 (92.3-95.1)	97.2 (96.0-98.4)
Province						
Central	71.7 (65.7-77.7)	88.9 (87.0-90.8)	86.1 (81.0-91.2)	84.8 (80.0-89.6)	87.7 (86.0-89.5)	98.1 (96.5-99.7)
Copperbelt	72.0 (67.7-76.3)	86.4 (82.1-90.7)	86.7 (82.4-91.0)	81.7 (80.0-83.4)	87.1 (85.0-89.2)	96.1 (94.1-98.1)
Eastern	81.3 (77.9-84.7)	86.8 (83.1-90.5)	86.7 (84.0-89.5)	87.7 (85.0-90.4)	90.7 (89.0-92.4)	96.0 (94.7-97.3)
Lusaka	86.7 (83.7-89.7)	86.1 (83.7-88.5)	87.7 (85.7-89.7)	79.9 (77.9-81.9)	88.0 (86.7-89.3)	93.0 (91.7-94.3)
Lusaka	74.7 (71.9-77.5)	86.2 (84.5-87.9)	86.2 (84.7-87.7)	86.7 (83.5-89.9)	86.2 (84.0-88.4)	96.7 (95.0-98.4)
Northwestern	87.0 (87.0-87.0)	81.0 (80.0-82.0)	86.2 (86.2-86.2)	76.0 (76.0-76.0)	86.0 (86.0-86.0)	93.1 (93.1-93.1)
Northwestern	88.3 (85.7-90.9)	71.0 (68.0-74.0)	87.0 (87.0-87.0)	81.0 (80.0-82.0)	87.7 (87.7-87.7)	93.0 (93.0-93.0)
Northwestern	64.5 (62.0-67.0)	86.8 (85.2-88.4)	85.1 (83.0-87.2)	79.1 (87.0-91.2)	86.0 (87.0-88.0)	96.0 (95.0-97.0)
Southern	74.0 (68.7-79.3)	87.0 (86.0-88.0)	85.0 (84.0-86.0)	80.0 (87.7-90.0)	86.7 (86.0-87.4)	96.0 (95.0-97.0)
Western	88.1 (84.0-92.2)	86.7 (87.7-87.7)	86.0 (85.0-87.0)	82.0 (87.7-90.0)	87.7 (86.0-89.4)	95.4 (93.0-97.8)
Zambia	71.4 (68.0-74.8)	87.1 (85.5-88.6)	88.2 (87.3-89.1)	86.4 (84.8-88.0)	90.0 (89.0-91.0)	96.2 (94.8-97.6)

Conclusions: Zambia achieved the 2nd and 3rd 95 targets after implementing a test and treat strategy. Despite notable progress in finding younger PLHIV since 2016, Zambia needs to enhance case finding in this group to reach UNAIDS targets.

Additionally, best practices for case finding and treatment initiation and maintenance from better performing areas can be adapted in lower performing areas.

EPC0337

Retrospective cohort study of factors associated with non-initiation of antiretroviral therapy among adults newly diagnosed with HIV in Andijan, Uzbekistan, 2018-2021

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Background: Immediate uptake of antiretroviral therapy (ART) by people newly diagnosed with HIV reduces morbidity and viral transmission, and it is critical to meeting global goals of ending the HIV epidemic. Since 2018, all people in Uzbekistan newly diagnosed with HIV are immediately offered ARVs. Nonetheless, just over half of people living with HIV in Uzbekistan are estimated to be

on ART. To reach the global goal of 95% of people on ART, we needed to understand factors associated with non-initiation.

Methods: We conducted a retrospective cohort study using secondary data analysis from the Andijan Province Republican AIDS Center. Our study included all people 18 years of age and older registered as newly diagnosed with HIV in the province between January 1, 2018, and June 31, 2021. We analyzed sociodemographic and behavioral factors associated with non-initiation of ART, defined as not having initiated ART by December 31, 2021. Using multivariable analysis, we calculated risk ratios (RR) and 95% confidence intervals (CI).

Results: From 2018 to 2021 in Andijan Province, 1,098 people were newly diagnosed with HIV, of which 113 (10.3%) did not initiate ART. Participants were mostly 30-49 years old (49%), male (56%), married (46%), and with secondary education (74%). Also, 39% and 31% had HIV clinical stage I and II, respectively.

Risk for non-initiation was higher among people with secondary education (RR=8.6 [CI: 1.2-60.9]) compared to higher education, with multiple partners (RR=2.7 [1.5-5.0]), with disease stage I (RR=3.3 [2.0-5.2]) and stage II (RR=4.4 [2.8-7.0]).

People with sexual partners living with HIV had higher risk of non-initiation (RR=1.8 [1.2-2.9]) than people with partners that did not have HIV. Being single was associated with reduced risk of non-initiation (RR=0.1 [0.03-0.3]).

Conclusions: About one in ten people newly diagnosed with HIV in Andijan Province have not initiated ART. Our study identifies groups of people that could be prioritized for increased ART initiation support, especially people with multiple partners and with partners living with HIV. There is need to further understand whether increased risk of non-initiation among people with disease stage I or II is client or provider driven.

EPC0338

Validation of a HIV risk differentiation tool for prioritizing prevention services in east Zimbabwe

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Background: Differentiating individuals at elevated risk for HIV infection may assist in guiding referrals for those who may benefit from HIV prevention. We conducted a longitudinal study to validate a risk-differentiation tool for predicting future HIV or HSV-2 incidence among HIV-negative young people in east Zimbabwe.


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Methods: HIV and HSV-2 status, and self-reported behavioural risk factors for HIV were measured at baseline and 12-month follow up among young women (15-24yrs) and men (15-29yrs) in a household survey across eight sites in Manicaland, east Zimbabwe. Associations between risk-behaviours and combined HIV/HSV-2 incidence were measured using Cox proportional hazards models. Sensitivity and specificity of risk-differentiation questions at detecting HIV/HSV-2 risk were calculated.

Results: 44 HIV/HSV-2 seroconversions were observed in 1812 person-years of follow-up (incidence rate: 2.43/100PY, 95% CI: 1.71-3.15). Half (22/44) of incident cases reported no sexual debut at baseline. Eleven behavioural risk questions gave a sensitivity of 38.6% (17/44) among all participants and 77.3% (17/22) among participants who had started sex at baseline.

Risk of HIV/HSV-2 acquisition was higher for those reporting non-regular partners (women: HR=2.71, 95% CI: 1.12-6.54; men: HR=1.37, 95% CI: 0.29-6.38) and for women with a regular partner reporting a recent STI (HR=7.62, 95% CI: 1.22-47.51). 34.3% of participants changed risk category over the 12-month study period; 21.5% increased (following sexual debut), 12.8% decreased (Figure 1).

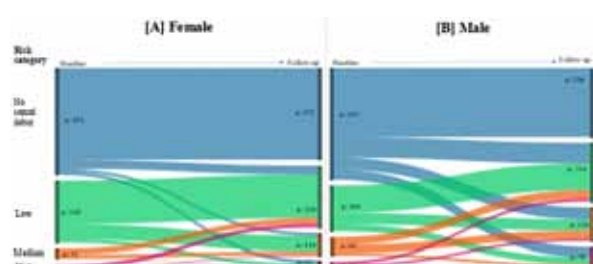


Figure 1.

Conclusions: Half of incident infections in a 12-month period occurred among people who reported they had never had sex and were missed by risk-differentiation at baseline. The final HIV risk-differentiation tool, including a question on non-regular partners, identified a high proportion of young people who had ever had sex at risk of HIV acquisition.

Rapid changes in risk-behaviour highlight the importance of regular risk screening and testing in populations with high HIV prevalence or incidence, and provision of HIV prevention to all requesting it.

EPC0339

Causes of mortality among people living with HIV: preliminary results from a cross-sectional study at 29 health facilities in Uganda

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Background: AIDS-related deaths in Uganda declined rapidly between 2010 and 2020 following the rapid scale-up of antiretroviral therapy (ART) but the rate of decline has slowed over time, with no change in the estimated deaths between 2019 and 2020. Globally, tuberculosis (TB) is the leading cause of death among people living with HIV (PLHIV).

To gain a better understanding of causes of death among PLHIV in Uganda, we conducted an assessment to investigate factors associated with mortality.

Methods: We purposefully selected 29 facilities from 13 regions to include regional referral hospitals and those with the highest number of deaths reported in DHIS2. We included PLHIV who had at least one documented clinic visit in 2021. Electronic medical records were used to identify deceased or lost clients. Healthcare workers called lost clients to determine if they were in care elsewhere or had since passed.

Chart reviews were then conducted on all known deceased clients, extracting information including cause of death. Quantitative data derived from the data collection tools were exported from SurveyCTO and analyzed using MSExcel and StataSE 15.

Results: In total, 899 health records were extracted, of which 846 were confirmed to be deceased and positive for HIV. Median age was 45, 52% were male, and mean weight was 55kgs. 619 had recorded CD4 tests, of which 41% were less than 200 copies/mL and 22% were above 500 copies/mL. 86% received cotrimoxazole at some point and 57% of eligible clients received TB preventive therapy (TPT). 32% had a cause of death recorded according to survey prepopulated categories; 35% listed 'other' cause and 33% 'unknown'.

Among the selected causes, TB had the highest proportion (42%), followed by cancer (17%), non-communicable diseases (11%), and cryptococcal meningitis (8%).

Conclusions: As it is globally, TB continues to be a leading cause of death amongst PLHIV in Uganda and increasing efforts to provide TPT may help to reduce this burden. Further investigation of the high proportion of 'other' and 'unknown' causes of death will additionally clarify drivers of mortality. Routinizing mortality audits could inform and improve evidence-based programming to further reduce AIDS-related deaths.

**EPC0340****Magnitude and profile of HIV retesting in non-treatment naïve clients in Rwanda**

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Background: Repeat HIV testing among people previously diagnosed and on antiretroviral treatment (ART) is a challenge for national HIV programs to identify new HIV infections, monitor progress to treatment targets, and improve case finding among the unaware.

We assessed viral load suppression (VLS) in a cohort of people living with HIV presenting at HIV testing services to characterize retesting in Rwanda.

Methods: We conducted a prospective cohort study of people receiving a HIV positive test result at 60 health facilities (HF) selected using probabilistic sampling from August 2021–October 2022. All participants who self-reported naïve to ART and no prior HIV diagnosis underwent a rapid test for recent infection (RTRI) and a baseline viral load (VL) regardless of RTRI result. We defined retesters as those with VLS (VL<1000 copies/mL) at baseline while those with unsuppressed VL (VL≥1000 copies/mL) were classified as a newly diagnosed case.

We used descriptive statistics and Fisher's exact tests to assess differences in sociodemographic and behavioral characteristics between retesters and newly diagnosed cases.

Results: Among the 1577 participants included in the study, 339 (21.4%) had VLS and were classified as retesters while 1238 (78.6%) were classified as newly diagnosed with unsuppressed VL. More than half of retesters were <35 years (61.9%), single or cohabiting (66.7%), and had 1 sexual partner in the past 3 months (63.4%). Compared to newly diagnosed cases, retesters were more likely to be female (72.3% vs. 63%, p=0.005), a female sex worker (14.2% vs. 9.2%, p=0.02), or reporting ≥2 sexual partners in the past 12 months (48.7% vs. 39.0%, p = 0.004).

Conclusions: One in five study participants had VLS suggesting that retesting in non-treatment naïve HIV clients is common in Rwanda.

There is a need to strengthen counseling by healthcare providers, including treatment literacy messaging, to minimize retesting among clients already on ART, and to develop a national case registry accessible by HF to identify patients who have a previous diagnosis to facilitate re-engagement in HIV care.

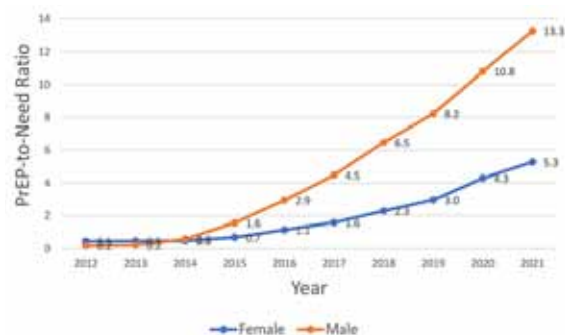
HIV testing programs would benefit from further research to understand reasons for retesting and inform clinical and counseling approaches.

EPC0341**PrEP Equity by sex and age, United States, 2012-2021**

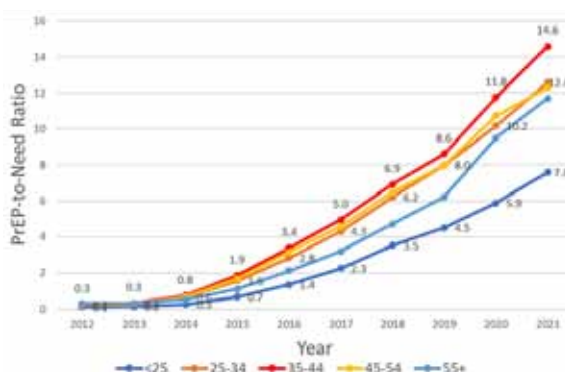
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Background: Reach of PrEP programs can be measured by enumerating PrEP users, but equity-based metrics like the PrEP-to-Need Ratio (PnR) and PrEP Equity Ratio (PER) are needed to assess PrEP equity or inequity.

Methods: Data on US PrEP prescriptions and PnRs by sex and age were reported from 2012-2021. PnRs were calculated as ratios of annual PrEP users [indicator of use] to new HIV diagnoses in the same year [indicator of epidemic need]. PERs were calculated by dividing the PnR of the health equity group (e.g. women, young people) by the PnR of the referent group (e.g. men or 35-44 year olds); PERs <1.0 indicate inequitable PrEP use.



Panel A. PrEP-to-Need Ratio by year and sex, United States 2012-2021.



Panel B. PrEP-to-Need Ratio by year and age group, United States 2012-2021.

Results: PrEP use and PnR increased for all sex (Panel A) and age (Panel B) groups from 2012-2021. Yet from 2015-2021, women were served by PrEP relative to their epidemic need at a level 56%-65% lower than their male counterparts (PERs [not shown in Figure]: 0.35-0.44).


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There were also inequities in PrEP use by age from 2014-2021: those aged 13-24 years were served by PrEP relative to their epidemic need at a level 48-64% lower than their counterparts aged 35-44 years (PERs: 0.36-0.52). Those aged ≥ 55 years were served by PrEP relative to their epidemic need at a level 19-40% lower than their counterparts aged 35-44 years (PERs: 0.60-0.81).

Conclusions: Despite overall increases in PrEP use since 2012, women and the youngest and oldest age cohorts have been consistently underserved by PrEP relative to their epidemic needs. To increase PrEP equity, additional efforts are needed to decrease barriers to accessing PrEP and increase the identification and prescription of PrEP to eligible women and people <25 and 55+ years of age.

EPC0342

Power analysis of PEPFAR's recency surveillance strategy: practical limitations of hotspot identification

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Background: Since 2019, PEPFAR introduced routine recency testing to identify hotspots of new and on-going HIV transmissions geographically, by age cohort, and among key population groups. Four years into programmatic implementation, coverage remains limited in many countries and questions have been raised about the utility and practicality of the program.

Methods: We conducted a power analysis to determine minimum sample sizes required to reliably identify differences in geographic or population-based sub-samples from a baseline recency rate. We follow a standard power analysis in four stages to identify sample sizes required to detect recency rate increases of 25% to 200% of baseline at a power level of 90% and varying p-values of .05-.2. Stage 1 is an unadjusted power analysis. Stage 2 adjusts for RITA reclassification rates of recency assays. Stages 3 and 4 adjust for recency assay sensitivity and RITA specificity using Rogan Gladen estimator methodology.

Results: Baseline recency and reclassification rates were set at 7.28% and 41% respectively based on data from Eswatini. RTRI sensitivity was assessed at 50% and RITA specificity at 95%. Sample sizes required are the number of individuals testing HIV positive in the sub-population being assessed in a given period. Results for final stage 4 analysis are shown in table 1.

Stage 4 – Reclassification = 41%; Sensitivity = 50% Specificity = 95%		25%	50%	75%	100%	125%	150%	175%	200%
p. value	.05	14,999	4,625	2,056	1,157	740	514	378	290
	.10	15,077	3,770	1,676	943	604	419	308	236
	.15	13,036	3,259	1,449	815	522	363	267	204
	.20	11,566	2,892	1,286	723	463	322	237	181

Table 1: Sub-Population/Geographic Sample Sizes Required of New HIV Diagnoses to Detect Recency Rate Increases (adjusted)

Conclusions: Based on current recency biomarkers and assays, the sample sizes required to reliably detect hotspots of new HIV transmissions at small geographic or subpopulation levels requires high numbers of people testing positive.

In FY2022 PEPFAR data, the median district level geographic region diagnosed only 436 new individuals all year and 108 per quarter - far below the sample sizes required to consistently identify even moderate hotspots at the district level, let alone at a smaller geographic level or facility level. PEPFAR should reassess this strategy given practical limitations of existing recency assays.

EPC0343

A force to reckon with: loss to follow up of children and adolescents in HIV care in Uganda, 2017 - 2021

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Background: Lack of robust estimates of children and adolescents living with HIV (CALHIV) at any given period limits progress in epidemic control and forecasting demand for HIV commodities. We investigated the contribution of aging out, loss from care and death on the number of children and adolescents in care to inform robust HIV programming projections.

Methods: We conducted a quantitative study and reviewed secondary data from electronic medical records (EMR) in selected high-volume health facilities across the country. We included all CALHIV who were active in care during each of the years from 2017 to 2021 and we collected data on: age, gender, date of enrolment in care and the status in care as of August 2022. This data was collected in excel and analysed using STATA.

Results: The study found that the number of CALHIV ranged from 39,227 in 2017 to 49,835 in 2021, with more females than males (1.3:1, P=0.001). During 2017-2020, there was an average annual increase of 2% (P=0.001) of CALHIV. Each year, an average of 16,073 CALHIV left care, most due to loss to follow up (56%) with the least contributor being death (5%).

The proportion of CALHIV leaving care due to loss to follow up or transfer out decreased by 1% during 2017 - 2021 (P>0.05) and the average mortality was at 2% each year. On average, 7% of adolescents aged out each year.

The median survival time for CALHIV in care during the study period was 4 years and was similar for males and females (P=0.170). Children aged 6 - 9 years and adolescents 10-14 years had longer median survival time in care compared to CALHIV of other age bands (P=0.05).

Conclusions: More than half of the reduction of numbers of CALHIV in care was attributed to losses to follow up from care. Furthermore, the decrease in the proportion of



losses during each year was paltry. This is despite the efforts and investments in place to mitigate losses to follow up in this sub-population group.

This study highlights the urgent need for review of current measures to curb loss to follow up of CALHIV in Uganda.

EPC0344

Assessing 95-95-95 progress in cities across four regions

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Background: In 2020, UNAIDS updated global HIV treatment targets from 90-90-90 to 95-95-95 to be attained by 2025. Cities often share a large proportion of the HIV burden and can have a significant impact on achieving these goals.

This analysis is the first to uncover gaps in regional urban responses towards the 95-95-95 targets.

Methods: A systematic review of three publicly available databases for city-level 95-95-95 data was conducted including: IAPAC Fast-Track City database (multiple sources reported by health authorities), UNAIDS NAOMI Spectrum, and the US AHEAD dashboard. Cities were organized by region, with regions <20 cities excluded from the analysis, resulting in data from 235 cities across Eastern and Southern Africa (ESA); Western and Central Africa (WCA); Western and Central Europe (WCE); and North America (NA). This abstract describes progress against the initial 90-90-90 and current 95-95-95 targets among Fast-Track Cities in these regions.

Results: 53% of the cities in ESA, 13.3% of the cities in WCA, 90% of the cities in WCE, and 45.8% of cities in NA have attained one or more of the 90-90-90 targets. However, only 15% of the cities in ESA, 1.2% of the cities in WCA, 73% of cities in WCE and 20.8% of cities in NA have attained one or more of the 95-95-95 targets.

Region	1st 90	2nd 90	3rd 90	1st 95	2nd 95	3rd 95
Eastern & Southern Africa (n=98)	51% (n=98)	19.4% (n=98)	40% (n=10)	12.2% (n=98)	5.1% (n=98)	10% (n=10)
West & Central Africa (n=83)	10.8% (n=83)	7.2% (n=83)	25% (n=4)	0% (n=83)	0% (n=83)	25% (n=4)
West & Central Europe (n=30)	77.8% (n=27)	90% (n=20)	95% (n=20)	40.1% (n=20)	60% (n=27)	65% (n=20)
North America (n=24)	15% (n=20)	10% (n=20)	47.4% (n=19)	10% (n=20)	5% (n=20)	10.5% (n=19)

Table 1: Proportion of Cities that Have Reached or Surpassed 90-90-90 and 95-95-95 Targets by Region

Conclusions: There is a vast difference in progress towards 95-95-95 that can inform regional urban responses. Cities in WCE have largely attained the 2020 90-90-90 targets indicating a necessary focus on closing gaps to 95-95-95 by 2025. Cities in WCA and NA could benefit from focus on interventions supporting the diagnosis and treatment targets. Cities in ESA are falling behind on the treatment target. Unavailability of 3rd 95 data in ESA and WCA makes it difficult to assess viral suppression progress in these regions.

EPC0345

Measuring HIV and hepatitis C incidence during the COVID-19 pandemic in a cohort of people who inject drugs

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Background: The HEPCO study is an open cohort of people who inject drugs in Montreal, Canada. HIV and hepatitis C virus (HCV) incidence is measured through three-month follow-up visits. Study visits were halted March-November 2020 due to the COVID-19 pandemic, and have been slow to recover through 2021-22, leading to longer follow-up times between study visits.

We aimed to estimate trends in HIV and HCV incidence, 2011-2022, while seeking to minimise bias due to extended follow-up times from 2020 onwards.

Methods: Participants have injected drugs in the past six months and provide blood samples for HIV and HCV (primary and reinfection) testing. In previous incidence analyses, cases have been assigned to the year of study visit. To avoid upwardly-biasing estimates by attributing all cases detected in 2022 to that year, we instead calculated a single incidence estimate for the period April 2020-September 2022 ("pandemic period"). Cases and person-years (PY) of observation for the first three months of 2020 were added to the 2019 estimate.

We examined the characteristics of participants before and during the pandemic period to assess if there have been changes in the cohort profile that may influence incidence estimates.

Results: HIV incidence was persistently low (0.24 per 100 PY, 95% CI 0.11-0.45). One participant tested positive for HIV between 2015 and 2019; two participants tested positive during the pandemic period. HCV incidence was declining (2011: 6.58 per 100 PY; 2018: 2.98 per 100 PY), but results for 2019 and the pandemic period suggest that this may have plateaued (2019: 3.98 per 100 PY; pandemic period 2.18 per 100 PY). The cohort profile during the pandemic was slightly older, with less cocaine injecting and more opioid injecting, but similar number of days injecting, compared to before the pandemic.



Conclusions: The COVID-19 pandemic has created challenges for measuring HIV incidence in cohort studies. We identified signals suggesting changes in HIV and HCV incidence that require ongoing assessment. The cohort profile may have shifted due to loss to follow-up that occurred during the pandemic period. New follow-up data from late 2022 onwards will support clearer interpretation of incidence trends.

EPC0346

Interest in and acceptability of dried blood spot (DBS) sampling in a bio-behavioural surveillance study among men who have sex with men in Aotearoa New Zealand

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Background: Governments require contemporary estimates of undiagnosed infection to guide elimination efforts. New Zealand's (NZ) only community estimate of undiagnosed HIV among men who have sex with men (MSM) was in 2011, prior to the combination prevention era, using in-person oral fluid specimens.

We aimed for a repeat measure using dried blood spot (DBS) collection, a novel method not trialled in NZ, and assess acceptability across key subgroups.

Methods: We conducted a national cross-sectional bio-behavioural surveillance study in 2022 (SPOTS: Sex and Prevention Of Transmission Study). COVID-19 restrictions forced us to pivot fully online. Participants completed a purposive online questionnaire about sexual behaviours and blood donation. Participants were then invited to receive a self-completed DBS kit by courier. Completed specimens were mailed freepost to the laboratory for analysis of HIV, syphilis and hepatitis C.

We assess interest in DBS and whether this varied by ethnicity, gender identity, number of partners and HIV status using odds ratios (OR) and 95% confidence intervals (CI).

Results: Overall 3,838 were eligible and 77% started the DBS section in the survey; being similar for participants of European (78%) and indigenous Māori (78%) ethnicity, lower among Middle Eastern, Latin American or African participants (66%, $p=0.001$) and those who had never tested for HIV (77%, $p<0.001$).

Of participants starting the DBS section ($n=2,907$), 62% ($n=1,815$) were interested in information about DBS. Of these, 92% ($n=1,495$) consented to being sent a DBS kit; being lower among participants who had never tested for HIV (OR 0.52, CI 0.41-0.65) and those living with diagnosed

HIV (OR 0.51, CI 0.36-0.73). There were no significant differences in DBS acceptability by ethnicity (including for Māori MSM), partner numbers or gender identity. Ultimately, 722 specimens were returned to the laboratory, 48% of participants who were sent kits.

Conclusions: SPOTS is the largest NZ HIV bio-behavioural study to date. Mail-out, self-completed DBS can be acceptable to MSM surveyed using this surveillance approach. DBS acceptability is similar among ethnic minorities, MSM with multiple partners and gender minorities, potentially reflecting investment in study consultation, processes and promotion. Widespread acceptability should reduce bias in study estimates.

EPC0347

Vertical transmission dynamics by age group – exploratory research findings from 9 Health Facilities in Mozambique

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Background: UNAIDS estimates that Adolescent Girls and Young Women (AGYW) aged 15 to 24 years accounted for a quarter of new HIV infections in sub-Saharan Africa in 2020. However, little is known on the contribution of AGYW to Vertical Transmission (VT) in Mozambique estimated at 13% in 2020. Routine data in the Prevention of Mother-to-Child Transmission (PMTCT) cascade is not reported by age group in the Mozambique's Health Information System (SIS-MA).

This exploratory analysis was commissioned by Ministry of Health, UNICEF, UNAIDS and WHO to explore age group specific Vertical Transmission dynamics in Mozambique.

Methods: A non-probability cohort sample of 396 children exposed to HIV, born between 21 June 2019 and 20 September 2019, with at least a single consultation registered in the Consultation of Children at Risk (CCAR) register book was collected across 9 Health Facilities (HFs) and the 18-month follow-up final HIV outcome status documented.

The 9 Health Facilities (HFs) were distributed regionally across 3 provinces: Inhambane, Zambézia, and Nampula. Ante-natal Care (ANC) follow-up records and HIV patient files of mothers of children exposed to HIV were linked to the CCR records using the mother's Antiretroviral Treatment Identity Number (ART ID).

Results: Although the numbers were small, children born to AGYW 15 to 24 years living with HIV had a risk of vertical transmission 1.6 times higher when compared to children of the same birth cohort born to adult mothers aged 25 years and older, based on the 18-month follow-up final HIV status (6.7% vs 4.2%). Mother-to-child transmission of HIV occurred mainly during pregnancy or at labor



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and delivery evidenced by a positive PCR test result at <2 months of age in 60% of the 20 children with an HIV-positive final outcome status at 18 months (66.7% among HIV+ children born to AGYW vs. 54.5% among HIV+ children born to adult women). ANC records show that AGYW are less likely to know their HIV status at 1st ANC compared to adult mothers.

Conclusions: Results of the exploratory research highlight the need to prioritize and focus HIV preventative efforts to AGYW before they become pregnant in order to reduce mother-to-child transmission among AGYW

Modelling the HIV epidemic

EPC0348

Adherence is the key: targeting long-acting injectable cabotegravir to MSM current oral PrEP users with low adherence would be highly effective and efficient, a modelling study with Dutch perspectives

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Background: Long-acting injectable cabotegravir (CAB-LA) is superior to oral-tenofovir-disoproxil-fumarate/emtricitabine (TDF/FTC) as pre-exposure prophylaxis (PrEP). The introduction of CAB-LA could help to reach WHO's 2030 goals. In the Netherlands, the number of new HIV diagnoses among MSM has strongly declined in recent years due to the use of PrEP and reaching the 95-95-95 goals. We hypothesize that the number of new infections can be further reduced by targeting CAB-LA to MSM that are (partially) non-adherent to TDF/FTC.

Methods: We developed a deterministic mathematical model, stratified by the current TDF/FTC using status and adherence. We calibrated our model to the Dutch HIV epidemic among MSM. CAB-LA was targeted to current TDF/FTC-users with low, median, and high adherence in 2025, assuming every MSM in the targeted sub-population would switch to CAB-LA and by different proportions of the actual switchers. TDF/FTC's real-world effectiveness was assumed to be 93%, 69% and 18% with high, median and low adherence, respectively. CAB-LA efficacy was assumed to be 91% following results from the HPTN083 trial. (Sub-)populational-effectivenesses and populational-efficiency of CAB-LA targeting strategies were evaluated over 5, 15, and 25 years.

Results: On the sub-population level, by expanding CAB-LA to low TDF/FTC-adherers only, 90.2%, 91.1% and 91.2% of new HIV infections among this sub-population would be averted, over 5, 15, and 25 years, respectively. While 71.5%, 72.0% and 72.3% of new HIV infections would be averted, and more HIV infections would result when expanding

CAB-LA to the median- and high-TDF/FTC adherers, respectively. On the population level, 8.8%, 15.3% and 20.8% of new HIV infections among all MSM would be averted by expanding CAB-LA to low-TDF/FTC-adherers only. Expanding CAB-LA to median-/high-TDF/FTC-adherers did not have an impact on the HIV epidemic.

From a populational-efficiency perspective, switching all low-TDF/FTC-adherers resulted in a number-needed-to-treat (NNT) to prevent one HIV infection of 222, 178 and 170 over 5, 15 and 25 years, respectively. While switching 75% low-TDF/FTC-adherers was estimated as the most efficient, resulting in an NNT of 118, 89 and 85.

Conclusions: Targeting low-TDF/FTC-adherers with CAB-LA can be impactful and efficient in settings with declining HIV incidence such as the Netherlands, on both (sub-) population levels.

EPC0349

Modeled estimates of HIV-serodifferent couples in tuberculosis-affected households in sub-Saharan Africa

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Background: Household-based tuberculosis (TB) contact evaluation may be an efficient strategy to reach people who could benefit from oral pre-exposure prophylaxis (PrEP) because of the epidemiological links between HIV and TB.

This study estimated the number of HIV serodifferent couples in TB-affected households and potential HIV acquisitions averted through their PrEP use in 4 TB-HIV high-burden countries.

Methods: We conducted a model-based analysis set in Ethiopia, Kenya, South Africa, and Uganda using parameters from population-based household surveys, systematic literature review and meta-analyses, and estimates from the Global Burden of Diseases, Injuries, and Risk Factors Study 2019. We developed one parameter using Markov chain Monte Carlo methods to fit the nonlinear



relationship between the proportion of serodifferent couples among people living with HIV and population-level HIV prevalence. We integrated all parameters in a mathematical model and propagated uncertainty using a Monte Carlo approach.

Finally, we estimated the HIV acquisitions that could be prevented assuming scenarios of 100%, 75%, 50%, and 25% PrEP eligibility among seronegative partners.

Results: We estimated the HIV prevalence among adults aged 15-49 living in TB-affected households to be higher than in the general population in all 4 countries. The proportion of serodifferent couples among all couples in TB-affected households was also higher than in the general population (South Africa: 20.7% vs. 15.7%, Kenya: 15.9% vs. 5.7%, Uganda: 13.7% vs. 6.0%, Ethiopia: 3.9% vs. 0.8%).

The estimated number of serodifferent couples in TB-affected households was 41,959 (95% uncertainty interval [UI]: 35,156-48,512) in South Africa, 21,200 (95% UI: 9,464-31,251) in Kenya, 16,189 (95% UI: 14,165-18,442) in Uganda, and 9,483 (95% UI: 8,181-10,950) in Ethiopia.

Finally, we estimated that up to 1,836 (95% UI: 1,304-2,358) HIV acquisitions in South Africa could be prevented annually by PrEP use in serodifferent couples in TB-affected households, 927 (95% UI: 413-1,464) in Kenya, 709 (95% UI: 523-893) in Uganda, and 415 (95% UI: 304-531) in Ethiopia.

Conclusions: We estimate that couples in TB-affected households are more likely to be serodifferent than couples in the general population in TB-HIV high-burden settings. Offering PrEP during household TB contact evaluation may prevent a substantial number of HIV acquisitions.

EPC0350

Projecting future health system usage under HIV and TB program scale-up in Malawi

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Background: Malawi is focussed on the joint goals of eliminating AIDS and TB as public health threats. However, the demands on the health system required given the frailties in supplies of key medicines is not yet understood. Here we predict the changing demands on the health system required to achieve these goals and the health impact of reported consumables constraints.

Methods: The Thanzi la Onse model is a stochastic agent-based simulation model tracking individual health, incorporating demands on the health system and frailties in supplies. This framework comprises a series of interacting modules, whereby certain diseases can predispose an individual to other health risks and interactions with the health system can have implications on more than one health condition.

Three scenarios focussed on HIV and TB were considered (detailed below). The model was calibrated to reported data and overall population health and demands on the health system were summarised for each scenario.

Scenario	HIV program	TB program
Maintain current program coverage	All testing, treatment initiation and adherence levels are fixed at current (2022) rates	All testing, treatment initiation and treatment success levels are fixed at current (2022) rates
Scale-up of program activity	UNAIDS 95-95-95 targets* are met	WHO's 90-(90)-90 targets** are met Gene Xpert used for first-line diagnostic testing
Scale-up with additional preventive measures	As in scale-up plus increased PrEP availability and retention for adolescent girls and young women, increased voluntary medical male circumcision, behaviour change counselling which reduce overall transmission risk	As in scale-up plus IPT eligibility expanded to all age-groups, IPT coverage increased in both PLHIV and contacts, retention on IPT increased

Results: Program scale-up reduces health burden contingent on consumable availability, however there are greater gains expected from scaling up the TB program given the considerable expansion required to meet targets, with predicted DALYs averted reaching 508,000 (95% UI 255,000 – 586,000) by 2035. Targeted access to PrEP in high-risk adolescent girls and young women would avert 25% of new HIV infections between 2023 and 2035, translating into 5,500 infections averted in this age-group. Increasing TB prevention and treatment reduces mortality rates to 9.7 (95% UI 6.2 – 17.2) deaths per 100,000py by 2035. Limited access to consumables for diagnostics and treatment would lead to roughly 7,200 additional deaths over the projected time-period. With current stock availability, 10-15% of infected individuals would not initiate treatment for ≥ 10 weeks even with enhanced screening.

Conclusions: Overall, demand for appointments and healthcare worker time falls with frailties in key medical supplies however long-term, this may translate into a higher demand as population health deteriorates. High priority must be given to both supply-side and demand-generation for health system engagement to ensure optimal performance of HIV and TB programs.



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EPC0351

Projected impact of scaling up a crowdsourced intervention to improve HIV self-testing among youth living in Nigeria

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Background: HIV incidence remains high among youth aged 14-24 in Nigeria, and finding effective interventions to prevent HIV in this age group is crucial for ending the HIV/AIDS epidemic in the country. We used data from an ongoing cluster-randomized controlled trial conducted in 30 local government areas in Nigeria in 2021-2022 (I-TEST: Innovative Tools to Expand Youth-Friendly HIV Self-testing (HIVST) project) to project the impact of this youth-led HIVST strategy on the HIV/AIDS epidemic in Nigerian youth.

Methods: We constructed a dynamic transmission model to simulate HIV transmission and disease progression in Nigerian population. We incorporated the status quo of HIV prevention in Nigeria, including age-specific HIV testing rates, condom use, pre-exposure prophylaxis use, and testing rates for other sexually transmitted infections.

We estimated the number of new HIV infections, people living with HIV, and HIV deaths among Nigerian youth over 2018-2050 under the status quo or a scenario of promoting a youth-led HIVST strategy from 2022.

Results: Under the status quo, the HIV burden among Nigerian youth would increase with population growth over 2018-2050. In promoting a youth-led HIVST strategy, the number of new HIV infections among youth is estimated to be 44,838 by 2050, which would be 42% lower than 2018 levels (77,490 new infections) and 60% lower than maintaining the status quo (111,730 HIV infections).

Under the intervention, the number of people living with HIV and HIV deaths among youth by 2050 would decline by 35% and 62% from 2018 levels, and by 54% and 72% from the status quo.

The total HIV burden among adults would also decline by 2050 compared to maintaining the status quo, and the share of young people in the HIV burden would decline by about 3%.

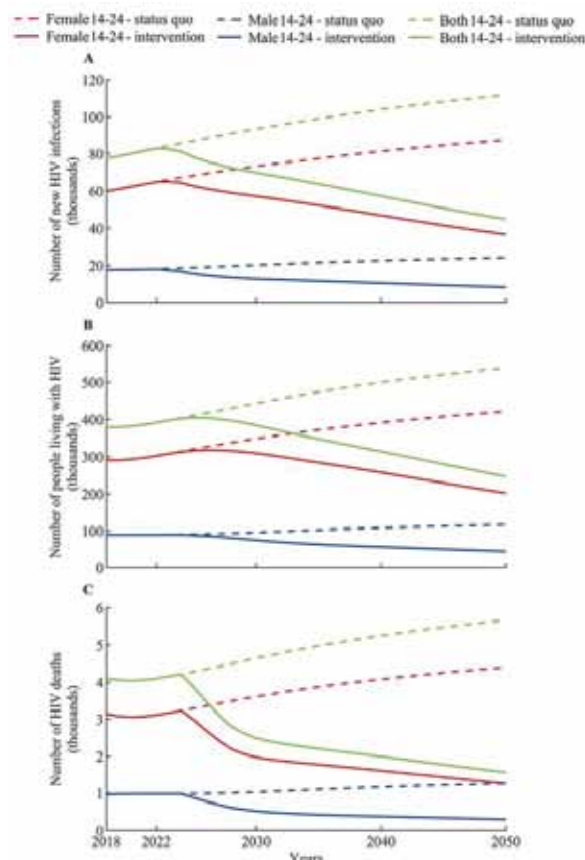


Figure 1. Projected HIV incidence, prevalence and mortality among youth aged 14-24 in Nigeria, 2018-2050, given two scenarios.

Conclusions: In Nigeria, scaling up HIV self-testing among youth would effectively reduce HIV incidence and mortality in this population.

EPC0352

Increasing age and duration of sex work among female sex workers in South Africa and its potential impact: a meta-analysis and simulation exercise

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Background: Estimates of HIV incidence among female sex workers (FSW) are frequently derived using mathematical models. These models require several behavioural characteristics as inputs, which are often assumed to be constant over time. This meta-analysis reviewed this assumption for two behavioural characteristics (age and duration of sex work (SW)) of FSW in South Africa.

Methods: We systematically searched for studies with information about age and duration of SW for FSW in South Africa. We extracted study size, study year, mean FSW age (and standard deviation) and mean SW duration. We assumed a Gamma-distribution for FSW age, an Exponential-distribution for SW duration, and fitted


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Bayesian hierarchical models to estimate time trends. We assumed weakly informative priors and a log-linear relationship (with common slope but study-specific intercepts) between time and the distributions' means. Finally, we performed a simulation exercise to examine if estimated time trends might impact estimates of HIV incidence rates in FSW.

Results: We included 19 studies contributing 33 estimates of mean FSW age and 11 studies contributing 19 estimates of mean SW duration. The studies were conducted between 1996 and 2019. Reported mean FSW age and SW duration ranged from 25 to 37 years and 1.8 to 10.1 years, respectively. Model fits showed strong evidence of an increase in mean FSW age from an estimated 26.3 years (95% credible interval 23.0-30.1) in 1996 to an estimated 32.4 years (28.2-37.6) in 2019 (**Figure**). There was some evidence for an increase in SW duration. The simulation exercise showed a decreasing HIV incidence rate since 2000 for the estimated time trends. This decrease was not observed if age and duration of SW were assumed constant over time.

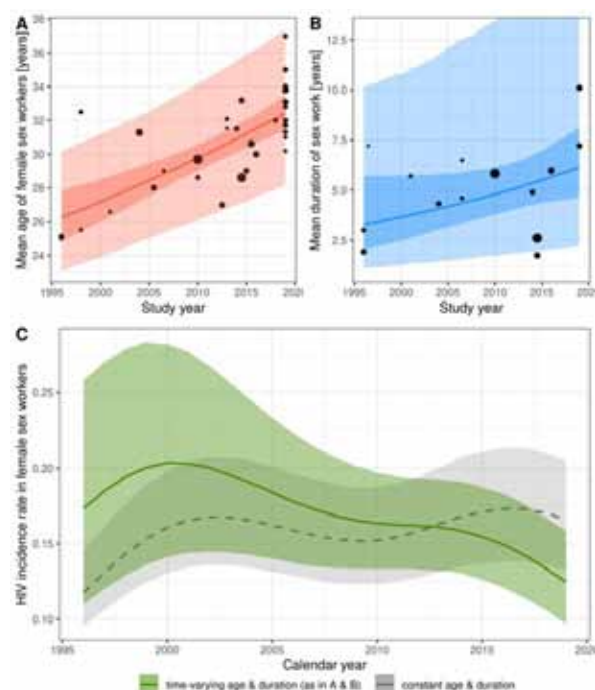


Figure. Time trends in the mean age of female sex workers (A) and the mean duration of sex work (B). Estimated means are shown as solid lines, 95% credible intervals as shaded areas (less transparent ones exclude random effect variation, more transparent ones include them). Points correspond to means reported in the studies with sizes proportional to study size. Panel C shows the results of the simulation exercise, which estimated HIV incidence rates assuming time trends in age and duration of sex work as in A & B (green), compared to assuming constant age and duration of sex work over time (gray).

Conclusions: In South Africa, age and SW duration in FSW have increased over time. Mathematical models used to derive HIV incidence for FSW need to adjust for these changes.

EPC0353

Trends of HIV prevalence, incidence, and mortality in China, 1985-2018: a modeling study

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Background: Comprehensive and accurate analysis of HIV epidemic is essential and primary for policy formulation and program evaluation. However, little is known about the nationwide HIV epidemic in China recently.

This study aimed to update the estimates in 2018 and further assess the trends of people living with HIV (PLWH), new HIV infections, and deaths due to HIV/AIDS in China.

Methods: Estimation and Projection Package (EPP)/Spectrum software was used for estimation. Data was inputted from over 1800 HIV sentinel surveillance sites, population-based seroprevalence surveys, and HIV screening of antenatal clinics/pre-marital medical check-ups between 1985 and 2017. Parameters of disease progression were adapted with assumptions by age and sex on CD4 progression rates and mortality on and off antiretroviral therapy (ART). Joinpoint (version 4.7.0.0) was used to examine trends of prevalence, incidence, and mortality.

Results: In 2018, the total number of PLWH adults in China was estimated to be 1.23 million, corresponding to approximately 106.5/100,000. 71.8% were men. 58.6% were acquired through heterosexual contact, 30.2% through male-to-male transmission, 9.0% IDU, and 2.3% due to former plasma donation. HIV incidence reached its first small peak in 1992 at 52,400 new HIV infections [2 700-920 000].

After a short period of fast decline in 1992-1994, the annual number of new infections increased again and stayed stable at 81 000 [60 000-105 000] in 2018. Recently, of new HIV infections, the number of people acquired through blood donation was eliminated, and kept reduced through injecting drug use. Sexual contact became the predominant transmission route, while casual sexual contact became more common.

Overall, HIV mortality has been rising steadily and has begun to decline recently during 2012-2018. The number of deaths in 2018 was about 35 000 [30 000-41 000].

Conclusions: The number of PLWH in China has exceeded one million, due to the continuing occurrences of new infections and longer survivals. HIV transmission through blood products has been eliminated. Casual sex has become an important transmission source.

It is recommended to further strengthen the implementation of strategies and measures for sexual communication in general population, and strengthen multidisciplinary research.

**EPC0354****The burden of adverse perinatal outcomes of pregnant women living with HIV in sub-Saharan Africa in 1990-2020**

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Background: Maternal HIV infection and antiretroviral therapy (ART) are associated with increased risks of adverse perinatal outcomes. The vast majority of pregnancies in women living with HIV (WLHIV) occur in sub-Saharan Africa, the region with the highest rates of neonatal and child morbidity and mortality globally.

We aimed to determine the burden of adverse perinatal outcomes attributable to HIV and ART in sub-Saharan Africa between 1990-2020.

Methods: We conducted a systematic literature review by searching Pubmed, CINAHL, Global Health and EMBASE for studies conducted in Sub-Saharan Africa and published between 1/1/1980 and 20/4/2020. Perinatal outcomes examined were preterm birth (PTB), very PTB, low birth weight (LBW), very LBW, small for gestational age (SGA), very SGA, and neonatal death.

We performed random effects meta-analyses to determine the risk difference (attributable risk, AR) of each adverse perinatal outcome among WLHIV receiving no ART, monotherapy, or cART initiated antenatally or preconception, compared to HIV-negative women.

We estimated the numbers of each perinatal outcome attributable to HIV and ART by combining the AR values with the numbers of WLHIV receiving the different ART regimens in sub-Saharan Africa between 1990-2020.

Results: 34 studies reported on 399,558 pregnant women in 14 countries in sub-Saharan Africa. WLHIV receiving no ART or cART initiated antenatally or preconception, but not monotherapy, are associated with increased risk of PTB, LBW and SGA, compared to HIV-negative women.

WLHIV receiving preconception cART had the highest AR of PTB (AR 0.065 (i.e. 6.8% absolute risk increase), 95% CI 0.039-0.090), and WLHIV receiving no ART had the highest AR of LBW (0.073, 0.049-0.096) and SGA (0.061, 0.026-0.114).

During the period 1990-2020, a total of 1,921,563 PTBs, 2,119,320 LBWs, and 2,049,434 SGAs were attributable to HIV and ART in sub-Saharan Africa, mainly among WLHIV receiving no ART, while monotherapy and preconception and antenatal cART averted many adverse outcomes.

In the year 2020, 64,585 PTBs, 58,608 LBWs, and 61,112 SGAs were attributable to HIV and ART, the majority among WLHIV receiving preconception cART.

Conclusions: As the proportion of WLHIV receiving preconception cART increases, the burden of adverse perinatal outcomes among WLHIV in sub-Saharan Africa is likely to remain high.

EPC0355**Leveraging social networks for identification of people living with HIV and high transmission potential**

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Background: The Ending the HIV Epidemic initiative in the United States calls for rapidly engaging individuals in HIV services to curb HIV transmission. Engagement will potentially become more challenging as the epidemic becomes more concentrated among disenfranchised groups.

Therefore, it is critical to investigate which engagement / re-engagement strategies best serve people with high HIV transmission potential.

Methods: We use a mathematical model (that incorporates sexual and contact networks, epidemic modeling, and phylogenetic methods) to compare two engagement strategies for Black men who have sex with men (BMSM) in Chicago—a group who are persistently impacted by HIV. The first strategy is recruitment based on social partners (SNS), while the second recruitment strategy is based on sexual partners (CT).

Our outcomes are the number of people living with HIV (PLWH) who are undiagnosed, PLWH who are out-of-care, PLWH who are members of molecular HIV transmission clusters (i.e., genetic HIV transmission pairs), and PLWH who are “known” HIV transmission pairs.

Results: SNS significantly outperforms CT in identifying the number of PLWH who are undiagnosed and out-of-care, but the two strategies engage similar proportions among all recruits for these outcomes. These results are consistent across various recruitment acceptance rates. CT outperforms SNS in terms of proportions when HIV prevalence is <20%. Neither strategy is successful at identifying genetic or known transmission pairs.

Conclusions: Our findings suggest that a larger proportion of the total population of PLWH can be identified by using a SNS strategy, with the number of administered tests being proportionately the same as CT for each newly diagnosed individual. If HIV prevalence is low, CT may yield more PLWH with fewer tests conducted.

However, if a greater absolute number of undiagnosed individuals is the goal, SNS always outperforms CT. The inability to detect genetic or known transmission pairs is likely due to small sample size.

EPC0356

Pre-exposure prophylaxis (PrEP) uptake & associated factors among adolescent girls and young women (15-20) participating in HPV vaccine trial

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Background: When combined with other methods, PrEP is highly effective and a vital HIV prevention tool for Adolescent girls and young women (AGYW). However, uptake, adherence and persistence are challenging in this cohort. We sought to evaluate the factors associated with PrEP uptake, continuation and discontinuation among AGYW participating in HPV vaccine trial.

Methods: Data from a blinded, prospective randomized study of a single dose efficacy HPV vaccination trial were used to evaluate uptake, continuation and associated factors over 36 months. Participants who were eligible and interested in taking PrEP were initiated, with refills being done every three months. Prep continuation was evaluated with the number of participants who refilled PrEP at least once within the period of initiation regardless of any gaps in pill coverage. Gaps in PrEP refill was defined as any stopping and restarting or having refilled more than fifteen days after their expected refill date. Within the generalized linear regression framework, poisson regression was used to analyze factors associated with PrEP uptake and continuation

Results: At 36 months, 523(46%) AGYWs out of the eligible 1148 sexually active were initiated on PrEP, median age 17 years IQR[15-23]. Among these, 472 (90%), continued on Prep. Participants reporting two or more sexual partners were 32% more likely to initiate PrEP (RR=1.32, 95%CI:1.0-1.65), those who had sex in the last six months had 30% increased likelihood of initiation (RR=1.30, 95%CI:1.10-1.54). AGYW who reported condom use during last sexual intercourse were less likely to initiate PrEP (P=0.002).

Participants who attained post-secondary level of education or were divorced/separated/widowed were more likely to continue on PrEP (RR=1.18, 95%CI:1.05-1.31, RR=1.15, 95%CI:1.0-1.24 respectively). Low perceived HIV risk (35%) and pill burden (29%) were common reasons for declining or discontinuing PrEP.

Among those ever initiated on PrEP, eleven seroconverted including eight who reported ongoing PrEP use with gaps, and three who had discontinued PrEP prior to HIV diagnosis.

Conclusions: AGYW with high sexual behavioural risk factors and increased perceived HIV risk initiated on Prep, these however, had gaps persisting on Prep. Pill burden

are a challenge for PrEP continuation. Targeted strategies are needed to improve persistence and adherence in this cohort.

EPC0357

Interest in and preferences for current and future PrEP modalities among men who have sex with men: results from a cross-sectional online survey in 15 countries and territories in Asia

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Background: Emerging PrEP modalities could increase PrEP uptake among men who have sex with men (MSM) throughout Asia. This analysis aimed to determine which forms of PrEP would be most appealing to MSM in Asia.

Methods: We conducted an online cross-sectional survey in 15 countries/territories in Asia among MSM between May-November 2022. Participants were asked about their interest in (non-mutually exclusive) and preference for (mutually exclusive) PrEP as: daily pills, event-driven pills, monthly pills, long-acting injectable (LAI-PrEP), and long-acting implant. Bivariate logistic regressions were conducted to compare interest between PrEP-naïve and PrEP-experienced participants.

Results: Among the 16,564 surveyed, interest was highest for the monthly pill (n=6920, 41.8%), and event-driven pills (n=6,616, 39.9%) followed by LAI-PrEP (n=6,311, 38.1%), daily pills (n=5,621, 33.9%), and implant (n=2,919, 17.6%). 1,226 (7.4%) participants were not interested in any modality included.

Compared to PrEP-naïve participants (n=11,956, 72.2%), PrEP-experienced participants (n=4,608, 27.8%) were more likely to be interested in using daily oral pills (46.0%, vs 29.3%, OR=2.06, 95%CI=1.92-2.21), LAI-PrEP (46.6% vs 34.8%, OR=1.63, 95%CI=1.52-1.75), and long-acting implants (21.5% vs 16.1%, OR=1.43, 95%CI=1.31-1.55).

PrEP experienced participants were less likely than PrEP naïve participants to be interested in event-driven pills (37.1% vs 41.1%, OR=0.85, 95%CI=0.79-0.91) or monthly pills (38.8% vs 42.9%, OR=0.84, 95%CI=0.79-0.90).



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Among those who were interested in using PrEP ($n=15,085$), overall preference largely followed that of interest (Figure 1).

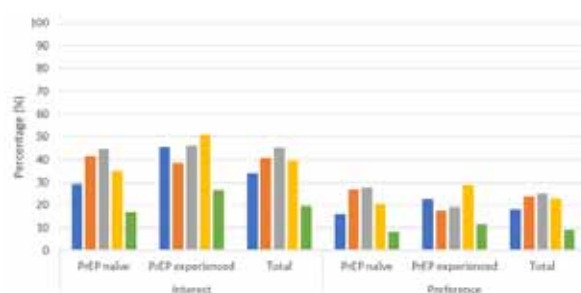


Figure 1.

Conclusions: MSM in Asia had similar levels of interest in event-driven pills, monthly pills, LAI-PrEP, and daily pills with more than one-third showing interest in each of these options. Less than one fifth were interested in long-acting implants. These findings point to urgent need to advocate for availability and affordability of each PrEP product for countries to be able to position them as equal choices in people-centred PrEP services.

EPC0358

Incident hypertension in adults initiating tenofovir alafenamide fumarate for HIV pre-exposure prophylaxis: analysis of data from an integrated health system in California

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Background: Emtricitabine/tenofovir alafenamide fumarate (TAF) was approved for pre-exposure prophylaxis (PrEP) in the US in October 2019. Studies demonstrated weight gain potentially associated with TAF use which may increase the risk for hypertension.

We evaluated the risk of incident hypertension in adults initiating TAF for PrEP compared with those who initiated emtricitabine/tenofovir disoproxil fumarate (TDF).

Methods: Adults (≥ 18 years) who initiated PrEP between October 2019-June 2022 were identified from Kaiser Permanente Southern California (KPSC), an integrated health system. Individuals with a hypertension diagnosis before and up to 30 days after the PrEP initiation were excluded. Initiation was defined as the first instance of TDF or TAF dispensing while enrolled in KPSC during the study period.

Each person who initiated with TAF was matched to 4 individuals who started with TDF using the propensity score informed by baseline demographics, cardiovascular risk score, smoking history, comorbidities, medical center, neighborhood deprivation index, and PrEP initiation year. Odds ratios (OR) and risk differences (RD) of incident hypertension within two years of PrEP initiation between matched TAF and TDF users were estimated using logis-

tic regression and g-computation, respectively. Missing covariates were handled with multiple imputation. The analysis was repeated in a subgroup of individuals ≥ 40 years of age at PrEP initiation due to higher hypertension risk in this age group.

Results: There were 338 individuals who initiated with TAF: mean age of 36 years, 99% male, 31% Hispanic, 6% non-Hispanic Black, 43% non-Hispanic white, and 4% with baseline diabetes. There were 8 (1.7%) hypertension cases identified among TAF initiators and a mean of 19 cases (1.3%, 95%CI: 1.09, 1.95%) in matched TDF initiators ($n=1,552$) across imputations ($m=50$). Odds ratio (OR: 1.7, 95%CI: 1.3, 2.2) and risk difference (RD 0.82%, 95%CI: 0.31, 1.3%) showed higher hypertension risk in TAF initiators versus matched TDF initiators. Differences between TAF and TDF initiators were higher among the subset of those ≥ 40 years at PrEP initiation (OR: 2.2, 95%CI: 1.3, 3.8; RD: 2.6%, 95%CI: 0.41, 4.8%).

Conclusions: TAF initiators may be at increased risk for hypertension. Findings need to be confirmed with larger studies.

EPC0359

Understanding the process of adolescent assent for Voluntary medical male circumcision in Zimbabwe: findings from a cross-sectional study

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Background: Voluntary medical male circumcision (VMMC) is a key HIV prevention option within combination prevention for adolescents >15 years in settings with generalized HIV epidemics. In Zimbabwe, policy currently allows the use of VMMC devices in adolescents >15 years, and there are considerations to lower the threshold to the age of 13 years.

There is a need to understand young adolescents' ability to provide informed assent, current practices in assent/consent, and parents' requirements for assent/consent to inform policy recommendations for use of VMMC devices and the VMMC programme.

Methods: Cross-sectional surveys were conducted in Zimbabwe among three groups in September 2022: uncircumcised adolescents/young men (AYM) aged 13-16 ($n=881$), circumcised AYM aged 13-20 ($n=247$), and parents ($n=443$) of uncircumcised adolescents aged 13-16. Surveys asked about VMMC knowledge, experiences with mobilisers, circumcised AYM's assent/consent experiences, and parents' preferences for assent/consent processes.


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Results: Detailed knowledge of VMMC was similar among 13-14 and 15-16 uncircumcised AYM and parents. However, 64% (150/247) of older circumcised AYM retrospectively felt they would not have been mature enough to make the decision about VMMC at age 13-14. 57% (142/247) of circumcised AYM had a one-to-one discussion with their provider before VMMC; 32% (80/247) said they were not fully informed prior to the procedure, and 54% (134/247) wanted more information about procedure-related pain. 56% (42/75) of uncircumcised AYM whose parents had not provided consent in-person reported that actual consent giving had not been verified with parents.

Conclusions: There are gaps in the current assent/consent process for VMMC. All providers should be trained to provide balanced information on risks and benefits of the procedure, including potential for pain. One-on-one discussions between providers and adolescents prior to the procedure, age-appropriate counseling, and tools for providers to ascertain the adolescent's understanding and ability to provide assent are essential processes, especially for younger adolescents who may be less mature than adolescents 15+ that providers have more experience conducting VMMC counselling with. There is also a need to standardise confirmation of parental consent for minors when their parents do not accompany their child to the clinic (e.g., a follow-up phone call).

EPC0360

Pharmacokinetics of on demand, single dose tenofovir rectal douche for HIV Pre-Exposure Prophylaxis in young men (ATN 163)

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Background: A behaviorally-congruent, on-demand rectal tenofovir (TFV) douche as pre-exposure prophylaxis (PrEP) to prevent HIV acquisition via receptive anal intercourse (RAI) would fill a critical gap in PrEP product availability. We previously reported pharmacokinetics (PK) of a single TFV douche in adult cisgender men (DREAM-01), median age 38 (range: 25, 64). Here we report ATN 163 describing the PK of the same TFV douche in young cisgender men, age 18-24, at risk of HIV via RAI.

Methods: Participants enrolled at a single site between January and August 2022. One 125 mL douche containing 660 mg TFV was rectally administered. We collected blood at 1, 6, 24, and 72 hours post-dose with sparsely sampled rectal swabs and tissue biopsies at 1, 24, and 72 hours. TFV and TFV diphosphate (TFV-DP) concentrations were quan-

tified using validated liquid chromatographic-tandem mass spectrometric assays. PK analysis was performed for TFV/TFV-DP. We compared ATN 163 to DREAM-01 using Mann-Whitney U tests.

Results: Eight male (62.5% White and 37.5% Black) participants not on PrEP were enrolled, with a median (range) age of 21 (18, 24) years. Median weight and BMI were 182.6 (146.1, 258.5) pounds and 27.0 (22.7, 36.2), respectively. Estimated GFR (CKD-Epi) was 143 (129, 156) mL/min. TFV and TFV-DP concentrations in plasma and rectal samples (Figure 1) were not significantly different from DREAM-01 (all p values > 0.11).

All PBMC TFV-DP concentrations were non-quantifiable. We observed no significant differences in plasma TFV T_{max} , C_{max} , $T_{1/2}$, and AUC_{last} comparing ATN 163 and DREAM-01 (all p values > 0.53). No adverse events were attributed to the TFV douche.

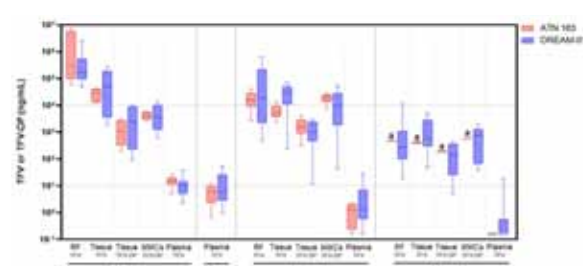


Figure 1. TFV and TFV-DP concentrations comparing ATN 163 and DREAM-01. Each box indicates the interquartile range (IQR) with center bar as median and whiskers indicates minimum and maximum.

RF: rectal fluid; MMCs: mucosal mononuclear cells; a: sample from only one participant. Rectal tissue/fluid density is assumed to be 1 g/mL; MMC size is assumed to be 282.9 fL/cell.

Conclusions: The TFV douche was well tolerated and demonstrated similar plasma and rectal PK between younger and older adults. This warrants inclusion of young men in future clinical investigations of the rectal TFV douche without dose adjustment.

EPC0361

Pharmacy provider perceptions of pharmacy-delivered injectable prep in Kenya

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Background: The Kenyan Ministry of Health is interested in implementing a long-acting injectable form of HIV pre-exposure prophylaxis (PrEP) that may help mitigate adherence and continuation challenges faced by daily oral PrEP users.



Pilot studies indicate that private pharmacies in Kenya have high demand for PrEP and may reach populations at HIV risk not usually reached by public health clinics.

We assessed Kenyan pharmacy providers' perceptions of the acceptability and feasibility of pharmacy-delivered injectable PrEP.

Methods: We administered a structured questionnaire to providers at 20 private pharmacies in Kisumu County. Because most pharmacy providers are not certified to deliver injections, we collected their perceptions of having a nurse stationed at their pharmacy to inject PrEP.

We assessed the acceptability and feasibility of this hypothetical scenario using 5-point Likert items informed by the Theoretical Framework of Acceptability (TFA) and Feasibility of Intervention Measure (FIM), and calculated descriptive statistics.

Results: From May to June 2022, 40 pharmacy providers completed the questionnaire. Of these, 42% (n=17) were pharmacy owners, and 11% (n=5) had >5 years of experience in pharmacy care. All (100%) liked the idea of delivering injectable PrEP at their pharmacies, and 92% (n=37) anticipated that they would feel comfortable having a nurse stationed on-site to offer the service (TFA construct: affective attitude).

Almost all providers disagreed that it would be hard to have a nurse stationed at their pharmacy to deliver injectable PrEP (92%, n=37; TFA construct: burden) or that this would interfere with their other priorities (95%, n=38; TFA construct: opportunity cost). Most pharmacy providers (92%, n=37) thought that delivering injectable PrEP at pharmacies would be doable (FIM).

Conclusions: The pharmacy providers in this study found the idea of pharmacy-delivered injectable PrEP to be highly acceptable and feasible. These findings suggest that, in Kenya and similar settings, private pharmacies may be a good venue for this intervention.

More research is needed to develop and test models of pharmacy-delivered injectable PrEP, including ones in which trained pharmacy providers (instead of nurses) initiate and continue clients on PrEP directly—a model that may be more cost-effective and easier to scale.

transmitted infections (STI) into the third year of the pandemic at one of the largest centers providing PrEP in the North Eastern U.S..

Methods: We extracted health records data to calculate quarterly numbers of:

1. Total PrEP prescriptions;
2. New PrEP prescriptions; and;
3. Individuals undergoing bacterial STI screening, from 1/2019-6/2022, as well as the average number of days between prescriptions per quarter.

We used Poisson regression to calculate incidence rate ratios (IRRs) which compared average quarterly numbers of prescriptions from 2020-2022 to 2019 (baseline), overall and disaggregated by race, age group, and insurance status.

Results: Q1-2020 saw the largest average number of PrEP prescriptions (3725); from Q1 to Q2-2020 (COVID onset), average quarterly prescriptions decreased 23%. Prescriptions remained stable until Q4-2021 when they decreased 37% as compared to Q1-2020.

Declines in prescriptions were greatest among individuals <30y of age (IRR in 2022=0.58, p<0.001) and those without insurance (IRR in 2022=0.42, p<0.001). No significant differences were observed by race.

The mean number of days between prescriptions increased from 108 days in 2019 to 127 days in 2022. Quarterly numbers of individuals with STI tests decreased at COVID onset but rebounded to a greater extent than PrEP prescriptions.

Conclusions: Diverging from national trends, PrEP prescriptions at this community health center specializing in sexual health care remain lower than pre-pandemic levels, suggesting a distinct evolution in patterns of PrEP use. Decreasing numbers of prescriptions could be a result of increased use of on demand PrEP, as suggested by greater intervals between prescriptions without attenuated STI testing, abstinence, disengagement from PrEP care, or receipt of PrEP care elsewhere.

Direct assessments with clients to understand patterns of sexual behaviors and PrEP use are needed to optimize PrEP engagement and effectiveness.

EPC0362

Changes in HIV pre-exposure prophylaxis prescriptions and sexual health screening before and during the COVID-19 pandemic in a Boston community health center

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Background: COVID-19 resulted in acute decreases in HIV pre-exposure prophylaxis (PrEP) prescribing and sexual health care, but national retail pharmacy prescribing data suggested recovery by late 2021. This recovery, however, may not have been observed uniformly. To investigate trends in subpopulations, we explored longer-term changes in PrEP prescriptions and testing for sexually


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EPC0363

Factors associated with event-driven PrEP use among men who have sex with men: results from a cross-sectional survey across 16 countries and territories in the Asia-Pacific region

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Background: Event-driven PrEP (ED-PrEP) is an effective method of preventing HIV among men who have sex with men (MSM) and is included in some clinical guidelines in Asia. This sub-analysis of existing PrEP users aimed to assess prevalence of ED-PrEP use and factors associated with ED-PrEP across the Asia-Pacific region.

Methods: We conducted an online cross-sectional survey in 16 countries/territories in Asia and Australia among MSM between May-November 2022. Participants were asked about current PrEP use and regimen. Analyses were restricted to current PrEP users who were MSM. Factors associated with ED-PrEP use were assessed with multivariable logistic regression.

Results: Among 3,556 current PrEP users; 2,351 (66.1%) were using daily PrEP, 1,126 (31.7%) ED-PrEP, and 79 (2.2%) taking it another way (see Figure for country-specific data).

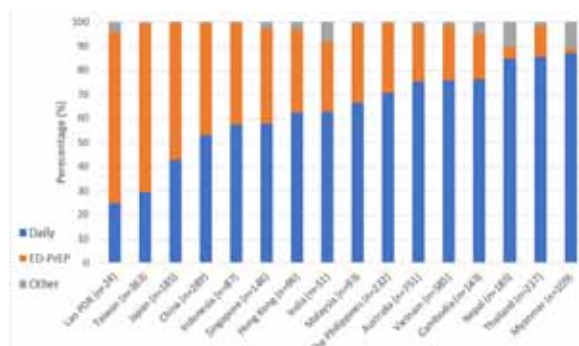


Figure.

Most users (n=3,035, 85.4%) had heard of ED-PrEP. ED-PrEP use was positively associated with having a university education ($\alpha\text{OR}=1.26$, 95%CI=1.06-1.50) and ED-PrEP awareness ($\alpha\text{OR}=2.52$, 95%CI=1.94-3.29), and was negatively associated with full-time employment ($\alpha\text{OR}=0.81$, 95%CI=0.68-

0.96), being in a relationship ($\alpha\text{OR}=0.82$, 95%CI=0.70-0.95), having >10 sexual partners in the previous 6 months ($\alpha\text{OR}=0.60$, 95%CI=0.49-0.72), recent injecting drug use ($\alpha\text{OR}=0.67$, 95%CI=0.51-0.90), and being diagnosed with an STI in the previous 6 months ($\alpha\text{OR}=0.61$, 95%CI=0.48-0.76). Compared to high-income Asian countries and territories (Hong Kong, Japan, Singapore, Taiwan), participants from low- and middle-income countries ($\alpha\text{OR}=0.25$, 95%CI=0.21-0.31) and Australia ($\alpha\text{OR}=0.29$, 95%CI=0.23-0.36) were less likely to use ED-PrEP.

Conclusions: A substantial proportion of MSM in the Asia-Pacific region were using ED-PrEP. ED-PrEP users demonstrated different risk patterns than daily PrEP users, with less frequent sex and lower injecting drug use. Efforts must be made to enhance ED-PrEP awareness and ensure that ED-PrEP is offered as an effective alternative to daily PrEP for MSM.

EPC0364

Association between use of tenofovir alafenamide for HIV pre-exposure prophylaxis and statin initiation in adults of an integrated health system in California

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Background: Daily oral pre-exposure prophylaxis (PrEP) with tenofovir alafenamide (TAF) is an alternative for tenofovir disoproxil (TDF) to prevent HIV infection. Studies showed that switching from TDF to TAF can worsen the lipid profile in people with HIV, which may increase statin initiation. However, there is a paucity of data regarding a possible association of TAF use and statin initiation among people on PrEP.

Methods: Adults (≥ 18 years) initiating PrEP between 10/2019-06/2022 in Kaiser Permanente Southern California (KPSC) with no evidence of HIV infection, or abnormal renal, hepatic, and hematologic function were included. First filled PrEP prescription (TAF or TDF) while enrolled in KPSC during the study period and subsequent statin initiation within 2 to 24 months following PrEP initiation were ascertained through pharmacy dispensing data. Individuals initiating TAF were 1:4 matched to those initiating TDF using a propensity score informed by baseline demographics, cardiovascular risk score, smoking history, comorbidities, medical center, neighborhood deprivation index, and PrEP initiation year. Odds ratio (OR) and risk difference (RD) of statin initiation were estimated using logistic regression and g-computation, respectively. Missing covariates were handled with multiple imputation. A subgroup analysis was performed in individuals ≥ 40 years at PrEP initiation as statins were more likely to be prescribed in this age group.

Results: We included 394 adults initiating TAF (mean age of 36 years, 99% male, 30% Hispanic, 42% non-Hispanic White, 7% non-Hispanic Black) and 1,576 matched adults



initiating TDF. During the follow-up, 6 (1.5%) individuals initiated statins in those with TAF use while 11 (0.7%) individuals initiated statins in those using TDF.

TAF use was associated with an increased statin initiation (OR: 2.3, 95%CI: 1.7-3.2; RD: 0.9%, 95%CI: 0.4-1.3%). Subgroup analysis among those ≥ 40 years revealed a more elevated likelihood of statin initiation among individuals with TAF use compared with those with TDF use (OR: 3.0, 95%CI: 1.9, 4.8; RD: 4.2%, 95%CI: 2.0-6.4%).

Conclusions: TAF use was associated with an increased statin initiation, especially among those ≥ 40 years at PrEP initiation. Studies with longer follow-up to evaluate clinical cardiovascular outcomes are warranted.

EPC0365

Factors associated with awareness of pre-exposure prophylaxis (PrEP) among Indian men who have sex with men: baseline findings from a Randomised Control Trial (RCT)

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Background: Despite PrEP being mentioned as a prevention strategy in India's National Strategic Plan for HIV/AIDS and STI for key populations including MSM, awareness and uptake of PrEP are not well understood among Indian MSM.

We investigated PrEP awareness and use and associated factors among sexually active MSM in Delhi, India.

Methods: We analysed baseline responses from 301 MSM recruited over social-media/online dating platforms from October 2022 – January 2023 and enrolled in an ongoing virtual behavioural randomized-control trial.

Eligible participants (≥ 18 years; living in Delhi, assigned male at birth; anal sex with a man/transgender woman in past 12 months; last HIV test ≥ 12 months ago/don't know-not sure; and HIV negative/unknown) completed a baseline survey and received INR 500 (USD \$5) incentive.

We analysed PrEP Awareness (yes/no) and identified factors associated with PrEP awareness using descriptive- and bivariate analyses.

Results: Participants (N=301) had a mean \pm SD age of 27 \pm 6 years. Majority (57.5%) had at least a higher-secondary education; 55.1% reported some employment; and 73.8% lived with family. Most (n=250, 83.1%) were unaware of PrEP; among those aware, only 2/51 (16.9%) were using PrEP. PrEP awareness was significantly ($p < 0.05$) associated with having at least a graduate/post-graduate degree (54.9%); had easy access to HIV testing (58.8%) and ability to use internet for finding sexual health information (80.4%). In contrast, PrEP-unaware participants rarely had someone to talk about sexual concerns (36.8%); were neu-

tral on their risk perception to HIV (43.6%); were unaware of PEP (92%) and about U=U (79.6%) (all $p < 0.05$, compared to PrEP aware).

Conclusions: Overall PrEP awareness and use were low, even in a relatively educated sample of MSM. Participants who were PrEP unaware were also less likely to know about other prevention approaches (i.e., PEP, U=U). National programs should prioritize upscaling PrEP education and information and other prevention approaches to promote informed prevention choices among MSM in India and develop programs to link individuals to diverse prevention choices.

EPC0366

Preferences for non-surgical and surgical VMMC among adolescents and their parents in Zimbabwe: findings from a cross-sectional study

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Background: Voluntary medical male circumcision (VMMC) is an essential option in the toolkit of HIV prevention interventions in East and Southern Africa. Zimbabwe's policy supports use of device-based methods such as the Shang Ring (SR) in males aged 15 and above, but WHO guidelines advise these devices can be used in males as young as 10, and there is interest in lowering this age threshold.

There is a need to understand potential demand for non-surgical devices in younger adolescents and their parents who must provide consent for the procedure.

Methods: Cross-sectional surveys were conducted in September 2022 in Zimbabwe among uncircumcised adolescents/young men (AYM) aged 13-16 (n=881), circumcised AYM aged 13-20 (n=247), and parents (n=443) of uncircumcised adolescents aged 13-16. Surveys asked each group about perceptions of surgical and device based VMMC, and drivers and barriers for VMMC uptake. Descriptive statistics were used to characterize attitudes in each group.

Results: There was clear preference for SR compared to surgical VMMC; 81%, 68% and 68% among uncircumcised AYM, circumcised AYM and parents respectively reported SR preference. Top perceived benefits of SR were similar across groups: fast procedure time, no stitches, and less pain compared to surgery. For uncircumcised AYM, top drawbacks were having to wear the device for a week and fearing pain of during device placement and remov-


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al. For parents, the top drawback was that SR was a newer procedure lacking provider experience as compared to surgery. Among circumcised AYM, a higher percentage reported experiencing pain the day and night of the procedure among those who had surgery (43%, 85/198) compared to SR (22%, 11/49).

Conclusions: The strong preference for Shang Ring indicates that non-surgical VMMC devices could play an important role to increase VMMC demand and uptake for long-term sustainability of Zimbabwe's VMMC programme. From the recount of men who have been circumcised, Shang Ring was also less painful than surgery, which is known to be the primary barrier to uptake of VMMC. Coupling this data on preference with safety data from an ongoing trial of Shang Ring in Zimbabwe will provide important information to guide VMMC programming in Zimbabwe.

EPC0367

Predictors of adherence to oral HIV pre-exposure prophylaxis in GBMSM: a machine learning approach using real-world data collected on a mobile application

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Background: Pre-exposure prophylaxis (PrEP) is an effective HIV prevention tool that relies on sufficient adherence in high-risk scenarios. Technology such as mobile applications allowing for logging users' daily behavior at close to the time they have sex or PrEP intake can be used to understand factors that predict adherence.

This study aims to establish a machine learning model using sex log and user attributes recorded in the mobile application UPrePU to predict if a sex event was protected by PrEP uptake.

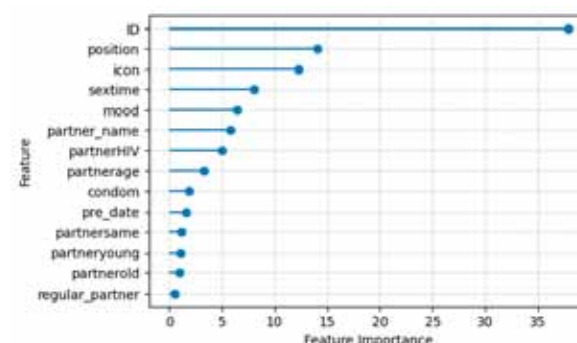
Methods: Data from January to November 2022 were included in this study. Users recorded details regarding sex events such as sex time and user's sex role (e.g., bottom/top/versatile). Different subsets of these features were involved in Catboost models to predict if sex events were associated with correct PrEP uptake.

The entire dataset was divided into two parts based on the sextime order: the first 80% went to the training set for training models and the last 20% went to the test set for calculating model performance metrics for model selection.

Influential features were identified by feature importance and SHapley Additive exPlanations values for model explanation.

Results: A total of 142 users recorded 1285 anal sex events on UPrePU. The best Catboost model had a good prediction performance (accuracy = 83%, precision = 85%, recall

= 90%, F1-score = 88%) and identified key features of PrEP protection. It suggests the correct PrEP intake is highly associated with individual behavior patterns, sex time in the evening and night, stable sex partners, and condomless sex.



Conclusions: Machine learning models revealed that behavioral patterns are significant contributors to HIV PrEP adherence. Mobile applications such as UPrePU designed to accommodate both daily and event-driven dosing regimen and allowed users to log their sex and PrEP intake diary can provide useful information that may be applied to develop just-in-time interventions to improve PrEP adherence.

EPC0368

Depression among female sex workers on pre exposure prophylaxis in Southwestern, Uganda

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Background: Oral pre-exposure prophylaxis (PrEP) is highly efficacious in preventing HIV transmission, but low adherence undermines effectiveness. Mental health disorders, particularly depression, may be a barrier to consistent PrEP use. In Uganda, depression is a common mental disorder among Female Sex Workers (FSWs), but; there is very little research evaluating the impact of depression among populations on long lasting drug regimens like PrEP. We evaluated the prevalence of depression, and factors associated with mental depression among Ugandan FSWs on oral PrEP.

Methods: We conducted interviews with 524 FSWs on PrEP living in rural southwestern Uganda, who were eligible if they were ≥18 years, sexually active and had traded and exchanged sex for money/gifts in the past 3 months and were currently dispensed PrEP for at least 6 months. FSWs interviewed lived in highway towns and landing sites along the Lake Victoria basin.

Depression was assessed using the nine-item Patient Health Questionnaire (PHQ-9; a score of ≥10 indicated depression). PrEP adherence was measured using pill count and dichotomized into poor (<6 pills taken in last week)



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and good adherence (6-7 pills in last week). Factors associated with depression were determined using logistic regression.

Results: Of the 524 women, median age was 26 (IQR=25-29), 43.5% (n=228/524) had a PHQ-9 score consistent with depression and 71% (n=372/524) had protective PrEP adherence.

Living in the fishing communities ($P=0.04$), having more than or equal to 100 sexual partners in last 3 months ($p=0.03$), taking PrEP only when feeling at high risk ($p=0.002$) and having an STI in the last 3 months ($p=0.001$) were significantly associated with depression.

FSWs with high depression were less likely to have protective PrEP; (aOR=0.77; 95% CI= 0.53 - 1.13;), there was no association between depression and adherence ($p=0.184$).

Conclusions: Depressive symptoms were high in this sample of FSWs on PrEP in Uganda. Integration of mental health services into PrEP programmes offer a useful way to connect HIV negative women to mental health services. If mental health was incorporated into PrEP services, then many more women may be able to get help than they otherwise would.

EPC0369

The prevention index testing model: Exploring sexual networks of HIV-negative individuals at substantial risk of HIV acquisition to reach undiagnosed PLHIV with treatment and expand PrEP uptake in Zambia

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Background: To end AIDS as a public threat by 2030, more innovative approaches are needed to identify undiagnosed people living with HIV (PLHIV) and expand access to HIV combination prevention for individuals at substantial risk of HIV acquisition.

This study assessed the feasibility of using HIV-negative individuals at substantial risk of HIV acquisition as 'index-clients' to explore their sexual networks for HIV case-finding and scale up of PrEP uptake among HIV-negative, at-risk individuals in USAID DISCOVER-Health supported facilities in Zambia.

Methods: The intervention was piloted in 32 project-supported sites in 2021 and 2022. HIV-negative PrEP clients were offered prevention index case testing to explore their sexual networks. All elicited individuals at substantial HIV acquisition risk were offered HIV index testing. Individuals testing positive for HIV were immediately offered antiretroviral therapy (ART); individuals testing negative were offered combination prevention services,

including PrEP. Client-level data were recorded in registers from which key variables were derived for analysis using SPSS.

Results: A total of 7,831 HIV-negative individuals, including 5,687 males aged 20-40 years and 2,144 females aged 18-35 years were offered reverse index testing within the study period. From these, 5,653 sexual network contacts were elicited. Females constituted the smallest proportion of elicited contacts at 1,357 (24%). Females were two times more likely to accept HIV testing than males (OR=2.47; 95% CI 2.18-2.81, $p<0.001$) and were twice as likely to test positive for HIV than males (OR=2.08; 95% CI 1.46-2.96).

Additionally, 128 (3.7%) HIV-positive contacts were identified, comprising 75 (59%) males and 53 (41%) females, all of whom were linked to ART.

Over 3,300 HIV-negative sexual contacts (93%) were linked to PrEP. Females were more likely to initiate PrEP than males (89% vs. 83%) (OR=1.62; 95% CI 1.28-2.05).

Conclusions: Prevention index testing may increase the identification of HIV-negative individuals at substantial risk of HIV acquisition with spillover benefits of finding undiagnosed PLHIV for scaling up linkage to combination prevention services and ART, respectively.

Further implementation and research is needed to assess the impact of this approach in high HIV risk populations.

EPC0370

Willingness to use and preference for long-acting dapivirine vaginal ring for HIV prevention among female sex workers in Vietnam

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Background: The long-acting Dapivirine vaginal ring (LA-DVR) was endorsed in the 2021 Vietnam HIV guidelines despite its unavailability in country. There are limited data on LA-DVR in Asia. This study aims to assess the willingness to use and preference for LA-DVR for HIV prevention among female sex workers (FSWs) in Vietnam.

Methods: Data collection was conducted from July to August 2022 and followed a cross-sectional design. We recruited HIV-negative females aged ≥ 18 , who reported sex work in past 12 months via purposive sampling through community-based organizations in 4 high-burden provinces in Vietnam. We introduced LA-DVR prior to conducting structured interviews. Descriptive statistics were used.

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Results: Among 71 FSWs, mean age was 39 (SD=9.0), and 57.7% had at least secondary education, with average monthly household income of 48USD. In the last 12 months, 56.3% had condomless sex and 42.2% had more than 6 sex partners. Over half (52.1%) had never taken oral PrEP, and 48.7% of these did not know about PrEP.

Overall, 53.5% reported definite or probable willingness to use LA-DVR if available. Of those not willing to use LA-DVR, the main reasons were perceived complications and discomfort related to changing it every 28 days (42.4%), effect on sexual intercourse (15.1%), and potential for it to cause vaginal allergies and gynecological diseases (12.1%). When given a choice between oral PrEP and LA-DVR, 36.6% of the overall sample preferred LA-DVR, 49.3% oral, and 11.3% both, with 2.8% choosing neither. FSWs would be more interested in LA-DVR if it contained medicine to prevent pregnancy (77.5%), it could not be felt during sex (69.0%), and they did not have to pay (64.8%).

Conclusions: Over half of FSWs were definitely or probably willing to use LA-DVR and over one third preferred it to oral PrEP, suggesting that LA-DVR can fill a gap to increase PrEP usage in this key population. LA-DVR uptake may be enhanced by offering it free, co-formulating it with contraception, and addressing main reasons for unwillingness to use. It would be beneficial to increase PrEP literacy and oral PrEP access among FSW while pursuing LA-DVR availability in Vietnam.

EPC0371

The PrEPTECH2 study: a randomized control trial to assess the impact of a telehealth PrEP care intervention on PrEP uptake among young MSM and transgender women in California and Florida

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Background: Despite rapid expansion of telehealth services for PrEP in recent years, formal, rigorous evidence of their efficacy is sparse. We conducted a randomized controlled trial of PrEPTECH, a telehealth intervention offering a fully virtual pathway to PrEP access including a free starter medication supply for young men who have sex with men and transgender women, to learn about the efficacy of telehealth PrEP interventions and explore moderators of PrEP uptake, including HIV risk perception and PrEP attitudes.

Methods: We assessed PrEP uptake (taking at least one dose in the past 90-days), baseline PrEP attitudes (with the PrEP Stigma and Positive Attitudes measure) and HIV risk perception (with the Perceived Risk of HIV Scale) among men who have sex with men and transgender women in California and Florida ages 18-27 who enrolled in the PrEPTECH2 study.

The two study arms, PrEPTECH intervention versus referral to publicly available resources, were compared with two logistic regression models including treatment group as the predictor and uptake of PrEP as the dependent variable.

Results: Among 229 enrolled participants, 183 (79.9%) completed a follow-up survey at least 90 days after enrollment. Among all participants, mean age was 23.7 ± 2.8 years, 8.7% identified as transgender female, and 56.8% identified as Black/African American or Hispanic/Latinx. A significant main effect of treatment was found ($B = 1.91$, $p < .001$) with 85% PrEP uptake in the treatment group and 45% PrEP uptake in the control group.

In model 1, there was no significant interaction by perceived risk of HIV on PrEP uptake ($B = 0.31$, $p = 0.36$). In model 2 there was no significant interaction by PrEP attitudes on PrEP uptake ($B = -0.30$, $p = 0.427$).

Conclusions: These results suggest that through increased accessibility, PrEPTECH had a strong impact on PrEP uptake for a group of young men who have sex with men and transgender women.

Furthermore, other moderators of PrEP uptake, beyond HIV risk perceptions and attitudes toward PrEP, may play a role in determining which young people initiate PrEP. Additional analyses will explore the impact of PrEPTECH on PrEP adherence, and other potential predictors of PrEP uptake.

EPC0372

Preferences for a community pharmacy-based PrEP delivery program: a discrete choice experiment

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Background: This study elicited preferences for attributes of a hypothetical community pharmacy-based pre-exposure prophylaxis (PrEP) delivery program among US men who have sex with men (MSM) and assessed the sociodemographic, psychosocial, HIV risk and PrEP status related predictors of the same.

Methods: Data were collected via a cross-sectional anonymous survey of US MSM aged 18-65 years, not transgender, reported HIV status negative/unknown, sexually active with a man in the past five years, and PrEP eligible. Seven attributes of pharmacy-based PrEP program (mode of initial screening for PrEP eligibility, preferred location for HIV Tests, time to get back HIV test results, mode of PrEP related decision making, location of PrEP-related consultations, PrEP medication fill mode, preferred



mode for ongoing monitoring) pre-tested using cognitive interviews, were included in the discrete choice experiment (DCE) with main-effects only design and balanced overlap generated using Sawtooth Software. Latent class analysis (LCA) was performed to analyze preference heterogeneity.

Multivariable logistic regression was conducted to assess predictors of group membership. Adjusted odds ratios (aOR) were reported, along with 95% confidence intervals (CI) and p values.

Results: This study included 390 MSM. Time to get back HIV test results was the most important attribute, followed by mode of initial screening for PrEP. Respondents' preferences clustered into four groups:

1. "Same day results and online monitoring" (SDROM) group (61.0%),
2. "Consumerist decision making" (CDM) group (15.9%),
3. "Self-screening (online questionnaire)" (SOQ) group (11.3%), and;
4. "Same day results preferring" (SDRP) group (9.5%).

Hispanic MSM [aOR=0.31, 95% CI (0.12-0.84), p=0.020] and MSM of other races [aOR 0.38, 95% CI (0.15-0.97), p=0.044] vs white; and those having STD [aOR 0.37, 95% CI (0.16-0.85), p=0.018], had lower odds of being in the CDM group vs the SDROM group.

Those in the Midwest [aOR 2.87, 95% CI (1.22-6.73), p=0.016] or West [aOR 3.27, 95% CI (1.43-7.43), p=0.005] vs Northeast had higher odds of being in the CDM group.

Conclusions: Study results indicate that MSM's preferences for attributes of a pharmacy-based PrEP program are heterogeneous, and community pharmacists should leverage innovations in HIV testing, screening, telehealth, and ongoing support services, to implement an effective program in their pharmacy.

EPC0373

Feasibility, acceptability, and preliminary efficacy of LifeSteps for PrEP for Youth (ATN 158) to enhance PrEP engagement

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Background: PrEP has been demonstrated to decrease HIV risk, but uptake, adherence and persistence have been suboptimal among young MSM (YMSM). LifeSteps is an evidence-informed, nurse-delivered, cognitive behavioral intervention designed to increase skills and self-efficacy to enhance medication adherence.

The current study was designed to evaluate adaptations of the intervention for YMSM initiating PrEP.

Methods: YMSM from Atlanta, Boston, and Chicago were randomized 1:1 to receive LifeSteps adapted for YMSM or standard of care (SOC). PrEP adherence and persistence were measured by self-report and dried blood concentrations of tenofovir diphosphate and emtricitabine triphosphate. Analyses used chi square statistics.

Results: Between November 2019 and September 2021, 32 YMSM enrolled. Most (69%) were 22-24 y.o.; 16% were 16-18 y.o.; 56% were White, 9% Black, and 6% Latino. Half identified as gay and none as heterosexual. Twenty-nine (91%) completed 6 months of follow-up, with similar retention rates in both LifeSteps and SOC groups.

At the 6 month visit, 60% of those randomized to receive SOC and 64% of those receiving LifeSteps reported at least one condomless anal sex act in the prior month. At 6 months, 69% percent of retained participants reported still taking PrEP, 71% receiving LifeSteps and 67% in SOC arm (p=NS).

Of those reporting PrEP use, everyone in each group self-reported taking PrEP at least 70% of the time; however, among those providing specimens (n=19), the proportion exceeding the lab-based adherence threshold was 38% in the LifeSteps group versus 55% receiving SOC (p=NS).

The most common reasons cited for non-adherence were losing pills or not having medication with them (10%), side effects (10%), and running out of medication (3%). Inter-



views suggested that participants found the intervention acceptable and helpful in supporting PrEP adherence. No seroconversions occurred.

Conclusions: LifeSteps for PrEP adapted for YMSM was found to be feasible and acceptable, although PrEP adherence and persistence were suboptimal. DBS levels suggested that self-reported adherence was over-estimated. Because of the small sample size in this pilot, efficacy was not demonstrated, but participant and staff feedback suggest that a larger trial powered to evaluate efficacy, and focused on youth experiencing adherence challenges, is warranted.

EPC0374

Awareness, access and uptake of HIV pre-exposure prophylaxis by young people in Zimbabwe

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Background: Pre-exposure prophylaxis (PrEP) is a highly effective intervention, but access remains low in many high burden countries. We investigated access to and usage of PrEP among young people in Zimbabwe.

Methods: A population-based survey of young people aged 18-24 in three provinces in Zimbabwe was conducted between October 2021 and June 2022. Questions included awareness, offer and uptake of PrEP, knowledge of HIV status and partner's HIV status. All participants underwent HIV testing. Data were analysed using Chi squared tests.

Results: We recruited 17,682 youth (60.8% female, median age 20 years). Overall, 2060 (11.7%) were aware of PrEP and among these, 235 (11.4%) had been offered PrEP (12.4% of females, 9.7% of males) and of those 118 (50.2%) had ever taken PrEP (48.8% of females, 52.8% of males). PrEP awareness was significantly higher among females (12.3% vs 10.7%, $p=0.002$), those aged 21-24 years vs 18-20 years (14.3% vs 9.3%, $p<0.001$) and those with higher levels of education and socioeconomic status. PrEP awareness was highest in HIV negative people with serodiscordant partners (33.3% vs 12.2%, $p=0.002$), in those who provided transactional sex (28.4% vs 13.4%, $p<0.001$) and those who had ever received treatment for an STI (20.5% vs 13.0%, $p<0.001$).

Among participants who had heard of PrEP, PrEP was offered to 50.0% of those with serodiscordant partners, 21.1% of those who provided transactional sex and 25.3% of those who have had treatment for an STI. Of those who were offered PrEP, uptake was higher in those aged 21-24 (57.8% vs 35.4%, $p=0.001$), those who had provided transactional sex (80.0% vs 52.4%, $p=0.039$) and serodiscordant partners (80.0% vs 45.7%, $p=0.2$). 28 participants reported having taken PrEP but not being offered it through a clinic or organisation.

Conclusions: Despite Zimbabwe being a high HIV prevalence setting; PrEP awareness and access is low among youth. Those who are at highest risk of HIV transmission are more likely to be aware of, offered and use PrEP but overall, 83.3% of HIV negative people in serodiscordant relationships have never been offered PrEP. Strategies to improve awareness and uptake of PrEP among young people are urgently needed.

EPC0375

Willingness to use and preference for long-acting injectable PrEP among men who have sex with men and transgender individuals in Vietnam

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Background: Long-acting injectable pre-exposure prophylaxis (LAI-PrEP) is recommended by the WHO as an important HIV prevention strategy. In Vietnam, men who have sex with men (MSM) comprise up to 50% of new HIV infections. Approximately 28,800 MSM are taking oral PrEP, but an estimated additional 62,000 could benefit but are not currently on PrEP. With the aim of informing future LAI-PrEP rollout in Vietnam, this study assessed willingness to use and preference for LAI-PrEP among MSM and transgender individuals.

Methods: Data were collected from July to August 2022 following a cross-sectional design. Study participants (self-reported HIV-negative adults assigned male at birth who reported condomless anal sex with a man in the prior 12 months) were recruited via purposive sampling from community-based organizations and PrEP clinics across 4 high-burden provinces in Vietnam. Following informed consent, data collectors administered a one-time in-person survey. Descriptive statistics were conducted and differences in LAI-PrEP preference were explored by bivariate analysis.



Results: Of the 424 participants (mean age 26, range 18–66), 239 currently or previously used oral PrEP and 185 had never used PrEP. Among those who reported gender identity, 381 identified as men and 35 as transgender, non-binary, or another gender.

Overall, 36% had heard about LAI-PrEP prior to the study. More than 90% reported willingness to use LAI-PrEP, with 52% saying they would probably and 40% saying they would definitely use LAI-PrEP if available. When given a choice between a daily pill or LAI-PrEP, 81% preferred injectable.

Those with multiple sex partners in the past year were more likely to prefer LAI-PrEP compared to those with one partner (84.1% vs. 71.9%, $p=0.009$).

There was no difference in preference for LAI-PrEP based on age, prior PrEP use, PrEP adherence, self-reported STI in past year, or substance use during last sexual encounter.

Conclusions: MSM and transgender participants reported a nearly universal willingness to use LAI-PrEP and a strong preference for injectable PrEP compared to oral daily PrEP. These data support making LAI-PrEP available to key populations in Vietnam as a person-centered option and suggest that LAI-PrEP could help fill the PrEP gap, moving Vietnam closer to HIV elimination.

EPC0376

Enhancing community participation in research – the role of the UVRI-IAVI CAB

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Background: With a growing arena of HIV prevention clinical trials, informed consent (IC) is recognized as a critical measurement of making ethics operational. While ensuring IC and voluntary participation are some of the most complicated aspects of clinical trials, volunteers at times get overwhelmed, overstretched, confused and feel pressured into participating in trials.

Researchers too have difficulties in translating terms and concepts into local languages, removing participants' feelings of a false sense of protection, demystifying misconceptions and handling of sensitive issues like sexuality, stigma and gender-based power dynamics.

Description: UVRI-IAVI HIV Vaccine Program conducts HIV-related trials in Uganda. The Program works with a Community Advisory Board (CAB) for advice on ICs, protocols, data collection tools, communication materials, etc. So, the CAB not only links research communities to the scientists but also helps in translating, communicating and condensing difficult concepts and terms to (prospective) volunteers.

Members are chosen through an electoral college system where groups such as PLHIV, fisherfolk, clergy, key & priority populations are represented in the multidisciplinary team.

Lessons learned: Community/CAB involvement in research is crucial in the successful implementation of trials. Activities such as helping to enhance participants' comprehension of the study requirements, making ICs more friendly enables greater screening, eligibility, enrollment and retention ratios. The Program-CAB partnership has strengthened the usefulness of ICs, disregarding the notion that ICs are a formality reduced to just a form and a signature! CABs are key in formulating approaches to information provision; helping to develop, review and test materials/tools and alert researchers on emerging community concerns. It is critically important to define advisory, information-giving and decision-making roles for both CABs and researchers as clearly as possible.

Conclusions/Next steps: When meaningfully nominated, the CAB members make an accurate representation of the populations of a research community. The CABs have a responsibility to continue to evolve and improve approaches and standards for Informed Consent, even if they may not be 100% perfect. It is then that trial participants will fully own and become part of trials without coercion and / or intimidation.

EPC0377

When does actual risk shape perceived risk? Sexual-related correlates of HIV risk perception among adolescent girls and young women in Kenya and Malawi

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Background: HIV risk perception, an important cognition for prevention, is theorized to engender service-seeking and risk-reduction behaviors. Comparatively, HIV risk perception's composition is poorly understood, a critical oversight as oral pre-exposure prophylaxis (PrEP) guidelines start considering self-appraised risk alongside epidemiologic indicators.

We examined country-specific correlates of self-reported HIV exposure among HIV negative adolescent girls and young women (AGYW) in Kenya and Malawi.

Methods: Using cross-sectional data collected in 2016–2017, we examined associations between experiences, circumstances, and sexual behaviors and self-reported likelihood of HIV exposure (likely vs. not). We generated adjusted prevalence ratios (aPR) using two multivariable


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model-building approaches:

1. Separate models for sexual-related factors, controlling for sociodemographic and cognitive factors, and;
2. A collective model including all sociodemographic, cognitive, and sexual-related factors.

We used $\alpha=0.10$ for model-building procedures and $\alpha=0.05$ to define correlates.

Results: Although few AGYW self-reported a likely HIV exposure (Kenya: 18.1%, Malawi: 47.5%), almost all (Kenya: 98.3%, Malawi: 99.7%) reported ≥ 1 HIV risk factor. From the separate models, partner(s) likely HIV exposure and partner(s) having other partners were correlates in both countries. STI symptoms and not knowing partner(s) HIV status were Kenya-specific correlates; Malawi-specific correlates included transactional sex, physical or sexual violence, and alcohol use before sex (Figure 1).

In the collective models, self-reported likely HIV exposures were 2- to 4-times higher if partner(s)' HIV exposures were likely (Malawi: aPR=2.34 [1.98-2.76], Kenya: aPR=4.54 [3.10-6.63]). Sexual intimate partner violence survivorship was also an independent correlate in Malawi (aPR=1.36 [1.22-1.52]).

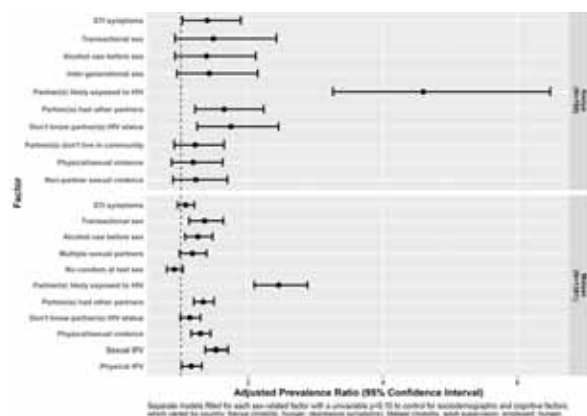


Figure 1. Correlates of self-reported HIV exposure, controlling for sociodemographic and cognitive factors, among AGYW in Kenya and Malawi.

Conclusions: AGYW's HIV risk perception was mostly influenced by partner-related characteristics and actions, rather than their own behaviors. Improving AGYW's risk appraisal could increase their uptake and effective use of HIV prevention methods. Complementary interventions addressing partners' HIV risk behaviors, gender-inequitable environments, and structural stressors may amplify these benefits. The introduction of long-acting PrEP underscores further investigation of risk perception's mechanisms is needed.

EPC0378

Use Patterns of Pre-exposure Prophylaxis (PrEP) among transgender women at a transgender-led health clinic in Thailand

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Background: The Tangerine Clinic is a transgender-led health clinic, which integrates gender-affirming care into HIV and sexual health services in Bangkok, Thailand. HIV pre-exposure prophylaxis (PrEP) is routinely offered as part of combined HIV prevention strategies for transgender women exposed to HIV risk. We assessed PrEP use patterns among transgender woman clients in our real-world clinic setting.

Methods: We collected demographics, behavioral risk characteristics, and clinical data from transgender woman clients who initiated PrEP at the Tangerine Clinic between June 2020-November 2022 and had at least one month up to three months of follow-up. We categorized PrEP use patterns into those who did not return, discontinued (no refill after 30 days of finishing PrEP), continued to refill, and restarted (started after discontinuation).

Baseline characteristics were compared between those who continued the refills and those who restarted, using Pearson's chi-squared test and Exact probability test.

Results: Of 791 transgender women, mean (SD) age was 27.2 (5.9) years; 41.3% had >1 partner; 17.1% participated in group sex; and 26.4% used substances. Among them, 420 (53.1%) did not return; 146 (18.5%) discontinued PrEP; 139 (17.6%) continued the refills; and 86 (10.8%) restarted PrEP. Median (IQR) days between the first two PrEP cycles was 166 (86-326), and 104 (88-226) between the next two cycles. There was no HIV seroconversion among transgender women who continued the refills or restarted PrEP. PrEP restarters were more likely to participate in group sex (28.6% vs. 5.0%, $p<0.001$) and to have no-to-low HIV self-perceived risk (28.0% vs. 12.9%, $p<0.001$) than those continuing refills.

Conclusions: Transgender women demonstrated variable patterns of PrEP use in our real-world clinic setting in Bangkok. Although less than one-fifth of clients used PrEP continuously, over ten percent returned to restart following a gap. Risk contexts may vary over time and therefore result in different PrEP use patterns.

Healthcare providers should make support available for various PrEP use patterns and empower their clients to make informed decisions effectively tailored to their own lifestyles.

**EPC0379****Scaling up of the Device Medical Male Circumcision method in Uganda military health facilities**

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Background: Voluntary Medical Male Circumcision (VMMC) reduces the risk of HIV transmission by 60%. The current VMMC prevalence in Uganda is 53% among men aged 15-49 years. Availability of surgical and device options is crucial for increasing the uptake of VMMC services. Some studies have shown that the device-based techniques are shorter, simpler to perform. While using the device method, the surgical method needs to be available within 6 hours in case of adverse events during placement and while the client is wearing the ring.

These techniques have been promoted to increase demand and program efficiency while maintaining safety. The trend and key interventions to improve uptake of the device method in Uganda military facilities are described.

Description: In 2020, 40 providers were trained on the device (Shang-Ring) method. Beginning Oct 2021, the target was to circumcise 785 men using this method but only 127 (16%) were circumcised by the end of the first quarter.

In Jan 2022, the team providing the surgical method was trained on Shang-Ring and the Shang-Ring team was trained on the surgical method. Static VMMC campaigns were conducted during which mobilization was boosted with commander involvement, targeting schools near military bases. The performance was tracked against the annual target of 785 circumcisions using the device method across 4 quarters. The follow-up rate and adverse events were reported using proportions/percentages.

Lessons learned: The pool of providers for the device method doubled from 40 to 80 at military VMMC sites. There was a steep rise in the uptake of the device method with the target for the device method surpassed by end of Quarter-2 (March 2022) with 812 (103%) men circumcised and 1,136 circumcised by end of Q4 (September 2022), achieving 115% of the annual target. All (100%) the men circumcised using the device method were followed up for ring removal at day-7 following the procedure with no severe adverse events reported.

Conclusions/Next steps: Uptake of the VMMC by device method was greatly improved by the presence of a pool of providers competent to provide both VMMC methods. Targeting schools as well as commander involvement in mobilization are critical interventions for improving the uptake of the device method.

EPC0380**Characteristics of Chinese MSM using HIV pre-exposure prophylaxis (PrEP), a cross-sectional study in 2022**

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Background: PrEP awareness among Chinese men who have sex with men (MSM) has increased since PrEP was approved in China in 2020, but uptake remains low. There is a need to describe the characteristics of Chinese MSM using PrEP.

Methods: We conducted a cross-sectional survey through Blued, a gay networking app, in November-December 2022 assessing sociodemographic status, sexual behaviors, PrEP use, HIV knowledge, and PrEP-related stigma using validated instruments. Eligible participants were PrEP-eligible in China's consensus statement, male ≥18 years, residing in Beijing or Chengdu, and reported sex with men in the past 6 months. We asked persons who reported ever using PrEP, "Are you currently taking PrEP?" Analysis was performed using Chi-square tests and t-tests.

Results: Overall, 9% (112/1314) of participants reported current PrEP use. There were no differences between PrEP users and non-users by age, sexual identity, and education. More PrEP users (60%) than non-users (39%) were in the highest income category (Table 1).

	PrEP Current User (N=112)		PrEP Non-current User (N=1202)		p-value
Monthly income > 10,000 Chinese Yuan (¥)	67	60%	471	39%	< 0.01
Had any anal sex with a male partner in the last 3 months	103	92%	1057	88%	0.26
Had open relationship	26	23%	121	10%	< 0.01
Had a partner living with HIV	15	13%	43	4%	< 0.01
Consistent condom use during anal sex in the last 3 months	39	35%	733	61%	< 0.01
Partner uses PrEP in the last 3 months	19	17%	40	3%	< 0.01
HIV Knowledge: mean (standard deviation, sd)	4.9 (1.3)		4.6 (1.6)		< 0.05
HIV PrEP Stigma Scale (HPSS): mean (sd)	2.2 (0.7)		2.7 (0.6)		< 0.01

Table 1. Characteristics of Chinese MSM Currently Using PrEP, a 2022 Cross-Sectional Study (N=1314)

Open relationships were more common among PrEP users (23%) than non-users (10%). PrEP users were more likely to have a partner living with HIV (13%) than non-users



(4%) and less likely to consistently use condoms (35%) than non-users (61%). PrEP users were more likely to have a partner using PrEP (17%) than non-users (3%). PrEP stigma scores for PrEP users (mean=2.2) were lower than for non-users (mean=2.7). HIV knowledge for PrEP users (mean=4.9) was higher than for non-users (mean=4.6).

Conclusions: Among a group of PrEP-eligible Chinese MSM, those currently using PrEP reported factors consistent with increased HIV exposure risk: sero-different partnerships, open relationships, and inconsistent condom use. PrEP users also reported a lower level of PrEP-related stigma, higher HIV knowledge, and were more likely to have a partner using PrEP.

Interventions to decrease PrEP stigma and increase population-level PrEP use should be explored for MSM in China.

EPC0381

A scalable program dramatically increases PrEP initiation in China

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Background: Despite high HIV incidence among men who have sex with men (MSM) in China, PrEP use remains low in 2022. We launched an intervention integrated directly into the world's most widely used geosocial networking platform for MSM, Blued, which has over 40 million users. Although many studies of apps providing HIV prevention goods exist, none to our knowledge have advanced beyond research and into broad public use.

Methods: Cognitive interviews and focus groups were used to develop Blued+, an add-on intervention to the existing Blued app.

After a 3-month control run-in period, all participants received access to Blued+, which provided:

1. A PrEP program with online orders, in-person laboratory tests, online clinician visit, and mailed prescription,
2. At-home HIV test ordering,
3. Condom and lubricant ordering, and;
4. HIV prevention messages.

Services were offered without cost to emulate health department provision. Eligible participants resided in Beijing or Chengdu, were not taking PrEP at baseline, and were PrEP-eligible.

We present preliminary results from the run-in control period (July-October 2022) and the first two months of the intervention period (November-December 2022). PrEP initiation was measured with self-report for the run-in pe-

riod; administrative pharmacy records measured intervention-period uptake because follow-up survey results will only be available after three months.

Results: During the 3-month control period, 25 (7%) of the 356 participants initiated PrEP. In the first two months of the Blued+ intervention period, 61 (17%) newly initiated PrEP. Most participants expressed interest in PrEP: 206 (58%) requested PrEP through Blued+ and 71 (20%) received laboratory testing. Most participants ordered and received HIV home tests (216; 61%), condoms (219; 62%) and lubricant (223; 63%). One-quarter (91; 26%) of participants ordered no services.

Conclusions: Integrating intervention services into an app widely used by MSM more than doubled PrEP uptake compared to a control period. We also observed high uptake of other prevention services.

These early findings suggest the potential impact of providing prevention services directly through geosocial networking (e.g. dating) apps in China; an approach offering rapid scalability and high reach. The longitudinal impact of app-integrated services will be explored in future analyses of the 12-month intervention.

EPC0382

HIV seroconversion in PrEP users in Indonesia; a survival analysis

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Background: PrEP, in combination with HIV prevention, will be effective in reducing HIV infection. As a country with a concentrated epidemic, HIV infection in Indonesia is highest among MSM, TG, FSW, and PWID. The purpose of this study is to determine the seroconversion rate of PrEP users in 21 cities in Indonesia.

Methods: We analyzed data obtained from Sistem Informasi PrEP (SI-PrEP) for all PrEP users in Indonesia who were enrolled in 2022. PrEP persistence through six months was assessed using Kaplan-Meier survival analysis among all key populations. Non-persistence for PrEP is defined as an ≥ 15 -day gap in PrEP availability for a scheduled visit.

Results: From January to December 2022, 3002 people from MSM, TG, FSW, and PWID were enrolled for PrEP in 21 pilot districts. The average age was 29 \pm 7.3, with 69% taking daily PrEP and the remaining 31% taking event-driven PrEP.

Of all key populations who could reach six months of post-PrEP initiation follow-up, 1258/3002 (41.9%) persisted with PrEP for one month, 550/1258 (43.7%) persisted with PrEP for three months, and 171/550 (31%) persisted with PrEP for six months. Adherence levels monitored through the self-assessment mobile app indicated that 69% took



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an average of ≥ 4 doses/per week. Five HIV seroconversions were observed (incidence 0.8 per 100 person-years, 95% CI 0.5, 1.1).

Conclusions: Although PrEP coverage in Indonesia is still low, high adherence can reduce HIV incidence in at-risk populations. According to the Differentiated Service Delivery (DSD) recommendations, a different strategy for each at-risk population is required. So that the coverage and adherence of PrEP can be increased and the seroconversion rate is lower.

EPC0383

Why I quit oral pre-exposure prophylaxis (PrEP)? A qualitative synthesis exploring PrEP discontinuation among rural female sex workers in rural Uganda

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Background: Different studies have explored facilitators and barriers to uptake and adherence of oral PrEP. However, less is known about why female sex workers (FSWs) stop adhering to PrEP. This exploratory study uses qualitative interviews to explore reasons why FSWS using PrEP for at least 3 months discontinue the drug regimen.

Methods: This exploratory qualitative study was conducted with 20 female sex workers residing in fishing communities and along Trans-African Highway towns in South-western Uganda.

They were aged 18 years or older; reported at least one instance of sex with a man in the preceding one month; involved in the exchange of sex for money or gifts; and were either on PrEP for >3 months or had stopped taking PrEP <3 months before the interview.

Snowball sampling was used to identify participants, semi structured in-depth interviews were conducted, and data were analyzed thematically.

Results: Different challenges and reasons were discussed by FSW for discontinuation:

- Personal factors included medication side effects including nausea and loss of appetite, preference of other HIV preventive methods (i.e. condoms);
- Interpersonal factors included lower perceived HIV risk, physical violence from partners who mistook PrEP for ARVs, pill-related stigma;
- Factors associated with their employment included difficulty establishing daily pill taking and adherence strategies, and lack of access to/inaccessible when working away from PrEP designated refill clinics; and institutional factors associated with the health service included transport-related costs for refills.

Conclusions: Client-centered counselling at enrollment of PrEP stresses the prevention – effective adherence paradigm. Apart from designated clinics, other strategies like

peer-oriented services may offer solutions to accessibility. Sensitizations, education and support for partners and families of PrEP clients may be an everlasting solution to PrEP related violence thus supporting continuation.

EPC0384

The cascade of oral HIV pre-exposure prophylaxis (PrEP) awareness, use and continuation among gay and other men who have sex with men (MSM) in 16 countries/territories in Asia and Australia

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Background: Despite global recommendations, oral HIV pre-exposure prophylaxis (PrEP) implementation and uptake will fall significantly short of 2025 regional targets unless substantially accelerated. In most Asian countries, little is known about PrEP awareness, uptake and continuation among gay and other men who have sex with men (MSM).

Methods: We conducted an online, cross-sectional survey among MSM in 16 countries/territories in Asia/Australia (May–November 2022). We constructed a PrEP 'cascade' examining awareness, previous use, and continuation. Those who had not taken PrEP but wanted to, or who had taken PrEP but had discontinued were asked why. Sociodemographic and risk factors associated with the PrEP awareness step of the cascade were identified using multivariate logistic regression with adjusted odds ratios (aOR) and 95% confidence intervals (CI).

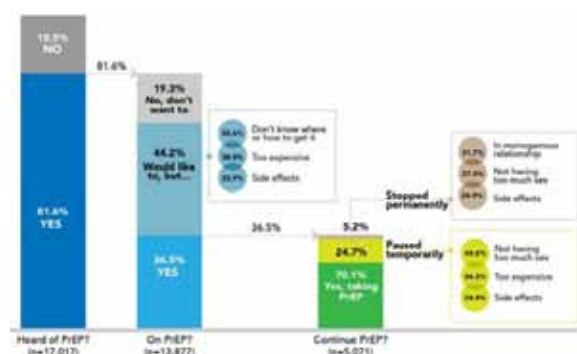
Results: Among 17,017 MSM, 81.6% were aware of PrEP (Figure). Of these, 36.5% had used PrEP, 19.3% did not want to, and 44.2% wanted to but had not (top reasons: not knowing where/how to get PrEP=55.6%, too expensive=38.0%, side effects concerns=33.9%).

Of those who had used PrEP, 70.1% continued taking it, while 5.2% stopped permanently (top reasons: monogamous relationship=31.7%; not having much sex=27.2%;



side effects concerns=24.9%) and 24.7% paused temporarily (top reasons: not having much sex=44.6%; too expensive=26.2%; side effects concerns=24.4%).

PrEP awareness was associated with university education (aOR=1.44, 95%CI=1.32-1.57), full-time employment (aOR=1.17, 95%CI=1.07-1.28), living in a capital/major city (aOR=1.65, 95%CI=1.51-1.80), recent HIV testing (aOR=1.95, 95%CI=1.77-2.15), having >10 sex partners in last 6 months (aOR=1.34, 95%CI=1.16-1.55), and living in a country/territory with relatively broad PrEP access (aOR=1.97, 95%CI=1.79-2.16). Recent sex work was negatively associated (aOR=0.74, 95%CI=0.65-0.85).



Conclusions: In the largest regional survey on PrEP, despite very high levels of awareness, our cascade analysis identified significant barriers in access to and continuation on PrEP. Efforts to address barriers and increase PrEP access are urgently needed to reduce regional HIV incidence.

EPC0385

Evaluating pre-exposure prophylaxis uptake and adherence outcomes among adolescents and young adults aged 10-24: a global systematic review, meta-analysis and meta-synthesis

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Background: Pre-exposure prophylaxis (PrEP) is a highly effective intervention for preventing HIV acquisition. This review aimed to synthesize evidence related to PrEP care cascade outcomes among adolescents and young adults (AYA) aged 10-24 years old to inform the development of tailored HIV prevention interventions within this population.

Methods: We searched six databases for peer-reviewed English articles published from January 1, 2010, to February 11, 2022, with no geographic limitation. Quantitative and qualitative studies that reported PrEP care cascade outcomes among AYA aged 10-24 were eligible for in-

clusion. Studies were grouped by stage of the PrEP care cascade (awareness, uptake, adherence, retention, and discontinuation and re-initiation) and pooled in a random effects model using R-software. We conducted a thematic meta-synthesis of data from qualitative studies using MAXQDA software.

Results: Out of 4545 de-duplicated studies screened, 87 were included. 62% (n=54) of the studies were from high-income countries (HICs), 27% (n=24) of studies targeted adolescent and young men who have sex with men (AYMSM), and 25.3% (n=22) engaged adolescent girls and young women (AGYW).

Overall, lower/middle income countries (LMICs) had lower pooled PrEP uptake (11%) and adherence at six months (36%) than HICs (12% and 66%, respectively). By population type, the pooled PrEP adherence rate at six months were lowest among AGYW (33% and) compared to AYMSM (72%) and mixed populations (53%). Seven studies explored factors associated with PrEP discontinuation and eight studies assessed daily oral PrEP persistence.

PrEP providing relief from fear of HIV acquisition and perceived HIV risk were the most explored facilitators of PrEP uptake and adherence. In contrast, lack of parental support, low perceived HIV risk, stigma, and fear of side effects were the most cited barriers.

Conclusions: AGYW in LMICs have the worst PrEP outcomes. This may be due to a disproportionate allocation of PrEP resources to LMICs relative to HICs, and current programs being centered on sexual and gender minority youths in most LMICs.

More tailored strategies that involve parents/guardians and stigma-reduction interventions are needed to scale-up PrEP cascade outcomes among AYA, especially among AGYW, in LMICs.



EPC0386

Developing and validating a screening tool for female genital schistosomiasis in urban Zambia

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Background: The World Health Organization estimates that 56 million women and girls live with female genital schistosomiasis (FGS) in sub-Saharan Africa. FGS is often confused with symptoms of other genital abnormalities, and gold standard diagnosis with colposcopy is infeasible in most health facilities. *Schistosomiasis haematobium* is endemic in Zambia, yet no routine screening or diagnostic efforts are taking place for FGS.

Our study aimed to develop and pilot test a feasible FGS screening algorithm to implement in Zambian government clinics.

Methods: We recruited 499 women from a longitudinal cohort of HIV-negative adult women in Lusaka and Ndola, Zambia. We used demographic, risk factor, and symptom data collected from standardized surveys, gynecological exams, and laboratory tests to develop a risk algorithm for FGS among a derivation cohort (n=349). After 5-fold internal cross-validation, the algorithm was validated in a validation cohort (n=150).

Results: The prevalence of FGS was 23.4% in the study population. The risk algorithm included childhood and travel exposure to rivers and streams; testing positive for visual inspection of the cervix with acetic acid; treatment, hematuria (blood in urine); reporting less than the median average age at first sex (<17 years); when asked what diseases can be transmitted via freshwater exposure, reporting 'unsure' or 'none'; being born outside of Lusaka or Copperbelt Province; and reporting their occupation as 'Housekeeper'.

The risk algorithm had reasonable discrimination in the derivation cohort (area under the curve [AUC]=0.69, 95% confidence interval [CI]: 0.66-0.79, p-value<0.001). Using a score cut off >=3, the risk algorithm in the derivation cohort had 73% sensitivity, 59% specificity, 39% positive predictive value, and 86% negative predictive value.

Conclusions: Given the high prevalence of FGS and its associated morbidities, improved screening for FGS is imperative. We developed a simple screening algorithm to improve the diagnosis and treatment of FGS among adult women in Zambian government clinics.

EPC0387

Temporal change of PrEP use and adherence in MSM: pill fatigue or COVID-19 effect?

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Background: Pre-exposure prophylaxis (PrEP) is an effective HIV preventive measure for MSM. However, PrEP usage and adherence may change over time due to pill fatigue, and/or the impact of circumstantial influences, notably the prevailing COVID-19 epidemic.

Methods: A PrEP implementation study was conducted in Hong Kong with 1-year follow-up (free Truvada pill refill and consultation) the timing of which clashed with the COVID-19 epidemic. Monthly survey data of MSM participants were analyzed in generalized estimating equation (GEE) models for each outcome variable (schedules: daily, on-demand, alternating, no PrEP; high adherence). Reported high PrEP adherence referred to not missing doses for anal sex for on-demand regimen, or above 90% for daily use in the month. Months from baseline and COVID-19 epidemic waves (wave 1: 1 Jan-19 June 2020; wave 2: 20 June-23 October 2020; wave 3: 24 October 2020-30 December 2021; wave 4: 31 December 2021-7 July 2022) were separately included in GEE models.

Results: Among 312 MSM (median=30, IQR=26-38 year-old) recruited in January 2020 – June 2021, 42% were PrEP-experienced at baseline. Since the first PrEP visit (1475 monthly surveys from 286 MSM), the adopted monthly schedule was 43%-77% for daily PrEP, 12%-40% for on-demand PrEP, 0%-10% for alternating schedule, and 1%-8% without PrEP. There was a declining proportion of MSM on daily PrEP (OR=0.90, 95%CI=0.88-0.93 for months from baseline; OR=0.45, 95%CI=0.27-0.76 for wave 4 comparing with wave 1), but increasing proportion with on-demand schedule (OR=1.13, 95%CI=1.08-1.18 for months; OR=2.71, 95%CI=1.14-6.43 for wave 4 comparing with wave 1) or no PrEP (OR=1.20, 95%CI=1.04-1.38 for months).

High adherence was associated with later waves (wave 1 as reference, OR=5.42 for wave 2, OR=3.59 for wave 3, OR=2.25 for wave 4) but not months. For MSM reporting


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missed doses, the main reasons were omission or busy (monthly range=39%-68%) and forgetting to bring pills along (monthly range=5%-38%).

Conclusions: PrEP adherence was associated with epidemic wave but not fatigue over time, while PrEP usage pattern was associated with both wave and months. Pre-occupation with daily activities as affected by COVID-19 epidemic might play a role.

EPC0388

Bridging the gap: the impact of an empowerment based intervention on the knowledge of biomedical HIV prevention tools among sub-Saharan African precarious immigrants in France. Results from the Makasi project

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Background: Sub-Saharan African immigrants are particularly affected by HIV in France and social hardship is an indirect factor of HIV acquisition. To prevent new HIV transmission, biomedical HIV prevention tools are available. However, evidence suggests a lack of knowledge of these tools among immigrants from sub-Saharan Africa. We aimed to analyse the impact of social and health empowerment intervention on the knowledge of treatment as prevention (TasP), Pre Exposure Prophylaxis (PrEP) and Post Exposure Prophylaxis (PEP) among a population of precarious sub-Saharan immigrants.

Methods: Data were collected in the Makasi social and health empowerment project. Participants were recruited in public places based on their precarious situations and followed during six months between 2018 and 2021. Following a stepped-wedge design, participants were randomised into two groups (intervention at recruitment in one group and 3 months later in the other). We described both groups and the knowledge of biomedical HIV prevention tools at each time point (0, 3, 6 months). We used random-effects logistic regression models to analyse both the intervention effect and time effect on the level of knowledge of these tools. The study protocol was registered on Clinicaltrials.gov NCT04468724.

Results: The majority of the participants were men (77.5%) and almost half of them arrived in France within 2 years prior to inclusion (49.3%). At the time of inclusion, 56% of participants knew about TasP, 6% knew about PEP and 4% knew about PrEP. Receiving the intervention increased the odds of knowing PEP (aOR=2.02 [1.09-3.75]; p<0.026). Inter-

vention effect were observed for TasP and PrEP only after 6 six months. We observed significant time effect for PEP (at 3 months aOR=4.26 [2.33-7.80]; p<0.001; at 6 months aOR=18.28 [7.39-45.24]; p<0.001) and PrEP (at 3 months aOR=4.02 [2.10-7.72]; p<0.001; at 6 months aOR=28.33 [11.16-71.91]; p<0.001).

Conclusions: The Makasi intervention appeared to impact knowledge of biomedical HIV prevention tools. The effect of the intervention was relatively small compared to the effect of time.

This suggests that exposure to the Makasi intervention and perhaps other sources of information together contributed to increase knowledge of biomedical HIV prevention tools among precarious sub-Saharan African immigrants.

EPC0389

Factors associated with retention of adolescents, girls, and young women in an HIV prevention program in South Africa

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Background: Adolescent girls and young women (AGYW) are at higher risk than other groups for acquiring HIV in South Africa. The DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe) program works to reduce the risk of HIV among AGYW. However, it is difficult to retain AGYW in HIV prevention programs. We examined the factors associated with the retention of AGYW in DREAMS.

Description: Methods: We used routinely collected data from 460,000 AGYW aged 10-24 years in DREAMS between October 2021 and September 2022 in seven provinces of South Africa. A cross-sectional study was used to compare the retention rates of AGYW in the program. Retention was defined as the completion of the recommended 18 sessions of the intervention. We ran Chi-square tests for associations of variables and constructed a multivariate logistic regression model to identify factors associated with retention using STATA 16.1.

Univariate analysis with a significant level set at 20% was used to identify factors for inclusion in the final model, then multivariable logistic regression at a 5% (p-value ≤ 0.05) significant level was used to determine the final model.

Lessons learned: Results: Retention was higher in the rural settings of KwaZulu Natal (75%), Eastern Cape (65%), Mpumalanga (65%), and Limpopo (64%). The 10-14 year-olds accounted for 76% of AGYW retained in the program. Having a passport (OR 2.4 95% CI 1.7-3.4, p<0.0001), a cell phone (OR 2.1 95% CI 2.0-2.2, p<0.0001), and an email address (OR 2.1 95% CI 1.8-2.4) were associated with higher odds of retention.



Furthermore, the parent/guardian contact phone availability had 6.5 times higher odds (OR 6.6 95% CI 6.3-6.9, $p<0.0001$) of retention. Prior exposure to vulnerabilities such as alcohol or substance abuse (OR 1.9 95% CI 1.8-2.0, $p<0.0001$), orphanhood (OR 1.8 95% CI 1.7-1.9, $p<0.001$), sexually transmitted infections (OR 1.9 95% CI 1.6-2.2, $p<0.001$), and sexual intercourse (OR 1.5 95% CI 1.4-1.6, $p<0.001$) had higher odds of retention.

Conclusions/Next steps: Exposure to vulnerabilities and availability of socio-demographic information of AGYW and parents/guardians were associated with the retention of AGYW in DREAMS programs. Collecting and using this information for DREAMS programming is critical and should be prioritized to improve retention.

EPC0390

Improvements in uptake of voluntary medical male circumcision in Malawi

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Background: The WHO and UNAIDS recommend voluntary medical male circumcision (VMMC) as an HIV prevention strategy in areas with high HIV prevalence. Malawi adopted the VMMC program in 2011 focusing on the southern region, where HIV prevalence is the highest in the country. However, scale up has been slow since its inception.

We used data from the 2016 and 2021 Malawi Population HIV Impact Assessment (MPHIA) surveys to compare VMMC uptake in the country between the two timepoints and examine gaps in the current survey.

Methods: The MPHIA surveys are cross-sectional nationally representative household surveys capturing HIV-related indicators. Data collection occurred between November 2015–August 2016 for the first survey and January 2020–April 2021 for the second survey. Demographic characteristics and self-reported circumcision status (medical, traditional, or uncircumcised) were captured. We defined VMMC if participants answered they were circumcised by a medical provider.

We compared uptake of VMMC among HIV negative males aged 15–49 years between the two surveys and described gaps in VMMC uptake for the recent survey. Data were weighted for the survey design.

Results: In total, 13,077 men aged 15–49 were eligible (5747 in MPHIA 2016 and 7330 in MPHIA 2021) in the two surveys. Overall circumcision proportion increased from 26.6% (95% CI: 24.3–29.0) to 34.3% (95% CI: 32.6–36.1) while VMMC uptake increased from 10.3% (95% CI: 9.2–11.5) to 17.6% (95% CI: 16.3–18.9) in 2016 and 2021, respectively. VMMC increased the most among 15–24 year-olds, from 14.0% (95% CI: 11.8–16.6) to 24.1% (95% CI: 22.0–26.1), and in the southern region, from 16.0% (95% CI: 14.0–18.3) to 29.0% (95% CI: 27.0–31.1). In terms of gaps in MPHIA 2021, VMMC uptake was lowest among males residing in urban areas, among populations with no education, and among those in the lowest wealth quintile [data not shown].

Conclusions: VMMC uptake in Malawi has increased over the five-year period, particularly among adolescent boys and young men. However, uptake is still low and below the national target of at least 60% among men aged 15–49. Increased investments and strategies targeting populations with low uptake in VMMC service may improve uptake in the country.

EPC0391

Increasing PrEP continuation amongst key populations in 10 Priority Geographical Area (PGAs) in Namibia

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Background: Providing information on the importance of Pre-Exposure Prophylaxis (PrEP) as an effective and preferred HIV prevention method is very essential in improving PrEP uptake as well as increasing high levels of PrEP continuation (PrEP_CT) amongst Key Populations (KPs).

The increase in numbers of individuals excluding those newly enrolled that return for PrEP refills with increased testing and treatment are crucial in reducing onward HIV transmission in the Priority Geographic Areas.

Methods: Intensive community screening for PrEP eligibility using the risk assessment (RACES) tool during case finding was employed and health education on PrEP was provided to Female Sex Workers (FSWs), Men who have Sex with Men (MSM) and transgender individuals (TGs). Conducted training on case management, basic counselling and PrEP for 30 Case Managers, 2 Project Officers, 4 Program Managers and 59 Peer Educators to enhance case management skills, including PrEP initiation and PrEP_CT. Conducted awareness raising on the benefits of PrEP to ensure correct PrEP messaging. Constant engagement of clients on PrEP through household visits, sending SMS reminders, phone calls and use of QuickRes online application to send reminders for the follow ups. Continuous mentorship and support to the Implementing Partners. Client escorts coupled with Health Care Workers (HCWs) sensitization meetings on KP-friendly health services, improved coordination with public health facility staff.

Results: The graph below shows PrEP_CT results from October 2021 to September 2022 for FSWs, MSM and TGs.



Conclusions: Multiple and coordinated interventions by devoted staff, systems strengthening, close collaboration with key KP-led organisations coupled with continuous engagement and conducive KP-friendly environment at public health facilities are essential for PrEP uptake and PrEP_CT for KPs at high risk of acquiring HIV.

EPC0392

Indications, adherence and outcomes of HIV Post-Exposure Prophylaxis (PEP) among users in military health facilities in Uganda

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Background: The use of HIV post-exposure prophylaxis (PEP) is effective in reducing the risk of HIV acquisition after exposure, but it is often underused due to limited information on its uptake.

This study assessed the indications for use, adherence to PEP medicines and outcomes among PEP users at military health facilities in Uganda.

Methods: We conducted a retrospective descriptive assessment using data collected from the Ministry of Health (MoH) Health Management Information System (HMIS) PEP registers at 9 purposively selected military health facilities in Uganda between October 2020 to September 2022.

We reviewed a total of 709 records from 9 health facilities and selected 679 records that showed completeness of data.

We assessed HIV status at baseline, 4 and 12 weeks after starting PEP. Treatment adherence was determined by self-report to full course of PEP drugs at week 4.

Results: Clients who received PEP services were mainly male (80%) with 81% aged between 20 - 39 years. The majority (73%) sought PEP for sexual exposure, 11% due to occupational exposure, and other exposures constituted 16%.

Findings indicate that 64% reported within 24 hours of exposure. While 99% of clients who sought consultation for PEP were initiated, only 57% had good adherence to PEP at 4 weeks, while 43% did not complete the course of treatment.

No clients seroconverted at the 4 and 12-weeks follow-up visit, however only 69% had a final HIV test done after 4 weeks and 52% at 12 weeks, the rest never returned for an HIV test.

Conclusions: We observed that PEP is a frequently used HIV prevention strategy among clients in military health facilities with sexual exposure being the most common indication for use. In those who reported back for follow-up testing, no new HIV acquisitions were detected among users, however follow-up testing rates and adherence are suboptimal.

There is urgent need to conduct a comprehensive assessment of sexual exposure risks and to determine barriers to PEP adherence and follow-up HIV testing at 4 weeks and 12 weeks among PEP users in military settings.

EPC0393

Peer-based model for reaching underserved MSM in Georgia

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Background: Annually, up to 5000 MSM are reached by prevention interventions and about 3000 MSM are tested on HIV either through facility-based or through self-testing approaches. However, majority of these interventions are concentrated in the capital as well as in several large cities of Georgia.

At the same time, according to the latest size estimation of MSM population, conducted in 2018, there are 18500 MSM in the country. It is obvious that quite a large proportion are still not reached by various interventions.

Some of the reasons for this could be: limited access to health-related interventions due to geographical limitations – living in rural areas; limited access to online resources and information; high levels of stigma and discrimination, especially obvious in smaller towns and villages.



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Description: Based on this, the project supported by CO-BATEST NETWORK developed and piloted peer-driven intervention to provide HIV information and Self-testing to hard-to-reach MSM groups in West Georgian regions of Imereti and Samegrelo. The main target was rural locations, where there is no outreach, and MSM are more hidden and hence underserved. Recruited peers from MSM population in targeted regions were trained on how to inform, counsel and offer HIV self-test to other MSM not previously reached and tested under existing prevention programs.

Lessons learned: From August till January, 2022, 201 rural MSM were reached with information and testing on HIV and linked to care. 200 participants were new to prevention programs and never tested.

All participants (100%) returned HIV self-test results. Test results notification in the ongoing prevention programs targeting MSM is 35%. Two tests results were found positive and both were referred to the nearest clinic providing antiretroviral therapy.

The project proved to be more effective in reaching and testing underserved rural MSM new to prevention/testing programs.

Conclusions/Next steps: As a result, the pilot intervention was described and tested, so that it can be replicated in other regions of the country and incorporated into national and/or GFATM-funded HIV prevention program targeting MSM population.

EPC0394

Pharmacokinetics and safety of long-acting islatravir and its novel prodrug islatravir alafenamide implants for HIV prevention

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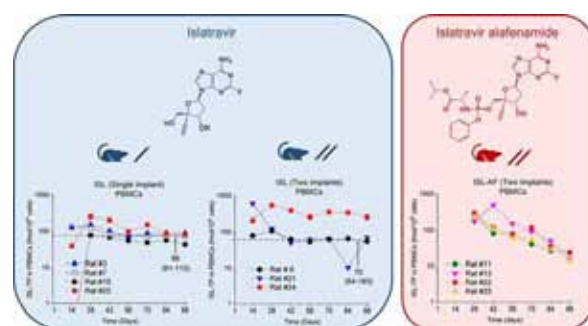
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Background: Sustained delivery of antiretrovirals (ARVs) for HIV pre-exposure prophylaxis (PrEP) can mitigate adherence challenges with existing on-demand regimens. Potent ARVs benefit long-acting systems by permitting lower effective dosing over longer durations between administrations.

We report findings on subcutaneous biodegradable implants for delivery of islatravir (ISL) or a novel ISL prodrug, islatravir alafenamide (ISL-AF). The potencies of ISL and ISL-AF were compared with *in vitro* cell studies and the safety and pharmacokinetic (PK) profiles of implants were assessed *in vivo* for 98 days.

Methods: Wild-type and mutant (M184V) HIV-1_{LAI} were assayed for susceptibility to ISL and ISL-AF using TZM-bl cells. Implants comprised ϵ -polycaprolactone containing ISL or ISL-AF formulations. Female Wistar rats received one ISL, two ISL, or two ISL-AF implants that were inserted contralaterally via trocar on the dorsal side. Plasma and PBMC sampling occurred at day 0 and biweekly thereafter until implant removal on day 98.

Results: Wild-type HIV-1 and HIV-1 with M184V had approximately 78-fold and 48-fold reduction in susceptibility to ISL-AF, respectively compared to ISL in the TZM-bl phenotyping assay. ISL implants were well-tolerated without signs of inflammation, swelling or erythema for the study duration. The active metabolite ISL-triphosphate (ISL-TP) was detected in PBMCs for all implant configurations with median values of 86 (81-110) for the single ISL implant, 70 (64-163) for two ISL implants, and 241-20 fmol/10⁶ cells for two ISL-AF implants. Purity was assessed post-implant removal and revealed high purity for ISL (~97%) and ISL-AF (~92%).



Conclusions: This work showed the safety and PK profiles of implants containing either ISL or the novel prodrug ISL-AF. While sustained levels of ISL-TP were observed over 3 months, ISL-AF exhibited declining PK profiles *in vivo* and higher IC₅₀ values in viral susceptibility studies. Our results support the continued advancement of long-acting delivery implants for HIV PrEP.

EPC0395

Parrying the pitfalls of PrEP: preventing premature PrEP discontinuation and STIs among men who have sex with men

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Background: The US HIV epidemic disproportionately impacts MSM; PrEP is a key prevention service. However, PrEP use among eligible MSM is below what is needed to substantially reduce new HIV transmissions. Research with MSM in Atlanta has demonstrated risks for PrEP discontinuation: incident STIs, change in sex partners, and anxiety or depression.



Offering a flexible menu of prevention choices, including offering STI post-exposure prophylaxis and options to change prevention choices over time, might increase PrEP uptake and persistence.

Methods: Project PEACH is a PrEP implementation study of MSM aged 18-45 in Atlanta. Men are offered PrEP options (daily oral and 2-1-1) and Doxy-PEP for STIs at baseline and are reoffered all prevention options 3-monthly for 24 months of followup. Participants on PrEP use a mobile phone app to proactively identify of risks for PrEP discontinuation; when discontinuation risks are identified, a motivational interviewing (MI) session is offered.

Participants can switch prevention options by indicating their interest during MI sessions or short monthly surveys, or by contacting study staff. Uber rides to study visits are provided to men expressing concerns about transportation.

Results: Among 141 MSM enrolled (72% Non-Hispanic Black, 14% Non-Hispanic White, 11% Hispanic, median age 29), 135 (96%) chose a baseline prevention option: 92% PrEP (+/- STI PEP) and 8% STI PEP only. Of 124 PrEP users, initial choices were 95 (77%) daily PrEP and 29 (23%) 2-1-1 PrEP. 12 participants have subsequently changed prevention options.

The most common reasons for changing are changes in risk behavior and not wanting to take daily pills. There have been 113 MI sessions.

Conclusions: Implementation-focused studies aimed at preventing premature PrEP discontinuations and averting STIs with a coherent approach are needed. Preliminary data indicate that multiple PrEP options and ongoing support through MI are acceptable to MSM. Offering men the option to change PrEP modalities allows them to align their PrEP choices with their evolving risks and preferences.

Offering of prevention options, the targeted use of MI, prevention navigation and steps to mitigate barriers to care (e.g., transportation challenges) are likely requisite to support optimal PrEP uptake and persistence among MSM in the US South.

EPC0396

HIV and Syphilis co-infection among pregnant women attending ANC in Tanzania mainland

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Background: HIV and Syphilis infections interact, and co-infection during pregnancy increases the risk of vertical transmission of HIV and adverse outcomes of pregnancy. We determined the burden of HIV and Syphilis co-infection among pregnant women attending antenatal clinics (ANCs) in Tanzania mainland.

Methods: The ANC surveillance was conducted from September to December 2020 in 159 ANC sites from all 26 regions of Tanzania's mainland and included all pregnant women aged 15 years and older on their first ANC visit in the current pregnancy during the survey period. Routine HIV and Syphilis counseling and testing using HIV& Syphilis Rapid Duo tests were done at the facilities according to the national guidelines.

Analyses were conducted using Stata 17 and accounted for the survey design of the study. Summary descriptive statistics were used and logistic regression methods were used to examine the independent predictors of HIV& Syphilis co-infection. The level of statistical significance was set at $p < 0.05$.

Results: Of the 39,516 pregnant women included in the 2020 ANC surveillance, 38,783 (98.1%) consented to participate in the surveillance. HIV was prevalent in 2,456 (5.9%) and Syphilis was prevalent in 582 (1.4%). The prevalence of HIV and Syphilis co-infection was 0.4% (0.3%- 0.5%). There was regional variability with the highest prevalence recorded in the Njombe region (1.6%), while none was recorded in the Manyara region.

Women with 1-2 previous pregnancies had 2.5 times higher odds of HIV& Syphilis co-infection than primigravidas (aOR 95% CI: 1.4- 4.7). Women with no formal education and those with only primary education had 3.5 (aOR 95%



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CI: 1.9-6.6) and 2 (aOR 95% CI: 1.2- 3.4) times higher odds of HIV& Syphilis co-infection respectively, compared to women with secondary education.

Conclusions: HIV& Syphilis coinfection in pregnancy is prevalent in Tanzania, especially among pregnant women with no and lower levels of education and those with 1- 2 previous pregnancies. To reduce the risk of vertical transmission of HIV and Syphilis and to improve pregnancy outcomes in Tanzania, continued efforts are needed in screening and treatment of HIV and Syphilis in pregnancy.

EPC0397

Real-world effectiveness of HIV pre-exposure prophylaxis in key and priority populations receiving HIV services from private-not-for-profit health facilities in Uganda: a retrospective cohort study

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Background: Pre-exposure prophylaxis (PrEP) is an evidence-based HIV prevention intervention with reported efficacy from randomized clinical trials ranging from 86% to 93%. We found few observational studies that have reported on research-based effectiveness of PrEP.

The objective of this study was to describe the effectiveness of PrEP in a Uganda cohort of key and priority populations at increased risk of acquiring HIV, using program data from PNFP health facilities.

Methods: We conducted a retrospective cohort study using data of clients who sought HIV services between October 2015 and September 2022 at private-not-for profit health facilities and organizations under the USAID Local Service Delivery for HIV/AIDS Activity. Data was obtained from the online key population tracker. We obtained data on age, sex at birth, population category, date of registration, date of last follow-up, baseline HIV test result, HIV result at last follow up date, PrEP screening at baseline and PrEP initiation at baseline. We only included clients with a negative baseline HIV test result. We determined the risk of acquiring HIV in relation with PrEP initiation using Cox proportional hazards regression adjusting for age category, sex at birth and population category. Data was analyzed using STATA v15.

Results: The analysis included 19,063 clients. Median time in care was 3.4 months (IQR 1.1 to 7.1). Over half of these (55%) were female at birth, over 80% were aged 15 to 34 years and 43% were sex workers. All were screened for PrEP at baseline, of whom 17,350 (91%) were eligible for PrEP. Of these, 15,811 (91%) initiated PrEP.

Overall, 25 of the 19,063 clients (0.13%) seroconverted. Of these, 19 (76%) were female, 14 (56%) were aged between 25-34 years, 14 (56%) were sex workers and 14 (56%) were on PrEP. The risk of acquiring HIV among those ever initiated on PrEP was reduced by 98.6% compared to those who never initiated PrEP, adjusted hazards ratio 0.014 (p<0.001, 95% CI 0.006 to 0.032).

Conclusions: PrEP is an effective HIV prevention intervention that should be scaled up if we are to end HIV as a public threat by 2030.

EPC0398

Evaluation of a community-based model for PrEP services among bar patrons in rural South Africa

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Background: Despite substantial advancement in HIV services in South Africa, low engagement persists among subpopulations such as young adults who engage in risky/hazardous alcohol use. Therefore, we piloted a community-based HIV service delivery model in rural KwaZulu-Natal, South Africa. Male nurses visited shebeens (alcohol venues) to provide HIV testing and prevention services, including pre-exposure prophylaxis (PrEP). After 4 months, participants were transferred to primary care clinics¹. We evaluated participants' experiences with the program, including perceived benefits, barriers, and future suggestions.

Methods: Participants were recruited through purposive sampling and underwent in-depth interviews using a semi-structured interview guide. Interviews were conducted virtually and continued until thematic saturation was achieved. Inductive thematic analysis was performed.

Results: All participants (n=20) were highly satisfied with community-based HIV testing and PrEP provision. Most reported good adherence, with lapses due to travel and alcohol use. Factors supporting adherence included daily routines, rapport with community nurses, and social support. Motivating factors for testing and PrEP initiation included desire to mitigate risky behaviors, encouragement from peers, and satisfaction with community nurses. Barriers included stigma (PrEP mistaken for ART) and complacent attitudes towards HIV.

Only 4 participants successfully transferred to clinic-based care to continue PrEP. Attrition was due to structural and cultural barriers. Structural barriers included clinic queues, travel distance, time-consuming appointments, and inconvenient clinic hours. Cultural barriers included gender norms that discourage clinic attendance among men and unwelcoming clinic environments (mistrust, negative interactions with female nurses). Cited advantages of community-based PrEP were structural (conve-


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nience, care continuity) and cultural (preference for same-gender community nurses, avoiding stigma of clinic attendance). A few participants reported privacy concerns (peer-pressure to disclose test results, pills/home visits mistaken for ART by friends/family/partner(s)).

Participants' suggestions included visiting additional sites (schools, churches), improving privacy (unmarked cars for home visits), assisting with disclosure to family/partner(s), and implementing PrEP ambassadors. Some supported monthly injectable PrEP, while others feared needles.

Conclusions: Novel community-based delivery models for implementing PrEP such as visiting shebeens can complement existing clinic-based services. Providing gender-concordant nurses, convenient services, and disclosure support to family/partner(s) can successfully engage young adults who consume alcohol in HIV testing and PrEP.

EPC0399

Associations between PrEP use, HIV risk behaviors, and perceived HIV risk among fisherfolk in Siaya County, Kenya: a cross-sectional multilevel analysis

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Background: Fishermen are a high priority population in Kenya to reach with oral PrEP, as risk of HIV acquisition is high, and their mobility disrupts uptake of health services. To optimize HIV prevention efforts and reduce HIV transmission in fishing communities, we must understand the relationship between fishermen's risk perceptions, HIV risk behaviors, and PrEP use.

Methods: Baseline survey data were collected in 2022 from 712 adults in 3 fishing communities in Siaya County, Kenya, in the ongoing 'Owete' trial (NCT# NCT04772469). Mixed effects logistic regression models were used to examine associations of self-reported PrEP use in the past 6 months with

1) HIV risk perception (none/low vs moderate/high), and 2) selected high-risk behaviors (partnership concurrency, higher-risk partnerships (e.g., commercial sex workers), hazardous drinking), controlling for age, education, occupation, and wealth, with random intercepts for community and social-network clusters.

Results: Median age was 37 years [IQR:31-44], 86% were married, 12% reported higher-risk partnerships, and 3.9% reported using PrEP. In bivariate analyses, partnership concurrency (odds ratio (OR):2.61; 95%CI:1.56,4.37), higher-

risk partnerships (OR:1.65; 95%CI:1.14,2.39), and condom use (OR:3.76; 95%CI:1.07,13.21) were associated with higher odds of PrEP use. In adjusted models, only relationship(s) with higher-risk partners remained associated with PrEP use (adjusted OR:1.98; 95%CI:1.45,2.70). Perceived HIV risk, hazardous alcohol use, and partner concurrency were not associated with PrEP use.

Characteristic	N (%)	Bivariate association OR (95% CI)	Model 1: Perceived HIV risk aOR (95% CI)	Model 2: Partner concurrency aOR (95% CI)	Model 3: Higher- risk partnerships aOR (95% CI)	Model 4: Hazardous alcohol use, aOR (95% CI)
PrEP use, past 6 mos. (ref: no)	28 (3.9%)		0.51 (0.04,5.77)	1.83 (0.31,3.88)	1.88** (1.40,2.70)	1.03 (0.50,2.12)
Age category (ref: 20-29)						
10-19	311 (43.7%)	0.84 (0.38,1.90)	1.21 (0.41,3.50)	1.2 (0.38,3.79)	1.21 (0.41,3.50)	1.21 (0.41,3.50)
20-29	170 (23.9%)	0.67 (0.20,1.94)	0.84 (0.14,4.93)	0.84 (0.14,4.93)	0.84 (0.14,4.93)	0.82 (0.16,4.32)
30 or older	95 (13.3%)	0.19 (0.03,1.14)	0.23 (0.01,4.78)	0.23 (0.01,4.78)	0.22 (0.01,4.90)	0.22 (0.01,4.78)
Education (ref: none to some primary)						
Primary	229 (32.3%)	1.51 (0.87,2.64)	1.16 (0.66,1.95)	1.21 (0.64,1.82)	1.21 (0.64,1.87)	1.32 (0.61,1.94)
Some secondary or higher	227 (32.0%)	0.9 (0.35,2.25)	0.72 (0.24,1.98)	0.94 (0.40,1.98)	0.82 (0.36,1.77)	0.9 (0.42,1.93)
Fishing occupation (ref: non-fishing occupation)	605 (85.0%)	0.79 (0.24,2.64)	0.68 (0.09,5.15)	0.89 (0.22,3.80)	0.84 (0.20,3.51)	0.89 (0.21,3.84)
Wealth quintile (ref: third)						
Lowest	140 (20.0%)	0.41 (0.04,3.80)	0.32 (0.03,3.08)	0.51 (0.05,5.88)	0.49 (0.05,4.95)	0.49 (0.05,4.95)
Second	124 (18.2%)	0.19 (0.01,1.88)	0.13 (0.01,1.88)	0.14 (0.01,1.98)	0.12 (0.01,1.94)	0.13 (0.01,1.91)
Fourth	126 (18.2%)	0.84 (0.14,5.18)	0.56 (0.03,8.82)	0.79 (0.12,5.34)	0.81 (0.13,5.29)	0.81 (0.12,5.30)
Highest	140 (20.0%)	0.88 (0.17,5.72)	0.77 (0.17,3.51)	0.9 (0.23,3.66)	0.85 (0.22,4.01)	0.88 (0.23,4.14)

Notes: Models are mixed-effects logistic regression models in a study population of n=712 men, n=712 of whom were sexually active in past 6 months. Models adjusted for age, education, occupation, and wealth. Missing status was removed from multivariable models because of low cell counts. OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval. * p<0.05, ** p<0.01, *** p<0.001.

Table 1. Bivariate and multivariable associations with PrEP use in the past 6 months among men residing in 3 Kenyan fishing communities (N=712).

Conclusions: PrEP use was low despite availability in government clinics at baseline of an intervention study among men in Kenyan fishing villages. PrEP use was associated with higher-risk sexual partnerships, but not reported HIV risk perception. Targeted promotion of PrEP is needed to increase uptake and reduce HIV acquisition among fishermen.

EPC0400

Voluntary Medical Male Circumcision related Adverse Events in South Africa: no room for complacency

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Background: Voluntary Medical Male Circumcision (VMMC) is a biomedical Human Immunodeficiency Virus (HIV) prevention modality being scale-up at high volume in countries with high HIV prevalence and low circumcision saturation. This is following clinical trials that proved that VMMC reduces the risk of HIV infection by 60% and further studies that demonstrated the efficacy of VMMC post clinical trials. Being a minor permanent surgical procedure, VMMC can be associated with very serious adverse events (AE) including deaths if performed by untrained personnel or in unsterile environment. We describe the types and prevalence of AEs in large scale VMMC program in SA.

Methods: This was a retrospective cross-sectional descriptive study that involved review of a high volume VMMC program data in 15 districts supported by Right to Care (RTC) in South Africa from April 2018 to September 2022 under CDC funding. Data was collected using standard RTC and National Department of Health (NDOH) VMMC data tools. This data was captured into a cloud-based M&E system with restricted access, extracted in excel format. Descriptive analysis was done, and associations were done using multivariate analysis using stata 16.1.



Results: Among 385,855 males that were circumcised by RTC during this period, 6096 AEs were identified, reported and managed. Majority of the AEs 5,919 (97.10%) were mild, with 118 (1.94%) moderate and 59 (0.97%) severe.

Among the severe AEs, 12 (20.34%) were notifiable. Intra-operative AEs were 4,335 (71.11%) and 1,761 (28.89%) were post-operative. Bleeding was the most identified AE 6,003 (94.15%) followed by infection 246 (3.86%), swelling 47 (0.74%), and wound disruption 24 (0.38%) respectively.

The districts with higher number of VMMC done reported highest number of AEs (Nkangala: 117,092 VMMC Vs 2,325 AEs, Amathole: 49,966 VMMCs Vs 2,899 AEs). 70% of AEs were among 15-34 age group.

Conclusions: Active AE monitoring and reporting is vital for VMMC program especially in high volume settings. High number of VMMCs are associated with high number of AEs. Bleeding related AEs remain the commonest and measures need to be put in place to capacitate clinicians in basic surgical skills and appropriate use of diathermy.

EPC0401

Effect of caregiver provided sexual reproductive health message on delayed sexual debut and safer sex practices among adolescents in HIV high burden communities, Benue State Nigeria

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Background: HIV infection rate among adolescents in Nigeria have increased steadily over the last half decade, with unprotected sex with an infected person being a major cause. Although national programs are in place, which ensure access to Sexual Reproductive Health (SRH) information and materials, they are mostly delivered by healthcare workers who adolescents seldom go to, teachers or religious instructors they avoid; for fear of being judged or by peers who often have low knowledge. Thus, adolescents continue to engage in risky activities that expose them to HIV, and at earliest ages.

The objective of this study was to analyze the effectiveness of caregiver provided sexual reproductive health messages on delayed sexual debut and safer sex practices among adolescents as a means of HIV prevention among this vulnerable population.

Description: 1,912 caregivers in three HIV high burden communities in Benue having a total of 5,760 adolescents age 9-17, were mobilized between October 2020 to August 2021. In-depth interviews were conducted for the adolescents using pre-designed questionnaire to ascertain their

involvement in sexual activities, while caregivers were reached with a 7 weeks course on their roles as primary communicators of sex and sexual values to their adolescents, by 51 Facilitators. Caregivers also received manuals containing homework assignments to help initiate delivery of SRH messages to their adolescents. Adolescents were re-interviewed after one year following receipt of SRH messages and data was analyzed using descriptive and summary statistics.

Lessons learned: For 1,510 (26%) adolescents yet to have sexual debut, knowledge of HIV in their community 272 (18%), considerations of family values on sex 362 (24%) and parenting plan for handling pressure 876 (58%) were identified as key abilities that helped them withstand factors driving vulnerability to sexual involvement, resulting to further delay of sexual debut. While for 4,250 (74%) sexually active, 3,910 (92%) accounted that they are now able to negotiate for safer sex from skills learnt from their caregivers.

Conclusions/Next steps: The study revealed that caregiver provided sexual reproductive message is effective in delayed sexual debut and safer sex practices among adolescents. Program interventions, which will strengthen caregiver's knowledge, skills and comfort level is highly recommended.

EPC0402

Acceptance of PrEP and Reasons for discontinuation among key populations in Cameroon: The CHAMP Project

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Background: In Cameroon, HIV prevalence among female sex workers (FSW) and men who have sex with men (MSM) was 24.3% and 20.7%, respectively, compared to 2.7% in the general population (DHS 2018). With support from USAID/PEPFAR, PrEP services have been added to Cameroon's HIV National Strategic Plan in 2019 for key populations served by the CHAMP project with the hope of scaling up after rigorous evaluation.

Methods: Data used were collected from routine program data from June 28, 2019, to October 31, 2020, from MSM and FSW in the CHAMP project. Eligibility criteria were MSM and FSW at least 21 years old, HIV-negative with high-risk sexual behavior. PrEP uptake was calculated as the proportion of eligible individuals who were initiated on PrEP. PrEP retention was determined at 3 months, 6 months, and 12 months. PrEP discontinuation was considered a formal discontinuation with no resumption during the data collection period. The program data collection tools were used to capture the reasons for PrEP discontinuation.


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Results: PrEP eligibility was assessed for 3851 beneficiaries (1382 FSW and 2469 MSM). At the end of the evaluation, 82% of FSW (1128) and 81% of MSM (2010) were eligible. 1409 beneficiaries were started on PrEP (61% FSW and 36% MSM). Retention on PrEP was 37% at three months, 28% at six months, and 19% at month 12.

The major reasons physicians decided to formally discontinue PrEP were: multiple missed appointments (19%), out of stock or expired medication (17%), non-compliance (11%), serious adverse side effects (3%), seroconversion (2%), and allergic reaction (2%).

The major reasons for clients' decision to officially stop PrEP were: medication side effects (14%), relocation or geographic mobility (11%), no exposure to significant risk factors (11%), no reason/loss of motivation to continue (8%), and numerous follow-up visits (5%).

Conclusions: PrEP is an important strategy. Good retention on PrEP requires protocols that have fewer side effects as well as long-acting preventive methods while enhancing continuous education during PrEP use, and integration of mHealth services for easy follow-up.

EPC0403

Awareness and intention to use event-driven and long-acting injectable pre-exposure prophylaxis among adolescent and young men who have sex with men and transgender women in Brazil

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Background: Prevention strategies such as event-driven oral pre-exposure prophylaxis (ED-PrEP) and long-acting injectable PrEP (LAI-PrEP) are emerging as alternatives for adolescents from populations more vulnerable to HIV.

We aimed to investigate the awareness and associated factors to intention to use ED-PrEP and LAI-PrEP among adolescents and young men who have sex with men (AYMSM) and transgender women (AYTGW).

Methods: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study of AYMSM and AYTGW aged 15–19 in Brazil. For this cross-sectional analysis, we included 597 adolescents enrolled in the cohort from December 2020–March 2022 in the Salvador and São Paulo sites. The outcome variables were the intention to use ED-PrEP and to use LAI-PrEP.

The explanatory variables were socio-demographics, sexual behavior, discrimination and violence, and previous use of daily oral PrEP. Descriptive statistics were carried out, and multivariate analysis was conducted to estimate adjusted odds ratios (aOR) and 95% confidence intervals (95%CI).

Results: Only 15.3% and 18.0% of the adolescents were aware of the ED-PrEP and LAI-PrEP options, respectively. Regarding intention to use, 56.4% and 81.5% reported ED-PrEP and LAI-PrEP, respectively. Adolescents with low adherence to daily oral PrEP were more likely to intend to use ED-PrEP (aOR=2.30; 95%CI:1.04–3.08). Those who reported consistent or frequent condom use in insertive anal sex with steady or casual partners were less likely to intend to use ED-PrEP (aOR=0.37; 95%CI:0.15–0.90).

As for LAI-PrEP, those with middle (aOR=1.93; 95%CI:1.05–3.53) or low socioeconomic status (aOR=3.13; 95%CI:1.30–7.51) and those who reported three or more casual partners in the previous three months (aOR=2.25; 95%CI:1.30–3.89) were more likely to intend to use LAI-PrEP. Adolescents who never used daily oral PrEP (aOR=0.31; 95%CI:0.11–0.92) were less likely to intend to use LAI-PrEP.

Conclusions: AYMSM and AYTGW in Brazil reported a low awareness and high intention to use LAI-PrEP over ED-PrEP. Their sexual behavior pattern and previous experience using daily oral PrEP strongly influenced their intention to use the method.

Making different modalities available could increase PrEP uptake and may be a potentially good option for adolescents who have not adapted to daily oral PrEP.

EPC0404

PrEP uptake, modality and sources in Aotearoa New Zealand: findings from national bio-behavioural surveillance

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Background: New Zealand (NZ) was one of the first countries worldwide to publicly fund PrEP in 2018 for populations at elevated risk of HIV. Despite early access and the low cost of PrEP (NZD \$5 for 3 month's supply), NZ has limited data on PrEP awareness, uptake and modality, that present barriers to implementation and eliminating HIV transmission.

We describe initial findings regarding PrEP among men who have sex with men (MSM), the population most affected by HIV in NZ.

Methods: We analysed data from the 2022 Sex and Prevention of Transmission Study (SPOTS) - NZ's first national bio-behavioural surveillance among MSM since PrEP was funded. SPOTS was a purposive, online, voluntary study. Promotion occurred via mainstream and social media, dating apps, influencers, posters, and community organisations.



Questions included PrEP awareness, use, prescriber type and procurement choice along with willingness for future modalities including long-acting-injectables.

Results: Overall, 3838 participants completed the behavioural survey. The sample was the largest ever sample of all MSM bio-behavioural surveillance in NZ. Almost all (96.6%) respondents were aware of PrEP; 24.4% had taken PrEP in the preceding six months. Choice of PrEP modality was predominantly daily (74.7%), followed by event-driven (16.9%), and daily for a limited time (8.0%). Prescribers of PrEP were mostly in Primary care (61.2%), followed by sexual health specialists (35.6%). Most (91.3%) respondents procured PrEP through pharmacies with public subsidy and only a minority (1.3%) purchased PrEP online from an international provider. Half of all participants (49.0%) reported willingness to use daily PrEP in the future, 37.4% were willing to use event-driven PrEP, and 48.5% to use a long-acting injectable form of PrEP. Only 11.5% of respondents indicated they would not be willing to use any form in the future.

Conclusions: PrEP awareness is high among MSM in this national online sample in NZ. Daily oral PrEP use is the dominant modality with prescribing and dispensing being largely through primary care; this indicates the significance of culturally competent primary care. A minority import PrEP from overseas. This data will inform NZ's PrEP Cascade, a country-level indicator to monitor PrEP delivery and equity.

Results: Results show that five clinics (12.5%) offered PrEP services, four (10%) offered referrals to other clinics for PrEP services, and four (10%) coordinated initial visits for PrEP. Clinics offering PrEP indicated an average of 228 (± 242) participants on PrEP. Four (10%) were Primary Healthcare Centers, and one (2.5%) was a community-based organization.

SMM provided insight into current challenges faced in accessing PrEP. SMM reported learning about PrEP from friends (39%) or social media (35%). Most of them resided in the main metropolitan area of PR (47%).

One SMM mentioned: "the whole process [to start PrEP] takes a long time". Others mentioned: "my provider didn't know about PrEP" and "[provider] didn't want to prescribe me PrEP".

Another SMM mentioned: "my medical insurance didn't cover PrEP". A HCP mentioned: "the [public] clinic is not ready for that [offering PrEP]. I can only offer it to participants with private insurance".

Conclusions: Although initial strides have been taken to increase PrEP uptake among SMM in PR, we are a long way behind in having true availability of the prevention strategy. Structural barriers such as lack of readiness for PrEP services, poor knowledge from providers, and stigma still hinder PrEP services in PR.

More structural and policy efforts to support the strategy are needed to ensure those at risk can have proper access to PrEP.

EPC0405

PrEP in Puerto Rico: Are we there yet?

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Background: Pre-Exposure Prophylaxis (PrEP) is a highly effective medication to reduce the risks for HIV infection. PrEP uptake among Latinxs in Puerto Rico (PR) is the lowest in the United States (U.S.). Yet, this population continues to be highly impacted by the HIV epidemic. Despite the promising opportunity to reduce the number of new HIV infections, as of 2021, only 343 individuals were using PrEP in PR.

Methods: From 2018-2020, we conducted a multi-source mixed methods analysis to characterize the uptake of PrEP services among sexual minority men (SMM) in PR. Descriptive statistics and a thematic analysis were completed. A total of 40 HIV clinics provided data on the availability of PrEP services; 100 SMM completed an online survey; 12 healthcare providers and 14 SMM completed a semi-structured interview.

Sexual and reproductive health and HIV prevention

EPC0406

"Una never tire?" - Understanding the challenges and lived experiences of HIV-negative female sex workers accessing oral pre-exposure prophylaxis and post-exposure prophylaxis services in public healthcare facilities in Nigeria

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Background: Pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) are crucial HIV preventive interventions for sex workers. Nonetheless, even in clinical settings, female sex workers (FSWs) experience various challenges while accessing these services. Despite a number of studies on FSWs and PrEP and PEP use, there appears to be a dearth of literature documenting their felt challenges and experiences when accessing such services from healthcare facilities.



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Therefore, the purpose of this study was to explore the challenges and lived experiences of FSWs accessing PrEP and PEP in public healthcare facilities in Nigeria.

Description: The study participants were 65 female HIV-negative clients between the ages of 18 to 43 who were accessing PrEP and PEP in 3 public healthcare facilities in Abuja, Nigeria, and who identified as sex workers. Telephone interviews discussing PrEP and PEP access challenges were conducted with participants between July and October 2022, at their preferred times.

The interviews lasted between 25 and 30 minutes, and conversations were audio recorded, transcribed, and thematically analyzed.

Lessons learned: Ninety-nine percent (99%) of the FSWs revealed that healthcare providers (HCPs) violated their confidentiality, gossiped with colleagues about their work roles as sex workers, displayed judgmental attitudes, and used stigmatizing words and language on them.

About 82% reported unnecessarily coerced questioning, such as about the last sexual encounter, body count, and reasons for engaging in sex work; coerced HIV-testing; delayed and discriminatory treatment; and, in some cases, denial of access to services once they are discovered to be sex workers.

In addition, 69% of the participants reported stigma associated with PrEP and PEP usage, as some HCPs perceived FSWs requesting PrEP and PEP as „dirty“ people who have multiple partners, and have had sexual encounters with HIV-positive clients.

Conclusions/Next steps: To prevent new HIV cases, HCPs must lead the way in offering stigma-free services. Health programs addressing stigma and discrimination by HCPs should be implemented in order to increase stigma awareness among HCPs and create a welcoming environment for people at risk of HIV.

Furthermore, healthcare facilities should develop, enact, and monitor the implementation of policies that address stigmatizing attitudes among HCPs while also promoting client health and safety.

Methods: We are conducting a 24-month cluster-randomized non-inferiority trial across eight Rwandan districts. Sixty schools were randomized 1:1:1 to control or to one of two CyberRwanda models – self-service (tablet only) and facilitated (tablet plus facilitator).

Surveys were conducted with a random sample of 100 youth aged 12-19 per school at baseline and at midline (12 months) to assess CyberRwanda's effect on intermediate outcomes: FP/RH and HIV knowledge, attitudes/beliefs/norms, self-efficacy, and behavior.

Generalized linear mixed models with a random intercept per school were used to estimate prevalence differences (PD) with 95% confidence intervals (CI).

Results: 5,768 youth (51% female, average age: 16) were included in the midline analysis. Compared to control, both CyberRwanda models significantly improved: knowledge of emergency contraception (PD(SS): 0.07, 95% CI 0.03, 0.12; PD(F): 0.11, 95% CI: 0.06, 0.15), confidence in getting a partner to use contraceptives/condoms, and favorable condom beliefs (PD(SS): 0.05, 95% CI: 0.02, 0.09; PD(F): 0.06, 95% CI 0.03, 0.09).

The facilitated arm had significantly higher confidence in providing sexual consent (PD(F): 0.08, 95% CI 0.04, 0.12), favorable beliefs about FP/RH (PD(F): 0.07, 95% CI 0.03, 0.12), and past use of FP/RH services (PD(F): 0.05, 95% CI 0.02, 0.07) versus control; the self-service arm discussed contraception with partners more often (PD(SS): 0.06, 95% CI 0.01, 0.12). No differences were observed for HIV or fertility knowledge, condom use, and confidence in HIV testing or accessing contraceptives.

	CR SS (n=184)	CR F (n=185)	Control (n=186)	PD, 95% CI (SS vs. control)	PD, 95% CI (F vs. control)
Knowledge					
Fertility knowledge	221 (12.3%)	224 (11.7%)	232 (13.1%)	-0.01 (-0.03, 0.01)	-0.02 (-0.04, 0.00)
EC knowledge	1056 (55.4%)	1038 (53.2%)	917 (47.3%)	0.07* (0.03, 0.12)	0.11* (0.06, 0.15)
HIV knowledge	1048 (55.3%)	1037 (53.1%)	1004 (51.2%)	-0.03 (-0.06, 0.01)	-0.02 (-0.05, 0.01)
Self-efficacy					
Confidence in ability to give consent	1239 (65.2%)	1454 (76.2%)	1307 (68.1%)	0.02 (-0.02, 0.06)	0.08* (0.04, 0.12)
Confidence in ability to get partner to use contraceptives or condoms	1807 (95.1%)	1704 (89.4%)	1632 (85.2%)	0.03* (0.01, 0.05)	0.03* (0.01, 0.05)
Confidence in ability to access and use contraceptive services**	945 (50.3%)	945 (50.3%)	907 (48.3%)	0.02 (-0.03, 0.11)	0.04 (-0.04, 0.13)
Confidence in ability to get HIV test	1858 (98.3%)	1865 (98.6%)	1853 (97.4%)	0.00 (-0.07, 0.08)	0.00 (-0.07, 0.08)
Attitudes, beliefs, norms					
Favorable views on FP/RH service utilization	1074 (57.8%)	1104 (59.1%)	993 (53.2%)	0.04 (-0.01, 0.09)	0.07* (0.03, 0.12)
Favorable condom beliefs	1478 (77.6%)	1484 (78.5%)	1388 (72.5%)	0.06* (0.02, 0.09)	0.06* (0.03, 0.09)
Behavior					
Used FP/RH services in past 12 months	373 (19.8%)	529 (28.5%)	342 (18.2%)	0.01 (-0.01, 0.03)	0.09* (0.02, 0.07)
Ever use of condom***	296 (15.5%)	318 (17.2%)	261 (13.8%)	0.06 (-0.01, 0.12)	0.02 (-0.05, 0.09)
Discussed contraception with most recent sexual partner***	276 (14.7%)	296 (16.0%)	234 (12.4%)	0.06* (0.01, 0.12)	0.04 (-0.02, 0.10)

*Generalized linear mixed model with random slope controlling for district (unit of randomization).

Missing data for variables: Fertility knowledge (n=7), Confidence in ability to give consent (n=6), Favorable views on FP/RH service utilization (n=7), Favorable condom beliefs (n=6).

**Missing females only (CR SS: n=184; CR F: n=185; Control: n=186).

***Missing sexually active participants only (CR SS: n=185; CR F: n=186; Control: n=186).

EPC0407

CyberRwanda's pathway to impact: shifts in knowledge, self-efficacy, norms, and behaviors related to contraception, HIV, and childbearing

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Background: CyberRwanda, a direct-to-consumer digital health platform, aims to improve access to FP/RH information and contraception for adolescents in Rwanda using storytelling, interactive FAQs, and an online shop for confidential ordering of health products from youth-friendly pharmacies and health posts.

Conclusions: CyberRwanda may improve FP/RH knowledge, attitudes/beliefs/norms, self-efficacy, and behavior among Rwandan youth. Results will be reassessed to determine the interventions' effectiveness on the intermediate and primary outcomes at endline (24 months).



EPC0408

Prevalence of unmet need for family planning and unintended pregnancies among women of reproductive age living with HIV in sub-Saharan Africa: a systematic review and meta-analysis

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Background: The World Health Organization estimated that 61% of all unintended pregnancies end with induced abortions, 45% of which were unsafe. Family planning is an effective intervention for women living with HIV who do not desire to have children to reduce vertical transmission and infant and pregnancy-related mortality.

We aim to evaluate the prevalence of unmet need for family planning (UFP) and unintended pregnancies among women living with HIV in sub-Saharan Africa.

Methods: This was a systematic review and meta-analysis among women living with HIV. PubMed, Cochrane Library, Google Scholar, and CINAHL were searched from March 2007 to December 2021.

UFP was defined as women who were sexually active and did not desire to have additional children (unmet need for limiting), or who delayed their next pregnancy (unmet need for spacing) but were not using any contraceptive methods.

Forest plots were used to present the pooled prevalence and 95% confidence interval (CI). Analyses were performed in STATA.

Results: A total of 31 articles with 14,156 women living with HIV were included in the final analysis. Overall, the pooled prevalence of UFP was 29.1% (95%CI, 25.4–33.0) (Figure 1). Pooled prevalence of unmet need for spacing was 12.0% (95%CI, 8.9–15.5) and 14.3% (95%CI, 11.5–17.7) for limiting. Prevalence of UFP was higher in southern compared to eastern Africa (39.1% vs. 28.5%) and in studies done before 2010 compared to 2020+ (34.3% vs. 27.3%). The pooled prevalence of unintended pregnancy was 17.2% (95%CI, 9.0–27.2).

Conclusions: Nearly three in ten women of reproductive age living with HIV in Africa have UFP and this proportion has been consistent for the past 15 years. Given the illegal nature of abortion in most African countries, efforts to prevent unsafe abortions from unintended pregnancies are needed to minimize UFP among women living with HIV.

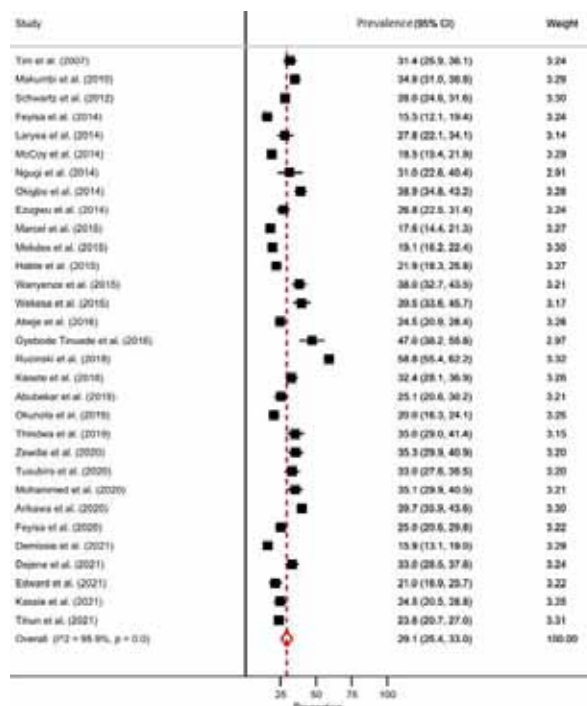


Figure. Prevalence of unmet need for family planning among women of reproductive age living with HIV in Africa, 2007-2021.

EPC0409

Role of health care workers in supporting mother mentors to address retention of mother-baby pairs in the global fund-supported regions. A case from Christian Social Services Commission, Tanzania

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Background: In the Prevention of mother-to-child transmission of HIV/AIDS (PMTCT), HCWs are responsible for providing health care to women and infants including reproductive health and family and infants living with HIV/AIDS including giving HIV/counseling, test result, provision of information about PMTCT options based on the Tanzania care health system.

Christian Social Services Commission in Collaboration with Amref Health Africa is implementing a three-year PMTCT Project under the support of a Global Funds grant covering eight regions (Arusha, Lindi, Pwani, Morogoro, Tabora, Shinyanga, Mwanza, and Geita) through a community model called mother mentors.

The objective is to improve the uptake and impact of PMTCT services in rural areas and non-supported health facilities in eight regions.

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Description: Trained 265 healthcare workers and 55 regional and council health management teams with mother mentors in eight regions for ten days based on the national PMTCT mother mentor's curriculum in June and July 2021.

The healthcare workers were selected from the supported 265 PMTCT health facilities, to implement the CSSC Global Fund PMTCT project in the supported regions.

Their roles were to supervise mother mentors and support the implementation of PMTCT activities in the targeted regions, to work side by side with the mother mentors at the facility and community level in the trucking of mother-baby pairs.

Lessons learned: After two years of implementation, we have observed 702 mother-baby pair retention in the 265 supported health facilities, Improved documentation of Mother mentors, and 446 clients were linked to Psychosocial and income-generating activities (PSAG).

In addition, 265 psychosocial and PSAG comprising 940 members were formed. All these have also contributed to increased male involvement in PMTCT-supported health facilities from 45% to 81%, improved PMTCT clinical quality of care services, and an increase of PMTCT clients in the supported regions.

Conclusions/Next steps: HCWs have a pivotal role to play in the provision of PMTCT services through the mother mentors' model toward the elimination of mother-to-child transmission is a concern. Their roles and responsibilities have a great impact on the retention of mother-baby care services in the PMTCT setting.

EPC0410

Missed HIV prevention opportunities among online sexual and gender minorities in India with low PrEP use and low perceived accuracy of U=U – results from a national cross-sectional survey

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Background: Sexual and gender minorities (SGM) using smartphones to seek partners in India are vulnerable to HIV acquisition as they are outside of the government's physical-hotspot-focused interventions. As an under-reached and under-researched population, little is known about the reach of HIV-related public health messaging and services for this population.

We investigated the coverage of contemporary HIV prevention strategies like daily Pre-exposure Prophylaxis (PrEP) and perceived accuracy of Undetectable=Untransmittable (U=U) among to identify the gaps and lost opportunities in the HIV prevention space for online SGMS in India.

Methods: We conducted online cross-sectional study (March-April 2022) of Grindr users across 33 states and union territories in India, including individuals ≥ 18 years who reported sex with men. Cisgender women were excluded. Associations with perceived U=U accuracy and PrEP use were estimated using adjusted prevalence odds ratios (aPORs) with 95% confidence intervals (95%CI).

Results: The median age of 3126 eligible participants who completed the survey was 28 years. 70.6 % (N=2206) identified to be from urban areas. 82.5% (N=2581) self-identified as male, rest identifying as transwomen, *hijra*, *Kinner* and other identities. The self-reported HIV prevalence in the sample was 3.1% (N=97).

7% (N=219) of participants reported ever using PrEP, which was associated with higher income ($>INR$ 62,000 aPOR 1.94 [95%CI 1.19, 3.14]), selecting English language for survey (aPOR 1.70 [95%CI 1.21, 2.40]), single relationship status (aPOR 2.35 [95%CI 1.45, 4.04]), and use of party drugs (aPOR 2.57 [95%CI 1.65, 3.93]).

After being provided with the correct definition of U=U, 25% (N=782) perceived it as completely accurate, which was associated with knowing their HIV status (HIV Negative aPOR 1.37 [95%CI 1.1, 1.71], HIV Positive aPOR 3.39 [95%CI 2.11, 5.46]), having awareness of PrEP (aPOR 1.58 [95%CI 1.29, 1.92]) or have used PrEP (aPOR 1.56 [95%CI 1.15, 2.12]) along with use of party drugs (aPOR 1.51 [95%CI 1.0, 2.10]) and attending LG-BTQIA+ events (aPOR 1.38 [95%CI 1.1, 1.73]).

Conclusions: With low perceived accuracy around U=U and low PrEP use, SGM using smartphones in India are missed by contemporary novel HIV prevention strategies. We recommend incorporating PrEP and U=U in programmatic interventions and adopting innovative digital strategies that could reduce stigma and promote HIV prevention.

EPC0411

Improving cervical cancer screening uptake at a high volume facility: a quality improvement project conducted at the AIDS Healthcare Foundation (AHF) Lamvelase Clinic, Eswatini

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Background: Eswatini had the highest incidence of cervical cancer (CxCa) at 84.5 cases per 100 000 in 2020, a prevalence of 34.3% among 15-49 years, and is the leading cause of female cancer in the country. The AHF Lamvelase clinic provides HIV care services to approximately 15000 clients, in Manzini region of Eswatini, 9800 (65.3%) of which are women aged >15 years. HIV positive women are at a higher risk of acquiring HPV and more likely to develop cervical cancer. Early detection and treatment of pre-cancerous lesions can reduce morbidity and mortality.



In 2020, AHF Lamvelase clinic only screened 9% (882/9800) of WLHIV >15years. In March 2021, we implemented a quality improvement project (QIP) to increase CxCa screening of eligible women from 9% to 60% by September 2022.

Description: A QIP team conducted a fishbone analysis and process flow analysis to identify root causes for low CxCa screening. Using pareto analysis, the following major root causes were identified; Inadequate provider training, ineffective client process flow, difficulty in identifying files of eligible clients, weak referral system to cryotherapy and LEEP, inconsistent documentation and lack of CxCa knowledge among clients.

The QIP team used the model of improvement and implemented changes using Plan-Do-Study-Act (PDSA) cycles. Data were analyzed monthly to measure if changes were yielding improvement.

Lessons learned: Results improved from 9% in December 2020 to 68% by September 2022. The VIA positivity rate is 2.2% (76/3411), 88% (67/76) of positives were treated, while 12% (9/76) are recent cases being followed up to ensure linkage to treatment.

Training providers on CxCa screening, daily clients education on CxCa, integrating CxCa eligibility screening in routine HTS and TB eligibility screening, integrating CxCa screening within HIV service provision, use of stickers and separation of files of eligible clients improved the clients flow.

Conclusions/Next steps: Training, health education, process improvement and integration of CxCa services yielded significant improvement. The CxCa screening standard operation procedure has been adopted to maintain and further improve uptake of the service to avert morbidity and mortality. However, to reach full coverage for a high-volume site (9800 women) like AHF, multiple screening rooms are needed.

EPC0412

Perceptions and Experiences of Daily and Long-Acting Pre-Exposure Prophylaxis (PrEP) among men having sex with men (MSM) in India – a qualitative interview study

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Background: Oral pre-exposure prophylaxis (PrEP) and long-acting injectable (LAI) PrEP are effective HIV prevention strategies and a high willingness to use oral PrEP among Indian men who have sex with men (MSM) has been reported. However, little is known about their real experiences with oral PrEP and perceptions of LAIs. We examined the motivators, barriers, and facilitators for PrEP use through in-depth interviews. Findings could inform demand generation and service delivery strategies for widescale PrEP uptake in India.

Methods: From February – July 2023, we purposively recruited participants (n=18) through active MSM social media networks in India who identified as MSM, were age 18 or above, and were either using or had used oral PrEP in the past. We conducted interviews via teleconferencing and coded transcripts according to interview topics. We summarized findings for each topic following a thematic analysis approach.

Results: All participants (median age 27.5 years, range 18 – 40) reported a high perceived risk of HIV, which was a key motivator for oral PrEP uptake. Most participants accessed PrEP through non-profit organizations, where doctor consultations and medications were either free or subsidized. Others used private practitioners.

Even with self-reported high adherence, participants expressed discontent with the requirement of having to take PrEP daily. Most participants used condoms concomitantly with PrEP, while a few preferred bareback sex. Affordability was a key decision-making value for PrEP continuation and method preference.

While participants could afford oral PrEP, they wished it was cheaper, which would also make it more accessible to the community at large. Most participants did not have prior knowledge of LAIs, but welcomed the intervention, alluding to cost and availability as key decision-making factors for switching to injectable PrEP.

Conclusions: Indian MSM adopted oral PrEP as an additional HIV prevention strategy to condoms through non-profit and private providers. However, for wider use of PrEP among the MSM community, cost, need for daily dosing and broader access remained significant concerns. PrEP should be offered at affordable cost through existing not-for-profit, private, and government channels to promote uptake and persistence. LAI PrEP options should be considered as part of existing HIV prevention programs.

EPC0413

Spatial auto-correlation of syphilis prevalence among young women in Central Uganda

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Background: Syphilis prevalence in Uganda is significantly higher among out-of-school than in-school females aged 10-24 years (2.6% vs 0.9%; p<0.001), and varies by region and rural/urban residence. We examined spatial variations and geographical clustering of syphilis prevalence among young women in Central Uganda.

Methods: We analyzed secondary data from a randomized trial evaluating the effectiveness of three partner notification approaches to antenatal syphilis (NCT02262390). Young women attending antenatal care in Kampala and Wakiso districts (Central Uganda) received syphilis and



HIV PCR testing at study enrollment. The primary outcome of this sub-study was spatial variation in syphilis prevalence by district administrative division.

We utilized spatial autocorrelation methodologies, including Global and Local Moran's I test, to map syphilis prevalence clusters. Local Indicator of Spatial Association (LISA) was used to establish relationships between clusters and neighborhoods. Data were analyzed using R Studio (version 4.2.2).

Results: In the analysis, we included 206 young women diagnosed with syphilis from 14 divisions: 125 (61%) and 81 (39%) from Kampala and Wakiso districts, respectively. The median age was 26 years (IQR: 23-29) and 12 (6%) were living with HIV. Syphilis prevalence was highest in the northern divisions of Kampala and Wakiso (Kawempe [73; 35%] and Kasangati [37; 18%]) and lowest in the southern divisions (Bunamwaya [2; 1%] and Ndejje [1; 0.5%]). Global spatial autocorrelation analysis revealed significant clustering of syphilis prevalence in northern and southern divisions (Moran's I=0.2, p=0.005). Local Moran's matrix found that most neighboring divisions had similar prevalence, except neighbors of Nabweru division in the north (p=0.02). LISA analysis confirmed high syphilis prevalence in northern divisions (Kawempe and Kasangati) (p=0.01).

By contrast, low and high prevalence areas clustered together in the southern divisions (p<0.001). Notably, syphilis prevalence varied across central divisions of Kampala and Wakiso (Rubaga [12%], Makindye [7%], Wakiso [4%], and Masajja [3%]) despite their geographical proximity (p>0.5).

Conclusions: Syphilis prevalence was similar among young women living in neighboring divisions of Central Uganda. Application of spatial analysis tools could enable detection and targeting of syphilis clusters with the goal of eliminating syphilis as a public health threat by 2030.

EPC0414

Strengthening provision of sexual and reproductive health knowledge and services to adolescent girls and young women through DREAMS in Nyamagana, Mwanza Region

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Background: Adolescent girls and young women (AGYW) are disproportionately impacted by HIV. UNAIDS 2021 data indicate that 6 of 7 new infections among adolescents in the region are in girls (15-24 years). In Mwanza region, FIKIA+ project experienced low uptake of sexual

and reproductive health services among AGYW, due to low knowledge, awareness, and access. This resulted in inadequate biomedical services coverage including HIV testing services (HTS), HIV self-test (HIVST) distribution, Pre-exposure prophylaxis (PrEP), and condom distribution.

Through implementation of DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored and Safe) in Nyamagana district, DREAMS peers were capacitated to provide of sexual reproductive health knowledge to participants with expansion of bio-medical services.

Description: ICAP engaged and trained 12 health-care workers (HCWs) from 11 health facilities (HF) to provide person-centered sexual and reproductive health education and services (SRHS) to AGYW in DREAMS community safe-spaces and health facilities.

HCWs provided HTS, HIVST, immediate linkage to anti-retroviral treatment services for those identified as HIV-positive, PrEP and condoms to DREAMS participants. ICAP recruited and trained 44 AGYW peers to sensitize and create demand for DREAMS services and uptake of biomedical services across all 18 supported wards in Nyamagana.

In addition, ICAP established adolescent and youth friendly services corners in mapped HFs to provide SRHS to AGYW during extended working hours including weekends, and public holidays for DREAMS participants.

Lessons learned: Enrollment into ICAP's DREAMS initiative increased from 1,371 in FY21 to 9,579 in FY22 with expanded uptake of sexual reproductive health and bio-medical services as shown in the table below.

Indicator	FY21	FY22
Enrolled in DREAMS	1,371	9,579
Received SRH sessions	1,038	7,419
FP Referrals	160	2,308
STI Referrals	124	772
GBV Referrals	80	196
Condom	26,591	93,227
HIVST	126	4,619
Newly diagnosed HIV positive	5	38
PrEP initiation	215	883

Conclusions/Next steps: Capacitated DREAMS peers and HCWs have potential to address gaps in knowledge, awareness, and access to sexual and reproductive health services through people centered services approach especially when coupled with layered primary and secondary services.

**EPC0415****Prevalence of sexually transmitted infections among HIV negative and HIV positive young women 18-24 years old in Mozambique**

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Background: In Mozambique, 11.8% of women 20-24 years old are living with HIV, compared to 3.8% of men in the same age group. Sexually transmitted infections (STIs) that cause genital ulcerations or inflammation can facilitate HIV transmission by increasing the infectivity of HIV-positive individuals and the susceptibility of HIV-negative individuals. Information about prevalence of STIs other than HIV and syphilis in Mozambique is largely unavailable.

Additionally, laboratory tests for most STIs are not widely accessible in the public health system and providers must instead rely on syndromic evaluations for diagnosis and treatment.

Methods: This study, conducted between August 2021 and September 2022 in four Mozambican health facilities within four provinces, utilized diagnostic tests to evaluate STI prevalence among 1,472 women aged 18-24 who self-reported STI symptoms and/or sexual risk behaviors. Molecular tests (GeneXpert® or Panther®) were used to detect chlamydia and gonorrhea. Trichomoniasis was tested using molecular (Panther®) or rapid testing. HIV, active or latent HSV2 (IgG/IgM) and syphilis were tested using rapid tests.

Results: Median age was 20 and 10.7% (n=158) of women were HIV-positive. Nearly one-third of HIV-positive women tested positive for chlamydia, trichomoniasis and/or gonorrhea, compared to 22% of HIV-negative women. When analyzed individually, all STIs other than chlamydia

were significantly more common among HIV-positive women than HIV-negative women (p=0.70 chlamydia; p<0.05 other STIs).

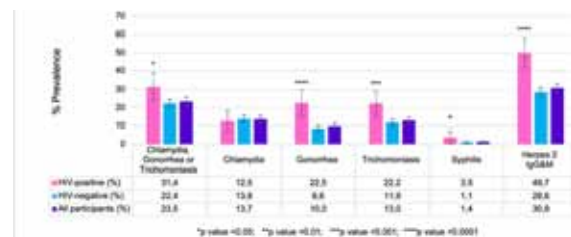


Figure. Prevalence of STIs among HIV+ and HIV- participants.

Conclusions: This study constituted one of the first efforts to estimate STI prevalence among young women in Mozambique using molecular and rapid tests. Prevalence of gonorrhea, trichomoniasis, syphilis, and HSV2 IgG/IgM was significantly higher among HIV-positive women compared to HIV-negative women.

Expanding access to STI testing for young Mozambican women with STI symptoms and/or at high risk of contracting an STI may reduce risks of HIV acquisition and transmission and improve STI diagnosis and treatment practices in the country.

EPC0416**Stigma and unfulfilled needs in sexual and reproductive health services for people who have sex between vulvas in Brazil**

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Background: Studies suggest that strategies to promote sexual and reproductive health often disregard people who have sex between vulvas. Although recent societal changes have partially improved acceptability and belonging for LGBTQIA+ communities, health services may still stigmatize and fail to meet the specific needs of these populations.

Methods: We used a self-completion electronic survey to obtain data concerning stigma experiences and access to sexual and reproductive health services among people who have sex between vulvas in Brazil.

Results: Between October 2022 to January 2023, 1508 consenting participants ≥18 years old were included in the study. Most were white/Caucasians (70%), and most (62%) reported per capita income ≥2 minimum wages. 83% identified as cisgender women, 10% as transgender men, and 7% as non-binary/queer. The percentage of participants reporting ever being tested for HIV, syphilis, hepati-


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tis B, and hepatitis C was, respectively, 78%, 74%, 72%, and 68%. Only 78% visited a gynecologist less than a year ago; 8% reported a last cervical cancer screening more than 3 years ago, and 23% reported never having done a cervical cancer screening. Only 43% of eligible participants reported being vaccinated for HPV. Among women ≥ 40 years old, 19% reported never having done a mammography. Information about prevention of sexually transmitted infections was obtained from healthcare providers for 46%; school or college for 19%; friends and family for 30%; social media for 63%; civil society organizations for 8%; and journals, magazines, and websites for 38%.

Only 14% reported that the information obtained in these sources was fully clarifying. Overall, 46% perceived stigmatizing attitudes from a healthcare provider due to their sexual orientation and/or gender identity.

Conclusions: People who have sex between vulvas still endure stigmatizing attitudes of health professionals, scarcity of targeted information concerning their sexual and reproductive health, and inadequate access to basic health services.

Interventions to reduce stigma and improve understanding about the specific needs of people who have sex between vulvas should be urgently implemented for healthcare providers in training. Health policies that prioritize this population could also support improvements in health outcomes for this population.

Population-specific interventions for HIV prevention

EPC0417

Met gender affirming care needs is associated with accessing HIV services among transgender people in a community-led clinic in Metro Manila, Philippines

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Background: There is limited uptake of HIV services among transgender people. Concurrently, gender-affirming care is inaccessible, such that some self-administer hormones or receive surgeries/procedures from unregulated providers. Both issues perpetuate health disparities on HIV and wellbeing.

We aimed to describe the characteristics and health-seeking intentions of transgender people who enrolled in a transgender community clinic in Metro Manila, Philippines.

Methods: We conducted a cross-sectional study among transgender adults who enrolled in Victoria by LoveYourself, an integrated HIV and gender-affirming care community-led clinic, from March 2017-December 2019. We stratified the sample to whether they initially accessed sexual health (i.e., HIV and/or HIV testing, treatment, or prevention) or gender-affirming care services (i.e., gender-affirming surgery/procedure assessment or hormonal therapy). We calculated the differences in proportions using Chi-square or Fisher exact tests.

Results: Of the 530 trans people enrolled in the clinic, 64.0% were trans men, 35.1% were trans women, and 0.9% were non-binary. Majority (82.5%) enrolled for the purposes of gender-affirming care, even though 47.9% and 30.0% reported of the analytical sample were already on gender-affirming hormonal therapy and have undergone at least one gender-affirming surgery/procedure, respectively. Of the 73 (13.8%) who initially accessed sexual health services, 91.8% were HIV-related consultations.

There were higher proportions of initially enrolling for sexual health services among trans women and non-binary people (p-value < 0.001), those who have sex with men (p-value < 0.001), those who have undergone gender-affirming surgery/procedure (p-value = 0.047), and those already on gender-affirming hormonal therapy (p-value = 0.001) (Table).

	Total (N = 530)		Initially accessed gender-affirming services (N = 437)		Initially access HIV services (N = 73)		p-value
	n	% col	n	% row	n	% row	
Age (years)							
18-24	246	46.4%	215	87.4%	31	12.6%	0.51
≥ 25 and above	259	48.9%	218	84.2%	41	15.8%	
Missing	5	0.9%	4		1		
Gender							
Trans men	339	64.0%	320	94.4%	19	5.6%	<0.001**
Trans women	186	35.1%	133	71.5%	53	28.5%	
Non-binary	5	0.9%	4	80.0%	1	20.0%	
Employment							
Not employed	130	24.5%	109	83.8%	21	16.2%	0.62
Employed	340	64.2%	293	86.2%	47	13.8%	
Missing	60	11.3%	55		5		
Location							
Metro Manila	323	60.9%	275	85.1%	48	14.9%	0.573
Outside Metro Manila	160	30.2%	140	87.5%	20	12.5%	
Missing	47	8.9%	42		5		
History of gender affirming surgery/procedure							
Received at least one surgery/procedure	159	30.0%	130	81.8%	29	18.2%	0.047*
None	366	69.1%	323	88.3%	43	11.7%	
Missing	5	0.9%	4		1		
History of gender affirming hormonal therapy (GAHT)							
Not on GAHT	273	51.5%	248	90.8%	25	9.2%	0.001*
On GAHT	254	47.9%	206	81.1%	48	18.9%	
Missing	3	0.6%	3		0		
Gender dysphoria							
No	20	3.8%	16	80.0%	4	20.0%	0.337*
Yes	499	94.2%	432	86.6%	67	13.4%	
Missing	11	2.1%	9		2		
Sex with a cisgender man							
No	334	63.0%	313	93.7%	21	6.3%	<0.001*
Yes	144	27.2%	97	67.4%	47	32.6%	

* significant at p-value < 0.05; * Fisher exact test

Table: Characteristics of transgender adults stratified by service accessed at initial point of care (N = 530)

Conclusions: Trans people who have met gender-affirming care needs were more likely to have accessed HIV-related services initially. Integrating gender-affirming care and HIV-related services provides an opportunity to address multiple health issues of transgender people holistically.



EPC0418

Comparing PrEP initiation rates among HIV-negative high-risk adolescents and young adults: a population-based prospective study in a high HIV prevalent district in South Africa

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Background: Pre-exposure prophylaxis (PrEP) is an effective HIV prevention intervention for people at high-risk of HIV such as adolescent girls and young women (AGYW) and adolescent boys and young men (ABYM). Various PrEP delivery approaches have been adopted in South Africa to overcome challenges that may hinder PrEP access and initiation among these populations. However, little is known about optimizing PrEP initiation for AGYW and ABYM.

This study investigated preferred and feasible PrEP models of care for improving PrEP initiation in a high HIV prevalent rural district.

Methods: We conducted a population-based prospective cohort study in 22 service delivery points (SDPs) from August 2021 to July 2022 in uMgungundlovu district, KwaZulu-Natal. Newly diagnosed HIV-negative, sexually active, high-risk, AGYW (15–24 years) and ABYM (15–35 years) were recruited at purposively selected PrEP SDPs (i.e., clinics, schools, and community-based youth zones). PrEP initiation, defined according to national guidelines, was extracted for each participant, and compared against local clinical records.

Association between demographic characteristics and PrEP initiation, stratified by SDP types were assessed using Pearson's Chi square test and a binomial regression model with a robust variance option.

Results: A total of 2772 HIV-negative AGYW and ABYM were recruited and 781 (28%) initiated PrEP, of which 82% were female (n=640) and 51% (n=402) were between 15–19 years. Non PrEP initiators (n=1991) were almost equally distributed by sex (females = 53%, n=1054 vs. males = 47%, n=937) and about half (52%, n=1045) were between 20–24 years.

Participants were 14 (95% CI: 5–38) and 37 (95% CI: 9–81) times more likely to initiate PrEP in youth zones and schools respectively compared to clinics (p<0.001). Females were four (95% CI: 3–6) times more likely to initiate PrEP than males in the different SDPs (p<0.001).

Conclusions: Preliminary findings suggest interventions aimed at improving PrEP initiation among AGYWs and ABYMs could prioritize service delivery at schools. Traditional clinic-based model may need refining to help improve PrEP initiation.

EPC0419

iPARTY: increasing Pre-Exposure Prophylaxis (PrEP) access and reach through telehealth for young men who have sex with men (YMSM) in Singapore

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Background: While PrEP services have been available in Singapore since 2016, PrEP uptake has been low amongst young men who have sex with men (YMSM) despite their greater risk of HIV infection and other sexually transmitted infections (STI).

The objective of this demonstration project is to evaluate the feasibility and acceptability of a PrEP teleconsultation service for YMSM.

Description: Self-reported HIV-negative YMSM between the ages of 18 – 29 years old were recruited in Singapore to partake in a 12-month demonstration project. Enrolled participants were provided and sponsored consultations, laboratory testing, and generic daily PrEP. Baseline and quarterly surveys were conducted to measure behavioural outcomes alongside HIV/STI results review and counselling.

Majority of the consultations with the PrEP physicians were conducted via a secure telecommunications platform (e.g., Zoom™), reducing the need for physical clinical visits.

Lessons learned: The cohort median age is 24 years old, with majority of the participants holding a university degree and 45.3% not employed full-time. Given that majority of the cohort earns little to no money, it is not surprising that cost is a major deterrent for YMSM in Singapore seeking PrEP or PrEP services, as previously published studies have found. 84.9% and 83.0% of participants had their sexual debut between the ages of 11 – 20.

Furthermore, 60.4% of participants had unprotected oral sex with at least > 6 partners in the past 6 months, while 69.8% and 37.7% had unprotected anal sex and group sex, respectively, in the past 6 months. This highlights the importance of developing PrEP services tailored to the needs of YMSM, as our cohort was found to be of relatively high



sexual risk. There were no technical issues or challenges encountered when conducting the telehealth services. Due to the convenience and acceptability of the service, all participants expressed high levels of satisfaction with their telehealth experience and thought the platform was appropriate for conducting HIV/STI counselling.

Conclusions/Next steps: Overall, a PrEP telehealth service appears to be feasible, acceptable, and in-demand among YMSM. However, more needs to be done to make PrEP more affordable and accessible to YMSM, especially given Singapore's lack of subsidy for PrEP and PrEP services.

EPC0420

Randomized trial of „fresh start“ SMS text messaging to improve return to care among people living with HIV who have missed scheduled clinic appointments in South Africa

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Background: Treatment interruptions are a barrier to successful antiretroviral therapy (ART) programmes. We aimed to test an innovative behaviourally-informed SMS intervention to increase return to clinic after a missed appointment. The message used public holidays to harness the „fresh start“ effect- the tendency of people to take action after temporal landmarks (e.g., new year), which signify a new time period and a clean slate going forward.

Methods: We conducted a randomized control trial in Capricorn District, South Africa, from June-July 2022. Using Tier.Net data (electronic clinic data), we included participants aged ≥ 18 years who had missed their ART appointment by >28 days with a valid cell phone number. All transfers out and deceased were excluded. Participants were randomized into:

- No SMS;
- Unframed SMS-no mention of a fresh start, and;
- Framed SMS explicitly stating the „fresh start“ potential of the public holiday.

Two messages were sent, 1 before and 1 after a public holiday.

The primary outcome was ART visit within 45 days of first SMS. Data was analysed using logistic regression. We report data for a public holiday.

Results: 6081/9630 participants who missed a visit were randomized into no SMS (n=3038), unframed SMS (n=1525), and framed SMS (n=1518). An ART visit occurred among 11.4% in no SMS group and 12.9% who received any SMS, (1.5% difference, $p=0.069$). An ART visit occurred among 11.9% and 14.0% in the framed and unframed SMS groups respectively (-2.1% difference; $p=0.083$). In multivariable analysis, ART visits were more likely among participants receiving any SMS versus no SMS (aOR 1.20 95%CI: 1.01-1.43); being on ART 6-12 months (aOR 2.18 95%CI: 1.42-3.33), and >12 months, (aOR 2.93 95%CI: 2.15-3.99) compared with <6 months. ART visits were less likely among those with treatment interruption duration ≥ 6 months (aOR 0.05 95%CI: 0.03-0.06) and those attending high-burden clinics (aOR 0.73 95%CI: 0.60-0.88).

Conclusions: SMSs sent around a public holiday increased return compared to no SMS. Framed messaging did not increase return compared to unframed messaging. SMSs were particularly effective in those with <6 months interruption duration. „Fresh start“ effect through public holidays shows potential and should be further investigated.

EPC0421

Increasing the uptake of PrEP services using quality improvement approach in Gulu Regional Referral Hospital - Northern Uganda

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Background: Pre-exposure prophylaxis (PrEP) is highly effective for HIV prevention. Globally there were about 940 000 people across 83 countries in the world who received PrEP at least once in 2020 (WHO, 2021).

In Uganda only 317968 people were initiated on PrEP (Global PrEP use Oct. 2022).

PrEP is one of the key prevention interventions in Uganda and in Acholi sub region to reduce HIV transmission. However, PrEP uptake remains low due to: perceived stigma, lack of awareness, and low risk perception are reasons that hinders uptake of PrEP, thus the reason for QI project at Gulu RRH.

Description: Problem Description

At Gulu Regional Referral Hospital, only 15% of PrEP eligible clients were being initiated on PrEP that this data is far way below the Ministry of Health and World Health Orga-



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nization standard that requires it to be at 100%, this was being attributed to by, weak linkage between the PrEP clinic and other Hospital entry points, Knowledge gap among staff, improper documentation.

Improvement Objective: To increase the proportion of PrEP eligible clients initiated on PrEP from 15% in April 2022 to 90% by 31st December 2022.

Methods used:

- Assigning PrEP focal Persons/ linkage facilitator at all the service as well as peer engagement at the different hotspots to walk with the identified clients from those services points to PrEP clinic for initiation.
- Weekly CEM at the PrEP and weekly clinical audit of files and registers.
- Integrating PrEP with other health services point within the facility.

Results: Results indicated an increase in PrEP initiated clients from 15% in April 2022 to 91% in October 2022.

Lessons learned:

- Assigning PrEP focal person / linkage facilitator at every service point is critical to improving initiation of PrEP eligible clients.
- Weekly clinical audit and CME is critical in promoting initiation of PrEP eligible clients.
- Good communication is critical in promoting uptake of PrEP and initiation of PrEP eligible clients.

Conclusions/Next steps: Use of PrEP linkage facilitator at all service points, Peer to peer engagement, Integration of PrEP with other health services and use of Assisted Partner Notification, increase PrEP initiation for the eligible clients.

EPC0422

HIV testing, prevention, treatment and medication-assisted therapy achievements for people who inject drugs in CDC/PEPFAR-supported countries, 2021-2022

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Background: People who inject drugs (PWID) face increased risk for HIV, but experience multiple challenges accessing HIV prevention, testing, and treatment services. These challenges often result from stigma, discrimination, and the criminalization of drug use, which limits their access to health services. Through the United States (US) President's Emergency Plan for AIDS Relief (PEPFAR), the US Centers for Disease Control and Prevention (CDC) has supported the delivery of HIV testing, prevention, and treatment services to PWID to address their disproportionately high HIV risk.

We describe the CDC's achievements in supporting HIV-related health services to PWID and their progress along the HIV clinical cascade toward reaching the UNAIDS 95-95-95 goals to end HIV by 2030.

Methods: Using PEPFAR's Monitoring, Evaluation and Reporting (MER) data, we describe the number and percentage of PWID receiving HIV testing, prevention, and treatment services delivered by CDC-funded and supported implementing partners (IPs) between October 2021 and September 2022 (fiscal year 2022) in 22 PEPFAR countries.

Results: In fiscal year 2022, CDC-supported IPs provided HIV prevention outreach for 55% (214,859) and HIV testing for 54% (191,178) of all PWID beneficiaries engaged in 22 PEPFAR countries. CDC-supported IPs contributed 56% (12,276) of new HIV diagnoses among all PWID and initiated 53% (16,865) of the HIV-negative PWID on PrEP. Furthermore, CDC-supported IPs linked 56% (11,322) of all HIV-positive PWID to antiretroviral therapy (ART).

CDC-supported IPs provided 75% (59,946) of total viral load testing among PWID in PEPFAR-supported countries; of those PWID tested for viral load, 96% were virally suppressed. Finally, CDC-supported IPs provided medication-assisted therapy (MAT) for at least 6 months to 90% (24,621) of all PWID in the 22 PEPFAR countries.

Conclusions: Despite the persistent structural barriers to access HIV services, CDC and its supported IPs in 22 PEPFAR countries have reached this marginalized population and provided substantial levels of medication-assisted therapy as well as HIV testing, prevention, and treatment services. CDC supports crucial service provision to PWID.

EPC0423

Program description of pioneer medication assisted therapy services in Kampala, Uganda, 2020-2022

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Background: The Uganda 2019 key population size estimate study indicated that Uganda had an estimated 7,356 people injecting drugs (PWIDs), 3,026 (41%) of whom reside in Kampala region (Kampala: 2,774; Wakiso: 252). In 2020, with funding from CDC-PEPFAR, the Infectious Diseases Institute (IDI) incorporated Medication Assisted Therapy (MAT) into the comprehensive package of HIV prevention and care services to PWIDs, aligned with WHO recommendations. We describe the MAT program and outline actions for service quality improvement.

Description: In 2020, Butabika National Referral Mental Hospital (BNMRH) became the first and to date only facility in Uganda to offer MAT. PWIDs are identified from hot spots through a peer support network and referred to community drop-in center (DIC) where DIC outreach workers use a standard tool to screen for MAT eligibility - defined by opioid use dependence and injection drug use in past 6 months.

At the DIC, referred PWIDs are provided with primary HIV prevention services like HIV testing and counselling, and referred for secondary ones. MAT-Eligible individuals are counselled and referred to the MAT clinic for clinical and

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psychological assessment, including readiness to initiate and sustain daily clinic visits, before enrollment on to MAT.

Lessons learned: During September 2020 - October 2022, 398 PWIDs were enrolled on MAT (methadone = 389 [98%]; buprenorphine = 9 [2%]), of whom 325 (82%) were men. Median client age was 32 years (IQR:30-34), 273 (68%) were unemployed, and 35 (8.7%) were HIV-positive. Of PWIDs with HIV infection, 100% (35) commenced ART, 49% (17) were on antiretroviral therapy (ART), and 76% (13/17) of those on ART were virally suppressed.

Retention rates for the July-September 2021 (398) entry cohort were 75% (82/110), 66% (73/110), 53% (58/110), and 54% (59/110) at 3, 6, 9, and 12 months respectively. RCA findings showed clinic distance as a barrier to daily attendance.

Conclusions/Next steps: Introduction of effective MAT services has been achieved. However, retention is low. Improving access through creating more delivery points could improve daily attendance and overall retention on the program.

Efforts are needed to ensure all HIV-positive PWIDs are initiated on ART and viral suppression is achieved.

EPC0424

Supporting HIV epidemic control through scaling HIV pre-exposure prophylaxis and voluntary medical male circumcision services in Zimbabwe

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Background: Zimbabwe has achieved 96/96/93 against UNAIDS three 95 benchmarks (UNAIDS) and declining HIV incidence (0.38% per year among adults, ZIMPHIA2020). Ongoing health systems and socioeconomic stressors have threatened national HIV progress.

PEPFAR/Zimbabwe supports the Government of Zimbabwe to end the HIV/AIDS epidemic as a public health threat by 2030. Prevention services are focused on reducing HIV transmission. High rates of HIV transmission occur among key populations (KP), adolescent girls and young women (AGYW), pregnant and breastfeeding women (PBFW), and highly mobile populations.

Description: PEPFAR/Zimbabwe collaborated with the Ministry of Health and Child Care (MoHCC), Global Fund, and implementing partners to provide evidence-informed HIV pre-exposure prophylaxis (PrEP) and voluntary medical male circumcision (VMMC) services.

From October 2021 - September 2022 (fiscal year [FY] 22), community engagement, peer support, tailored demand creation, differentiated and decentralized services, clinical

mentorship, and leveraging broader AGYW and KP programming expanded PrEP services. During the same period, VMMC services were adapted through differentiated demand creation and service delivery to reach men 15-29 years old at increased risk of HIV acquisition.

Lessons learned: Based on PEPFAR/Zimbabwe FY22 program data, the program supported PrEP delivery in all 10 provinces, and PEPFAR/Zimbabwe-supported sites achieved 194% (75,371/38,772) of the FY22 PrEP initiation target; 19,703 individuals reinitiated or continued PrEP. During FY22, 27,559 individuals who identify as a member of a KP initiated PrEP. Female sex workers comprised the highest proportion of PrEP initiations among KP (range: 3,233 - 5,505 across quarters).

During each quarter, approximately half (range: 47-52%) of all PrEP initiations and one-third of PrEP clients who returned for a follow-up or reinitiation visit were AGYW. Throughout FY22, PrEP follow-up and reinitiation visits among PBFW increased from 142 to 443.

PEPFAR/Zimbabwe-supported sites achieved 101% (134,668 / 133,955) of the FY22 VMMC target in the PEPFAR/Zimbabwe VMMC program's 37 high burden districts. 85% of VMMCs occurred in the priority age group (15 - 29 years).

Conclusions/Next steps: Zimbabwe's prevention achievements directly support ending HIV/AIDS as a public health threat by 2030. PEPFAR/Zimbabwe will continue to collaborate with the MoHCC to scale access to evidence-informed, differentiated HIV prevention services in an equitable manner.

EPC0425

Barriers to the uptake of oral pre-exposure prophylaxis among adolescent and young key populations in Nigeria

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Background: Adolescent and young key populations (AYKP) contribute to the burden of HIV in Nigeria and are a priority population for oral pre-exposure prophylaxis (PrEP). However, PrEP coverage among AYKP in Nigeria remains low. In this study, we assessed the main barriers to PrEP uptake among AYKP (15-24 years) in Nigeria.

Methods: This study was a secondary data analysis of the 2020 Integrated Biological & Behavioural Surveillance Survey conducted among key populations (KP), including female sex workers (FSW), men who have sex with men (MSM), people who inject drugs (PWID), and transgender people (TG), in 12 states in Nigeria.

In the survey, KP who were aware of PrEP but had never taken it were asked: "What is the main reason you have never taken PrEP?"

We recategorized these main reasons into six barrier themes:

i. Fear of side effects (Afraid of side effects),



- ii. Low risk perception (Don't feel at risk for HIV),
- iii. Lack of access (Not available where I live and Don't know where to get it),
- iv. Lack of interest (Don't want it),
- v. Stigma and discrimination (Embarrassed to talk about it with doctor/nurse and Don't want others to know), and;
- vi. Nonspecific/others (Other and Don't know).

We performed weighted descriptive statistics and multi-variate logistic regression analysis.

Results: From the 1,776 AYKP included in this study, the main barriers for never taking PrEP were: lack of interest (30.9%), lack of access (27.4%), low risk perception (18.5%), unspecific/others (11.3%), fear of side effects (8.9%), and stigma and discrimination (3.0%).

The most cited main barriers by KP typology were: lack of access (28.3%) and fear of side effects (28.3%) by FSW; lack of interest (37.1%) by MSM; low risk perception (65.5%) by PWID; and lack of access (34.4%) by TG.

The odds of reporting low risk perception, fear of side effects, lack of access, lack of interest, and nonspecific/other reasons varied significantly by KP typology.

Conclusions: Several barriers limit the uptake of PrEP by AYKP. However, these barriers vary by typology. Our results highlight the need for KP-specific interventions to improve the uptake of PrEP among AYKP in Nigeria.

EPC0426

Prevalence of non-fatal overdose among people who inject drugs in Iran in 2020

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Background: People who inject drugs (PWID) are at risk of overdose. However, little is known about substance use-related overdoses among PWID in Iran. We investigated the prevalence of non-fatal overdose and its associated risk factors among PWID in Iran using data from the most recent national survey.

Methods: PWID were recruited between July 2019 and March 2020 from 11 major cities in Iran, using the respondent-driven sampling approach. Self-reported history of lifetime non-fatal overdose was the primary outcome of interest. Sociodemographic, behavioral and structural correlates of non-fatal overdose were assessed using multivariable logistic regression models.

Results: The median (IQR) age of the participants was 39 (34;46). Of 2,618 PWIDs who participated in the study, 21.7% (n=568, 95% Confidence Interval (CI): 20.1; 23.3).

reported at least one lifetime overdose event. Factors associated with a higher likelihood of self-reported overdose were higher education (Adjusted Odds Ratio (aOR): 1.52; 95% CI: 1.19, 1.93), drug use initiation before the age of 18 (aOR: 1.42; 95% CI: 1.12, 1.79), HIV seropositivity (aOR: 2.13; 95% CI: 1.20, 3.77) and history of polydrug injected in a lifetime (OR: 2.67; 95% CI: 2.12, 3.37).

Self-reported non-fatal overdose was also higher among those who had witnessed overdose in the last three months (aOR: 3.98; 95% CI: 3.10, 5.12), had attempted suicide (aOR: 2.31; 95% CI: 1.84, 2.90) and had received needle/syringe or injection equipment (aOR: 1.99; 95% CI: 1.48, 2.68) in the last 12 months.

Conclusions: Our findings illustrate more than one out of five PWID had an experience of non-fatal overdose with varying risks among different subgroups.

While Iran benefits from an extensive network of public and private opioid agonist therapy services, it lacks overdose prevention and management interventions, such as take-home Naloxone and community-based drug overdose prevention programs.

Such services are urgently needed to reduce harms among PWID.

EPC0427

The coupon incentivized model for identification of people who inject drugs: case study of the medication assisted therapy clinic, Butabika National Referral Mental Hospital

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Background: To prevent HIV among people who inject drugs (PWIDs), the WHO recommends a 10-point package of interventions, including opioid substitution as part of Medication Assisted Therapy (MAT). In Uganda, the estimated prevalences of HIV and antiretroviral coverage among PWIDs are 17% and 78%, respectively.

With support from PEPFAR and the Ministry of Health, the Infectious Diseases Institute (IDI) started the first-ever MAT clinic in Uganda, in September 2020, at Butabika National Referral Mental Hospital. In April 2021, the coupon-incentivized model was introduced to find and enroll hard-to-reach PWIDs.

Description: The coupon-incentivized model involved health workers issuing coupon incentives to index peers for line-listed injection partners who would then be followed up for enrollment. An incentive of UGX 20,000 (\$5) was paid out to the index peer upon enrolment on MAT of the line-listed partner.

We analyzed data from April 2021 to September 2022 using MS Excel to determine the proportion of MAT clients who were identified and enrolled through the model.


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Lessons learned: With the introduction of the coupon-incentivized model, we noted an increase in the number of PWIDs identified and enrolled on MAT from less than 70 clients/quarter for more than three quarters to 71 (40%) and 110 (37%) in the period of April-June 2021 and July to September 2021 respectively. In 2022, the overall number of enrolments on MAT declined including those enrolled through the coupon incentives model although the proportion of enrolments through the model remained stable. In total, the coupon model contributed to 28% of total PWIDs enrolled on MAT.

Implementing period	No. of PWID enrolled on MAT	No. enrolled through other models: peer-to-peer, Alcohol and drug unit & private rehabilitation centers (% of total)	No. enrolled through coupon model (% of total)
July–September 2020	18	18(100%)	-
October–December 2020	62	62(100%)	-
January–March 2021	14	14(100%)	-
April–June 2021	71	31(44%)	40 (56%)
July–Sept 2021	110	73(66%)	37 (34%)
October–December 2021	49	34(69%)	15 (31%)
January–March 2022	29	21(72%)	8 (28%)
April–June 2022	26	19(73%)	7 (27%)
July–Sept 2022	19	13(68%)	6 (32%)
Total enrolment	398	285(72%)	113 (28%)

Conclusions/Next steps: The use of the peer coupon-incentivized model targeted at identifying injectors led to an increase in the number of PWIDs referred and linked to the MAT program. Expanding coverage of HIV interventions for PWIDs can decrease the number of new infections in the country.

EPC0428

Prioritizing nutrition in the management of advanced HIV disease in Zimbabwe – secondary data analysis from the electronic Patient Management System (ePMS)

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Background: There is a bidirectional connection between HIV infection and inadequate nutrition, and this leads to increased impaired immune function and susceptibility to opportunistic infections (OIs) in people with advanced HIV disease (AHD). AHD clients are more susceptible to HIV-related morbidity and mortality when experiencing inadequate nutrition.

The objective of the study was to assess the nutritional status of clients with AHD using pre-existing patient data in the electronic Patient Management System (ePMS) from all OI/ART clinics in Zimbabwe to inform nutrition interventions.

Methods: The secondary data analysis utilized pre-existing data from the Ministry of Health and Child Care ePMS dataset between the 3rd quarter of 2014 until mid 2022. Proxy WHO standard clinical indicators captured by a clinician for assessing nutrition status among AHD clients and all people living with HIV (PLHIV) were used. These included, "Wasting Syndrome (WS)", "Weight loss >10% (WL)", and "Failure to Thrive (FT)". Body mass index (BMI) was not calculated due to data availability.

Descriptive statistics were performed, and a logistic regression assessed sociodemographic factors associated with HIV-related "WS," "WL," and "FT" among AHD clients. We also developed a Menu Modelling Tool (MMT) an e/online tool for nutrition education among AHD clients.

Results: A total of 91,004 client records were accessed from the ePMS dataset, including 33,996 (18,889 females and 14,904 males) AHD clients (WHO stage 3 and 4 only). Prevalence of inadequate nutrition was higher among AHD clients compared to other PLHIV: WS: 16.91% (AHD) and 9.02% (PLHIV); WL: 7.67% (AHD) and 3.97 (PLHIV); FL: 3.13% (AHD) and 2.85% (PLHIV).

The following categorical socioeconomic variables were significantly associated with the probability of having HIV-related WS, WL, or FL: *level of care, province, marital status and education level.*

Conclusions: This assessment provided critical data on the burden of malnutrition among PLHIV, and specifically, AHD clients in Zimbabwe. Routine nutrition analysis from patient records can help inform the design of nutrition interventions.

There is need to prioritize regular nutrition assessments such as BMI and nutrition interventions as part of the package of care for clients with AHD to improve morbidity and mortality outcomes. The MMT is a potential intervention solution.

**EPC0429****The effects of MyChoices and LYNX mobile applications on HIV testing and PrEP use by young U.S. sexual minority men**

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Background: Young sexual minority men (YSMM) have amongst the highest rates of HIV in the United States (U.S.) (including undiagnosed HIV), yet use of evidence-based prevention strategies, including routine HIV testing and pre-exposure prophylaxis (PrEP), remain low. Mobile apps have enormous potential to increase HIV testing and PrEP use among YSMM.

Methods: As part of the National Institutes of Health's Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), we implemented a three-arm randomized controlled trial to test the efficacy of two community-informed, theory-driven mobile apps—LYNX and MyChoices—against standard of care (SOC) in 9 U.S. cities. The co-primary outcomes were: self-reported HIV testing and PrEP initiation over 6 months of follow-up.

Between October 2019 and November 2021, 381 YSMM aged 15-29 at risk for HIV acquisition were enrolled and equally randomized; all participants completed behavioral assessments at baseline, and after 3 and 6 months.

Results: The mean age was 22.4 (SD=3.17); 51% were white, non-Hispanic, 18% were Black, non-Hispanic, and 18% were Latino. Three-quarters (72%) identified as gay; 23% as bisexual. Half (52%) resided in the U.S. South, 30% in the Northeast, 15% in the Midwest and 3% in the West.

At baseline, 29% had never had a HIV test and an additional 67% had not tested in the prior 3 months. Eighty-six percent had never used PrEP. Sociodemographic and behavioral characteristics did not differ by study arm.

Compared to SOC (59%), participants randomized to MyChoices (74%; $p=.010$) were more likely to have received at least one HIV test over 6 months of follow up; those randomized to LYNX also had higher proportion of testing (70%) but it was marginally statistically different ($p=.078$).

While participants in both MyChoices (21%) and LYNX (20%) arms had higher rates of starting PrEP compared to SOC (16%), these differences were not significant ($p=.516$).

Conclusions: Given the ubiquity of mobile app use and modest resources required to scale this intervention, a 25% relative increase in HIV testing among YSMM, as seen in this study, could facilitate curtailment of the epidemic in the U.S. and even globally.

Additional refinements might further enhance the apps' efficacy on PrEP initiation.

EPC0430**Sustained continuity of treatment for key populations in security challenged Zamfara state of Northern Nigeria**

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Background: Sustaining continuity-of-treatment-among-key-populations-(KPs)-living-with-HIV-(KPLHIV) is a huge task in security-challenged Zamfara state of Northern-Nigeria. There are 14 LGAs in the state with 6 of them high-security-risk including most of the rural-areas in the state. The HIV prevalence in the state is 0.4% with 15,897 estimated number of PLHIV. (NAIIS 2018), with only 29% of them on ART.

A major aim of the project was to identify HIV-positive-KPs, place on ART and ensure continuity-of-treatment.

Description: Society-for-Family-Health with support of PEPFAR-through-USAID-funding commenced the KP-CARE-2 project in the state in November 2021. The Project provides a person-centered, evidence-informed-differentiated-service-delivery-models aligned with the 5x3 approach of PEPFAR-strategy towards attainment-of-UN-AIDS-95:95:95 target. To ensure continuity-of-treatment, the project engaged and trained motivated-positively-living-KPLHIV-residents in the communities as Case-Managers-(CMs). The CMs were assigned clients-in-care to support using the "First-180-Days" package-of-services for all new-clients through enhanced-counseling to support-adherence, disclosure-of-status, treatment-literacy, and stigma-reduction messaging.

Furthermore, all clients were placed on varying levels of MMD to reduce transport needs. To this were added daily-security-updates to protect both CMs and clients, while community support groups were formed to improve support. These CMs were clustered into groups by LGAs for real time monitoring and prompt feedback.

Lessons learned: Clustering-of-the-LGAs into axis encouraged healthy-competition among the CMs in maintaining and sustaining continuity-of-treatment of the KPLHIV assigned to them above 98% despite the security-challenges as shown in the graph below.


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Figure. Continuity of treatment in Zamfara state.

Interruption-in-treatments was generally below 2% in the state due to the DDD-model of CCSAPs and home delivery by the CMs.

Daily-security-update by PLSO, project-regional-security-specialist and local-terrain-security-intelligence by vigilantes-in-the-communities ensured safety-of-the-staff and continuous-tracing and tracking-of-clients immediately after a missed-appointment.

Conclusions/Next steps: Sustaining continuity-of-treatment for KPLHIV using community-members living in security-challenged locations was efficient-and-cost-effective.

Activation of several CCSAPs in the high-risk security communities significantly improved access-to-treatment, care, and support. However, due diligence must be conducted on all recruited staff to prevent recruitment of bandits and terrorists.

EPC0431

Engagement and outcomes of an individualized case management intervention to support PrEP persistence among female sex workers in Durban, South Africa

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Background: Targeted HIV prevention efforts in South Africa have increased pre-exposure prophylaxis (PrEP) initiation among female sex workers (FSW). However, high PrEP discontinuation has limited its impact as a HIV prevention tool in South Africa. Real-world evaluations among cisgender women in South Africa has demonstrated approximately 50% by 1-month and <33% by 4-months. We assessed engagement with an individualized case management (ICM) intervention and PrEP persistence among FSW in Durban, South Africa.

Methods: From October 2020-February 2021, 30 HIV-negative FSW initiating PrEP enrolled in the pilot, inclusive of 12 weeks of ICM. Participants received weekly ICM sessions for 1-month, and then chose weekly to monthly sessions. We assessed intervention engagement and PrEP refills at 1- and 4-months with engagement in sessions categorized based on ICM sessions completed vs. planned (low<50%, moderate 50-80%, high≥80%). PrEP persistence data were compared to FSW initiating PrEP in the program in the month before and after the pilot.

Results: Of the 30 participants, PrEP persistence at 1- and 4-months was 90% (27/30) and 60% (18/30) respectively. In comparison, 4-month average refill in the program immediately before and after the pilot was 15%.

In the first month, 37% (11/30) of participants had high engagement, 40% (12/30) moderate, and 23% (7/30) low. The following two months, 17% (5/30) had high engagement, 27% (8/30) moderate, and 56% (17/30) low.

Those engaging with the intervention at moderate to high levels were more likely to refill their PrEP at both time points (1-month:p=0.004; 4-months:p=0.005; Figure).

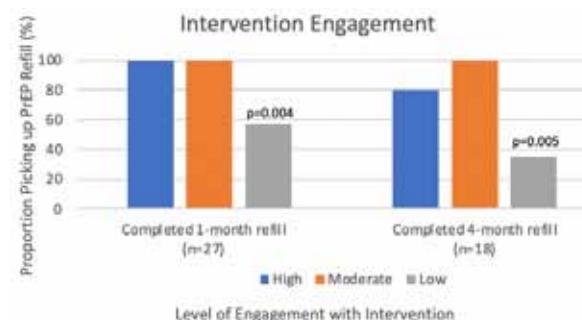


Figure. PrEP refill pick-ups in pilot in relation to intervention engagement.

Conclusions: While PrEP discontinuation among FSW is highest following initiation, findings suggest that individualized case management is potentially important to address specific needs among this population and provide tailored support for persistence.

However, there is a need to achieve moderate to high engagement to realize this potential. Testing implementation feasibility and effectiveness at a larger scale is warranted.

EPC0432

Comparison of new HIV diagnosis and teenage pregnancy in DREAMS and non-DREAMS districts, Malawi 2017-2022

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Background: The Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) program provides a package of core interventions to address key factors that make adolescent girls and young women (AGYW) vulnerable to HIV.

DREAMS was introduced in Malawi in 2016 and scaled up in three districts by 2018, with implementation by the President's Emergency Plan for AIDS Relief (PEPFAR) partners. The objective of this analysis is to evaluate the impact of DREAMS on reducing HIV new infections and teenage pregnancies among AGYW after over half a decade of implementation in Malawi.



Description: Using PEPFAR Measure Evaluation and Reporting data, a two-sample test of proportions on new HIV diagnosis and teenage pregnancy (among 15-19 years) for DREAMS districts (Blantyre, Machinga, Zomba) compared to non-DREAMS (Chikwawa, Mangochi, Lilongwe) was conducted to determine if proportions between timepoints (2017 quarter 2 (baseline) and 2022 quarter 3 (endline)) or populations (DREAMS and non-DREAMS districts) had changed.

Lessons learned: Among AGYW aged 15-19 in the DREAMS districts (117,472), the percentage of new HIV diagnoses decreased from 2.8% at baseline to 0.6% at endline, representing a percentage change of 77.8% ($p<0.001$). A decline of 58.1% occurred among AGYW in non-DREAMS districts (140,000), from 1.6% to 0.7% ($p<0.001$).

The difference in the percentage change among AGYW aged 15-19 in DREAMS versus non-DREAMS districts was statistically significant ($p=0.003$). The percentage of teenage pregnancies among AGYW attending antenatal care (ANC) in the DREAMS districts decreased from 25.4% to 22.3% (percentage change 12.2%; ($p<0.001$).

A decline of 6.5% occurred among women attending ANC visits in non-DREAMS districts, from 24.7% to 23.1% ($p<0.001$). The difference in the percentage change of AGYW attending ANC visits in DREAMS versus non-DREAMS districts was not statistically significant.

Conclusions/Next steps: If scaled up intensely, the DREAMS comprehensive package of interventions could have a greater impact on HIV transmission among vulnerable AGYW.

EPC0433

HIV pre-exposure prophylaxis awareness, use and continuation cascade among transgender women in 11 countries in Asia

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Background: Transgender women in Asia have a substantially higher risk of acquiring HIV compared to other population. HIV pre-exposure prophylaxis (PrEP) could reduce new HIV infections among transgender women, but few data are available on transgender women's awareness, use, and continuation of PrEP in Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Philippines, Thailand and Vietnam.

Methods: We analyzed cascade data on PrEP awareness, use and continuation among transgender women respondents from an online cross-sectional survey conducted in 11 countries in Asia between May-November 2022. Multivariable logistic regression was used to identify factors associated with PrEP awareness.

Results: Among 1,250 transgender women, 77.6% were aware of PrEP. Of these, 60.8% had used PrEP, 18.4% did not want to, and 20.8% wanted to but had not (top reasons: 42.6% concerned about PrEP side effects, 34.2% did not know where/how to get PrEP, and 27.7% unavailability of PrEP).

Of those who had used PrEP, 78.1% were still using it, while 19.5% had discontinued PrEP (top reasons: 30.4% not having too much sex, 27.8% not wanting to take pills, and 26.1% were concerned about side effects).

In addition, 2.4% stopped using PrEP permanently (top reasons: 35.7% monogamous relationship, 35.7% unavailability of PrEP, and 28.6% concerns about side effects). Knowing HIV status ($aOR=1.81$, $95\%CI=1.19-2.75$), living in a


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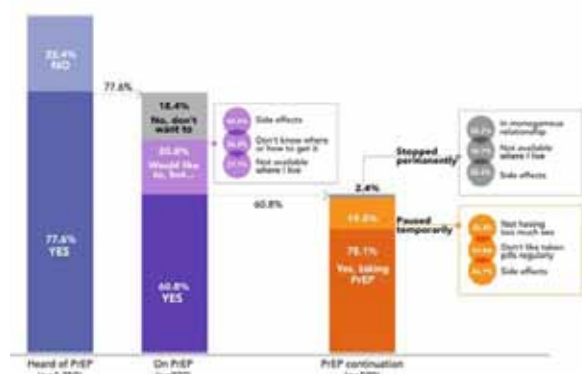
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capital/major city ($aOR=1.57$, $95\%CI=1.16-2.14$), having a romantic relationship ($aOR=1.60$, $95\%CI=1.19-2.16$), engaging in sex work in the last six months ($aOR=1.98$, $95\%CI=1.44-2.73$), having condomless intercourse in the last six months ($aOR=1.47$, $95\%CI=1.10-1.97$), and living in a country with relatively wide access to PrEP ($aOR=1.48$, $95\%CI=1.08-2.03$) were associated with PrEP awareness.



Conclusions: Three-quarters of transgender women in Asia were aware of PrEP. However, 20% had not used it although they wanted to. Implementation strategies to facilitate PrEP availability and access to PrEP service tailored to transgender women are urgently needed.

EPC0434

Assessing renal safety of daily oral tenofovir disoproxil fumarate and emtricitabine pre-exposure prophylaxis in pregnant and lactating women: using locally developed normal reference range in an open-label randomised control study

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Background: There are no normal reference values for serum creatinine or CrCl during pregnancy, instead clinicians are guided by reference values for non-pregnant adults. Use of certain antiretrovirals particularly tenofovir diphosphate fumarate (TDF) are known to have adverse effects on renal function. We aimed to assess renal function in pregnant and postpartum women exposed to TDF-PrEP. **TENOFOVIR DISOPROXIL FUMARATE AND EMTRICITABINE** using normal reference ranges for renal function derived from the control study group of pregnant women not exposed to TDF-PrEP in an open-label, randomised controlled trial in Durban, South Africa.

Description: Reference ranges for eGFR by Cockcroft-Gault (CG) for use during pregnancy were derived from the mean and ± 2 SDs of eGFR values after adjusting for age

and BMI among Black African pregnant women not exposed to TDF-PrEP. Similarly, reference ranges for serum creatinine during pregnancy were derived from the mean ± 2 standard deviations of values for each week of gestation from 14 weeks to 40 weeks.

We further graded sCr abnormalities based on the DAIDS toxicity grading for clinical trials using the control group derived reference range and determined the proportion of women with CrCl values less than the LLN.

Lessons learned: The ULN of sCr in pregnancy and post-delivery were 60 $\mu\text{mol/l}$ and 77 $\mu\text{mol/l}$ respectively, approximately 20% lower in pregnancy than postdelivery (or non-pregnant state). The LLN for CrCl in pregnancy and postdelivery were 120 ml/min and 90 ml/min respectively and is approximately 35% higher than the LLN postdelivery (or non-pregnant state).

Using the ULN of sCr, the frequency of Grade 1 and 2 sCr abnormalities were 4.5% (13/268) during pregnancy and 2.7% (4/147) postdelivery in women receiving TDF-PrEP. Using the LLN of CrCl, 4.5% (12/268) of pregnant women and 8.8% (13/147) of women postdelivery exhibited CrCl lower than the LLN. Six pregnant women with abnormal CrCl during pregnancy exhibited persistent abnormalities postdelivery.

Conclusions/Next steps: In our study using internally derived normal reference ranges, we were able to monitor renal function during TDF-PrEP use and detected a higher proportion of pregnant and postdelivery women with abnormal renal function markers when compared to other studies ($<1\%$ in pregnancy).

EPC0435

A qualitative exploration of key influences on HIV prevention and harm reduction services use among people who use drugs in Kampala, Uganda

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Background: Integrating pre-exposure prophylaxis (PrEP) delivery into existing harm-reduction services could reduce HIV acquisition among people who use drugs (PWUD). We explored key influences on HIV prevention and harm reduction service utilization among PWUD in Kampala.

Methods: Between March 2021 and August 2022, we conducted 34 semi-structured in-depth individual interviews with PWUD accessing harm reduction services in Kampala. Harm reduction services included needle syringe exchange programs and medication-assisted treatment (MAT). Purposively sampled participants represented a range of PWUD in Kampala, including those currently utilizing and not utilizing harm reduction services.



Interview topics included experiences of drug-use, HIV prevention services (including oral PrEP), and harm reduction services. Interviews were conducted in English and Luganda at five HIV prevention or harm reduction program sites, were audio recorded and transcribed. Data were coded and analysed thematically to identify key influences on service utilization.

Results: We identified two key themes describing PWUD experiences accessing and using HIV and harm reduction services.

First, HIV risk awareness did not directly translate to uptake of services. PWUD were aware of their potential exposure to HIV because they sold sex to buy drugs, had condomless sex under the influence of drugs, and shared injecting equipment.

Oral PrEP was perceived as an effective HIV prevention strategy but adherence was challenging when they were 'high' and forgot to take pills.

Second, poverty created challenges to drug use cessation, a common desire. Lack of food, school fees, or shelter were cited as reasons driving people back to drug use as a coping strategy. Limited finances caused participants to choose between earning an income or attending visits for methadone therapy which have high transportation costs.

In addition, participants described food insecurity, and noted challenges adhering to MAT and/or PrEP on an empty stomach. Given these challenges, PWUD preferred healthcare providers improve flexibility and attitudes when offering these services.

Conclusions: The syndemics of low income and drug addiction are well at-play in Kampala, Uganda hindering access to addiction programs and increasing HIV risk. Socio-economic interventions could increase PWUD engagement in integrated harm reduction and PrEP services.

EPC0436

Predictors of preference for community-based PrEP delivery among pregnant and postpartum women with experience using daily oral PrEP in South Africa and Kenya

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Background: PrEP uptake remains low among pregnant and lactating people (PLP) in South Africa (SA) and Kenya. Differentiated service delivery of PrEP, such as offering PrEP pick-up in community settings, may mitigate barriers to uptake experienced by PLP. We evaluated preferences and acceptability of differentiated service delivery for PrEP among PLP with experience taking oral PrEP in SA and Kenya.

Methods: From September 2021 to February 2022, we surveyed PLP without HIV enrolled in PrEP cohort studies in SA and Kenya. We evaluated PrEP attitudes and theoretical preferences for community PrEP delivery. We report descriptive participant responses and multivariable logistic regression models (adjusting for age and site) to assess predictors of preferring community-based vs. clinic PrEP pick-up.

Results: We surveyed 190 SA women (67% postpartum, median age 27y; IQR=22-32) and 204 Kenyan women (79% postpartum; median age 29y; IQR=25-33). Overall, SA participants were more frequently interested in community PrEP delivery compared to Kenyan participants (59% vs. 25%, $p=0.01$). Of those preferring community PrEP delivery ($n=163$), most were interested in home PrEP delivery ($n=117$, 72%) and pick-up at community halls ($n=80$, 49%). Preference for community PrEP delivery was associated with younger age ($aOR=1.46$, 95% CI=1.05, 2.04), endorsement of ≥ 1 internalized PrEP stigma statement ($aOR=2.59$, 95% CI=1.58, 4.23), and disliking oral PrEP side effects ($aOR=3.26$, 95% CI=1.92, 5.51) (Table). Preference for community PrEP delivery was negatively associated with Kenyan site ($aOR=0.23$, 95% CI=0.15, 0.36) and having ≥ 1 current sexual partner ($aOR=0.34$, 95% CI=0.12, 0.95).


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Summary Statistics						
	Prefers community delivery (n=163)	Prefers clinic pick-up (n=231)	Unadjusted OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
Maternal age** (median, IQR) years	29 [25-33]	27 [23-32]	1.68 [1.22, 2.30]	<0.01	1.46 [1.05, 2.04]	0.03
Country (n, %)						
Kenya	50 (31)	77 (33)	0.22 [0.14, 0.34]	<0.01	0.23 [0.15, 0.36]	<0.01
South Africa	113 (69)	154 (67)				
≥1 Sexual partner (n, %)	148 (91)	225 (97)	0.26 [0.10, 0.69]	<0.01	0.34 [0.12, 0.95]	0.04
Endorsed ≥1 PrEP stigma statement (n/N, %)	65/156 (42)	64/224 (29)	1.79 [1.16, 2.75]	<0.01	2.59 [1.58, 4.23]	<0.01
Oral PrEP dislike: Side effects (n, %)	53 (34)	44 (19)	2.16 [1.36, 3.43]	<0.01	3.26 [1.92, 5.51]	<0.01

Non-significant predictors (p>0.10): Obstetric history, other sociodemographic characteristics

*Each individual model adjusted for maternal age, country

**Per 10-year decrease

Table: Predictors of community PrEP delivery preference among pregnant and postpartum women with experience taking oral PrEP in Kenya and South Africa (N=394), September 2021 – February 2022

Conclusions: PrEP-experienced PLP in SA and Kenya described varied preferences in community PrEP delivery, emphasizing the importance of offering choice in differentiated service delivery and clinic options for PrEP pick-up. Further, differences in responses among SA and Kenyan participants emphasize the need for context-specific strategies of offering PrEP to PLP.

EPC0437

Daily PrEP use patterns among clients of key population-led clinics in Thailand

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Background: Pre-exposure prophylaxis (PrEP) is highly effective for preventing HIV when taken as prescribed by individuals with risks. PrEP use may be non-continuous with cyclical use patterns. We studied real-life PrEP use patterns among men who have sex with men (MSM), transwomen, female and male sex workers (FSW, MSW), and people who inject/use drugs (PWID/PWUD) in key population-led clinics in Thailand.

Methods: Demographic and clinical data were collected between June 2019 to October 2022 from ten key population-led clinics in Thailand. Kruskal-Wallis equality-of-populations rank test and Pearson's chi-squared test were used for data association. PrEP use patterns were

categorized into No Return (after PrEP initiation), Discontinuation (>30 days after scheduled visit), Continuous Refill, and Restart (returned after discontinuation).

Results: Of 16,288 new PrEP clients (12,375 MSM, 2,223 transwomen, 322 FSW, 453 MSW, and 27 PWID/PWUD), 93.7% used daily PrEP while 6.3% used event-driven PrEP. Among daily PrEP users, 22.8% of clients did not return for PrEP refills after initiation, 18.4% discontinued by not returning for their refill appointment 30 days after finishing PrEP, 35.2% continuously refilled their prescriptions, and 23.6% restarted after a gap.

More than half of transwomen and FSW dropped-off PrEP. Drop-off was lower among MSW and MSM, and lowest among PWID/PWUD.

PWID/PWUD, FSW, and MSM practised Continuous Refill more than Restart. MSW and transwomen, however, preferred Restart to Continuous Refill. Median (IQR) days off PrEP after the first cycle was 159.0 (86.0-263.0) and was 123.0 (87.0-221.0) after the second cycle.

	Total, n(%)†	No Return, n(%)‡	Discontinue, n(%)‡	Continue, n(%)‡	Restart 1 time, n(%)‡	Restart 2 time, n(%)‡	Restart 3 time +, n(%)‡	All Restart, n(%)‡	p-value
Overall	11756 (100.0)	2682 (22.8)	2169 (18.4)	4139 (35.2)	2040 (17.3)	574 (4.9)	161 (1.4)	2775 (23.6)	
MSM	9689 (82.4)	2005 (20.7)	1719 (17.7)	3725 (38.4)	1663 (17.2)	445 (4.6)	132 (1.4)	2240 (23.2)	<0.001
Trans-woman	1409 (12.0)	526 (37.3)	294 (20.9)	271 (19.2)	223 (15.8)	78 (5.5)	17 (1.3)	318 (22.6)	<0.001
FSW	250 (2.1)	81 (32.4)	53 (21.2)	90 (36.0)	25 (10.0)	0 (0.0)	1 (0.4)	26 (10.4)	<0.001
MSW	391 (3.3)	66 (16.9)	103 (26.3)	32 (8.2)	129 (33.0)	50 (12.8)	11 (2.8)	190 (48.6)	<0.001
PWID/PWUD	26 (0.2)	4 (15.4)	0 (0.0)	21 (80.8)	0 (0.0)	1 (3.8)	0 (0.0)	1 (3.8)	<0.001

Table 1. Follow-up status after initiation of daily PrEP by population.

†Percentage by column. ‡Percentage by row.

Conclusions: Different PrEP use patterns were seen among key populations in a real-life setting in Thailand. Transwomen and FSW had the highest drop-off and how they preferred PrEP continuation seemed to vary. Support for different PrEP use patterns must be made available to allow an informed health decision to be made based by key populations on their life contexts.



EPC0438

Don't forget about PEP:

HIV post-exposure-prophylaxis uptake, characteristics and linkages to prevention and treatment in Vietnam

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Background: Although national guidelines in Vietnam include post-exposure prophylaxis (PEP) as an essential component of HIV preventative services for key populations (KP), access has been limited.

We describe efforts to increase availability of PEP and strengthen linkages to care and prevention through private clinics serving KP.

Description: Starting in October 2020, five KP-led or -friendly private clinics in two major urban areas, Hanoi and Ho Chi Minh City, were supported to strengthen their PEP services by:

1. Training all clinicians in PEP;
2. Ensuring consistent supply of the three ARV PEP regimen, tenofovir disoproxil fumarate-lamivudine-efavirenz, as per national guidelines;
3. Implementing client follow-up for treatment or prevention including pre-exposure prophylaxis (PrEP);
4. Advertising PEP to clients online and through word-of-mouth and;
5. Putting in place metrics to track PEP uptake and referrals overtime.

Lessons learned: Overall, 1,529 clients sought PEP services, 85.3% (1304) were men who have sex with men (MSM), 5.9% (90) general population, 4.8% (73) transgender women, 1.6% (25) HIV negative partners of people living with HIV, 1.4% (21) people who inject drugs, and 1.0% (16) female sex workers.

The median age of PEP users was 28 (min 16, max 67). PEP uptake was relatively steady overtime except for during a surge in 2021 immediately following removal of strict COVID-19 lockdown measures. All clients seeking PEP received at least a baseline HIV test, 66% were tested for syphilis and 57% received a mental health screening.

In terms of diagnosis and linkages, 4.3% of PEP clients tested HIV-positive and 100% were enrolled on treatment, 7.6% were diagnosed with syphilis and 72% were treated; however only 8.6% of those who tested HIV-negative were referred to PrEP services; the majority of these referrals were MSM (97.4%).

Conclusions/Next steps: Although PEP services are accessible through private clinics that cater to KP, and strong HIV diagnosis to treatment pathways are in place, there

are significant missed opportunities in linking HIV-negative clients to PrEP. Quality improvement interventions will be undertaken to strengthen counseling and referrals from PEP to PrEP. Updating guidelines to allow PEP to include the same ARV drugs as oral PrEP could also enhance PEP-to-PrEP linkages.

EPC0439

Opioid Substitution Treatment Program coverage among people who inject drugs in Bio-Behavioral Study sites of Kyrgyz Republic, 2021

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Background: The HIV epidemic in the Kyrgyz Republic (KR) is primarily driven by injection drug use. In this study we aim to assess the opioid substitution treatment (OST) program coverage among people who inject drugs (PWID) in bio-behavioral study (BBS) sites of KR.

Methods: BBS was conducted among PWID in Bishkek, Kara-Balta, Karasu, Osh, Tokmok, and Sokuluk in September-December 2021. Respondent-driven sampling (RDS) was used to recruit PWID aged 18+ years. Interviewers collected information on demographics and risk behaviors. Weighted estimates were generated where appropriate. Logistic regression was used to produce weighted ORs by BBS sites, except for Kara-Balta.

Results: The prevalence of HIV was high with low OST coverage in BBS sites (HIV prevalence: 13.3%-25.9% and OST: 1.3%-19.7%). The mean (sd) age of PWID was 41.9 (9.8) years. Bishkek had the highest current OST uptake (19.7%) followed by Tokmok (13.2%), Osh (6%), Karasu (5.1%), and Sokuluk (1.3%). HIV prevalence (ORs: 1.1-1.1, 95%CI: 1.0 – 1.2, except for Bishkek) and OST coverage (Tokmok OR: 1.1 95% CI: 1.0 – 1.1) were positively correlated with duration of injection drug use with some fluctuations by site.

Conclusions: Despite the availability of OST in KR since 2002, PWID reported low OST uptake. The HIV prevalence and OST coverage increased with a duration of injection drug use among PWID indicating relatively low OST uptake among younger PWID.

The findings can be used to inform state policy makers on OST uptake improvement with particular attention afforded to young injecting drug users.

**EPC0440**

Barriers and facilitators to pre-exposure prophylaxis uptake and continuation: a qualitative study of high-risk adolescent girls and young women 15-24 years in clubs in two districts of Malawi

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Background: Pre-exposure prophylaxis (PrEP) was approved by the Ministry of Health in October 2020. Expanding Malawi HIV/AIDS Prevention with Local Organizations Working for an effective Epidemic Response (EMPOWER) project-initiated PrEP in Determined, Resilient, Empowered, AIDS-free Mentored and Safe (DREAMS) clubs in March 2021. PrEP uptake among adolescent girls and young women (AGYW) was low, yet the causes were not well understood.

We conducted a qualitative study to explore barriers and facilitators to PrEP uptake and continuation among AGYW to inform the development of improvement strategies.

Methods: We conducted 12 focus group discussions (FGDs) in Zomba (*n*:6) and Machinga (*n*:6) districts in October 2021 involving (*n*:70) AGYW aged 15-24 newly initiated on PrEP, (*n*:36) screened eligible but declined PrEP and reviewed PrEP trackers for non-continuing users.

Follow up FGDs in December 2021 targeted (*n*:60) continuing and (*n*:15) non-continuing AGYW. We transcribed FGDs, examined data, did a thematic analysis and interpreted the themes into context.

Results: Barriers to PrEP uptake were low HIV risk perception, lack of comprehensive knowledge, and stigma. Long distances to PrEP sites was a barrier to continuation. Facilitators were high HIV risk perception, peer/community influence, service providers' attitudes and integration of PrEP in sexual and reproductive health (SRH) services.

In January 2022, we integrated PrEP into club sessions; conducted dialogue sessions targeting traditional/religious leaders, parents and caregivers of AGYW to destigmatize PrEP; identified PrEP champions; initiated community-based refills and a PrEP tracker to facilitate targeted counseling and mobilization.

This resulted in a 263% and 748% increase in PrEP uptake and continuation respectively from January to September 2022.

Conclusions: Understanding barriers and facilitators from AGYW perspectives, integrating HIV/SRH services, addressing community misconceptions and stigma, en-

gaging peers/community influencers as change agents are key facilitators and critical in improving PrEP uptake among AGYW.

EPC0441

Systematic review of the Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) initiative among adolescent girls and young women

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Background: Adolescent girls and young women (AGYW) in sub-Saharan Africa face a high risk of acquiring HIV compared to male peers. To mitigate this risk, the Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) initiative, a comprehensive, multi-layered HIV prevention program, was developed and implemented across 15 countries.

We conducted a systematic review to assess the effects of DREAMS on health-related outcomes, access to services, and sexual risk behaviors.

Methods: We searched scientific literature on Medline, Embase, Cochrane Central, Cinahl, and PsycInfo databases and relevant conference abstracts (e.g., CROI, IAS, ICASA). The search was restricted to papers published between 1 January 2014 and 1 September 2022, and no restrictions were placed on the language of publication or publication status.

We included studies with a concurrent or historical comparison group. The risk of bias was assessed using the Newcastle-Ottawa Scale.

Results: Of 288 studies screened, 18 met eligibility criteria from 8 countries; 13 were cohort and 5 were cross-sectional studies. The definitions of DREAMS participation/exposure, outcomes, and measurements varied widely.

A total of 35 outcomes were reported; the most commonly reported were knowledge of HIV status or testing (*n*=9) and condom use or self-efficacy (*n*=9).

Five (56%) studies reported significant increases in knowledge of HIV status or testing compared to the control group. Similarly, 5 (56%) studies reported significant increases in condom use or self-efficacy. HIV incidence was reported in 3 studies; two reported no significant change, and one from South Africa reported a significant reduc-



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tion for AGYW aged 15–24 (aRR 0.74, 95% CI 0.62–0.87) compared to pre-DREAMS implementation. HIV prevalence was included in 3 studies, where 2 (67%) reported a significant decrease compared to the control group. Only 3 studies reported PrEP-related outcomes, with mixed results.

Conclusions: Included studies showed mixed results on the effects of DREAMS across different outcomes. Heterogeneity in definitions of exposure (DREAMS program), comparison groups, outcomes, and measurements limited the ability to compare and quantify the effects of DREAMS.

Embedding a comprehensive evaluation framework into DREAMS program could contribute to systematically measuring the impact of this comprehensive and multi-layered program across different settings.

EPC0442

Event-driven PrEP is a feasible and effective HIV prevention option for Men who have Sex with Men (MSM) in Zimbabwe: evidence from a prospective cohort study

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Background: HIV prevalence remains high among MSM. Preventive options such as oral PrEP have low uptake, especially in Sub-Saharan Africa. Several studies (Zimbabwe, Kenya, and Zambia) have shown one-, two- and three-month continuation rates of below 50%. Population Solutions for Health, PSI, and the Ministry of Health and Child Care piloted event-driven PrEP (Prep 2-1-1) among men who have sex with men (MSM) using WHO guidelines. PrEP 2-1-1 involves taking two pills of Truvada two to 24 hours before unprotected sex, another one 24 hours after the initial dose then the last pill 24 hours after the subsequent dose. The pilot sought to measure continuation rates, adherence, and seroconversion to inform method scale-up.

Methods: A prospective cohort design recruited 381 MSM from Harare and Bulawayo between January – September 2022. Participants were followed at one, two- and three months post-baseline. PrEP continuation point estimates and proportions of clients reporting correctly taking pills according to the WHO PrEP 2-1-1 guidelines were calculated including 95% confidence intervals. Qualitative insights from MSM on their experience on PrEP 2-1-1 were documented.

Results: Of 381 study participants, continuation rates were 82.9% (1 month), 79.5% (2 months), and 73.8% (3 months). Dosing adherence was high and improved sig-

nificantly over time on PrEP 2-1-1 (see graph below). Two out of 381 clients tested positive at a 3-month follow-up. Study participants appreciated PrEP 2-1-1 convenience in minimizing pill burden and side effects. Service providers were confident in scaling up.

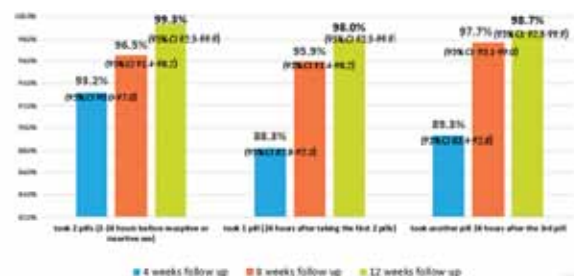


Figure. Increasing PrEP 2-1-1 adherence over time.

Conclusions: Eligible MSM demonstrated high PrEP 2-1-1 continuation rates [MM1] and improved dosing adherence over time. PrEP 2-1-1 is effective as evidenced by a few seroconversions. In a resource-limited environment, event-driven PrEP should [MA2] be scaled up as a feasible and effective HIV prevention option among eligible MSM.

EPC0443

Youth friendly center for reaching the unreachable people who inject drugs (PWIDs) in Churachandpur district of Manipur

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Background: Churachandpur, Manipur has high incidence of injecting drug use among younger adolescent population. Compared to adults, they are less likely to attend the government-run Targeted Interventions due to age-of-consent and requirement to disclose attendance to parents/guardians.

There is a need for focused youth-led interventions specific to the needs of this age group.

Description: Community consultation with 50 young PWIDs (18-22 years) resulted in establishment of a youth friendly center and service delivery model (figure).

This center provides a space where young PWID can spend their time in a safe and welcoming environment. Youth counsellors are identified and trained on community mobilization, peer counselling, comprehensive package of services and reporting including privacy and confidentiality. Peer volunteers identified from the community are trained to promote harm reduction practices.

Lessons learned: From January to December 2022, 216 young PWID were registered. Of them, 91% (193/216) were new and never enrolled in an HIV program before; 69%

(149/216) were tested for HIV and 44% (94/216) were tested for Hepatitis C, of those 3% (4/149) were found HIV positive and are on ART, 65% (61/94) were found Hepatitis C positive and linked to treatment; total 14% (31/216) were enrolled for Medication Assisted Treatment (MAT). Sessions to facilitate psychosocial support, mental health, skills training, and enabling family support system along with 454 counselling sessions were held with young adolescent PWIDs. The Center provides recreational activities and family group meetings on substance use disorder to support family members. All these activities resulted in linking these 216 unreachable adolescents with HIV prevention and harm reduction services.



Conclusions/Next steps: Community-led, youth-friendly services create an enabling environment to bring previously unreachable younger adolescent PWID to HIV care services. The center received an excellence certificate by the Churachandpur District Administration for the life-saving work. This model has potential to reach the unreachable young PWID across India.

EPC0444

Implementing social network strategy with fidelity facilitates high HIV testing yield among key populations

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Background: Due to high levels of stigma and discrimination, key populations (KP) -- men who have sex with men, sex workers, people who inject drugs, and transgender persons-- are often hard-to-reach for HIV testing services. Social network strategy (SNS) is a network-based, HIV case-finding approach that encourages people living with HIV or persons at high-risk for HIV infection to refer their sexual, drug-using, or social network members for HIV testing services. In doing so, SNS can efficiently identify undiagnosed HIV-positive KP members.

Description: The U.S. Centers for Disease Control and Prevention (CDC) introduced SNS in 17 PEPFAR countries to improve upon traditional case-finding methods and to diagnose KP who may be missed in other HIV-testing efforts. Kenya, South Africa, Tanzania, and Zambia were selected as examples of countries with SNS programs that operate with fidelity to the SNS model, which includes the core elements of engagement with KP civil society on implementation strategy, proper coupon tracking, well-trained staff, and data monitoring Population- and region-specific considerations were incorporated into the SNS approaches in each country, customizing SNS for their specific needs.

Lessons learned: HIV testing yield for SNS was reported for each country selected in 2022 and ranged from 4.4% in Kenya to 20.4% in Zambia (Figure 1).

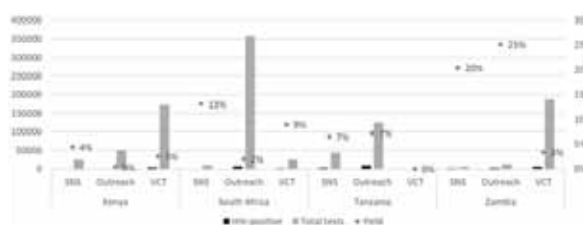
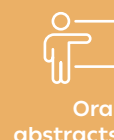


Figure 1. HIV testing results for social network strategy, voluntary counseling and testing (VCT) and outreach testing among CDC-funded key population programs in Kenya, South Africa, Tanzania and Zambia, 2022.

The number of HIV tests conducted using SNS varied greatly. Tanzania conducted the most with 43,876 tests and Zambia conducting the fewest with 6,689 tests. With-



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in each country, SNS testing yields were generally higher compared to voluntary counseling and testing (VCT) and outreach testing. SNS testing targeted KP, while outreach and VCT targeted all populations.

Conclusions/Next steps: SNS continues to be an effective strategy for HIV case-finding among KP. While each SNS program was customized to the local context, the core elements within the strategy are important to identify undiagnosed KP and achieve high HIV testing yields.

EPC0445

Discrepancy between behavioral-indicated and perceived candidacy for PrEP among MSM in Chengdu, China

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Background: Even though behaviourally eligible for PrEP (e.g., inconsistent condom use, sex with a virally unsuppressed HIV-positive partner), some men who have sex with men (MSM) may not consider themselves appropriate candidates for PrEP, which poses a significant challenge to PrEP implementation.

This study aimed to explore this discrepancy (behavioral-indicated candidacy vs. perceived candidacy) and its associated factors among a Chinese sample of MSM.

Methods: We recruited a sample of 622 HIV-negative MSM who are regular clients of a community-based organization located in Chengdu, China, from November to December 2021.

A cross-sectional questionnaire was used to collect participants' information on social demographics, PrEP-related knowledge and cognitions, and risk behaviors. In this study, behaviourally eligible for PrEP was defined as performing at least one type of high-risk behavior in the past six months, including inconsistent condom use, sex with an HIV-positive partner, confirmed STI diagnosis, substance use, and post-exposure prophylaxis experience.

Logistic regression models were fitted, and multivariate analyses were adjusted for social demographics.

Results: Among 622 eligible participants, 52.6% (327/622) were classified as behaviourally eligible for PrEP; however, only 37.9% (124/327) of them perceived themselves as appropriate candidates for PrEP. After adjusting for age, education, relationship status, and income, we found that perceived candidacy for PrEP was positively associated with previous PrEP counseling experience (Adjusted Odds Ratio (AOR): 1.32; 95% Confidence Interval (CI): 1.03-3.00), PrEP knowledge (AOR 1.41; 95% CI 1.12-1.77), a greater number of friends who were on PrEP (AOR 1.96; 95% CI 1.12, 3.41), and perceiving a higher risk of HIV infection (AOR 5.36; 95% CI 1.90-11.15). PrEP information channel, HIV testing history, RUSH use, and engagement in transactional sex were not statistically associated with this perceived candidacy.

Conclusions: We observed a high discrepancy between behavioral-indicated and perceived candidacy for PrEP among MSM in China. Future PrEP implementation efforts should be made in skills training in assessing HIV infection risk, increasing PrEP knowledge, providing professional PrEP counseling, and fostering peer support environment.

EPC0446

Uptake of Oral PrEP among the General Population as a Key Component in HIV Prevention: A Case of Nakuru County in Kenya

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Background: Oral Pre-exposure prophylaxis (PrEP) has been demonstrated as a game changer in prevention of HIV acquisition among HIV-uninfected individuals. Nakuru County has a HIV prevalence of 4.1% with estimated 65,860 People living with HIV making PrEP access critical to the HIV response.

This review looks at access to PrEP within October 2021 to December 2022 as a HIV prevention strategy in line with the Ministry of Health guidelines.

Methods: Nakuru County conducted training of health workers on PrEP, followed by community sensitization to enhance access and acceptability during community outreaches and within the health facilities. A PrEP champion was identified at the community, facility, Sub-County, and county level to accelerate uptake. PrEP has been integrated into other services (outpatient, FP, MCH).

A self-report approach method was used to reach eligible subjects using the national PrEP initiation guidelines. Intensive rapid response initiative activities followed by daily, weekly, monthly, and quarterly data reviews with real-time action plans were put in place. Data was collected from routine reporting tools and analyzed.

Results: From the data collected over the period October 2021 to December 2022, Q1 of the FYs has had the greatest contribution at 40% (5,316/13,172) to the total individuals initiated on PrEP. The approaches adopted led to a 51% (1,343 to 2,029) increase in PrEP initiations within the same reporting period. Females had the highest uptake at 58% (7,660). The age groups with the highest PrEP initiations were 25-29 (23%), 20-24 & 30-34 (20%) and 35-39 (15%).

Females 24-39 years accounted for 61% (6,198/8,810) of all those initiated on PrEP in the reported period. Retention on PrEP was 8% after three months, 44% after six months, 65% after nine months and dropped to 20% at one year. There were no clients who seroconverted within the reporting period.

Conclusions: PrEP uptake requires continuous community and Health care workers' education and sensitization to increase uptake and accessibility.



EPC0447

Predictors of exiting without graduation in an orphans, vulnerable children and youth program in South Africa

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Background: The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) Orphans, Vulnerable Children and Youth (OVCY) program provides interventions targeting social, economic, and emotional consequences of HIV and AIDS on children/youth. Program graduation is the point at which a household or participant is deemed no longer in need of project-provided services. However, some exit without graduation (EWG), defined as not receiving services in the two preceding quarters without meeting benchmarks. This has the potential to negate the gains of the program, thus the importance of determining predictors and designing appropriate mitigating measures.

Methods: A total of 1,313 participants were sampled from those enrolled in 2021 into the one-year program. The data collected included province, cell phone number, caregiver cell phone number, gender, disability, age, quarter, adjusted HIV status, viral load, a child living with HIV, household eligibility, HIV status of caregiver, orphanhood, child/youth at risk, child survivor, caregiver key population, and interview mix. Using this routinely collected data we conducted a retrospective cohort study. We employed univariate and multivariable cox-regression of survival analysis using Kaplan-Meier curves and log-rank test set at 25% and multivariable cox-regression analysis set at 5% respectively, to determine predictors of EWG in the program.

Lessons learned:

Variable	Adjusted Hazard Ratio	95% Confidence Interval	p-value
Province: Eastern Cape	2.20	1.39-3.49	0.001
Limpopo	0.62	0.41-0.91	0.015
Age Group: 5-9 years	2.18	1.17-4.09	0.015
10-14 years	2.19	1.14-4.21	0.019
Quarter: Two	4.29	3.19-5.78	<0.0001
Three	14.01	5.80-33.82	<0.0001
Caregiver HIV positive: Yes	3.12	2.12-4.60	<0.0001
Interview Mix: Remote	3.51	2.20-5.61	<0.0001
Both in-person and remote	0.39	0.27-0.57	<0.0001

Table. Multivariable Cox regression analysis

Conclusions/Next steps: EWG mitigation activities in the OVCY programs must prioritize rural provinces, age group 5-14 years, those enrolled in quarters 2 and 3, those with HIV-positive caregivers, and provision of in-person services.

EPC0448

Mixed-methods evaluation of methadone take-home pilot in Vietnam shows promising results for national scale-up

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Background: Prior to COVID-19 epidemic, take-home dosing integrated into methadone maintenance treatment (MMT) has been proven to improve treatment outcomes. However, many countries are reluctant to introduce take-home policy due to concerns about safety and acceptability. To address high drop-out rates in the MMT program, Vietnam started to pilot methadone take-home in April 2021 in three provinces (two rural mountainous provinces and one urban city).

This study aims to assess the feasibility, acceptability and treatment outcomes of the pilot program.

Methods: A mixed method study was conducted in all pilot provinces from September 2021 to December 2022. Quantitative data was extracted from medical records of 1855 clients who have ever received (N=1674) or been waiting to receive take-home doses (N=181).

Qualitative data was collected with 3 in-depth interviews with provincial leaders, 9 group discussions with health-care providers and 30 in-depth interviews with clients and family members.

Results: After 17 months of follow-up, retention rate in the take-home pilot was 84.1% and in MMT among clients ever receiving take-home doses was 89.5%. Clients who are not currently receiving take-home doses observe higher prevalences of missing doses and having positive urine tests with MOP than those receiving take-home doses. Very few cases of diversion and adverse effects were reported. Both providers and clients acknowledged the benefits of the program including improved treatment adherence, increased employment opportunities, improved health status and family relationships. The program eased the impacts of travel restrictions during the COVID-19 pandemic.

However, contrary to the program's expectation, work burden of providers was not clearly reduced, mostly due to pilot program's requirements creating extra burden of monitoring and administration.

Conclusions: The pilot program has shown promising results in terms of both feasibility and acceptability as well as in MMT retention. Relaxing various requirements would help reducing provider's work burden and, therefore, would facilitate expansion and sustainability of the program.



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**EPC0449****Condom use among female sex workers in Nigeria: lessons for national HIV programming**

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Background: Correct and consistent condom use remains one of the most effective means of preventing HIV acquisition and spread globally. Since 2007, Nigeria has been conducting Integrated Biological and Behavioral Surveillance Surveys (IBBSS) to estimate HIV disease burden, associated factors and prevention efforts. Female Sex Workers (FSWs) have HIV prevalence of 15.5% compared to 1.8% among the female in the general population.

In order to strengthen HIV prevention efforts among the FSW, there is a need to evaluate male condom uptake among FSW, and its determinants towards reducing the spread of HIV in the population.

Methods: Secondary data analysis of 2020 IBBSS conducted by Federal Ministry of Health was done. The survey involved HIV testing. Multistage sampling technique was used to identify 4,974 FSWs in 12 Nigerian states. Administered questionnaires had information on socio-demographic variables, HIV, sexual and reproductive health indicators. Weighted estimates were obtained, and multivariable logistic regression models were used to evaluate determinants of consistent condom use.

Results: The mean age was 28.4±6.9years; average age at first sex was 17.4±3.0years; and average clients/day was 4. About 11.0% and 45.7% had completed tertiary education and secondary education respectively. About 67.1% were single with 2.5% currently married, and 4.4% living with partners. Consistent condom use with clients was 78.1% and 30.3% experienced condom breakage. About 32.1% had anal sex, 68.4% had genital itching, 59.5% had genital discharge and 10.7% had genital ulcer.

Determinants of consistent condom use include those that had 4 or more clients per day OR=2.4 95%CI(1.6-3.4); FSW aged ≥25years OR=2.1 95%CI(1.3-3.2); did not complete at least secondary education OR =0.7 95%CI(0.6-0.9) and condom breakage OR=0.6 95%CI(0.5-0.9).

Conclusions: Consistent male condom use of about 78.1% among FSW is suboptimal. There is a need for targeted interventions to promote condom uptake among FSW. There is also a need to target younger FSW, those with limited education, and distribute quality products to promote consistent condom use with little or no breakage. Lessons from FSW condom uptake will be useful in improving HIV prevention efforts in Nigeria.

EPC0450**Intensified, focused supervision of care to infants exposed to HIV results in sustained improvement in early infant diagnosis (EID) infant testing coverage in Malawi**

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Background: Universal ART coverage and improved PMTCT care have decreased but not eliminated infant HIV acquisition. Gaps in the implementation of the early infant diagnosis (EID) cascade remain, including active linkage of care of mother infant pairs, timely followup HIV testing at milestones and active discharge. We delivered a focused guided supervision intervention to help address these gaps.

Methods: An electronic supervision tool, flagging best practices in EID care to close implementation gaps and reach 100% testing coverage was introduced at 95 Baylor-Tingathe supported sites in November 2021. Creation of a central supervision dashboard monitored by program leadership facilitated focused support to sites. Routine EID testing program data were used to report testing coverage trends, and to derive the impact of the intervention in single group interrupted time series analysis. Impact was calculated overall and by age group (2, 12, and 24 months).

Results: Testing coverage of 2, 12, 24 mo EID cohorts and overall increased from 85, 87, 80, and 84% in November 2021 to 95, 97, 93 and 95% in November 2022, respectively. Interrupted time series analyses demonstrated that the intervention was effective overall and its effect varied by age group, with the greatest effect seen among older children (Figure 1). While the immediate effect of the tool differed by EID cohort, we consistently obtained sustained positive significant trends in EID coverage in each group post-intervention. Overall EID coverage increased by nearly one percentage point per month in the post-intervention period, which suggests a consolidation/improvement of coverage efforts over time.

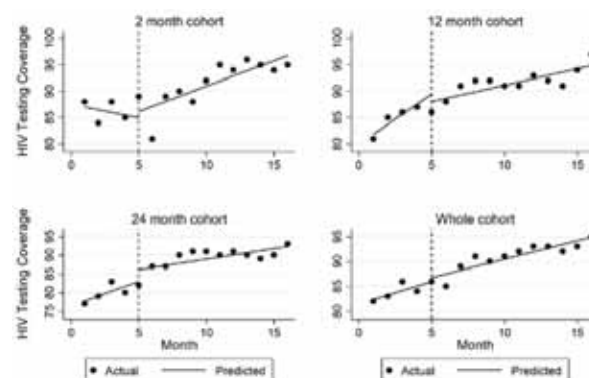


Figure 1. Impact of a guided supervision tool on HIV testing coverage.

Intervention start: month 5 (December 2021)



Conclusions: Utilizing a real-time supportive supervision tool resulted in sustained implementation of program best practices and improvement in EID testing coverage.

EPC0451

Psychosocial wellbeing, substance abuse and HIV sexual risk behavior among GBMSM in selected communities in Cape Town, South Africa

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Background: Interventions to promote the health and psychosocial well-being of Gay Bisexual Men who have Sex with Men (GBMSM) remain a priority in South Africa as HIV prevalence remains high amongst this population.

Various behavioural, social and structural risk factors contribute to the high HIV and STI burden amongst GBMSM. To address these challenges, healthcare providers need to tailor interventions that support GBMSM.

Methods: Activating MSM Peers for Life and Family (AMPLIFY) is a project that is being implemented with the goal of improving the health, psychosocial wellbeing, and mental health of MSM in South Africa and beyond. Through this project, m2m is adapting its proven, high-impact model for the MSM community to build peer-led support networks around MSM, their families, and social networks to promote HIV prevention and the initiation and retention of MSM in HIV care and treatment.

A qualitative formative study to inform the development of Project AMPLIFY was undertaken by m2m from March to October 2022 to explore the health/psychosocial support needs of GBMSM and their families in Cape Town. Focus was given to the psychosocial wellbeing including mental health, substance abuse and HIV sexual risk behaviour of GBMSM.

In-depth interviews with purposively selected GBMSM (n=25) and GBMSM family members (n=20) were conducted. Data was analysed thematically in NVivo 13.0. Both inductive and deductive coding was conducted to extract emerging themes.

Results: The findings indicate that GBMSM engage in high-risk HIV behaviours including having multiple sexual partners, unprotected sex, lack of adherence to PrEP and ART treatment, and low HIV testing. Alcohol abuse was identified as one of the major coping mechanisms that participants used to deal with stressors such as HIV stigma and discrimination, unemployment, poverty, lack of acceptance, STI or HIV infections, sexual abuse, bullying and feelings of guilty after an unprotected sexual encounter.

Conclusions: Study findings support recommendations that multi-stakeholder collaborations are necessary in order to successfully combat the disproportionate impact of the HIV epidemic on GBMSM.

EPC0452

Changes in county-level access to medications for opioid use disorder for medicare beneficiaries following medicare-coverage of Methadone treatment in the US

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Background: In 2020, Medicare began reimbursing for opioid treatment program (OTP) services, including methadone maintenance treatment for opioid use disorder (OUD), for the first time. Methadone is highly effective for OUD; yet, its availability in the US is restricted to OTPs.

The prevalence of OUD and opioid overdose deaths are rising rapidly among the Medicare population, and opioid-related harms exacted on many of Medicare's 64.9 million enrollees entail significant Medicare program costs. However, access to medications for opioid use disorder (MOUD) for Medicare enrollees has been limited.

Methods: We used data from the 2022 National Directory of Drug and Alcohol Abuse Treatment Facilities (the Directory) to examine county-level factors associated with OTP acceptance of Medicare insurance. We calculated descriptive statistics for all study variables. We mapped county-level access to MOUD in non-OTPs for Medicare beneficiaries in 2019 (pre-SUPPORT Act) and compared it to overall access to facilities (OTP and non-OTP) offering MOUD in 2021. Last, we used logistic regression to examine associations between county-level characteristics and access to an OTP that accepted Medicare in 2021.

Results: After the addition of the new OTP benefit, 526 counties (16.8% of counties) had an OTP that accepted Medicare. In 126 of those counties, the OTP was the only treatment facility offering MOUD and accepting Medicare insurance.

Counties with higher proportions of rural residents (Odds Ratio [OR] 0.96, $p < .001$) and counties located in the Midwest (OR: 0.16, $p < .001$), South (OR: 0.27, $p < .001$), and West (OR: 0.43, $p < .01$) were less likely to have an OTP that accepted Medicare than counties in the Northeast.

Counties with a non-OTP that accepted Medicare and offered buprenorphine or naltrexone in 2019 (prior to the OTP benefit) were more likely to have an OTP that accepted Medicare (OR: 2.84, $p < .001$).

Conclusions: The new OTP benefit improved the availability of MOUD for beneficiaries, though geographic gaps in access remain. Continued Medicare reform and innovations to expand care delivery are needed.

Options include expanding access to mobile methadone, allowing access to methadone in long-term care facilities and Federally Qualified Health Centers, and removing state-level barriers to opening new OTPs (e.g., state moratoria).



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HIV self-test distribution to HIV key populations by pharmacy channel through the Sate-Cha digital platform in Myanmar

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Background: The HIV/TB Agency, Information, and Services Activity is the 5-year long USAID/PEPFAR-funded project to end the HIV and TB epidemic in Myanmar. As a differentiated approach, Community Partners International contracted 10 profit pharmacy shops for the distribution of HIV self-testing kits so that Key Populations can get tested free at their nearest location.

Description: The Sate-Cha digital platform was built for an integrated data flow from the user and the pharmacy to the counselor and the service center. Key populations can register by Facebook messenger, take the kit at the nearest pharmacy with a QR code, and then test it at their home by watching counseling and demonstration videos.

Afterward, they can choose to connect with the counselor virtually for the request of linkage to care. Within the pilot tenure, August–October 2022, five trained peers disseminated the service information to their network to participate in the trial.

Lessons learned: Within three months, 94 males, 24 females, and 8 TG women got tested using the platform. 64% of them had never tested their HIV status before, and 5 (4%) tested reactive and got the linkage to care. The telephone interview with randomly selected 10 KP responded that the platform was user-friendly from registration to getting the kits; the videos were also convenient except for some jargon indications.

However, informing the result to the counselor was hindered by hesitation, perceived unnecessary, and feelings of insecurity. The quantitative data showed that 84 (67%) only returned to the counselor within a week after up-taking the test kit from the pharmacy, and the longest time was 38 days to inform the counselor, and the majority of them were facilitated by peers to do so.

Conclusions/Next steps: This digital platform gave alternative testing options for those who don't want to show up at the facility, and it was found efficient and provided full privacy.

The pilot didn't include the demand generation online for mobilization. It needs to amend small portions of the platform as per clients' suggestions, and it will be tested again to understand the client's behaviors of independently seeking linkage to care without peer support.

EPC0454

Reactive HIV testing and PrEP use in a London sexual health clinic

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Background: There are concerns HIV pre-exposure prophylaxis (PrEP) could delay HIV seroconversion.

Methods: This is a retrospective routine clinic dataset of all HIV testing outcomes from a single sexual health centre in London, UK in 2021. Gender, age, sexual risk, PrEP use, HIV test results and follow up testing was recorded. HIV testing involves an initial HIV 1&2 antibody and p24 antigen reactive screening and subsequent triple assay test for reactive screening test. Discordant results on the triple assay was classified as indeterminate.

Results: There were 56266 HIV tests performed over twelve months. 292 people had a reactive HIV test, 57.5% (n=168) had confirmed HIV positive results, 7.5% (n=22) had discordant results, 34.9% (n=102) reactive tests had negative triple assay outcomes (see figure 1). The median age of those with a reactive HIV result was 34.5 years old (IQR 28.5–39.5). 90.4% (n=264) were cis male, of whom 93.2% (n=246) were having-sex-with-men, 5.1% (n=15) cis female with high risk partners and/or sex workers, 4.4% (n=13) transwomen having unprotected anal sex.

Of those with discordant results 40.9% (n=9) had documented PrEP use within six months, and 22.7 % (n=5) started PrEP on the day of testing, 13.6% (n=3) declined PrEP, 9.2% (n=2) were known to be living with HIV and 13.6% (n=3) did not have PrEP use documented. Median number of days to subsequent test was 7 days. See figure 1 for PrEP use and subsequent HIV testing for triple assay negative people. In this group, median number of days to subsequent test was 101 days.



Conclusions: In our dataset, PrEP did not appear to delay seroconversion. Limitations include being retrospective observational data and unable to determine timing of HIV acquisition; lower follow-up rate; and predominately in GBMSM. Further testing with viral load testing, Western Blots and proviral DNA maybe needed.

**EPC0455****New challenges to optimize early diagnosis of HIV infection in the post-COVID-19 pandemic**M. Pedrola¹, N. Haag¹, G. Alaniz¹, F. Bagilet¹¹AIDS Healthcare Foundation, Ciudad Autónoma de Buenos Aires, Argentina

Background: The COVID-19 pandemic produced a strong collapse in the health system that, in terms of HIV/AIDS, led to a 25% decrease in HIV diagnoses in Argentina. Trying to reach an early diagnosis of HIV infection (> 500 CD4) we are faced with the fact that we currently continue to observe a significant number of new diagnoses below 350 CD4 (late presenters).

This study aimed to determine percentage of late presenter in cohort 2022 of people with new HIV diagnostic

Methods: The AHF Argentina database was used, which covers 35 testing centers throughout the country. 23,839 tests were carried out during 2022 (01/01/2022 to 12/31/2022), of which 958 were positive. Viral load and CD4 count were performed at the Point of Care (POC) for 620 of the new diagnoses. Four categories were defined according to their CD4 counts (>500; 500-351; 350-201 and <200).

Results: Regarding gender (202 women, 417 men and 1 trans woman). Late presenters were 46% (35% >500 CD4; 19% between 500-351 CD4; 25% between 350-201 CD4 and 21% <200 CD4). There was no significant difference between genders or ages. In the 40-49 age range there were more people with less than 200 CD4 counts than with 201-350 CD4 counts (27% vs 25%).

2022	<200	201 - 350	351 - 500	>500	Total
0-14	0	0	0	4	4
15-19	0	4	3	3	10
20-29	27	51	50	77	205
30-39	43	54	35	70	202
40-49	33	31	19	41	124
50-59	20	12	8	16	56
>60	6	2	4	7	19
Total	129	154	119	218	620

Table. Age and CD4 count in people with new HIV diagnostic.

Conclusions: Although in Argentina access to HIV diagnosis is free, we continue to observe, and even more so after the COVID-19 Pandemic, a significant percentage of late presenters. These results lead us to propose new strategies to achieve an early diagnosis for the start of timely treatment in order to reach 95-95-95

EPC0456**Dissatisfaction with general health services is negatively associated with uptake of HIV testing among men in Malawi: a community-representative survey**M. Thorp¹, K. Balakasi², S. Khan³, C. Stillson⁴, J.J. van Oosterhout², B.E. Nichols³, M. Cornell⁵, K. Dove^{1,2}

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Background: Across sub-Saharan Africa, men are less likely to know their HIV status than women, leading to later treatment initiation and higher HIV-related morbidity and mortality. Negative experiences with HIV services are qualitatively shown to discourage men's future use of HIV services, however little is known about how experiences with general health services affect men's use of HIV testing. This question is important as national programs further integrate HIV and general health services and seek to understand men's health holistically.

Methods: We used data from a 2019 community-representative survey of men in Malawi to understand frequency and cause of men's negative health service experiences (defined as men reporting they "would not recommend" a facility, or "WNR" experiences) and their association with men's future HIV testing. We conducted univariable and multivariable logistic regressions to determine which aspects of health facility visits were associated with WNR experiences and to determine if WNR experiences 12-24 months prior to the survey were associated with HIV testing uptake in the 12 months prior to the survey.

Results: We included 1,098 men who were eligible for HIV testing in the 12 months prior to the survey. Median age was 34 years; 75% were married; 21% had attended secondary school. Of 3,805 health service visits reported, 10% were for HIV-related services. 9% of men reported at least one WNR experience, which did not differ by men's sociodemographics, gender norm beliefs, or HIV stigma beliefs. The factors most strongly associated with WNR experiences were cost (aOR 5.8, 95%CI 2.9-11.4), cleanliness (aOR 4.2, 95%CI 1.8-9.9), medicine availability (aOR 3.3, 95%CI 1.7-6.4), and wait times (aOR 2.7, 95%CI 1.5-5.0). Reporting a WNR experience was associated with a 59% decrease in likelihood of testing for HIV (aOR 0.41; 95% CI:0.17-0.96).

Conclusions: Dissatisfaction with general health services was strongly associated with reduced HIV testing among men in Malawi. Findings suggest men do not segregate their health service experiences and may reduce use of HIV services in response to negative experiences with other services. Coverage of high-priority screening services like HIV testing among Malawian men may benefit from improving overall health system quality.



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EPC0457

Effectiveness of sports based HIV prevention: improvement approach to increase community HIV testing uptake to out of school adolescent girls and young women in Tanzania

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Background: In Tanzania, Adolescent girls and young women (AGYW) face disproportionately high risk of acquiring HIV. Youth are approximately to 28,000 HIV new acquisition annually, AGYW accounts for 80% of new HIV acquisition. Out of school AGYW considered the most vulnerable group since they are hard to reach with school based HIV programs. Beyond the biological factors, the burden of HIV among AGYW are driven by behavioral, social and structural factors that operate together to shape individual vulnerability.

Concerted and accelerated efforts are required to address psycho-social, environmental and cultural factors facing AGYW finding difficulties to access HIV testing services (HTS).

Description: Amref Health Africa in Collaboration with Tanzania youth alliance under Global Fund implement Timiza Malengo program in Singida, Dodoma, Tanga, Geita and Morogoro regions of Tanzania targeting out of school AGYW aged 10-24. The program established Sport based HIV prevention (SBHP) approach during community outreach services using trained AGYW sports coaches. Coaches interactively engage AGYW in various local sports including football by utilizing girls community football teams to raise awareness and attract other AGYW towards accessing HTS. During the sports, peer educators provide behavioral intervention by providing HIV and AIDS educational messages and linkage to biomedical and structural services; accessing age-appropriate sexual reproductive health rights (SRHR) where by HTS Councillors provide HIV testing services at the communities, AGYW tested HIV positive are enrolled to care and initiated Antiretroviral therapy ART. Other services provided as part of combination prevention includes social protection services and condom programming.

Lessons learned: Sports have great influence towards increased uptake of HTS services among AGYW in the community. In the period of one year 2021 to 2022, The program trained 120 AGYW sports coaches and 969 peer educators, 141,822 out of school AGYW were reached with SRHR services, 81% received HTS and know their results, (1,155) were tested positive with a yield of 1.01% and among the newly identified HIV positive 99% were linked to Care and Treatment and Initiated ART.

Conclusions/Next steps: The government is urged to utilize the SBHP approach in all remaining AGYW implementing regions of Tanzania and strengthen capacity of AGYW sports coaches by integrating knowledge from cross cutting HIV interventions.

EPC0458

Should HIV self-testing be offered as an additional testing option in health facilities?: A systematic review and meta-analysis

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Background: Since 2016, HIV self-testing (HIVST) has been implemented globally across various settings and approaches. In high-burden settings, distribution and use of HIVST at facilities has the potential to increase testing uptake and improve efficiency. HIVST at facilities can also replace screening tools to prioritize testing for certain individuals.

We conducted a systematic review to evaluate the benefits and harms of facility-based HIVST (FB-HIVST).

Methods: The systematic review was conducted across nine databases through February 1, 2022. We searched for randomized controlled trials (RCTs) comparing FB-HIVST to any other HIV testing service, offered at facilities or at home, or no intervention. Pair-wise meta-analyses was conducted for studies reporting on comparable dichotomous outcomes, using random-effects model for relative risks (RR). Other outcomes were summarized descriptively. Risk of bias was assessed using Cochrane's Risk of Bias (ROB) tool.

Certainty of evidence was evaluated using Grading of Recommendations, Assessment, Development and Evaluations (GRADE).

Results: Of the 2203 references identified, we included four RCTs comparing FB-HIVST to facility-based provider-administered rapid HIV testing among 4,811 people from Malawi and Kenya. FB-HIVST may improve HIV testing uptake (RR = 2.47; 95% CI: 0.96, 6.33; low certainty) and lead to higher HIV-positivity (RR = 3.77; 95% CI: 0.81, 17.44; low certainty).

In a single trial, a 3-fold increase in linkage to care was observed in FB-HIVST compared to SOC (RR = 3.26; 95% CI: 0.68, 15.62; low certainty). All trials found FB-HIVST acceptable and there was no evidence of social harm.

Conclusions: FB-HIVST is a safe and effective approach which can be used to improve HIV testing coverage in clinics and should especially be considered as a way to replace risk-based screening tools.

**EPC0459****Associations with late-stage HIV diagnoses and reasons for HIV testing among people newly diagnosed with HIV in Australia**

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Background: To the best of our knowledge, reasons for HIV testing leading to HIV diagnoses recorded in routine surveillance data have not been described in the literature. We use Australian National HIV Registry data to describe reasons for testing leading to an HIV diagnosis, and factors associated with late-stage HIV. Such data will help inform HIV testing guidelines to reduce the proportion of people diagnosed with late-stage HIV (defined as a CD4 count <350 cells/ μ L at time of diagnosis).

Methods: In Australia, reasons for HIV testing have been collected as multiple binary variables in routine HIV surveillance since 2016. Using HIV notifications with a diagnosis date of between 1 January 2017 and 31 December 2021, we described the reasons for testing leading to an HIV diagnosis.

We also investigated reasons for HIV testing leading to a late-stage HIV diagnosis using logistic regression, adjusting for age at diagnosis, place of birth, HIV exposure, and year of HIV diagnosis.

Results: Among 3722 HIV notifications included in the study, sexually transmissible infection (STI) screening was the most common reason for testing (38%) followed by presenting with symptoms suggestive of HIV (28%) or reported risk behaviour (13%).

In multivariate analysis, people newly diagnosed with HIV were more likely to have late-stage HIV if they were tested because of symptoms indicative of HIV (adjusted odds-ratio (aOR): 2.10; 95%CI 1.75-2.51), were older at diagnosis (aOR per five-year age increase: 1.13; 95%CI: 1.10-1.17), born overseas (aOR: 2.07; 95%CI: 1.76-2.43) or classified as heterosexual exposure (aOR: 1.53; 95%CI: 1.27-1.83).

Conversely, those tested because of risk behaviour (aOR: 0.44; 95%CI 0.34-0.57) or STI screening (aOR: 0.75; 95%CI: 0.63-0.90) had lesser odds of being diagnosed with late-stage HIV.

Conclusions: After adjusting for age, place of birth, year of diagnosis, and exposure, HIV testing conducted due to symptoms indicative of HIV rather than due to STI screening or reported risk behaviour was associated with increased odds of late-stage HIV diagnosis.

Understanding which populations are at risk of late-stage HIV, including the identification of risk behaviour for the purposes of targeted testing may reduce the time to diagnosis, engagement in care and improved health outcomes.

EPC0460**Implementation of novel tools to improve partners identification through Index Case Testing strategy in Nampula, Mozambique**

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Background: HIV case identification is still the main challenge for HIV epidemic control in Mozambique, with 71.6% of people living with HIV (PLHIV) knowing their HIV status. Targeted testing interventions are essential to address this gap. Index case testing is a high yield testing strategy and strengthening contact elicitation and testing is essential to improve case identification.

ICAP, in coordination with the Provincial Health Directorate, developed and implemented a contact elicitation job aid and a longitudinal tool to improve identification of contacts, especially multiple sexual partnerships.

Methods: In August 2021, ICAP developed and implemented new index case testing tools across 59 health facilities (HFs).

The contact elicitation job aid depicted multiple types of sexual partners, using local terminology, to help providers identify multiple sexual contacts, including non-regular partners.

The longitudinal tool supports systematic screening of index clients at all visits, identifying all contacts and their preferred testing location (i.e. facility or community level), and tracking testing coverage longitudinally. Both tools were allocated at all testing and clinical consultation points at the supported HF.

All clients newly identified as living with HIV or attending HIV treatment follow-up visits were screened, and contacts were updated in the longitudinal tool, including preferred location for testing. ICAP HF staff and provincial-level staff reviewed testing coverage monthly.

Results: Data from October 2020-September 2021 (pre-implementation) and October 2021-September 2022 (post-implementation) demonstrate an increase in the number of sexual contacts elicited through index case testing strategy by 28% (from 52,478 to 67,063), number tested increased by 12% (from 52,478 to 58,683), number testing positive by 15% (from 10,564 to 12,185), while yield of HIV-positive tests remained stable (19.8% and 20.8% in pre- and post-implementation periods, respectively).

Conclusions: Implementation of these tools resulted in an increase in contacts elicited and tested, improving case identification, especially among sexual partners.

The design of the job aid supported clinicians to elicit a higher number of contacts, specifically sexual partners, from index clients. ICAP will continue to monitor and sup-



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port HFIs in the implementation of measures developed to increase the number of contacts reached for HIV testing using the index case strategy.

EPC0461

Should caregiver-assisted testing with HIV self-test kits be offered as an additional HIV testing approach for children 18 months and older? A systematic review and meta-analysis

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Background: Caregiver-assisted testing using HIV self-test kits (C-HIVST) is a proposed approach to address current gaps in global pediatric HIV testing targets and reach more undiagnosed children. We conducted a systematic review to evaluate the benefits and harms of C-HIVST.

Methods: The systematic review was conducted across nine databases, and experts were contacted to identify additional articles and abstracts. Included studies compared C-HIVST to any other child HIV testing services, or to no intervention. Due to methodological and clinical heterogeneity, evidence was summarized narratively.

Risk of bias was assessed using the Risk of Bias in Non-randomized Studies – of Interventions (ROBINS-I) tool. Certainty of evidence was evaluated using Grading of Recommendations, Assessment, Development and Evaluations (GRADE).

Results: Nine prospective cohort studies examined C-HIVST for children aged 18 months and above, in Zimbabwe, Kenya, Uganda, and Zambia. Two studies compared C-HIVST to home-based and facility-based provider testing, and remaining studies were single-arm trials.

One study of 6,062 children, demonstrated low uptake (3.30% vs. 56.71%) and positivity (RR = 0.44; 95% CI: 0.06, 3.20) in C-HIVST compared to provider-administered HIV testing (very low certainty).

Two studies found that among all children testing positive, 97.48% were linked to confirmatory testing, among whom 37.1% were confirmed positive, and 97.7% then received same day ART initiation.

One study found that among caregivers who received a demonstration, 92.4% correctly performed the test compared to 77.9% who received no demonstration. C-HIVST was acceptable among caregivers enrolled into the studies. Risk of false positive results was high, with pooled positive predictive value of 36.72% (3 studies).

Average cost were higher than SOC. Cost per child tested and screened ranged from \$5.12 in Zambia to \$154.23, and average cost per child diagnosed from \$869.00 in Uganda to \$2,467.68 in Zimbabwe (in 2021 USD).

Conclusions: Certainty of evidence was very low. While C-HIVST was acceptable among caregivers who had already opted into the intervention and feasible for those receiving demonstrations, limited evidence of impact, high proportion of false reactivities, costs and risks of potential harm remain. Further research is needed prior to wide-scale implementation.

EPC0462

Elimination through Inclusion: capacity building of community health workers, improvement in supply chain, data recording and reporting system resulted in improved PMTCT outcomes: innovation from Global fund supported Ahana project

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Background: While India has made a significant progress in arresting and reversing the HIV epidemic, testing coverage among pregnant women remained low in some states. Evidence suggests access to HIV testing remained low at 36% during 2016-17, in the 13 project states with an estimated annual pregnancy of 14 million (48% of total in the country) per year.

Complementing Govt. of India's EMTCT of HIV strategy, Plan India has been implementing PMTCT project supported by The Global Fund towards attaining Elimination of Mother to Child Transmission.

Description: Three-fold approach was adopted;

- Investing in the capacities of community health worker,
- Advocacy and coordination for uninterrupted supplies of HIV testing Kits and consumables. and
- Strengthening recording and reporting systems of public health facilities.

While more than thirty thousand periphery level Govt. health workers were trained to carry out Whole Blood Finger prick Testing (WBFPT), supply chain capacities at the state and district level was strengthened and capacity building on recording and reporting witnessed improved data reporting.

Lessons learned: HIV testing among PW in the project states increased significantly from 36% (against estimated PW) during 2016-17 to 89% during April- Dec, 22. Supply side strengthening with Increased access to HIV testing at the periphery level ensured pregnant women receiving HIV testing at the village and remote rural areas.

This has resulted in 25% increased identification between the periods of 2016-17 to 2022. More than 18 thousand pregnant women were identified as HIV positive, linked to ART services and followed up for care and support during the project period. HIV testing carried for HIV exposed infants at 18th month confirmed that more than ten thousand infections has been successfully averted.

Conclusions/Next steps: Supply side strengthening led to increased access to HIV testing ensured more pregnant women accessing testing services and knows HIV test re-



sult. As testing services was made available in the peripheral public health units with uninterrupted supplies of kits and consumables; HIV testing increased manifold with successful reporting. Plan India's Ahana project shows the pathways to elimination of mother to child transmission in most vulnerable and resource poor settings of India.

EPC0463

Undiagnosed HIV infection and repeat HIV testing among partners of index clients in Uganda: results from a national assessment of the assisted HIV partner notification program

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Background: Assisted HIV partner notification (APN) can improve HIV testing rates among partners of HIV-positive index clients. However, prior studies have generally focused on the index clients at the expense of the partner. We assessed HIV testing rates and linkage to HIV care among partners of index clients in Central Uganda.

Methods: This cross-sectional study was conducted at 22 health facilities in three districts (Masaka, Mubende and Kayunga) in Central Uganda between September and October 2021. Data about the partners of index clients were extracted from the APN register at each health facility. Partners were then scheduled for a face-to-face or telephonic interview using interviewer-administered questionnaires.

Data were collected on socio-demographic and behavioral characteristics, HIV testing history, whether or not they were notified about their potential HIV risk, who notified them and how, whether or not they tested for HIV, and if HIV-positive, whether or not they linked to HIV care. Descriptive statistics on key APN variables were determined as proportions using STATA version 16.0.

Results: Of 500 partners interviewed, 92% (460) were notified about their potential HIV exposure and the need to test for HIV. Of these, 67% (308) were notified by a health provider; 27% (124) by the index client, and 6% (28) by both the provider and the index client.

Forty-two per cent of the partners were notified through a home visit; 40.4% through a phone call and 17.9% through other means. Sixty-seven per cent (206) were told about which health facility to go to for HIV testing while the rest were left to choose a facility on their own. Ninety-two per cent of notified partners (422) tested for HIV; 56% (237) tested HIV-positive.

Of HIV-positive testers, 71% (168) were repeat HIV-positive testers while 29% (69) were first-time HIV-positive testers. Eighty-two per cent (57) of first-time HIV-positive testers were linked to HIV care.

Conclusions: APN identified a high proportion of newly diagnosed HIV-positive partners, majority of who were linked to HIV care.

However, the high rates of repeat HIV-positive testing lowered the enthusiasm for APN, calling for innovative, targeted HIV testing strategies to reach untested partners.

EPC0464

"Give us the HIV self-test kits and we will distribute them immediately" – a qualitative study exploring community-led HIV self-test distribution in rural Zimbabwean communities

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Background: Communities can successfully drive public health interventions. We present lessons learned from community-led distribution of HIV self-tests (HIVST) in a trial comparing community-led distribution with programme-led distribution of HIVST in rural Zimbabwe.

Methods: In intervention communities, programme implementers promoted community-led HIVST distribution as a strategy for U=U and supported each community to design and implement a suitable/preferred HIVST distribution model.

We evaluated the intervention through:

- Observations of model development meetings and distribution processes,
- In-depth interviews with kit distributors (20), community members (20) health workers (20),
- 12 community focus group discussions, and;
- A participatory learning workshop with 10 communities. Data were analysed thematically.

Results: Community-led HIVST distribution was implemented for one month in 20 communities between Jan-Dec 2019. Qualitative research participants were aged 16-70 years; 42% were male. All communities enthusiastically embraced community-led HIVST at the introductory meeting, "Give us the kits and we will distribute them immediately".

The average number of kits distributed per distributor ranged from 34-134. Greater community involvement, including greater planning/development meeting attendance, active participation and equitable gender and age representation led to more kit distribution with lowest distribution where community leaders imposed their ideas ("the headman single-handedly selected the distributors and took over...").



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Communities whose distribution models brought kits to the people (versus from a collection point) reached more people needing to test, e.g., high-risk young people in informal gold mines. Across evaluation methods, it was evident that although most communities were eager to implement community-led HIVST, support would enhance success, e.g., distributor incentives and transport. Two communities not perceiving benefit from the intervention were less motivated in design/implementation: “... people are not keen to participate any further because you didn't give us food at the HIV self-test introductory meeting.”

Conclusions: Communities can design and implement their own HIVST models, and most felt community-led HIVST was a priority. The trial nesting this work found that community-led HIVST distribution achieved similar outcomes as programme-led distribution and that communities with greater cohesion identified more HIV positives.

There is need to integrate community-led HIVST into broader community systems planning and implementation where there is programme/government support.

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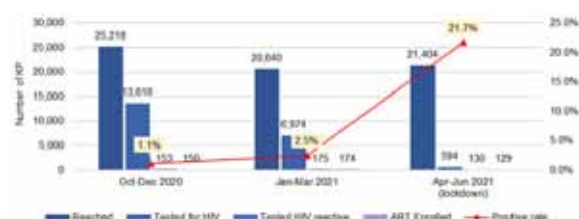
New modalities to fill gaps in new case finding among high-risk key populations during COVID-19 in Phnom Penh, Cambodia

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Background: Half of Cambodia's estimated 100,000 key population (KP) members live in Phnom Penh. Before the COVID-19 pandemic, 50% were reached physically by outreach workers for HIV risk screening and testing. COVID-19 related lockdowns reduced face-to-face contacts to near zero and new strategies were needed to ensure continued access to counseling and testing.

Description: From October–December 2020, before COVID-19 lockdowns, of 25,000 KPs reached face-to-face, 13,618 were tested and 150 (1.1%) were HIV reactive. During COVID lockdowns, local community-based organizations (CBOs) intensified their virtual outreach and added an HIV self-testing (HIVST) modality. Outreach workers met clients through online gay dating sites, Facebook, and other social media and networking sites. Virtual contact rates were similar to face-to-face rates and outreach workers provided counseling on the importance of testing. Arrangements were made to deliver/pick-up HIVST kits for clients requesting them. During the lockdown from April–June 2021, 594 were tested (572 through HIVST); 130 (21.7%) had reactive results. If reactive, clients were referred for confirmation and enrollment in care.



Lessons learned: Focused online outreach, effective counseling, and self-testing can find nearly as many high-risk HIV-positive individuals as more labor-intensive face-to-face screening of those at lower risk. There was no significant loss to follow-up as clients moved from self-testing to finding a reactive result, and confirmatory testing to enrollment in antiretroviral therapy (ART).

Conclusions/Next steps: As COVID-19 restrictions are reduced and CBOs return to face-to-face outreach and testing, virtual outreach, and self-care-approaches for those at risk should continue. A hybrid model of physical hot-spot-focused, face-to-face outreach, combined with virtual outreach to those finding partners online, along with provision of HIVST may produce better results in HIV case detection and enrollment in care.



EPC0466

Trends and associated factors in HIV testing among heterosexual men and women in Melbourne, Australia, 2012-2020

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Background: Despite the recent increase in the proportion of HIV notifications attributed to heterosexuals in Australia, little is known about HIV testing practices among heterosexuals. We aimed to investigate the trends and factors associated with HIV testing practice among heterosexuals.

Methods: This is a retrospective analysis of heterosexuals first attending Melbourne Sexual Health Centre between 2011 and 2020. We calculated the proportion of heterosexuals who had ever tested for HIV, had tested for HIV in the last 12 months and the number of months since their last HIV test.

Univariable and multivariable logistic regression analyses were performed to identify the factors associated with ever HIV testing and HIV testing in the last 12 months.

Results: In total, 78,652 heterosexuals were included, with 41,778 (53.1%) men and 36,873 (46.9%) women. Overall, the proportion of heterosexuals ever tested for HIV was 40.8% (32,078/78,652), with a declining testing trend from 40.2% (2,412/5,997) in 2011 to 36.5% (2,164/5,936) in 2020.

Additionally, the proportion of heterosexuals tested for HIV in the last 12 months was 15.7% (12,354/78,652), with no significant change in the testing trend ($P_{\text{trend}}=0.489$). The median months since the last HIV test decreased from 18.0 (IQR 6.7-37.3) in 2011 to 15.0 (IQR 6.4-32.5) in 2020 ($P_{\text{trend}} < 0.001$).

Furthermore, those having condomless sex with casual partners ($\alpha\text{OR}=0.92$, 95% CI: 0.88-0.96) and who were diagnosed with a sexually transmitted infection ($\alpha\text{OR}=0.88$, 95%CI:0.84-0.93) were less likely to ever tested for HIV.

Conclusions: HIV testing was low among heterosexuals, and individuals who engaged in condomless sex and had another STI were less likely to get tested. To reduce HIV transmission, strategies to improve HIV testing among heterosexuals are needed.

EPC0467

Factors associated with late first DNA PCR test among HIV-exposed infants in Kyenjojo and Kyegegwa districts, Uganda, July-December 2019

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Background: The World Health Organization recommends that all infants born to HIV-positive mothers be tested within four to six months of life to initiate early treatment for those infected. Early Infant Diagnosis HIV testing for all HIV-exposed infants by deoxyribonucleic acid polymerase chain reaction, commonly termed as early first DNA PCR testing should be done within the first eight weeks of birth. The target remains unmet.

To guide programmatic interventions to improve EID and the survival of HIV-infected infants, we determined the prevalence and factors associated with late first DNA PCR testing in select facilities in Uganda.

Methods: We conducted a facility-based cross-sectional study using routine data from 11 healthcare facilities in Kyenjojo and Kyegegwa districts in western Uganda. We included all caregiver-infant pairs with an HEI aged <18 months who had received a first DNA PCR test between July-December 2019 at study sites. We collected demographic data as well as health-seeking behavior of mothers during the last pregnancy.

Our outcome was a late DNA PCR test (after eight weeks of age). We computed the proportion of HEI who tested late and used logistic regression to determine the significance of association.

Results: Three hundred sixty-two caregiver-infant pairs were recruited. Most caregivers were farmers or businesswomen (64.9%), had attained a primary or lower level of education (60.5%), had attended any ante-natal care (ANC) (97.8%), and delivered at a health facility (88.1%). The prevalence of late testing was 9.9% (36/362). In univariable analysis, late testing was associated with delivering at home (OR 5.0; 95% CI 2.6-12.1), ANC non-attendance (OR 78.4; 95% CI 9.3-659.8), and using mixed or replacement feeding methods (OR 64.4; 95% CI 19.7-210.6).

In multivariable analysis, late testing was associated with delivering at home (OR 3.54; 95% CI 1.2-9.9), ANC non-attendance (OR 11.0; 95% CI 0.7-173.3), and mixed or replacement feeding methods (OR 47.8; CI 13.3-172.2).

Conclusions: Approximately 10% of HEIs in Kyenjojo and Kyegegwa districts were tested late during July-December 2019. To ensure that all HEIs are tested in time for proper management, there is need to promote interventions for pregnant women to attend ANC and deliver at health facilities.



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**EPC0468**

Index testing strategy optimizes HIV case finding among men in five Nigerian states, moving country closer to epidemic control

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Background: Nigeria accounts for 9% of the global HIV burden, with about 10% of new HIV cases occurring in the country. The National Agency for the Control of AIDS (NACA) states that only 60% of men 15 years and older living with HIV are currently on HIV treatment. Studies show that men and boys are less likely than their female counterparts to test for HIV, initiate antiretroviral therapy and remain engaged in care. Structural barriers, such as clinic operating hours or locations that are inconvenient for men who work, and the direct or indirect opportunity costs of obtaining services, such as time lost from work, prevent men from accessing HIV services.

Due to these factors, identifying men with HIV is more difficult relative to women. The USAID-funded Reaching Impact, Saturation, and Epidemic Control (RISE) project implemented Index Testing (IT) as a strategy to increase HIV case identification among men through their sexual partners.

Methods: A comparison of data on index testing from October 2019–March 2020 (before) to April–September 2020 after providers' training, routine data reviews, and remediation were used to intensify index testing.

Registers were reviewed to assess the number of HIV tests and HIV-positive clients identified from both modalities to determine their yield and contribution for both periods.

Results: Before intensified index testing, 3,245 men aged 15–44 years were tested through the index modality, and 480 tested positive (yield: 15%, contribution: 18%). Similarly, 68,562 men were tested for HIV, and 2,212 tested positive from other modalities (3% yield and 82% contribution).

Following implementation of intensified index testing, 6,418 men were tested, and 1,157 positives were identified (18% yield and 28% contribution), while other modalities tested 91,056 and identified 2,974 positives (3% yield and 72% contribution).

Results from the two modalities showed a 141% and 34% increase in case identification between the two periods for index and other modalities, respectively.

Conclusions: Strengthening providers' capacity on index testing and routine data reviews and remediation has been found to be an effective strategy for HIV case finding among men, which is critical in achieving epidemic control.

EPC0469

Awareness and willingness to use HIV self-testing among people who inject drugs in Iran

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Background: Only one-third of people who inject drugs (PWID) tested recently for HIV in Iran. While PWID face barriers to HIV testing at health facilities, HIV self-testing (HIVST) shows promise to improve HIV testing and reach individuals who might not otherwise test for HIV.

This study aimed to examine the level of awareness and willingness to use HIVST among PWID in Iran. We also identified participants' characteristics associated with a higher willingness to use HIVST.

Methods: PWID aged ≥ 18 years who reported illicit drug injection in the previous year were recruited in 11 major cities across Iran using a respondent-driven sampling method from June 2019 to March 2020. Willingness to use HIVST was defined as a binary variable (very low/low willingness vs. high/very high willingness).

We used multivariable logistic regression to examine associated factors of the study outcome and report adjusted odds ratio (aOR) along with their 95% confidence intervals (CI).

Results: Of 2,321 PWID, 375 (16.2%) had ever heard of HIVST, however, 1,721 (74.2%) reported high/very high willingness to use HIVST.

Multivariable analysis showed that willingness to use HIVST was higher among PWID who reported high school or more education compared to less than high school education (aOR 1.63; 95%CI 1.23, 2.16), homelessness in the previous year compared to never homelessness (aOR 2.42; 95%CI 1.81, 3.24), >10 years of injecting compared to < 5 years (aOR 1.97; 95%CI 1.44, 2.68), daily injection drug use in the last three months (aOR 1.50; 95%CI 1.14, 1.98), and having a high/moderate HIV risk perception compared to low HIV risk perception (aOR 5.09; 95%CI 3.52, 7.38).

Conclusions: The vast majority of PWID in Iran, particularly those experiencing homelessness, inject drugs for a longer time and more frequently, and those with a high to moderate HIV risk perception would be willing to use HIVST. The low awareness of HIVST highlights the need for enhancing HIVST awareness through increased access and health education programs. Implementation science studies to effectively design and run HIVST programs for PWID in Iran can also increase their access to HIV testing.

**EPC0470****Crowdsourced partner services among men who have sex with men living with HIV: a pilot randomized controlled trial in China**X. Yan¹, J.D. Tucker^{1,2}, W.C. Miller³, H. Xu⁴, Y. Zhou^{5,6}, W. Tang^{1,6}

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Background: Partners of people living with HIV have a higher HIV prevalence. To improve the uptake of HIV partner services (HIV PS) among men who have sex with men living with HIV (MLWH) in China, our team developed a crowdsourced intervention. This study assessed the acceptability, feasibility, and preliminary effectiveness of the intervention.

Methods: A pilot two-arm randomized controlled trial (RCT) was conducted to compare the proportion of partner HIV testing of MLWH. Indexes in the control arm received conventional HIV PS using referral cards. Indexes in the intervention arm received a crowdsourced HIV PS intervention which included HIV self-testing kits for secondary distribution (HIVST-SD), digital education materials, and assisted PS via provider/contract referral.

The primary outcomes were intervention feasibility (i.e., the frequency of indexes using crowdsourced intervention components), intervention acceptability (i.e., the evaluation of indexes on intervention components using Likert scales), and the preliminary impact of the intervention (i.e., the proportion of partners getting HIV testing within three months of index enrollment). Descriptive analysis was conducted, and generalized linear models were used to test whether the proportional differences were significant.

Results: A total of 121 newly diagnosed MLWH were enrolled between July 2021 and May 2022 in Guangzhou and Zhuhai, China, with 81 in the intervention arm and 40 in the control arm. The 3-month follow-up rates were 93% (75/81) and 83% (33/40), respectively.

In the intervention arm, 23 indexes used HIVST-SD, six used online provider-referral to notify nine sexual partners. Indexes visited the digital educational materials 2.3 times on average. The intervention components also demonstrated acceptability, with HIVST-SD rated 4.4 out of 5 and the digital educational materials rated 4.1 out of 5.

The proportion of partners getting HIV testing among all identified partners was 38% (65/171) in the intervention arm, compared to 27% (24/89) in the control arm. The difference was not statistically significant (11%, 95% CI: -2% ~24%).

Conclusions: The crowdsourced HIV PS intervention components were acceptable and feasible among Chinese MLWH and may improve the proportion of partners receiving HIV testing.

Further implementation science research is needed to expand HIV PS among key populations in low and middle-income countries.

EPC0471**The use of influencer marketing and E-commerce platforms to increase the uptake of HIV self-test kits among sexually active individuals in Nigeria**P. Omodele¹, D. Aizobu², S. Malaba³, G. Omoregie², O. Idogho², J. Anyati², B. Adesina², D. Ukaga², O. Akpabio², N. Nnannah²

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Background: HIV self-testing (HIVST) provides a more convenient and accessible means for individuals to test for HIV compared to conventional HIV testing services. However, uptake of HIVST kits among individuals in Nigeria remains low.

To address this challenge, the Strengthening HIV Self-Testing in the Private Sector (SHIPS) project is using influencer marketing to increase the awareness and uptake of HIVST kits through e-commerce platforms.

Description: The SHIPS project is being implemented by Society for Family Health in Nigeria to increase HIV self-testing awareness and uptake among 18 – 34 year old individuals in Abuja and Lagos.

Influencer marketing involves collaborating with an individual who has influence over a large group of people to market products or services.

The project utilized influencer marketing and partnered with myPaddi, a Sexual & Reproductive Health focused e-commerce platform. 4 influencers were used to promote the HIVST kits on social media while advertising the e-commerce platform as a private, convenient, and confidential channel for individuals to purchase the kits.

Lessons learned: The project demonstrated that that influencer marketing and e-commerce platforms are effective tools for increasing the uptake of HIV self-testing kits as it reached 379,065 individuals through influencer marketing and recorded 1,739 HIVST kit sales through the e-commerce platform between May and October 2022.

This activity highlighted the benefit of providing an easily accessible purchase channel for HIVST kits. The project also found that partnering with influencers can be effective in driving health behavior change.

The analysis revealed that influencer content was able to reach a wide audience, increase knowledge about HIV self-testing and promote positive attitudes towards it.

Conclusions/Next steps: Influencer marketing and e-commerce platforms helped increase the uptake of HIV testing kits among sexually active individuals in Nigeria.



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Influencer marketing also helped to bridge the information gap caused by a lack of HIVST awareness and promoted positive health behavior.

EPC0472

HIV self-testing in men who have sex with men in Argentina: high acceptability and the importance of tailored implementation

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Background: Men who have sex with men (MSM) constitute a key population with a high prevalence of HIV (12-15%) in Argentina. HIV self-testing (HIVST) has been internationally recommended as a tool for increasing access to diagnosis. In this context, our study aimed to evaluate the use of an oral-based HIVST among MSM for the first time in Argentina.

Methods: Between January-September 2022, HIV negative MSM underwent oral HIVST under supervision at an NGO. Participants were recruited through social networks in Buenos Aires. They were then given a second oral HIVST to perform in 90 days, outside the health system, being followed up through a messaging application. Experience using the HIVST was reported through a self-administered online survey. Data was analyzed using SPSS.

Results: HIVST was performed by 100 seronegative MSM at an NGO. Most participants (95%) were able to follow the instructions without making mistakes. Most tests delivered for use within 90 days were reported as performed (95%). All tests were HIV negative.

The survey was responded by 90.5% (86/95) and most reported: having taken the second HIVST at home (95.3%), having performed it without accompaniment (75.6%), willingness to use HIVST again (90.7%) and that they would test themselves for HIV more frequently using it (81.4%). No errors were reported with the second HIVST and 83.7% of MSM believed that the instructions were clear, the test was easy to perform and the results were easy to read. Compared to those who expressed dissatisfaction in at least one of these aspects, these participants were more willing to use ($p<0.001$), recommend ($p<0.001$) and distribute ($p<0.01$) HIVST, and were more likely to trust in the result ($p<0.001$) and test themselves more frequently if it were available ($p=0.02$).

Conclusions: Improving HIV testing uptake is one of the most important strategies to end the HIV pandemic as a public health problem.

Our findings indicated high acceptability to use the test (either at the NGO as at home) as well as to reveal result. Future studies that include secondary HIVST distribution are needed to implement a comprehensive HIV self-test policy in Argentina.

EPC0473

Evaluating growing adolescent populations when developing subnational HIV testing strategies in PEPFAR countries using Global Census Data using correlational research methods

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Background: Testing strategies should evolve with shifting demographics, and growing youth populations. Testing strategies, especially in countries close to epidemic control, should align with demographic data. This study aimed to analyze testing trends compared to demographic trends in PEPFAR Countries, specifically among adolescents.

Methods: Correlational research methods were used to compare census data and PEPFAR HIV Testing results. Census data from the United States Census Bureau International Database, UN Population Dynamics World Population Prospects, and WorldPop were analyzed to achieve subnational age/sex disaggregated population levels for the 10-24 age disaggregates, in PEPFAR countries. Subnational population estimates were derived using WorldPop 100m2 gridded population estimates within each polygon and then linked to PEPFAR testing results for that subnational unit. PEPFAR HIV Testing data from FY2017 - FY2020 were then broken down by age/sex disaggregates at the subnational level. Analysis was completed on overall trends in testing, positives identified, and yield. Testing data trends were then compared to the census data to identify areas where testing strategies were not statistically in line with identified demographic shifts in adolescent populations.

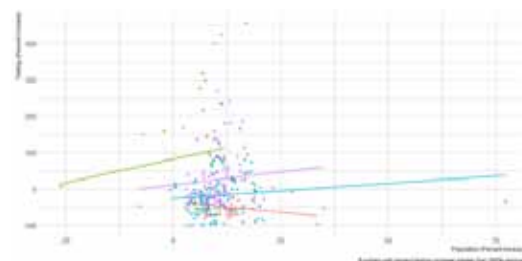


Figure. Percent increase in testing by percent increase in population. 2017 to 2020, population 10 to 24 years old.

Results: Four (4) PEPFAR supported countries, Kenya, Malawi, Tanzania, and Uganda experienced significant growth in the adolescent population (10-24 years old), while testing strategies did not change based on age. Of 273 total subnational units, 36 were found to have decreased testing amongst adolescents, despite significant population



growth in this age group. 31 subnational units increased adolescent testing efforts despite seeing decreasing or stable adolescent populations.

Conclusions: Adolescent populations are growing significantly in many PEPFAR-supported countries. In numerous regions and countries, adolescent testing has not grown with the population. Testing strategies should be reviewed and updated with demographic growth in mind in order to accurately track and adapt to changing trends among young populations.

EPC0474

Ending AIDS in children by 2030: finding and linking undiagnosed children living with HIV (CLHIV) to ART using the 'know your child's HIV status (KYCS)' model in Zambia

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Background: Barely half of all CLHIV were on ART in 2021 (UNAIDS 2022). Ending AIDS in children by 2030 begins with closing the gap of low CLHIV identified and linking them to treatment. The global coalition to ending AIDS in children launched in 2022 envisions an AIDS-free pediatric population beyond 2030 through 4 pillars one of which is HIV case-finding.

KYCS, as demonstrated in USAID DISCOVER-Health Project-supported facilities in Zambia is one of the innovations that can help bridge this gap in pediatric HIV case-finding.

Methods: The intervention was rolled out to all supported facilities in early 2022. A line-list of all women living with HIV (WLHIV) on treatment was obtained from each facility from which biological and non-biological children (contacts) aged 19 years and below were elicited for HIV testing.

The project oriented all key technical staff and provided resources (registers, test kits, transport) to facilitate HIV testing. Facility-level aggregates of data from electronic tools with key variables such as age, sex and other demographic parameters were collected for analysis.

Results: In total, 30,830 (85%) WLHIV on the Project's records were line-listed, from which 56,521 contacts were elicited. From these, only 24,513 (43%) had documented known HIV status. Ninety percent (28,926) of the contacts with unknown HIV status were tested.

Overall, the Project identified 903 CLHIV aged 19 years and below (1.46% yield), all of whom were linked to ART. The median age of identified CLHIV was 15.2 years. Female contacts were one and half times more likely to test positive for HIV than males (OR=1.56, 95% CI 1.35 to 1.81,

p<0.001), and female adolescents aged 15-19 years almost three times more likely to test positive than their male counterparts (OR=2.74, 95%: 2.07 to 3.68, p<0.001).

Conclusions: Despite KYCS requiring more HIV tests to be used to identify a positive child, it remains a crucial strategy for closing the gap in the number of children left behind in HIV treatment.

Additionally, intentional investments are required to ensure equitable access to HIV combination prevention services among adolescent girls to address the high HIV incidence.

EPC0475

Contributions of stigma-free clinics on improving access to HIV-testing services (HTS) and PrEP uptake for men having sex with men (MSM) in Haiti: lessons learned towards equity

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Background: For over a decade the HIV prevalence has been stabilized at 2%. However, Men who have Sex with Men (MSM) are disproportionately affected by HIV with a prevalence of 13%. MSM are more likely to experience discrimination and gender-based violence, which hinder access to HIV services.

We present here the results of a customized intervention aiming at improving MSM access to HIV-Testing Services (HTS).

Description: To achieve the 95-95-95-UNAIDS goals, the National AIDS Control Program (French acronym: PNLS) revised the National HIV-testing guidelines and recommended targeted HTS, which implies: offering services to clients found to be at risk for HIV, initiation HIV-positive clients on Antiretroviral therapy (ART) and counseling on HIV prevention methods including condom use, pre-exposure prophylaxis (PrEP) for HIV-negative clients.

We provided training on Stigma and discrimination for the staff at our health facilities to help them comply with the stigma-free policy adopted by the organization while protecting confidentiality.

We involved MSM clients in the design of suitable and cost-effective outreach activities in compliance to the COVID-19 restrictions in place for safety.

Collectively we planned monthly Saturday Clinics dedicated to celebrating MSM who remain active on PrEP/ART by offering healthcare services and socio-educational activities where they networked, learnt more about HIV and COVID-19 prevention, listened to music, play games, trained on COVID-19 safety measures and receive Personal Protective Equipment. They freely referred their partners/peers to join our safe environment where quality and health equity prevail.



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Lessons learned: At baseline (FY20-Q4), of 17 MSM tested for HIV, 4 were HIV-positive and 12 accepted PrEP. Following our intervention, in FY2021, 354 MSM were tested for HIV of whom 114 were diagnosed HIV-positive and 163 initiated PrEP. In FY2022, 638 MSM tested for HIV of whom 202 were HIV-positive and 356 accepted to begin PrEP.

We noticed a steady increase in the number of MSM getting tested for HIV, the positivity rate (32%) and the proportion of HIV-negative MSM clients enrolling on PrEP (77%). Additionally, all HIV-positive diagnosed MSM received tailored assistance for linkage to ART.

Conclusions/Next steps: Strong commitment to combat stigma and promote gender equity within health facilities may increase the uptake of HIV testing and PrEP enrollment among MSM.

EPC0476

ACTUP-PNG – a model for scaling up point-of-care HIV Viral Load and Early Infant Diagnosis in Papua New Guinea and other resource limited settings

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Background: Papua New Guinea's (PNG) National STI & HIV strategy details the importance of reliable laboratory services and point-of-care (POC) HIV diagnostics for people living with HIV (PLHIV). Previously, a centralised testing model, relied on postage of dried blood samples to Port Moresby, this delayed result turnaround time for HIV Viral Load (HIVVL) and Early Infant Diagnosis (EID) hampered both coverage and timely patient care, including the initiation of life-saving HIV treatment for infants.

Description: ACTUP-PNG's laboratory strengthening provides clinic-based POC testing for HIVVL and EID. The GeneXpert™ platform provides (HIV-1 VL) for PLHIV 10yr+ and EID testing (HIV-1 Qual).

The m-PIMA™ performs HIVVL (HIV-1/2 VL) on children. ACTUP-PNG supports clinics in Port Moresby General and Mount Hagen Provincial Hospitals, serving the largest

population of PLHIV. Clinic-based testing has improved HIVVL and EID testing coverage and reduced result turnaround.

Lessons learned: 3,703 PLHIV have been provided with same day HIVVL, including 51 children. Routine HIVVL monitoring according to national guidelines is followed and repeat testing for 305 PLHIV has occurred. ACTUP has played a significant role in increasing HIVVL coverage, accounting for ~45% of all HIVVL tests nationally. 848 HIV exposed infants tested, has given 10.1% positivity rate, is the only molecular POC in country facilitating timely initiation of ART.

Introduction of the m-PIMA™ ensures equitable access to POC testing for all. Between 90-96% of results are returned to clinicians on the same day, ~56% within 3hrs. Changing the culture to encourage PLHIV remain to receive their results remains an ongoing challenge as they accustomed to waiting weeks.

ACTUP-PNG employs 6 full-time laboratory staff and provides educational support to PLHIV and health workers. Challenges include COVID-19, violence related to national elections, ethnic conflicts, consumable logistics and growing workspace requirements.

Conclusions/Next steps: POC HIVVL and EID testing is possible in PNG and offers a successful model for scaling up of testing services to improve equitable, timely diagnostics and clinical monitoring for all PLHIV.

Ongoing efforts are needed to improve the same day return of results to PLHIV to fully realise the potential POC technologies can play in the HIV response in PNG.

EPC0477

Innovations in HIV testing: mobile HIV testing units in Mizoram

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Background: In India, the state of Mizoram reports the highest HIV prevalence of 2.37% compared to the national average (0.22%) among the adult population. To improve the testing coverage, several initiatives focused on vulnerable populations from hard-to-reach areas, including People who Inject Drugs (PWID), young and adolescent people and people in closed settings.

Description: To provide comprehensive one-stop HIV services, inclusive of HIV testing with confirmation, treatment linkage, and ART initiation for vulnerable populations, we worked with the Mizoram State AIDS Control Society to establish six Mobile HIV Testing Units (MHTU) in five dis-



tracts of Mizoram. The MHTU is a decentralized mobile unit on motorbike conducting confirmatory testing by team of counsellor, laboratory technician, and a navigator on rotation.

Each MHTU is directly linked to a standalone government integrated counselling and testing center for reporting purpose and ART center for treatment linkages.

Lessons learned: Seventy-one percent (6,708/9448) of individuals tested for HIV were below 35 years of age and represented 72% (291/404) of all positive clients. The turn-around-time from screening, confirmation and linkage to ART was reduced from three to one day.

The MHTU also identified 1,308 (1436-128) HIV negative KP who had never reached by any government program and 94% of them were linked with prevention services.

Of the 404 positives, 331 (82%) were linked and initiated on ART. Sixty-seven percent of individuals who initiated ART were under 35 years. The average baseline CD4 count (n =331 individuals) was 402 cell/mm³.

April 2021 to September 2022	Tested for HIV	Detected with HIV	Positivity %
KP enrolled with Targeted Interventions	4,542	149	3%
Unreached KP	1,436 (never reached by any other program)	128	9%
General population	2,987	122	4%
Other vulnerable population	483	5	1%
Total	9,448	404	4.3%

Conclusions/Next steps: The MHTUs served as an important strategy to reach young KP for early engagement in care.

EPC0478

Optimizing HIV case finding in Burundi: do characteristics of index clients influence case-finding rates?

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Background: Index testing (IT) is highly effective in identifying new HIV cases. The objective of this study was to determine which people who accept index testing have sexual partners who are at greater risk of HIV.

Methods: A list was extracted from the national HIV database of all people living with HIV 15 years and older who accepted IT between November 2018 and June 2022 at five sites supported by the USAID-funded RAFG project in Burundi.

Data for the sexual partners of these clients were then extracted from IT registers at the supported sites. We determined differences in HIV case finding (CF) and index client

(IC) characteristics among people diagnosed with HIV ≤ 6 months – new clients (NC) – and people diagnosed with HIV > 6 months – old clients (OC).

Difference in proportions and means were calculated by chi-square and Student's t-test, respectively. Stratified analyses controlled for confounding. P-values <0.05 were considered significant.

Results: A total of 1,137 people who accepted index testing (667 NC, 460 OC), and reported an average of 2.5 partners, were included in the analysis. NCs reported 2.7 partners compared to 2.2 partners among OCs (p<0.001); male ICs reported more partners than female ICs (2.8 vs. 2.4, p<0.05). CF was higher in partners of NCs than partners of OCs (21.6% vs. 15.0%, p<0.001), partners of male ICs vs. female ICs (31.4% vs. 12.7%, p<0.001), partners of employed ICs vs. unemployed ICs (22.0% vs. 15.3%, p<0.001), partners of ICs having same-day ART initiation vs. later initiation (20.7% vs. 16.6%, p<0.001).

Multivariate logistic regression showed that CF was higher among partners of male ICs (adjusted OR [aOR]=2.8, CI=2.3–3.5, p<0.001), and partners of ICs attending Site 2 (aOR=2.0, CI=1.5–2.5, p<0.001) of the five sites included in the study.

In stratified analysis, multivariate logistic regression showed that CF was significantly higher for partners of male ICs than those of female ICs for both NCs and OCs.

Conclusions: Some characteristics of people who accepted IT were associated with case finding among their sexual partners. Given limited resources, priority could be given to testing partners of NCs and partners of males.

EPC0479

The use of differentiated demand creation strategies to promote client retention on PrEP programmes: Lesotho's Bonolo Meds2Me Mobile App

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Background: Lesotho also has higher concentrations of high-risk (key) populations, for example, sex workers and men who have sex with men. These key populations face a disproportionate risk of acquiring HIV in Lesotho and have been recognized as clients who would benefit from Pre-exposure prophylaxis (PrEP). Although HIV Testing Services (HTS) and PrEP programmes have been initiated in Lesotho, there are several challenges to retaining clients on PrEP programmes in Lesotho.

Description: Right ePharmacy in collaboration with the Ministry of Health and other implementing partners, have designed a mobile app (Meds2Me), customized for the Bonolo Meds national, decentralized drug distribution campaign, which is intended to help clients locate and access HTS and PrEP services close by, provide information to address misconceptions about PrEP and send user-friendly reminders to help promote adherence and knowledge about the consistent use of PrEP.



The Meds2Me mobile technology is also used to reach younger population groups, by facilitating community engagement, through health initiatives and site activations.



Lessons learned: Although new innovations can be used to create awareness and education, various demand-creation activities should be deployed to respond to unique local, logistical, and cultural complexities.

Based on our initial launch and findings we note that the region struggles with the enrolment of clients and more so, the retention and continuation of treatment, where clients see PrEP as a once-off modality.

Conclusions/Next steps: Together with the implementation of the Meds2Me mobile app, at site level, we will facilitate training for health professionals who will conduct the initial enrolment.

The upskilling of staff will ensure that part of the consultation and counselling will include the importance of continuing with the treatment and advising on various pick-up points to gain access to treatment. Quantitative analysis will be done to monitor the success of the demand-creation strategies and technologies in retaining clients on PrEP programmes.

Cascades of HIV care and treatment

EPC0480

High dynamic range serologic recency assays can support VL monitoring during ART

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Background: Viral Load (VL) monitoring is a key component of client care during antiretroviral therapy (ART) but is not routinely available in many resource-constrained settings.

We hypothesise that a high dynamic range serologic 'recent infection' test (Sedia LAg assay) which detects antigen-driven antibody response can provide informative proxies for VL trajectories.

Methods: Analysed Sedia LAg ELISA normalised optical density (ODn) data trends from the repository for recent infection test benchmarking (CEPHIA) – with selected client panels comprising:

1. Observations straddling ART start;
2. Observations from a period of stable viral suppression;
3. Observations straddling rebound after a period of viral suppression.

Using groups 2 and 3 we evaluated specificity and sensitivity of a proxy for "latest observation at VL rebound" defined as follows: we estimated client-specific mean-previous-ODn for all observations with ≤ 2 preceding virally suppressed observations.

Standard errors on mean-previous-ODn estimates were derived by subject-specific or pooled variance estimates, and deviations were interpreted via t or Z tests, respectively. We considered various thresholds to define "VL suppression" and "ODn uptick".

Results:

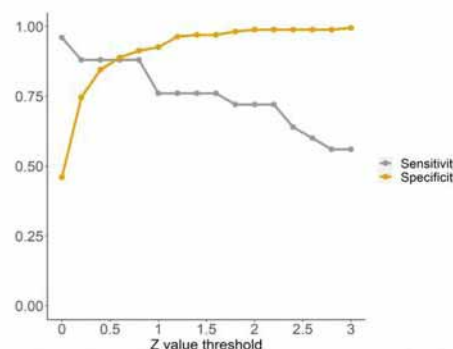


Figure 1. Sensitivity and Specificity for detecting an initial viral resurgence, as a function of 'Z-value threshold' in comparing a most recent Sedia LAg ELISA Normalised Optical Density to the mean of preceding values during suppression. Note that in this (pooled variance) analysis, at a Z score threshold of 0.8, the observed specificity and sensitivity are both close to 90%. If ODn values are truly normally distributed, the specificity is expected to be about 80%.

In regression analysis by category:

1. ODn readings consistently decline statistically significantly after ART-start. ($p=0.025$)
2. During periods of stable viral suppression, ODn tended to decline, but not statistically significantly, for a range of clinically meaningful "VL suppression" thresholds. ($p=0.956$)
3. During "VL rebound", ODn showed consistent statistically significant increasing trends ($p=0.001$).

Figure 1 shows accuracy for detecting 'viral uptick', as a function of a Z-score threshold.

Conclusions: The Sedia LAg ELISA test may provide meaningful information about the success of ART, during treatment initiation, at times of stable suppression, and flag possible viral rebound. It should be investigated how this can be combined with client management workflows and (clinical and) other data, to provide efficiencies in monitoring viral control in resource-limited settings.

**EPC0481****Improving access to HIV prevention and care and treatment for adolescent and youth through community-based service delivery models in Nampula, Mozambique**

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Background: Adolescent and young people (AYP) in sub-Saharan Africa (SSA) are disproportionately affected by the HIV epidemic. Among 1.75 million adolescents living with HIV worldwide, 88% (1.5 million) are in SSA. In Mozambique, 98,000 individuals were newly infected with HIV in 2020 and 17% (17,000) were adolescents. ICAP worked with Nampula's Provincial Health Authorities (DPS/SPS), community-based organizations (CBO) and the private sector to design and implement a community service delivery model to reach AYP and engage them in health services in Nampula Province.

Description: In June 2022, AYP-targeted mobile brigades (MB) were launched, in collaboration with provincial and facility leadership. The MB offered comprehensive HIV prevention, care and treatment (C&T) at the community level, integrated into general health services (e.g. maternal and child health services, outpatient consultation). Preferred locations were identified with AYP, focusing on AYP congregation areas, universities and technical schools. Recreational activities, such as music, sports and theatre competition, complemented clinical services to promote demand for services and to strengthen HIV and health literacy.

Lessons learned: Between June and November 2022, 31 MB were implemented, reaching 1,043 AYP (615 females and 428 males). Of these, 730 tested for HIV, with 28 (4%) testing positive and all initiating antiretroviral therapy. Of the 702 who tested negative for HIV, 259 (141 females and 118 males) were eligible for pre-exposure prophylaxis (PrEP) and 98% (138/141) of females and 95% of males (112/118) accepted and initiated PrEP.

Conclusions/Next steps: Contextualized interventions to reach AYP are essential, as targeted demand creation and health literacy strategies using peers, coupled with decentralization of services to communities, resulted in high uptake of health services.

A relatively high percentage of males were reached, and demand and acceptance of PrEP was high among adolescent females and males. These initial results reinforce that service delivery models should be reviewed to ensure they respond to AYP needs and interests.

EPC0482**Trends in continuity of HIV treatment among children and adolescents living with HIV in fourteen districts in South Africa, 2018 - 2022**

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Background: South Africa has the largest pediatric HIV epidemic globally. Monitoring continuity of HIV treatment among children and adolescents (C/ALHIV) aged 0 - 19 years remains a challenge programmatically in the absence of an integrated electronic health record system. We aimed to explore trends in treatment interruption and growth for C/ALHIV using available routine data in USAID-supported districts in South Africa.

Methods: We conducted a retrospective review of routine programme data reported in the U.S. President's Emergency Fund for AIDS Relief (PEPFAR)'s Data for Accountability, Transparency, and Impact Monitoring system (DATIM) over a 5-year period between January 2018 and September 2022. Districts (n=14) were selected for this analysis based on continuous support during the analytic period. We further compared aggregate DATIM data with district-level C/ALHIV modeling estimates from UNAIDS's NAOMI model.

Results: In the period, the number of children receiving treatment peaked at 105,107 in March 2020, representing a 57% growth from March 2018 (66,790). From March 2020 to September 2022, there was a 21% reduction in the treatment cohort (83,287) despite 31,223 new treatment initiations (i.e., representing 30% anticipated growth from March 2020) in the same period.

Treatment interruptions were marked by seasonality with 6 - 8% interruptions during December, compared to 4 - 5 % during non-holiday months. Mortality accounted for 0.9 - 2.4% of losses each quarter between October 2019 to September 2022 (1,148 total deaths).

Viral suppression trends ranged from 78 - 81% each quarter. The 21% reduction in treatment growth correlates with the 22% reduction in new infections based on HIV modelling estimates (2017 - 2021).

Conclusions: Some reduction is expected among the pediatric cohort, due to aging-out of defined aggregated age bands, transitioning out of childhood and adolescent care, reduction in new HIV infections, and mobility.

Nonetheless, these results highlight complexities in retention for C/ALHIV and underscore a need for enhanced programmatic data utilization to improve accountability and treatment continuity in this vulnerable and priority population.



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**EPC0483**

Mpox cases at a large urban health system in Philadelphia reveal opportunities for strengthening HIV prevention services as part of status-neutral HIV care: results of a retrospective review

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Background: The global mpox outbreak presents a unique opportunity to engage people living with HIV and those at increased risk of acquiring HIV in status-neutral HIV care. Black MSM in the United States have a 1 in 2 chance of acquiring HIV in their lifetime and low rates of PrEP uptake, highlighting the need for HIV prevention in this population.

The objective of this study is to evaluate the status-neutral care cascade among individuals diagnosed with mpox.

Methods: We performed a retrospective clinical chart review of individuals diagnosed with mpox at the University of Pennsylvania Health System, a large multi-hospital health system in Philadelphia. Subjects were included if they had a positive orthopoxvirus PCR between 5/1/22 and 10/31/22. We abstracted demographics, linkage to care for HIV positive individuals, and testing/linkage to prevention services for HIV-negative individuals.

Results: We identified 129 individuals (91% cisgender men) with mpox, accounting for 24% of reported cases in Philadelphia. 72% identified as Black or African American. 53% were enrolled in Medicaid (public insurance for people with limited income) and 11% were uninsured.

The most common site of diagnosis was the Emergency Department (ED) (70%). The performance of the status neutral HIV care cascade is depicted in Figure 1.



Figure 1. Status-neutral HIV care cascade.

Conclusions: This study highlights the critical role of the ED in HIV testing, prevention, and re-engagement in care for people with barriers to accessing routine healthcare. While we found high rates of linkage to care for people living with HIV and high rates of HIV testing for individuals vulnerable to HIV, linkage to PrEP services was suboptimal. HIV prevention services for Black MSM in Philadelphia could be improved by increasing resources directed to the ED for linkage to PrEP.

EPC0484

Same day ART initiation, loss to follow-up and viral load suppression among people living with HIV in low- and middle-income countries: a systematic review and meta-analysis

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Background: In 2015, the World Health Organization recommended early antiretroviral therapy (ART) initiation after HIV diagnosis. Although some studies revealed better outcomes on same-day ART initiation (SDI) compared to non-same-day ART initiation (NSDI), other studies have shown higher proportions of loss to follow-up (LTFU) among those who receive SDI. These mixed results call for the need to further evaluate the benefits of SDI on LTFU and viral load suppression (VLS) after seven years of its implementation.

Methods: This was a systematic review and meta-analysis of people living with HIV in low- and middle-income countries (LMICs). PubMed, Cochrane Library, Google Scholar, and CINAHL were searched from March 2004 to December 2022. VLS was defined as HIV RNA <1,000 or <400 cells/ml depending on studies. Forest plots were used to present the pooled prevalence and 95% confidence intervals (CI). Analyses were performed in STATA.

Results: A total of 8 studies (2 clinical trials, 5 cohorts, and 1 cross-sectional) were included in the final analysis. Of 156,445 people living with HIV, 45,502 (29.0%) were LTFU. Compared to those who received NSDI, those who received SDI were more likely to be LTFU (risk difference (RD)=0.04; 95%CI: 0.01-0.08). There was not a statistically significant difference in VLS among those who received SDI compared to the NSDI (RD=0.02; 95%CI: -0.04-0.06). The 6-, 12- and 24-month VLS results comparing SDI vs. NSDI were also similar (RD=0.01; 95%CI: -0.04-0.06, RD=0.04; 95%CI: -0.11-0.20, and RD=-0.02; 95%CI:-0.10-0.06, respectively). Among 8 studies included in the final analysis, six reported 6- and 12-month LTFU only, and 2 did not specify the time point for LTFU. For these 6 studies, a sub-group analysis showed no statistically significant difference in LTFU (RD=0.04; 95%CI: -0.00 - 0.09 and RD=0.03; 95% CI: -0.03 - 0.10, respectively).

Conclusions: Nearly three in ten people living with HIV in LMICs who initiated ART were LTFU. Although there was not a statistically significant difference in VLS among SDI compared NSDI, SDI was associated with increased risk of LTFU. Efforts to prevent LTFU among those who receive SDI are critical to maximize its potential benefits.

EPC0485

Effect of the COVID-19 pandemic on HIV service delivery and viral suppression in Northern Nigeria

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Background: During the COVID-19 pandemic, HIV programs scaled up differentiated service delivery (DSD) models to better serve people living with HIV (PLHIV). We evaluated the effects of COVID-19 on delivery and uptake of services in Northern Nigeria.

Methods: We analyzed routine data for PLHIV ≥10 years old from 63 facilities enrolled between 04/2019 and 03/2021. We defined the study period as pre-COVID (before 04/2020) and during COVID (after 04/2020), missed refill appointment if records lacked documentation of a visit >28 days after the scheduled date, and MMD3 and MMD6 as having ART refills occurring at ≥3 months and ≥6 months intervals respectively. We assessed viral load (VL) testing, turnaround time (TAT) and viral suppression (<1000 copies/ml) among those on ART for ≥6 months. We used test of proportions and t-tests to determine differences in outcomes, and fitted a multivariable logistic regression model to determine factors associated with maintaining/achieving viral suppression during COVID for those in care before and during COVID.

Results: Of 84,776 patients, 58% were <40 years old, 67% were female, 55% were on ART for >5 years, and 93% were from facilities with community-based ART refill services. A higher proportion were on MMD3 (95% versus 74%, $p<0.001$) and MMD6 (56% versus 22%) during COVID than pre-COVID. A higher proportion had a VL test during COVID (55,271/69,630, [84%]) than pre-COVID (47,747/68,934, [73%], $p<0.001$). Viral suppression was also higher during COVID (93% [51,196/55,216] vs 91% [43,336/47,728], $p<0.001$). There was a higher proportion of missed clinic visits during COVID (40% [28,923/72,359] vs 39% [26,304/67,365], $p<0.001$). VL TAT increased during COVID (mean number of days: 38 versus 36, $p<0.001$). Modifiable factors associated with maintaining/achieving suppression during COVID were receiving MMD3 or MMD6 (OR: 2.8 [95% CI: 2.30-3.47] and OR: 6.3 [95% CI: 5.11-7.69] respectively), and attending clinics with community-based ART refill (OR: 1.6 [95% CI: 1.39-1.87]).

Conclusions: The Nigeria HIV program demonstrated resilience during the COVID-19 pandemic and adoption of DSD had a positive impact on HIV care. Though VL TAT and missed clinic visits slightly increased during the pandemic, VL testing coverage improved and viral suppression moved closer to 95%.

EPC0486

Enhanced adherence counselling linkage, completion rates and viral load suppression among people living with HIV in Africa: a systematic review and meta-analysis

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Background: In 2016, the World Health Organization (WHO) recommended adherence assessment among people living with HIV on ART with persistent viremia (viral load > 1000 c/ml). The recommendation requires implementation of at least three enhanced adherence counselling (EAC) sessions with the goal of achieving 70% viral load suppression (VLS) following its implementation. We summarized pooled estimates of EAC linkage, completion rate, VLS and compared EAC linkage, EAC completion on VLS among people living with HIV in Africa.

Methods: This was a systematic review and meta-analysis among people living with HIV. PubMed, Cochrane Library, Google Scholar, and CINAHL were searched from January 2015 to December 2022. Those who attended three EAC sessions were considered to have completed and VLS was defined as HIV RNA < 1000 cells/ml. Forest plots were used to present the pooled proportions with a 95% confidence interval (CI). All analyses were performed on STATA.

Results: A total of 12 studies (7 cohorts, 4 cross-sectional and 1 mixed method) were included in the final analysis. Overall, the pooled EAC linkage was 85.1% (95% CI 74.6 – 93.2), EAC completion was 63.6% (95% CI 46.7 – 78.9) and VLS was 51.0% (95% CI 44.2 – 57.9). Linkage to EAC was associated with increased chance of achieving VLS compared to not linking to EAC (RD=0.09; 95%CI: 0.00-0.18; $p = 0.05$). Compared to those who did not complete EAC sessions, those who completed EAC sessions were more likely to be virally suppressed, although results were not statistically significant, (RD=0.07; 95%CI: -0.08-0.23; $p = 0.36$). Pooled estimates of VLS were similar for studies involving adolescents, adults, and both adults and children, [54.1% (95% CI 30.3 – 77.0); 54.5% (95% CI 51.6 – 57.3); and 49.8% (95% CI 42.4 – 57.3) respectively].

Conclusions: Among people living with HIV eligible for EAC, nearly 15% were not linked to EAC services and 36% did not complete three EAC sessions. Although linkage was associated with increased chance of achieving VLS, the overall VLS was less than that recommended by WHO. In addition to EAC, other interventions are needed to support persons with persistent viremia in the efforts of achieving HIV epidemic control.



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Where did they go? – An exploration of “silent” and “non-silent” cross-facility geospatial movements of persons on HIV treatment in Kenya, 2020-2021

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Background: A superficially “leaky” HIV treatment cascade may result from inaccurate accounting of persons living with HIV (PLHIV). PLHIV may register afresh in a different facility as “silent transfers” soon after initiating antiretroviral therapy (ART) or transfer out officially (“non-silent” transfers).

We analyzed longitudinal data from HIV case-based surveillance (CBS) system to describe “silent,” and “non-silent” inter-facility geospatial movements and factors associated with the movements of PLHIV initiated on treatment in 40/47 counties in Kenya from 2020-2021.

Methods: We selected a few demographic variables and clinic numbers and used Stata's *dtalink* package to match and identify duplicate PLHIV who had moved from the facilities where they initiated ART.

We mapped interfacility movements and explored factors associated with these movements using logistic regression.

Results: Of the 201,465 PLHIV who initiated ART in this period, 4,859 were duplicate PLHIV. Among duplicate PLHIV 66 (1.4%) had moved from their original facility silently; 2,473 (50.9%) PLHIV were documented as still active in their original facility - 40.9% (27) of the “silent” and 51.0% (2446) of the “non-silent” transfers. Most PLHIV (>50%) moved within 1-3 months, 1,396 (28.7%), and 1,315 (27.1%) within 6-12 months. Half of the movements were within medium HIV burden counties (figure).

PLHIV initially registered in county or referral hospitals (levels 5 or 6) had higher odds of moving than those initiating ART in lower-level facilities adjusted odds ratio (aOR) 2.3, (95% CI: 1.1-5.0); and being female compared to male aOR 2.5, (95% CI: 1.2-5.4).

Conclusions: Individual-level and facility factors influence the movement of PLHIV; of whom half moved across facilities but were still alive and currently on treatment, and should not be double-counted.

A functional national unique person's identifier will help classify inter-facility PLHIV movements better through shared health records and make PLHIV management efficient as they re-engage in care.

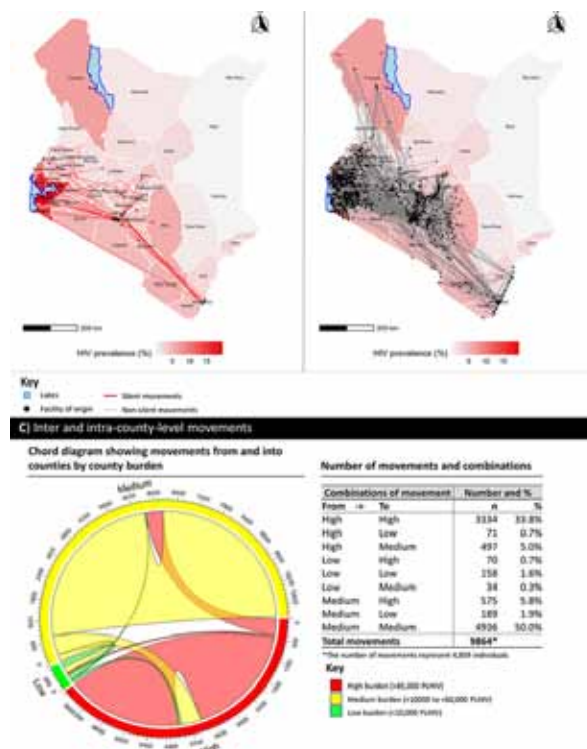


Figure 1. a. silent and b. non-silent interfacility, and c. inter and intra-county movement of PLHIV on treatment in Kenya, 2020-2021.

EPC0488

Trends in interruptions in treatment among men, pregnant women and non-pregnant women: retrospective cohort study in Zambézia Province, Mozambique (2013-2021)

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Background: Since Option B+ strategy commenced in Mozambique in July 2013, universal ART for all persons living with HIV (PLHIV) (Test & Start, „T&S“) was introduced in 2016. We describe trends over time in interruption in treatment (IIT) outcomes between PLHIV groups (pregnant women [PW], non-PW and men).

Methods: Retrospective cohort study was conducted involving adult (≥15 years old) PLHIV who initiated antiretroviral treatment (ART) between July 2013-June 2021 in 107 health facilities in Zambézia Province. Routine data were used to summarize temporal trends in proportions of PW, non-PW, and men experiencing an IIT (i.e., having no


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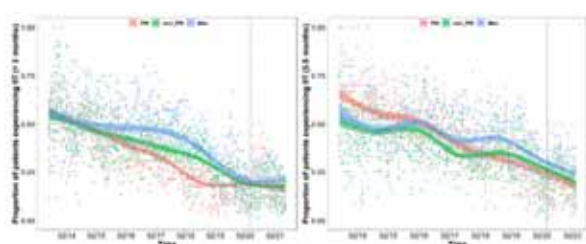

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clinical contact for 28 days after last scheduled/expected contact) less than 3 or within 3-5 months post-ART initiation ("IIT<3m", "IIT3-5m", respectively). Mixed-effect logistic models were built with district as random effect and splines on time variable.

Results: Data from 228,628 adults were included, 25.5% PW, 40.4% non-PW. Overall, monthly IIT<3m proportions for each group decreased from approximately 55% to 20%. Trends in IIT<3m were more pronounced for PW; while men and non-PW showed continued higher proportions of early IIT, improvements were seen from 2019 on. Similarly, monthly IIT3-5m proportions for all groups decreased from 2013-2021 (~65% to ~18% for PW, ~50-55% to ~20-25% for non-PW and men), with variations among groups: higher proportions of PW experienced an IIT3-5m from 2013 to early 2016, while non-PW and men had biennial increases in IIT3-5m from 2013-2018. After 2018, IIT3-5m trends consistently decreased for all groups (Figure).



Conclusions: Trend analysis showed prominent decrease in treatment interruptions in Zambézia for all groups. Men and non-PW had overall slightly higher proportions of IIT, with significant improvements among these groups after T&S was introduced, while the established Option B+ strategy showed continued positive effect. Though trends are reassuring on early retention, continued efforts are needed to ensure sustained effect.

EPC0489

Correlates of experiencing continued interruption in treatment among people living with HIV in Geita, Tanzania, 2020-2022

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Background: There are approximately 1.5 million PLHIV receiving antiretroviral therapy (ART) in Tanzania. Achieving and sustaining epidemic control requires minimizing their interruptions in treatment (IIT), defined as no clinical contact for at least 28 days following the last appointment. Although many factors associated with IIT are known, there is limited evidence on the drivers of continued IIT, especially in geographic regions like Geita with predomi-

nant seasonal economic activities such as fishing and mining. This analysis aimed to identify the correlates of continued IIT among PLHIV in Geita, Tanzania.

Methods: De-identified client-level data were used to examine continued IIT; defined as PLHIV with IIT who never returned to treatment or had prolonged IIT.

We retrospectively examined a cohort of PLHIV with one or more IIT by the end of fiscal year (FY) 2020 (n=11,172). PLHIV with continued IIT by May 2022 (n=9,082) were compared with those who returned to treatment (n=2,090) within this same period. Modified Poisson regression was used to model the associations of PLHIV's socioeconomic and clinical characteristics with experiencing continued IIT. The models used robust variance estimation to account for facility-level clustering of PLHIV and reported prevalence ratios (PR) and 95% confidence interval (95%CI).

Results: Overall, 81% of the PLHIV cohort in our study experienced continued IIT. PLHIV with stage IV disease were 8% more likely to experience continued IIT [aPR 1.08, 95%CI: 1.02-1.15]. Not being on dolutegravir-based regimen was associated with 48% increased likelihood of continued IIT [aPR 1.48, 95%CI: 1.33-1.65]. Being on ART for less than a year was associated with 20% increased likelihood of continued IIT [aPR 1.20, 95%CI: 1.16-1.25].

Additionally, being a male, lack of treatment supporter, and not initially identified by community health workers were associated with continued IIT.

Conclusions: This analysis showed the magnitude and potential drivers of continued IIT in Geita, which can inform similar assessments in Tanzania and elsewhere. The widespread continued IIT is a major threat to achieving and sustaining HIV epidemic control.

Interventions targeting males and use of treatment supporters may be beneficial in improving continuity of treatment, especially in geographic areas with seasonal movement patterns.



EPC0490

HIV care and prevention cascades indicate low engagement among young trans women at high risk of and living with HIV in Rio de Janeiro, Brazil

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Background: Youth are the only age group facing a rise in HIV. The HIV prevention and care needs of young trans women in low-and middle-income countries are understudied despite the extraordinary risk this population faces. We evaluated the HIV care and prevention cascades among young Brazilian trans women and examined the association between HIV-related risk factors and engagement in HIV prevention.

Methods: We assessed baseline data collected in 2022 from BeT - a status neutral intervention to increase HIV prevention and care behaviors among young trans women ages 18-24 in Rio de Janeiro, Brazil. We describe the HIV care and prevention cascades among young trans women. Odds ratios were also calculated to determine correlates of HIV testing, post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP).

Results: We enrolled 165 participants with a median age of 21 years (interquartile range 18-24), 64.4% identified as Black or *Pardo*/mixed. Among 23 participants living with HIV, 9 (39.2%) were linked to care, 5 (21.7%) missed an HIV appointment in the last 6 months, and 5 (21.7%) were virologically suppressed. Of the 142 HIV-negative young trans women, 109 (76.8%) had ever been tested for HIV, 89 (81.7%) of them in the past 12 months, 91 (64.1%) and 120 (84.5%) were aware of PEP and PrEP, respectively. Only 19 (13.4%) ever used PEP, and 13 (10.8%) ever used PrEP. Young trans women who had ever done sex work had significantly higher odds of HIV testing (OR:3.20, 95%CI:1.32-8.66, p=0.014) as did those who had recently used substances (OR:3.29, 95%CI:1.00-10.41, p=0.042). Young trans women who had experienced food insecurity had a borderline association with lower PrEP use (OR:0.35, 95%CI 0.10-1.12, p=0.084) as did youth who screened positive for depression (OR:0.32, 95%CI:0.07-1.10, p=0.095).

Conclusions: None of the HIV care and prevention cascade indicators measured among young trans women in Brazil were close to meeting UNAIDS targets, except for ever HIV testing. HIV prevention interventions may benefit from examining strategies young trans women who use substances and do sex work employ. Instrumental support like food and mental health care may improve HIV prevention behaviors among those who are least engaged in HIV prevention.

EPC0491

Children and adolescents living with HIV who are active in the OVC program are more likely to be virally suppressed than those not in the OVC program in Ethiopia

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Background: OVC programs provide clinical wraparound support services to children and adolescents living with HIV/AIDS (C/ALHIV). These services include: HIV testing referrals; linkage to clinics; ART adherence and viral suppression (VS) support; and psychosocial, education, economic strengthening, and post-GBV support. This analysis assessed the association between receiving OVC support and achieving improved clinical outcomes among C/ALHIV.

Methods: USAID looked at C/ALHIV enrolled in the OVC program and those not enrolled in the OVC program who are being served in the same clinic in a subset of PEPFAR supported SNUs. Staff of local implementing partners gathered anonymous data using clinical and OVC program files to determine the rate of VS within each group. This sample was used to test the feasibility of the methodology prior to assessing the VS rate in all program areas.

Results: USAID collected VS data for 49 OVC and 49 non-OVC, 50% were female and the average age was 17. All were on ART. With VS as the outcome (see graph), the RR revealed that OVC are ~20% more likely to be virally suppressed than are non-OVC (RR=1.19; 95% CI=1.0323-1.3621). OVC are ~57% more likely to not miss a doctor's appointment (RR=1.57; 95% CI=1.2445-1.9722). OVC are ~68% more likely to not miss medication pick-up (RR=1.68; 95% CI=1.3082-2.1538).

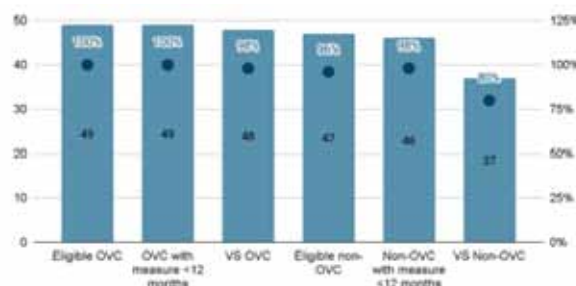


Figure. VL cascade for OVC and non-OVC shows marked improvement in VS rate for OVC.

Conclusions: While this sample is small relative to the 13,710 HIV+ OVC served in the program in FY22, this effort demonstrated that it is possible to collect VS data, and it suggests that OVC program may be helping to fill the gap in C&T for C/ALHIV. Next steps include collecting data from all SNUs and holding discussions with staff to understand how results were achieved.

**EPC0492****Improving viral load coverage and sustaining high viral load suppression amidst operational challenges in Burundi**

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Background: Over recent years, Burundi has experienced enormous challenges including natural disasters, socio-economic strain, HIV, COVID-19, malaria, and tuberculosis epidemics. These stressors have tested the resilience of the national HIV program. The PEPFAR/Burundi program directly supports ~90% of the national HIV treatment cohort. PEPFAR/Burundi's overarching goal is to support Burundi to end HIV/AIDS as a public health threat by 2030.

The ability for individuals to achieve and maintain viral load suppression is essential for preserving the program's HIV treatment achievements.

Description: Deliberate collaboration across Ministries of Health and Defense, implementing partners, and broader stakeholders accelerated gains achieved through ARV optimization, multi-month dispensing, and person-centered differentiated service delivery models. During fiscal year 22 (FY22), PEPFAR/Burundi clinical and laboratory partners worked to improve viral load coverage and sustain viral load suppression through intentional efforts to expand demand generation, improve sample quality and transport, and transition to an all-inclusive viral load commodity agreement. Additionally, the program conducted a Diagnostic Network Optimization exercise.

Lessons learned: Based on FY22 program data, overall viral load coverage (VLC) improved from 82% to 93%. By the end of FY22, the lowest VLC was in young children <5 years old (77%) and ≥ 95% VLC was achieved in adults 40-44 years and 50+ years of age. The lowest viral load coverage was in Makamba (84%), where there is a lack of viral load testing instruments.

At the end of FY22, aggregate viral load suppression (VLS) remained at 97%, with each province maintaining >95% except Bujumbura (93%) and 71% of sites achieving >95% VLS. However, VLS for children and adolescents was <95% (85% in children 1-4 years old, 89% in children 5-9 years old, and 94% in adolescents 10-19 years old).

Conclusions/Next steps: Burundi's national HIV program has made substantial strides in achieving national level epidemic control benchmarks. Careful attention is required to ensure adequate VLC and VLS are achieved and

sustained across geographies and across populations -- especially for children and adolescents -- to assure ending the HIV/AIDS epidemic as a public health threat by 2030 in an equitable manner.

EPC0493**Advancing HIV epidemic control through improved HIV treatment continuity in Zimbabwe**

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Background: Zimbabwe has achieved 91% antiretroviral therapy (ART) coverage among all PLHIV and 96% among PLHIV with known HIV status (UNAIDS). This progress with HIV treatment coverage has occurred despite COVID-19, other communicable disease outbreaks, and socio-economic burdens this past year. To end HIV/AIDS as a public health threat by 2030, PEPFAR/Zimbabwe supports > 90% of the national HIV treatment cohort.

The program's HIV treatment services aim to address HIV treatment gaps across populations and subnational geographies. The largest HIV treatment gaps exist among children, adolescents and youth, and key populations.

Description: PEPFAR/Zimbabwe collaborated with the Ministry of Health and Child Care, Global Fund, and implementing partners to strengthen treatment continuity. From October 2021 - September 2022 (fiscal year [FY] 22), the program directly supported ~1600 HIV treatment facilities. There was a concerted effort to provide differentiated services, expand multi-month dispensing, enhance treatment literacy, provide peer support, and leverage electronic health systems to follow up with clients with a missed appointment (within 24 hours). These efforts supported the national program's core interventions to reduce treatment interruptions.

Lessons learned: From PEPFAR/Zimbabwe FY22 program data, sites supported by PEPFAR/Zimbabwe achieved 96% of the annual treatment cohort target and maintained and estimated 98% retention. The program's efforts were associated with a notable decrease in treatment cohort attrition (quarter 2 program loss of 10,938 vs quarter 4 program loss of 9,061).

Program wide, the rate of treatment interruptions in FY22 was highest among people on ART 3-5 months (5.3%) followed by those on ART <3 months (4.0%), and lastly, those on ART ≥ 6 months (0.5%). In general, adult females aged 20-24 years experienced the highest percentage of attrition (1.17 - 1.44% across each quarter).

Conclusions/Next steps: HIV treatment continuity is key to ending HIV/AIDS as a public health threat by 2030. Zimbabwe has demonstrated the feasibility and importance



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of delivering and monitoring person-centered services to reduce treatment interruptions. Additional efforts should be tailored to support individuals newly initiated on ART and young adult women.

EPC0494

Facilitators and barriers to antiretroviral therapy adherence among people living with HIV in Iran prisons: a qualitative study

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Background: Adherence to Antiretroviral Therapy (ART) is critical for the success of HIV treatment and for achieving viral suppression. Facilitators and barriers to ART adherence among incarcerated populations during and post-incarceration in low- and middle-income countries are unknown.

This phenomenological qualitative study aimed to investigate the perceptions and lived experiences of people living with HIV (PLHIV) regarding HIV treatment and adherence to ART during incarceration and subsequent transitioning to the community post-incarceration.

Methods: In 2021, we enrolled a purposeful sample of 11 inmates from two prisons diagnosed with HIV disease in Kerman and Tehran, Iran. Eligible participants were inmates who were at least 18 years, provided consent, and were diagnosed with HIV based on their health medical records. One trained interviewer conducted in-depth qualitative interviews using a guide that included open questions about 7. All discussions were recorded and transcript later. Thematic analysis was used to analyze interviews using MaxQDA.

Results: On average, participants were 45.1 (±5.6) years old, were in prison for over 10 times (±8.1) years, and were diagnosed with HIV for 12.0 (±3.7) years. 4 (36.3%) started ART after their HIV diagnosis, and 3 (27.2%) were on ART at the time of the study.

Participants reported drug injection, poor HIV knowledge, and perception (including misinformation and misconception), HIV stigma, and lack of transparent and consistent HIV treatment protocols as major barriers to ART adherence during incarceration.

In contrast, social support, rising awareness about HIV, and positive perception were reported as facilitators of ART adherence during incarceration. Untreated mental health diseases, substance use disorders and other comorbidities, economic factors, HIV stigma, and social

isolation and its economic consequences were reported as major barriers to ART adherence when transitioning to the community post-incarceration. Maintaining confidentiality for not disclosing HIV serostatus, providing social and financial support, and treatment for substance use were identified as facilitators of ART adherence outside the prison.

Conclusions: Improving health literacy on HIV and its treatment, reducing HIV stigma, addressing comorbidities and substance use, reducing social isolation, and providing economic support after release are reported commonly as effective strategies to improve ART adherence during and after incarceration.

EPC0495

Cango Lyec: HIV vulnerabilities & prevalence among young women in Northern Uganda

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Background: Adolescent girls and young women (AGYW) account for disproportionate numbers of HIV infections in sub-Saharan Africa. This study estimated the prevalence of HIV infection and related vulnerabilities among AGYW under 25 living in post-conflict Northern Uganda.

Methods: The 'Cango Lyec' Project is an open cohort involving conflict-affected populations in mid-Northern Uganda. Between December 2020 and March 2023 a total of 888 consenting AGYW aged 13-24 years were enrolled and interviewer-administered data were collected on trauma, depression and socio-demographic-behavioral characteristics. Venous blood was taken for HIV and syphilis serology. Multivariable logistic regression modeling was used to assess the independent effect of factors associated with HIV prevalence.

Results: HIV prevalence was 2.7% (1.1% among 13-14, 1.7% among 15-19, and 5.0% among 20-24). Six (25.0%) out of 24 HIV cases were not sexually active. Among sexually active AGYW (N=424), HIV prevalence was 4.2% (2.2% among 15-19, and 5.2% among 20-24).

Among the 24 HIV+, 50% had detectable viral loads. The prevalence of probable PTSD was 2.7% (95%CI: 1.7-4.0) overall, and 4.1% (95%CI: 2.4-6.3) among sexually active AGYW. The mean resilience score was only 60.5 (95%CI:



59.8–61.2). After adjusting for age and district in multivariable logistic regression: AGYW who had a first partner at least 10 years older were 3.68 times more likely to have HIV (95%CI: 1.00–13.61; $p=0.051$). AGYW who lost a parent (OR: 4.00; 95%CI: 1.54–10.00; $p=0.005$), had syphilis (OR: 11.93; 95%CI: 3.18–44.81; $p<0.001$), ever attempted suicide (OR: 5.86; 95%CI: 1.88–18.31; $p=0.002$), or never vaccinated for HPV (OR: 7.14; 95%CI: 0.88–50.00; $p=0.065$), were associated with an increased risk of HIV.

Conclusions: The ongoing legacies of war, especially gender violence, are contributing to HIV vulnerability among AGYW in Northern Uganda. Wholistic approaches integrating HIV prevention with culturally-safe mental health initiatives are urgently required in Northern Uganda.

EPC0496

Heterogeneity among people re-engaging in antiretroviral therapy highlights the need for a differentiated approach: results from a cohort study in Johannesburg, South Africa

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Background: Disengagement and subsequent re-engagement with antiretroviral therapy (ART) are common in South Africa HIV programmes but data on the profile of people and the duration of interruptions is sparse. Anova conducted a project to implement the National Adherence Guidelines SOP on re-engagement (SOP9) in Johannesburg, South Africa to better understand and describe the characteristics of people re-engaging in HIV care.

Methods: Between July and November 2022, admin clerks in nine primary health care sites collected data on the number of people visiting the clinic who had missed their scheduled ART appointment by <14 days or ≥14 days, using registers. Clinicians completed "re-engagement forms" for those identified as having missed by ≥14 days. Forms were completed in duplicate and the copy captured into REDCap. Forms included information about the consultation including number of days since last appointment, clinical details, and the management plan. Data were analysed using descriptive measures and visualised in PowerBI dashboards.

Results: Of the 2,111 people re-engaging, the majority (59.9%, $n=1,221$) had missed their appointments by <14 days. Re-engagement forms were captured for 803 patients (803/890, 90.2%) of which 699 had a missed appointment date captured.

Of those with a captured missed appointment date ($n=699$), 24.6% ($n=172$) returned within 14–28 days, 45.8% ($n=320$) within 5–12 weeks and 29.6% ($n=207$) after > 12 weeks. While the majority (339/645, 52.6%) who missed a visit self-reported interrupting ART, 47.4% (306/645) reported utilizing buffer stock or treatment sourced elsewhere to cover the missed appointment period.

A clinical concern was reported in 90 (11.2%) cases. A pre-disengagement viral load result was available for 561 patients with the majority (401/561, 71.5%) being suppressed.

Conclusions: Re-engaging clients frequently return to care shortly after their missed appointment. Despite missing their ART refill date, many have not interrupted ART and the majority were adherent prior to disengagement. Clinical concerns were infrequently identified through a re-engagement specific clinical assessment.

A differentiated approach is required to support the heterogeneity of re-engaging and to effectively utilize scarce health system resources.

EPC0497

Mental health symptoms, retention in HIV care, and viral suppression 6 months after HIV care initiation among a cohort of people with HIV in Cameroon

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Background: People with HIV (PWH) in Africa experience high levels of depression and other mental health conditions. Untreated mental health disorders may compromise quality of life and achievement of optimal HIV treatment outcomes.

Methods: We conducted structured interviews with 426 PWH aged 21+ who were initiating HIV care in Cameroon between June 2019 and March 2020. Clinic visit data was used to ascertain retention in care and viral suppression six months after HIV care initiation.

We used log binomial regression to assess the relationship between symptoms of depression, anxiety, and post-traumatic stress disorder (PTSD) at HIV care initiation and 6-month retention in care and viral suppression.

Results: Nearly 25% of individuals ($N=100$) had disengaged from care 6 months after care initiation. Among those retained in care at 6 months, 72% were virally suppressed ($N=169/234$). In the study population overall, and in women specifically, no meaningful relationships were observed between symptoms of depression, anxiety, or PTSD and 6-month retention in care (Table 1).

Among men, the risk of disengagement from care was greater among those who reported PTSD symptoms at care initiation compared to those who did not. No meaningful relationships were observed between mental health symptoms and viral suppression among women



retained in care at 6 months (Table 2). Viral non-suppression was significantly higher among those reporting symptoms of anxiety at care initiation in both the population retained overall, and among retained men.

Conclusions: Men initiating HIV care with poor mental health may be particularly vulnerable to disengagement from care and viral non-suppression. Interventions are needed for men specifically to foster improved mental health and HIV treatment outcomes.

	Total population (N=426) RR (95% CI)	aRR (95% CI)	Men (n=176) RR (95% CI)	aRR (95% CI) ^a	Women (n=250) RR (95% CI)	aRR (95% CI) ^a
Depression	1.23 (0.83, 1.82)	1.05 (0.69, 1.59)	1.45 (0.84, 2.50)	1.54 (0.83, 2.85)	1.13 (0.65, 1.96)	0.79 (0.45, 1.40)
Anxiety	1.31 (0.89, 1.95)	1.19 (0.80, 1.77)	1.06 (0.56, 2.01)	1.05 (0.54, 2.03)	1.60 (0.96, 2.67)	1.25 (0.74, 2.12)
PTSD	1.26 (0.82, 1.92)	1.08 (0.70, 1.69)	1.75 (1.02, 3.01)	1.95 (1.05, 3.63)	0.98 (0.52, 1.86)	0.76 (0.39, 1.45)

Table 1. Log-binomial regression characterizing the relationship between mental health with loss to care 6 months after care initiation.

^aAdjusted for hunger, employment, clinic

	Total population (n=326) Crude CCA RR (95% CI)	Adjusted CCA aRR (95% CI)	Adjusted adjudication aRR (95% CI)	Men (n=128) Crude CCA RR (95% CI) ^a	Adjusted CCA aRR (95% CI) ^a	Adjusted adjudication aRR (95% CI)	Women (n=198) Crude CCA RR (95% CI)	Adjusted CCA aRR (95% CI) ^a	Adjusted adjudication aRR (95% CI) ^a
Depression	1.46 (0.91, 2.35)	1.68 (0.98, 2.88)	1.35 (0.97, 1.88)	1.80 (1.00, 3.26)	2.22 (1.02, 4.86)	1.54 (0.94, 2.53)	1.43 (0.72, 2.83)	1.27 (0.61, 2.65)	1.25 (0.79, 1.99)
Anxiety	1.62 (1.04, 2.54)	1.70 (1.06, 2.71)	1.44 (1.06, 1.96)	2.06 (1.24, 3.44)	2.51 (1.32, 4.76)	1.86 (1.21, 2.86)	1.31 (0.64, 2.69)	1.17 (0.53, 2.59)	1.25 (0.79, 2.00)
PTSD	0.71 (0.35, 1.42)	0.71 (0.35, 1.47)	0.77 (0.49, 1.22)	0.59 (0.17, 2.06)	0.50 (0.14, 1.79)	0.57 (0.24, 1.35)	0.87 (0.37, 2.05)	0.87 (0.37, 2.07)	0.90 (0.52, 1.56)

Table 2. Log-binomial estimates characterizing the relationship between mental health and detectable viral load among those retained in care at 6 months.

EPC0498

Integration of sputum sample transportation with HIV viral load sample transportation system increases access to tuberculosis testing among people living with HIV in Shinyanga, Pwani, and Kigoma, Tanzania

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Background: Tuberculosis (TB) is among the most prevalent and life-threatening opportunistic transmissible among people living with HIV (PLHIV). In 2019, TB contributed to 30% of all total deaths among PLHIV, making it the leading cause of death globally PLHIV with latent TB have high annual and lifetime risk of developing active TB disease. Diagnosis of TB among PLHIV is challenging using conventional approaches, resulting in delayed diagnosis; however, testing by GeneXpert has high sensitivity compared to sputum microscopy.

Despite introduction of GeneXpert machines in 2012, PLHIV have limited access to TB diagnosis because the machines are few and stationed in the regional and district hospitals, and no clear system for sample transportation.

Description: In 2019, Tanzania Health Promotion Support, in collaboration with regional and council health management teams, implemented various approaches to increase access to TB diagnosis among PLHIV that included sensitization and raising awareness among healthcare providers on the importance of TB testing using GeneXpert and integrating sputum sample transportation with HIV viral load sample transportation through the hub and spoke model. There is a wide network across all regions; remote health facilities transport samples to hub sites, which are equipped with GeneXpert machines. Data were documented and captured in all respective TB registers and updated in the care, and treatment clinic database, which has the option to enter the type of TB test conducted.

Lessons learned: Integration of sputum sample transportation with HIV viral load samples has contributed to the increased access to TB diagnosis by using GeneXpert, with turnaround time of the results improved from 14 to 3 days.

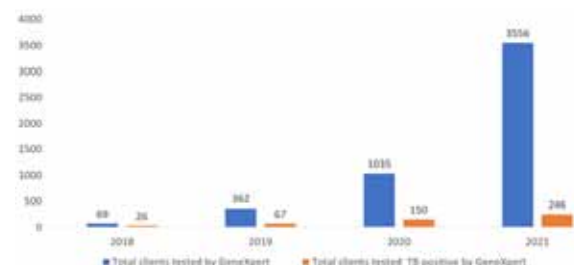


Figure. GeneXpert testing trend in Shinyanga, Pwani and Kigoma FY 18 - FY 21.

Conclusions/Next steps: Integration of sputum and HIV viral load sample transportation for GeneXpert testing contributed to increasing the number of PLHIV accessing timely TB diagnosis without additional costs, with the advantage to further investigate for drug-resistant TB and provide them with appropriate treatment.

EPC0499

Factors associated with accessing early infant HIV diagnosis services cascade in the Oti and Volta regions of Ghana

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Background: Despite proven measures to prevent mother-to-child HIV transmission (MTCT), infant HIV infections continue, particularly in Sub-Saharan Africa (SSA). In 2021, 81% of pregnant women living with HIV and 76% of adults overall received antiretrovirals, but only 52% of children (0-14 years) did. Although Ghana has one of the highest rates, uptake and use of early infant HIV diagnosis (EID) remain low. This study identified maternal and institutional factors that influence EID service access in order to guide the design of an integrated intervention to tackle implementation issues and improve EID outcomes.

Methods: An exploratory mixed methods strategy involving a 5-year records review of EID data, an interviewer-administered survey, focus group discussions among mothers living with HIV, and in-depth interviews of EID providers elicited their understanding, perspectives, and experiences with EID services in 9 health facilities in the Volta and Oti regions of Ghana. Logistic regression models were used to identify factors associated with EID. Odds ratios with a 95% confidence interval were calculated. Qualitative data were transcribed, coded and thematically analysed using Atlas ti. Ethics approval was obtained from the Ghana Health Service Ethics Review Committee [GHS-ERC007/10/18].

Results: Of 253 mothers, 147 accessed EID and 106 did not. Their mean age was 31.1 (± 6.0) years, primarily Christian (82.2%) and married (65.22%). EID coverage was 66.9%, below the WHO recommendation of 80%. The MTCT was 3.7% and only 48.6% of infected infants started antiretrovirals. About 46% of mothers lived in rural settings. Women who did not reveal their HIV status to their partners (aOR = 0.43; 95% CI: 0.20-0.91, $p = 0.034$) had lower odds of accessing EID, while mothers who were not members of a social HIV group/network had higher odds. Mothers with no formal education (aOR: 0.17; 95% CI: 0.07, 0.36, $p < 0.0001$) and mothers with incorrect EID knowledge had a reduced likelihood of accessing EID.

Conclusions: EID was suboptimal with high HIV positive rates among pregnant women attending antenatal care and high MTCT rates. Mothers were more likely to get EID for their babies if they had a formal education and their partners were aware of their HIV status.

EPC0500

Poorer self-reported ART adherence among adolescents in boarding school compared to day school

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Background: Adolescents living with HIV (ALH) have poorer adherence to antiretroviral therapy (ART) than adults. Many ALH in sub-Saharan Africa (SSA) are enrolled in boarding schools. Understanding school factors associated with adherence may help develop interventions.

Methods: We collected sociodemographic data, school information, medical history, and viral load (VL) data from ALH ages 14-19 in 25 HIV clinics in 3 counties in Kenya. Using generalized estimating equations, we compared ART adherence in ALH attending day and boarding schools.

Results: Of 880 ALH, 798 (91%) were enrolled in school, of whom 189 (24%) were in boarding school. Of those in school, the median age was 16 (IQR: 15, 18), 55% were female, 78% had a parent as a primary caregiver, and 74% were on DTG-based ART. Median age at ART initiation was 6 years (IQR 3, 10).

Overall, 227 (29%) ALH self-reported missing ART when school was in session. After adjusting for sociodemographic and HIV care characteristics, ALH in boarding were significantly more likely to self-report missing ART than those in day school (OR: 1.44, 95% CI 1.01, 2.06, $p=0.043$).

Being in boarding school was associated with a higher odds of a higher stigma score in the public attitudes' domain (OR: 1.11, 95% CI 1.00, 1.23, $p=0.040$) while being in



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day school was associated with a needing to attend clinic when school was in session (OR: 0.62, 95% CI 0.44, 0.87, $p=0.006$)

Common reasons for ART non-adherence among all ALH were related to school/medication schedules (59% for day and 45% for boarding). Among ALH in boarding school, stigma (30%) and lack of access to medicine (18%) were reasons for ART non-adherence; these were not reported as reasons for non-adherence among ALH in day school. Among 194 ALH with VL data, 60% had undetectable viral load (62% for day and 51% for boarding school); with no significant differences in viral suppression by day or boarding school.

Conclusions: ALH attending boarding schools need tailored interventions to support and maintain ART adherence. Schools remain a critical untapped potential resource to improve outcomes for ALH.

EPC0501

Country program-level association between timing of maternal ART initiation and vertical HIV transmission rates in 15 PEPFAR-supported programs

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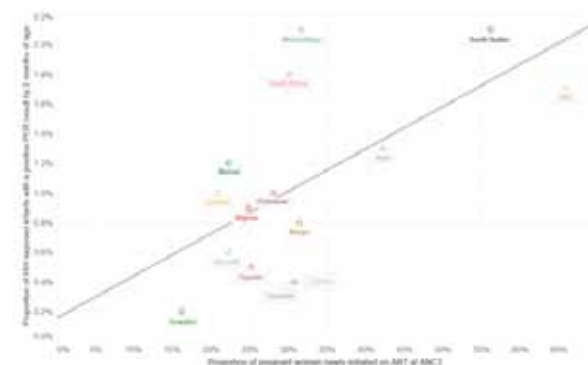
Background: Over two million child HIV infections have been averted globally since the expansion of antiretroviral therapy (ART) to all pregnant people living with HIV (PPLHIV). However, late ART initiation by PPLHIV increases their infants' risk of HIV acquisition.

We analyzed U.S. President's Emergency Plan for AIDS Relief (PEPFAR) data from 15 USAID-supported sub-Saharan African and Caribbean countries to assess country-level relationships between timing of maternal ART initiation and HIV-exposed infant (HEI) positivity rate ≤ 2 months of age (≤ 2 mo).

Methods: Routine quarterly data included PPLHIV on ART (disaggregated by those already on ART versus initiating ART at first antenatal visit [ANC1]) (January-March 2021); and of HEI testing positive ≤ 2 mo (July-September 2021). The periods selected approximate time from first ANC1 at

20 weeks gestation to the first virologic sample collected from HEI, as cohort data was unavailable. The country-level percent of PPLHIV initiated on ART at ANC1 was compared to the percent of HEI testing positive using a linear trend model. Pearson's correlation coefficient (r) was also calculated.

Results: Across 15 countries, an average of 31.5% (range: 16-66%) of PPLHIV initiated ART at ANC1, and 1.1% (range: 0.2-2.1%) of HEI tested positive at ≤ 2 mo. From the linear trend model, the percent PPLHIV newly initiated on ART at ANC1 and percent HEI testing positive at ≤ 2 mo were significantly associated ($r^2 = 0.348$, $p = 0.015$) and had a relatively strong correlation ($r = 0.615$).



Conclusions: This analysis identified a significant association and relatively strong correlation at the country-program level between the percent of PPLHIV initiating ART at ANC1 and the proportion of HEI diagnosed with HIV by ≤ 2 mo. Programs should support early HIV diagnosis and ART initiation among people of reproductive age, ideally prior to conception or early in pregnancy, to ensure continued progress towards vertical HIV transmission elimination.

EPC0502

Identifying gaps in the HIV care continuum among indigenous Mayan persons living with HIV in Guatemala

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Background: The HIV care continuum outlines the stages that people living with HIV/AIDS (PLWHA) go through from diagnosis to achieving and maintaining viral suppression. We conducted a study in rural Guatemala to identify gaps in the HIV care continuum among Mayan PLWHA.

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Methods: From January 2020 to December 2022, we studied 200 consecutive newly diagnosed HIV clients in the Integrated Care Clinic of the regional *Hospital de Especialidades "Rodolfo Robles"*, in Quetzaltenango, Guatemala. We measured demographic information, baseline CD4 cells/milliliter, baseline viral copies/milliliter, days to ART initiation, viral load suppression, and retention in care. We fitted multivariate logistic regression models adjusted for age, sex, and education to identify differences between Mayan and Spanish/Mayan ("*Ladino*") PLWHA.

Results: Most were male (90%) with the median age of 31 (IQR=25-40). 54% were Mayan and 46% were Ladino. 33% of PLWHA self-identified as heterosexual, 62% were sexual and gender minorities (SGM; MSM, gay, transgender individuals) and 5% were sex workers.

The median baseline CD4 count was significantly lower among Mayan (Median=190 cells/ milliliter; IQR=59 -360) compared to Ladino (Median=327 cells/milliliter; IQR=168-449) PLWHA. The median baseline viral load was non-significantly higher among Mayan (Median=142,500 copies/milliliter; IQR=22,800-608,000) compared to Ladino (Median=81,400; IQR= 7,530-424,500) PLWHA.

The median days from the initial visit to starting ART was 0 (IQR=0-0), with no significant difference between Mayan and Ladino PLWHA ($P=.651$). 74% of the PLWHA had suppressed viral loads at 6 months with no-significant difference between Mayan and Ladino PLWHA ($P=.390$). Retention was affected by 12 deaths, 18 abandonments and 10 clinic transfers.

Multivariate logistic regression models adjusted for age, sex, and education showed that Mayan PLWHA had higher odds ($aOR=3.34$; 95%CI=1.12-9.95) of self-identifying as SGM compared to Ladinos. Mayan PLWHA had lower odds of reaching above a secondary school education ($aOR=.077$; 95%CI=.006-.916).

Conclusions: In rural Guatemala, Mayan PLWHA are being diagnosed later than their Ladino counterparts. Community based programs should encourage HIV testing with rapid referral for Mayans, especially among sexual and gender minorities. Structural barriers, such as lower educational level, may make early diagnosis and retention especially challenging for Mayan PLWHA.

EPC0503

Health on bike: making HIV and health services accessible in hard-to-reach terrain

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Background: Noklak district is the eastern most district of Nagaland, India with an estimated population of 59,300 people in 38 villages. People in and around Noklak have been disproportionately impacted by substance use disorder. In Noklak, 634 people who inject drugs (PWID) are reached with harm reduction services and 665 (56%) of an estimated 1197 People Living with HIV (PLHIV) are on anti-retroviral therapy (ART) till Dec. 2022.

Due to poor road connectivity and absence of public transport, accessing harm reduction, HIV testing and treatment services remain a challenge.

Description: To address the challenges, Nagaland State AIDS Control Society, with support from PATH and I-TECH India through PEPFAR, initiated Health on Bike (HOB) in Noklak. Five service delivery points (SDPs) were identified to cover 38 villages.

Two Bike Outreach Coordinators with one motorbike were deployed twice a month to remote villages to provide HIV/ STI/ TB testing and treatment, medically assisted therapy (MAT) and other associated services for the key populations living with and at risk for HIV.

Lessons learned: From June 2020 to August 2022, all 38 villages were reached through SDPs; A total of 484 PWID partners, spouses, and biological children were reached with HIV testing services, (191 through community-based screening and 295 through index testing services) of which 21 tested HIV positive through index testing and 18 (86%) were initiated on ART. Two hundred fifty four people were screened for syphilis, with 4 cases confirmed and treated. MAT services were provided to 204 PWID, 128 were reached through Needle Syringe Exchange Programs and 7 PWID linked to the targeted Intervention program. MAT enrolment in Noklak scaled up from 160 clients in August 2021 to 272 in November 2022.

Additionally, through the HOB strategy, we established six Community ART Refill Groups, providing ART to 191 PLHIV, ensuring treatment continuity. HOB has since been scaled-up across Nagaland.

Conclusions/Next steps: Health on Bike is a strategy to improve equity and access and ensures continuity of expanded services across the HIV prevention to treatment continuum for people living in remote geography in Noklak, Nagaland with limited access to services.

**EPC0504****Community based HIV testing and treatment is feasible and yields high level of viral load suppression**

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Background: Youth living with HIV (YLWH) have disproportionately poor virological outcomes. We investigated whether community-based HIV services incorporating testing, treatment and adherence support *integrated with sexual & reproductive health (SRH) services* and delivered by teams specifically trained in youth friendliness would result in good outcomes across the HIV care cascade.

Methods: A cluster randomized trial (CHIEDZA) was conducted across 3 provinces in Zimbabwe, each randomized 4:4 to control (existing, largely facility-based, services) or to intervention clusters (total 24 clusters). A cluster was a geographically demarcated area with a community center, from where weekly integrated HIV & SRH services were delivered to intervention cluster residents aged 16-24 years. Newly HIV-diagnosed youth could access antiretroviral therapy (ART) through CHIEDZA or at health facilities. Youth in care already could opt to switch to CHIEDZA. All YLWH (known or newly diagnosed) were invited to join community adherence support groups.

Those who were newly diagnosed were offered viral load testing at 6 months and those who received treatment somewhere else could access viral load testing at any time if they had not had a viral load in the past 6 months. Viral load suppression was defined as a viral load of <1000copies/ml.

Results: 36,991 youths accessed CHIEDZA of whom 84% had ≥1 HIV test. A total of 377 YLWH were newly diagnosed with HIV, 336 (89%) women, 263 (70%) aged 20-24 years. 191/377 (51%) linked to care at CHIEDZA and 190/191 started ART. 92/377 (24%) linked to care at other clinics. Viral load suppression among newly diagnosed YLWH accessing care at CHIEDZA was 90%. Among previously diagnosed YLWH who accessed CHIEDZA, few (61/1162, 6%) changed from their existing care provider to receiving care at CHIEDZA, and 86% had viral load suppression. Among YLWH (n=1097) who continued their care at public clinics, viral load suppression was 78%.

Conclusions: Uptake of HIV testing was high, but yield of new HIV diagnoses was lower than expected. Community-based testing and treatment is feasible and yields high levels of viral load suppression, and comparable to that among YLWH accessing care in facility-based settings.

EPC0505**Low level of HIV-1C integrase strand transfer inhibitor resistance mutations among recently diagnosed ART-naïve Ethiopians**

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Background: With the widespread use of Integrase strand transfer inhibitors (INSTIs), surveillance of HIV-1 pretreatment drug resistance is critical in optimizing antiretroviral treatment efficacy. However, despite the introduction of these drugs, data concerning Integrase strand transfer inhibitors resistance mutations (INSTI RMs) is still limited in Ethiopia.

Thus, this study aimed to assess INSTI RMs and polymorphisms at the gene locus coding for Integrase among viral isolates from ART-naïve HIV-1 acquired Ethiopian population.

Methods: This was a cross-sectional study involving the isolation of HIV-1 from plasma of 49 newly diagnosed drug-naïve HIV-1 acquired individuals in Addis-Ababa during the period between June to December 2018. The integrase region covering the first 263 codons of blood samples was amplified and sequenced using an in-house assay.

INSTIs RMs were examined using calibrated population resistance tool version 8.0 from Stanford HIV drug resistance database while both REGA version 3 online HIV-1 subtyping tool and the jumping profile Hidden Markov Model from GOBICS were used to examine HIV-1 genetic diversity.

Results: Among the 49 study participants, 1 (1/49; 2 %) harbored a major INSTIs RM (R263K). In addition, blood specimens from 14 (14/49; 28.5%) participants had accessory mutations. Among these, the M50I accessory mutation was observed in a highest frequency (13/49; 28.3%) followed by L74I (1/49; 2%), S119R (1/49; 2%), and S230N (1/49; 2%). Concerning HIV-1 subtype distribution, all the entire study subjects were detected to harbor HIV-1C strain as per the Integrase gene analysis.

Conclusions: This study showed that the level of primary HIV-1 drug resistance to INSTIs is still low in Ethiopia reflecting the cumulative natural occurrence of these mu-



tations in the absence of selective drug pressure and supports the use of INSTIs in the country. However, continuous monitoring of drug resistance should be enhanced since the virus potentially develop resistance to these drug classes as time goes by.

EPC0506

Closing the viral load suppression (VLS) gap for children living with HIV (CLHIV): Improving VLS rates among CLHIV by addressing household vulnerabilities

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Background: Namibia has achieved the UNAIDS 90-90-90 targets among adults; however, viral load (VL) suppression remains low among CLHIV on antiretroviral treatment (ART). Only 63% of children (0-14 years) on ART are virologically suppressed (NAMPHIA, 2017). Despite global efforts to reduce the VLS gap among children, HIV treatment programs struggle to link and retain CLHIV on treatment.

Project HOPE Namibia implements the USAID/PEPFAR-funded Namibia Adherence and Retention Program (NARP) with a focus on improving clinical outcomes for CLHIV through identifying and addressing common household vulnerabilities.

Methods: Data was collected from records of CLHIV on ART who were served by NARP from October 2020 to September 2022. Household vulnerabilities were assessed, case management plans were developed and implemented. CLHIV with elevated VL were reassessed at least monthly, support services provided, and the case management plan updated based on the individual CLHIV needs. Data from these regular assessments and VL testing were collected and analyzed.

Results: The analysis found a correlation VLS among CLHIV and length of time enrolled in NARP. 7,128 CLHIV were enrolled into NARP; at initial assessment 1,218 (17%) were not eligible for VL, 2,746 (39%) were eligible but had no valid VL result, 3,164 (54%) had a valid VL result with an overall VLS of 89%. By September 2022, 89% of beneficiaries had a valid VL result and 92% of them with a VL <1000. VLS rates improved with time in the program: 90% among CLHIV 0 to 6 months, 92% for 6 to 12 months, 94% among 13+ months in the program.

The most frequently identified household vulnerabilities were hunger, lack of transport to health facilities, and lack of civil registration; suggesting that these vulnerabilities are most critical to address in CLHIV households.

Conclusions: Finding and addressing household vulnerabilities early is important for CLHIV to attain VLS. The household vulnerabilities most associated with unsuppressed viral load were hunger, lack of transport to health facilities, and lack of civil registration.

To close the gap in VLS for CLHIV in Namibia, community HIV treatment initiatives must ensure these vulnerabilities are recognized and adequately addressed through holistic HIV care and treatment interventions.

EPC0507

Factors associated with achieving viral suppression among people living with HIV in Ghana: a retrospective analysis

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Background: Viral load (VL) suppression remains a challenge to achieving epidemic control in most sub-Saharan Africa. Although Ghana made significant progress in the third 95 from 68% in 2019 to 79% in 2022, further insight into the factors associated with VL suppression is critical to inform clinical counseling and care approaches, client-level VL literacy and demand generation activities.

This study investigates the factors associated with viral suppression among people living with HIV (PLHIV), using retrospective data from a large cohort.

Methods: We conducted a retrospective analysis of 14,777 HIV clients with viral loads results on the National HIV database system (E-tracker). We extracted two years of clients' data (2020-2022) on the 15th January, 2023 for Western, Western North and Ahafo regions.

A stepwise regression model was used to determine factors associated with viral load suppression among HIV clients with VL results. The outcome variable was VL status (suppressed, unsuppressed).

Results: Among the 14,777 clients with VL results, 76% were females. The mean age of the study population was 42. From the results, 13,116 representing 88% of the clients were virally suppressed (<1000 copies/mL).

Clients who were currently active on ART were 1.8 times more likely to be virally suppressed compared to those who interrupted treatment (OR=1.8, CI=1.6-2, p<0.001).

Clients on multi-month dispensing (MMD) were 2.3 times more likely to be virally suppressed compared to single month dispensing (OR=2.6, CI=2.0-2.5, p<0.001). Clients-initiated at hospitals had higher odds of experiencing viral load suppression than clients initiated at lower level



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facilities, i.e., clinics [(OR=1.7, CI=1.1-2.6, p=0.02)]. For every one-year increase in age, there was a 1.7 timely increase in VL suppression (OR=1.0, CI=1.0-1.1, p<0.001). Males were 0.8 times less likely to be virally suppressed (OR=0.8, CI=0.7-0.9, p<0.001).

Conclusions: Our study found that uninterrupted ART, hospital initiation, MMD, and age were positively associated with VL suppression among HIV clients, while being male was negatively associated. Scale-up of Ghana's differentiated service delivery policy, which provides for MMD scale up and addresses the inherent challenges faced by sub populations including males and younger clients, is key to achieving VL suppression nationwide.

EPC0508

Improving retention in ART care through client experience: a snapshot from Petauke District Hospital, Zambia

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Background: Globally, adherence to antiretroviral therapy (ART) and retention in care remain a challenge. Among the reasons, suboptimal client satisfaction has been cited as a contributing factor to interruption in treatment (IIT). We share experiences from implementing the client experience approach for improving client satisfaction for retention at three select facilities of Petauke District in the Eastern Province, Zambia.

Description: To improve adherence to ART and retention in care, FHI 360 supported the Eastern Province Health Office (EPHO) by deploying client experience associates (CEAs) and introduced the client experience concept. The approach uses hospitality and public relations principles to build strong client-focused professional relationships. We reviewed the data of all clients that missed an appointment by June 2021. In August 2021, we conducted a baseline client satisfaction survey among active clients to establish client perception of quality of services.

Later, we trained CEAs in telephone etiquette and gave them cell phone airtime to provide respectful, responsive, and responsible client experience. Data from the baseline survey was analyzed in themes to establish objectives for quality improvement. Following nine months of implementation, we conducted a post-intervention survey with the same clients to document any change.

Lessons learned: When comparing the survey outcomes before client experience rollout baseline (August 2021) and after (June 2022), survey data demonstrated that the approach was successful at improving client perception and satisfaction of quality of services in ART care in the three select facilities. We interviewed 600 and 357 clients at baseline and endline, respectively. Following rollout of client experience (October 2021 to June 2022), key findings are summarized in Table 1.

Survey indicator	Before	After
Proportion of respondents with valid phone number	67%	77%
Proportion of clients rating services as poor	2%	0%
Proportion of clients spending > 1 hour at the clinic	56%	41%
Proportion of clients who missed appointment due to forgetting	23%	17%
Proportion of clients who do not see a need to set own appointment date	34%	84%
Proportion of clients reporting never being followed up after IIT	53%	25%

Table 1. Before and after client experience intervention

Conclusions/Next steps: Overall, introduction of the client experience approach demonstrates that adopting hospitality and public relations principles to improve client experience is effective in improving client satisfaction and likely retaining clients in ART care. Thus, we recommend scaling up this approach as an effective means for quality assurance and retention, ensuring compliance to prescriptions and appointments—both key ingredients for reaching epidemic control.

EPC0509

Digital and online interventions to improve adherence to ART among youths living with HIV/AIDS in Africa: a systematic review

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Background: Human immunodeficiency virus (HIV) affects 3.4 million young people between the ages of 15 and 24 with majority of them residing in Africa. Antiretroviral medication (ART) adherence rates among youth living with HIV (YLHIV) are typically lower when compared to other age groups, which has an adverse effect on long-term morbidity and mortality outcomes.

Given the growing usage of mobile phones and internet among youths in Africa, we systematically evaluated the impact of digital interventions used to improve YLHIV ART adherence in Africa.

Methods: We searched four databases (PubMed, Web of Science, CINAHL, and PsychInfo) for studies published from the database onset until 30th November, 2022 using MeSH words, Keywords and Boolean terms. We also conducted a reference search for similar studies; EndNote 20 was used to manage references.

The studies were assessed by two researchers independently for risk of bias using the Cochrane Risk of Bias assessment tool for Randomized Control Trials studies and the National Institute of Health quality assessment tool for Pre- and Post-intervention studies without control group. The study followed the recommendations of the PRISMA guideline.

Results: A total of 386 studies were found across 4 databases and after the reference search for similar literature. Eight (8) articles that met the eligibility criteria included 2,631 participants from 4 countries were published between 2010 and 2021. Interventions to increase ART adher-



ence among youths aged 15 – 24 years lasted from 13 – 96 weeks. Significant intervention-related improvements in viral suppression were discovered in four of the eight studies.

Of these four effective interventions, three leveraged the short message platform (SMS) for appointment and adherence reminders sent daily while the last one combined weekly text messaging with mobile phone calls, counseling, home visits, and monthly support groups. Most studies included in the review had a low risk of bias.

Conclusions: This study has provided evidence that SMS interventions can improve adherence to ART among YLHIV in Africa. There is need for more research to evaluate the effectiveness of digital and online platforms in improving youth ART adherence.

EPC0510

The impact of armed conflicts on HIV treatment outcomes in Sub-Saharan Africa: a systematic review

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Background: Sub-Saharan Africa has disproportionately high numbers of internal armed conflicts and burden of HIV infection. Nevertheless, the impact of the armed conflict on HIV treatment outcomes in conflict settings in Sub-Saharan Africa has not been thoroughly and systematically synthesized.

This review summarised the best available evidence on the impact of war on HIV treatment outcomes in Sub-Saharan Africa.

Methods: We conducted a systematic review of all quantitative studies published in English between September 2002 and September 2022. Lost-to-follow up (LTFU), adherence, virologic failure, and mortality were the HIV treatment outcomes considered in the review. Three steps of systematic search were carried out including:

- Initial search across Google Scholar,
- Full search strategy across five databases, and
- Screening titles and abstracts.

Data were extracted using a standardized JBI instruments and analyzed through narrative synthesis.

Results: We included 16 studies for data extraction, and the number of participants ranged from 102 in South Sudan to 2572 in multi-country studies. We discovered that the percentage of LTFU ranges between 5.4% and 43.5%, with LTFU being highest in the first three months and lowest after 24 months.

Four studies found that virologic suppression ranged from 25% to 33%, four studies found that CD4 gains ranged from 129-163 cells/mm³, and five studies found that adherence rates ranged from more than 80% in all settings, and six studies discovered that mortality rates ranged

from 4.2% to 13%. Being male, having an advanced stage of the disease, having high baseline HIV viremia, and being older were all linked to poor treatment outcomes.

Conclusions: The clinical outcomes of the studies reported in this review are comparable to those reported from non-conflict or pre-conflict settings, however, they lack understanding the complexity of HIV care services in conflict settings.

More research is needed to answer questions about the reciprocal relationship between conflict and HIV care outcomes.

EPC0511

Evaluating the scale-up of the use of short-course TB preventive therapy (3HP) among people living with HIV above 15 years in the two sentinel sites in Kiambu County, Kenya

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Background: Isoniazid (H) and rifapentine (P) given once weekly for three months (3HP) was included in the list of the recommended regimen by World Health Organization (W.H.O) in March 2018, for the prevention of tuberculosis (TB) in a high-risk group. Kenya adopted WHO recommendation in 2020. The 3HP regimen is associated with less toxicity, better adherence, and improved treatment completion rates compared.

The primary goal of the evaluation was to assess the routine programmatic implementation of 3HP (uptake and completion rates) for the PLHIV > 15 years.

Description: This was an observational evaluation across the two sentinel sites using routine patient-level information for a cohort of patients retrospectively from patient files and registers at Thika Level 5 and Ruiru-sub county hospital.

A total of 503 patient files from 546 patients enrolled into care were evaluated, and anonymized patient level data was abstracted from the facility's electronic medical records registers and keyed in a secure, encrypted data collection tool only accessible by TB program staff in the country for analysis.

Lessons learned: Of the 546 PLHIV enrolled into care between January to December 2021 in the two sentinel sites, (92%) 503 PLHIV were started on 3HP with a median age of 39 years. Females comprised almost 60% (N=301) of patients initiated on 3HP.

Of those initiated on 3HP, only 164 (32.6%) were ART treatment naïve with less than 90 days on ART and the rest were non-naïve. Of the 503 PLHIV who initiated 3HP, 94.8% (N=477) completed their 3HP treatment course. Ten individuals (2%) discontinued treatment, five were lost to



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follow-up, one died, 7 (1.4%) did not have their treatment outcome determined, and two developed TB and initiated on first line treatment. Of then ten who discontinued 3HP only two who stopped due to toxicity.

Conclusions/Next steps: The conclusion from the evaluation shows that from the high-risk population evaluated (PLHIV) from the two sentinel sites, there is enough evidence that 3HP may provide suitable and ideal treatment for latent TB infection with few side effects, high completion rate, low death rate, and low TB disease during and after Rifapentine and isoniazid treatment.

EPC0512

HIV prevention and treatment cascades among young Brazilian MSM: results from the Conectad@s project

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Background: Oral HIV pre-exposure prophylaxis (PrEP) and antiretroviral therapy (ART) are universally available in Brazil through the Public Health System. Nevertheless, the HIV epidemic continues to rise, especially among young gay, bisexual, and other men who have sex with men (YMSM). We evaluated HIV prevention and treatment cascades among Brazilian YMSM.

Methods: Using baseline data from a respondent-driven sampling study conducted in Rio de Janeiro, Brazil, between November 2021 and October 2022, we assessed HIV status, PrEP outcomes, linkage to HIV care, ART use, and virological suppression among YMSM. PrEP eligibility was determined according to Brazilian guidelines. Same-day PrEP and ART were offered as applicable.

Results: We recruited 409 YMSM, 40(9.8%) were living with HIV and 369 (90.2%) were HIV-negative; median age was 21 years (interquartile range:20-23); 70.3% (n=291) self-reported as Black/*Pardo*/Indigenous.

Among YMSM living with HIV, 50% (n=20) were aware of their serostatus, 47.5% (n=19) were currently on ART, and 42.5% (n=17) were virologically suppressed. Same-day ART was initiated for 95% (n=19) of newly diagnosed HIV individuals.

Among the HIV-negative participants, 94.0% (n=347) knew about PrEP, 85.6% (n=316) were willing to use it, but only 2.4% (n=9) had ever used it, and 0.8% (n=3) were currently using it. PrEP eligibility was 88.1% (n=325) and 246 (75.7%) individuals initiated PrEP at baseline.

Among 79 (24.3%) participants not initiating PrEP at baseline, 54 (16.6%) had no interest and 25 (7.7%) initiated post-exposure prophylaxis, after which 19 (76.0%) started PrEP. Final PrEP uptake was 81.5% (n=265).

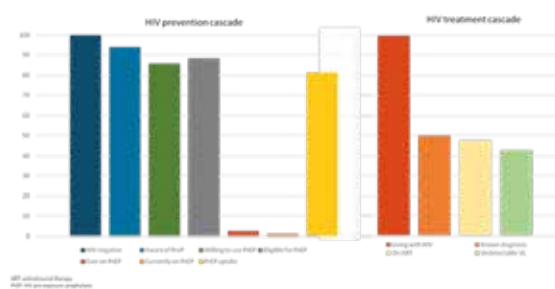


Figure 1. HIV prevention and treatment cascades among young MSM enrolled in the Conectad@s Project, Brazil, 2021-2022.

Conclusions: Our findings show that less than half of HIV+ YMSM were virally suppressed, with a considerable proportion of HIV status unawareness. Despite high PrEP awareness, willingness, and eligibility, very few YMSM had ever used it. Once offered, PrEP uptake was substantial. These results highlight major challenges that YMSM face to access health services, with homophobia and stigma as central barriers. HIV prevention/care models must address these barriers to respond to the needs of YMSM.

EPC0513

W96 results of the OPTICARE program (France), an implementation program to optimize care among vulnerable persons living with HIV (PLWH) in virological failure (VF)

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Background: The OPTICARE program through a personalized care management, aimed to reengage in care ART treated PLWH with VF and vulnerability criteria.

Methods: OPTICARE is a single center (Paris, France) interventional study which enrolled ART treated PLWH in VF (HIV plasma viral load (pVL)>50cp/mL) with vulnerability criteria (social, psychiatric, recent migration). The program included a personalized approach including physician, educational nurse, psychologist, social worker with a close follow up over the year 1. After W48, patients returned back to standard of care with 6-month visits until W96. We present here final W96 data (intent to treat analysis), with rate of retention in care (RiC), virological suppression (VS) (pVL<50cp/mL) and changes in social and administrative status from baseline to W96.

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Results: A hundred and nine vulnerable PLWH had been enrolled from January 2019 to January 2021 (55% women, median (IQR) age 41 years (33 - 52) including 76% migrants (68% from Sub Saharan Africa) of which 30% had less than two years of stay in France.

Baseline parameters were: HIV pVL 3.5 (2.6-4.9) \log_{10} , CD4 cells 192/mm³ (94-354), duration of HIV diagnosis 11years (5-20); 56% (61/109) had previous AIDS events.

W96 analysis showed high and persistent RiC rate (78% (95% CI 69-85) (13 lost to follow up, 3 deaths) although lower than at W48 (83% (95% CI 74-89), $p=0.49$).

In comparison to W48, W96 VS rate was higher (61% (95% CI, 51-70) versus 57% (95%CI 46-66), $p=0.094$). Individuals with VS ($n=66$) included 44 (66%) of those who previously reached VS at W48 and 16 (24%) who had pVL between 50-200cp/ml and 6 (9%) who had pVL > 200cp/mL, respectively at W48.

Over 96 weeks, 68% (27/40) had obtained a regular permit residency ($p<0.0001$), 31% (20/65) a stable accommodation ($p=1.0000$) and 50% (12/24) had recovered health insurance ($p<0.0001$); 32% (14/44) remained with ≥ 2 vulnerable factors ($p<0.0001$). In multivariate analysis, no factor associated to virological suppression was found.

Conclusions: Our results support the necessity of a multi-disciplinary and close approach to improve RiC and maintain HIV control among PLWH with important hardship.

EPC0514

Correlates of HIV disclosure by adult caregivers to children living with HIV: a programmatic multi-center evaluation in four Nigerian states

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Background: Scaled-up access to suppressive ART has improved treatment outcomes of children living with HIV (CLHIV). Disclosure remains an essential step toward long-term HIV management and optimal quality of life among CLHIV.

We investigated factors influencing HIV status disclosure among caregivers to CLHIV in four Nigerian states.

Methods: A cross-sectional study was conducted in March-April 2022 among randomly-selected adult caregivers of CLHIV aged 5-19 years receiving care at health facilities in the Federal Capital Territory, Katsina, Nasarawa and Rivers.

An interviewer-based semi-structured questionnaire captured data on caregiver/CLHIV socio-demographics and CLHIV clinical data. Binary logistic regression was per-

formed to identify predictors of HIV disclosure, categorized as full (includes using the term HIV), partial (informing child that they have a chronic illness), or none.

Results: A total of 887 caregivers of CLHIV were interviewed at 35 facilities. Mean age was 38.3 (SD 11.3) years; most caregivers (70.2%) were female, 55.1% and 20.0% were biological mothers and fathers of CLHIV respectively, and 65% of caregivers were themselves living with HIV. Caregivers were interviewed about 887 wards: 13.6% under-5, 61.2% age 5-14 and 25.1% age 15-19 years.

Among caregiver respondents, disclosure rate to CLHIV was 60.4% (43% full; 17.5% partial), and 12.3%, 45.1% and 39.6% to CLHIV aged 5-9, 10-14 and 15-19 years, respectively. For CLHIV, being age 5-14 years ($aOR=9.0$, $95\%CI=4.7-17.1$) and 15-19 years ($aOR=156.9$, $95\%CI=64.9-379.5$) vs <5 years, in school ($aOR=2.47$, $95\%CI=1.10-5.56$) and having a non-related guardian ($aOR=5.77$, $95\%CI=1.2-27.7$), was significantly associated with the likelihood of caregivers disclosing their wards' HIV status to them.

Conclusions: Findings from this study show that school attendance, age, and caregiver relationship to a child affect the disclosure rate of CLHIV. This underscores the need to develop tailored interventions that will improve CLHIV disclosure among non-related caregivers such as client-centered, culturally and age-appropriate disclosure counselling support. Lastly, a multivariate analysis to further evaluate these correlates is warranted.

EPC0515

Impact of COVID-19 on the HIV care cascade within three clinical settings in Saskatchewan, Canada

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Background: COVID-19 public health restrictions (PHR) prompted HIV care providers in the Canadian province of Saskatchewan (SK) to respond accordingly. This project compared the response and client outcomes of three HIV clinical care models in SK during the pandemic. These models represent three unique care approaches:

1. Facility-based;
2. Community-based; and
3. Rural-remote care with Indigenous communities.

Collectively, these three sites care for most persons living with HIV (PLWH) in SK. The project objective is to determine the efficacy of the pandemic response of each model.

Description: SK has the highest rates of HIV in Canada (16.9 per 100,000 - 4x the national average). SK's HIV epidemic is driven largely by intravenous drug use among



marginalized Indigenous population. The negative social and health impacts of COVID-19 PHRs are seen as disproportionately affecting marginalized populations. This project examines and compares three HIV care models, and their respective responses to the PHRs.

We analyzed retrospective active client medical records who attended at least one HIV-related visit across the three clinical sites from May 1, 2019, to April 30, 2022. We defined viral suppression as the most recent lab value <200 copies/ml.

Lessons learned: As HIV rates increased across SK during the pandemic, care cascade outcomes reflected each clinic's response to care delivery. With acute care closed, client outcomes were lowest, with engagement rates at 51% and those on ARV treatment at 45% in 2021-22. Total client numbers at the community-based clinics continued increasing while treatment rates remained consistent, around 60%. Suppression rates were highest in the remote community-based care model with 89% in 2021-22. For the urban-based community clinic, suppression rates dropped from 83% (2019-2020) to 69% (2021-22).

Conclusions/Next steps: Results are consistent with literature findings that community-based care has better success rates in reaching and retaining clients along the cascade. However, the impact of PHRs and lockdowns on the population with or at-risk for HIV is clear. Those most vulnerable to gaps in care had poorer outcomes, while those with community-based supports had better outcomes.

These findings will inform program strategies as services and care provision is restored and adapted during the post-pandemic recovery period.

Methods: In April 2020 (period 1) and July-November 2020 (period 2), two consecutive cross-sectional surveys among were conducted among PLWH using a web-based multi-lingual questionnaire.

The questionnaire assessed HIV follow-up, psychosocial well-being (using the PHQ-2 tool for depression screening and GAD-2 tool for anxiety screening), occurrence of COVID-like symptoms, COVID-19 restrictive measures, and their impact on HIV care. Consenting PLWH submitted their responses anonymously.

Results: Participants included PLWH residing in Western Europe (mostly Belgium and France); Eastern Europe (mostly Russia, Belarus, and Ukraine); Latin America (mostly Brazil). Responses were obtained from 317 PLWH (mean age 43.4±11.7; 71.6% male) for period 1 and from 247 PLWH (mean age: 44.5±13.2 years; 73.7% male) for period 2. Across study periods, the prevalence of depression increased from 23.3% to 27.9% ($p=0.213$) and that of anxiety rose from 22.7% to 27.1% ($p=0.229$).

Adaptations of HIV care during the COVID-19 outbreak (period 1 only) included greater quantities of antiretroviral refill in 67 (21.1%), phone consultations in 25 (7.9%), and new refill sites in 12 (3.9%); PLWH who reported such adapted HIV care delivery had significantly lower odds of experiencing COVID-like symptoms (OR=0.513, IQR: 0.307-0.848). Furthermore, by the time of the conduct of the second survey (period 2), 43.7% of PLWH reported having no HIV follow-up during the past month, and only 48.6% of respondents reported that HIV care had returned to pre-COVID normalcy. Compared to period 1, the proportion of PLWH reporting substance use increased from 58.6% to 67.2% in period 2 ($p<0.001$).

Conclusions: Our findings suggest that the well-being and medical follow-up of PLWH have been significantly affected by the persisting COVID-19 pandemic. Pro-active interventions such as COVID-19 vaccination, remote HIV follow-up (telemedicine) and increased psychosocial support for PLWH should be envisaged in the medium to long-term as we adapt to the new normal imposed by COVID-19.

Epidemiology of COVID-19

EPC0516

Impact of the COVID-19 pandemic on the medical follow-up and psychosocial well-being of people living with HIV

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Background: The COVID-19 pandemic has engendered disruptions in the delivery of healthcare in general, including HIV care delivery. We prospectively surveyed people living with HIV (PLWH) in different countries to investigate whether their medical follow-up and psychosocial well-being had been compromised due to COVID-19 and associated restrictions.

**EPC0517****Prevalence of SARS-CoV-2 among persons on HIV antiretroviral treatment in Mozambique: baseline characteristics among participants of the COVIV cohort study**

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Background: The impact of the COVID-19 epidemic among persons living with HIV (PLHIV) is unknown in Mozambique. The COVIV ("**COVID/HIV**") cohort study, implemented in three provinces, aims to investigate prevalence and incidence of SARS-CoV-2 among PLHIV in care. The present analysis describes the baseline characteristics of enrolled participants.

Methods: Participants were recruited at three health facilities in Maputo, Inhambane and Zambézia provinces. All were screened at baseline for COVID-19 risk, using a standardized risk assessment questionnaire, and for SARS-CoV-2 antibodies, using Abbott™ IgM/IgG antibody rapid test (AB-RT). Those with either positive risk assessment or AB-RT underwent SARS-CoV-2 PCR testing.

Participants, selected at convenience, were enrolled in one of the following arms, depending on the presence of active infection/exposure, irrespectively of COVID-19 vaccination status:

1. Not-actively-infected/not-exposed (AB-RT and PCR negative);
2. Active COVID-19 infection (PCR positive);
3. Not-actively-infected/exposed (AB-RT positive and PCR negative).

Results: A total of 1286 PLHIV were recruited from June 2021 to April 2022 (which included the 3rd [June-September 2021] and 4th wave [December 2021-January 2022] of the country's epidemic); 637 (49.5%) in Maputo, 296 (23.0%) in Inhambane, 353 (27.4%) in Zambézia. Median age was 40 years (IQR [interquartile range]:32-49), 65.3% (840/1286) were female.

Median time on ART was 5.3 years (IQR:2.7-8.7), median CD4+ T-cell count was 506 cells/mm³ (IQR:367-671), and 1016/1076 (94.4%) who had a viral load result within 12 months prior to enrollment were virally suppressed. Among enrolled participants, 410 (32%) tested positive for

SARS-CoV-2 IgG/IgM, and 777 (60.4%) underwent PCR testing based on risk assessment/AB-RT. Among those with PCR testing, 64 (8.2%) had a positive result. Most active infections (53 [82.8%]) were identified in Maputo. Of all, 54 (84.4%) occurred between June-August 2021, 6 (9.4%) in December 2021-January 2022. No differences were seen in baseline CD4+ T-cell count or viral load between the three arms ($p=0.64$ and $p=0.07$, respectively).

Conclusions: About one in three PLHIV in this cohort were reported being exposed to SARS-CoV-2; one in 20 were confirmed actively infected with SARS-CoV-2, consistent with timing of COVID-19 epidemic waves in Mozambique. Follow-up of active infection is important to monitor clinical, immunological and virologic HIV-related short and mid-term outcomes.

EPC0518**No impact of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) on maternal mortality or infant adverse birth outcomes in Botswana during the Omicron era**

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Background: SARS-CoV-2 infection during pregnancy was associated with maternal mortality and adverse birth outcomes in the pre-Omicron era (particularly during the Delta era), including a stillbirth rate of 5.6% in Botswana. Most adverse birth outcomes were highest with co-exposure to HIV and SARS-CoV-2.

We re-evaluated these outcomes in the Tsepamo Study during the Omicron era. In Botswana, SARS-CoV-2 vaccination became common for young adults and pregnant women only in the Omicron era.

Methods: The Tsepamo Study abstracts data from antenatal and obstetric records in government maternity wards across Botswana.

We assessed maternal mortality and adverse birth outcomes for all singleton pregnancies from mid-November 2021 (the start of the Omicron era) to mid-August 2022 at nine Tsepamo sites, among individuals with documented SARS-CoV-2 screening PCR or antigen tests and known HIV status.



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Results: Of 9,705 women routinely screened for SARS-CoV-2 infection at delivery (64% of deliveries at these sites), 373 (3.8%) tested positive. Women with HIV were as likely to test positive for SARS-CoV-2 (77/1833, 4.2%) as women without HIV (293/6981, 4.2%) ($p=1.0$). There were 5 recorded maternal deaths (0.03%), one occurring in a woman with a positive SARS-CoV-2 test result. In contrast, maternal mortality was 3.7% and 0.1% in those with and without SARS-CoV-2, respectively, during the pre-Omicron era.

In the Omicron era, there were no differences among infants exposed or unexposed to SARS-CoV-2 in overall adverse birth outcomes (28.1% vs 29.6%; aRR 1.0, 95%CI 0.8-1.1), severe adverse birth outcomes (11.9 vs 10.6%; aRR 1.1, 95%CI 0.8-1.5), preterm delivery (15.1% vs 14.9%; aRR 1.0, 95%CI 0.8-1.3), or stillbirth (1.9% vs 2.3%; aRR 0.8, 95%CI 0.4-1.7).

Adverse outcomes among those exposed to both HIV and SARS-CoV-2 were similar to those exposed to HIV alone (31.2% vs. 33.1%; aRR 0.9, 95%CI 0.6-1.3; $p=0.5$).

Conclusions: Maternal mortality was far lower in Botswana during the Omicron era than in the pre-Omicron era, and adverse birth outcomes were no longer significantly impacted by exposure to SARS-CoV-2 either overall or with HIV co-exposure. Increased population immunity to SARS-CoV-2, less stress on the hospital systems in the Omicron era, and possible differences in viral pathogenicity may combine to explain these findings.

EPC0519

Assessment of COVID-19 vaccination uptake among people living with HIV in CDC-supported regions in Tanzania, August-September 2022

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Background: People living with HIV (PLHIV) may be at increased risk for severe COVID-19 disease. Ensuring optimal COVID-19 vaccine uptake provides an opportunity to maximize protection of PLHIV against severe COVID-19 outcomes. In Tanzania, routine programmatic data suggested very high uptake of COVID-19 vaccination among PLHIV. However, programmatic data are characterized by data quality issues, notably related to missing or duplicate data, and inaccurate denominators. We aimed to empirically understand drivers of COVID-19 vaccine uptake among PLHIV in select regions in Tanzania.

Methods: A cross-sectional facility-based survey was rapidly conducted between August and September 2022 among 1,198 PLHIV aged 18 years and older. The survey

was conducted in six regions of Tanzania mainland and Zanzibar. A total of 106 health facilities were randomly selected and structured exit-interviews were conducted with PLHIV.

The main outcome of interest was COVID-19 vaccination uptake – defined as receiving at least one dose of a COVID-19 vaccine approved by Tanzania government. Modified Poisson regression models accounting for facility clustering of PLHIV were used to assess correlates of COVID-19 vaccination uptake.

Results: Overall COVID-19 vaccination uptake among PLHIV in the selected regions was 78% and was highest in Kigoma region (94%). The Janssen vaccine manufactured by Johnson and Johnson was received by 54% of PLHIV. PLHIV residing in Kigoma [aPR: 1.33, CI:1.15-1.53], Tabora [aPR: 1.22, CI:1.04-1.44] and Tanga [aPR: 1.23, CI:1.05-1.43] were more likely to be vaccinated compared to those in Dar es Salaam region. PLHIV who had never married [aPR: 0.85, CI:0.76-0.95] were less likely to be vaccinated. PLHIV who responded that the COVID-19 vaccines were 'not safe at all' were less likely to be vaccinated [aPR: 0.39, CI:0.27-0.57] compared to those who responded that vaccines were safe.

Conclusions: The findings of this rapid assessment demonstrate that uptake of COVID-19 vaccination was high among PLHIV, and safety concerns were a major vaccination barrier. Messages that reassure PLHIV of the safety of COVID-19 vaccines may help to improve vaccine uptake among this population. Targeted vaccination strategies adapted to the urban setting in Dar es Salaam may be needed to improve uptake.

EPC0520

Roles of community health workers in advancing health security and resilient health systems: emerging lessons from the COVID 19 pandemic in Tanzania

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Background: In Tanzania the Johnson & Johnson/Janssen Covid-19 vaccine was rolled out on 27th July, 2021 with prioritization to healthcare workers, national security staff, persons above 50 years and those with chronic illnesses. Later, vaccination was extended to eligible persons above 18 years with several other vaccine types.

Despite the fact that Tanzania response to the pandemic was slow, it managed to reach the WHO recommended target in September 2022. To increase uptake of the vac-


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cine, Amref through the Global fund implemented a community mobilization and distribution through Community Health Providers.

Description: The project was implemented in ten identified high risk COVID regions from November 2021 to June 2022. Community Health Care Workers who were already working for HIV and TB were recruited, paired with community influential people or community leaders and health facility vaccine supervisors. They were oriented on C19 vaccine and prevention methods. The team conducted outreach to villages, streets and in all market. The team were performance based remunerations which motivated the team to work.

Lessons learned: Up to June 2022 a total of 2, 644,885 individuals were fully vaccinated through the contribution of this team from the 10 regions. These efforts has contributed to Tanzania to achieve 71.66% full vaccination for J&J, Moderna, Pftzer making it a total of 21,823,737 fully vaccinated up to up to October 2022. Regions like Kilimanjaro, Ruvuma and Dodoma were able to reach more than 100% of the set targets. CHWs worked closely to ensure mobilization and a link to HCWs who were vaccinating people after the role of CHWs.

Conclusions/Next steps: During the response, the regular role of a CHW in health education and promotion focused on awareness-raising and the promotion of "new normal" behaviours; CHWs also played critical roles in assisting in surveillance and contact tracing and vaccine uptake. Concurrently, CHWs and the community team ensured continuity of essential health services.

However, there were challenges, such as stigma, a lack of adequate training or protective equipment, and limited levels of incentives and recognition from the higher authorities. Payment for performance also discouraged some CHWs as it depended on performance of all group members including health care workers.

EPC0521

Quality of life and fatigue among individuals after COVID-19 hospitalization

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Background: Long COVID conditions in people who had severe COVID-19 illness can include a variety of health problems, directly impacting health related quality of life (QoL). We evaluated QoL and fatigue changes overtime after hospital discharge due to COVID-19 in participants from RECOVER-SUS BRASIL study.

Methods: RECOVER-SUS aims to understand the dynamics and dimension of the sequelae in individuals who were discharged after COVID-19 hospitalization in Brazil. Participants from INI-FIOCRUZ site (Rio de Janeiro) were contacted per telephone calls 30 and 180 days after hospital

discharge. We used ACTG SF-21 to assess QoL, which has 8 domains (scores from 0 [worst] and 100 [best]), and multidimensional questionnaire of fatigue (MFI-20), which has 5 domains (scores from 4 to 20; increased scores indicate more fatigue).

We evaluated differences in mean change in QoL and fatigue between visits using generalized estimating equation methods.

Results: Of 220 participants included, 83 (37.7%) were aged 60+ years at hospital admission (median age: 55; IQR:45-65), 125 (56.8%) were cisgender man, 98 (44.6%) black/mixed-black, 84 (39.4%) primary education or less, 97 (48.7%) low income (\leq USD500/month) and 167 (75.9%) at least one comorbidity HIV prevalence was 5% (N=11/220), 186 (85.3%) needed oxygen support. Considering QoL scores, general health perception decreased significantly between visits, while physical functioning and role functioning increased (Table 1).

For fatigue, reduced activity scores decreased significantly between visits, meaning improvement in this MFI-20 domain. No difference between visits was observed for other QoL or fatigue domains.

	30 days	180 days	Difference between visits	p-value
Quality of Life SF-21				
General Health Perception (GHP)	58.8 (24.3)	53.3 (26.0)	-5.5 (24.7)	0.023
Physical Functioning (PF)	66.2 (26.4)	64.3 (29.2)	-1.7 (27.6)	0.48
Role Functioning (RF)	72.8 (30.5)	80.7 (30.0)	7.8 (30.8)	0.007
Social Functioning (SF)	71.9 (26.8)	78.3 (29.3)	6.3 (32.7)	0.019
Cognitive Functioning (CF)	69.1 (26.3)	70.4 (27.5)	1.3 (27.9)	0.60
Pain (P)	69.2 (25.5)	68.3 (26.9)	-0.8 (30.2)	0.72
Mental Health (MH)	67.7 (23.0)	68.2 (26.7)	0.4 (25.0)	0.85
Energy/Fatigue (EF)	60.1 (23.1)	62.3 (26.8)	2.2 (28.3)	0.72
Multidimensional Fatigue Inventory (MFI-20)				
General Fatigue	11.6 (3.9)	11.4 (4.5)	-0.2 (4.6)	0.61
Physical Fatigue	11.7 (3.9)	10.9 (4.9)	-0.8 (4.8)	0.070
Reduced Activity	10.9 (3.9)	10.0 (4.7)	-0.9 (5.0)	0.037
Reduced Motivation	7.5 (3.0)	7.4 (3.4)	-0.1 (3.7)	0.80
Mental Fatigue	9.6 (4.1)	9.5 (4.8)	-0.2 (4.8)	0.71

Table 1. Quality of life (SF-21) and multidimensional fatigue inventory (MFI-20) mean (standard deviation) scores at 30 days visit, 180 days visit and differences between visits.

Conclusions: Individuals who required COVID-19 hospitalization had poor or no improvement on QoL and fatigue 180 days after hospitalization discharge. Understanding participants' general perception of their own health is crucial to seek strategies to improve QoL and fatigue. Future studies with longer follow-up period are required to better understand the effects of long COVID.

**EPC0522****Sentinel surveillance for early detection of COVID-19 in Malawi**

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Background: Malawi's routine national surveillance system has faced challenges including inconsistent testing for SARS-CoV-2 infection, inadequate monitoring of community transmission, and limited capacity to detect new variants.

To address these challenges, the Public Health Institute of Malawi established a COVID-19 sentinel surveillance system to monitor SARS-CoV-2 infection trends and variants and inform the nation's response.

Methods: The sentinel surveillance was established in July 2022 in 5 health facilities (HF) and 2 busy land points of entry (PoE). At each HF, 10 symptomatic and 5 asymptomatic persons of any age seeking care are systematically sampled per day. We use WHO integrated COVID-19 and Flu case definition of influenza-like illness, acute respiratory infection, and severe acute respiratory infection to identify symptomatic patients.

Ten travelers ≥5 years at the PoEs are similarly sampled. All consented participants provide a nasopharyngeal (NP) swab for RT-PCR test and respond to COVID-19 epidemiological, vaccine and clinical questions. SARS-CoV-2 positive samples are sent to the national reference laboratory for genomic sequencing. We analyzed recruitment data and RT-PCR positivity rates (PR) by site, sex, and age.

Results: Between July 11 and November 4, 2022, 6,038 NP samples were collected and tested. The average number of participants per week was 355 (range 225-508), median age 30 years (interquartile range: 23-41 years).

From the HFs, there were 297 symptomatic participants (cumulative PR 8.9%, weekly PR range 1.1-33.6%), 131 asymptomatic (cumulative PR 7.4%, weekly PR range 0-33.3%) and 40 travelers (cumulative PR 3.5%, weekly PR range 1.2-9.1%) with positive SARS-CoV-2 infection at the POEs.

The proportion of females infected (8.5%) was higher than males (5.9%) ($p < 0.001$), and PR was higher in those aged ≥70 years though not statistically significant. PR decreased over time and was generally low among travelers.

Conclusions: Trends in PR between symptomatic and asymptomatic were similar, highlighting the need to target both groups. The ongoing detection of infections among travelers, despite instituted COVID-19 travel restrictions,

indicates the need for continued surveillance in PoEs and provides an opportunity to detect novel variants coming into the country. The COVID-19 sentinel sites ensured that trends in COVID-19 infections were available during low incidence periods.

EPC0523**COVID 19 Lethality in people living with HIV at the Mexican Institute of Social Security. Result from an observational cohort**

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Background: The impact of COVID 19 epidemic had a greater extent in persons of vulnerability. The effect on people living with HIV (PLWH) in terms of lethality is uncertain. The evidence of studies regarding COVID-19 risk of mortality is not conclusive.

The aim of this study was to determine lethality of COVID-19 in people living with HIV who had medical care at the Mexican Institute of Social Security (IMSS).

Methods: An observational, comparative study was performed. people living with HIV aged over 15 years and COVID-19 confirmed based on the WHO definition were included in the analysis.

Data were obtained from the COVID-19 Epidemiological Surveillance System in the period comprised from February 27th 2020 to April 8th 2022.

Lethality rate was estimated using a Cox regression model, adjusting for sex, gender and other comorbidities. Statistical significance was considered when $p < 0.05$.

Results: 4377 people living with HIV with confirmed COVID-19 were included in the cohort, 3,360 persons (76 %) were persons and 1,009 persons (23%) required hospital care

There were 470 deaths which accounts for a global lethality rate of 10.75, most of these deaths occurred in male persons, yet after adjusting for gender lethality rate was of 15.71 for women compared to 9.72 for men.

Compared to the general population lethality rate was higher for people living with HIV (10.7 vs 6.5 respectively).

There was no increased risk of death when obesity, arterial hypertension, diabetes were present. Regarding to age, people older than 50 years had a HR of death of 7.9 compared to younger people (CI 95 % 1.01-62.01, $p =$



0.048). In the group from 15 – 49 years, lethality rate was 6.87 for females and 5 for males. Finally, of those persons who required hospitalization 20 % died within the first 10 days.

Conclusions: In this cohort we observed a higher lethality rate in people living with HIV compared to general population, with a greater impact on people older than 50 years

EPC0524

Evaluating novel delivery strategies for COVID19 rapid diagnostic testing in Malawi and Nigeria: lessons from a changing epidemic

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Background: COVID19 testing was slow to scale-up in Sub-Saharan Africa, with per capita testing coverage and frequency below other regions. In 2021, we delivered community-based services using COVID-19 antigen rapid diagnostic tests (CV19-RDT) to meet international and national priorities in Malawi and Nigeria, settings lacking formal address systems, challenging postal delivery models.

Description: Funded through Unitaaid/STAR 3ACP Project, symptom screening and COVID19 professional use-RDT testing were delivered from April-Sep 22:

- Arriving unvaccinated travellers at 5 land border-posts in Southern Region, Malawi.
- Indoor congregate facilities with suspected outbreaks in Blantyre, Malawi, if notified by District Health Office.
- Transport hubs and educational facilities, in Abuja FCT, Nigeria

In Malawi, border-post testing was offered to unvaccinated incoming land border travellers, in line with national requirements, regardless of symptom status.

Free on-demand outbreak testing was available to any workplace and educational facilities, in event of suspected outbreaks. In Nigeria, free symptom screening and RDT testing in pre-identified congregant settings included transport hubs and educational institutions, regardless of symptom status.

By September 2022, outbreak investigation had ceased in Nigeria, and cross-border testing ended in Malawi. No outbreaks were identified in Malawi, and no outreach-testing conducted.

Lessons learned: Testing was provided to 2,468 clients regardless of symptoms at border-posts in Malawi, of whom 0.8% (19/2,468) tested COVID-19 positive. Within regional transport hubs and educational institutions in Nigeria, testing was provided to 819 clients, of whom 235 were symptomatic (at least 1 of 10 COVID-19 symptoms), and 0.5% (4/819) were CV19-RDT positive. Of 23 RDT-positive patients in both countries, only one met criteria for severe disease. Median age was 36 and 32 respectively for border- and Nigerian transport hub/ educational facility testing, and men made up 69% and 50% of Malawian and Nigerian clients.

Conclusions/Next steps: Community-based access to COVID-19 testing in Malawi and Nigeria was feasible and acceptable, with high numbers of participants, but with low positivity and minimal detection of severe illness, reflecting young age, and consistent with low incidence of symptomatic manifestations of SARS-CoV-2 infection in most African countries.

EPC0525

Leveraging new strategies to improve on clients' outcomes: implementation of multi-month dispensing (6 MMD) in Rwanda during the Covid-19 pandemic

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Background: Since 2016, Rwanda adopted the "Treat all" strategy following the World Health Organization recommendations, and all clients who test HIV-positive are linked to care and initiated on Antiretroviral Therapy (ART). National HIV treatment guidelines has adapted to include differentiated service delivery model and stable clients benefit from three multi-months' drug dispensing (3MMD). In response to the Covid-19 pandemic, the National HIV program initiated 6 multi-month dispensing (6MMD) distribution for stable clients on Tenofovir-Lamivudine-Dolutegravir (TLD) to ensure uninterrupted access to ART and limit the frequency of physical contact and congestion at health facilities.

Description: From September 2020, 6 MMD started in Kigali city for 3 districts. Due to the Covid-19 pandemic, physical meetings were not allowed in the country, and training of health care providers as well as shipment of TLD 90 was difficult. The team from RBC/HIV Division with clinical mentors from hospitals visited Health Care Providers (HCPs) across the country and discussed the eligible PLHIV for 6MMD. An onsite training was conducted in 2021 for 8 districts and the training of remaining HCPs was conducted in 2022. All health facilities in the country are implementing 6MMD as a less-intensive models of drug refill starting on those on TLD regimen. In total of 212,525 PLHIV on the ART; 23,8%(50,697) are on one-month pharmacy dispensing, 29,9%(29,90848) on 3MMD and 46%(98,265) on 6MMD.



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Lessons learned: Implementation of 6MMD during the covid-19 pandemic required the training of healthcare providers and the identification of eligible clients. Onsite training was a good way to reach health care providers and responding similarly as the non-onsite training.

Conclusions/Next steps: The 6MMD dispensing decreased number of clinic visits and the workload of health care providers who were overloaded due to covid-19 pandemic.

Both PLHIV and healthcare providers appreciated the model and commended its expansion above 6 months' pharmacy pick up for sustained HIV epidemic control.

EPC0526

How has the COVID-19 pandemic impacted adolescents to access SRHR and Comprehensive Sexuality Education (CSE) in 8 countries in East and Southern Africa?

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Background: Lockdown measures following the COVID-19 pandemic resulted in the closure of schools leaving an estimated 1.54 billion learners out of school. This challenged access to vital comprehensive sexuality education (CSE) and to SRHR for adolescents.

UNESCO commissioned a study on the impact of COVID-19 on CSE and key SRHR indicators for adolescent including unintended pregnancy, GBV and early and forced marriage in 8 countries: Botswana, Kenya, Lesotho, Malawi, Namibia, South Africa, Zambia and Zimbabwe.

Description: Data was collected in 164 schools across the 8 countries. Quantitative data was collected through a survey administered to 4713 adolescents and a second survey administered 671 teachers. A total of 156 KIs were conducted with representatives from ministries, UN agencies, CSOs and 39 FGDs held with guardians and community members.

Lessons learned: The COVID-19 pandemic and school closures had negative impact on CSE and SRHR for adolescents. The loss of in-person learning led to a lack of access to information.

Online learning platforms were used but faced challenges such as limited access to devices, internet connectivity and high data costs. A significant proportion of adolescents had access to mobile phones, radios, and TV, but the majority (81%) did not have contact with teachers despite being perceived as the main source of information for SRH.

Qualitative data shows adolescents faced challenges accessing SRH services due to restricted movements and fear of COVID-19 infections.

The most accessed services were HIV counselling and testing (45%) and menstrual health (25%), with the least accessed being ART (8%) and STI screening/treatments (14%).

The study also showed negative effects on adolescents' wellbeing and protection outcomes. Qualitative data shows school closures exacerbated the instances of unintended pregnancies, early and forced marriage, GBV and mental ill-health.

Conclusions/Next steps: COVID-19 reinforced existing inequities in education systems and strained emergency response measures. Recommendations include investment in digital and remote CSE and SRH information and services, teacher training on ICT, collaboration with caregivers, integration of CSE into emergency responses, decentralization of CSE.

Policy recommendations include investing in mental health, coordinated policy approach, equity and inclusion in learning, mandatory CSE through distance learning, removing barriers to internet connectivity, and improving e-governance.

EPC0527

Changes in resilience among older PLWH in Ukraine during the COVID-19 pandemic and the Russian invasion

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Background: In Ukraine, the COVID-19 pandemic and the Russian invasion have adversely affected people with HIV due to disruptions to the economy and health care services, and have dramatically impacted mental health. Resilience is defined as the capacity to recover from difficult life events that can improve health outcomes along the HIV continuum of care.

Our objective was to assess mental and physical health and the dynamics of resiliency during the Ukrainian multicrisis.

Methods: We conducted a four wave survey from May 2020 through May 2022 among older (≥50 years) people with HIV (OPWH) in Kyiv, Ukraine to collect data on socio-demographics, mental health, resilience, COVID-19/war experiences and HIV care. The first 3 waves were during the initial stages of the COVID-19 pandemic, while the 4th wave was conducted after the onset of the full-scale Russian invasion in February, 2022.

Resilience was assessed with the Brief Resilience Scale as a continuous score (1 to 5). Multivariable imputation by chained equations was used to impute missing data. A nested linear mixed-effect model was used to examine factors associated with mean resilience score, including time point. Backward selection was used to identify a parsimonious multivariable model.

Results: Of the 122 OPWH who completed the baseline survey, 51% were women and the median age at baseline was 54.8 (SD 6.5). In total, 97 people completed all fol-



low up interviews, for a total of 431 observations across the 4 waves. Resilience was found to be positively associated with perceived meaning in life (0.17, 95%CI:0.08–0.27, $p<0.001$), having at least one substance use disorder (1.58, 95%CI:0.65–2.51, $p<0.001$), being a woman (1.41, 95%CI:0.56–2.25, $p<0.001$), and was significantly higher at the fourth wave, after the onset of war (1.33, 95%CI:0.43–2.22, $p=0.004$). Resilience was negatively associated with increased age (–0.08, 95%CI:–0.15– –0.01, $p=0.021$) and having mild-to-severe depression symptoms (–1.67, 95%CI:–2.43– –0.91, $p<0.001$).

Conclusions: Counterintuitively, resilience among OPWH has significantly increased since the Russian invasion. Women and OPWH with better psychological health had higher resilience. OPWH with depression and of greater age demonstrated lower resilience. Timely support should be provided to OPWH to ensure continued resilience in multicrisis settings.

EPC0528

Improving access and coverage of COVID-19 vaccination among people living with HIV in South-South Nigeria

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Background: People Living with HIV have an increased risk of severe illness and death from COVID-19, however, uptake for COVID-19 vaccination remains suboptimal for this at-risk population. USAID through funding from PEP-FAR implemented a vaccination SURGE to improve the uptake of the COVID-19 vaccine among PLHIV in Nigeria. This paper summarizes the COVID-19 vaccination surge implementation strategy and reports on vaccination uptake among PLHIV in Nigeria.

Description: The vaccination SURGE implemented in Akwa Ibom and Cross River states, Nigeria, between January to September 2022, was targeted at PLHIV (≥ 18 years), and strategies implemented were retrospectively grouped using the EPIS framework.

During the exploratory phase, brainstorming sessions were conducted with key stakeholders, including the State Primary Health Development Agency (SPHCDA) in charge of vaccination, community gatekeepers and the Network of People Living with HIV in Nigeria (NEPWHAN), to identify potential barriers and facilitators to vaccine uptake.

In the preparatory phase, advocacy visits were conducted to the identified stakeholders to gain their buy-in and strengthen collaboration; healthcare workers and NEPWHAN members were trained in Inter-Personal Communication and Counselling (IPCC) to improve communication skills needed to address myths and misconceptions

linked to COVID-19 vaccines; PLHIV were engaged as vaccine ambassadors to activate their network and sensitize members; and at least two mobile teams were formed in each of the 34 supported Local Government Areas (LGA), comprising of healthcare workers, trained as vaccinators and recorders, and integrated into the ART service flow at the facility and community.

Implementation commenced in April 2022 across 155 ART clinics and 2,422 ARV drug pickup points within the community. COVID-19 report was documented in the Electronic Medical Records daily, profiled and triangulated with commodity utilization weekly to ensure real-time updates, and address data quality issues and implementation challenges.

Lessons learned: COVID-19 vaccination coverage among PLHIV improved from 1.0% (1797/111665) in December 2021 to 70.8% (128187/180972) in September 2022, with 74.8% (95874/128187) fully vaccinated and 25.2% (32313/128187) partially vaccinated. 89.8% (115080/128187) of the PLHIV ever vaccinated occurred during the implementation phase of the SURGE.

Conclusions/Next steps: The success of the SURGE can be attributed to the multi-faceted approach to implementation.

EPC0529

Scaling up COVID-19 vaccination uptake among people who inject drugs attending medication assisted treatment clinics: experience from the Pwani region, Tanzania

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Background: People who inject drugs (PWID) are at higher risk for coronavirus disease 2019 (COVID-19). Vaccination against COVID-19 remains an effective and safe strategy at protecting PWID from getting seriously ill, being hospitalized, and dying. In Tanzania, COVID-19 vaccination uptake varied across regions and population groups, with low uptake among PWID.

We aimed to describe programmatic strategies to improve COVID-19 vaccination among PWID attending medically assisted therapy (MAT) clinics in Pwani region, Tanzania.

Description: As of February 2022, among 409 PWID attending MAT clinic, only 56 (13.7%) were fully vaccinated. To accelerate vaccination uptake, we instituted targeted intensified efforts for active engagement and utilization of all relevant stakeholders such as the regional and district health management teams, health facility in-charges, peer educators, vaccine champions and grassroots political and influential leaders.



We established vaccination points at MAT clinics; recruited health care workers to trace MAT clients via phones and using map cues and conducting community outreach services; and daily monitoring of unvaccinated clients attending the clinic and attaching with peer educators for follow-up. We report vaccination uptake nine months after scaling up these interventions.

Lessons learned: By 19th December 2022, 710/756 (94%) of MAT clients were fully vaccinated in Pwani region while the rest 46 (6%) were partially vaccinated, Bagamoyo 399 (90%), and 311 (100%) in Tumbi special referral hospital were fully vaccinated, 10 (100%) of women and 700 (94%) of men were fully vaccinated while the remaining 46 (6%) of men were partially vaccinated, 45 (100%) of PWID aged 50+ years were fully vaccinated while 665 (94%) of those aged <50 years were fully vaccinated, 452 (60%) of PWID were vaccinated by Sinovac and 304 (40%) were vaccinated by JJ.

Conclusions/Next steps: Sensitization of MAT clients' pay per performance for health care workers, involvement of local government authority, political and grassroots leaders, use of peer educators and vaccine champions and daily monitoring of unvaccinated clients attending the clinic are key to reaching MAT clients.

EPC0530

Integrating COVID-19 vaccination and care and treatment services among PLHIVs in Lindi region, Tanzania

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Background: The COVID-19 pandemic with no doubt has resulted to healthcare service interruptions and has become an additional threat to PLHIV, although it is not scientifically proven that PLHIV's are more susceptible than non-PLHIV's but due to the nature of the disease attacking most people with chronic illness then this was a burden to them.

It was observed that there was low vaccine update among PLHIV in Lindi where only 17% of PLHIV's were vaccinated by June 2022.

Description: The USAID Afya Yangu Southern Program (2021-2026) aims at supporting the Government of Tanzania to deliver high quality integrated HIV and Tuberculosis (TB) services prevention care and treatment services that will improve health outcomes, particularly for youth and children.

The program intends to increase the demand for and use of quality integrated HIV and TB services in Iringa, Lindi, Morogoro, Mtwara, Njombe, and Ruvuma. In July 2022 US-

AID Afya Yangu southern program started implementing support in maximizing vaccination coverage while focusing on PLHIV.

Lessons learned: The Program supported 98 health facilities in integrating Vaccination services at CTCs, this model ensured that all PLHIVs could be vaccinated at CTCs instead of going to the RCH section. 15 short-term vaccinators and 32 Vaccination champions were recruited and trained.

Management support from R/CHMTs and program staff through supervision and embedding vaccination activities in other indicators activities.

The program ensured daily monitoring of vaccination activities, data reporting of vaccinated PLHIV

Results: As of 30th June 2022, vaccination coverage in the Lindi region among PLHIV was at 17% but after the program fully started implementing vaccination activities on July 2022 with other supported ART services rose to 72% by September 30th 2022.

Conclusions/Next steps: With this success in COVID-19 vaccination among PLHIVs in Lindi, it is then recommended that while preparing for pandemics to highly consider integrating the new preventive measures with ART services to make them easily accessible among PLHIV.



Track D: Social and behavioural sciences

Social science theories, concepts and methods

EPD0531

Participant perspectives on incentives for TB preventative therapy adherence and reduced alcohol use: a qualitative study

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Background: People with HIV (PWH) who drink alcohol heavily face challenges to completing TB preventative therapy, despite high risk of related morbidity and mortality. Economic incentives to promote health behavior change have shown promise in reducing substance use and promoting medication adherence.

However, few studies have explored perceptions of incentives for substance use reduction and medication adherence among PWH.

Methods: The Drinkers' Intervention to Prevent Tuberculosis (DIPT) trial enrolled PWH in Uganda with latent tuberculosis and unhealthy alcohol use in a 2x2 factorial design that independently incentivized recent alcohol abstinence and isoniazid (INH) adherence using monthly urine testing while on TB preventive therapy.

Qualitative in-depth interviews were conducted with 32 DIPT participants, purposively sampled across study arm, site, sex, and alcohol (EtG) and INH-related (IsoScreen) urine testing results to maximize heterogeneity.

A thematic analysis approach was used to explore perspectives on the interventions.

Results: Participants described:

1. Satisfaction with incentives of sufficient size that allowed them to purchase items that improved their quality of life (e.g., "These incentives have helped me a lot. I would win then I go and shop what I need at home... did not have a hen at home and one time I won and bought one.");
2. Multiple ways in which incentives were motivating, suggesting variable effects of extrinsic and intrinsic motivation (e.g., "I felt happy about [the incentive] and thought that if I stop drinking alcohol for good then even incentives will increase.") and;

3. Finding value in learning results of increased clinical monitoring (e.g., "I had also developed the courage about my health after testing and being told that my organs function well.")

Conclusions: In this exploration of perspectives on incentives for TB preventative therapy and alcohol abstinence, we found that:

1. Carefully selected incentives of appropriate size led to satisfaction,
2. Multiple mechanisms (including intrinsic motivation to improve health and extrinsic reward for target behavior) appeared to promote behavior change, and;
3. Participants valued program elements that increased transparency about their health.

These elements may be helpful in building future programs to support both reduced substance use and medication adherence among PWH.

EPD0532

Can HIV vaccines be shared fairly? Perspectives from Tanzania

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Background: For over 35 years, Africa has continued to host HIV vaccine trials geared towards overturning the HIV/AIDS pandemic in the continent. However, the methods of sharing the vaccines, when available remain less certain.

Therefore, the study aims to explore stakeholders' perspectives in the global South, in this case, Tanzania, on how HIV vaccines ought to be fairly shared.

Methods: The study deployed a qualitative case study design. Data were collected through in-depth interviews and focus group discussions with a total of 37 purposively selected participants.

The study was conducted from November 2020 to November 2021. This included researchers, institutional review board members, a policymaker, HIV/AIDS advocates, and community advisory board members. The data obtained were inductively and deductively analyzed.

Results: Findings indicate that HIV vaccines can be shared fairly under the principles of distributive justice (contribution, need and equality). Thus, contribution-based sharing ought to be utilized upon the necessity to prioritize vaccine access or subsidized trial benefits to host communities. Need-based sharing ought to be considered



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for non-host communities that are at an increased risk of HIV acquisition. Lastly, equal-based sharing would be useful at later stages of vaccine distribution or when the aforementioned principles are deemed morally inappropriate.

However, none of the benefit-sharing approaches is free of limitations and a counterbalancing sense of unfairness.

Conclusions: Fair sharing of HIV vaccines, when available, ought to be informed by the contribution, need and equality principles of distributive justice. Countries in the global south including Tanzania are likely to be prioritized during the distribution of the HIV vaccines due to their participation in HIV vaccine trials and due to the disproportionate HIV burden evident in the region.

EPD0533

Motivational interviewing increases HIV PrEP initiation and adherence: a scoping review

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Background: PrEP initiation and adherence remain low among high-priority populations globally. Interventions that incorporate motivational interviewing (MI) have improved HIV testing, ART adherence, and PrEP initiation using core concepts of collaborating with participants and evoking their ideas about behavior change. However, variability exists in the design and implementation of MI-based interventions, and research that identifies the necessary components of MI that could improve PrEP uptake and adherence is largely unknown.

This scoping review identifies the essential components of MI-based interventions to improve PrEP use among priority populations globally.

Methods: We searched four databases (Medline, CINAHL Plus, Embase, and Web of Science) for articles that met inclusion criteria:

- Published between 2012-2020,
- Used MI independently or part of a larger HIV intervention, and
- PrEP initiation and/or adherence was a primary or secondary outcome measure. PRISMA guidelines were used for reporting findings.

Results: Five articles met inclusion criteria. Studies were conducted in diverse settings (e.g., HIV/STI clinics, primary care settings, or community-based clinics). Four of the five studies were conducted in the U.S.; one study was conducted in Uganda. Three studies investigated MI in SMM populations. The two remaining studies focused on non-SMM populations, specifically U.S. Black women and Ugandan men and women in serodiscordant re-

lationships. The number of MI sessions varied (e.g., 2-10 sessions), lasting between 15-20 minutes. There was little consistency in MI counselor credentials and demographic characteristics. MI content included rapport building, PrEP education, identifying barriers to PrEP uptake, and strategies to overcome barriers.

Conclusions: MI is feasible to improve PrEP initiation and adherence among diverse study populations. However, variability across study designs and limited details about individual study features hindered our ability to assess MI efficacy on PrEP initiation and adherence.

Behavioral HIV interventions should reconsider classifying interventions as "MI-consistent" given that they deviate from the "true spirit of MI" by having PrEP initiation and/or adherence as an *a priori* outcome.

EPD0534

Perspectives of the community in HIV research for U=U and digital advocacy

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Background: The objective of this study was to explore the perspectives of the community on HIV research and digital advocacy surrounding the U=U (Undetectable = Untransmittable) message.

Description: The study was conducted over a period of 6 months in a urban setting with a diverse sample of individuals living with HIV. The structure of the study consisted of focus group discussions and surveys to gather data on the participants' experiences, beliefs and attitudes towards HIV research and U=U. Digital advocacy was also a key component, with participants being asked about their use of social media and online resources for information and support.

Lessons learned: The findings of the study revealed that the U=U message was widely accepted and believed to be a positive development in HIV research, but that there was still a lack of understanding and misinformation among certain groups in the community. Participants also expressed a strong desire for more information and support through digital channels, such as social media and online forums.

The study highlights the importance of targeted and culturally-sensitive digital advocacy efforts in support of the U=U message.

Conclusions/Next steps: The results of this study underscore the need for continued education and outreach to the community to increase understanding and acceptance of the U=U message, as well as the importance of utilizing digital platforms for advocacy and support for individuals living with HIV. Future research should aim to further understand the needs and perspectives of the community and how best to support them through digital advocacy efforts.


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EPD0535

Characteristics of male social networks of fishermen in three communities in a high HIV prevalence region of Kenya

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Background: In Kenya's Lake Victoria communities, HIV incidence (2.4-9.3/100PY) and prevalence (24-26%) remain high, and treatment uptake is suboptimal (53-61%). Fishermen have low uptake of testing, treatment and PrEP. Social network-based interventions might help to overcome barriers to uptake. In the 'Owete' Study, 'promoters' in three communities distributed HIV self-tests and promoted linkage to PrEP (for HIV- men) or ART (for HIV+ men) to their peers. Here, we describe fishermen's social networks, to inform the design of peer-based interventions.

Methods: At each beach, we collected data on health-related behaviors, and multiple social relations including work, hanging out for fun, exchange of food and finances, discussion of health issues, emotional support, and sharing of personal secrets. 'Alters' (others men most often interacted with) were uniquely identified by survey participation and/or partial phone number. These data were used to characterize social networks and network-central men.

Results: Figure 1 displays the network of relations for our smallest beach, showing a cohesive weak-tie structure with embedded 'cliques' of strong ties.

When considering all ties, the average participant is connected to (average degree) 13 other men, 98% are in the largest connected component; 75% are embedded in a set that includes shared ties to 7 others (*k*-core of 7).

These figures drop substantially when considering men sharing at least 4 relations, to an average degree of 2, 60% in the largest component, and the highest *k*-core (4) containing only 7 people.

Conclusions: The structure of social relations is characterized by a broad substrate of weak-tie cohesion embedded with strongly re-linked smaller cliques. This suggests a setting that can easily spread reputational information: gossip is free to circulate widely across weak social ties.

Yet, this rich social milieu contains close peers with multiplex and trusting relations that crosscut work and leisure; these sets are good targets for peer health interventions.

EPD0536

Quantifying the effect of a community-led monitoring intervention in Malawi and South Africa

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Background: Global guidance encourages the use of community-led monitoring (CLM) to shape effective health services. Yet, the attribution of CLM to service improvements is often imprecise. To our knowledge, this is the first study that aims to quantify this effect.

Methods: We implemented a CLM intervention at 33 health facilities in Malawi and South Africa, collecting data from November 2018 – October 2022. We conducted monthly clinic records surveys of HIV and TB services, and interviewed 505 healthcare workers and recipients of care. Data was fed back to facilities on a quarterly basis to discuss gaps and identify solutions. Regular community education sessions generated demand for services. We then compared outcomes at our monitored sites to other facilities.

Results: In 2020, COVID-19 led to a 64% decline in voluntary medical male circumcision in South Africa (nationally), with a similar (66%) decline at our monitored sites. In 2021, circumcisions increased by 126% nationally, and by 156% at our monitored sites.

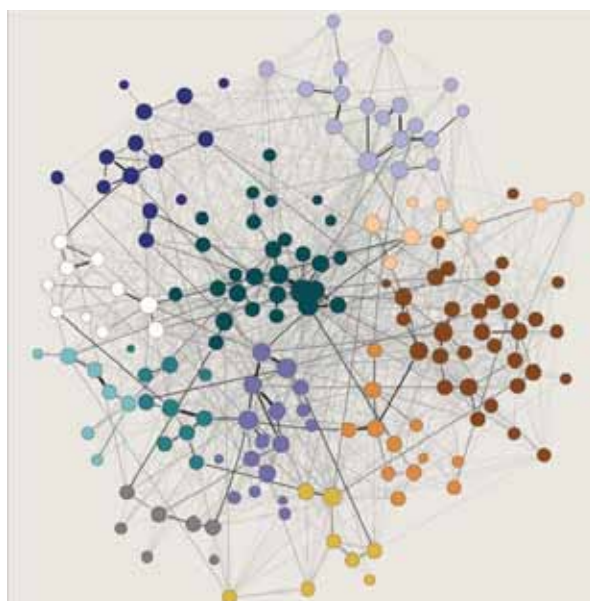


Figure. Relations amongst respondents in one sampled Beach. (Edge thickness proportional to sum of nominations across relations. Colors reflect natural communities.)



A professional nurse said that CLM encouraged her to "start afresh, giving health education". In 2019, the TB treatment success rate was comparable at our monitored sites (78%) and in South Africa as a whole (79%). In 2020, it was 85% at our monitored sites and 78% nationally. Recipients of care site improvements to physician and nurse support as a result of the CLM. During COVID-19 in Malawi, HIV testing fell by 39% in facilities without CLM (control study) compared to 25.5% at our monitored sites. Since then, new ART initiations are increasing ten times faster at our monitored sites than the rest of Malawi. Healthcare workers say CLM improved testing and treatment services, prompting them to "start escorting new HIV-positive clients to treatment counseling and potential initiation" and to create "a dedicated private space for client intake and consultations".

Conclusions: The CLM intervention was associated with more resilient HIV and TB services. If the CLM effect is extrapolated to a national level, this equates to 48,529 additional circumcisions, 568,308 additional HIV tests, 15,595 additional ART initiations, and 13,285 additional people successfully treated for TB. This is a compelling case for the continued scale-up of CLM.

EPD0537

Innovative approaches to access SRHR and HIV information for young adolescents in Uganda

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Background: SRHR and HIV information is critical in HIV prevention and control. One of the roles of the Sexual Reproductive Health and Rights (SRHR) Alliance Uganda is the provision of age-appropriate SRHR information to young people in their diversities to make informed life choices. However, it is difficult to provide information to young people aged (7-14) years as they lack interest and concentration.

Comprehensive Sexuality Education (CSE) is also slowed and has a policy, social and cultural controversy.

Description: The SRHR Alliance Uganda through its youth advisory committee (YAC) members used the UNAIDS Maloza Games and SRHR Alliance Uganda short video animations approaches to provide SRHR and HIV information to 928 young adolescents, from Primary one to Primary Seven, in Kapchorwa Demonstration Primary school and Binyiny Primary School, in Kapchorwa district.

The games were played and animations were shown in the presence of their teachers and parents in November 2022. Thereafter, an evaluation was done to evaluate the effectiveness of the approaches compared to the traditional methods.

Lessons learned: Evaluation of these activities indicated a preference for these approaches compared to the traditional approaches. Results from the evaluation indicated that 82% of young adolescents reported having received SRHR and HIV information while having fun (playing), compared to the traditional methods of information provision.

Parents and teachers reported having accepted the approaches as they had faced difficulty in talking to their children and students, especially about SRHR and HIV issues at that young age.

Young people reported drastic shifts in the reported stigma and discrimination because young adolescents understood the SRHR and HIV concepts better than before. The two approaches allowed the young adolescents to lead a more in-depth discussion on the SRHR and HIV issues beyond the traditional means of information provision.

Conclusions/Next steps: It is the right for all to have access to information, including children and young adolescents, even when it is difficult for parents and teachers. Innovation and invention of ways to protect this right to information will enhance HIV prevention and control, but mostly uproot stigma and discrimination among young people at an early stage.

EPD0538

The undetectabilised body: embodiment of undetectable viral load (UVL) results among people recently diagnosed with HIV

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Background: *U=U* ('Undetectable equals Untransmittable') is a discursive intervention intended to reduce stigma by emphasising the impossibility of sexual transmission of HIV between individuals in the context of viral suppression. While there has been much attention given to knowledge about, and belief/confidence in, *U=U* (among both people living with HIV and their sexual partners), there has been much less emphasis on how people living with the virus embody either their 'undetectable' or 'untransmittable' status.

Methods: As part of an in-depth interviews in an ongoing qualitative study of people recently diagnosed with HIV, participants were asked about their viral load results since diagnosis, their knowledge of viral load and

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other clinical markers, and the importance they placed on reaching and maintaining an undetectable viral load. Drawing on theories of embodiment, and using a critical discourse analytic approach, we explored the ways in which participants incorporated knowledge about viral load – and specifically undetectability – into their lived experience of, and embodied practices related to, HIV.

Results: Among the 35 study participants (median age 33 years; 33/35 male) knowledge of viral load prior to their HIV diagnosis was very limited.

Participants' accounts provided insights into how people living with HIV (PLHIV) increasingly understand their positive status and experience their own bodies through biomedical technologies (especially viral load) and how related discourses such as U=U have created a link between viral load and the possibility of sex. This link operates not only at a social or intellectual level, but is also felt via specific sensations, which are described by way of metaphors relating to sexual desire (e.g. a 'switch').

In addition, participants reported experiencing other bodily effects such as increases in energy or confidence related to an undetectable viral load result.

These effects were contrasted with how participants described feeling prior to either starting treatment or receiving an undetectable result (e.g. anxious, dirty, viral, contagious).

Conclusions: We argue that incorporating UVL is a process, and that the bodies of PLHIV become 'undetectabilised' through incorporating biomedical information into their bodily experiences and practices. Findings from this study illustrate the embodied effects of discourses related to viral suppression.

EPD0539

Communicating beyond psychological, social and cultural boundaries: a mental model approach towards understanding adolescent interpretation of HIV and AIDS messages

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Background: The gaps in the HIV response resulting to new infections are as a result of inequality. According to the UN News Centre (2015), progress for adolescents HIV and AIDS interventions has fallen behind. In Kenya, Adolescents between 15 to 19 years are the only group which AIDS-related deaths are not declining. Targeted HIV messages are not effective since they seem to have very little impact on this age group.

Methods: A mixed method approach that incorporates aspects of Johnsons Laird's mental models' theory and Mental Model approach to risk was applied. A Mental Model Mapping Tool was used to assess whether adolescents and producer of the 'Kuwa True' Communication intervention had similar mental models based on an existing set of factors.

Interpretation and meaning making of HIV communication interventions was measured through analytical and experiential reasoning.

A self-report assessment tool was used during Direct Mental Model Elicitation Sessions to gather information related to the overlap of individuals' set of knowledge and/or assumptions between adolescents and content producers that act as the basis for understanding the 'Kuwa True' condom advertisement and uptake of safe sexual practices by adolescents.

Results: The Cohen's kappa statistic (k) test was used to measure the level of agreement between the advertiser's message and respondent's interpretation of the message.

Results from the study, showed that there was poor agreement between advertiser's message and the interpretation of the message by the adolescents (Kappa=0.146, 95% CI -0.024; 0.349) with a 53% average percentage agreement indicating very little or no mental model similarity between content producers of the 'Kuwa True' campaign and the adolescents leading to sub optimal behaviour with regard to uptake of safe sexual practices.

Conclusions: Kenya's fast track plan to end HIV and AIDS among adolescents identified mass media and social marketing campaigns as evidence-based interventions targeted towards reducing sexually risky behaviour among adolescents.

In health communication it is important that content developers understand and correctly use shared mental model measurement methods to enhance effective communication.

EPD0540

Using behavioral science to design a new global framework that operationalizes person-centered HIV care: experiences in Zambia and Ghana

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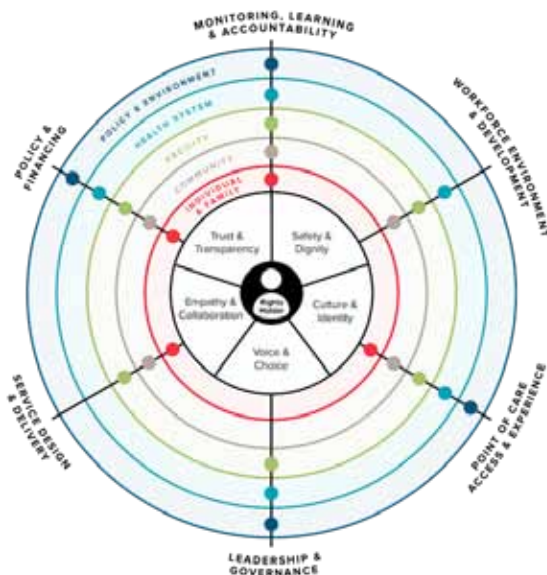
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Background: Despite widespread recognition that person-centered care (PCC) underpins high-quality HIV services, identifying approaches to operationalize PCC remains a challenge. JSI conducted a desk review and co-creation workshops with 39 colleagues from diverse geographies and health areas to develop a PCC framework grounded in behavioral science.

This framework has proven to support implementers and service providers design and implement person-centered strategies that improve HIV services and outcomes.

Description: The PCC framework features five principles realized through six domains. Interventions can be designed and implemented through each domain at any level of the socio-ecological model.



The USAID DISCOVER-Health and USAID Strengthening the Care Continuum projects implemented interventions across domains and socio-ecological levels in Zambia and Ghana.

At individual and community levels, DISCOVER engaged peer mentors and recruited/trained community health workers to increase PrEP uptake. Interventions at the facility level included locating clinics according to client preference and offering triple case management for children and caregivers.

In Ghana, we implemented interventions at the facility and individual levels that included new treatment and medication refill sites to increase client access, and walk-in ART service provision.

Lessons learned: Applying behavioral science to operationalize interventions using the PCC framework improves the uptake of HIV commodities and treatment. In Zambia, a supportive environment for PrEP uptake resulted in an increase of AGYW initiating PrEP from 39% in Q4 2020 to 61% in Q3 2021.

A cohort analysis found continuity of treatment of 95% one year after initiation and 93% two years after initiation. In Ghana, the treatment interruption rate reduced from 21% in December 2019 to 1% in June 2021.

Conclusions/Next steps: The framework helps practitioners operationalize PCC to transform HIV prevention and treatment strategies conjunctively across socio-ecological levels. It can inform future strategies in Zambia, Ghana and other countries, and leverage lessons from other health areas for HIV program innovation.

Social and behavioural aspects and approaches to HIV

EPD0541

Association of perceived, anticipated, and experienced stigma with types of HIV status self-disclosure among adolescents and young adult women (18-24 years old) in Rwanda and Tanzania

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Background: Self-disclosure of HIV-status is usually associated with ART adherence and living positively with HIV. However, exposure to HIV-related stigma usually decreases confidence for self-disclosure.

Little is known about associations between types of HIV-related stigmas with types of self-disclosure (e.g., to sexual partners, family members, or friends) among female adolescents and young adults with HIV (FAYAWH) in Sub-Saharan Africa.

Methods: Data collected from FAYAWH (18- to 24-year-olds) were selected from two parallel studies (one in Rwanda, one in Tanzania) on HIV-stigma scale adaption for women with HIV between March to August 2021.

Logistics regression assessed associations between three dichotomous disclosure outcomes (current partner, family and friend) and three continuous stigma predictors (perceived, anticipated and experienced), scores ranging from 1-100. Three models were developed for each outcome, with one predictor in each model.

All models were adjusted for socio-demographic (age, marital status, education, years living with HIV and country) and psychosocial factors (depressive symptoms and self-esteem).

Results: The data sub-set had 174 participants (Rwanda N=74, Tanzania N=100), median age 22 (20, 24). Among 137 participants with partners, 70 (51.09%) had disclosed. Every one unit increase in anticipated stigma score was associated with 0.983 decreased odds of disclosing to a partner (α OR = 0.983; 95% CI = 0.968, 0.998; p = .030).

Neither perceived nor experienced stigma were associated with partner disclosure. Family disclosure was 90.80% (158/174). Every one unit increase in anticipated and perceived stigma scores were associated with 0.951 (α OR = 0.951; 95% CI = 0.920, 0.983; p = 0.003), and 0.966 (α OR = 0.966; 95% CI = 0.934, 0.999; p = 0.043) decreased odds of disclosing to a family member respectively.

Experienced stigma was not associated with family disclosure. Among 170 participants with friends, 72 (42.35%) had disclosed. Increasing levels of anticipated stigma



were associated with 0.981 decreased odds of disclosing to a friend ($\alpha\text{OR} = 0.981$; 95% CI = 0.968, 0.994; $p = 0.004$). Neither perceived nor experienced stigma were associated with friend disclosure.

Conclusions: Anticipated stigma was associated with decreased likelihood for all disclosure types. To promote positive living among FAYAWH, program/research interventions to address anticipated stigma should be prioritized.

EPD0542

"With this study, we have hope that something is coming": community members' perceptions of HIV cure and immunotherapy research in Durban, South Africa

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Background: Women with HIV have been critically under-represented in cure research globally. To promote enrollment equity, participant-centered trial design is urgently needed, particularly in areas with high HIV burden and in low- and middle-income countries. In June 2022, a first-in-Africa HIV cure trial with an analytical treatment interruption (ATI) was launched, assessing a regimen of dual-broadly neutralizing antibodies (bNAbs) and a TLR7 agonist, in young women recruited from the Females Rising through Education, Support and Health (FRESH) cohort in Durban, South Africa.

A socio-behavioral research study engaged community members to share their views about HIV cure and trial participation.

Methods: In July–August 2022, focus group discussions (FGDs) were conducted, enrolling members of a community advisory board and other advocates where the FRESH-HIV cure trial was taking place. FGDs were conducted in local language (*isiZulu*), recorded, transcribed, and translated into English. Data were analyzed using a modified grounded theory approach.

Results: Twenty individuals (7 males, 13 females, aged 23–60 years) participated in three FGDs. They expressed optimism about HIV cure-related research and excitement about the possibility of eliminating the need for daily antiretroviral treatment (ART).

HIV cure was perceived as a means of addressing treatment default and HIV-related stigma. Concern about possible unknown side effects from interventional products and mixed feelings about ATIs were expressed.

The importance of ensuring participants fully understand ATI-associated risks and providing pre-exposure prophylaxis (PrEP) for sex partners was underscored. Some raised concerns about requiring disclosure of HIV status and ATI participation, citing danger of intimate partner violence for women. It was felt that trial participants should be allowed to decide whether to inform their partner(s).

Finally, providing clarity on the goals of HIV cure was deemed important.

Conclusions: Early engagement of communities where HIV cure trials are planned may offer insights for investigators and inform the design of resources to communicate the value of ATIs and their associated challenges, acceptable partner protections, and disclosure support needs, and ultimately, contribute toward safer, more equitable enrollment in cure research.

With HIV cure trials set to launch across Africa, there is a pressing need to understand regional implementation preferences and barriers.

EPD0543

Stigma and discrimination against people living with HIV/AIDS: experiences of affected individuals

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Background: HIV/AIDS related stigma and discrimination (HARSAD) are widely acknowledged as major setbacks against the prevention and control of the disease. The reality of such issues affecting persons living with HIV/AIDS (PLWHA) has had profound negative impact on the realization of WHO's 90-90-90 target by 2020 which proposed that 90% of all people living with HIV should know their HIV status, 90% of those diagnosed should receive antiretroviral therapy (ART) and 90% of those should have durable viral suppression.

Studies have shown that many countries including Ghana have failed to meet this target due to the magnitude of HIV/AIDS-related stigma and discrimination.

This study therefore sought to explore the experiences of PLWHA on stigmatization and discrimination against them and how it could be addressed from their point of view.



Methods: A descriptive phenomenological study was conducted among 15 purposively sampled PLWHA who patronize ART clinics at two hospitals in a municipality in Ghana. Participants' consent was sought and a semi-structured interview guide aided in exploring their views on stigmatization and discrimination against them and ways of curbing the menace. The data was transcribed verbatim and analyzed into themes inductively.

Results: Participants comprised 13 females and 2 males within the ages of 27 years and 54 years. Five themes were generated and they included:

1. "facilitators and drivers of stigma and discrimination" which described the root causes of stigma and discrimination,
2. "stigma and discrimination practices and experiences" which elaborated the circumstances encountered by PLWHA,
3. "challenges faced by affected individuals" elaborated the emotional, social and economic constraints that such individuals endure,
4. "perceived effects" also revealed the impact of stigma and discrimination on PLWHA, and finally;
5. "suggested remedies" highlighted how the problem could be addressed from participants' point of view.

Conclusions: Discrimination and stigma against people living with HIV/AIDS persist and are impeding the achievement of the 90-90-90 target set by the WHO. This requires effective and sustained measures to curb the menace. Intensifying public health education of the masses and provision of social support systems for PLWHA will be pivotal in the fight against stigmatization and discrimination.

EPD0544

The impact of psychosocial support in preventing the loss of follow-up of people on antiretroviral therapy in Mozambique

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Background: In Mozambique there are approximately 1.9 million people living with HIV on ART. As part of the treatment package, psychosocial support is integrated in the follow-up schedule, to reinforce adherence and the improvement of the people's quality of lives. Healthcare providers offer interventions to the persons to identify themselves as key agents in their own health, identify adherence risks to the treatment and support a good habit with a package of positive prevention. Ideally, Psychosocial support visits should happen at least every quarter, however in 2022 only approximately 75% of the treatment population attended an adherence session.

Description: To better understand the factors that can negatively or positively influence defaulter status, which is measured in Mozambique as being more than 7 days

after the scheduled appointment, a report was created in the electronic client tracking system. This report includes if the beneficiary had at least one adherence session in the past 3 months as well as other indicators for Viral Load, Pregnant and Breastfeeding women, and different age groups in the general population.

Lessons learned: For 2022 the ART beneficiaries that had at least one psychosocial session for in the last three months were significantly less likely to be defaulter, with an average of 15.2% for the year. The second closest defaulter rate was for Pregnant Women, with 19.1%, and looking at the average of all the different groups the national defaulter average is 25.5%, significantly higher than the psychosocial support rate.

During the psychosocial sessions the healthcare provider should track factors that can affect adherence, such as difficulties in disclosing the diagnosis, stigma/discrimination, anxiety/depression, side effects to the medication or even pill fatigue.

The assessment of adherence to medication taking is also carried out, classifying it as good, risk and bad adherence to ARTs, which will influence the plan of psychosocial sessions, home visits or phone calls.

Conclusions/Next steps: To improve the offer of Adherence follow-up was oriented to offer psychosocial support integrated in clinical consultations, telephone calls and during home visits.

If the coverage of psychosocial support sessions could increase there could be broader benefits within the treatment population including less ART loss.

EPD0545

Sustaining resilience against HIV through community collective capacity: analysis of heterosexual Black men in Ontario, Canada

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Background: Collective resilience uses a group's shared experience to sustain the group's ability to withstand, adapt to and recover from adversity. At a personal level, this ability is described as individual resilience. A resilience-focused HIV care showed that collective resilience strengthens individual resilience against HIV.

Therefore, alongside collective resilience, IR is relevant in addressing the disproportionate impact of HIV among Heterosexual Black men (HBM) and their communities in



Ontario. Hence, we analyzed the effect of Community Collective Resilience (CCR) on Individual Heterosexual Black Men's Resilience (IR) in Ontario.

Methods: The analysis is drawn from a mixed methods study with 866 HBM in four cities in Ontario (London, Ottawa, Toronto, and Windsor). IR was measured on an adapted 16-item 5-point Likert-type Resilience Scale (Cronbach $\alpha = .89$, Max score=80). Sub-categories of attributes on the scale include adaptable personality, supportive environment, fewer stressors, and compensating experiences. CCR was measured with pro-Black community attitudes 5-point adapted Likert-scale (Cronbach $\alpha = .81$) on community attributes: trust, cohesion, support, and participation.

We used hierarchical linear regression modeling to estimate the predictive effect of CCR on IR while controlling for demographic, structural, and psychosocial factors. The best-fit model (*Adjusted R*² = .25, *F* = 8.03, *p* < .001) was obtained by stepwise and forward variables selection procedures.

Results: The mean IR score was 61.3 (SD=9.8) and the mean difference across cities was not statistically significant. Community Collective Resilience ($\beta = 0.42$, *p* < .001, CI = .23, .6) associated with increase Individual Resilience. Control variables contributing to increased individual resilience at *p* < .05 were greater than a college education, HIV Knowledge, experiencing discrimination experiences, and enacting hegemonic masculinity. Less than five points on the self-health rating scale was associated with reduced Individual resilience, excellent health was rated as five points.

Conclusions: Collective resilience strengthens heterosexual Black men's resilience in the fight against HIV/AIDS. Interventions to reduce HIV Vulnerabilities among Heterosexual Black men should promote collective resilience in their communities.

EPD0546

Prevalence and correlates of alcohol drinking among adults living with HIV: results from the Tanzania HIV Impact Survey 2016-2017

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Background: Alcohol consumption is associated with increased risk for HIV infection. Further, hazardous drinking has been linked to poor health outcomes among people living with HIV (PLHIV) including poor adherence to antiretroviral therapy (ART). In Tanzania, few studies have examined the potential effects of alcohol use on ART use and viral load suppression (VLS).

We examined the prevalence and correlates of alcohol use among PLHIV in Tanzania.

Methods: We used data from the Tanzania HIV Impact Survey 2016-2017, a cross-sectional household-based nationally representative survey. Consenting participants were interviewed and tested for HIV with return of results using the Tanzania national algorithm. HIV-positive results were laboratory confirmed and tested for viral load. VLS was defined as HIV RNA <1,000 copies/ml. Our analysis included laboratory confirmed PLHIV aged 15 years and older.

We classified participants who responded to question on alcohol frequency in the past 12 months as non-drinkers or drinkers. We used AUDIT-C scores to determine hazardous drinking status.

The primary outcome variable was self-reported alcohol consumption. Secondary outcomes included VLS and self-reported missing days of ART. Logistic regression models were used to assess correlates of overall drinking, ART and VLS. We estimated odds ratios (ORs) with their corresponding 95% confidence intervals (95% CI).

Results: Among 1,812 PLHIV, 33.9% were classified as drinkers, with 246 (13.1%) being hazardous drinkers. Among males, 17.9% were considered hazardous drinkers compared to 11.8% of females.

The odds of alcohol consumption were two times greater among males compared to females (α OR: 2.31, 95% CI: 1.69-3.16) and almost three times greater among older adults, aged 50+ years compared to younger adults, aged 15-24 years (α OR: 2.91, 95% CI: 1.45-5.81). Further, drinkers had 75% greater odds of missing one or more days of ART in



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each month compared to non-drinkers (aOR: 1.75, 95% CI: 1.14-2.69). The association between VLS and alcohol consumption was not statistically significant in the multivariable model.

Conclusions: These findings highlight the sub-populations where alcohol use is most prevalent among PLHIV in Tanzania. Given alcohol use is associated with missing more days of ART, addressing alcohol use among PLHIV can aid in increasing ART adherence.

EPD0547

Progress toward the Australian National HIV Strategy 'quality of life' target: findings from the HIV futures study

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Background: The Eighth Australian National HIV Strategy outlined a target of 75% of people living with HIV (PLHIV) reporting 'good' quality of life by 2022.

This study reports on progress toward this target via HIV Futures, a comprehensive and longstanding cross-sectional study of approximately 3% of PLHIV in Australia.

Methods: Data were extracted from two iterations of HIV Futures: HIV Futures 9 (n=847; 2018-19) and HIV Futures 10 (n=816; 2021-2022). Participants in both iterations were recruited via HIV services and organisations, in clinic waiting rooms, or via targeted social media advertising, completing a cross-sectional survey in digital or hard-copy format.

Quality of life was assessed using PozQoL, a validated scale measuring HIV-related quality of life, including 'social', 'functional', 'health-related' and 'psychological' domains. Overall PozQoL scores ≥ 3.0 out of 5.0 were considered 'good' quality of life.

Results: In HIV Futures 10, 71.8% of participants had an overall PozQoL score of 3.0 or higher, contrasted with 63.1% in HIV Futures 9. All quality of life domains increased between HIV Futures 9 and HIV Futures 10, with exception of the 'psychological' domain, which remained stable.

Factors associated with good quality of life in HIV Futures 10 included: being 65 years or older, not experiencing financial stress in the last 12 months, having an annual household income of over \$80,000, reporting higher levels of social connection, living with a partner or spouse, not reporting that well-being was significantly impacted by the COVID-19 pandemic, reporting higher general health, and living in a capital city or inner suburban area.

Conclusions: While the National HIV Strategy target to achieve 75% of PLHIV reporting 'good' QoL by 2022 was not met, there has been a substantial increase in the proportion of participants reporting a good QoL between 2018-19 and 2021-22. With subsequent national strategy targets likely to increase beyond 75%, attention must be

paid at a national level to improve the HIV-related experiences of PLHIV who are younger, experiencing financial distress, and are less socially connected.

EPD0548

"Injectable ARVs will give me more peace..."

Exploring participant's perceptions about willingness to use Long-acting Injectable Antiretroviral Therapy (LART) in Prevention of Vertical Transmission programs (PVT) in Uganda

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Background: A third of women who initiate or continue antiretroviral (ARV) treatment during pregnancy are lost-to-follow up (LFU) within six months. This is highly driven by stigma and fear of disclosure. We explored the perceptions of mothers about the use of potentially discreet Long-acting Injectable Antiretroviral Therapy (LART) and willingness among women receiving care at PVT clinics in Kampala.

Methods: Ten focus groups discussions (FGDs) were conducted in 5 health facilities; 5 with mothers retained in care and 5 with disengaged mothers from the PMTCT clinics. A woman was categorized as retained if she had at least one clinic encounter within her last scheduled visit and disengaged if she had no clinic encounter within the last 28 days from the scheduled visit. A total of two follow-up interviews were conducted with disengaged mothers. A thematic approach was used for analysis and two experienced social scientists developed and coded the FGD and interview transcripts. NVivo software was used to manage the data.

Results: Five themes emerged from the data and these included perceptions on:

1. Positive ARV experiences such as disclosure of HIV status,
2. Negative antiretroviral therapy experience such as HIV diagnosis during pregnancy, stigma and discrimination due to unintended disclosure related to oral ARV tablets packaging;
3. Awareness of LART and sources of information including media and friends in the clinic,
4. Positive attitudes towards use of the LART such as emotional relief from daily drugs, viral load suppression, reduced pressure to disclose status, reduction on stigma and discrimination, reduction of LTF,
5. Negative attitude towards use of LART due to fear and side-effects of monthly injections, fear of stock outs, fear of the cost and uncertainty of availability of LART,
6. Perceptions about women's willingness to accept LART; belief it will cure HIV and provide relief from travelling with the drugs.

Conclusions: Women initiating or on ART through PVT have a positive attitude towards the rollout of the LART because of its likely impact on improving adherence and reducing stigma and discrimination. LART offers a potential solution to LFU and could improve retention in care.

EPD0549

"They fear the solution that they will be given": men aware of their HIV positive status but not on ART in Mozambique

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Background: There is paucity of information regarding the profile or characteristics of people living with HIV who are aware of their status but not on treatment. This group is often hard to reach, yet understanding their characteristics, beliefs, knowledge and attitudes around HIV as well as their access to information sources is essential for providing appropriate treatment and services. In Mozambique, viral load suppression (VLS) among all adults is estimated to be 64.1%, with a strong gender and age gradient (VLS among adult men: 58.8%; VLS among men 25-34: 43.3%).

Methods: We conducted a mixed methods study in three provinces of Mozambique. The quantitative sample consisted of men 25-34 who had previously tested positive for HIV (N=1934) who had recently started/restarted ART (N=1605) or were not currently on ART (N=329). Qualitative data comprise adult men living with HIV (MLHIV) 18-35 not on ART (N=7).

Results: MLHIV not on ART were less likely to be married/cohabiting ($p<0.05$), but did not otherwise differ significantly by age, education, wealth quintile, religion or media access to those on ART. Those not on ART had significantly lower levels of knowledge about treatment, more stigmatizing attitudes about both HIV and ART and lower awareness of U=U than their ART-using peers ($p<0.05$). Interview data suggest men not using ART expressed concerns about stigma, HIV status disclosure risk, and side effects should they start treatment. Discussing ART, one commented: "they fear the solution that they will be given". Most participants not on ART in the qualitative study struggled to accept that an "undetectable" viral load meant that it was not possible to transmit HIV to another person through sex.

Conclusions: Our results suggest the background characteristics of MLHIV in Mozambique who are on, and not on ART do not differ in any meaningful way. The key differences we found were in HIV knowledge, attitudes and fear of disclosure. The concept of an undetectable viral load was largely well understood, but there remains a gap in understanding of HIV being untransmissible as a result. Targeted U=U information is needed for this group.

EPD0550

The role of researcher-participant relationships and trust in children and adolescents living with HIV participating in research

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Background: Health research with children and adolescents living with HIV (CALWH) is critical to improving clinical outcomes, particularly in high burden countries. Unique vulnerabilities of this group, including their age, HIV status, and social contexts, raise bioethical questions, including their interactions with and confidence in the researchers, which might impact their experience. We evaluated perspectives on the role of researcher-participant relationships and trust in CALWH research participation.

Methods: In-depth, semi-structured interviews were conducted with CALWH (ages 10-24 years, enrolled in HIV care at Academic Model Providing Access to Healthcare (AMPATH) in western Kenya), caregivers of CALWH, and other subject matter experts (SMEs). Thematic analyses were conducted to identify preliminary codes and themes.

Results: Interviews were conducted with 99 participants (53% male): 40 CALWH (median age 17.5 years, (range 11-24), 50% female), 20 caregivers (70% female), and 39 SMEs (33% female; 46% community leaders, 26% health care providers, 15% clinical researchers, 8% social scientists, 3% international research experts, 2% laboratory experts). All groups highlighted the importance of relationships and trust-building between researchers and CALWH participants. Caregivers and SMEs discussed the implied trust associated with researchers due to the beliefs that there are inherent benefits of research participation and that researchers have the individuals' best interests in mind. SMEs and CALWH stressed the importance of researchers demonstrating and proving their ability to maintain confidentiality, noting that confidentiality facilitates trust. Similarly, SMEs held the perspective that CALWH may be more willing to share vulnerable HIV-related information when trust is built with the researcher. All groups indicated that CALWH and caregivers are more likely to consent to future contact and participation in research if trust has been established. Caregivers reported being more comfortable with research biospecimens leaving Kenya for analyses or sharing data with other researchers if there was an established relationship and trust built with the original investigator.



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Conclusions: Researcher-participant trust is integral in conducting studies among CALWH. This trust influences what is shared during the study, as well as future decisions about research participation. Efforts should be devoted to maximizing researcher-participant relationships and trust.

EPD0551

Using multi-channel demand creation to address awareness as a barrier to the uptake of HIV self-testing (HIVST) kit in the private sector

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Background: Despite the introduction of HIVST as one of the HTS strategies, uptake in the private sector has been very limited. This low uptake from the Strengthening HIV self-testing in the private sector (SHIPS) market research report is attributed to several barriers which includes lack of awareness from the clients on their availability in community pharmacies or patent medicine vendors. The low awareness remains a huge challenge to the private sector stocking HIVST kits.

This pilot implementation is demonstrating the impact of a multichannel demand creation aimed at reaching different segments of the population.

Description: SHIPS is currently implementing a fifteen (15) months demand creation campaign through community mobilization, community activation as well as social media. Using community mobilization and community activation, the project is improving awareness about and uptake of HIVST using one-on-one and group approaches as well as road shows to reached individuals in selected communities in Lagos and Federal Capital Territory (FCT). Furthermore, utilizing the popularity of social media, effective messaging was curated on social media.

Lessons learned: Within (9) months (April to December 2022), the traditional demand creation campaign reached **34,206** and **20928** during community mobilization and community activation respectively within the pilot communities. While on social media **638,437** individuals were reached on Instagram, Facebook and twitter using sponsored ads, influencer marketing and content creation. Additionally, the increase in awareness catalyzed an increase uptake of HIVST kit in the private sector from an initial baseline sale of about **152** HIVST kit in 3 months to a total sale of **7317** HIVST kits in 9 months indicating a **4711.84%** increase.

Conclusions/Next steps: Implementing multi-channel demand creation activities to target different segments of the population will help break the barrier on low awareness on the availability of HIVST kits in the private sector thereby resulting in increasing number of providers stocking HIVST kits and uptake from clients.

EPD0552

"This is part of services for health": a qualitative study of strategies to scale up and sustain efforts to reduce HIV-related stigma in healthcare settings in the Asia-Pacific

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Background: HIV-related stigma and discrimination (S&D) in healthcare settings remain a significant barrier to achievement of HIV prevention, treatment, and care targets in the Asia-Pacific region.

Reducing stigma in healthcare settings presents an important opportunity to promote continued engagement in care and achieve clinical health outcomes.

Evidence-informed interventions to reduce S&D exist, but limited work has explored strategies for scaling up and sustaining these interventions beyond pilot studies or time-limited projects.

The Southeast Asia HIV Stigma Reduction Quality Improvement (QIS+D) Learning Network consists of six national teams committed to using quality improvement methods to accelerate adoption of stigma-reduction programming in healthcare facilities.

As part of Network activities, participating countries are convened to routinely measure S&D, test interventions, share implementation experiences, and generate best practices.

Methods: We conducted semi-structured interviews with key informants (n=21) from the QIS+D Network, which includes members from Ministries of Health, civil society organizations and implementing partners. The interview guide was developed to explore strategies for scaling up and sustaining stigma-reduction interventions.

Interview data were analyzed using a grounded theory approach, and themes were presented alongside representative quotations.

Results: Interviewees identified several determinants of successful scale up and sustainment of stigma-reduction activities (*Table 1*), characterizing these processes as inherently dynamic and sensitive to the strengths, limitations, and structures of local health systems.

Key themes included the importance of strong coordination among stakeholders outside the HIV program and across all levels of the health system; the benefits and challenges of securing leadership support; the value of continuous monitoring to inform implementation; the need to adapt interventions to local settings; and the value and challenge of involving communities in stigma-reduction activities.


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Themes	Representative quotations
The importance and challenge of coordination across the health system	<p>"We have to make sure that each level of health services understands. In the past, even though we have a policy, ART services are only one unit in the provincial hospital. It is very difficult if the director of the hospital does not understand [...] The director of the hospital should know this is part of services for health." –MoH informant</p> <p>"We need to have a two-pronged approach on this. Engaging the government for the policies and standards, and at the same time working at the local government level for the resources and the actual delivery of services." –CSO informant</p>
The benefits and challenges of securing leadership support	<p>"We need to have strong leadership at multiple levels...from the national level, to the provincial level, and the facility level. So, without this leadership at multiple levels, it would not be easy to expand this initiative throughout the country." –MoH informant</p> <p>"in the beginning, we had a lot of engagement with the leaders of the facility, district and province [...] but over time, as we were trying to scale it up, it became too difficult, too resource-intensive, to have that leadership engagement in every facility [...] That leadership engagement is so important to keep things moving." –IP informant</p>
The value of continuous monitoring	<p>"[...] it is not a typical project where you have a baseline, and you do your evaluation and that's it. No, it's a dynamic process. This is what we've been telling all of our players [...] This is ongoing." –MoH informant</p> <p>"Previously we just think, okay, we do have stigma, maybe we can do a CME course or a speech. But nothing on how to monitor pre- and post- [...] Something that is continuous, this is very good." –MoH informant</p>
The need for adaptation	<p>"Another crucial element, I think, in our context [...] is how do we ensure that the national strategic plan is being adapted, or implemented, at the local government units, considering that they have autonomy." –CSO informant</p> <p>"I can see what we've done here is not new. But we improvise to suit our local context." –MoH informant</p>
Commitment to engaging communities, but challenges determining "how"	<p>"I think, also, there's a feedback loop that needs to be encouraged where they [HCWs] feel appreciated by community members. And if they get a positive response from community members that makes people enthusiastic. They know they're respected, they know people like to come there [...] so creating those positive feedback loops from patients could engender more friendly services." –IP informant</p> <p>"We want to strategize on how to strike the balance between government funding of activities and yet the community still having their independence. As to how...I don't have a concrete answer yet, but that is the way we want to go." –CSO informant</p>

Table 1. Interview themes with representative quotations

Conclusions: As countries seek to scale up and sustain initiatives to reduce HIV-related S&D in healthcare settings, there may be significant value in addressing the "how" of implementation.

Results of this work suggest that identification of planned strategies to promote intersectoral coordination, strong leadership, continuous monitoring, adaptation, and community engagement may be particularly beneficial.

EPD0553

Quality of life profile in treatment naive population on Dual Therapy

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Background: ANDES was a randomized, open-label, phase IV study comparing dual therapy (DT) based on boosted Darunavir plus lamivudine with triple therapy (TT) in PLWH treatment-naïve. Secondary objective was to compare changes in quality of life (QoL) in both treatment groups through 48 weeks.

Methods: QoL was measured with Medical Outcomes Study HIV Health Survey (MOS-HIV), and EuroQoL 5D-3L (EQ-5D-3L). Instruments were administered at baseline, week 24, week 48. MOS-HIV comprises 10 domains, two summary dimensions: Physical Health Summary (PHS), Mental Health Summary (MHS). EQ-5D-3L comprises five dimensions and a self-rated health Visual Analogue Scale (VAS). To compare between treatment groups and time, a mixed effects linear regression model was fit.

Results: Sample size: 336 participants (DT=171;TT=165). Mean age: 32 (SD ±9.2); 90% male, 74% MSM. Median HIV pVL log 4.5 (IQR4.1-5.0), median CD4 cells count/mm³:415 (IQR300-599), CDC Stage A (94%). At baseline, MOS-HIV dimensions were not different between groups (PHS: 57.5 TT/57.3 DT, p=0.90; MHS: 41.7 TT /42.0 DT, p=1.0). Throughout 48 weeks, QoL significantly improved over time (p<0.01 for PHS and MHS time factor, Figure1) in both groups.

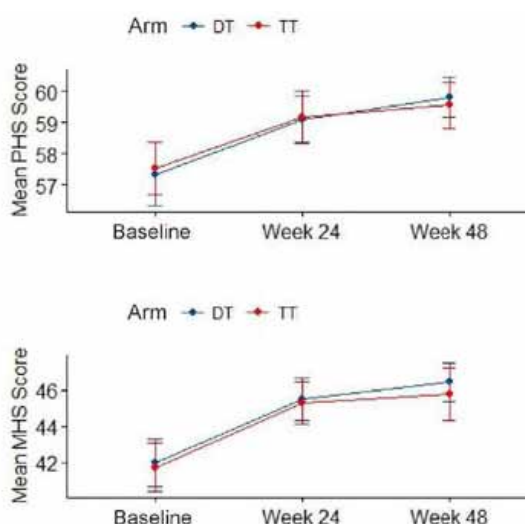


Figure 1. Physical health summary (PHS) and mental health summary (MHS) scores over time by treatment group (mean, 95% CI).

The highest improvements were on health distress (13.4 pp); general health perception (13.2 pp), QoL perception (7.8 pp), and mental health (7.3 pp). Differences in MOS-HIV between groups were neither observed over time (PHS p=0.91; MHS p=0.90). Baseline EQ-5D-3L: summary and VAS scores were not different between groups (sum-



mary score: 0.88 TT vs 0.88 DT, $p=0.9$; VAS: 82.3 TT vs 83.7 DT, $p=0.3$). At 48 weeks: EQ-5D improved over time (summary score ($p=0.01$) and VAS ($p<0.01$)), without differences between groups.(Figure2).

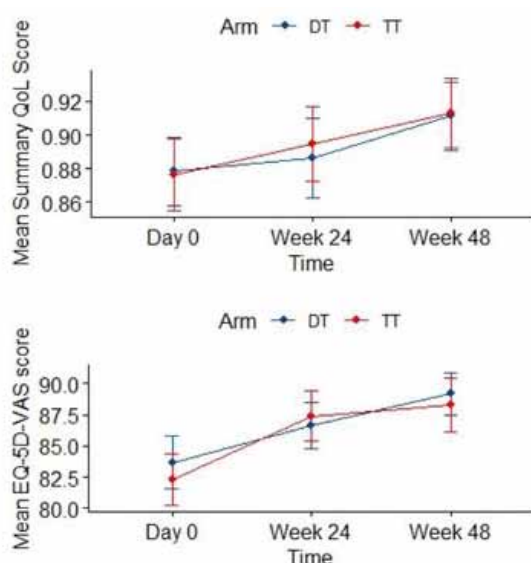


Figure 2. EQ-5D summary QoL score and EQ-5D-VAS score over time by treatment group (mean, 95% CI).

Conclusions: Participants on DT improved their mental and physical health-related QoL over time as well as those on TT, mainly in dimensions linked to mental health. This analysis shows that QoL improvement with this ARV combination based dual therapy is similar to standard antiretroviral therapy.

EPD0554

Assessing PrEP uptake associated factors amongst adolescents at HIV risk in Eswatini

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Background: Evidence have shown that HIV pre-exposure prophylaxis (PrEP) is highly effective when taken correctly and consistently by individuals at substantial risk of HIV infection. PrEP's benefits, include the ability to use PrEP for individual protection without having to consult a sexual partner. Due to the high HIV incidence among the general population of Eswatini, PrEP for HIV-exposed individuals is recommended. The Triple-R project supports the government of Eswatini to prevent new HIV infections and reducing the HIV vulnerability for orphans and vulnerable children, adolescent girls and young women (AGYWs).

As part of the project, AGYWs are assessed for their health needs and linked to health services as per identified needs including PrEP. However, PrEP uptake is still low in Eswatini. Objective: To understand the characteristics of adolescent initiating on PrEP.

Description: Method: Secondary data analysis of routine data collected from January 2022 to December 2022 within ongoing project implementation was explored to assess the characteristics of AGYWs who initiated on PrEP.

Trained Mentors recruit and complete needs assessment where AGYW's HIV risks and health needs are assessed. Adolescents interested in PrEP uptake are then issued referrals for initiation. This study comprise a sample of 8249 adolescents issued PrEP referral and 2352 who eventually initiated.

Lessons learned: Results: About 29% (2352/8249) AGYWs initiated on PrEP. Amongst the single AGYWs 45% accessed PrEP and the rate was 69 (41%) for married AGYWs. Adolescents aged <20 (40%) were more likely to initiate on PrEP. Predictors of PrEP uptake included having STI exposure (36%, $P=0.00001$) and marital status (0.00021).

Conclusions/Next steps: The findings indicate that PrEP uptake was higher amongst adolescents older than 20 years and amongst those who are single. PrEP uptake is still low amongst Eswatini AGYWs, this is despite that more are interested and referred for PrEP initiation. Having an STI exposure and marital status was associated with PrEP.

Understanding the motivations by current users to begin PrEP is fundamental for future rollout strategies. There is need for deeper analysis on the extent of the influences of marital status, STI exposure and other variables on PrEP uptake.

EPD0555

Maintaining viability of HIV services through virtual platforms during dual pandemic and political crises in Myanmar

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Background: After a one-year struggle with the COVID-19 pandemic, Myanmar experienced unprecedented political instability beginning in February 2021. Protests, escalating violence, ongoing COVID-19 restrictions, and surging numbers of internally displaced persons contributed to a major limitation in access to antiretroviral therapy (ART). As a technical assistance partner for Myanmar's HIV response, ICAP developed new approaches to mitigate HIV service disruptions.

Description: Leveraging digital platforms was a key approach undertaken during the dual crises. In July 2020, ICAP introduced an Undetectable = Untransmittable (U=U) campaign on Facebook that became a hub where people living with HIV (PLHIV) and at-risk populations acquired HIV-related information.

Despite internet restrictions, its reach was maintained with more than 7 million users nationwide, and more than 2,200 new users reached out via Facebook Messenger for HIV service information nearly 2 years after nationwide unrest. ICAP systematically collected on-the-ground information about HIV services, which was relayed directly to clients and a chatbot was set up to address frequently



asked questions. In addition, ART facility information was updated in the pre-existing "HIV Services Directory" mobile app, which assisted PLHIV to find their nearest HIV facilities.

Furthermore, ICAP created and moderated a chat group on the Telegram platform that included nearly 800 ART clients, allowing them to share their concerns and challenges during this difficult time.

Lessons learned: Digital innovations were rapidly implemented to disseminate information that promoted treatment continuity during major service interruptions. The multi-pronged approach of posting critical information on a pre-existing U=U campaign page, providing individual inquiry services, facilitating a virtual group chat and providing up-to-date information on a mobile app, assisted PLHIV and at-risk populations to navigate service disruptions.

These also helped to address emotional distress and promote ART and U=U literacy. Clients positively acknowledged the services available through these digital innovations, which enabled them to seek HIV services and/or continue treatment.

Conclusions/Next steps: The use of digital innovations helped clients navigate rapidly changing HIV service points and ensure ART continuity, despite health and political crises. Digital innovations should be further strengthened to promote person-centered information sharing and support treatment continuity.

EPD0556

Prevalence of human immunodeficiency virus in human papillomavirus infected and uninfected men who have sex with men residing in the North-West region of Pretoria

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Background: Men who have sex with men (MSM) are at high risk (HR) of acquiring HIV whilst having acquired Human Papillomavirus (HPV). No studies in the Pretoria region have been conducted investigating both HIV and HPV. This study aimed to determine the prevalence of HIV in HPV negative and positive MSM and to perform their molecular characterization.

Methods: A cohort of 199 MSM (median age 32 years, IQR 26–39) enrolled at Medunsa Clinical Research Unit (MeCRU) was screened for HIV using the Alere Determine™ HIV-1/2 Ag/Ab Combo test. For HPV, Swabs from anal canal were tested using a highly sensitive PCR based genotyping method. Multivariate analysis was performed to predict factors associated with high-risk (HR) positivity.

Results: Overall, 66.3% of the MSM were HIV positive, HPV prevalence (77.9%, $p < .001$) was significantly higher among HIV positive MSM (74.2%) than HIV negative MSM (38.6%).

63% HIV positive MSM had a detectable (>20 copies/mL) HIV Viral load (VL). 70.8% samples were successfully sequenced and were all subtype C by phylogenetic relation. Most sequences (82.4%) had drug resistant mutations (DRM).

HPV multiple acquisitions were evidenced in 48.2% of the HIV negative and 76.1% of the HIV positive MSM ($p < .001$). HPV16 was the most prevalent genotype in both groups (23.3% in HIV positive and 17.6% in HIV negative MSM). HPV 6 was the most frequent low risk (LR) type.

Conclusions: The present findings highlight the need to create a more significant awareness about HIV and HPV. Moreover, the responsiveness of the health system must be improved in strengthening HIV treatment plans and vaccination strategies for the prevention of HPV.

EPD0557

Exploring the awareness and acceptance of U=U amongst East and Southeast Asian men who have sex with men in Ontario, Canada: a mixed methods study

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Background: In 2018, Canada was the first country that signed on to the global campaign for "Undetectable = Untransmittable" (U=U). Despite this, there has been limited research on U=U within Canada and with key populations, such as racialized men who have sex with men. Thus, the current study's aim was to identify significant factors impacting the awareness and acceptance of U=U amongst East and Southeast Asian men who have sex with men (AMSM) in Ontario, Canada.

Methods: A mixed methods sequential explanatory design was used. Online survey data was collected from May to October 2022 on sexual health and behaviour, perception of HIV risk, and knowledge and acceptance of U=U. Using SPSS, two-tailed tests, chi-square, and correlation analyses were performed. In September and October 2022, two virtual focus groups occurred to discuss understanding of U=U, barriers and facilitators, and reception in the AMSM and MSM community.

Results: Out of 156 survey participants, 51% heard about U=U versus 49% who had not. AMSM who heard about U=U were more likely to have a family doctor, be HIV-positive, tested for STIs three times or more in the last year, and rated the effectiveness of PrEP and PEP more highly than AMSM who had not heard about U=U ($p < .05$). U=U acceptance scores were significantly higher for AMSM living in a metropolitan area, living with HIV, who got tested for STIs more frequently and rated PEP as highly effective. Acceptance was also significantly higher for AMSM who were exposed to more information after initially



hearing about it, pursued more information, and who identified as completely fluent in understanding English. Using thematic analysis, the themes that emerged from the focus groups were stigma, particularly cultural stigma, sources of education, trust with oneself and others, socio-historical factors, and recommendations for the U=U campaign.

Conclusions: These results suggest that access to health services and sexual health information benefit in AMSM's awareness and acceptance of U=U. Since marginalized communities often face barriers to accessible services and information, future research should continue to explore U=U amongst racialized groups and communities whose first language is not English.

EPD0558

Perceptions of PrEP Use amongst women engaged in HIV prevention services in South Africa: baseline findings from the multi-district *Le Kip Kip* trial to influence social norms around PrEP

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Background: Multi-level barriers to PrEP uptake and continuation exist among PrEP priority populations, including adolescent girls and young women (AGYW) and female sex workers (FSW).

This analysis characterizes perceptions of PrEP use among FSW and AGYW in South Africa to inform a campaign to change PrEP social norms among women and communities.

Methods: AGYW (n=249) and FSW (n=349) at-risk for HIV acquisition and engaging in decentralized HIV prevention services offered by the non-profit TB HIV Care were recruited across a random sample of 131/748 priority locations across 6 randomly sampled program districts in South Africa for a cross-sectional survey between May-June 2022. Data were collected on PrEP knowledge, use, attitudes, and perceptions.

The analysis assessed drivers of negative perceptions of PrEP dichotomized from the question, "people would think I am a bad person if they knew I took PrEP." Factors associated with the outcome were modeled separately for FSW and AGYW using Poisson regression.

Results: While 39% of AGYW and 64% of FSW program users sampled reported current PrEP use, 52% (129/249) of AGYW and 35% (122/349) of FSW participants thought others would think they were a bad person for taking PrEP. Among AGYW, an anticipated negative family perception of PrEP (aPR: 2.04 CI: 1.34-3.12) was associated with a negative perception of PrEP use. Among both populations, as-

sociating sex work with PrEP was associated with a negative perception of PrEP use, as was concerns that others would assume multiple partners (Table).

Multivariable associations with negative perceptions of PrEP use among AGYW and FSW across six districts in KwaZulu-Natal, Mpumalanga, North West Provinces in South Africa, 2022

	AGYW (n=249) aPR (95% CI)	FSW (n=349) aPR (95% CI)
PrEP Knowledge & Usage		
Participant's understanding of PrEP's preventative purpose		
Correct understanding	REF	REF
Incorrect understanding	0.93 [0.74-1.18]	1.04 [0.74-1.45]
Participant's perception on duration of PrEP use		
< 1 month to <2 years	0.87 [0.60-1.28]	0.79 [0.50-1.24]
As long as they are at risk	REF	REF
Lifelong / forever	1.12 [0.88-1.42]	1.40 [1.06-1.84]
Do not know	0.86 [0.56-1.33]	0.80 [0.46-1.38]
Participants currently taking PrEP		
No	REF	REF
Yes	1.21 [0.96-1.55]	0.82 [0.60-1.12]
Participant's personal risk assessment over the last 3-months		
Not at any risk		REF
A little bit of risk/Somewhat at risk		0.72 [0.50-1.03]
Very much at risk		1.30 [0.99-1.78]
Attitudes around PrEP		
People would assume I slept around and don't use condoms if they knew I took PrEP		
Disagree	REF	REF
Agree	1.85 [1.23-2.80]	2.04 [1.44-2.88]
Neutral	0.96 [0.52-1.72]	2.11 [0.65-6.92]
People would assume I am a sex worker if they knew I took PrEP		
Disagree	REF	REF
Agree	2.52 [1.79-3.54]	4.91 [3.01-8.01]
Neutral	1.47 [0.85-2.54]	4.78 [2.34-9.78]
Family Perception		
Negative	2.04 [1.34-3.12]	---
Positive	1.04 [0.80-1.35]	---
Neutral	REF	---
Friend/peer perception		
Negative	0.66 [0.45-0.97]	1.21 [0.81-1.82]
Positive	0.88 [0.70-1.12]	0.95 [0.69-1.31]
Neutral	REF	REF

Multivariable model built based on univariable results statistically associated with the outcome at p<0.10

aPR= adjusted Prevalence Ratio

*Bold is p<.05

¹Correct understanding means they chose the answer choice "medication/pill taken to prevent HIV before exposure" vs. "pill to treat HIV" or "pill taken after potential exposure to HIV"

Table.

Conclusions: Social networks and sex work-related stigma influence individuals' perceptions of PrEP use among AGYW and FSW and may discourage women from starting or continuing PrEP. Strategies are needed to address PrEP knowledge among potential users and to generate positive social messages and support within their broader communities and families among AGYW to support PrEP uptake and persistence.

EPD0559

Attitude to condom-use negotiation among young unmarried Indonesian women and their determinants: a cross-sectional study

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Background: Premarital sex and its associated practices in Indonesia have been underreported as its viewed as a taboo. In this study, we aim to obtain an approximation of this information by proxy of attitude to condom-use negotiation among unmarried young women (15-24) who have been in a romantic relationship.

Methods: We analyzed the young unmarried women dataset from the Indonesian Demographic and Health Survey (IDHS) 2017. Analysis was limited to unmarried women aged 15-24 years old who reported to have been or are in a romantic relationship.



Attitude to condom-use negotiation was measured through the question "Does a wife justified to ask her husband to use condom during sex if she knows he has a sexually transmitted disease?". The primary analysis was conducted through complex sample logistic regression on IBM SPSS 23.0 (Armonk, USA).

Results: From 9,971 respondents, 7,973 were eligible for analysis. Median age was 18 (IQR 16-21) years and the majority (4,773, 59.9%) lived in urban areas. The majority (4,790, 60.1%) of respondents attended high school with a further 2,090 (26.2%) attended college although only 1,276 (16.0%) have comprehensive HIV knowledge, 2,932 (36.8%) aware of other STIs, and 3,004 (37.7%) aware of the condom's protection against HIV/STIs.

Only 148 (1.9%) admitted being sexually active although more petting sessions (532, 6.7%) and kissed (1,656, 20.8%) while 3,908 (49.0%) know friends who have had sexual intercourse. Positive attitude to condom-use negotiation was reported by 5,576 (69.9%) respondents.

Determinants of positive attitude included exposure to HIV information at school (aOR 1.49, 95%CI 1.22-1.81) and mass media (1.24, 1.07-1.44); exposure to condom-related information in mass media (1.58, 1.37-1.84); know condom protects against HIV/STIs (4.05, 3.55-4.63); comprehensive HIV knowledge (2.08, 1.63-2.66); and acceptance of intimate partner violence (0.47, 0.35-0.65).

Conclusions: Premarital sex seems to be underreported compounded with low knowledge and awareness regarding HIV, STIs, and the role of condoms in their prevention. However, condom-use negotiation attitude seems to be considerably high, primarily determined by knowledge and attitude toward women's empowerment in relationships. Promotion of condom-use should focus on imparting knowledge as well as empowering women in relationships.

onward. As part of interviews, participants were asked to recall their experiences of receiving an HIV diagnosis and attitudes toward how clinicians conveyed positive HIV test results. Interviews were recorded, transcribed verbatim, and analysed thematically.

Results: Participants frequently described reactions of shock, distress, and concern for the future when receiving an HIV diagnosis. Participants commonly valued diagnostic encounters in which clinicians conveyed information in a straightforward, clear, and concise manner.

Emphasising the role of treatment and undetectable viral load in managing HIV and preventing sexual transmission helped alleviate concerns of some participants about the impact of HIV on their own health and the risk of onward transmission.

Clinicians who delivered this information with confidence provided some participants with a sense that the health impacts of HIV could be well managed. Conversely, encounters in which clinicians were perceived as inexperienced and felt to have handled the diagnosis poorly left participants feeling isolated, unsupported and concerned about future interactions with healthcare providers.

Conclusions: Emphasising the role of treatment in managing HIV and eliminating the risk of sexual transmission can minimise some distress associated with receiving an HIV diagnosis. The manner in which diagnoses are conveyed may also influence future experiences with healthcare providers.

An increasing number of HIV diagnoses are occurring outside specialist sexual health settings making it more likely that diagnoses are being made by clinicians limited HIV experience. It is important, then, for resources to equip inexperienced clinicians with the tools to provide newly diagnosed PLHIV with accurate clinical information and referrals to specialist HIV care.

EPD0560

Conveying HIV diagnoses: perspectives from people recently diagnosed with HIV

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Background: Receiving an HIV-positive diagnosis can be a challenging and difficult experience. The ways in which HIV diagnoses are conveyed can influence how people living with HIV (PLHIV) engage with healthcare systems, including treatment uptake and adherence, over time.

We explored accounts of how HIV diagnoses were conveyed among a cohort of recently diagnosed PLHIV in Australia.

Methods: Semi-structured interviews were conducted with 35 PLHIV (33 male and two female) living in Australia who had received a positive HIV diagnosis from 2016

**EPD0561****Rate of and factors associated with high viral load after enhanced adherence counselling among HIV-positive Recipients of care in five Nigerian States**

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Background: Enhanced Adherence Counselling (EAC) is a structured method for creating an individualized adherence support plan for HIV-positive Recipients of Care (RoCs) with high viral load (VL). This ensures that all RoCs meet the HIV prevention agenda of HIV Undetectable equals Untransmittable (U=U). The current HIV treatment guideline in Nigeria recommends EAC for all RoCs with elevated viral Load after the first six months of treatment. Despite best efforts, a percentage of RoCs still have high VL post-EAC.

Reaching Impact, Saturation, and Epidemic Control (RISE) project funded by the United States Agency for International Development (USAID) supported 103 health Facilities (HF) in Akwa Ibom, Niger, Adamawa, Cross River and Taraba States, Nigeria to provide HIV services.

The analysis assesses the rate of and factors associated with high VL post-EAC among RoCs in supported Health Facilities.

Methods: The analysis used a de-identified client-level dataset of RoC with unsuppressed VL enrolled in the EAC program at RISE-supported HF. A log binomial regression model was used to report crude and adjusted risk ratio with 95% Confidence Intervals (95% CI) and a p-value of 0.05 to determine the association between clinical characteristics and suppression of VL post-EAC in the RISE program (July 2020 –June 2021).

Results: Thirty-six percent (2001/5,521) RoCs with VL > 1000 copies/ml completed EAC. 290(26%) out of 1,117 post-EAC VL results returned were unsuppressed. On bivariate analysis, age group 11-19 years (p=0.0059), community ART enrollment (p=0.034), second-line ART regimen (p<0.001), and duration on ART >10 years (p=0.0076) were significantly associated with high VL post-EAC.

On multivariable analysis, the second-line ART regimen (p<0.001) was a significant predictor of viral load non-suppression. Age greater than 30 years and RoCs on the 2nd line regimen had a 50% risk of viral load non-suppression relative to RoCs on the first-line regimen(p<0.001).

Conclusions: One in four RoC had unsuppressed VL post-EAC; with age groups greater than 30 years and second-line ART regimen as predicting factors. Clinicians should individualize EAC sessions based on these factors to optimize the effectiveness of HIV treatment.

EPD0562**Male Mentorship Clubs; a catalytic peer to peer approach for sustainable VMMC uptake amongst adolescent boys and young men in Zimbabwe**

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Background: The INTEGRATE program piloted community led demand model to achieve community ownership in VMMC demand creation as a sustainability strategy to maintain 80% VMMC coverage. PSI through Population Solutions for Health and SaAIDS, piloted the use of Male Mentorship Clubs (MMC) as open and safe spaces for men and boys to engage in VMMC and biomedical prevention services.

Description: The program established MMCs within schools and communities in four rural districts of Chirumhanzu, Nyanga, Rushinga and Seke, as intimate peer-led learning platforms on HIV biomedical prevention through open conversations. MMCs recruit uncircumcised young men who demonstrate VMMC interest but face barriers due to misinformation and community myths and misconceptions. Trained and circumcised peer champions facilitate weekly club sessions with 20 participants exposed to six VMMC sessions and three broader HIV biomedical prevention sessions. MMCs safe spaces integrate community recreational activities to motivate participants. During sessions, adolescent boys and young men (ABYM) interact openly, expressing barriers, fears and misconceptions. Peer champions disseminate correct and consistent VMMC information and share personal experiences and long-lasting benefits beyond HIV prevention.

Lessons learned: The creation of MMCs within schools promotes the uptake of VMMC through augmenting intention to undergo VMMC and provides an avenue for addressing barriers. Data from 4 districts attributed 10% of total VMMC achievement to MMCs. Cumulatively, 16% of the club members that attended sessions were referred for VMMC, with a 70% linkage rate. Service uptake conversion was attained after minimum exposure to four sessions and the conversion rate was higher within ABYM in school.

Peer to peer reach among ABYM is a key driver to VMMC services amongst this group. MMCs generate VMMC interest among ABYM through addressing common relatable barriers and provide assurance through intimate personal experience sharing.



Conclusions/Next steps: Creating safe spaces demonstrated enhanced learning opportunities to confront barriers and influence behavior change. Moving forward, the program will widen coverage of MMCs across all targeted wards, to influence and promote health seeking behavior among males in the broader community.

EPD0563

'I was afraid to test, but the providers and the space made me feel comfortable': Acceptability of community-based integrated HIV and sexual and reproductive health services in Zimbabwe

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Background: HIV services often do not appeal to youth, leading to limited engagement and poor HIV outcomes. Co-designed with youth, we trialled a community-based HIV and integrated sexual and reproductive health (SRH) service for youth (16-24 years) in Zimbabwe (CHIEDZA). Weekly services (HIV testing, treatment and adherence support, family planning, STI and menstrual health management, condoms, health counselling) were delivered in intervention communities from 2019-2022. We investigated acceptability of CHIEDZA for youth who attended.

Methods: An endline population-based cross-sectional survey with 16,800 18-24 year olds included questions on acceptability. Qualitative data from observations of CHIEDZA sites and services (n=58), interviews with providers (n=51), clients (n=80) and youth in communities (n=42) were analysed inductively and thematically. Quantitative and qualitative data were triangulated to understand acceptability and its contributing factors.

Results: Of 2,135 young people who reported accessing CHIEDZA in the survey, 96.1% rated their overall experience as excellent/very good on a 5-point visual scale (males: 97.2%; females: 96.6%). The features of CHIEDZA that were most often valued by attendees were: free services (92.6%); easy to access (90.1%) and community-based (86.9%); friendly providers (86.9%) and confidentiality (85.9%); and having multiple services in one space (82.2%). The least liked features were: long waiting times (3.5%), product stock-outs (2.5%), and inconvenient opening hours (2.0%).

Integrated HIV and other SRH services in one place provided convenience and increased uptake of different services: *"I came wanting pads, and then also got tested for HIV"*. Free services and products were particularly valued, in a context where *"condoms and pads are expensive"*, and with clinic user fees. Non-judgemental, trustworthy and *"open-minded"* interactions with healthcare providers,

with adequate time given for each client to receive quality person-centred care and *"without fear of being judged"* were central to acceptability of integrated HIV/SRH services. Community-based location was valued for convenience and separation from clinics which youth *"dreaded to go to"*. Offering social activities was highly acceptable, but were stopped due to COVID-related restrictions.

Conclusions: Engagement with HIV services by youth could be strengthened by offering integrated, free-of-cost, community-based services and supporting providers to deliver compassionate and youth-centred care.

EPD0564

Consenting and re-consenting Kenyan children and adolescents living with HIV in research involving biological sampling and bio-banking

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Background: Research involving collection, storage, and bio-banking of biological samples requires contacting and consenting, at times repeatedly, as well as considerations on confidentiality, research-related results reporting, and sharing of samples. However, full understanding of such matters by participants is not always clear. Such concerns are amplified in vulnerable populations, like children and adolescents living with HIV (CALWH). We investigated views of Kenyan CALWH, their caregivers, and Subject Matter Experts (SMEs) on these matters.

Methods: Semi-structured interviews were conducted with 99 participants; CALWH (20 enrolled in an ongoing study, 20 research-naïve; all aware of their HIV status), 20 caregivers of study-enrolled adolescents, and 39 SMEs (community advisory-board members, providers, community leaders, ethics experts, clinical researchers, social scientists, and laboratory leads). Audio recordings were transcribed and thematically analyzed, and emerging themes were derived.

Results: Among participants (53% male), CALWH had median age 17.5 years, (range 11-24), and 50% were female; caregivers were 70% female, and SMEs were 33% female. All groups identified that repeat contacting and re-consenting are both needed and important legal considerations, as they ensure participants understand the purpose of storing samples, methods of maintaining confidentiality, and when samples may be shared with local and/or international researchers.



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CALWH, both with and without research experience, thought that the original consent should indicate results that will be provided through the study, and when and how to access them. Caregivers highlighted benefits and sufficiency of using specific biospecimen usage consent language at study enrollment, and that re-consenting is not required for future specimen usage. Caregivers also expressed trusting researchers, and the regulatory and institutional processes.

Conclusions: Researchers should provide comprehensive information on the purpose of biospecimen storage, if and when samples will be shared with local and/or international researchers, confidentiality measures and procedures for accessing study results. Re-consenting should be initiated when specific biospecimen usage consenting language was not previously used.

Additional work is needed to ensure that research participants clearly understand comprehensive information included in consent forms.

EPD0565

Extending HIV care responsibility beyond families to include community health workers in the settings of Tanzania

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Background: In Tanzania, like most African families, caring for an HIV-positive family member, especially a child or an older person, is primarily a family's responsibility. However, the task can be overwhelming and can change the life system of the affected families. Routing to using expert clients working as community health workers (CHWs) can transform HIV care into a shared responsibility.

The purpose of this case study was to assess the effectiveness of the differentiated care model approach through task-shifting to community health workers.

The aim was to learn how HIV care responsibility has shifted or remained the same after implementing HIV Test and Treat intervention that piloted the differentiated care model approach.

Methods: An ethnographic study was conducted as part of a clinical HIV Test and Treat intervention in Tanzania between 2016 to 2023. Data were collected in two phases using observations, and formal and informal interviews with clients, healthcare providers, and community members.

Phase one explored the acceptability and social impacts of the intervention and phase two assessed the sustainability after the intervention ended. Data were analyzed inductively using thematic analysis following Virginia

Braun & Victoria Clarke(2006) Using thematic analysis in psychology and O'Connor and Gibson (2003) A step by step guide to qualitative data analysis.

Results: HIV clients who initiated treatment at any point of their disease, become stable within three to six months while social support from their families was the main driving force for their treatment success. Clients who were not living with their own families or did not receive enough support on their treatment presented challenges in becoming stable even after several months of initiating treatment. Community health workers (CHWs) referred to as expert patients hired by the intervention for treatment surveillance found themselves assuming the care responsibility beyond their job descriptions.

Conclusions: Older people and children living with HIV and coming from poor families are still experiencing the lethality of the disease due to poor care. Therefore, extending care responsibility beyond families helped ill HIV clients get stable.

However, there is a blurring difference between the paid and unpaid care work done by CHW for HIV clients.

EPD0566

Incognito patients to measure and address intersectional stigma in healthcare settings: a pilot randomized controlled trial

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Background: Efforts to combat HIV stigma enacted in healthcare settings are hampered by the inherent challenges of objective stigma measurement. We developed an experimental audit approach using unannounced standardized patient (SP) visits to observe provider behaviors in real clinical settings in southern China. Results from a baseline round of visits informed a culturally appropriate and tailored intervention for providers.

Our pilot cluster randomized control trial (RCT) assessed feasibility, acceptability, and preliminary effects of an intervention to reduce stigma towards men who have sex with men (MSM) and people living with HIV (PLWH).

Methods: Trained SPs conducted unannounced clinic visits with consenting providers who knew that visits would happen but not when. Randomly varying the HIV status and sexual orientation of presented cases allowed us to quantify stigma by comparing care quality received in each scenarios.

Care quality was assessed in four domains: diagnostic testing, sexual history taking, physical exams, and behavioral counseling. The stigma training consisted of didactic, experiential, and discussion-based modules de-



livered in in-person and hybrid virtual formats. Following a second round of unannounced visits, linear fixed effects regression was used to assess preliminary intervention impact.

Results: Feasibility and acceptability of the SP approach and the intervention were high. 87.3% of eligible providers enrolled (N=55) and 238 unannounced clinics visits were completed. No adverse events were reported. All intervention participants reported that training content was "highly useful" or "useful" and that they would attend future sessions if offered.

Preliminary effects suggest that the stigma reduction intervention may have improved care when SPs presented as MSM in terms of diagnostic testing ($\beta=0.12$; $SE=0.19$) and thoroughness of physical exams ($\beta=0.69$; $SE=0.34^{**}$). The intervention may have also improved care for PLWH in terms of behavioral counseling ($\beta=0.43$; $SE=0.35$) and sexual history taking ($\beta=0.46$; $SE=0.41$).

Conclusions: Our pilot RCT demonstrated high feasibility, acceptability, and preliminary impact of our stigma reduction intervention. Unannounced visits provided key insights for intervention design and provided a rigorous yet feasible way to measure stigma.

Preliminary effect estimates should be considered in light of the pilot nature of this study which was not powered to detect intervention effects.

EPD0567

Perceived quality of life among older adults aging with HIV in a Mississippi transitional home: a pilot study

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Background: The purpose of the study was to assess QOL perceptions of older adults aging with HIV and to determine the relationship between selected demographic variables and QOL scores. The hypotheses tested were:

1. Older adults aging with HIV have negative perceptions of their overall QOL (physical, psychological, level of independence, social relationships, environment, and spiritual/religious/personal beliefs), and;
2. If a significant relationship between the overall QOL scores and selected sociodemographic variables (age, gender, initial date of diagnosis, education attainment, mode of HIV transmission) exist.

Older adults, 50 years and older, have challenges that are HIV health-related, aging non-HIV related, and the economic burdens of aging. There is a need to develop more research that explores the QOL perceptive needs of older adults aging with HIV.

Methods: This study was conducted over five (5) months. It is a quantitative cross-sectional survey approach. The participants were 45 and older while living long with HIV in a transitional home/community outreach resource

center. The WHOQOL-HIV BREF Instrument was utilized to assess QOL perceptions. Descriptive statistics, Shapiro-Wilk, Kruskal-Wallis, and the Mann-Whitney U tests were analysis methods. Data collected were analyzed by SPSS version 27.

Results: Most participants were males, 63 (58.3%), ages 45 - 49 (32 or 30.5%), received secondary education (56 or 51.4%), and single (67 or 62.0%).

The findings revealed:

1. Older adults aging with HIV have positive QOL perceptions;
2. No relationships between QOL and demographic variables, except educational attainment.

The hypothesis revealed the following:

1. All hypotheses were rejected;
2. A significant relationship exists between overall QOL scores and educational attainment.

Conclusions: This study was significant to:

1. Understand the interconnection between HIV care, treatment, aging, and QOL;
2. Assess older adults' health and well-being;
3. Evaluate health outcomes, and;
4. Ensure inclusivity in healthcare decision-making.

The findings may have long-term implications for HIV prevention strategies, care and support services, and access to mental health services. All are influenced by policies from researchers, healthcare providers, and public health practitioners.

EPD0568

Identifying the differentiating characteristics of HIV treatment clients with advanced HIV disease in Kyrgyzstan

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Background: Low coverage of interventions to screen for, prevent, and treat advanced HIV disease (AHD) contributes to preventable consequences among individuals at risk of AHD even after initiating HIV antiretroviral therapy (ART). We sought to identify differentiating characteristics of PLHIV of the PEPFAR-supported Meeting Targets and Maintaining Epidemic Control (EpiC) project with AHD to prioritize services for these individuals.

Methods: We queried project and national databases to identify clients on ART who were confirmed HIV positive between September 1, 2020, and December 31, 2021. Individuals were classified as having AHD if they had ever had a CD4 cell count <200 cells/mm or a WHO clinical stage 3 or 4. We conducted descriptive analyses, bivariate and multivariable logistic regression to identify associations between client characteristics and AHD.

Results: Among 240 new HIV-positive clients, 79 (32.9%) had AHD. We found bivariate associations between AHD and: being a person who injects drugs or member of a



population group (sexual partners of PLHIV/KP, FSW, clients of FSW, synthetic drug users) other than the men who have sex with men and transgender women who have been prioritized by the local project (OR=4.44; CI=2.13–9.25); being ≥ 30 years old (OR=4.15; CI=1.93–8.92); being widowed or divorced (OR=3.21; CI=1.78–5.78); having secondary level education or below (OR=1.98; CI=0.95–4.11); and being diagnosed via index testing vs. other HIV testing modalities (OR=1.74, CI=0.99–3.05).

In a multivariable model that iteratively removed factors that no longer sustained significance, being a member of a population group not prioritized by the project, being divorced or widowed, and being age 30 years or older all remained independent predictors of an increased likelihood of experiencing AHD (Figure 1).

Conclusions: Enhanced efforts to link specific client segments to earlier HIV testing – and to AHD prevention, screening, and treatment upon diagnosis – may help to reduce their AHD risks.

EPD0569

Bridging the gaps: a qualitative assessment of barriers and facilitators for uptake of isoniazid preventive therapy among people living with human immunodeficiency virus in Pune, India

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Background: Isoniazid preventive therapy (IPT) is one of the key interventions recommended by the World Health Organization to reduce the burden of the human immunodeficiency virus (HIV)-associated tuberculosis (TB). However, it has achieved limited success in low and middle-income countries.

With limited empirical research and programmatic strategies exploring the suboptimal IPT uptake, we conducted qualitative interviews to understand the barriers as well as facilitators of IPT uptake from adult people living with HIV (PLHIV) and to know healthcare providers (HCPs) perspectives.

Methods: Study participants were recruited through purposive sampling in a government medical college in Pune, India. We conducted 11 in-depth interviews (IDIs); five IDIs with PLHIV ≥ 18 years of age (initiated, completed, default-er, and never initiated an IPT); 3 males and 2 females and six with the healthcare providers; 1 physician, 2 nurses, 1 counselor, 1 pharmacist, and 1 data manager from May to October 2022.

The PLHIV participants were asked to describe their barriers to IPT uptake and motivators for completing or not completing the IPT. The HCPs were interviewed to know

their perspective on the challenges and facilitating measures for IPT uptake. Interviews were transcribed, translated, and coded using inductive and deductive coding and analyzed using rapid qualitative analysis.

Results: The reported barriers to IPT uptake were mostly from the healthcare system such as insufficient stock of IPT drugs, shortage of staff, fear of IPT toxicities, and need for detailed training. HCPs' acceptability of IPT was influenced by factors relating to the organizational context, TB-HIV training, their perception of its efficacy, duration, and clarity of IPT guidelines.

The challenges reported by PLHIV included the difficulty in keeping a fixed schedule for drug intake, side effects, and transport costs. The enabling factors reported by the PLHIV were the motivation and counseling for the IPT uptake, drug distribution strategy, fear of losing life, and lesser burden of pills.

Conclusions: This study provides insight into the complexity of factors affecting IPT implementation in India. Modifiable factors like health system preparedness, frequent staff training, increased client motivation/counseling, and a regular supply of drugs can be considered for optimal IPT uptake.

EPD0570

Adaptation and pre-post workshop results of the FRESH HIV and intersectional stigma reduction intervention for sexual and gender minorities with HIV and their providers: Dominican Republic

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Background: Eliminating stigmas that harm sexual and gender minorities with HIV (SGMH) is critical to ending the epidemic. Finding Respect and Ending Stigma around HIV (FRESH) is a healthcare setting HIV stigma-reduction intervention that applies interpersonal contact between providers and clients to reduce stigma and improve HIV continuum of care outcomes.

In this study, FRESH was adapted for intersectional stigmas experienced by Dominican Republic (DR)-based SGMH, for Spanish-language, and local contexts. It was then tested via a pilot hybrid type 1 effectiveness-imple-

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mentation stepped wedge cluster randomized controlled trial (RCT). In this abstract, we present the adaptation process and workshop pre-post findings.

Methods: In 2021, qualitative in-depth interviews and focus groups with HIV providers and SGMH from rural and urban DR were conducted to inform adaptation of FRESH into the Spanish DR-version, Construir Respeto y Eliminar el Estigma en torno al VIH (CREEV), leveraging the ADAPT-ITT framework.

CREEV was piloted in an adaptation workshop with SGMH and providers; participant adaptation feedback was used to fine-tune the final intervention for the pilot RCT during which two HIV clinics (N=36: n=20 providers, n=16 clients) participated in CREEV workshops and pre-post data, including validated stigma scales, were collected to evaluate acceptability, feasibility, and preliminary impact using paired t-tests.

Results: The adaptation process revealed the need to add information on protective laws, explain clients' rights, incorporate a strengths-based approach, and explain stigma in layman terms to equip SGMH with language to express themselves about their experiences.

Nearly 100% reported that the workshop improved stigma knowledge "a great deal," being highly satisfied, and that they would definitely recommend CREEV to friends or colleagues.

After CREEV participation, providers had reduced negative opinions of people with HIV (PWH, $p<.01$); among SGMH, healthcare empowerment increased ($p<.05$). While empathy towards PWH increased among providers, the change was not statistically significant.

Conclusions: For stigma-reducing interventions to be impactful, they must be tailored to local contexts. CREEV (FRESH) has shown to be a promising HIV and intersectional stigma-reducing intervention for SGMH and their providers in the Spanish speaking Caribbean. Future directions include statistically powered full-scale testing in the DR and scale-up into other Spanish-speaking Caribbean nations.

EPD0571

Perspectives of people living with HIV on ART-related weight change and healthy weight

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Background: Newer HIV antiretroviral therapy (ART) regimens are associated with greater weight gain compared with older regimens, but myriad factors affect weight change among people living with HIV (PLWH). This qualitative study examined how PLWH experience weight

change in their daily lives, how they feel about their body image, and how that influences health behaviors, including ART adherence.

Methods: PLWH were recruited through Amida Care, a Medicaid managed care organization in New York City, and screened to ensure a diverse sample (N=61). Half the participants (51%) were cisgender men (71% gay/bisexual), 36% were cisgender women (9% lesbian/bisexual), and 13% were transgender/nonbinary individuals; 87% were Black and/or Hispanic. Ages ranged from 23 to 65; 49% of the sample were over 50. Semi-structured interviews were conducted by phone during fall 2021.

Topics included participants' stories of weight changes, if any, particularly in relation to HIV disease or ART initiation and switches; perspectives on healthy weight; and approaches to self-care. Interviews were inductively analyzed to identify themes using a constructivist grounded theory approach.

Results: Many participants had gained weight since their HIV diagnosis. Some, especially long-term HIV survivors, interpreted "weight change" as referring to lipodystrophy. Many attributed weight change at least partly to ART initiating or switching.

Other cited causes were eating habits, lack of exercise (exacerbated by the COVID pandemic), other medications, attaining sobriety, or depression and anxiety. Body image satisfaction varied widely across the sample. Some seemed to have responded to the HIV diagnosis by focusing on healthful habits, but others struggled with weight and other health issues, including ART adherence.

Conclusions: Our findings suggest that some PLWH may grapple with a loss of control in terms of managing weight and weight change, whether or not they attribute the changes to ART. Achieving and maintaining viral suppression is the priority, but for many participants HIV treatment was associated with health and body image problems they felt forced to accept.

These perspectives can help health care providers counsel and support PLWH in maintaining viral suppression and healthy weight by elucidating PLWH's challenges and concerns associated with ART and weight change.

**EPD0572****Empathy-based training of HIV treatment peer supporters improves performance and reduces treatment interruptions: experience from the I CAN Campaign in Malawi**

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Background: In Malawi, approximately 1,000,000 people are living with HIV (PLHIV) and over 850,000 of them are on treatment. Sustaining treatment adherence is key to maintaining this accomplishment and realizing the benefits of treatment for HIV prevention. Studies have shown that support from trained peer supporters known as "expert clients" can improve treatment adherence.

The "I CAN" treatment literacy campaign piloted in Malawi sought to strengthen this approach through provision of empathy-based training and visual job aides to expert clients known as "ART Champions."

Here, we review the effect of the ART Champion approach in improving performance of expert clients and reducing treatment interruptions.

Description: From 2020 to 2022, PSI with Malawi Ministry of Health and stakeholders rolled out a national treatment literacy campaign called "I CAN." The campaign focused on increasing motivation among PLHIV to start and stay on treatment.

ART Champions were recruited from existing expert clients recommended by facilities, trained on empathy-based counseling and job aides, and deployed to support ART clients struggling with adherence.

40 ART champions were trained and placed in 6 targeted facilities in Lilongwe, Blantyre and Mangochi between March and September 2022. These sites also employed expert clients with standard training. Both were provided with a targeted number of clients per week to follow up. We analyzed routine data to determine success rate and treatment interruptions, comparing ART Champions to expert clients with standard training.

Lessons learned: In the targeted facilities we had **40** vs **53** ART champions and Expert clients respectively. ART Champions reached **2,785** ART clients with missed appointments of whom **2,443** returned to the clinic, representing an **89%** success rate. Expert clients reached approximately **2,718** ART clients **1,552** returned to the clinic, representing a **57%** success rate.

A performance comparison analysis showed ART Champions had an improved ability to bring back clients to care; **80%** vs **56%** for the standard trained expert clients. Overall, ART Champions contributed to a **23% (p-value 0.008)** reduction in treatment interruptions across the targeted facilities.

Conclusions/Next steps: Our results demonstrate that empathy-based training and tailored job aides for expert clients yield superior results in bringing ART clients back to treatment.

EPD0573**Exploring use of social media online campaign to challenge HIV stigma: Uganda's experience**

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Background: HIV stigma, discrimination, criminalisation and legal barriers are some of the key factors preventing young people living with HIV (YPLWHIV) from accessing HIV treatment, care and prevention services. Despite the HIV Stigma and Discrimination Country Policy in Uganda, many YPLWHIV continue to be at risk of HIV-related stigma; at home, in school, workplaces, in the community and health facilities.

During the COVID-19 outbreak, restrictions on social gathering prompted the use of innovative approaches such as motor cycle (Boda boda) to deliver ART drugs to patients at their homes and social media for prevention and health information.

This paper describes our experience of using social media to challenge HIV stigma experienced by YPLWHIV.

Description: A social media manager from MU-JHU posted anti-stigma content based on HIV-stigma lived stories, messages and call-to-action statements by YPLWHIV, social media influencers, and the psychosocial staff. Use of two hashtags in different language; #youthovercomingstigma and #vijaanapamoja targeted Uganda, Kenya and Tanzania.

Posting was done five days per week on twitter, face book and Instagram digital platforms. Independent social media influencers based in Kampala engaged their audiences with call-to-action advocacy statements.

Twitter analytics was used to capture the campaign performance such as impressions, engagements and positive sentiments from 1st December 2022 to 10th January 2023. To increase the reach of our message, the Twitter Ads feature was added to the campaign.

Lessons learned: Developing and reviewing adequate content is critical to enable consistent posting for the campaign period. Twitter registered the most connections and interactions. Total impressions were 145,657 of which 99% were from Uganda.



The stigma story in school yielded the most views -4,077, followed by e-poster call to action to end AIDS with 1,874 views and an e-poster quoting Winnie Byanyima-1,486. The total engagements; likes, shares and retweets together were 26,143.

Conclusions/Next steps: Conducting social media HIV campaigns has a wider reach in creating public awareness in a short period spun. people also have an opportunity to be part of the campaign and share their views. It is critical to continue recycling the hashtag so that the campaign does not lose momentum and extend the campaign to other communities.

EPD0574

Reducing drug use stigma in HIV clinics in Tanzania to improve HIV treatment for people who use drugs: results of a pilot study

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Background: In Tanzania, HIV prevalence among people who use drugs (PWUD) exceeds that in the general population by 4-7 times. In HIV clinics, stigma toward PWUD inhibits testing and treatment and must be addressed. We adapted and pilot tested an evidence-based health facility HIV stigma reduction intervention to address drug use stigma in HIV clinics in Dar-es-Salaam, Tanzania. The ADAPT-ITT model guided the adaptation through formative research, a 2-day stakeholder workshop, and external expert review. Five 2.5-hour after-work trainings delivered across 2 weeks reached 227 HIV clinic staff (HCS) (99 clinical/128 non-clinical) in 7 clinics (January-April 2022).

Methods: A mixed methods approach to assess acceptability, feasibility, and preliminary effectiveness, including pre-post (3-month) HCS surveys (n=148); 8 post-training HCS focus group discussions (FGDs) (n=64, 27M/37F); and process documentation (attendance sheets, trainee evaluation forms, training observations). We measured three quantitative outcomes: stigma (Opening Minds Scale), social distance (modified Bogardus scale) and drug-use knowledge.

We assessed changes in outcomes by linear mixed effect models with random effects by individual and fixed effects to control for demographics, clinic, duration and type of employment, contact with PWUD, and social desirability bias.

Results: High attendance demonstrates the intervention's feasibility: 95% of participants attended 4+ sessions (73% all 5 sessions).

Additionally, on a 5-point scale (5=highest agreement), participants rated the intervention as very acceptable (4.7, standard deviation (SD)=0.4), appropriate (4.8, SD=0.3), and feasible (4.7, SD=0.4).

In the FGDs, participants reported liking the content, structure, and participatory nature of training. They noted new awareness of their own stigmatizing language and behavior towards PWUD in clinics; new understanding of drug use as a medical condition; increased comfort and empathy and reduced fear related to PWUD; and improved skills for providing HIV services to PWUD. All quantitative outcome measures showed significant change post-intervention (Table 1).

Outcome (Scale range*)	Change post intervention (95% CI), adjusted
Stigma (8-40)	-6.1 (-7.0 to -5.2)
Social distance from PWUD (6-24)	-4.1 (-5.8 to -1.0)
Knowledge about drug use (1-5)	1.0 (0.9 to 1.1)

*For all scales, higher values indicate higher levels of the attribute

Table 1.

Conclusions: Context-adapted drug-use stigma reduction training within HIV clinics is acceptable, feasible and indicates preliminary effectiveness. Ending HIV clinic drug-use stigma is an essential step to optimizing HIV testing and care for PWUD.

EPD0575

Development of the HIV Care Continuum & Beyond Initiative: key focus areas to end HIV in the Asia-Pacific region

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Background: Approximately 6 million people are living with HIV (PLHIV) in the Asia-Pacific region; however, only 76% know their status, and of these, 86% are on antiretroviral therapy. Urgent action is needed to identify PLHIV or those at high risk of acquiring HIV to optimize linkage to HIV testing and care services. The HIV Care Continuum & Beyond Initiative was developed to convene regional stakeholders to comprehensively review and assess current progress and identify focus areas to reach HIV treatment-related targets.

Description: The initiative was implemented between September 2021 and December 2022, and established a steering committee of 12 experts, including HIV health-care professionals, researchers, community leaders, and HIV advocates from 6 territories: China, Hong Kong Special Administrative Region, Singapore, South Korea, Taiwan, and Thailand.



The committee's goals were to develop and refine recommendations for HIV programs at local and national levels based on quantitative and qualitative assessments. A multi-lingual literature review was conducted to summarize information on overall care continuum progress and policies, access to prevention and treatment services, and planned research.

The results of the review informed interview guides for 13 semi-structured anonymous interviews of PLHIV, community experts, healthcare professionals, and policymakers across the 6 territories. A modified Delphi method was used to achieve consensus over the course of 4 virtual meetings.

Lessons learned: Four focus areas to improve regional HIV outcomes were identified:

1. Stigma and discrimination;
2. HIV prevention;
3. HIV testing, diagnosis, and treatment; and
4. Quality of life of PLHIV.

Proposed initiatives to reduce the regional impact of HIV and increase awareness of "undetectable = untransmittable" included:

1. Engaging community-led/based healthcare systems to deliver treatment,
2. Providing access to and education on testing options (eg, self-testing),
3. Offering free and same-day treatment initiation,
4. Standardizing data collection methods to improve surveillance and research, and
5. Expanding efforts to understand barriers to achieving quality-of-life goals.

Conclusions/Next steps: The HIV Care Continuum & Beyond Initiative identified key focus areas to improve health outcomes for PLHIV, reduce the HIV burden in the Asia-Pacific region, and help communities achieve global HIV targets.

EPD0576

DoxyPEP use, acceptability, and associated health behaviors among a multisite sample of men who have sex with men and transgender women

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Background: Doxycycline post-exposure prophylaxis (doxyPEP) reduces sexually transmitted infections (STIs) in men who have sex with men (MSM) and transgender women (TGW) in the U.S. In a clinical trial of doxyPEP, we sought to assess acceptability, impact, and meaning

of use among MSM/TGW with recent history of sexually transmitted infection (STI) and either living with HIV (LWH) or on PrEP.

Methods: We conducted semi-structured, in-depth 1:1 interviews with MSM/TGW at 4 U.S. clinics in 2 cities (Seattle/San Francisco), purposely sampling those endorsing high (>30 pills) and low doxyPEP use over the past 3 months, and intentionally oversampling U.S. racial/ethnic minorities. Using a framework by Mensch et. al., we queried motivations for/meaning of use, attitudes/beliefs, adherence, effect on sexual practices, and partner/community/structural factors related to use. We coded interview transcripts into content areas, followed by thematic coding.

Results: We interviewed 44 participants (median age 38; 2% TGW, 17% Black, 61% white, 30% Hispanic; 45% LWH), yielding three overarching themes.

First, participants found doxyPEP to be highly acceptable and efficacious. Participants found it easy to adhere to, acceptable to sex partners, with minimal side effects. While some expressed concern regarding potential antibiotic resistance, they reported this was not a barrier to use.

Participants who reported ongoing unprotected sexual activity believed doxyPEP likely prevented their own acquisition of an STI, though many participants believed it was not necessary for oral sex.

Second, participants reported that initiation of doxyPEP did not change their sexual practices (e.g., frequency of sex, number of partners, whether or not condoms were used).

Third, use of doxyPEP benefitted quality of life and mental health, offering "peace of mind" by greatly reducing anxiety over acquiring or unwittingly transmitting STIs. Participants reported feeling more "in control" of preventing STIs, and felt positive about supporting personal, partner, and community health.

Conclusions: In a multi-site sample of MSM/TGW of mixed serostatus with history of recent STI, use of doxyPEP was highly acceptable, easy to adhere to, and was perceived as efficacious, yielding quality-of-life benefits including reduced anxiety and sense of control over sexual health. Use of doxyPEP had little impact on sexual practices.



EPD0577

Characterizing the relationship between HIV peer support groups and internalized stigma among people living with HIV in Nigeria

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Background: HIV-related stigma persists as a significant barrier to implementing effective HIV treatment and prevention strategies in Nigeria. Peer support groups have been shown to enhance adaptive coping strategies and can potentially decrease HIV-related stigma. Despite the high uptake of peer support groups among people living with HIV (PLHIV) in Nigeria, the relationship between group membership and internalized stigma remains understudied.

This study aimed to provide insights into the potential role of peer support groups on internalized stigma among PLHIV in Nigeria.

Methods: This study draws from a cross-sectional mixed-methods survey - Stigma Index 2.0 implemented by PLHIV-led organizations across 16 states and the Federal Capital Territory in Nigeria. Internalized HIV-related stigma was measured using the Internalized AIDS-related Stigma Scale.

A multivariable multinomial logistic regression model was used to assess the relationship between self-reported engagement in peer support groups and internalized stigma. Anticipated or experienced stigma was explored as a potential effect measure modifier.

Results: The majority (75.1%; 934/1244) of respondents were engaged in HIV peer support groups. Over half (56%; 690/1244) and about one-third (28%; 343/1244) of the study respondents demonstrated low/moderate and high levels of internalized stigma respectively, with an overall mean internalized stigma score of 2.44 (SD = 1.88). PLHIV engaged in HIV peer support groups were less likely to report both low/moderate (versus no) (aOR: 0.47 (95% CI: 0.27 to 0.81)) and high (versus no) (aOR: 0.30 (95% CI: 0.17 to 0.53)) levels of internalized stigma compared to those not engaged.

Evidence of effect measure modification by anticipated or experienced stigma was not observed.

Conclusions: The burden of internalized stigma is high in this study among PLHIV in Nigeria. Engagement in peer support groups appears to mitigate these stigmas. Though adaptive coping strategies promoted in HIV peer support groups could explain the observed relationship, further research investigating this mechanism is needed. Stigma mitigation strategies at individual, community, and structural levels to increase peer support may represent a critical tool in decreasing treatment gaps among PLHIV in Nigeria.

EPD0578

Assisted Partner Notification acceptance advances at the speed of trust: lessons learnt from a skills-development workshop implementation from 10 clinics in Honduras

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Background: One of the goals of the USAID-funded HIV Care and Treatment program in Honduras, led by Intra-Health International, is to support 95% of all people living with HIV to know their HIV status, using testing strategies recommended by UNAIDS and WHO, namely, Assisted Partner Notification (APN). These organizations also encourage tailoring this strategy to each specific context. APN acceptance in Honduras was a challenge, reaching as low as 32% in the third quarter of 2021. Therefore, the program implemented counseling-skills development workshops, giving emphasis on tailoring APN to each person's individual needs.

Description: On the first quarter of 2022, 4 workshops were held with 51 health providers who implement APN in 10 health facilities including nurses, physicians, social workers, among others. Workshops had a psychosocial approach and focused on improving skills for attaining better user acceptance of APN. They included a technical reinforcement, development of assertive communication skills, sexuality topics relevant to key populations, a person-centered approach with emphasis on rapport building, empathy, and creating an environment of trust with clients. Workshops also involved creating scripts for offering APN to different populations, role play exercises, and follow-up feedback sessions.

Lessons learned: Immediately after the workshops, acceptance of APN increased from 47% to 56%, and reached a peak of 70% five months later. During group interviews after the workshop, participants reported they were able to recognize the importance of rapport building and adapting their intervention to each client. Additionally, results suggest that practice was essential to fully install the skills recently learnt.

Conclusions/Next steps: There is scant research on the importance of therapeutic alliance/relationship and trust building to ameliorate acceptance of the APN strategy in Latin America. Also, adapting WHO-recommended strategies to local contexts is essential to achieve the "first 95"



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of the 95-95-95 goals. The results of these workshops point to the relevance of strengthening counseling skills to incorporate a person-centered approach in APN service and might be helpful for other APN implementers in the region.

EPD0579

A metasynthesis of healthcare provider perspective and practice of couples HIV testing and counseling and other couple-centered HIV services: using i-PARIHS as a guiding framework

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Background: Couple's HIV testing and counseling (CHTC) and other HIV couples centered approaches has clinical and psycho-social benefits for people living with HIV. However healthcare provider endorsement, and facilitation in real world settings is largely unknown.

Guided by the i-PARIHS framework, we conducted a metasynthesis on provider perspectives on CHTC and couple-centered HIV services.

Methods: Four databases (PubMed, Scopus, Embase, Psycinfo) were used to identify and review the global literature on healthcare provider perspectives on CHTC and couple-centered HIV services.

After duplicates and ineligible studies were removed, data abstraction identified 24 eligible articles published between 2000 to 2021. Findings were synthesized using three main constructs of the i-PARIHS framework: evidence, context and facilitation.

Results: Most studies (N=18) were focused on perspectives and practices in sub-saharan Africa. The context for CHTC and couple-centered HIV services was limited to antenatal and preconception health services, and services exclusively for HIV serodifferent couples.

Overall providers endorsed CHTC and confidence in facilitating couple-centered HIV services. Such approaches were deemed to promote greater HIV care engagement, consistency in HIV treatment and reproductive health services. They also fostered trust and commitment in couples, engendered stronger fatherhood roles and facilitated joint family planning decision making.

Some providers had reservations, did not endorse the HIV science (U=U) and perceived HIV transmission within serodifferent couples to be inevitable, even if the partner living with HIV is on treatment.

Additionally, the capacity for viral load testing was not always available. Other providers did not endorse conception among people living with HIV. CHTC and couple-centered HIV services facilitation was influenced by workplace policy or a providers personal practice to support HIV prevention of mother to child transmission. Providers recommendations for CHTC and couple-centered HIV

services included: institutionalized policies, appropriate training/education, integrated care models, and increased investment in the strategy.

Conclusions: As global efforts towards ending the epidemic intensifies, this metasynthesis is timely. Findings demonstrated overall provider acceptance of CHTC and general couple-centered HIV services, but also illuminated that greater endorsement of the science undergirding these strategies - U=U is needed.

Additionally there are missed missed opportunities in engaging populations not seeking conception and antenatal services.

EPD0580

Raising new voices in HIV cure research: a review of an advocacy-for-cure academy and grant program

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Background: Africa has the largest population of people with HIV, yet African civil society has historically been underrepresented in decision-making and advisory spaces related to the direction and impact of HIV cure research. Advocates and community leaders play an important role accelerating ethical research and eventual product introduction. Global recognition of the need to fast-track progress on Africa-led HIV cure research has increased investments in basic research capacity and increased the number of clinical trials enrolling in Sub-Saharan Africa. In 2018, AVAC and the International AIDS Society introduced a combination training and grant program to build engagement for HIV cure research and promote sustainable literacy and advocacy efforts among civil society in Sub-Saharan Africa.

Description: Every year, approximately twenty-five seasoned HIV prevention and treatment advocates from low-and-middle-income countries (LMICs) interested in cure research are selected to participate in a three-day intensive training academy in Eastern or Southern Africa. Six researchers join each academy to create connections and foster future collaborations.

An alumni academy is offered every third year to deepen knowledge and strengthen connections. Academy Alumni have access to conference attendance and grants to advance HIV cure research and advocacy locally.

Lessons learned: Since 2018 there have been 93 Academy Alumni from 17 African countries. Eight alumni have received grants to advance HIV cure research in their local context. Grantees have developed innovative training methodology and created social media platforms to train

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and engage young people on HIV cure research happening in their local settings and in global spaces. Academy Alumni have been invited to join advisory boards, speak at conferences and claim seats at influential tables discussing HIV cure research. In coordination with other key country-level stakeholders, alumni have started shaping country-level policy shifts and research agendas around HIV cure research.

Conclusions/Next steps: Through continued investments in literacy and advocacy, it is possible to increase the African civil society engagement in HIV cure. Future grants will focus on linking projects to create momentum on key advocacy issues in core countries.

Continued investment is needed to deepen the knowledge of alumni, support additional grants and create supportive country-level networks to maintain durable and sustainable leadership development.

EPD0581

Stigma towards people living with HIV in Australia: are public attitudes changing?

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Background: Stigma towards people living with HIV remains a significant barrier to the HIV response worldwide. Experiencing or anticipating stigma can have significant detrimental effects on people living with HIV, and undermines efforts to improve HIV prevention, testing, and treatment.

We investigated expressed stigma towards people living with HIV among the Australian public to determine the extent to which public attitudes towards people living with HIV have changed in recent years.

Methods: A single item measure of expressed stigma was included in the 2017 Australian Survey of Social Attitudes (a postal survey of a representative sample of the Australian population). In 2021, the same item was included in an online survey of a random sample of the Australian population, with data collection coordinated through a Qualtrics research panel.

Comparisons of expressed stigma towards people living with HIV between the two surveys were compared using logistic regression.

Results: 3,252 survey responses were included for analysis (n=1,001 in 2017; n=2,251 in 2021). The average age of participants in 2021 was higher than in 2017 (57.9 years vs. 54.3 years, $p<.001$). There was a smaller proportion of female participants in 2021 (50.2%) than in 2017 (54.5%, $p<.01$).

When controlling for these demographic differences, the proportion of participants who reported that they would never express stigma towards people living with HIV was larger in 2021 than in 2017 (49.6% vs. 47.7%, aOR=1.04, $p=.043$), while the proportion who would rarely express stigma was smaller (24.3% vs. 27.6%, aOR=0.95, $p=.017$).

There were no significant differences in the proportions who reported that they would sometimes, often, or always express stigma towards people living with HIV. Conservatism was identified as the strongest predictor of expressed stigma towards people living with HIV.

Conclusions: More than half of surveyed members of the Australian public reported that they would express stigma towards people living with HIV.

Although expressed stigma was slightly lower in 2021 than in 2017, there is a clear and urgent need to address HIV-related stigma throughout the community, particularly with interventions tailored to groups in society where stigma is most likely to be expressed.

EPD0582

Using the community score card approach to monitor quality of HIV/SRHR services in Uganda

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Background: The Community Score Card (CSC) is a participatory community-based monitoring and evaluation tool that enables citizens/beneficiaries to assess the quality of services they receive such as health, education, water and transport for evidence-based advocacy. The CSC was conducted in 12 health facilities in districts of Isingiro and Kamuli at Health Centre III and IV reaching 278 respondents (108 Male and 170 Female).

Methods: The Community Score Card (CSC) approach used Focus Group Discussions, Key Informant Interviews and Interface Meetings with service beneficiaries and service providers for consensus scoring. People Living with HIV, health workers, village health teams, community and local councilors and district local government officials were interviewed.

The study followed the thematic areas of the National Strategic Plan for HIV Prevention, Care & Treatment, social support and systems strengthening such as staffing, equipment and utilities for HIV/SRHR and other integrated services. In details it looked at HIV/SRHR & TB service delivery, coaching and mentorship programs, psychosocial support, rights awareness, capacity building for care givers, home based care and treatment of opportunistic infections.

Results: Some of the findings included; regular stock outs of drugs and other supplies, limited follow-up of recipients of care, inadequate mentorship of peer buddies, lack of cancer and hepatitis B screening services, poor adolescent HIV&SRHR management, limited integration of TB and other services, Low uptake of family planning services and safe male circumcision.

Conclusions: To address the gaps, National Medical Stores (NMS) needs to ensure constant supplies of drugs, equipment's and reagents including testing kits and condoms to reduce frequent stock outs. Do routine screening of cancer & hepatitis B, conduct regular mentorship



programs for peers buddies and offer social support protection, patient's rights and responsibilities based on the patients charter.

EPD0583

Improving HIV service delivery for young men in Eswatini - a community leadership engagement model

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Background: Eswatini has a sustained progress towards UNAIDS 95-95-95 targets at 94-97-96 with young men aged 15 -24 years at 91-96-87. However, HIV incidence transmission rate amongst young-men aged (20 - 34) is still high. Eswatini HIV Recent Infection Surveillance (EH-RIS) further shows that males constitute about 50% of the females tested for recency, due to men's poor health seeking behavior. Gaps remain in diagnosing men with HIV and young men achieving viral load suppression. To respond to this, Pact implements a project called Triple-R which supports the Government of Eswatini to reach young men through community leadership (CLs). Triple R supports young men through providing HIV prevention interventions to reduce HIV risks and transmission.

The purpose of the study is to assess the effectiveness of community leadership in improving health service uptake for Eswatini young men.

Methods: Routine project data covering 20 constituencies from January to December 2022 was utilized. Community Leadership Engagement Officers (CLEOs) build capacity of traditional CLs on HIV prevention. CLs then identify and organize young men aged 20-29 for HIV prevention sessions in their constituencies. CLEOs further identify available resources like clinics and engage them to provide services for the young men. During the sessions, the young-men are encouraged to access the available services.

Results: There were 203 community leaders reached with HIV prevention and resource mobilization skills. CLs then organized about 2617 men who were then have reached on HIV prevention services. As a result, 1502 (57%) of men were referred for clinical service uptake where 1399 (93%) accessed clinical services.

Conclusions: CLs prove to be very effective in community mobilization. Young men attend HIV prevention sessions and take up services if they are offered in their places of comfort. Seeing other men accessing health services proves to be amotivation to do the same. There is an urgent need to support CLs efforts in improving HIV prevention services uptake in their communities.

Public health systems and policies need to integrate community led innovations to enforce equitable and sustainable HIV service delivery.

EPD0584

The AWAMU HIV awareness campaign: training peer educator champions to spread HIV prevention and awareness information among key populations in five districts across Uganda

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Background: In Uganda, as of 2021, the estimated HIV prevalence among adults aged 15-49 is 6.2%, with HIV prevalence among key populations estimated to be three times that. This is attributed to a number of factors, including: commercial sex, drug use, limited access to HIV prevention and testing services, and poor perceptions and attitudes towards HIV prevention programs.

Description: Working in partnership with district health offices and local health partners, communities in need of HIV prevention and testing outreach were identified for awareness outreach.

A two-day Peer Educator Champions training in HIV prevention messaging aimed at overcoming barriers between HIV knowledge and social stigma was conducted in each of the five districts. Peer Champions approached key populations in various locations for free HIV services, including HIV testing and counselling, PrEP information/initiation and condom distribution.

A structured survey was conducted to collect program data which was uploaded in real time onto a secure encrypted database using cellphone data or wi-fi.

Lessons learned: A total of 67 Peer Educator Champions were trained in Kabale, Sheema, Mbarara, Kasese and Lira. They consisted of young people, HIV +ve individuals, and key community leaders. 4,996 people from key populations were reached with HIV information and awareness.

Of these, 27% were sex workers, 13% truck drivers, 24% 'Boda Boda' drivers and 36% youth and adolescents. 3,641 were referred for HIV testing with 403 people referred for PrEP. The program opened a mobile HIV clinic in Katuna (Uganda/Rwanda border) for targeted testing among special groups.

A total of 147 HIV +ve individuals have been linked to care through our HIV Adherence, Retention and Treatment (HART) program which uses quality improvement methodology to monitor adherence and retention.

Peer Educator Champions were successful at creating networks within their key populations which increased attendance.

Conclusions/Next steps: The results show that a peer-to-peer approach to HIV awareness is effective. Despite the challenges of low resources and hard to reach communi-



ties, we were able to exceed our targets by over 50 per cent. Given that the AWAMU campaign has run for only 12 months, we are confident that we can see positive results as we continue.

EPD0585

Dynamic partnership to redefine community engagement in HIV programming in Nigeria

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Background: Since 2007, Clinton Health Access Initiative (CHAI) has introduced several transformational interventions to improve access to optimal HIV diagnostics, treatment, and technologies. To enhance community engagement in HIV interventions, Unitaid and CHAI partnered with Afrocarb Treatment Access Partnership (Afrocarb) in 2016 to develop activities centered on improving treatment literacy among people living with HIV (PLHIV) and driving the uptake of optimal HIV products through the Optimal community advisory board (Optimal CAB).

Description: At the inception of the Optimal project funded by Unitaid, CHAI supported the Optimal CAB to implement community engagement activities across 56 health facilities in 12 states within Nigeria.

The key deliverables of the Optimal CAB were:

- To facilitate optimal product adoption,
- To improve treatment literacy among PLHIV on optimal products to generate demand, and;
- Obtain feedback from PLHIV on optimal products to inform policy.

CHAI provided evidence on optimal products while Optimal CAB members disseminated this information to the community.

Lessons learned: The Optimal CAB supported the adoption and uptake of 9 HIV products in Nigeria: Tenofovir-Lamivudine-Dolutegravir, Lopinavir/ritonavir pellets, Pediatric Dolutegravir (pDTG), Darunavir/ritonavir, Liposomal Amphotericin B, Flucytosine, VISITECT, CrAg Lateral Flow Assay, and TB-LAM.

Optimal CAB advocacy contributed to the recommendation of DTG as the preferred first-line antiretroviral regimen, and over 1.6 million people are now on DTG-based regimens in Nigeria.

On product uptake, the Optimal CAB has produced and disseminated 14 print and 5 audiovisual Information Education and Communication materials on HIV services to 54% (20) of states in Nigeria. Optimal CAB members trained 56 adherence counsellors on AHD and 148 mentor mothers on pDTG, disseminated information that de-

bunked myths resulting in equitable and increased access to DTG among women, supported tracking of HIV services and facilitated drug delivery during the COVID-19 movement restriction.

Optimal CAB observed low ADRs and OIs reporting rates, hence built PLHIV capacity to report these for appropriate management.

Conclusions/Next steps: Community engagement has become a pillar of HIV programming in Nigeria and should be integrated into HIV interventions. More critically, the engagement should be targeted at treatment literacy on optimal HIV services to achieve better treatment outcomes.

EPD0586

Using pharmacy activations to create demand for HIV self-testing in the private sector in Kenya

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Background: Private sector distribution channels play a huge role in the provision of preventive healthcare services globally. The channels have promoted access to HIVST by hard-to-reach population as well as promote sustainable programs. Much is yet to be done to accelerate the sale of HIVST kits in the private sector as implementors have strategized on how to reach clients reached with HIVST. PS Kenya utilized pharmacy activations to accelerate uptake of HIVST kits in Kisumu and Nairobi in November 2022. We assessed the effectiveness of activations in creating demand for HIVST kits.

Description: 25 Goodlife pharmacies were mapped (Nairobi 19 and Kisumu 6). 11 sale promotion agents were oriented to conduct in store activations for seven days. The agents were deployed to the pharmacy to speak to clients on the importance of HIVST, types of HIVST kits available and their use. The pharmacies were stocked with Information and educational materials to sensitize clients on the need for HIV testing. Agents mobilized clients within the pharmacy vicinity and provided t-shirts to clients who bought HIVST kits. Agents spoke to clients one-on-one or in groups to enable in-depth education of clients on HIVST kits use. The clients were encouraged to purchase other Sexual and Reproductive Health products alongside HIVST kits.

Lessons learned: A total of 365 customers were engaged in Kisumu and 49 kits were sold while 368 customers were engaged and 62 Kits sold in Nairobi. 111 Quality Assured (QA) Kits were sold during activations depicting increased clients' awareness of availability of HIVST kits at pharmacies. Pitch and demonstrate usage of HIVST to customers provoked the need for testing. Leveraging on merchandise was received well and alleviate sell of QA kits. Price



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influenced consumer buying behaviors and preferences for the kit where majority preferred QA.70% of Nairobi customers talked to were willing to purchase kits anonymously from online platforms whereas 90% in Kisumu preferred buying from a pharmacy. 60% of the clients bought SRH product alongside HIVST kits for double prevention.

Conclusions/Next steps: Pharmacy activations are effective approach to increasing awareness on pharmacies that stock the kits and subsequently increase sale.

EPD0587

Strengthening HIV prevention and sexual health among Vietnamese youth through an innovative public-private partnership

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Background: Young people in Vietnam are at increased risk of sexually transmitted infections (STIs) like syphilis, gonorrhea, chlamydia, and HIV, and often lack access to accurate health information and youth-friendly sexual and reproductive health (SRH) services.

The Vietnam Ministry of Health (MOH), Durex, Glink key population-led clinic, and USAID/PATH STEPS Project co-designed the "Break the Shame, Come Together" campaign to support greater HIV/SRH awareness and health-seeking among youth.

Description: In August 2022, STEPS convened representatives from the Vietnam MOH, Durex, and Glink in a series of co-creation sessions to discuss a potential partnership for addressing low youth uptake of HIV, STI and broader health services. During these sessions, the team gathered insights from a range of youth informants, assessed data on youth uptake of HIV/SRH services, and reviewed current youth/student outreach initiatives. Through this, we identified several challenges preventing youth from accessing HIV/STI services—including stigma around SRH health-seeking; lack of awareness of why, where, and how to seek HIV/STI testing; and cost of services—and applied these insights to form the "Break the Shame, Come Together" campaign in Vietnam.

Reinforcing online and offline campaign activities, including a YouTube video, campaign website, and online registration platform for free STI testing at Glink, were promoted across social and mass media channels, at eight in-person events at schools, and on the platforms of popular youth influencers.

Lessons learned: Generating insights from a range of young people throughout the campaign design and implementation process enabled the development of trustworthy and accessible content. From November 2022-January 2023, the campaign resulted in 1,257 people

registering for STI testing at Glink and 1,017 people seeking STI testing, of whom 154 had a positive test and were referred for follow-up treatment and care.

Additionally, the campaign team distributed 265 HIV self-tests and supported 175 individuals to book pre-exposure prophylaxis appointments.

Conclusions/Next steps: Public-private partnerships can be a powerful strategy for reaching young people with essential SRH information and services that aligns with their needs and preferences.

Further growing the number and types of these engagements is essential for realizing Vietnam's twin goals of ending AIDS and ensuring universal health coverage by 2030.

EPD0588

Development and validation of the transition readiness assessment tool for adolescents and young adults living with HIV in southwestern Uganda

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Background: Treatment outcomes are reported to be poorest among adolescents and young adults living with perinatally acquired HIV (AYPLHIV) compared to adults and young children living with HIV. The rates of disengagement from care, loss to follow up, poor adherence to ART and mortality are highest during the transition from pediatric to adult HIV care.

AYPLHIV facing transition should be equipped with skills in health care management, self-care, and health care decision making, and assessed for transition readiness before transition.

Methods: We developed and validated a transition readiness scale for use among AYPLHIV in rural Southwestern Uganda using mixed methods between December 2020 and November 2021.

First, we conducted in-depth interviews with AYPLHIV, caregivers, and healthcare providers to get their perspectives on transition readiness of AYPLHIV facing transition to adult HIV care.

We generated an initial item pool of 71 items that we reduced to 54 items through focus groups discussions with AYPLHIV and health caregivers. We pilot tested the 54-



item questionnaire with a convenience sample of AYLPHIV (n=30) that resulted into 49 items. We then administered the 49 items questionnaire to a validation sample of AYLHIV (n=300) majority of whom had not transitioned to adult HIV care. We used confirmatory factor analysis to verify the proposed scale structure. We evaluated the scale for reliability and validity.

Results: The mean age of the participants in the development phase was 20 (standard deviation [SD 3.1] while that for the pilot phase was 20.07 (SD=3.27) years, while the mean age of the validation sample was 19.1 (SD=2.81) years. The duration on ART for the validation was 15 (SD=4.72) years.

We identified four domains related to transition readiness including self-management, health care navigation, transition preparation and HIV stigma. The 23-item scale was internally consistent with a Cronbach's alpha of 0.87 with good test-retest and interrater reliability.

Construct validity was good as demonstrated through correlation with related constructs including social skills ($p<0.001$) and self-management ($p<0.001$) as well as age ($p<0.001$).

Conclusions: The new 23 item transition readiness scale is a reliable and valid measure of assessing transition readiness among AYLPHIV.

EPD0589

Using human centered design and marketing to unpack U=U in Zimbabwe

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Background: Undetectable=Untransmittable (U=U) remains abstract in Zimbabwe. We used human centred design to inform a multi-level marketing campaign to articulate the benefits of HIV treatment and viral load suppression (VLS) in a way that resonates with U=U among clinical providers and people living with HIV.

Description: Job aids complemented the campaign to help providers communicate VLS. 3 "Be OK" bead bottles adapted from South Africa's 'Coach Mpilo' demonstrate how HIV treatment works with illustrations attached to each bottle to guide provider interpretation of client viral load (VL) test results.

A 'wheel' illustration helps providers identify treatment knowledge gaps. 37 ART Champions living with HIV were trained to inspire ART adherence among their peers by

sharing HIV treatment testimonies. Three pilot facilities implemented between September 2021 and September 2022.

Lessons learned: VL testing at pilot sites increased by 164% during the pilot. Providers cited increased efficacy to communicate results.

"I have seen these tools work and they simplify my way of counselling. Before these tools, I wasn't as confident to explain viral suppression." [Clinician]

ART Champions reported increased understanding of VLS among their peers.

"Before these tools, people were not aware that adhering to ART would lead to TND (Target Not Detected) which means you are less likely to pass HIV to others. This was difficult for people to understand. When you use these tools, you can give vivid examples. I use 3 bottle beads and each bottle represents my body." [ART Champion]

ART Clients expressed motivation to achieve VLS.

"After the demonstration, I understood that I was in the first bottle and I was motivated to move to the third. I wanted to experience the benefits of being virally suppressed." [ART Client]

Conclusions/Next steps: Combining marketing and human centered design drove simple, relatable messaging and uptake of the communications interventions. Simplifying complex medical concepts helps providers and recipients of care to communicate benefits of VLS. Effectively communicating U=U in Zimbabwe and beyond requires relatable language and models to unpack VLS and create demand among recipients of care, potentially reducing provider follow-up burden. The campaign and tools could be adapted for implementation in other contexts.

EPD0590

Meaningful engagement of young people into care through provision of holistic psychosocial support, YGA model

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Background: In the response to fight HIV/AIDS, MUJHU was created in Kampala, Uganda in 1988 as a partnership between two universities and with a mission to improve the health status of families infected and affected by HIV/AIDS through research, training, prevention and care. MUJHU has conducted women and child centered research to prevent vertical and sexual HIV transmission in Uganda and improve the care of HIV-infected children, adolescents, women and their families.

It provides PMTCT services at the adjacent national referral Hospital since 2000 which includes around 30,000 women attending antenatal care services and serves approximately 3,500 HIV infected clients and their infants and families with comprehensive HIV care. MUJHU real-



ized early the need to address the unique needs of children and young people living with HIV thus the development of MUJHU Young Generation Alive (YGA) a psychosocial support group for children, adolescents, and youth infected with and affect by HIV/AIDS.

Methods: MU-JHU YGA conducts various activities to address the key challenges affecting young people living with HIV/AIDS including; monthly peer led meetings where session's organised and facilitated by young people themselves to support their fellows in various key areas of life as adherence, gender based violence, sexual reproductive health rights, addressing stigma and its related challenges.

The program also extends the reach to the community level through school and community outreach programs to create awareness about HIV/AIDS to combat stigma and discrimination and also achieve the 95.95.95.

Results: Due to peer to peer support, membership has escalated from 5 in 2005 when the group was started to 436 up to date. In 2023, there is a significant impact of viral load suppression among young people in the group with over 80% virally suppressed.

Empowerment sessions during the meetings have enabled majority of young people to live their dreams and become role models to other members in the group.

Conclusions: There is need to provide comprehensive services such as psychosocial support in addition to treatment support offered to young people by various medical stakeholders to enhance a better life among young people infected and affected by HIV/AIDS.

EPD0591

HIV positive sero-status disclosure to sexual partners among sexually active young people on anti-retroviral therapy in Central Uganda

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Background: Disclosure is a fundamental HIV prevention and care strategy yet there is a paucity of literature about self-disclosure of HIV serostatus to sexual partners among young people on anti-retroviral therapy (ART).

This study intended to comprehend the factors associated with HIV-positive serostatus disclosure to sexual partners among young people aged 15 to 24 years on anti-retroviral therapy in selected public health facilities of Central Uganda.

Methods: The explanatory sequential study utilized quantitative data of 238 sexually active young people on ART from seven districts of Central Uganda, from the interviewer-administered questionnaire. Young people that had been on ART for not less than 12 months and in a sexual relationship for over 6 months, participated in this study. Frequencies, percentages, Pearson's Chi-square, and multinomial logistic regression analysis at $\alpha=0.05$. Qualitative data from 18 young people; was collected using an in-depth interview guide, and thematic analysis was used to explain key quantitative findings.

Results: Non-disclosure was at 26.9%, one-way disclosure was at 24.4%, and two-way disclosure was at 48.7%. Participants who contracted HIV from their partners were three times more likely (RRR=2.752; 95% CI: 1.100-6.888) to have one-way disclosure than no disclosure, compared to those who had a perinatal infection. Those who contracted HIV from their partners were twice more likely (RRR=2.357; 95% CI: 1.065-5.214) to have two-way disclosure than no disclosure, compared to those who had a perinatal infection.

Participants who stayed with their partners were four times more likely (RRR=3.869; 95% CI: 1.146-13.060) to have two-way disclosure than no disclosure, compared to those who stayed with their parents. Young people disclosed because they were tired of secrecy and desired treatment adherence. Those who did not disclose feared stigma and losing their partners' support.

Conclusions: Many sexually active young people on ART do not disclose their HIV-positive status to sexual partners mainly due to poverty, being in casual sexual relationships, and fear of stigma.

Interventions fighting stigma and poverty, and those promoting serious sexual relationships among sexually active young people on ART, should be strengthened to facilitate self-disclosure which is still critical in HIV prevention, care and treatment.

EPD0592

Thandizo Approach: Increasing ART Adherence among Young People Living with HIV in Malawi

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Background: In Malawi, many young people (10-24 years) living with HIV struggle to achieve optimal adherence to antiretroviral therapy (ART). With funding from Aidfonds, Coalition of Women Living with HIV and AIDS (COWLHA) conducted a study in 2018 on factors that hinder young people from adhering to ART. As a result of the study, a risk assessment tool called *Thandizo App* was developed to help young with treatment adherence through youth support groups as entry points.

Description: The Thandizo mobile app is a risk-assessment tool to support young people. It identifies risks for interruption of HIV treatment and provides information,



advice and referrals to health services. The app provides materials for community health volunteers to use in support groups with young people living with HIV. Discussion topics and animation videos aim to facilitate group discussions on topics such as stigma and discrimination, community knowledge and gender norms.

Lessons learned: Thandizo App improved ART adherence among young people living with HIV (YPLHIV) and most defaulters were brought back to care with successful retention of 89%.

The community health volunteers referred 1,105 young people to support groups, 1,059 to health facilities and 237 to teen clubs to ensure YPLHIV get the care and support they need.

The safe space in support groups, which saw their numbers increase from 395 (2019) to 2421 (2021), helped young people to live a healthy life with hope for the future.

The support groups in combination with the mobile app help YPLHIV to deal with stigma mental health challenges and increases (treatment) knowledge, self-worth and confidence.

Conclusions/Next steps: The Thandizo approach is effective in improving treatment adherence among YPLHIV in Malawi and contributes to achieving UNAIDS 95-95-95 targets for 2025.

The success of Thandizo allows COWLHA and Aidsfonds to explore options for scaling up the approach to support more young people living with HIV in other districts and countries.

EPD0593

Stigma and poor mental wellbeing: a global community approach to identifying and addressing common barriers to living well with HIV

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Background: Inequities in socially marginalized and disenfranchised communities continue to drive disparities in HIV transmission rates, testing, as well as linkage and retention to care. Identifying and addressing common barriers to living well with HIV may improve health outcomes for these communities.

Description: Ten community leaders of diverse, under-represented groups of people living with HIV, including women and girls, LGBTQ+, people of color, migrants, older adults, sex workers and people who use drugs, from Europe, North America, Africa, and Asia-Pacific convened

twice over a three-month period to identify the collective barriers to living well with HIV and the specific challenges experienced within the regions and communities represented. Supported by a structured literature review, the HIV Community Council (HCC) focused further discussion on identifying and evaluating solutions aimed at helping address the identified barriers impeding the successful long-term management of HIV and ultimately improve health outcomes and person-centered care.

Lessons learned: The HCC identified seven systematic and cultural barriers, mainly linked to stigma and discrimination, as well as poor mental/emotional wellbeing, that are applicable across all regions and consistently prevent people from living well with HIV. Self-stigma and stigma in the healthcare setting are intrinsically linked, negatively impact mental health, and reduce access to care.

To address stigma, solutions should frame HIV in the context of everyday life, disseminate the power of an individual's story through social and conventional media, and deliver positive and clear messages around viral suppression, including undetectable=untransmittable (U=U). To address poor mental wellbeing, interventions should be person-centered and contextualized for people living with HIV. In addition, community-based support should be bolstered with formal mental health training and include access to structured referral systems that bridge the gap between community-based support and clinical care.

Conclusions/Next steps: Identifying barriers to living well with HIV from the perspective of community representatives is key to informing future interventions, facilitating access, and ensuring a meaningful, culturally appropriate, and lasting response to HIV care.

The community now "calls for action" to frame these insights within a set of recommendations that make it possible for all people to live well with HIV.

EPD0594

Saving for a rainy day: piloting a savings intervention to reduce HIV risk among young female sex workers in Siaya County, Kenya

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Background: Female sex workers (FSWs) are at higher risk of HIV due to unprotected sex with multiple partners whose HIV status they are unaware of or who pay higher premium for unprotected sex. Hard economic times currently being experienced post-COVID has reduced the 'demand' for sex work by male clients and increased the 'supply' thus making FSW more desperate to earn a living. The desperation may drive FSW to engage in more risky sexual practices. We are piloting a savings intervention encouraging FSW to save part of their earnings and call it back whenever in need, to avoid risky sexual encounters.



Methods: We enrolled self-identifying FSW ages 18-24 years working in beaches along Lake Victoria in Siaya County, Kenya. Half were randomized to the savings intervention and half to control. Those in the intervention arm were asked to consider saving part of their earnings through mobile banking coordinated by the study team. They were informed that the purpose of the saving was to help them reduce engagement in risky sex by having a small financial reserve they can call back when needed. Participants in both arms were also given diaries to keep records of income, loans and expenditure over the 6-month intervention period.

Results: We enrolled 209 participants, 102 assigned to the intervention arm. Mean age was 21.2 years; 42.6%, 54.5% and 2.9% had primary, secondary and post-secondary education, respectively; 54.5% were single and 44.0% were married/cohabiting.

To supplement sex work, 61.2% were engaged in petty trade while 36.8% had wage employment. 39.2% saved a total of US\$282.3 (average US\$7.1 per person) over 6 months while 16 (n=40) recalled US\$56.8 back (20.1% of saved amount), averaging US\$3.6 per person who saved. Even without training on savings, participants' diaries indicated a monthly balance from income-plus-loan minus expenditure of US\$1.2, which they can save for 'a rainy day.' Data collection on the effect of savings on sexual risk-taking is ongoing and will be reported during the conference.

Conclusions: FSW can save part of their earnings and call back as needed, but require nudges to increase the proportion saving and the amounts saved.

EPD0595

Women's socio-spiritual empowerment for HIV/AIDS acceptance in Bandar Lampung City, Indonesia

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Background: Acceptance of HIV/AIDS status is not easy for women diagnosed for the first time. This is especially important for women who do not engage in risky HIV/AIDS behaviors. We must encourage women who have been diagnosed with HIV/AIDS to accept their HIV/AIDS status. The research aimed to investigate the concept of empowerment to accelerate women's acceptance of their HIV/AIDS status in Bandar Lampung City.

Methods: Through mixed-methods research with a sequential exploratory approach. In-depth interviews with two key informants and nine HIV/AIDS companion informants from three HIV/AIDS communities and networks

in Bandar Lampung City were obtained by purposive sampling. Then, they distributed online questionnaires to 27 women who transmission with HIV or AIDS. Validity of data on one HIV/AIDS female informant and member verification on three HIV/AIDS community/network coordinator informants Data analysis uses content analysis.

Results: The stages of empowerment for HIV/AIDS women were obtained, namely:

1. The cooperation stage;
2. The case-finding stage;
3. The self-introduction stage;
4. The problem exploration stage and self-potential;
5. The assistance implementation stage,
6. The monitoring and evaluation stage.

The companion takes a "socio-spiritual" empowerment approach by acting as an administrator, ARV sender, educator, preacher, motivator, facilitator, medical escort, enabler, befriender, fundraiser, and advocate. by utilizing social media, personal approach methods, and group methods that are carried out continuously.

Through the concept of socio-spiritual empowerment, it was found that 92.6% of women accepted their HIV/AIDS status as "good."

Conclusions: It is necessary to develop a socio-spiritual empowerment module for guidelines on empowering women to receive HIV/AIDS status.

EPD0596

HIV stigma, mental health and substance use in transgender women with HIV: results of the first year of follow-up in the TransCITAR cohort

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Background: TransCITAR is a prospective cohort study that monitors physical and psychosocial health of 500 transgender and non-binary people over a five-year period in Buenos Aires, Argentina.

This study presents monitoring of HIV-related stigma and mental health indicators in transgender women with HIV (HIV TGW) at 12-month follow-up.

Methods: From September/2019 to January/2023, 100 HIV TGW enrolled in TransCITAR completed both baseline and 12-month psychosocial questionnaires. Instruments screened for HIV-related stigma (Berger scale, 4 dimensions): personalized stigma, disclosure concerns, negative self-image, and concern with public attitudes toward people with HIV; depressive symptoms (CES-D) and sui-



cide ideation (last week); suicide attempts and nonsuicidal self-injury (last year), alcohol (AUDIT) and drug (DAST) use (last year). Student's paired t-tests and McNemar test were used to analyze changes over time.

Results: Median age:31 years (IQR 27–37). At baseline, 16.3% showed hazardous drinking and 1.3% drug abuse; 34.7% reported significant depressive symptoms and 15.8% suicide ideation; and 2% suicide attempts and 4% non-suicidal self-injury.

After 12 months, there were no significant changes in these mental health indicators (depressive symptoms: 31%; suicide ideation: 13.3%; suicide attempts: 2%; nonsuicidal self-injury: 3%; hazardous drinking:22%; drug abuse: 5.2%).

However, HIV stigma decreased significantly, ($t(95)=2.52$; $p<.05$), particularly, the following dimensions: personalized ($t(95)=3.28$; $p<.05$) and negative self-image ($t(95)=3.25$; $p<.05$).

Conclusions: Although HIV stigma decreased at one-year follow-up; there was a concerning rising trend in alcohol and substance-related problems and no changes in the proportion of poor mental health indicators. Consistent with previous evidence these findings show persistent mental health problems in TGW and highlight the importance of monitoring and understanding the trajectory of these indicators and mediators involved, to identify and establish priorities for health policies, regarding prevention, intervention and treatment for this population.

EPD0597

A socio-ecological analysis of the barriers and facilitators to HIV pre-exposure prophylaxis uptake among transgender persons in four districts in South Africa

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Background: The Uptake of HIV-related treatment and prevention services and retention in care varies among key populations, with lower rates reported amongst transgender persons ("trans" people). Under the Global Fund grant (2019 – 2022), Beyond Zero scaled-up access to HIV pre-exposure prophylaxis (PrEP) for trans people in four districts as part of comprehensive HIV prevention programs. 7 288 TG were identified to be HIV-negative and eligible for PrEP in the implementing districts. To enhance PrEP uptake among trans people, this study examines their perceptions of PrEP.

Methods: We conducted three focus group discussions (FGDs) with 24 peer educators and two FGDs with 13 target beneficiaries across all the implementing districts. The FGDs were conducted in March 2021 as part of the mid-term evaluation of the comprehensive HIV prevention programs for trans people implemented by Beyond

Zero. The data were inductively examined with a content analytic approach to construct descriptive categories. We supplemented findings from the primary qualitative analysis with quantitative indicators derived from program records to describe the current PrEP coverage among trans people in the service districts.

Results: The PrEP coverage was 13% of estimated HIV-negative trans people. Participants identified barriers at the sociocultural level, including the sexual identity-related stigma associated with HIV PrEP being marketed as an intervention for "key populations"; HIV-related stigma associated with the labeling of PrEP medicines as antiretroviral therapy (ART); lack of sensitized healthcare workers at public healthcare facilities.

At the community level, healthcare access issues e.g., medicine stock-outs and PrEP availability only in larger urban centers; and limited community knowledge were reported. P

artner-level barriers included the perception of PrEP as ART by sexual partners and the need to hide PrEP due to trust issues that arise. Individual-level barriers included reluctance to take a daily oral tablet for prevention and concerns about PrEP's safety.

Conclusions: Scale-up of the PrEP program requires careful attention to individual, social and structural factors that act as determinants of HIV vulnerabilities in the South African context.

Our findings can inform future PrEP research with trans people in South Africa, as well as PrEP implementation efforts to increase uptake among this population.

EPD0598

Hazardous alcohol use associated with higher risk sexual risk behavior among fishermen in a high HIV prevalence area of Kenya

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Background: Alcohol use among fishermen residing in Lake Victoria communities is common. Links between hazardous alcohol use and HIV-related risk behaviors including unprotected sex, transactional sex, and partnership concurrency are well-established. We sought to examine patterns of sexual risk behavior associated with



hazardous alcohol use among Kenyan fishermen to inform efforts to reduce HIV transmission in this high-priority population.

Methods: Baseline survey data were collected in 2022 among 733 fishermen in three communities in Siaya County, Kenya, among whom 715 (97.5%) were sexually active in the past 6 months, in the ongoing 'Owete' study. Survey modules included the AUDIT-C 3-item alcohol screener for measurement of alcohol use disorders, and a sexual relationship history calendar.

We fitted three logistic regression models to examine associations between hazardous alcohol use in past 3 months and:

1. Any concurrent sexual relationship,
2. Concurrent relationship among non-polygamous men only, and
3. Any higher-risk sexual relationship (e.g., commercial sex worker, one-night stand) in past 6 months, incorporating a random effects intercept for community and controlling for age and income level;

where warranted, models adjusted for marital status and clustering at community-level.

Results: Most 89.5% were in a relationship, with 21% in polygamous marriages. Self-reported PrEP (6.6%) and condom use (<5%) in the past 6 months were low. About one-third (35.2%) reported any alcohol use, and 16.8% reported hazardous use, in past 3 months. Hazardous alcohol use (along with younger age and higher income) was significantly associated with higher-risk sexual partnerships (aOR=1.66; 95% CI 1.10,2.51) and concurrent partnerships (*all participants*: aOR=1.67; 95% CI 1.11,2.51; *non-polygamous participants only*: aOR: 2.00; 95% CI: 1.29,3.09).

Characteristic	N	%	Model 1: Any concurrency all men, past 6 mo.			Model 2: Any concurrency, non-polygamous men, past 6 mo.*			Model 3: Any higher risk sexual partners, past 6 mo.**		
			aOR	p	95%CI	aOR	p	95%CI	aOR	p	95%CI
Hazardous alcohol use											
AUDIT-C 0-3	630	83.2	ref.			ref.			ref.		
AUDIT-C ≥4	103	16.8	1.67	0.014	1.11 2.51	2.00	0.002	1.29 3.09	1.66	0.015	1.10 2.51
Age											
Age<18	678	92.5	ref.			ref.			ref.		
Age≥18	55	7.5	3.04	0.000	1.71 5.77	4.22	0.000	2.36 7.56	-	-	-
Age (continuous)			-	-	-	-	-	-	0.99	0.047	0.97 1.00
Income level											
Below median	334	45.6	ref.			ref.			ref.		
Above median	399	54.4	1.71	0.002	1.26 2.30	1.41	0.058	0.99 2.01	1.37	0.019	1.05 1.74
Partnership status											
Single/divorced/separated	77	10.5	ref.			ref.			ref.		
In a partnership	636	89.5	1.77	0.004	0.99 3.15	-	-	-	0.48	0.004	0.25 0.77

Notes: Models are logistic regression or mixed-effects logistic regression models in a study population of n=733 men, n=715 of whom were sexually active in past 6 months.

*Model 2 excludes n=138 men in polygamous marriage

**Model 3 incorporates a random intercept for community and adjusts for clustering at community level (models 1 and 2 did not require)

Table 1. Hazardous alcohol use associated with higher risk sexual behavior among fishermen in Siaya, Kenya (2022).

Conclusions: Hazardous alcohol use co-occurred with higher-risk sexual behavior among fishermen residing in lakeshore communities. In this population vulnerable to HIV acquisition with low uptake of prevention services to date, HIV prevention efforts may need to address hazardous drinking.

EPD0599

"I felt out of place" - lived experiences of adolescents who have transitioned to adulthood care at the Lighthouse Clinic in Lilongwe: a qualitative analysis

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Background: Adolescents and young people represent a growing number of people living with HIV worldwide. At Lighthouse Trust (LH) ART clinic, adolescents aged 10-19 living with HIV are managed through teen clubs that happens on Saturdays, until they are transitioned to adulthood care. A successful transition is critical for optimum health outcomes for young adults, hence there is a need to understand the factors affecting ART uptake among young people living with HIV (YPLHIV) who have transitioned to adulthood care.

This study aimed at exploring the young adults' experiences of adulthood ART care at LH ART clinic in Lilongwe.

Description: This was a qualitative study using a phenomenological design. We retrospectively reviewed teen club transition records of YPLHIV aged 20-24 who were in teen clubs at LH from 2013-2021. Twelve in-depth interviews were done with purposively selected young adults and their guardians, including six healthcare workers providing ART to the transitioned young adults. Interviews were recorded and transcribed. We explored three main themes based on YPLHIV experiences at adolescent age, transitioning phase and post transition to adult care. Data were analyzed thematically.

Lessons learned: We reviewed 387 records of which 212 (55%) were women and 175 (45%) were men. In the adolescent phase, the YPLHIV reported the teen clubs contributed positively to ART uptake before transitioning to adult care.

However, during the transitioning phase, the YPLHIV had negative perceptions of the adult care due to feeling abandoned and losing peer support. Post transition, the YPLHIV felt positively due to the independence of managing their appointments and medication adherence without their guardians' support.

Still, they were concerned with potentially being identified as HIV positive when attending standard clinic hours during the week, the lack of peer interaction and support, and healthcare providers' attitudes.

Conclusions/Next steps: Our study highlights a need to continue engaging YPLHIV who have transitioned to adult care such as establishing unique peer-based interventions for YPLHIV for continued emotional support. There is also a need for healthcare providers to work closely with transitioned YPLHIV to identify and strengthen coping strategies as they become independent.

**EPD0600**

Positive Thinking, A Way to Be and Act: use of Facebook to engage young boys aged 15-24 years in HIV prevention, care, and treatment, in four provinces of Mozambique

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Background: Reaching global targets to end AIDS by 2030 requires focusing on people who are not yet accessing lifesaving HIV services. Young people (15-24) account for 30% of all new adult HIV infections, and although young women are disproportionately affected by HIV, young boys are less likely than their female counterparts to test for HIV, initiate antiretroviral therapy, and remain engaged in care. Social media is increasingly used to deliver HIV interventions, and Facebook is one of the most accessible and popular websites among young people worldwide.

This study analyzes ECHO's social media strategy performance to reach young boys in nine cities across the four provinces supported by the project, after the first six months of implementation.

Methods: A previous study on social networks habits of target population conducted in the four provinces found that Facebook and WhatsApp are the social networks most used by the age group 15-24. ECHO designed a 2-phase approach to implement its social media strategy using Facebook:

1. Recruiting social fans through first-person narratives and role models,
2. Promotion of HIV services through challenges, quizzes, tips, and influencers.

Posts content focused on prevention, care, and treatment issues.

We analyzed performance using two indicators:

1. The engagement rate, defined as the total number of interactions (reactions, comments, shares, and clicks) by the total number of users reached, and;
2. The growth rate of fans, represented by the page likes count.

Results: As of November 30, 2022, the total number of fans on ECHO's Facebook page was 3,140, representing a percentage growth rate of 65.7% from the number during the first 3-months of implementation (June-August 2022); 99% of the fans were males, 95% aged 18-24, and 97.5% from target locations. The engagement rate was 4.9%.

Conclusions: ECHO's Facebook strategy is reaching the target population, while with challenges for the 15-17 age group, given Facebook restrictions to target people <18. An engagement rate between 3.5%-6% is generally considered high in the social media industry.

Further analysis will be necessary to measure the impact of the strategy on demand for HIV services and retention rates.

EPD0601

Human-centred design and market segmentation approaches to support demand creation for a novel HIV prevention method for women: the Dapivirine Vaginal Ring

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Background: The dapivirine vaginal ring (DVR) is the first long-acting, woman-controlled HIV prevention product recommended for use by the WHO and approved by African regulatory authorities. With DVR rollout commencing in 2023, it is important to co-create communications strategies that resonate with potential end-users by addressing their barriers and facilitators to use. This study provides end-user insights and demand creation recommendations.

Methods: This study utilized a human-centered design methodology to produce end-user/community-led demand creation strategies.

The study was two-fold:

1. Understanding end-users through behavioral segmentation and,
2. Co-designing and testing communication approaches. Quantitative and qualitative methods were used to identify end-user segments among 1300 women, aged 15-45, across 5 countries (South Africa, Zimbabwe, Malawi, Kenya and Uganda). Areas of exploration included: ring perceptions, partner dynamics, reproductive health, communication channels and HIV risk profile. Workshops with 422 women, 52 men and 38 stakeholders were held to co-create messages and communication tools.

The study centered each stage of the end-user's journey with the ring: awareness; consideration; obtaining the product; and first/ continued use.

Results: Four to five segments were identified per country which revealed that women from rural locations were more likely to use the ring. Young women aged 15-29 were most interested in using the ring. In South Africa, however interest was greater in women aged 30-45. The co-design workshops generated demand creation prototypes that address the facilitators and barriers to ring use.

Findings suggested that: awareness was dependent on peer/social networks; consideration was based on perceived level of HIV risk; obtaining it corresponded with a heightened sense of empowerment; and first and continued use needed to address issues of vaginal insertion.

Conclusions: By employing human-centred design methods this study produced an in-depth understanding of the potential end-user segments and a package of country-specific demand creation prototypes that were co-designed with and tested by these segments.

The community-led nature of this study ensured that messaging and positioning of the ring resonated with and was relevant to the potential end-users and key stakeholders' perspectives and experiences.



Oral
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The study outputs will be made available to real-world ring implementation projects to support recruitment, up-take and continued use.

EPD0602

Experiences of stigma, social support, and anxiety in people living with HIV in South Carolina: a multiple mediation model

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Background: People living with HIV (PLHIV) experience numerous psychosocial stressors, including HIV-related stigma and heightened prevalence of mental health disorders. However, limited research has investigated predictors of anxiety within this population.

This study aimed to explore the relationship between HIV-related stigma and anxiety symptoms among PLHIV in South Carolina (SC) and to examine the role of social support as a mediator for this relationship.

Methods: A total of 402 PLHIV receiving HIV care in SC completed a survey, reporting sociodemographic variables, as well as experiences of HIV-related stigma (i.e., enacted, anticipated, and internalized stigmas), social support, and anxiety.

A multiple mediation model was conducted using path analysis to determine whether social support mediated the relationships between the three types of HIV-related stigma and anxiety.

Results: The root mean square error of approximation suggested only minor misfit (RMSEA = 0.055) of the model, and the model predicted a significant portion of the variance in social support ($R^2 = .104$, $p = .0004$) and anxiety ($R^2 = .263$, $p < .0001$).

Social support was negatively predicted by enacted stigma ($B = -.314$, $SE = 0.106$, $p = .003$) and internalized stigma ($B = -.312$, $SE = .106$, $p = .003$) but positively predicted by anticipated stigma ($B = .311$, $SE = .11$, $p = .005$).

Anxiety was positively predicted by enacted stigma ($B = .245$, $SE = .094$, $p = .009$) and internalized stigma ($B = .267$, $SE = .092$, $p = .004$). Social support and anticipated stigma did not predict anxiety ($p > .05$).

The indirect effects through social support on anxiety were not significant for enacted, anticipated, nor internalized stigma ($p > .05$).

Conclusions: These findings add to a limited body of research examining predictors of anxiety amongst PLHIV. Experiences of enacted and internalized stigma are associated with increased anxiety symptoms, suggesting HIV-related stigma may partially explain the heightened prevalence of anxiety amongst PLHIV.

Mental health practitioners should be aware of and address the specific stressors such as HIV-related stigma experienced by PLHIV. Beyond individual interventions, community-based stigma reduction efforts must be made to improve the mental health outcomes of PLHIV.

EPD0603

A community-based participatory research training and mentorship program empowers and mobilizes community leaders to improve HIV response in underserved communities in the Dominican Republic

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Background: The health system gaps are more notorious in vulnerable communities across the Dominican Republic (DR), particularly the HIV response in underserved rural areas (Bateyes). Community mobilization and empowerment effectively create culturally appropriate and evidence-based prevention and mitigation strategies that lead to epidemic control. Yet, most HIV research implemented in these communities does not involve community leaders in identifying health priorities, designing and implementing research proposals, or creating evidence-based strategies. Thus, the Building Academic Capabilities and Knowledge with Underserved Populations (BACKUP) Project sought to increase skills in community-based participatory research (CBPR) by establishing a formative platform to set the stage for future academia-community collaborations to promote evidence-based actions that improve HIV response at the community level.

Description: BACKUP consisted of an inter-institutional collaboration of training and mentorships between the US and the DR. A cohort of health sciences students and community leaders (CLs) participated in 13 synchronous and asynchronous sessions from March to August 2022. National and international public health experts facilitated sessions in a hybrid modality.

In addition, hands-on training and coaching were delivered to community research dyads (CRDs), comprising 2 students and 3 to 4 CLs. The goal of the CRDs was to co-design research proposals that addressed health disparities faced by the Batey Cinco Casas (BCC) community.

Lessons learned: BACKUP allowed CLs to partner with aspiring researchers and develop five CBPR projects (1 per CRD); one of them was funded and implemented after IRB approval. The research focused on social determinants of health and identified barriers to accessing the HIV Integrated Care Services (SAI, Spanish acronym). CLs were intrinsically motivated to propose strategies to the SAI to address the issues revealed in the study.

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Conclusions/Next steps: Training and mentoring CLs in CBPR increased their confidence in their ability to impact their community and initiated a community mobilization, resulting in a better understanding on the impact of HIV on the BCC community and on how to propose locally adapted strategies to improve access to HIV services.

In addition, the newly trained CLs acquired knowledge and skills to work with local HIV researchers and to transfer them to other surrounding Bateyes of the DR.

EPD0604

Factors associated with uptake of Enhanced Adherence Counseling among Adolescents with HIV viremia in health facilities in Nairobi County, Kenya

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Background: Enhanced adherence counseling (EAC) is a structured method of assessing current adherence levels, exploring barriers, and developing individualized adherence intervention plans to improve viral suppression. Adherence to treatment among adolescents has been reported to impede good treatment outcomes. WHO recommends EAC for People Living with HIV (PLHIV) with high HIV viremia and suspected treatment failure and EAC has been associated with high re-suppression, yet limited information exists on the uptake of EACs among the adolescent population.

The study focused on assessing the uptake of enhanced adherence counseling among Adolescents living with HIV (ALHIV) on HAART with a documented high viremia in selected health facilities in Nairobi City County.

Methods: The study used a cross-sectional analytical design and purposively sampled adolescents aged between 10 and 19 years who had a documented high viremia as of December 2018. A total of 379 viremic adolescents who consented to participate in the study were randomly selected and interviewed from 45 facilities in Nairobi County.

Data were collected utilizing questionnaires and key informant interview methods and conducted focus group discussions (FDG). Qualitative data were collected, coded, and categorized to come up with emerging themes.

The Data analysis was done using Stata version 16. Continuous variables and categorical variables were described by measures of central tendencies and frequency tables respectively. To assess the relationship between predictor and result variables chi-square tests were applied.

Results: The findings showed, only 41% of ALHIV who participated in the study received EAC and completed the 3 adherence sessions, 55% were females and the median age was 14 years.

The type of treatment supporter was associated with the uptake of EAC $p = 0.039$. Level of knowledge and compliance to prescribed medication were significantly associ-

ated with EAC where 73% had adequate knowledge and 80% were compliant ($\chi^2 = 8.1907$, d.f = 1, $p = 0.004$) and ($\chi^2 = 14.563$, d.f = 1, $p = 0.000$) respectively.

Conclusions: The study demonstrates low uptake of EAC sessions despite adequate levels of knowledge on EAC. Tailoring strategies for adolescents with high viremia packed and structured by age categories and availing illustrative materials may increase re-suppression rates for adolescents to support viral suppression.

EPD0605

A qualitative study on food insecurity and coping strategies among clients receiving highly-active antiretroviral therapy in a tertiary health facility, Southwest Nigeria

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Background: Individuals that have acquired HIV in LMIC are doubly burdened by food insecurity and malnutrition. Lack of access to adequately nutritious food will impair viral load suppression making them resort to different survival measures for food sustenance. There is paucity of data on food insecurity and coping strategies among PLHIV in Southwestern Nigeria, this study therefore aimed to assess food insecurity, and coping strategies among clients receiving highly active antiretroviral therapy at Olabisi Onabanjo University Teaching Hospital (OOUTH), Ogun State.

Methods: This was a qualitative study carried out at the HIV clinic of OOUTH, Ogun State. Trained health professionals conducted in-depth interviews on PLHIV, 18 years and above, that have been on HAART for at least 6 months, and are attending HIV clinics in OOUTH in the consulting rooms of the clinic. Interviews were conducted until saturation of data was reached.

A pre-tested interview guide, adapted from the Household Food Insecurity Access Scale (HFAS), was used. Interviews were recorded, transcribed, and thematically analyzed using Atlas.ti software.

Results: A total of 20 respondents (8 males and 12 females), aged 26-61 years were interviewed. Three major themes emerged from this study; food insecurity status, effects of food insecurity on viral load suppression, and coping mechanisms for food insecurity. Majority of the participants were food insecure, and expressed difficulty in getting food, which compromises their adherence to medications leading to poor viral load suppression.

The respondents identified transactional sex, selling personal belongings, meal skipping, eating less desirable food, and borrowing money from friends and relatives, as coping strategies for food insecurity in this study.

Conclusions: Food insecurity is a major problem among a significant number of clients interviewed in this study, hence a quantitative study is needed to investigate the



magnitude of this problem. In addition, management of HIV/AIDS should entail a comprehensive nutritional intervention to meet up with the nutritional requirement of PLHIV.

EPD0606

Together, we can make it: insight from community-clinical linkages for children and adolescents living with HIV (CALHIV) enrolled in Children Tariro OVC Program, Family AIDS Caring Trust (FACT) Manicaland, Zimbabwe

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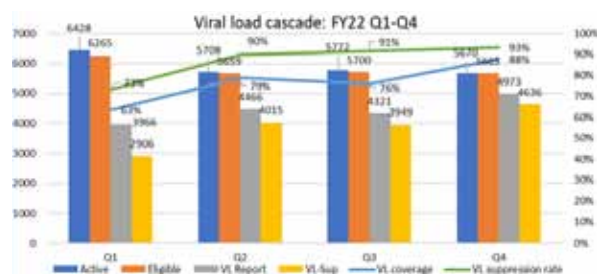
Background: Between October 2021 and September 2022, FACT Zimbabwe and its consortium implemented the Children Tariro (CT) Program, supported by PEPFAR through USAID. The program provided a comprehensive and integrated package of services ensuring children are healthy, schooled, safe, and in stable households.

This was to improve the HIV-related outcomes for orphans and vulnerable children (OVC) aged 0 to 17 years and meet their individual/family needs and contribute to UNAIDS' 95-95-95 epidemic control objectives.

Description: FACT collaborated with Ministry of Health and Child Care-MOHCC, Clinical Partners, Department of Social Development-DSD, households, and other stakeholders in FY22. Clinic and community health data shared to identify children with unknown HIV status, on ART and requiring other services such as education, consumption support, etc. MOHCC provided line lists of women with HIV to assist track biological children for status, assessed children with risk of HIV acquisition, and longitudinally tracked infants exposed to HIV. MOHCC/Clinical Partners provided HIV Testing Services through community/clinical referrals. Service provision was through home visits, virtual, and case conferences in collaboration with relevant stakeholders. Community cadres had biweekly and monthly contact with ill and stable children respectively. Collaboration, weekly referral stakeholder meetings, and case management/conferences improved beneficiaries' access to and uptake of services.

Lessons learned: 15/597/2,5% through collaboration were newly diagnosed HIV positive from Q1 -Q4 initiated ART and enrolled into OVC. 6,428 enrolled in Q1 were already on ART.

The diagram below shows, 99,9%CALHIV received services in Q4 compared to 96% in Q1. Viral suppression: improved from 73% to 93% Q1 - Q4 respectively, compared to provincial-78%, VL coverage increased to 88% in Q4 from 63% in Q1 (Provincial-50%). OVC Community-clinical linkages improved identification and management of CALHIV.



Conclusions/Next steps: Community-clinical partners sharing and comparing data enables comprehensive treatment, care and support of CALHIV and their caregivers, improving linkages, coverage and viral suppression.

EPD0607

Exploring the impact of eServices on m2m Peer Mentors and their clients during the COVID-19 pandemic

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Background: The m2m program implemented eServices, including Virtual Mentor Mother Platform and Peer via Phone, during the COVID-19 pandemic to continue providing comprehensive services to clients in South Africa, Kenya, and Lesotho.

The objective of this study was to explore the effect of these eServices on the workload and effectiveness of m2m Peer Mentors and the outcomes of their clients.

Description: The study utilized a mixed-methods approach, including in-depth interviews, focus group discussions, secondary client data analysis and key informant interviews with Peer Mentors, Site coordinators, and Programme Managers. Data was collected over a period of 6 months, between December 2020 and May 2021.

Lessons learned: Results showed that while the majority of Peer Mentors had a positive experience using eServices, they also reported increased workloads, with some indicating a need for a reduced number of calls or a review of the content of calls.

Additionally, network and data challenges were reported as barriers to the effective use of eServices. On the clients' side, the eServices we see attributable results in adherence to ART, HIV testing, and viral load testing, with an increase of 5% in client's adherence to ART and 10% in HIV testing. However, clients from rural areas faced challenges accessing the services due to lack of network and electricity.

Conclusions/Next steps: The study highlights the importance of continuous improvement of eServices for m2m to offer quality services to clients. Recommendations include reviewing the workload of Peer Mentors and the structure and content of Peer via Phone calls, utilizing other platforms to push educational content to clients, and further research to determine the clients' experiences of the eServices platforms. This is the basis for the conceptualisation of m2m's Peer and Allied Health Worker Model.

**EPD0608****To Tell or Not to Tell: changes in Ukrainian older adults' HIV status disclosure behaviours during humanitarian crisis**

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Background: During the war, HIV care becomes a key concern for older people with HIV (OPWH). Due to logistical and informational obstacles, they may require support with HIV care from new contacts. We sought to understand longitudinally how crises have changed OPWH disclosure behaviours.

Methods: We surveyed OPWH in Kyiv, Ukraine, by phone between May-June 2020 (Wave 1), January-February 2021 (Wave 2), January-February 2022 (Wave 3) and May-June 2022 (Wave 4). Participants' binary responses were compared between Wave 1, Wave 2, Wave 3 and Wave 4 to assess changes in HIV disclosure status. The primary outcome was new HIV disclosure, and the exposure variables were living conditions (living alone, not living alone) and HIV care support.

Other variables were: age, gender, comorbidities, social support, anxiety and depressive symptoms defined as scores on the Patient Health Questionnaire-9 (PHQ-9) >5 and the Generalized Anxiety Disorder-7 scale (GAD-7) >5, time since disclosure, and history of substance use disorder (SUD) and/or alcohol use disorder (AUD). Associated factors were identified using logistic regression.

Results: 98 OPWH completed the survey across all four waves. In Wave 4, there were 47 (48%) women, and the average age was 56.9 (SD=6.4). Men appeared less likely to disclose their HIV status, with 40 (64.5%) during Wave 1, 48 (85.7%) during Wave 2, 41 (85.4%) during Wave 3, and 43 (89.6%) during Wave 4, compared to 48 (78.7%) women in Wave 1, 50 (87.7%), 54 (100%) and 49 (96.1), respectively. During Wave 4, only twenty-five (26%) reported HIV care support, while 71 (72%) reported increased depressive symptoms, 58 (59%) indicated anxiety symptoms and 3 out of 4 OPWH reported having social support.

History of SUD and/or AUD (OR 3.34, $p < 0.05$) and time since disclosure (OR 1.10, $p = 0.01$) were associated with increased HIV status disclosure. Living condition was not associated with disclosure.

Conclusions: The war challenged accessing HIV care for OPWH in Ukraine. As many confidantes fled the war, OPWH experienced adverse psychological outcomes and

were forced to disclose to new supports, with higher disclosure rates in Wave 4. Interventions to support disclosure processes among OPWH are needed.

EPD0609**Factors associated with disclosure of known HIV-positive status in a facility-based index testing program in Telangana, India**

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Background: Disclosure of HIV-positive status is important for preventing onward transmission and ensuring rapid linkage to care and antiretroviral therapy initiation for those diagnosed. Yet, individual and structural barriers may impede prompt disclosure even among spousal/partner relationships. In a facility-based index testing program in Telangana, a high HIV burden state of India, we characterize factors associated with disclosure of known HIV-positive status by contacts to index clients.

Description: We implemented index testing in 50 HIV testing and treatment facilities and identified 25,883 contacts. Among these, 795 contacts (elicited from 714 indexes) reported to counsellors that they already knew they were HIV-positive. To measure disclosure, we characterized these 795 participants with respect to whether the index client was previously aware of the contact's HIV-positive status. Associations between disclosure of positive HIV status and contact characteristics were evaluated using logistic regression.

Lessons learned: Of 795 contacts who acknowledged their HIV-positive status to a counsellor, the median age was 32; 60% were female; 85% were married to the index, 6% were non-spousal sexual partners, and 9% were biological children. Overall, 84% were reported as HIV positive by the index client, while 16% as either HIV negative or status unknown. Among adult contacts, disclosure was significantly more common for spouses (adjusted odds ratio vs. sexual partners [AOR: 3.03]) and female [AOR vs. male clients: 1.48] contacts and less common for older contacts [AOR per 5 years, 0.88; $p < 0.05$ for all]. Of the 795 contacts, 74% were on ART at the time of elicitation, 15% were linked to ART after counselling, and (11%) have not yet been linked to ART.

Conclusions/Next steps: While overall disclosure of HIV-positive status appeared to be high in this index testing program, we identified some gaps. Index clients were less likely to be aware of the HIV-positive status of older and non-spousal contacts. Targeted counselling and other strategies to improve disclosure of HIV status should be considered in these groups.



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EPD0610

Social media use, internet access and HIV-related perceptions among people presenting for HIV testing in South Africa

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Background: Interventions delivered through mobile phones and social media, known as mHealth, have been shown to improve adherence, testing, and retention in care, but rely on the coverage of phone ownership, internet access, and/or social media.

This study examines the prevalence of internet and social media use among a cohort presenting for HIV testing, and associations with HIV stigma and clinical outcomes.

Methods: We conducted a prospective study among HIV-naïve people presenting for HIV testing in Umlazi township, South Africa between September 2013 and April 2017. Participants completed baseline questionnaires on internet access, social media use, prior HIV testing, perceived HIV risk, and HIV stigma (via validated scale). Those who tested HIV-positive were followed for 12 months. Retention, viral suppression (≤ 40 copies/mL), and partner notification were recorded at month 12.

We estimated adjusted prevalence ratios (aPR) with Poisson models for baseline associations, and adjusted odds ratios (aORs) for 12-month outcomes. All models were adjusted for baseline age, sex, education, employment, income, and food insecurity.

Results: Among 7814 participants, 46.8% had internet access and 54.1% used social media. Social media users were 13% more likely to have previously tested for HIV (aPR=1.13; 95%CI 1.10–1.16), 28% more likely to believe they were at high risk for HIV acquisition (aPR=1.28; 95%CI 1.21–1.35), and were 8% more likely to endorse stigmatizing attitudes than non-social media users (aPR=1.08; 95%CI 1.04–1.11). Similarly, internet access was positively associated with prior HIV testing, high HIV risk perceptions, and stigmatizing attitudes about HIV.

Among PLHIV, social media users were 49% more likely to be retained at 12 months (aOR=1.49; 95%CI 1.25–1.78). There were no statistically significant associations between internet or social media use and viral suppression or partner notification.

Conclusions: Among people presenting for HIV testing in South Africa, internet access and social media use were associated with prior HIV testing, higher HIV risk perceptions, and stigmatizing attitudes towards HIV. These results should inform the scale-up of mHealth technologies and highlight an area of caution: Internet and social

media platforms can helpfully disseminate public health messaging, but may also contribute to stigmatizing attitudes.

EPD0611

Opioid use and HIV prevention related outcomes among Black sexual diverse men: assessing an understudied priority area of HIV research

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Background: Research specific to the use of opioids and psychosocial aspects of HIV prevention among Black sexual diverse men (BSDM) warrants further attention. Although substance use, in particular, stimulant and alcohol use, have received considerable attention, less is known about the impact of opioid use and HIV among BSDM, yet the area is evolving given the broader concerns regarding the epidemic of opioid use across the USA.

Methods: Participants (N=474) were enrolled in a randomized controlled trial to increase access to HIV prevention services. Participants identified as BSDM and resided in the southeastern region of USA. Surveys assessments and HIV/STI testing were completed at baseline and follow up assessments (3 follow ups) over the course of one year. Data were collected between 2017–2020. Bivariate and multivariate regression analyses were used to evaluate patterns and relationships of opioid use and HIV prevention behavior within the sample.

Results: Overall prevalence across all study time points of recent (past three month) opioid use was 11.6% (N=56). Among a subset of the overall sample who accessed HIV/STI testing (N=369), opioid use was related to testing reactive to HIV during the time period prior to COVID related shutdowns (8/42, 19% among opioid users and 30/327, 9.2% among non-users $\chi^2(1)=3.93$, $p<.05$). Participants, however, who reported opioid use (75/93, 80.6%) were less likely than non-users (335/337, 89.9%, $\chi^2(1)=5.91$, $p<.05$) to show to HIV testing appointments. Opioid use was found to be related to psychosocial measures including higher levels of stigma towards people living with HIV and perceiving oneself to be at an increased risk for HIV transmission.

Conclusions: Data from the current study suggest that opioid use is associated with greater risk for HIV and reduced access to HIV prevention services. Important relations also emerged between the use of opioids and negative psychosocial beliefs. The need to understand opioid use, in particular among individuals at elevated risk for HIV (i.e., BSDM), is imperative, yet limited research in this area exists. As opioid use unfolds across populations vulnerable to HIV, efforts to monitor the impact opioids will remain critical.

EPD0612

HIV-positive, heterosexually married men who have sex with men in China: sexual behaviors and HIV status disclosure

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Background: While previous studies addressing HIV status disclosure to sexual partners could prevent HIV transmission and increase HIV care adherence and support in people living with HIV (PLWH), we have limited knowledge about life changes and interactions with their spouse and/or sexual partners among HIV-positive individuals who married to heterosexual women in China. This qualitative study aimed to:

1. Explore sex life among HIV-positive, heterosexually married men who have sex with men (HIV+ MSM) before and after HIV diagnosis, and;
2. Understand their life experiences of disclosing HIV status to their spouses and/or same-sex sexual partners from a public health perspective.

Methods: We undertook a descriptive, exploratory study to pursue this line of inquiry. Eighteen semi-structured interviews among HIV+ MSM were conducted between March-May 2022 in China.

Results: Drawing on the concepts of queer theory and heteronormativity, the thematic analysis generated three major themes: inconsistent condom use with same-sex sexual partners before HIV diagnosis (due to limited HIV-related knowledge, low-risk perceptions, and risky sexual behaviors) and HIV disclosure and sexual behaviors after HIV diagnosis. HIV disclosure was uncommon amongst respondents after a full evaluation of their social interactions.

After the diagnosis, disclosing HIV status to their wives was challenging due to fears of sexual identity exposure and family rejection; nonetheless, they sought to manage secondary HIV transmission to their wives and same-sex sexual partners with different strategies (no sex, alternatives to intercourse, the U=U).

Conclusions: Our findings indicate that HIV disclosure is not well equipped in taking into consideration of negative social climates towards HIV+ MSM and legal regulations surrounding HIV disclosure, HIV stigma, and family.

In all, HIV disclosure is not just a public health issue, it requires the collaborative efforts of medicine, public health, social work, education, and laws (system) to promote equality, guarantee human rights, non-discrimination, and de-criminalization, and access to social services in

China. Last but not least, the results suggest that multi-level HIV education programs increase awareness, acceptance, and testing uptake and point to key factors that need to be taken into account in future efforts to optimize HIV treatment adherence for PLWH.

EPD0613

Loss to contact affects uptake of TB prevention services by refugees tested for TB in post COVID-19 pandemic era in Nairobi, 2023: benchmarking the refugee act, 2021 in Kenya

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Background: Stable housing and food security for all are key to maintaining adherence. In the case of immuno-compromised persons these targeted and specific interventions may counter loss to contact. The End to TB goal is premised on identifying, diagnosis, screening, testing and treatment for all persons living with TB. However, for immuno-compromised refugees confounding hardships lead to their being "left behind" or "lost to contact."

This paper models different combinations of service modalities fostering cost-effective strategies addressing the hardships thus increasing demand for services by refugees.

Description: We used Respondent Driven Sampling (RDS) technique to identify 7 eligible shelters where refugees living with TB lived. We used a mixed method approach to obtain data. A structured questionnaire was sent out to targeted 67 respondents, supplemented by a web and literature search for existing studies or data reports. Data were analysed using SPSS Statistics version 21.0 (Chicago, IL, USA) and Microsoft Excel 2010.



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Lessons learned: The shelters provided a home, food and livelihood opportunities for the refugees. Low adherence was observed in (2) shelters; medium adherence observed in (3); and high adherence in the next (2).

An analysis of factors for high adherence revealed contributions by and presence of expert TB prevention champions, good-will, rapport and connections with different service-providers facilitated quick referrals in case of complications; housing stability, food security and existence of livelihood projects facilitated access to incomes and ability to afford social amenities.

Conclusions/Next steps: Expert, motivated TB Prevention Champions, facilitated shelters, housing stability, food security and economic independence foster health seeking practices among refugees. This highlights benefits, the capacity of shelters and refugee friendly social support mechanisms to catalyse motivation to engage in health seeking practices leveraging adherence. Mechanisms for shelters to foster healthy living provide insight into observed adherence or lack thereof.

The Refugees Act, 2021 provides protection to a person in Kenya who is outside his or her country of nationality or habitual residence, who is fleeing persecution or serious harm or for other reasons. Housing stability, food security and economic independence should be aspirations that this act ensures. This has ripple benefits on good health and wellness of refugees.

EPD0614

Assessing the Impact of Pharmaceutical Patents on Access to Antiretroviral Treatment in Africa: A Review from 1990-2020

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Background: Globally, Africa bears the greatest burden of HIV. Approximately 69% (23.5 million) of the 34 million people living with HIV worldwide are located in Africa. Despite this, access to antiretroviral treatment (ART) in the continent for people living with HIV remains a significant challenge. One major factor contributing to this challenge is the issue of pharmaceutical patents, which limits the production and distribution of generic antiretrovirals in the continent.

This review was to assess the impact of pharmaceutical patents on access to ART in Africa from 1990-2020.

Methods: A comprehensive review of literature was carried out by searching databases such as PubMed, Google Scholar, and Cochrane with keywords: "pharmaceutical patents", "antiretrovirals", "Africa", "HIV", and "people living with HIV".

Supplemental data were also obtained from official directories of the International Federation of Pharmaceutical Manufacturers' Association and the World Health

Organization. Only papers published between 1990 and 2020 and those that reported country-specific evidence of the impact of pharmaceutical patents on access to ART were selected. Qualitative content analysis was then carried out on the resultant data extracted.

Results: Of 517 studies identified in the search, 201 reported country-specific cases. We found that between 1990 and 2020, pharmaceutical patents significantly impacted the availability of and access to ART in Botswana, Burkina Faso, Ethiopia, Ghana, Kenya, Liberia, Malawi, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, and Uganda. Evidence from our study revealed that when these countries attempted to import or manufacture generic versions of antiretrovirals that will be affordable for people living with HIV, legal charges/lawsuits were filed against them by pharmaceutical companies that held patents on the drugs.

Conclusions: This study has important implications for policymakers and stakeholders seeking to improve access to ART in Africa. Our results suggest that the relaxation of patents on antiretrovirals could improve access to ART for people living with HIV in the continent.

Furthermore, greater attention to the enactment of flexibilities in international trade laws, such as compulsory licensing, to bypass pharmaceutical patents and produce or import generic versions of antiretrovirals at lower costs could improve access to ART for people living with HIV.

EPD0615

Barriers and facilitators to accessing HIV prevention and treatment services among migrant youth globally: a scoping review

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Background: Both migrants and young people experience disproportionately high rates of HIV acquisition and poor access to HIV prevention and treatment services. To develop effective interventions and reach epidemic control, it is necessary to understand the barriers and facilitators to accessing HIV services among migrant youth. We conducted a scoping review to identify these factors for migrant youth ages 15-24, globally.

Methods: We conducted a PRISMA-concordant scoping review using keyword searches in PUBMED and Web of Science for peer-reviewed primary literature published between January 2012 and October 2022. We included studies that investigated barriers and facilitators to accessing services for migrant youth participants. We used the Social Ecological Model as an analytical framework.



Results: The 53 studies meeting the inclusion criteria spanned 20 countries, of which 53% (n=28) were low- and middle-income countries. Study methods were: quantitative (n=27, 51%), qualitative (n=22, 42%), and mixed methods (n=4, 7%). Thirty percent (n=16) of studies included immigrant youth, 17% of studies (n=9) included refugee/asylum-seeking youth, 17% of studies (n=9) included migrant worker youth, and 8% of studies (n=4) included rural-to-urban migrants. The remainder represented unspecified migrant youth populations.

At the individual level, barriers to HIV services included self-stigma, language challenges, and lack of HIV/AIDS knowledge. At the relationship level, fear of social ostracization posed a barrier to HIV services.

Conversely, migration also provided the opportunity to form more accepting social bonds forged by shared experiences, acting as a facilitator to HIV services.

At the community level, barriers to HIV services included discrimination by the community and by healthcare providers due to intersectional stigma towards HIV and migrants.

At the societal level, barriers to HIV services were: stigmatizing social norms, lack of health insurance, and fear of deportation. Migration to an environment where HIV was less stigmatized facilitated greater linkages to HIV services.

Conclusions: Migrant youth face significant, unique barriers to accessing HIV services. However, facilitators exist that can be leveraged to enable access.

Future implementation science research and adapted programmatic interventions should prioritize migrant youth as a distinctive sub-population to receive targeted HIV services.

EPD0616

Self-disclosure of HIV serostatus significantly affected the willingness to provide dental care among dentists in Taiwan

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Background: The aim of this study is to analyze the influence of serostatus disclosure on dentists' willingness to treat HIV-positive clients in the context of the National Health Insurance (NHI) PharmaCloud System in Taiwan.

Methods: This cross-sectional survey was conducted during March to June 2022 by self-administered KAP (knowledge attitudes and practices) questionnaires containing 56 questions either in web-based or paper-based forms.

The participants were recruited from the annual meetings of the dental associations and from online dental communities. Data were analyzed by descriptive statistics and independent sample T test.

Results: A total of 618 valid questionnaires (588 web-based, 30 paper-based) were collected. 52% of them were male and the mean age of this cohort was 38.9 years old. 67% had provided direct dental treatment to PLWHA (people living with HIV/AIDS).

Selective willingness to treat HIV-positive clients of different life-styles: 76% were willing to treat gay populations; 62% to sex workers; 50% to drug users; 50% to all PLWHA; 10% refused to treat any of PLWHA.

Willingness to treat the disclosed and non-disclosed clients were 81% and 29%, respectively; the difference was statistically significant ($p < 0.001$).

Acceptance of the way of disclosure: 36% only accepted that PLWHA disclosed at the reception counter before seeing the dentist. 52% further accepted being informed verbally and directly to the dentist. Only 12% accepted all ways of disclosure including by PharmaCloud.

Agreement about displaying HIV-diagnostic code on PharmaCloud: 54% strongly agreed; 41% conditionally agreed; 5% thought no need to display.

Among the dentists who strongly demanded HIV-diagnostic codes be displayed on PharmaCloud also showed significantly less willingness to treat all kind of PLWHA, less willingness to both the disclosed and non-disclosed, and had stricter attitudes toward the way of disclosure (all of them $p < 0.001$).

Conclusions: Whether PLWHA disclosed their serostatus to dentists significantly affected dentists' willingness to treat PLWHA – among the community of dentists in Taiwan, the stigma on HIV/AIDS was essential. Since the PharmaCloud already displayed HIV-diagnostic codes, policy might appeal to dentists for accepting PharmaCloud as an alternative way of disclosure, which prevents PLWHA from the risk of privacy exposure to the greatest extent.

EPD0617

Examining the role of cultural norms in HIV-related outcomes in Latinx Sexual Minority Men

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Background: The United States continues to struggle with an HIV epidemic that disproportionately affects racial and ethnic minority communities. Latino sexual minority men (LSMM) alone account for approximately one-quarter of new diagnoses.

This health inequity fuels an HIV incidence in Latinx-majority Miami-Dade County, that is three times the national average. Previous theoretical and empirical research



shows linkages between internalized homonegativity and HIV risk via condomless sex and reluctance toward pre-exposure prophylaxis (PrEP). However, the National Institutes of Health's Cultural Framework for Health suggests that cultural factors are also key to consider when designing interventions to prevent HIV acquisition.

Pinpointing the mechanisms by which cultural factors prevalent in LSMM, including machismo, familism, and acculturation stress, influence the relationship between internalized homonegativity and HIV risk may highlight important areas of intervention for this often-overlooked community.

Methods: Data were collected from the ongoing ¡Adelante! study, consisting of (n=150) HIV-negative LSMM aged 18-34 in South Florida. Adjusted multivariable logistic regression analyses were performed to assess the association between Latino cultural norms and internalized homonegativity on recent (past 90 days) condomless anal sex and current PrEP use.

A moderation analysis explored the role of three cultural norms (machismo, familism, and acculturation stress) on the relationship between internalized homonegativity and HIV risk.

Results: Of the participants recruited thus far (n=64), more than half (n=33, 52%) reported recently participating in recent condomless anal sex, and 31%(n=20) were currently taking PrEP. The mean internalized homonegativity among this sample was (μ = 13.61, SD= 5.45, range 10-25). Preliminary analyses suggest a significant association between internalized homonegativity and both outcomes of interest (recent condomless sex and PrEP use) and a moderating effect of machismo on this relationship.

Conclusions: When seeking to develop community-based interventions, it is critical to understand the role of Latino cultural norms, yet the role of cultural context within LSMM remains poorly understood.

Results suggest addressing multilevel factors including internalized homonegativity and Latinx cultural norms, such as machismo, may be important components of HIV prevention interventions in this often overlooked and under-researched population. Data collection and full analyses will be complete by June 2023.

EPD0618

Bringing science to justice: impact of the expert consensus statement on the science of HIV in the context of the criminal law over the past five years

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Background: In 2018, 20 leading HIV scientists developed an expert consensus statement to address the misuse of HIV science in laws and prosecutions for acts related to sexual activity, biting or spitting. A detailed analysis of the best available scientific and medical research data on HIV transmission, treatment effectiveness and forensics was performed and described so that HIV science may

be better understood in criminal law contexts. The statement was the end result of a multi-year process developed by a partnership comprising the IAS, IAPAC, UNAIDS and HIV JUSTICE WORLDWIDE.

More than 70 additional expert scientists endorsed the statement prior to its publication in the Journal of the International AIDS Society (JIAS).

Description: Following an initial scoping report published in 2020, the HIV Justice Network undertook a desk-based review examining the impact of the statement on the unjust application of criminal law against people living with HIV on the basis of their HIV-positive status (HIV criminalisation) in the five years since its publication.

Lessons learned: The statement continues to meet its primary aim to support defence arguments in HIV criminalisation cases. For example, it has been entered as evidence in court cases in Canada, Colombia, Kenya, Lesotho and Taiwan. It also meets its secondary aim, supporting lobbying for law and policy reform, including in Burkina Faso, Moldova, Ukraine and Zimbabwe.

In addition, the ongoing process of promoting the statement has further supported advocacy efforts to raise the profile of the harms of HIV criminalisation.

Conclusions/Next steps: By providing accurate messaging about HIV science in the context of criminal law, the statement has elevated the global conversation about HIV criminalisation and the importance of science- and evidence-informed laws and policies. Nevertheless, too many laws and prosecutions for HIV-related offences continue to rely on incorrect and outdated interpretations of scientific evidence.

Although some lawmakers and courts have acknowledged scientific advances, others remain hesitant to revisit decades-old laws or depart from previous judicial decisions. Ending HIV criminalisation cannot rely on science alone.

Nevertheless, the statement – and its influential authors – can help limit unjust prosecutions while we work to end the HIV-related stigma, discrimination and structural inequalities that drive criminalisation.

EPD0619

Consensus statement: what it will take to get to the heart of HIV stigma and act on achieving the societal enabler targets in diverse contexts around the world

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Background: Precise articulation of stigma and discrimination is required in relation to and distinct from each other so that actions can be duly targeted and resources appropriately allocated. A consensus building process


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was undertaken in 2022 to seek consensus on key ideas, concepts, measures and approaches to guide responses to HIV-related stigma.

Methods: A Delphi consensus-building process was undertaken in 2022. Survey questions were developed based on findings from a systematic literature review (Ferguson et al. 2022) and key documents from a steering group.

A survey consisting of 103 data points was sent to a global expert panel of 50 people. Forty-four experts responded; the majority were from civil society (46%) and academia (39%).

Other respondents were from legal and clinical practice, donor agencies or policy organisations. From one round of responses, consensus (100% outright, or on aggregate, of those who responded to those items) was identified on thirty-two data points.

Results: Achieving consensus on definitions was seen as enabling comparability, cross-setting learning and efforts to assess progress towards global targets. It was identified that well-documented community participatory approaches, validated and community-led measures are important for effective monitoring and evaluation of stigma and discrimination. Adapting existing standardized stigma instruments/measures to specific cultural contexts and having guidance for local adaptation are important.

Consensus was found on the need for a regular review and coordination of the relevant global funding landscape, and for organizations to track and report their stigma and discrimination-reduction investments. The experts agreed that interventions should endeavour to target a combination of structural- and individual-level risks alongside resilience to tackle internalized stigma.

Conclusions: The global funding landscape is insufficient to meet the 10-10-10 societal enabler targets, including reducing experiences of stigma and discrimination to less than 10%. Strong political and financial commitments are essential.

There was consensus that investment is needed to establish a robust evidence base, across a range of settings and diverse populations, of promising interventions, partnerships and processes to support community-, individual-, institutional-level and policy-level interventions and in societal enabling approaches that remove legal barriers, shift harmful social and gender norms, reduce inequalities and improve institutional and community structures.

EPD0620

"Similar to drugs, it is a matter of choice."

Facilitators and barriers to smoking conventional and electronic cigarettes among Filipino people living with HIV in Metro Manila, Philippines

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Background: Electronic cigarettes (EC) are relatively new consumer products compared with conventional cigarettes (CC). Literature has discussed using ECs as a smoking reduction and cessation device. However, not much is known about its effect and the factors affecting the respiratory health of people living with HIV (PLHIV). This study aimed to qualitatively identify the barriers and facilitators to smoking CC and EC among Filipino PLHIV in Metro Manila Philippines.

Methods: Case design was utilized to ascertain the knowledge and develop relevant themes on barriers and facilitators that led PLHIV to use or not use EC/CC. Twenty Filipino PLHIV were recruited from an HIV clinic hub in Metro Manila, Philippines. In-depth interviews using a semi-structured questionnaire were administered in English or Filipino.

In addition, findings were thematically analyzed using NVivo software after transcribing all audio recordings.

Results: Four main themes were identified, with specific topics for each theme noted as facilitators or barriers (Fig.1). These central themes were personal, familial, community, and societal. Moreover, personal themes had curiosity, stress, and firm belief in the non-healthy effects of EC/CC. The familial theme included parental upbringing, while the community theme comprised peer pressure and relationships.

Furthermore, accessibility, economics, and news about the adverse events of EC use were the facilitators or barriers that emerged from the societal themes.

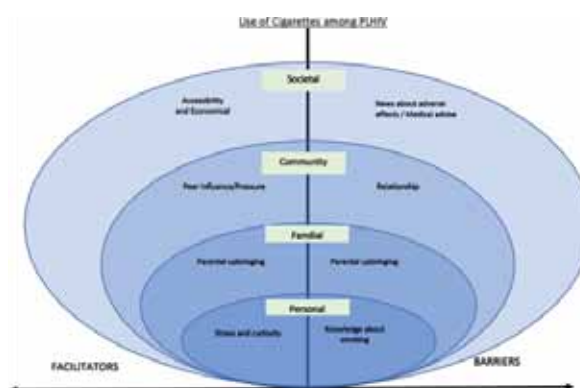


Figure 1. Facilitators & barriers among PLHIV that modified their usage of EC & CC.

Conclusions: Facilitators and barriers to EC and CC smoking among PLHIV may identify specific health determinants towards this behavioral use of EC and CC. PLHIV are



known to have a higher risk of developing detrimental respiratory outcomes. Strengthened and targeted EC/CC preventative campaign measures for PLHIV in the Philippines are recommended using our identified factors. Further understanding of this social behavior is warranted to prevent unwanted smoking-related morbidity and mortality among PLHIV.

EPD0621

Exploring the intersection of sexual and reproductive health and HIV issues in Hijra community: a call to action

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Background: Hijras are a cultural group in India who may identify as male-to-female transgender or intersex. Hijras are often marginalized and face discrimination but have gained some legal recognition in recent years. Castration (removal of male reproductive organs) is one of most significant aspects of gender identity and cultural expression of the Hijra community and is mostly conducted in unscientific manner resulting in SRH issues including STIs. As per the NACO, the latest national average HIV prevalence in Hijra/TG communities is 3.14% whereas out of 7 million STI/RTI clients visit to the clinics, only 1.5% were from the community.

Description: This study aims to examine the intersection of sexual and reproductive health (SRH) and HIV issues in hijra communities. It seeks to understand the unique challenges faced by this population in accessing SRH and HIV services, as well as the impact of stigma and discrimination on their health outcomes.

The study used qualitative methods, including in-depth interviews and focus group discussions, to gather data from hijra individuals in three cities – Delhi, Faridabad, and Lucknow.

Lessons learned: Hijra individuals face elevated risk due to castration and HIV infection. Despite significant advances in hormonal and surgical gender affirmation options, access to comprehensive sexual and reproductive health (SRH) care remains limited for many hijra individuals. In total, 119 hijra individuals participated in the study from July till November 2022 out of which notably 88% underwent castration by senior community members and remaining by quacks. Nearly 95% reported to face UTI post castration but could not access proper medical treatment due to stigma associated with their gender expressions. 2/3th of the study population visited government hospitals for treatment but only 5% could complete the treatment. All reported to facing discrimination and inappropriate questions by the medical providers. 3% tested positive for HIV.

Conclusions/Next steps: This study highlights the urgent need to address the SRH needs of hijra individuals through culturally competent and inclusive healthcare

services. To achieve the SDGs it is critical to better understand the specific SRH needs and experiences of hijra individuals, and to develop effective interventions to improve their overall health outcomes.

EPD0622

Community security system: efforts to prevent criminalization of the community Hanjar Makhmucik

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Background: The 2019-2022 period saw at least more than 30 cases of arrests and raids on the LGBT community in Indonesia. The existence of the LGBT community is always considered a social disease and is often the target of law enforcement officials in making arrests on the grounds of disturbing public order, violating traditional and religious values in Indonesia. There were 10 people arrested for entering the court process, 5 people were released because the evidence was not strong. The arrests were made as an effort by law enforcement officials to control the existence of LGBT in Indonesia.

Methods: Strengthening the community by establishing a community security system in 9 related districts, forming a security communication network, handling complaints and legal assistance, Forming legal aid services, building partnerships with strategic partners and increasing sensitization of gender issues within the scope of LBH law, establishing a communication forum between the community and law enforcement officers law.

Results: As many as 40 representatives from each of the LGBT communities in 9 districts received training on community security systems, the community is able to understand surveillance methods, conduct security mapping and analysis, is able to negotiate when an arrest is made by law enforcement officers, the availability of communication media between law enforcement agencies and the community in each district which has an impact on reducing cases of arrests against the community.

Conclusions: The criminalization of the LGBT community will continue as long as there is stigma in society, especially by the government. Efforts to control by law enforcement officials through a series of arrests for various reasons is a form of violation of human rights, a community security system is needed in an effort to fight this form of criminalization.


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EPD0623

Associations between confidentiality-promoting state laws and lifetime HIV testing among sexually active male high school students in the United States: no differences by sexual behavior

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Background: Confidentiality concerns are a major barrier to health care for U.S. adolescents. These barriers may be even greater for young men who have sex with men (YMSM), who are disproportionately affected by HIV and experience stigma on multiple levels.

This study utilized a representative sample of sexually active male high school students to evaluate whether associations between confidentiality-promoting state laws and lifetime HIV testing would be significantly stronger among YMSM than among males who reported opposite-sex sexual contact only (non-YMSM).

Methods: Data were aggregated from the 2019 state-level Youth Risk Behavior Surveillance System (23 states; $N=17,509$). Five binary variables were created to indicate whether states had *confidentiality-promoting* laws:

1. Minors *explicitly* allowed to consent to HIV testing,
2. No age requirements,
3. Parental notification *not* permitted,
4. Confidentiality of insured dependents *protected*,
5. No HIV-specific criminal laws requiring disclosure.

Multilevel logistic regression was used to examine associations between each law and lifetime HIV testing, adjusting for individual- (grade, race/ethnicity) and state- (median household income, percentage of the population that graduated high school, lifetime HIV testing among adults) level covariates. Interactions between laws and YMSM status were included to test whether associations differed by YMSM status.

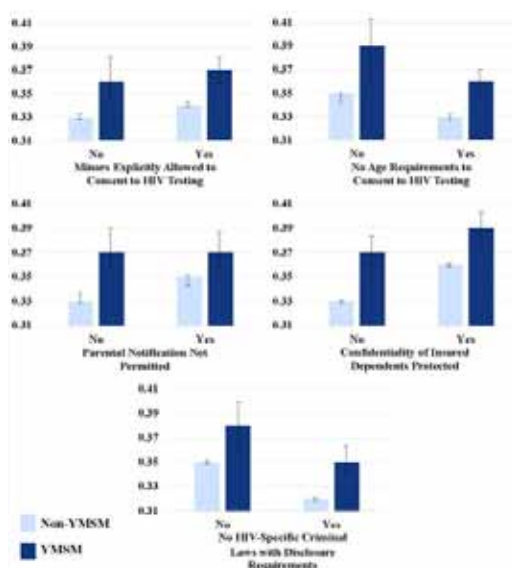


Figure 1. Model-based predicted probabilities of lifetime HIV testing among sexually active male high school students by YMSM status and confidentiality-promoting state laws, 2019 state-level youth risk behavior surveillance system ($N=17,509$).

Results: YMSM ($n=1,718$) and non-YMSM ($n=15,791$) were comparable by grade (e.g., 12th: 33% vs. 32%) and race/ethnicity (White: 44% vs. 47%; Black: 17% vs. 15%; Hispanic: 31% vs. 30%). YMSM were more likely than non-YMSM to identify as sexual minorities (gay/lesbian: 29% vs. 1%; bisexual: 30% vs. 2%; $p<.001$) and report lifetime HIV testing (22% vs. 14%; $p<.001$).

Findings did not support the hypothesis that associations would differ by YMSM status; however, main effects of laws and YMSM status on lifetime HIV testing were statistically significant across all models (Figure 1).

Conclusions: Confidentiality-promoting laws may facilitate HIV testing for sexually active U.S. male adolescents, regardless of sexual behavior.

EPD0624

Factors associated with forced sex among PLHIV in Kenya: a Stigma Index 2.0 analysis

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Background: People living with HIV (PLHIV) are at significant risk for violence, potentially resulting in sustained physical and psychological distress. Research conducted on sexual violence experienced by PLHIV has generally focused on individual-level factors, with limited exploration of structural determinants.

Guided by a socioecological model (SEM), we assessed the relationship between forced sex and individual-, social-, and community-level factors among PLHIV in Kenya.

Methods: Study implementation was led by NEPHAK, a network of PLHIV in Kenya, through the Stigma Index 2.0 in partnership with GNP+, ICW, and UNAIDS. PLHIV completed a socio-behavioral questionnaire to assess demographics and past experiences of violence.

Using modified Poisson regression, we estimated unadjusted and adjusted prevalence ratios (PR) and 95% confidence intervals (CIs) for associations of multi-level factors with experiences of forced sex.

Results: Among 2,087 PLHIV, the median age was 38 [IQR(28-47)], and 59.4% ($n=1239$) were cisgender women. Of all respondents, 4.5% ($n=99$) reported ever experiencing forced sex. Forced sex was associated with inability to meet basic needs (PR: 2.50, 95% CI: 1.15-5.26).



Participants who reported disability (PR: 3.42, 95%CI: 2.10-5.54) also had a higher prevalence of forced sex. Higher prevalence of forced sex was observed among key populations including people who use drugs (PR: 2.97, 95%CI: 1.61-5.48), people who exchange sex (PR: 5.60, 95%CI: 3.69-8.50), gay men and other men who have sex with men (PR: 2.83, 95%CI: 1.73-4.65), and women who have sex with women (PR: 2.26, 95%CI: 1.13-4.50).

n (%)	PR (95% CI)	p-value	aPR* (95% CI)	p-value
Age	0.97 (0.95-0.99)	<0.01	0.98 (0.95-1.00)	0.09
Number of children	0.92 (0.84-1.02)	0.10		
Work status				
Unemployed	Ref			
Part time	0.99 (0.63-1.56)	0.97		
Full time	1.14 (0.70-1.88)	0.60		
Not always able to meet basic needs	2.50 (1.15-5.26)	0.02	3.59 (1.13-11.46)	0.03
Education				
None/Primary	Ref			
Secondary	0.85 (0.55-1.34)	0.49		
Higher education	1.27 (0.78-2.06)	0.34		
Individuals with disabilities	3.42 (2.10-5.54)	<0.01	3.13 (1.92-5.12)	<0.01
Persons who use drugs	2.97 (1.61-5.48)	<0.01	1.51 (0.78-2.93)	0.22
MSM	2.83 (1.73-4.65)	<0.01	1.11 (0.60-2.05)	0.74
WSW	2.26 (1.13-4.50)	0.03	0.89 (0.44-1.81)	0.75
Persons who engage in transactional sex	5.60 (3.69-8.50)	<0.01	4.09 (2.49-6.72)	<0.01

* variables that met a priori selected threshold of .1 in univariate models were included in multivariable model

Table. Factors associated with forced sex among 2087 PLHIV in Kenya.

Conclusions: Findings suggest that among PLHIV in Kenya, individuals who identify as key populations and other marginalized identities experience a disproportionate prevalence of sexual violence. To reduce occurrence and address the impact of sexual violence on communities, interventions must focus on the needs of these specific groups.

Prevention and response strategies at the structural and community levels should include expanded economic opportunity, justice reform, and community empowerment and mobilization.

EPD0625

HIV risk perceptions, knowledge, and information sources among reproductive-aged individuals in Kenya

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Background: Increasing HIV knowledge has been a core intervention of the HIV response. However, it is unclear if improved HIV knowledge is associated with risk perception and behavior changes. We identified classifications of HIV knowledge and information sources to assess the

relationship with HIV risk perceptions and ultimately prevention behaviors among reproductive-aged people in Kenya.

Methods: In this cross-sectional analysis, we used screening data from the RV393 HIV cohort in Kisumu County, Kenya, which recruited participants aged 18–35 years from the general, sex worker, and fishing communities. Staff-administered questionnaires collected data on sociodemographic characteristics, HIV knowledge and information, and prevention/risk behaviors.

Knowledge scores were calculated by quantifying correct responses to prevention/transmission questions. HIV knowledge and information source typologies were identified using latent class analysis (LCA). Within classes defined by posterior probabilities, prevention/risk behaviors were compared, stratified by risk perception (high or low/no risk).

Results: Among 926 individuals screened between 2017–2019, 51% were female, 40% had at least a secondary education, and 97% were employed. LCA fit statistics suggested a three-class model (Figure).

All classes demonstrated high HIV knowledge, with differences defined by varying levels of community-based information. Within all classes ($p < 0.05$), those at high risk reported a significantly greater number of sex partners and were more likely to exchange sex compared to those at low/no risk. Across all classes, consistent condom use was low, ranging between 8.5% and 12.0% among individuals at high risk. HIV testing practices were similar for individuals irrespective of class.

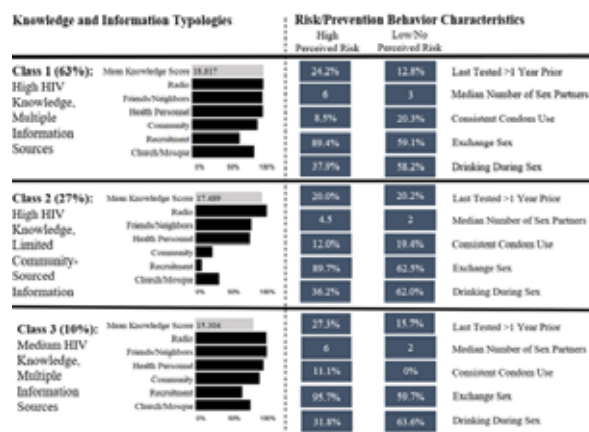


Figure. Knowledge and information typologies and corresponding risk/prevention behaviour characteristics stratified by perceived HIV risk.

Conclusions: HIV-related knowledge and risk perception were high but didn't translate to consistent condom use and HIV testing. The disconnect between risk perception and HIV prevention behaviors provides insight into sustained, high HIV incidence in these communities.

Ultimately, structural interventions facilitating an enabling environment for HIV prevention services are critical to improve individual outcomes and HIV epidemic control.



EPD0626

"I Felt Targeted:" exploring the impact of police violence, racial justice protests, access to HIV services, and mental health among Black and Latino MSM in California and New York

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Background: The racial justice protests of 2020 in the United States (US), during the height of the COVID-19 pandemic, reignited a conversation around police violence against people of color. Police violence, which is often deadly, disproportionately impacts Black and Latino men. Previous studies among Black and Latino men who have sex with men (MSM) examined the intersection of antiretroviral adherence, homonegativism and other sociostructural factors. However, there is an absence of information on the intersection of police violence, access to HIV services, and mental health among this population. The purpose of this study is to explore the impact of police violence, the 2020 racial justice protests, access to HIV services, and mental health among Black and Latino MSM living in California and New York.

Methods: In this qualitative descriptive study, we utilized in-depth, individual, semi-structured interviews as the primary source for data collection. Data were collected between August 2021 and December 2022 from 41 adult participants in California and New York. Interviews were recorded, transcribed verbatim, and analyzed using thematic content analysis.

Results: Participants ranged in age from 19-65 years. The majority described their gender as male (93%) with the remaining identifying as other. Black participants comprised the majority of the sample (73%), with Latinos accounting for 25%. More than half the sample expressed being unreasonably stopped and questioned, searched, or arrested by the police.

Overall, participants' narratives revealed being targeted by police, a lack of general safety, and anger with the frequency of police violence against unarmed Black and Latino men. Access to HIV care services during the pandemic was complicated by medical provider HIV stigma, the racial justice protests, and fear of contracting COVID-19. Participants narratives also revealed a sense of general hopelessness, despair, anxiety and depression—which negatively impacted their mental health.

Conclusions: These findings suggest the cumulative effects of police violence, racial justice protests, poor access to HIV services and mental health sources negatively impacted Black and Latino MSM. In the U.S., public health and policing reforms are urgently needed to address the impact of police violence on access to HIV and mental health services among Black and Latino MSM.

EPD0627

Understanding the intraorganizational attributes and processes of syringe services programs implementation in rural counties in Kentucky (USA)

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Background: Several decades of research evidence documents the public health benefits of syringe services program (SSP) implementation, including reductions in community-level risks for HIV outbreaks. Existing literature primarily reflects studies conducted in urban areas. This represents a significant gap in the literature given that many rural communities in the United States are vulnerable to injection drug use-associated HIV outbreaks.

Enhancing how we understand the intraorganizational aspects of SSP implementation (e.g., educating staff about SSP operations) in rural communities may afford insights that support more expeditiously launching and scaling up access to SSPs.

This study aims to explore the intraorganizational attributes and processes of SSP implementation in rural Kentucky (USA) counties.

Methods: In-depth, semi-structured interviews with eighteen persons who were involved with SSP implementation in rural Kentucky (USA) counties were conducted in late 2020. The interview guide was informed by the Consolidated Framework for Implementation Research, and explored intraorganizational attributes and processes pertaining to SSP implementation (e.g., staffing and staff qualities, organizational readiness, trainings/education). Interviews were professionally transcribed verbatim and resulting text pertaining to intraorganizational aspects of SSP implementation were analyzed through a modified constant comparison approach.

Results: Many participants reported that they were initially hesitant to support SSP implementation; however, their views changed upon learning about the public health benefits of SSPs, including their role in decreasing HIV risks among people who inject drugs. SSP staff reported a number of ways in which they learned about SSPs and their role in HIV prevention, including through formal trainings and visiting other programs. Participants emphasized that interacting with clients was critically important to changing how many staff members perceived SSP implementation.

Conclusions: SSPs are essential components of comprehensive HIV prevention strategies; however, their implementation can be impeded by intraorganizational barriers, including staff support. This research demonstrates that staff at rural organizations seeking to implement SSPs may benefit from formal and informal education about the public health benefits of SSPs. Scaling up access to evidence-based trainings about SSP implementation is an important next step for HIV prevention in rural communities in the United States given the magnitude of non-urban areas vulnerable to injection drug use-associated HIV outbreaks.



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**EPD0628**

Current HIV and hepatitis C prevalence and associated factors among people who inject drugs (PWID) in suburban areas of Klang Valley, Malaysia: Implications for improved social and legal environments

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Background: Efforts to reduce HIV transmission rates among people who inject drugs (PWID) in Malaysia have been concentrated on methadone and needle-syringe programs (NSP). In 2014, the Ministry of Health reported a drop in the number of new cases among PWID, indicating the effectiveness of these programs.

The aim of this study is to estimate the current prevalence and associated factors of HIV and Hepatitis C (HCV) among PWID in suburban areas of Klang Valley.

Methods: Between September 2021 and March 2022, a cross-sectional, respondent-driven sampling (RDS) survey was conducted. Participants completed rapid HIV and HCV testing as well as social and behavioural assessments. Adjusted odds ratio (aOR) for factors associated with HIV and HCV positive results were estimated using logistic regression.

Results: Four-hundred and seven individuals were recruited in the study, of whom 382 (94%) were males. The prevalence of HIV and HCV was 5.5% and 41%, respectively. Of these study participants, 121 (30%) reported current injection drug use. Current heroin and amphetamine-type stimulant use, regardless of injection or non-injection use, were reported by 342 (84%) and 329 (81%) individuals, respectively. Past exposure to the criminal justice system (lock-ups, prison and compulsory drug detention centres) was associated with both HIV (aOR = 3.13) and HCV (aOR = 3.14) positive results.

Additionally, lifetime enrolment in methadone treatment was associated with being positive for HIV (aOR = 2.00) and HCV (aOR = 2.41). HCV positive results were also associated with current mixing of drugs through injection use (aOR = 2.07).

Conclusions: Low HIV prevalence was observed among PWID in this study. However, the prevalence of HCV among this subgroup was high. Higher odds of obtaining positive HIV and HCV results among PWID who reported to have ever enrolled in methadone programs indicate that treatment may not be continuous once initiated. Interruptions may be caused by common exposure to the criminal justice system due to criminalisation of personal

drug use in Malaysia. Additionally, participants may have already acquired HIV or HCV before entering methadone programs.

Findings from this study underscore the need to support HIV services for PWID within an improved social and legal environment.

EPD0629

Barriers and opportunities to link people released from closed-setting rehabilitation centers to community-based services in Vietnam

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Background: Closed-setting drug rehabilitation is a major governmental response to substance use disorders (SUD) in Vietnam. Long-term closed-setting rehab is associated with negative health, social and economic outcomes. We explored the barriers and opportunities to link people with SUD (PWSUD) released from closed-setting rehabs to pro-recovery services.

Methods: Between Oct 2021 and Aug 2022, we interviewed PWSUD returning from or about to leave closed-setting rehabs (n=30), their family members (n=30), and addiction professionals (n=30) in three cities across North, South and the Center of Vietnam. Interviews probed post-release concerns, how the current drug policies met their needs, and recommendations for improving linkage to care.

Results: Lack of outpatient drug treatment services other than methadone made closed-setting rehab the default option to relieve families of PWSUD-related emotional and financial burdens and increased the likelihood of subsequent detention given that relapse was common upon release.

Respondents indicated that programmatic support to PWSUD has decreased compared to a decade ago. While current policies emphasize support for job placement as well as access to substance use and HIV treatment, most PWSUD could access health services but find employment support absent or unfriendly and ineffective.

The connection between the closed-setting rehabilitation and community-based services and among community-based services was weak. Individual-level factors including stigma and low socioeconomic background contributed to the struggles of PWSUD. Facilitative factors included family support, shorter stay in closed settings, greater accessibility of methadone and HIV services, and peer support.

Conclusions: There exist barriers but also opportunities to support recovery process of PWSUD who are released from closed settings. Specific recommendations include greater options for community-based drug treatment, improving and enforcing current supportive policies, and increased support to their families.

EPD0630

Deconstructing discriminative social and peer norms that impact widows impacted with HIV in East Africa and promoting change through the SYFF (Securing Your Family Future) curriculum

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Background: SYFF is a curriculum-based intervention designed to change peer norms about women's land rights among men, women, leaders in local communities in Kenya, Uganda & Tanzania to promote access to property rights justice for widows impacted by HIV, these widows have continuously been discriminated against based on their status and rendered to have no property rights. In 2016 three non-governmental organizations in East Africa (KELIN, PWC, and UCOBAC) worked to explore how inequitable social norms about widows can be changed. The partnership conducted a regional research and identified key social norms that discourage women's land rights, reframed these norms so that they encourage widows rights.

Methods: Techniques will be applied in the SYFF course.

- Craft messages about desirable social norms (and also counter negative social norms if not too threatening)
- Identify people who are in the reference group (i.e., people who are setting and reinforcing the norm) and create opportunities for them to argue/reason against the undesirable norm.
- The three organization will engage in weekly engagement conversations with identified 100 change agents in Kenya, Uganda and Tanzania with 1 session per week within the village level and thereafter a mid-line and endline in person monitoring and evaluated conducted to monitor progress.

Results: Social norms play a great role in influencing societal perspectives and thus an important tool to interrogate as we seek to promote access to justice for those at the margins of the society. There is need to conduct message development advocacy on existing rights for both duty bearers and rights holders for women impacted by HIV/AIDS within the community level to ensure identification and claiming of these rights.

Conclusions: A better understanding of the multiple threats to women's land rights in the context of HIV is urgently needed, both by organisations already committed to the issue and by the wider land, resource, and human rights fields, where gender analyses are too frequently absent.

EPD0631

Widowhood and HIV: impact of gender and late disclosure on health of women living with HIV in Mumbai, India

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Background: Married women are vulnerable to acquiring HIV from their infected spouses. Gender inequality, late disclosure or nondisclosure of husband's sero-positive status, low awareness about HIV disease, poor risk perception and diagnosis at late stage of disease can adversely impact their health status.

Methods: We analysed data from 2910 HIV infected widows from 18 public Anti-retroviral treatment centres in Mumbai. We collected information on demographics: current age, age when widowed, time since death of the husband; and clinical and ART related information: year of start of ART, CD4 counts at the start of ART and most recent values, type of ART regime, and viral loads.

Results: The mean (SD) age of women was 50.6 (7.8) years. The women were widowed at mean (SD) of 45.1 (9.6) years and were widowed for median (IQR) of 5.4 (0.2, 10.3) years. Majority (73%) of these women (2123/2910) were diagnosed after the death of the husband and 27% (787) were diagnosed before death.

In about 8% of women, ART was started in the same year, 25.6% after 1-5 years, 22.8% after 5-10 years, and 24.6% after 10 years of the husband's death.

A higher proportion of women diagnosed after the death of the husband had CD4 counts <100 cells/mm³ compared with before death (12.3% vs 9.9%) (p=0.04). Majority of these women were on 1st line treatment (80.7%); only 10.3% were on 2nd line treatment and 1.1% were on 3rd line treatment. The median (IQR) latest CD4 counts were 668.5 (502, 869) and 92% had undetectable viral loads.

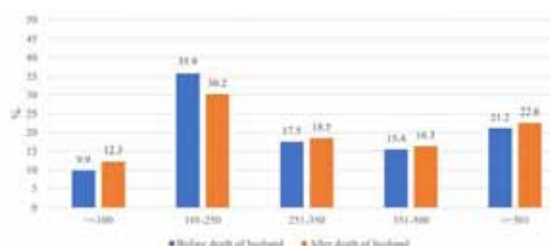


Figure. CD4 counts of WLHIV and time of diagnosis.

Conclusions: The study highlights the need for focused interventions for disclosure counselling & regular testing of spouse at HIV facilities. Training of Health care providers in gender sensitive counselling, building support groups and linkage to social support schemes for widowed women need to be incorporated in the program strategy.



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**EPD0632**

An exploratory study on harm reduction resources for women who use drugs in Nairobi, Kisumu, Kwale, Kilifi and Mombasa Counties in Kenya

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Background: Despite efforts to scale up harm reduction interventions for people who use drugs in Kenya, a large number of women are unreached with these services, yet females comprise over a tenth of the people who inject drugs in Kenya. Expanding the provision of harm-reduction services that are gender-responsive requires the integration of reliable research data to ensure effective delivery.

However, studies related to female drug users in Kenya are relatively inadequate, yet they are needed to inform the development of gender-sensitive social and harm reduction services.

It's on this basis that this study was designed to explore the extent to which the available harm reduction interventions, services, and programs reach and support women who use drugs and their needs and based on its findings, make recommendations to better reach women and ensure they have access to quality, dignity-affirming services.

Methods: The study adopted a cross-sectional study design. Lot Quality Assurance Sampling methodology assessed the extent to which current harm reduction and drug policy, and programming incorporate the needs and priorities of women who use drugs in their work. The qualitative data provided explanative data for each LQAS analysis output.

Results: The study found a wide range of environmental and contextual factors in existing drug control laws, policies, and dependency interventions that compound the health, safety, and justice needs of WWUDs in Kenya.

The major findings of the study are shown in the table

Conclusions: Understanding WWUDs can assist stakeholders to expand harm reduction resources for women who use drugs through appropriate gender-sensitive and gender-specific implementation considerations. The findings of this study can be used to inform policies, laws and practices that undermine women's access to HIV and harm reduction services.

Further, the study identifies challenges specific to protecting women who use drugs from HIV transmission, including structural and behavioral barriers, that need to be considered when designing local and national interventions.

There is a need for increased technical support for implementation research to strengthen how interventions targeting WWUDs address gender issues.

LEGAL ENVIRONMENT	The legal environment, stigma, and discrimination increase the likelihood of HIV risk behavior among WWUDs
HOW EXISTING DRUG CONTROL AND DEPENDENCY INTERVENTIONS COMPOUND HEALTH NEEDS OF WWUD	<p>Access to health services by women who use drugs was explored under three different contexts: when interacting with the general population, when arrested, and when incarcerated.</p> <ul style="list-style-type: none"> ○ The study established that there are no independent programs for women who use drugs or exclusive timing for them to access services, but rather, programming for harm reduction provided by both state and non-state actors is generalized. ○ Women who use drugs, particularly those who identify as active users experience greater challenges in accessing available harm reduction services and especially when accessing healthcare services through public healthcare services. ○ Costs relating to drug control and treatment interventions such as transport costs to MAT facilities and costs of rehabilitation centers are prohibitive for WWUDs.
HOW EXISTING DRUG CONTROL AND DEPENDENCY INTERVENTIONS COMPOUND SAFETY NEEDS OF WWUD	The nature and environment of drug use increase the risk of WWUDs to verbal abuse, physical assaults, sexual violence, and intimate partner violence (IPV). The nature of the living arrangement of women who use drugs plays a critical role in their safety.
HOW EXISTING DRUG CONTROL AND DEPENDENCY INTERVENTIONS COMPOUND HELP SEEKING AND JUSTICE NEEDS OF WWUD	Limited understanding of their legal rights and procedures which is exacerbated by the limited access to legal representation has left WWUDs vulnerable to arbitrary arrests and undefended cases against them.
IMPLICATIONS OF COVID 19 EMERGENCY ON DRUG CONTROL AND DEPENDENCY INTERVENTIONS	The COVID-19 pandemic and the prevention and measures adopted adversely affected WWUDs impacting their mental health, disrupting drug use behaviors, and increasing their exposure to risky behavior due to transactional sex in exchange for drugs or other resources

Table.

EPD0633

Identifying syndemic determinants of condom use among Nigerian youth: a latent class analysis

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Background: Consistent condom use is one of the critical strategies for HIV prevention. However, consistent condom use among Nigerian youth continues to face challenges. Few studies have utilized person-centered approaches to examine correlates of condom use among youth in low-and middle-income settings.

This study draws on Syndemics theory, which postulates that multiple factors are often exacerbated by societal circumstances, to assess the clustered impact of social, structural, and psychosocial determinants of health on condom use among Nigerian youth, using latent class analysis (LCA).

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Methods: The 2018 Nigeria Demographic and Health Survey, a nationally representative dataset, were analyzed for this study. A sample of 9,757 youth between the ages of 15–24 years who were sexually active were included in the study. LCA was used to identify distinct groups, defined by social, structural, and psychosocial determinants of condom use among youth.

We then used multinomial logistic regression to examine associations between class membership and condom use.

Results: The study showed a low prevalence (24%) of consistent condom use among Nigerian youth. Using LCA, three latent classes representing unique pattern profiles for condom use emerged.

We labeled these groups as risk profiles: the high-risk group (representing ~46% of the population), the moderate-risk group (~36%), and the low-risk group (~18%).

Level of education, gender, place of residence (urban/rural), religious affiliation, and wealth index were significant predictors of condom use ($P < 0.05$).

Young people in the high-risk group were more likely to be younger [AOR: 1.45, 95% CI: 0.42–0.95], be of a low wealth index [0.93, 95% CI: 0.56–0.98], be female [AOR: 3.42, 95% CI: 1.63–5.42], and reside in a rural area [1.49, 95% CI: 0.55–0.82] compared to members of the low-risk group.

Conclusions: Our study identified subgroups of Nigerian youth with distinct condom use predictor profiles, which provides implications for targeted and segmented HIV prevention strategies.

Our findings contribute to the vast literature showing the diversity of Nigerian youth and underscore the significance of socio-demographic and contextual factors in shaping HIV prevention behaviors. Tailored and targeted HIV prevention interventions for diverse risk patterns are required to address the growing burden of HIV among Nigerian youth.

EPD0634

Psychosocial and multiprofessional approach to the enrolment of adolescents under 18 years old in PrEP services in Brazil

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Background: Enrolling adolescents under 18 years of age in pre-exposure prophylaxis (PrEP) is challenging because of the low-risk perception of this population. The psychosocial approach of multidisciplinary health teams can improve adolescents' persistence in PrEP.

We aimed to describe the experience of a psychosocial team in enrolling adolescent men who have sex with men (aMSM), and transgender women (aTGW) in a PrEP service in Brazil.

Description: PrEP1519 is a prospective, multicenter, open-label PrEP demonstration cohort study conducted with aMSM and aTGW aged 15–19 in Brazil from April 2019 to May 2022. In this project, the multidisciplinary health team adopted a psychosocial approach in the work of the psychologist and social worker in the Salvador site of PrEP1519. The team assessed the population by analyzing situations of violence, broken families, and other vulnerabilities and, when possible, promoted dialogue with the adolescent's family to explain the use of the prophylaxis.

Lessons learned: 45 adolescents aged 15 to 17 were included in this analysis. Of these, 27 were enrolled in PrEP without their parents' or guardians' awareness of the team's conclusion of a possible risk of violence against adolescents. We communicated this procedure to the Public Prosecutor's Office and the Juvenile Court of the State of Bahia. Conversely, we enrolled 18 adolescents based on dialogue with their legal guardians.

Conclusions/Next steps: The psychosocial approach to adolescents aged 15 to 17 years was significant for enrolling this population in a PrEP service. In Brazil, the PrEP policy of the National Health System was expanded to include adolescents 15 years or older.

Therefore, this experience may inspire programs to facilitate the inclusion of young adolescents in PrEP without parental or guardian consent.

EPD0635

Barriers to accessing health care among trans-people in four South African districts

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Background: In support of South Africa's National Strategic Plan and the National LGBTI HIV Plan, 2017–2022, HIV, TB and STI intervention program was implemented from April 2019 to reduce the incidence of HIV amongst trans-people in four selected districts of South Africa.

This abstract highlights areas that have significant implications for the developmental agenda of SA regarding the plight of trans-people as well as the healthcare service delivery.

Methods: A mid-term evaluation of the intervention program was conducted during February and March 2021. Qualitative data collection methods including in-depth interviews and Focus Group Discussions in line with the evaluation objectives explored various categories of the intervention program stakeholders including program beneficiaries, peer educators and program managers, as well as other key informants involved in policy formulation, including LGBTI, AIDS Council and Civil Society.

Purposive sampling was conducted for these interviews with a total of 10 interviews conducted across the various categories.



Results: Inequalities in society and in the SA health system were raised as the primary challenge. The biggest barrier to health care reported is lack of access due to suboptimal training of healthcare workers (HCWs) on transgender health issues, combined with judgmental and discriminatory attitudes.

The absence of national policy guidelines on gender affirmation surgery or hormonal therapy for gender-affirming healthcare seekers also contributed to lack of access to care, resulting in high costs to access these services in specialized academic centers or private sector clinics. Other barriers cited include health systems barriers (inappropriate electronic records, forms, lab references, clinic facilities) and socio-economic barriers (lack of income, marginalization in the communities and poor mental health).

Conclusions: Trans-people require health care that addresses their unique health concerns, including transition-related medical procedures and mental health. This requires the inclusion of members of the trans-community in health policy decision making spaces at national and local levels.

In addition, there is a need for rigorous national research to determine:

1. The ability of the national health care system to provide adequate care for transgender individuals,
2. HCW knowledge and biases on trans health, and;
3. Socio-economic barriers, including mental health.

EPD0636

Effects of Medicaid expansion in the United States on Pre-Exposure Prophylaxis (PrEP) prevalence and PrEP to need ratio (PNR)

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Background: Despite its high efficacy, Pre-Exposure Prophylaxis (PrEP) uptake is low within the United States (US), particularly amongst those at highest risk for HIV. In 2020, only 25% of the 1.2 million people indicated for PrEP received prescriptions[YX1].

Beginning in 2014, many states expanded Medicaid eligibility to include individuals with a household income below 133% of the federal poverty level, increasing access to health insurance and improving health outcomes.

The present study sought to understand how Medicaid expansion predicted PrEP uptake.

Methods: County-level publicly available data from years 2012-2021 were used from AIDSVu, Kaiser Family Foundation, American Community Survey, Center for Disease Control and Prevention, and the county health rankings

& roadmaps program. Differences in differences regressions with Medicaid expansion as the treatment and PrEP uptake outcomes were conducted, controlling for the effects of socio-economic status (SES), income inequality and racial distribution.

PrEP uptake was measured through PrEP prevalence, the number of PrEP prescriptions per 100,000 individuals in the population and PrEP to need ratio (PNR), the number of PrEP prescriptions divided by the number of annual new HIV diagnoses.

Results: PrEP prevalence ranged from 1 to 826 per 100,000 individuals [YX1] [MS2] ($M = 10.31$) in 2012 to 11 to 1628 per 100,000 individuals ($M = 65.2$) in 2021. Medicaid expansion was associated with increased PrEP prevalence ($B = 84.43$, $p < .001$). This pattern held true for all subgroups including men, women, and each age group examined.

In contrast, Medicaid expansion was associated with overall decreased PNR, suggesting PrEP use did not meet its need ($B = -32.41$, $p < .001$). This held true for certain categories of the age subgroups (< 25, 25-34, and 35-44 years old), but not for men, women, ages 45-54, and ages 55+ years old ($p > .05$).

Conclusions: Overall, PrEP uptake has increased yet still is insufficient. Medicaid expansion is supportive of PrEP uptake regardless of age and sex. However, Medicaid expansion was associated with decreased PNR.

This likely reflects diagnosis gaps in non-expansion states rather than a greater need for PrEP in expansion states, given the higher PrEP prevalence associated with Medicaid expansion.

EPD0637

The state of 10-10-10-related policies across 194 countries

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Background: Criminalizing and stigmatizing legal environments perpetuate discrimination against people living with HIV (PLHIV), key populations, and vulnerable populations and hinder equitable access to HIV prevention, treatment, and support services. The 10-10-10 societal enabler targets, as part of the Global AIDS Strategy 2021-2026, uses an equity lens to identify and reduce social and legal barriers against PLHIV.

We examine seven policy indicators tracked by the HIV Policy Lab that countries need to adopt to achieve the targets: non-criminalization of:

1. Same-sex sex,
2. Sex work,
3. Drug use,
4. HIV transmission;
5. Creation of national human rights institutions; and legal protections against
6. Discrimination and
7. Gender-based violence.



Methods: Georgetown University's HIV Policy Lab (HIVPL) tracks 33 evidence-based laws/policies and their adoption status across 194 countries. Using the data from HIVPL, we map and compare policy adoption, and analyze global and regional policy progress toward achieving the 10-10-10 goals.

Results: The preliminary findings indicate that while 181 countries have adopted at least one of the seven laws/policies, no country in the world has adopted all seven policies. The 10 countries with the highest HIV incidence have adopted, on average, 2.7 policies (range: 2-4) around 10-10-10.

We observed variation in terms of regional and individual policy adoption. In terms of individual policies, the adoption rates for policies like protection against gender-based violence (79%) and non-criminalization of same-sex sex (56%) is high, whereas only 3% and 4% of countries have adopted non-criminalization of sex work and non-criminalization of drug possession and use.

In terms of regional variation, the highest regional gap in policy adoption is observed for non-criminalization of same-sex sex policy: a high of 97% in Western and Central Europe and North American regions and a low of 15% in the Middle East and North Africa region.

Conclusions: Systematically gathering and monitoring data on policy adoption status across countries for these seven policies provides a global analysis of variations in policy adoption.

Our analysis shows that while there has been tremendous progress in some corners, we are woefully behind in adopting several policies crucial to achieve the 10-10-10 goal.

EPD0638

Associations between ART use and employment discrimination among women living with HIV across 11 countries in sub-Saharan Africa

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Background: Economic factors including poverty worsen the challenges faced by women. Equitable access to employment, economic stability, and protections for women and other undervalued communities within society currently remain neglected and impede HIV control.

In this study, we aim to understand ART use and estimate the association with experiences of employment discrimination and national non-discrimination protections among women living with HIV in sub-Saharan Africa.

Methods: This study utilized data from the People Living with Stigma Index (PLHIV) 2.0 study from 11 countries in Sub-Saharan Africa including Angola, Benin, Burkina Faso, Cote D'Ivoire, Ghana, Kenya, Mauritania, Nigeria, Lesotho, Togo, and Zimbabwe. Study implementation was led by networks of PLHIV in each country between 2020 and 2021. Interviewer-administered socio-behavioral questionnaires were used to collect self-reported measures. The analytical sample included 10,555 cisgender women living with HIV. Multilevel logistic regression with random intercepts and slopes were used to assess the associations between ART use and exposures of interest.

Results: Among all participants, 76.7% reported current ART use, 6.5% reported having been refused employment or income due to their HIV status, and 5.0% reported having been refused a promotion due to their HIV status. In settings without non-discrimination protections, current ART use was negatively associated with ever being refused employment or income due to HIV status (aOR:0.54; 95%CI: 0.42, 0.69), but this association was not observed in settings where protections were in place (aOR:0.89; 95%CI:0.53,1.48) Table 1.



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Conclusions: Economic opportunities and stability may serve an important role in HIV outcomes among women living with HIV. Women who experienced employment discrimination in settings without non-discrimination protections reported lower levels of ART use, and therefore may experience higher morbidity and mortality. Establishment and enforcement on non-discrimination protections related to employment may support the wellbeing of women living with HIV, help achieve HIV control and improve their quality of life.

	No non-discrimination protections					Non-discrimination protections				
	Total (N=7180)		Current ART use			Total (N=5380)		Current ART use		
	%	n	ART %	n	95% CI	%	n	ART %	n	95% CI
Employment discrimination										
Ever refused employment or income due to HIV status	6.90	426	6.19	296	0.54 0.42, 0.66	5.57	171	4.96	11	0.09 0.03, 0.14
Ever refused promotion due to HIV status	5.43	296	4.75	262	0.56 0.42, 0.74	4.24	125	3.77	81	0.36 0.33, 0.93

Robustness: logistic regression model with random intercepts and adjusted for age, education, relationship, time from HIV diagnosis, PEPFAR country, HIV prevalence among adults, HIV prevalence among women.

Table. ART use and associations with economic stability and employment discrimination, stratified by non-discrimination protections.

EPD0639

Challenging the law on deliberate transmission of HIV in Kenya

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Background: The law in Kenya criminalises 'the deliberate transmission of HIV or other life threatening sexually transmitted disease.' This section of the law, while worded in the context of a sexual offence, has been used to harass and arrest persons living with HIV even where they have not been accused of a sexual offence.

Description: In 2018, KELIN supported six clients living with HIV, all of whom were facing or threatened with criminal charges under this law, to challenge this law in court. These included a person who had been arrested for biting, another who was in a consensual relationship and had made disclosure to their partner, a woman who had been falsely accused of breastfeeding a neighbour's child and another who had suffered intimate partner violence. These clients demonstrated to the court how this law was used to perpetuate stigma.

KELIN also presented to the court scientific evidence on the chances of transmission through various modes in a bid to demonstrate the overbroad nature of the law and to show how it was undermining the public health response to HIV.

Lessons learned: The challenge was dismissed by the Court in 2022, which stated that while living with HIV is not a crime, there was need for laws on transmission of HIV, to ensure that it is managed'.

However, the court cautioned that the penal law should be used in a restrictive manner and in line with accepted human rights standards on criminal law.

Conclusions/Next steps: In dismissing the challenge to the law, the court restricted the application of criminal law but failed to appreciate how overbroad laws criminalizing deliberate transmission of HIV can be interpreted in a manner that perpetuates stigma. The court also failed to engage with the scientific evidence presented to it.

Nonetheless KELIN has appealed the judgment and will now undertake training of duty bearers to ensure that they are aware of the restricted manner that they now ought to interpret the law.

Key populations and other vulnerable populations: Behavioural, social and cultural issues and contexts

EPD0640

Comparing risks between adolescents who sell sex and adults who sell sex: results from the Population-Based HIV Impact Assessment surveys in Cote d'Ivoire, Lesotho, Malawi, Namibia, Tanzania, Zambia and Zimbabwe

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Background: Prior research in Mozambique, the Philippines, and Romania has shown that adolescents under age 18 who sell sex more often engage in some risk behaviors and less often access some health services than adult sex workers.

These studies used venue-based, snowball, and respondent-driven sampling in selected regions. The present study uses nationally representative data to compare adolescents and adults who sell sex in seven African countries.

Methods: Cross-sectional data were from the 2015-2018 Population-Based HIV Impact Assessment surveys in Côte d'Ivoire, Lesotho, Malawi, Namibia, Tanzania, Zambia, and Zimbabwe. Analyses were limited to participants who ever sold sex for money. Weighted chi-square tests, proportional odds models, and multivariable logistic and ordinal regression analyses conducted using Stata 17.0 compared risks reported by adolescents aged 15-17 to adults aged 18 and older.

Results: 7.4% of participants who ever sold sex were adolescents (n=221/2973). The rate of ever testing for HIV among adolescents who sold sex (35.2%) was less than half the rate among adults who sold sex (75.6%) (p<0.001). Likewise, current use of any method to avoid pregnancy was much lower among adolescents who sold sex (21.6%) relative to adults who sold sex (41.5%) (p<0.001). 37.6% of adolescents and 44.5% of adults used a condom at last paid sex (p=0.164). However, a higher proportion of adults who sold sex (52.0%) than adolescents who sold


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sex (28.7%) had multiple sexual partners in the past year ($p<0.001$). After controlling for covariates, adolescents who sold sex had lower odds of using contraception, testing for HIV, and having multiple partners than adults who sold sex.

	Total	Côte d'Ivoire	Lesotho	Malawi	Namibia	Tanzania	Zambia	Zimbabwe
All genders	1.8% (1.5-2.1)	0.8% (0.5-1.4)	0.8% (0.4-1.5)	1.6% (1.1-2.3)	0.3% (0.1-0.7)	2.8% (2.2-3.5)	1.7% (1.2-2.4)	0.1% (0.05-0.4)
Female	3.3% (2.7-3.9)	0.6% (0.3-1.3)	0.7% (0.3-1.9)	3.2% (2.2-4.6)	*	5.4% (4.2-6.9)	3.1% (2.1-4.5)	*
Male	0.4% (0.3-0.7)	1.0% (0.5-2.0)	0.8% (0.3-2.1)	*	*	0.4% (0.2-0.8)	0.3% (0.1-0.9)	*

*Unable to estimate due to small cell counts ($n<5$)

Table 1: Weighted prevalence of selling sex among 15-17-year-olds

	Ever tested for HIV	Using any method to avoid pregnancy	Used a condom at last paid sex	Number of sexual partners in the past year
Adjusted odds ratio (95% confidence interval)	0.17 (0.11, 0.28), $p<0.001$	0.38 (0.23, 0.65), $p=0.001$	0.77 (0.47, 1.26), $p=0.280$	0.39 (0.24, 0.63), $p<0.001$

Note: All analyses controlled for gender, urban/rural residence, highest level of education, and marital status

Table 2: Weighted regression results comparing outcomes in adolescents versus adults who ever sold sex

Conclusions: Given the low rates of condom and contraception use, adolescents who sell sex in these countries may be at high risk for HIV, sexually transmitted diseases, and teenage pregnancy. Youth-friendly sexual and reproductive health services including pre-exposure prophylaxis are needed for this vulnerable population.

EPD0641

Multidimensional approaches to HIV prevention and care for sex workers in Kenya: addressing the complexities of the epidemic - ICRHK Stawisha project

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Background: HIV epidemic among sex workers in Kenya is a complex issue that is influenced by multiple factors. According to a study conducted by the Kenyan Ministry of Health in 2018, the HIV prevalence among female sex workers in Kenya was estimated at 12.9%, while the prevalence among male and transgender sex workers was estimated at 11.4%. This is significantly higher than the national average of 5.6%.

To effectively address the HIV epidemic among sex workers in Kenya, programs must take a multidimensional approach that addresses the underlying social and economic determinants of the epidemic, while also providing targeted and tailored interventions to this highly vulnerable population.

Methods: Kilifi county is one of the Kenyan counties with a high HIV burden with an HIV prevalence of 4.4% and of viral load suppression among all HIV-positive of 15-64 years at 46.9%-91.8%(KENPHIA, 2018), which is below the UNAIDS 2030 target to end HIV epidemic.

From October 2021 to August 2022 ICRHK used a combination of interventions that meet needs and barriers to HIV care and treatment optimization among HIV-positive sex workers. The approaches included community-led Psychosocial support Groups, engagement of sex workers as Peer Navigators and clinician follow-up and reminder calls.

Results: ICRHK conducted a retrogressive facility-level data analysis of data for October 2021 to August 2022 to determine trends of HIV positive Care and treatment among Female sex workers. 218 had newly tested HIV positive in the period. All HIV-positive sex workers 100% ($n=218/218$) were linked to HIV treatment. Out of the eligible FSWs for viral load testing, 57% of the KP were tested for Viral load.

From the results, the overall viral suppression for all eligible viral load samples taken was 98% which is above the UNAIDS target of 95% ($n=295/295$). This was an improvement compared to the previous period where only a single dimension of intervention was used.

Conclusions: This approach to HIV prevention and care is effective in addressing the complexities of the HIV epidemic among sex workers. Providing tailored interventions to address barriers and meet the unique needs of sex workers is essential in the reduction of HIV epidemic among marginalized groups.

EPD0642

Tailoring innovative legal solutions for key populations to prevailing conditions of criminalisation and active politicisation: a case study of Human Rights Awareness and Promotion Forum - Uganda

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Background: Human Rights Awareness and Promotion Forum Uganda (HRAPF) is the pioneer legal aid service provider for LGBTIQ+ persons, sex workers and injecting drug users in Uganda. Over the past fourteen years, the organisation has provided support to its clients despite active politicisation and criminalisation of consensual same-sex relations, sex work and drug use, and persons living with HIV/AIDS.

Description: HRAPF started operations in August 2008. Its legal aid clinic remains the only one dedicated to key populations (KPs) in Uganda. The legal aid clinic provides services based not on a means test but rather one's self identification as a member of a key population. HRAPF's legal aid network consists of over 300 community paralegals selected from KPs themselves, three regional legal



aid centres, two specialised legal aid desks, for transgender persons and lesbian women and the main legal aid clinic. HRAPF also does strategic litigation with over 10 cases, the majority of which have been successful. HRAPF has produced over 15 original studies on KPs. HRAPF trains duty bearers on KP rights and so far 1227 police officers, 1381 health workers and 200 magistrates and 90 state attorneys have been trained on KP issues.

Lessons learned: The main lessons learned from HRAPF's 14 year journey is that the legal approach can help to legitimise the struggle for KP inclusion even in conditions of criminalisation and active politicisation.

What is required is a brave and determined approach that puts the law and human rights at the forefront plus a dedicated team of pro-KP lawyers and advocates. HRAPF's work has had a lot of impact despite the criminalisation and politicisation of KP issues in Uganda in the last decade.

For example, HRAPF's studies and researches have been used by policy makers to suggest improvements, strategic litigation has seen the discriminatory laws removed and trainings of duty bearers have increased their knowledge on KPs and thus lower arrests as well as more access to HIV services among KPs.

Conclusions/Next steps: HRAPF's approach is a blueprint that organisations in other countries that face similar challenges of criminalisation of KP behaviours and politicisation can emulate and use in their contexts.

EPD0643

A dyadic qualitative analysis OF Coping experiences of Chinese serodiscordant male couples to HIV care

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Background: The coping experiences of HIV care in Chinese serodiscordant male couples (one man is HIV-positive, and the other man is his HIV-negative partner) remain unknown. The communal coping process theoretical framework, which acknowledges couples as a whole coping with stressors related to chronic illness for optimal client adjustment pathways, has not been applied to this unique cultural setting.

The aim of this study was to explore coping experiences of Chinese serodiscordant male couples to HIV care by applying the theoretical framework of the communal coping process.

Methods: A dyadic qualitative study using face-to-face interviews was conducted between July and September 2021. Recruitment via community-based organizations in two Chinese metropolitans through purposive sampling. A total of 20 serodiscordant male couples (n = 40) were included. Eligibility include one partner was HIV-positive and the other was HIV-negative, both were 18 or older, biologically male, gay or bisexual, and in a relationship at least three months. A 60-minute semi-structured individual interview was audio recorded, transcribed, and translated.

Once thematic saturation was reached, recruitment was stopped. A hybrid deductive-inductive approach integrated with dyadic interview analysis and framework method were used to analyze individual and dyadic data.

Results: We identify three themes in the coping process in HIV care:

1. Coping as a contextualized communal process;
2. Coping as a dissonant process; and
3. Coping as an autonomous process.

The communal coping process of HIV care was contextual. For the dissonant coping process, we suggested two potential risk factors: HIV-positive partner's internalized HIV stigma and couples' asymmetric relationship goals. Inconsistent appraisals on HIV care engagement might lead to couples' divergent negative coping strategies and non-interactive support.

For the autonomous coping process, most couples adopted either disengaged avoidance or mutual non-involvement as negative coping strategies and presented a support continuum from no support to interactive support.

Conclusions: Our broadening of the theoretical framework of communal coping offers significant insights into how serodiscordant male couples appraise and cope with stressors connected to HIV care. It will inform the development of dyadic interventions based on health psychology for Chinese serodiscordant male couples for effective HIV care engagement.

EPD0644

The risks for HIV among cisgender men who have sex with men who engage in chemsex in low- and middle-income countries: a systematic review

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Background: Chemsex is associated with high-risk sexual behaviours and HIV among cis-gender men who have sex with men (cis-MSM). What is known about chemsex mostly come from studies in high-income countries (HIC) and may not be applicable to low- and middle-income countries (LMIC). We explored chemsex behaviours, its determinants, and its relationship with high-risk sexual behaviours and HIV among cis-MSM in LMIC.


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Methods: We reviewed studies published from January 2000-June 2022 examining chemsex, high-risk sexual behaviours, and diagnoses of HIV among cis-MSM in LMIC. We excluded studies solely focused on HIC, alcohol, and HIV-positive individuals. We searched through MEDLINE, Embase, GlobalHealth, PsychINFO, CINAHL, and grey literature. Quality and risk of biases were assessed. We extracted data using the Antecedent-Behaviour-Consequence framework and reported the findings using PRISMA.

Results: We identified 7,272 records and included 39 studies: largely from Asian and American regions (Figure 1). Between 7.4%-70.0% participants engaged in chemsex recently (within six months), with higher prevalence among men <30 years old, with lower income and education, and with HIV diagnosis (Figure 2).

Chemsex antecedents span from individual to structural levels. Compared to cis-MSM who had not recently engaged in chemsex, participants who recently engaged in chemsex reported higher prevalence of recent condomless anal intercourse (28.4%-70.0% vs 13.1%-47.6%), HIV incidence (13.1-16.2 per-100-person-years vs 5.4-7.7 per-100-person-years), and HIV prevalence (5.3%-34.0% vs 3.9%-18.6%).

Figure 1: Regional distribution of included studies for the systematic review of chemsex behaviours among cisgender men who have sex with men and HIV among low- and middle-income countries – January 2000 to August 2022



Figure 2: Summary of findings of the systematic review of chemsex behaviours among cisgender men who have sex with men and HIV among low- and middle-income countries – January 2000 to August 2022



Conclusions: Chemsex behavioural patterns appear differently in LMIC and further studies are warranted. Structural changes and integrated harm reduction approaches to address drug use and sexual health issues could mitigate these health disparities.

EPD0645

Advertising patterns of Internet-based male sex workers who have sex with men in 16 U.S. cities in 2022: LGBTQIA+ events associated with greater advertisements for sex work

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Background: HIV prevalence among sex workers is, on average, twelve times higher than the general population. Research into populations of male sex workers who have sex with men (MSMSW) has historically been stymied because it remains illegal and stigmatized in most U.S. jurisdictions. In recent years, the Internet has significantly influenced how sex workers advertise services. To date, few studies have leveraged Internet advertising data to inform MSMSW-specific HIV prevention efforts. This study's primary objective is to describe the association between (MSMSW) advertising and the presence of LGBTQIA+ events (e.g. pride) in 16 U.S. cities during the 2022 pride season.

Methods: Data were extracted at weekly intervals from an Internet platform popular among MSMSW in 16 U.S. cities (14 designated "Ending the HIV Epidemic" [EHE] jurisdictions) with LGBTQIA+ events over 18 weeks spanning June-October 2022 (e.g. the LGBTQIA+ Pride Season) in an longitudinal, observational study. A Poisson regression was fitted for the outcome of number MSMSW advertisements/week per city examining the association with LGBTQIA+ pride events (binary, no/yes), adjusted for month.

Results: The cities with the greatest number of MSMSW advertisements were: New York City, San Francisco, and Chicago, with 848.2 ($SD = 48.0$), 293.3 ($SD = 34.7$), 252.3 ($SD = 22.8$) mean weekly advertisements, respectively (see Table 1). LGBTQIA+ events were significantly ($p < .05$) associated with an increased number of MSMSW advertisements during the study period in San Francisco (IRR = 1.16, 95% CI = 1.07, 1.25), New York City (IRR = 1.15, 95% CI = 1.05, 1.26), and Chicago (IRR = 1.25, 95% CI = 1.12, 1.39).

		B	SE B	IRR	95% CI	p
Chicago	LGBTQIA+ Event	0.22	0.05	1.25	1.12 - 1.39	0.000*
New York City	LGBTQIA+ Event	0.14	0.05	1.15	1.05 - 1.26	0.002*
San Francisco	LGBTQIA+ Event	0.15	0.04	1.16	1.07 - 1.25	0.000*

Poisson regression models where LGBTQIA+ events not significant and/or model fit not significant not included here due to table space limitations. These cities include: Atlanta, Austin, Charlotte, Columbus, Denver, Fort Lauderdale, Houston, Las Vegas, Minneapolis, Orlando, Portland, San Diego, and Seattle.

Table 1. Poisson regression models: Associations between LGBTQIA+ events and MSM sex worker advertising during 18-week period spanning June-October 2022.

Conclusions: In San Francisco, New York and Chicago, weeks with LGBTQIA+ events exhibited significant increases in MSMSW advertising compared to weeks without LGBTQIA+ events during the study period. In these EHE jurisdictions, LGBTQIA+ events could be opportuni-



ties to overcome legal and political barriers to reaching MSMSW community members. Further, this data may assist in identifying priority cities for MSMSW-specific sexual health/HIV prevention initiatives.

EPD0646

Using visual arts as a medium for HIV education and communication: insights from let's connect in Pakistan

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Background: Visual arts have long been recognized as a powerful medium for education, communication, and expression. This study, conducted by Let's Connect, an organization dedicated to improving the sexual reproductive health and rights of marginalized communities in Pakistan, explores the use of visual arts as a tool for raising awareness about HIV and AIDS in a sample community in Pakistan.

Description: The study was conducted over a period of six months in a rural community in Pakistan. A variety of visual arts activities were implemented, including art workshops, mural painting, and theater performances. These activities were designed to educate the community about HIV and AIDS, to promote HIV prevention, and to create a supportive environment for people living with HIV.

The study was evaluated through a combination of quantitative and qualitative research methods, including surveys, focus group discussions, and key informant interviews.

Lessons learned: The use of visual arts as a medium for HIV education and communication was well received by the community and was effective in raising awareness about HIV and AIDS. Participants reported increased knowledge about HIV transmission and prevention, and expressed positive attitudes towards people living with HIV. The visual arts activities were also successful in creating a supportive environment for people living with HIV, and in promoting HIV prevention. Best practices included the use of local artists and community involvement in the planning and implementation of the visual arts activities.

Conclusions/Next steps: The findings of this study demonstrate the potential of visual arts as a powerful tool for HIV education and communication, particularly in marginalized communities.

Let's Connect's experience with using visual arts as a medium for HIV education and communication highlights the importance of community involvement and the use of local resources in successful HIV prevention efforts.

Future efforts should focus on expanding the use of visual arts as a medium for HIV education and communication, and on building the capacity of local organizations to implement similar programs.

EPD0647

Qualitative findings support the use of digital interventions to promote HIV care/prevention among young Brazilian MSM: the Conectad@s Project

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Background: Reported HIV cases in Brazil are increasing among young gay and other men who have sex with men (YMSM). YMSM have worse HIV prevention/care outcomes compared to older peers. There is a lack of interventions for YMSM in resource-constrained settings.

We aimed to obtain formative data for a digital intervention to promote rapid linkage to HIV care/prevention among YMSM aged 18-24 years living in Rio de Janeiro, Brazil.

Methods: As part of the Conectad@s study, we conducted in-depth interviews (N=20) and focus groups (N=18) using semi-structured guides from January-February/2021 with purposive sampling for diversity in age and race. Audio recordings were transcribed verbatim in Portuguese and translated to English. Descending hierarchical categorical analysis was conducted using IRAMUTEQ. Excerpt selection and coding were performed using Dedoose.

Results: Among 38 participants, 76% were aged 20-24 years, 76% self-identified as gay, 47% as black, and 76% completed secondary education. Three main thematic axes emerged: LGBTQIAP+ social networks and outness, HIV prevention and access to health care, and challenges for implementing studies targeting YMSM. Most participants reported that discrimination by race, class, and body weight affects social networks and outness. Social distancing impacted socialization, especially during the first months of the COVID-19 pandemic.

Most participants were screened for HIV at least once in their lifetime, mostly at public health clinics. YMSM who never tested reported confidentiality concerns, fear of test result, HIV stigma, and not knowing where to get tested as barriers.

Pre- and post-exposure prophylaxis awareness were low. Potential side effects were the main barriers to PrEP. Peer delivery of interventions, regardless of age, and internet access available at research sites were important intervention components.

Recruitment barriers included confidentiality concerns, especially among religious YMSM and those who had not disclosed their sexual identity, and business hours of research sites.

Acceptability of text messages to support adherence was high, especially through WhatsApp, which is commonly used in Brazil.


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Conclusions: Digital interventions using text messages may increase HIV care/prevention engagement among YMSM. Discrimination, HIV stigma, and low HIV knowledge must be overcome to decrease new HIV cases among the youngest MSM.

EPD0648

Promoting the role of bisexual male sex workers in HIV prevention response in Kampala-Uganda

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Background: The different categories of sex workers, described by various authors and studies, tend to recognise Female sex workers (FSWs) as the only sex worker category and with different risk profiles. While this has left other sex worker categories limited with targeted health services including HIV programming.

Due to the current lack of data and information available regarding bisexual male sex workers in Uganda, SIU requested for the support of its partner UHA1 to conduct a hotspot mapping exercise to identify the hotspot for bisexual male sex workers in areas Kampala.

Description: The project was aimed to measure the volumes of transactional sex by bisexual male sex workers taking place in Kampala, analyse the characteristics of bisexual male sex workers including the locations, life style, analysing their experiences in exercising their human rights, and assessing the level of availability and accessibility legal and health.

Lessons learned: Ever since the mapping report was launched and disseminated among key health stakeholders and human rights advocates, it has been viewed as a great contribution to baseline knowledge of the epidemiology of STI, HIV, drug abuse and mental health issues of bisexual male sex workers, some partners have approached SIU to partner together in addressing some of the health issues that affects bisexual male sex worker. Improved organising of bisexual male sex workers, Has registered formation of four (4) psychosocial support groups of male sex workers. Improved strategic partnership between Ministry of Health and Bisexual male sex workers.

Conclusions/Next steps: The information gap about Bisexual sex workers to the extent that their existence is doubtful to the community is majorly due to the limited organising of bisexual male sex workers, so this calls for the need to enhance Bisexual male sex worker organising, amplify their voices through supporting community-led initiatives, and strengthen their capacity to be the centre of their ideas, priorities and programs that directly impact them.

To ensure appropriate and targeted interventions for Bisexual male sex workers, there is need to conduct a country wide hot spot mapping exercise and baseline assessment of health issues (HIV and AIDS, SRHR and mental health).

EPD0649

Psychosocial outcomes for migrants in a multidisciplinary HIV clinic with rapid and free B/F/TAF initiation: the 'ASAP' study

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Background: Psychosocial challenges hinder engagement at all steps of the HIV care cascade for migrants living with HIV (MLWH). To improve engagement, multidisciplinary HIV care, alongside rapid and cost-covered treatment, is recommended. However, evidence supporting this approach is lacking.

As such, we sought to examine change over time and by sociodemographics in psychosocial factors for MLWH enrolled in multidisciplinary HIV care with free and rapid treatment initiation.

Methods: In January 2020, we initiated a 96-week prospective cohort study at a hospital-based clinic in Montreal, Canada. All participants received bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) for free and as soon as possible following care linkage. MLWH were provided care by a multidisciplinary team composed of physicians, nurses, social workers, and pharmacists.

Four client-reported measures were administered at weeks 4, 24, 48, and 96 after treatment initiation:

1. *Internalized AIDS-related Stigma Scale* (score range: 0-7, higher scores indicate greater internalized stigma);
2. *Kessler Psychology Distress Scale* (score range: 6-30, scores >19 indicate probable to serious mental illness);
3. *MOS Social Support Survey* (score range: 0-100, higher scores indicate greater social support),
4. *PROMIS Global Health - Mental Health Subscale* (score range: 20-80, scores <40 indicate worse mental health, scores >60 indicate better mental health).

Descriptive statistics and linear mixed model analyses with bootstrapping for parameter estimates are reported.



Results: As of December 2022, data for 31/37 enrolled MLWH were available for analysis. Many participants were men-who-have-sex-with-men (n=16, 52%) and from Africa (n=14, 45%).

At the four time-points, average scores ranged from:

1. 3.8-5.2 (SD range: 1.9-2.4) for internalized stigma;
2. 23.0-26.5 (SD range: 3.8-5.5) for distress;
3. 52.4-56.2 (SD range: 27.4-35.7) for social support, and;
4. 46.5-52.1 (SD range: 8.4-10.9) for global mental health.

For all measures, no significant differences were found over time or by sociodemographic characteristics.

Conclusions: Irrespective of time engaged in care and sociodemographics, MLWH continued to experience moderate to high levels of stigma, distress, lack of social support, and mental health challenges, despite access to multidisciplinary care with free ART and rapid ART initiation.

Further research is required to understand MLWH experience with our clinical social workers and explore their unmet psychological needs in this context.

EPD0650

Correlates of sexual activeness and sexual satisfaction among older adults living with HIV in China: a cross-sectional survey

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Background: Sexual lifestyles are closely related to overall health and well-being. Few studies have focused on sexual lifestyles among older adults living with HIV (OALHIV), especially in low- and middle-income countries.

The objective of this study was to elucidate the basic characteristics of sexual lifestyles among OALHIV and identify some associations with sexual lifestyles.

Methods: We conducted a hospital-based, convenience sampling, cross-sectional survey among OALHIV in four cities in China between April 2020 and April 2022. Participants were recruited from infectious disease hospitals that provide HIV care in four cities in China. Eligible participants were people living with HIV aged 50 years and older. We used logistic regression to assess the correlates of sexual activeness and sexual satisfaction.

Results: 680 OALHIV (180 women and 500 men, mean age 60.3±7.8 years) were recruited. The majority were bisexual (66.9%) and lived in urban areas (69.7%). 37.1% were sexually active. Younger age (aOR 0.94, 95% CI 0.92-0.97), male gender (1.69, 1.06-2.68), being in a steady relationship (2.25, 1.33-3.79), and being employed (1.67, 1.12-2.50) were associated with being sexually active.

The prevalence of sexual satisfaction was 69.8% among sexually active OALHIV. Good or very good health status (2.37, 1.01-5.58) and depressive symptoms (0.21, 0.05-0.82) were associated with sexual satisfaction.

Conclusions: OALHIV's sexual activeness was likely to be defined by their socio-demographic characteristics. Better physical and mental health status may parallel with higher sexual satisfaction. To encourage successful aging in OALHIV, future studies should address the effect of health management on sexual satisfaction among OALHIV, especially those sexually active.

EPD0651

Physician-patient interaction quality mediates the association between HIV-related stigma and HIV-prevention behaviors among high-risk young men in Zambia

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Background: HIV-related stigma is a prominent barrier to HIV prevention for gender and sexual minorities including high-risk young men (HRYM) in Zambia, yet a dearth of studies has explored the underlying mechanisms.

This study aims to explore the role of healthcare providers by testing whether physician-patient interaction quality mediates the association between HIV-related stigma and HIV-prevention behaviors among HRYM in Zambia.

Methods: HRYM aged 18-35 years with multiple sexual partners were purposively recruited in four districts in Zambia between February and November 2021 for a cross-sectional survey.

Participants were asked about their demographic characteristics, experienced and internalized HIV-related stigma, physician-patient interaction quality, HIV-testing intention (next 3 months), and current use of pre-exposure prophylaxis (PrEP).

Path analysis was conducted to examine the mediation effect of "physician-patient interaction quality" in associations of "HIV-related stigma" with "HIV-testing intention" and "currently taking PrEP".

Results: A total of 206 HRYM (Age: Mean=24, SD=4.37) participated in the study. Participants were most likely to belong to "Bemba" ethnicity (39.32%), have completed senior secondary education (64.56%), be unemployed while able and seeking employment (53.4%), earn a monthly income



between 1001-2500 (31.55%), and be single (83.33%). Most were not using PrEP (86.4%) and were very likely to take an HIV test in the next three months (51%).

Higher self-reported physician-patient interaction quality was negatively associated with HIV-related stigma ($\beta = -0.268$, $p = .005$), and positively associated with HIV-testing intention ($\beta = 0.403$, $p = .003$) and currently taking PrEP ($\beta = 0.578$, $p < .001$).

HIV-related experienced and internalized stigma among HRYM had a significant and negative *indirect effect* on HIV-testing intention ($z = -2.037$, $p = .042$), and currently taking PrEP ($z = -2.393$, $p = .017$) through physician-patient interaction quality. The model had a good model fit to the data ($\chi^2 = 24.298$, $df = 3$, $p = .000$; CFI = .944, TLI = .958, RMSEA = .043, and SRMR = .000).

Conclusions: HRYM's HIV prevention behaviors appear to be indirectly influenced by HIV-related experienced and internalized stigma through physician-patient interaction quality. Healthcare providers in front-line HIV prevention service delivery play a critical role in promoting HIV prevention measures among gender and sexual minorities.

HIV prevention efforts should integrate strategies that promote physician-patient interaction quality through healthcare provider training, targeting HIV-related stigma in healthcare settings, and devising inclusive healthcare policies.

EPD0652

Implementation of an intensive case-management program improves outcomes for at-risk people living with HIV

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Background: The UNAIDS 2025 targets include 95% of people living with HIV having received a diagnosis, and 95% of those on treatment having an undetectable viral load. The Australian 2022 annual surveillance report found that 91% of people living with HIV were diagnosed, 92% of individuals receiving care were receiving antiviral therapy, and 98% of those on treatment had an undetectable viral load.

Individuals who have challenges engaging in care often have significant contributing psychosocial factors, which may include lack of employment, unstable housing, limited access to transport, substance use or misuse, and mental ill-health. New models of care to support these vulnerable individuals are required.

Description: Cairns Sexual Health Service is a large regional sexual health clinic, located in Far North Queensland, Australia. The clinic provides care to more than 400 people living with HIV. The region's population has substantially more First Nations people than the Australian average and is relatively socio-economically disadvantaged compared to the rest of the state.

Following an unusually high number of new HIV diagnoses in 2016, Cairns Sexual Health Service implemented a multidisciplinary, case management service – the HIV Access Team (HAT).

The team includes dedicated nursing staff, First Nations health workers, a social worker, pharmacy and medical support. HAT provides a client-centred flexible model of care, which aims to remove or reduce the barriers preventing engagement in clinical care.

The HIV Access Team case-managed 38 clients in the program's first year of operation (2019). Of these, 30 (78%) identifying as First Nations and 25 (66%) had undetectable viral loads. By the end of December 2022, HAT managed 63 clients, 33 (51%) identifying as First Nations and 60 (95%) had undetectable viral loads.

Lessons learned: Despite being resource intensive, HAT has shown that case-management is highly effective in assisting vulnerable clients to remain engaged in care with good virological outcomes.

Conclusions/Next steps: We plan to continue the HAT case-management program and this model of care could be implemented in other services with significant numbers of at-risk clients.

EPD0653

PrEP for women – another purview paradox? A qualitative analysis of HIV pre-exposure prophylaxis prescribing for Australian cisgender women

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Background: HIV Pre-Exposure Prophylaxis (PrEP) in Australia has largely been targeted towards men who have sex with men, with very few cisgender women prescribed PrEP. Widespread PrEP uptake has contributed to significant reductions in HIV notifications amongst Australian born MSM over the past 10 years, however there has not been such a dramatic decline in HIV incidence amongst other key populations.

We explored clinician experiences of PrEP prescribing for cisgender women.

Methods: Semi-structured interviews were held with Australian wide prescribers in 2022. Participants were recruited through relevant clinical services, newsletter distribution and snowball sampling. Interviews were audio-recorded, transcribed and analysed thematically.



Results: Seventeen prescribers participated, of whom 9 were Sexual Health Physicians. All reported limited clinical experience prescribing PrEP for women. Consistent with international reporting, most PrEP prescribing to women was in the context of a serodiscordant relationship.

Although high risk sexual history was a key indication, commercial sex work alone was often not considered high enough risk and several participants reported that women needed to meet multiple risk factors to be eligible. Barriers to prescribing included low client and clinician awareness and difficulties with risk assessment.

Although participants recommended targeted education for the public and clinicians and service expansion to facilitate access, they disagreed on the most appropriate service to provide PrEP to women, emphasising the 'purview paradox' associated with PrEP implementation on an international scale.

Conclusions: Clinician experience of PrEP prescribing to Australian cisgender women is limited, with significant barriers to access.

Further research should explore the experiences of a broader range of clinicians, women living with HIV and HIV-negative sexually active women. Women are a key population in the pursuit of global HIV elimination. Their inclusion in HIV prevention research and clarity of clinical ownership over PrEP implementation for women is essential.

EPD0654

A multifaceted approach to assess the needs and barriers in accessing comprehensive sexuality education among young people at risk in 7 provinces of Eastern Indonesia

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Background: Comprehensive Sexuality Education (CSE) is becoming challenging for young people at risk as a vulnerable and marginalized population in Eastern Indonesia due to taboo beliefs and health and education coverage inequality. This assessment comprehensively explores the needs and barriers from the perspectives of young people at risk, parents, communities, and stakeholders in accessing and providing CSE.

Methods: A Participatory Rural Appraisal design was used in 7 provinces of Eastern Indonesia, namely Papua, West Papua, Maluku, West Nusa Tenggara, South Sulawesi, North Sulawesi, and Central Sulawesi. In total, 115 youth aged 14-24 participated, 51% women, 44% men, and 5% trans women, with 90% sexually active, 52% heterosexual, 41% homosexual, and 7% bisexual. Furthermore, 37% of young respondents are HIV positive, 3% use drugs, and 23% only graduated from middle school and below. Additionally, a total of 67 respondents participated in FGD, representing parents, community supporters, and stakeholders.

Results: Parents or family are perceived to be the ideal CSE resources (40.6%) yet have been the least to be reached (13.7%). The internet has become the most accessed sexuality information resource (54.7%). The topic regarding contraception and unplanned pregnancies became the least information the adolescents ever learned (39.6%), followed by topics on sexual, reproductive, and gender rights (37.5%). Through in-depth discussion, it was found that social norms, beliefs, culture, and social constructs, have affected decision power and became hindering factors for adolescents accessing CSE.

Parents and stakeholders whose power in providing CSE still lack understanding and have misconceptions about sexual-related topics. CSE available topics in school and primary health care programs remain limited to reproductive health with no standardized curriculum.

Community supporters hold a strategic position in connecting young people at-risk to CSE.

Conclusions: Sociocultural and social constructs have influenced the behavior and opportunity of young people at risk of accessing CSE. Understanding and acceptance of CSE among parents and stakeholders are crucial in providing CSE. The Internet platform can be an opportunity to provide digital CSE for youth at risk in Eastern Indonesia. Investments in building community supporters' capacity can be beneficial in educating young people at risk and advocating CSE.

EPD0655

Growing old with HIV and the quality of life: an analysis of narratives of women ageing with HIV/AIDS in Indian Kashmir

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Background: The effective ART interventions have increased life expectancy of people living with HIV/AIDS (PLHA) across the globe. The same is case in Indian-Kashmir where PLHA experience more morbidity and mortality than the general people. The age-specific-illnesses and disorders related to cancers, cardiovascular diseases, mental or psychological diseases, bone issues and other geriatric syndromes greatly alter and affect their wellbeing.

The paper explores the issues of Kashmiri women while ageing with HIV/AIDS. These issues are co-related with various gender inequalities and inequities that dominate the lives of women in the region. These structural variants hinder identification, diagnosis, access to healthcare-services that hugely impairs the quality of life among these women.

Methods: The study is located in Indian Kashmir, a South Asian Territory. Seventeen (17) women, above the age of 45 years, living and aging with HIV participated in the study in 2019-20. An Interpretative Phenomenological Analysis was used to study and interpret their narratives.

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The self-accounts of participants are not seen as revealing any generic 'truth', rather they are treated as stories whose meanings are situationally located and require to be discovered.

The results have been elaborated in themes and sub-themes, with qualitative-illustrations.

Results: The participants were more likely to be invisible and isolated, keeping their status hidden from social-ecology which results in shrinking their social-network and there-by increasing their emotional-disconnect. They are afraid to disclose their HIV-status because of the stigma and discrimination surrounding the illness in the local-communities.

Most of these women reported early onset of age-specific and other-geriatric-disorders like osteoporosis, cardiovascular issues and mental health disorders but they prefer not to visit healthcare settings for fear of disclosure. They also majorly report loneliness and isolation.

The altered and ageing immune-system has preponed and increased the burden of illnesses, which has negatively affected their health-trajectory and reduced their quality-of-life and wellbeing.

The healthcare institutions and other government-agencies in Kashmir are not sensitive to this phenomenon of ageing-and-HIV,

Conclusions: 'These findings present a new challenge to healthcare-system in Kashmir. The increasing complexity of care for PLHA needs to be addressed though evidence-based-interventions so as to enhance quality-of-life among WLHA after adhering to ART-therapy.

EPD0656

Establishment of key populations-led facility monitoring committees for strengthening uptake of comprehensive HIV prevention services at public health facilities in Harare, Zimbabwe

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Background: Key populations (KPs) bear a disproportionate burden of HIV in Zimbabwe. HIV prevalence among KPs (sex workers, men who have sex with men (MSM), and transgender individuals) ranges from 21-42%, much higher than the 12.7% among the general population.

Working with KP communities in the design, planning, implementation, and monitoring of KP interventions is key to optimizing Zimbabwe's goal to ending AIDS by 2030.

Description: Pangaea Zimbabwe AIDS Trust (PZAT) established Key Populations Health Facility Monitoring Committees (KPFMCs) integrated into existing Ministry of Health and Child Care Health Center Committees at 17 supported facilities between July-August 2021.

A consultative process was conducted to develop terms of reference which listed the constituencies represented on the KPFMCs, including health care workers, the Zimbabwe Republic Police Victim Friendly Unit, networks of KP members, and their roles and responsibilities.

At each of the supported facilities, 11-13 nominated KPFMCs members were trained on monitoring quality of services and mobilization to reach and enroll additional KPs. Members are volunteers and only receive transport reimbursements for attending meetings. Peer KPs (MSM, female sex workers, transgender, and people who inject or use drugs) were responsible for linking the KP community to facility-based services.

From October 2021 to September 2022, all 17 facilities met quarterly to review performance and develop action plans to scale-up utilization of HIV prevention services.

Lessons learned: KPFMCs were successful in linking the KP communities to services, with improvement in access to services. Satisfaction levels remained high, even when client volume increased.

Indicator	Performance before KPFMC	Performance after KPFMC	Relative increase
Number of KPs reached with HIV prevention messages	2,670	6,462	142%
Number of KPs initiated on PrEP	1,622	2,272	42%
Overall client satisfaction with quality of prevention services	94%	98%	4%

Table. Performance on key program indicators before and after setting KPFMCs.

Conclusions/Next steps: his intervention, which capitalizes on existing structures and KP-trained health experts, is a potential low-cost, sustainable strategy for effectively linking KPs to HIV services.

Our results demonstrate KP-led facility monitoring groups increase the utilization of HIV prevention services and satisfaction among KPs. KPFMCs give communities ownership of primary health care service delivery points and that may have high impact if this model is scaled up to all public health care facilities in Zimbabwe.



EPD0657

Geographical variations associated with condom use and transactional sex among young men (15-24 years old) in Nigeria: cross-sectional analysis

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Background: HIV continues to disproportionately affect young people in Nigeria. Although males are more likely than females to use condoms in Nigeria, consistent condom use remains low, and little is understood about male condom use behaviors among men who engage in transactional sex in Nigeria. Therefore, this study examines geographic differences between male condom use and transactional sex practices among sexually active young men based in Nigeria.

Methods: The 2018 Nigeria Demographic and Health Survey, a nationally representative dataset was used for this study. A sample of male participants in Nigeria (n=13,311) between the ages of 15–24 years who were sexually active at the time of data collection were included in the study. Frequency distributions, bivariate, and multivariate analyses were conducted using Chi-square test χ^2 (Fisher's exact test cells <5) to assess independent factors associated with condom use. The results were reported using adjusted odds ratios (AOR) with 95% confidence interval.

Results: Of the 486 men ages 15-24 who were sexually active, 60% reported to have never used a condom with their recent sexual partner and 8% who used a condom in most recent paid sexual encounter. Participants who were located in urban areas [AOR=0.63; P=0.044; 0.40-0.98], Northcentral [AOR=0.33; P=0.002; 0.16-0.67], and Northeast [AOR=0.13; P<0.001; 0.05-0.35] were at decreased odds of engaging in condom use during transactional sex. Participants who exchange money for sex across education (P=0.002) and wealth (P=0.031) were significant factors for increased condom use. However, marital status (P<0.001), literacy (P=0.046) and being in the Northeast of Nigeria (P=0.006) result in a decreased odds of using condoms.

Conclusions: This study validates the inconsistent use of condoms in non-commercial sexual relationships among Nigerian young men. Transactional sex plays an important role in HIV transmission and condom use is likely to vary across different geographic regions in Nigeria. The spatial polygamy of consistent condom use during non-commercial sex can inform ways that HIV prevention interventions and policies can adhere to the complexity of condom use among historically neglected and high-risk youth for HIV acquisition in Nigeria.

EPD0658

"There is no need to leave the beach to test": a qualitative study of HIV self-testing knowledge, acceptability, and willingness to distribute HIVST kits among fishermen in western Kenya

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Background: HIV self-test kits (HIVST) can improve HIV testing uptake by offering added convenience and privacy. Yet HIVST uptake remains limited among high-priority populations, including men and mobile populations. We assessed HIVST knowledge and acceptability among highly mobile fishermen in communities along Lake Victoria, Kenya, participating in a social network study to promote HIVST (#NCT04772469).

Methods: Sixty-five in-depth interviews (IDIs) were conducted with fishermen, including 30 socially-connected men recruited as "promoters", from 3 fishing communities in Siaya County. Fishermen were purposively sampled based on age (<35 years) and community for interviews exploring HIVST knowledge, perceived benefits, and concerns. IDIs were audio-recorded, translated/transcribed into English, then inductively coded and analyzed by six researchers using a framework approach.

Results: Most participants were >35 years (56%) and married (83%). Nearly all (98%) participants had heard about HIVST and expressed willingness to use HIVST. About half (44%) learned about HIVST via a prior study. Perceived benefits of self-testing included privacy, convenience, and being able to learn one's status with the freedom to choose when and where to test, which minimized stigma and work interruptions. Few (N=7) participants had used HIVSTs, all of whom reported ease of use; four had tested with their partner. Perceived barriers to HIVST use included fear of HIV-seropositive results, being unsure of use procedures, and fear of stigma if a kit was discovered. Nearly all socially-connected "promoters" indicated they would distribute HIVST



to help their friends know their status. They also acknowledged that some men may not be receptive to receiving HIVST due to fear of being suspected of having HIV. Promoters stressed the importance of approaching HIVST discussions strategically and thoughtfully to garner trust and engagement, and felt they needed training to answer friends' HIVST questions.

Conclusions: While few fishermen had ever used HIVST, this study found high awareness, positive perceptions, and substantial willingness to use and distribute HIVST to other men.

There is a need to bolster awareness of the benefits of HIVST, along with thoughtful dissemination that includes promoter training on minimizing stigma and building trust among this high-risk population.

EPD0659

Chemsex, HIV risk behaviors and access to services among men who have sex with men and transgender women in Cambodia: an exploratory study

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Background: Chemsex is the intentional use of psychoactive drugs to increase sexual pleasure. Chemsex is increasing among men who have sex with men (MSM) and transgender women (TGW) and has likely contributed to HIV epidemic in Cambodia. Understanding of user demographics, routes of administration, risk practices, types of drugs, settings, and ways of engagement in Chemsex is currently lacking.

This study aimed to understand Chemsex practices and effects, user characteristics and experiences, and access and uptake of HIV prevention services among MSM/TGW in Cambodia.

Methods: We conducted a mixed-methods study among MSM/TGW Chemsex users aged 15 years and older living in Phnom Penh. The study was conducted from 25 August to 18 September 2022. A total of 135 active MSM/TGW Chemsex users were enrolled, and 15 in-depth interviews were performed. Risk-tracing sampling was used as the recruitment strategy. Quantitative data were analyzed using SPSSX. Content analysis was used for the qualitative component.

Results: Participants were relatively young (28.1 years) and most not living alone (70.4%). Respondents reported high numbers of sexual partners and frequent attendance of Chemsex events. Crystal methamphetamine (68.8%) and Ketamine (50.4%) were the Chemsex drugs of choice. Some also injected crystal meth (13.3%). Non-condom

use during anal intercourse was common (15.6%), despite condoms (71.9%) and lubricants (82.2%) being readily available. Uptake of frequent HIV testing was low (66.7%) and only a few had ever heard of or had used HIV Pre-Exposure Prophylaxis (PrEP).

The internet and social media such were most frequently mentioned (85.2%) for identifying and recruiting Chemsex partners. Sexual partners and friends are the most influential. Non-consensual sex (17.7%) and drugging before or during Chemsex (9.7%) were relatively common.

Chemsex use was problematic in many cases with almost half (49.6%) showing signs of dependency and addiction. An important role was found in the exchange of Chemsex in return for money and drugs.

Conclusions: HIV risk behavior in Chemsex users was found to be high in combination with limited uptake of HIV prevention and other services. Increased and improved HIV prevention activities and drug management and addiction services, including innovative strategy to reach virtual and physical, are urgently needed.

EPD0660

Demand creation strategies to increase acceptance of HIV pre-exposure prophylaxis among pregnant and breastfeeding women (PBFW) as part of the eMTCT strategy in Mazowe District, Zimbabwe

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Background: Pre-exposure prophylaxis (PrEP) is effective in reducing risk of HIV acquisition among all populations, including pregnant and breast-feeding women (PBFW) as part of the national elimination of mother-to-child transmission (eMTCT) strategy in Zimbabwe.

However, PrEP uptake has been low among PBFW due to limited awareness. Pangaea Zimbabwe AIDS Trust (PZAT), in collaboration with MOHCC and partners initiated targeted demand creation activities to ensure PBFW are reached with PrEP services across public health facilities in Mazowe district.

Description: From July to October 2022, 50 Health workers (HCWs) from 29 supported facilities including nurses, primary councilors, health promotion officers were trained using the standard MOHCC training package. During the



same period, 35 existing PrEP Champions (PCs) were oriented on demand creation and PrEP for PBFW. PCs are women trained to raise awareness, mobilize, and advocate for PrEP uptake through peer-peer models. The HCWs and PCs delivered targeted demand creation activities including eMTCT and PrEP Information Sessions (PISs) directed at PBFW at Family and Health Care departments. Facilities held 1-2 sessions per day, depending on client volume. Safety and benefits of using PrEP during pregnancy and breast-feeding were emphasized. PBFW Interested and eligible for PrEP were linked to services.

Lessons learned: Targeted demand creation activities through multiple platforms at facility level increased PrEP uptake among PBFW. From July-October 2022, 220 PISs reached 578 PBFW. During the same period, 210 pregnant and 224 breast-feeding women were initiated on PrEP translating to 73% uptake.

However, facility-based PISs are limited in that they only reach PBFW who are coming to the facilities. To reach more, PISs and other strategies need to be conducted at community level.



Figure. Number of PBFW initiated on PrEP in Mazowe District, Mar '21-Oct '22.

Conclusions/Next steps: Employing multiple, targeted demand creation strategies at facility level increases oral PrEP uptake by PBFW. However, this strategy will need to be complemented by community-based strategies targeting PBFW, their partners and other influencers.

EPD0661

Structural and stigma barriers to ART adherence for marginalized trans and gender diverse people in the border region of Nepal

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Background: Only half of people living with HIV in Nepal are virally suppressed. Key populations outside the metro area of Kathmandu may face the most ART adherence challenges. This study was conducted to identify social and systems barriers to ART adherence among hardly reached and marginalized trans and gender diverse women living with HIV who reside in the border region of Nepal.

Methods: Qualitative focus group data were collected with ten trans and gender diverse women from the Terai highways district region of Nepal along the India-Nepal Border region.

Focus groups were conducted in Nepalese and Maithili – the latter being local language of the Terai region. Data were collected in December of 2022. Content analysis was conducted to identify key themes related to ART adherence barriers.

Results: A key ART adherence barrier was the many hours of travel and significant transport cost due to the distance between participants' home villages and the two metro ART dispensation sites where they acquired monthly ART medications.

Additional hardships occurred when ART center closures happened unexpectedly. All participants seasonally migrated to India for work as dancers and were not able to access multi-month prescriptions. Participants had to travel back to Nepal monthly to maintain ART adherence, which was not possible for most.

Lastly, stigma created adherence barriers. To avoid HIV stigma, most trans women did not disclose their HIV status to family members with whom they lived. As a result, they had to hide pill taking.

And some participants registered at government ART sites outside their designated geographical area to avoid HIV stigma, creating additional travel and cost barriers.

Lastly, not all participants were eligible to use the local LGBT NGO dispensation site because they did not register as trans with the government, making them ineligible for medication dispensation at the trans-serving NGO.

Conclusions: Structural barriers and discrimination intersected to present formidable barriers to ART adherence for trans and gender diverse women in the border region of Nepal.

Structural interventions including more ART dispensation locations in rural areas and addressing HIV and anti-trans stigma are needed to improve ART adherence in this key population.

EPD0662

Association between symptoms of depression and sexual risk behaviours among young people in Manicaland, East Zimbabwe: a cohort study

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Background: Evidence on the relationship between depression and sexual risk behaviours among young people in sub-Saharan Africa is limited. We examined whether symptoms of depression were associated with starting sex and sexual risk behaviours in Manicaland, East Zimbabwe.


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Methods: Data were from a general population HIV sero-survey cohort. Men, aged 15-29, and women, aged 18-24, were surveyed at baseline (2018/19) and followed-up after six months (2019/20). At baseline, participants were tested for HIV, and symptoms of depression were measured using the Patient Health Questionnaire-9, allowing calculation of a symptom score (range:0-27). At follow-up, participants who were not sexually active at baseline were asked if they had started sex.

Simultaneously, participants who were sexually active at baseline were asked whether they had: used a condom through-out their last sex, given or received money, goods, or services for sex in the last month (transactional sex), and/or had a non-regular partner in the last six months.

We selected HIV-negative people for analysis. Logistic regression was used to assess whether depression symptom scores at baseline were associated with starting sex and sexual risk behaviours at follow-up, while adjusting for socio-demographic confounders.

Results: The analysis included 903 (n=466, 51.6% female) participants; 560 (n=350, 62.5% female) had started sex at baseline. Among men, there was no evidence of associations between symptoms of depression and starting sex (adjusted odds ratio:1.02, 95% confidence interval:0.88-1.17) or with any of the sexual risk behaviours. Among women who had not started sex at baseline, each unit increase in depression score at baseline was associated with 1.27 (1.06-1.54) times higher odds of having started sex at follow-up. Among women who had started sex at baseline, each unit increase in depression score was associated with 1.09 (1.01-1.17) times higher odds of not using condoms through-out their last sex and with 1.10 (1.00-1.21) times higher odds of having had a non-regular partner in the last six months. There was no evidence of an association for transactional sex (0.97, 0.85-1.09).

Conclusions: Screening for depression and providing psychological support to young HIV-negative women may increase condom use and reduce their numbers of non-regular partners, decreasing their risk of acquiring HIV.

EPD0663

Ongoing war and human rights of key populations in Ukraine: impact and response informed by community-led monitoring

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Background: There is a strong link between human rights violations of key populations and spread of HIV. Armed aggression actions are known to have destructive impact on availability and accessibility of health services, as well as on health seeking behaviour of key populations. Russia's full-scale invasion into Ukraine on February 2022 significantly exacerbate pre-existing human rights vulnerabilities among key populations.

Description: Since 2019 REAct (Rights - Evidence - ACTions) on-line system for monitoring and response to human rights violations faced by key populations has been implemented by 70 community-based organizations in 17 regions out of 24 in Ukraine. The system allows to document cases of human rights violations, as well as to provide health, legal and other services. More than 6100 cases of human rights violations among key vulnerable to HIV and TB populations were registered since the start of the system. In 2022, the year of war, 2800 cases of human rights violations among key populations were registered, among them 35% were related to a full-scale war of the Russian Federation against Ukraine. Disaggregation of REAct clients by key populations is the following:

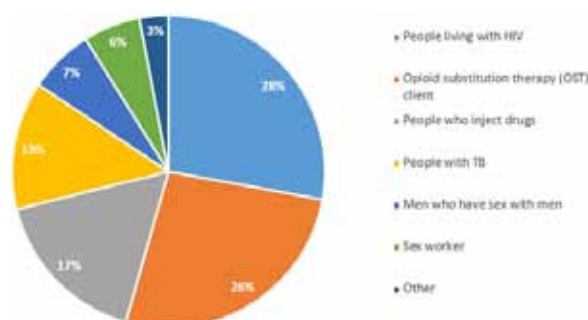


Figure. Key populations of REAct clients.

Lessons learned: The devastating impact of the ongoing war in Ukraine has put key populations in extremely limited access to HIV prevention and treatment, opioid substitution therapy and other health services, as well as social and legal services.

Even under conditions of war and active hostilities in some regions of Ukraine, REAct system has been serving for clients to provide them necessary assistance, about 90% of all cases were resolved positively.

Conclusions/Next steps: Identification of human rights-based barriers in accessing health services under the war time is crucial to redesign existing HIV prevention programs to address the needs of key populations effectively. REAct evidence should be highly considered, when planning and implementing human-centered and human rights-based HIV programs.



EPD0664

Impact of different forms of stigma on the mental health of high-risk young men in Zambia

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Background: Mental health problems are common among High Risk Young Men (HRYM) complicated by stigma related to sexual identity. Previous research has reported mixed findings on this relationship, but few considered the impact of different forms of stigma on mental health among HRYM.

This study explored the relationship between mental health of HRYM and enacted and perceived stigma.

Methods: A cross-sectional survey in English was conducted with HRYM across four districts in Zambia between February and November 2021. The survey was completed via pre-programmed, self-administered tablets.

The survey included questions on different forms of stigma and mental health. Using SAS, we conducted multiple logistic regression to examine the impact of different forms of HIV-related stigma on depression, anxiety, and post-traumatic stress disorder, controlling for demographic variables, substance use, self-esteem, social support, and resilience.

Results: A total of 206 HRYM (Age: Mean=24, SD=4.37) recruited from the four districts in Zambia participated in the study. Majority of them belonged to ethnicity "Bemba" (39.32%), completed senior secondary education (64.56%), were unemployed but able and seeking employment (53.4%), earned a monthly income between 1001-2500 Zambian Kwacha (31.55%), and were single (83.33%). Most were not using PrEP (86.4%).

Results indicate that depression was associated with enacted stigma ($\beta=2.08$, $SE=0.84$, $p=.014$); anxiety was associated with enacted stigma ($\beta=0.58$, $SE=0.26$, $p=.026$) and perceived stigma against HRYM ($\beta=0.53$, $SE=0.22$, $p=.015$); and PTSD was associated with the perceived stigma against HRYM ($\beta=0.62$, $SE=0.22$, $p=0.005$) and social support ($\beta=-0.35$, $SE=0.14$, $p=.010$).

Conclusions: Different forms of HIV related stigma seem to have differential effect on the mental health of HRYM, highlighting the importance of including these measurements in addressing the mental health of this population. More studies are needed to validate the stigma scales and how different forms of stigma affect utilization of HIV prevention services and care by HRYM.

EPD0665

Loneliness and its correlates among older adults living with HIV in China: a multicenter cross-sectional study

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Background: With the aging among people living with HIV, it is critical to understand the health needs of older adults (aged 50 years and above) living with HIV (OALHIV). Loneliness, as the next critical public health issue, was rarely mentioned among OALHIV.

Methods: A multicenter cross-sectional study was conducted between April 2021 and April 2022. Participants were recruited from infectious diseases hospitals that provide HIV care in four cities in China. The associations with loneliness symptoms (measured by a three-item UCLA Loneliness Scale) were analyzed by logistic regression models.

Results: A total of 680 OALHIV (500 male, 180 female, mean age 60.3 ± 7.8 years) were included in the analysis. About one-fifth (18.1%) of OALHIV reported loneliness symptoms. Living in urban areas (aOR 3.50, 95% CI 1.76-6.95), having children without close intergenerational relationships (2.85, 1.15-7.07), higher self-perceptions of aging (1.10, 1.06-1.15), being heterosexual (0.26, 0.13-0.52) or bisexual (0.37, 0.16-0.82), having children with whom they kept close intergenerational relationships (0.36, 0.14-0.98), and reporting life satisfaction (0.40, 0.24-0.66), were associated with loneliness symptoms.

Conclusions: Loneliness was prevalent among OALHIV. Living in urban areas, being homosexual, having children with whom they kept fragile intergenerational relationships, being dissatisfied with life, and having higher self-perceptions of aging were independent risk factors for loneliness. Routine health management needs to incorporate the assessment of aging perceptions and loneliness.

EPD0666

An autoethnography of a principal investigator as a peer change agent to increase perceived HIV risk and PrEP initiation among Black Sexual Minority Men

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Background: Solutions to substantially improve PrEP uptake among U.S. Black sexual minority men (SMM) remain elusive. Peer change agents (PCAs) can improve PrEP initiation because they can build trust, circumvent multilevel barriers, and facilitate communication between Black SMM and clinicians and/or researchers. However, information regarding how PCAs leverage personal characteristics, PrEP care experiences, and communication with Black SMM to improve PrEP initiation is unknown. Therefore, I conducted an autoethnography of being a PrEP-using PCA in a multicomponent pilot intervention called POSSIBLE.

Methods: POSSIBLE was theoretically guided and designed to increase perceived HIV risk and willingness to accept a PrEP referral among Black SMM between 2019 and 2021. Participants used a smartphone app to record sexual risk behaviors and completed two 20-minute motivational interview-based sessions with me as the PCA to assess their PrEP interest (N=69).

I initiated PrEP as the PCA to better understand clinical experiences, discuss relative HIV risks, address PrEP misinformation, and disclose personal experiences with participants. Autoethnographic data included journal entries of my healthcare visits, interactions with PrEP care teams, and attitudes towards adherence.

Data also included summaries of study visits focused on interpersonal dynamics with participants, concerns about personal disclosures, and angst about personal identity versus professional responsibilities.

Analysis involved weekly team meetings to discuss multilevel PrEP experiences, being an in-group researcher, and implications for research teams.

Results: Daily PrEP adherence and follow-up care visits reinforced awareness of multilevel challenges of being a Black SMM and triggered loneliness, shame, medical mistrust, and treatment nonadherence. Participants reported greater expectations of a culturally congruent PCA/researcher to disclose personal information and help them understand their healthcare experiences, navigate decisions about sex, relationships, and PrEP, and avoid multilevel barriers to PrEP care. Iterative reflections of PrEP experiences, professional responsibilities, and participant expectations influenced study visits.

Conclusions: A PCA struggles to navigate multilevel barriers despite having PrEP facilitators. PCAs might need to scaffold Black SMM's healthcare decision-making beyond their professional scope. Therefore, PCAs require additional support from research teams to mitigate PrEP barriers,

maintain professionalism, and ensure they can manage countertransference to ethically and effectively serve Black SMM.

EPD0667

Improving comprehensive AIDS response targeting men who have sex with men (MSM) community in Ekiti State, Nigeria

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Background: Preliminary data from the IBBSS 2020 reveal an increase in the disproportionate rate of HIV infection among Key Populations (KPs) in Nigeria, (FSW 15.5%, MSM 25%, PWID 10.9%, and TG 28%) compared to 1.4% (NAIIS, 2018) of the general population. These figures show a gap in HIV response for KPs, hence the need for a program targeting the KPs and the MSM.

This project's strategic goal and objectives were to increase new case findings, reduce cases of missed appointments and lost to-follow-up among MSM Living with HIV, and enrolment into ART care to achieve viral load reduction.

Description: Ekiti State government's partner, APIN Health Initiative through Access To Health And Rights Development Initiative (AHRDI) carried out an "Improving Comprehensive AIDS Response Enhanced for Sustainability (iCARES) project" that aspires to close identified gaps in MSM HIV programming for the Prevention, Care and Treatment of HIV/AIDS in Ekiti State, Nigeria, between October 1st 2021 to September 30th 2022.

The project objectives were achieved by advocacy, site estimate, capacity building of the CBO, condom/lubricant distribution, index testing, self-testing, case, and viral load tracking.

Lessons learned: Project staff are mostly members of the community which enhanced the quality and productivity of intervention for MSMs. At the end of the 1-year program covering 7 local governments in 36 sites, the results obtained served as the baseline. 2,281 were reached with prevention services, 112,928 male condoms, and 14,720 lubricants were distributed.

Also, 2,192 were reached with HIV testing services with 217 HIV positive, a total of 291 were those who are currently on treatment with 70% of them screened for viral load and 100% with viral load suppression.

Another lesson learnt was the ability to capture the hard-to-reach communities which constituted over 58% in the state. They are High-class MSMs, Closeted MSMs, the Down lows (DL), and the Married MSMs

Conclusions/Next steps: At the end of the project, there was a vast improvement in access to health care, prevention, HIV Testing services, treatment, and viral load sup-



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pression by the MSM community. The second round of the project started immediately, using the data from the first round as the baseline.

EPD0668

More than deficit approach: how to develop animated video resources to enhance HIV health literacy of diverse migrant populations in Australia

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Background: Heterosexuals from Sub-Saharan Africa and gay, bisexual, and men who have sex with men from Asia and South America are identified as priority migrant populations due to their experience of inequities in accessing Australian relevant HIV information and services. There is a need to enhance their HIV health literacy; however, most interventions rely on deficit models where the gaps in their knowledge are addressed through a top-down and biomedical-driven educational approach.

To shift away from this model, our aim was to develop and distribute animated video resources that highlight the capacities of said communities to reflect on HIV health information on emotional, social, and cultural levels.

Methods: We developed the animated video resources using a series of interviews and focus group discussions with the priority migrant populations. Both data collection methods were conducted by four peer researchers. A script writer also co-facilitated the group discussions to inform the creation of video scenarios and scripts. Additional feedback was sought from community members, and a consortium of academe and industry researchers.

Finally, a professional animator converted each scenario into a suit of animated videos.

Results: We produced 6 short animated videos and translated into relevant languages. The videos portrayed thematic conversations within and across the priority migrant populations. Each video unpacked a particular issue that illustrated a specific challenge in accessing, appraising, and applying HIV health information. Issues covered included HIV stigma, language barriers, and how to engage with health providers.

The focus group discussions also highlighted the following themes:

1. Epidemiological and ethnonational-based groupings do not always represent how migrants socially engage with HIV health information;
2. Conversations must achieve a balance between being realistic and aspirational in promoting change in socio-cultural norms that stigmatise sex and HIV;
3. Using educational and government institutional logos and information channels is likely to enhance message credibility;
4. Linguistic exchanges and barriers are negotiated differently depending on contexts.

Conclusions: While this shift of model extensively requires on community knowledge and participation, health promotional resources must consider the relational and contextual aspects of engaging with information to effectively enhance HIV literacy of diverse migrant populations in Australia.

EPD0669

Correlates of drinking refusal self efficacy among sexual and gender minority men in San Francisco and implications for HIV prevention and care

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Background: Heavy episodic drinking (HED) is associated with HIV sexual risk behaviors, reduced adherence to antiretroviral therapies and HIV seroconversion among sexual and gender minority men (SGM). Drinking refusal self-efficacy (DRSE; i.e. the belief that an individual can refuse alcohol), has previously predicted HED. Although HED is highly prevalent among SGM, there is little information about SGM's perceived self-efficacy when confronted with high risk situations.

We sought to identify correlates of perceived ability to resist drinking in high-risk social, emotional and opportunistic situations in a sample of SGM with alcohol use disorder (AUD).

Methods: We conducted a secondary data analysis of baseline data from a randomized controlled clinical trial in San Francisco, that evaluated the efficacy of naltrexone

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to reduce HED. SGM with AUD (n=120) completed surveys that assessed demographics, drinking refusal self-efficacy questionnaire (DRSEQ-R), alcohol use disorders identification (AUDIT), depression scale (CES-D), and severity of dependence scale (SDS).

We fitted multivariable logistic regression models, adjusted for age, race/ethnicity and education, to identify correlates of the three DRSEQ-R subscales (all with high internal validity in this sample): 5-item social pressure ($\alpha=.84$), 7-item emotional relief ($\alpha=.93$), and 7-item opportunistic ($\alpha=.97$); each item had a score of 5 points.

Results: The study had a median age of 37 (IQR=30-49) and was comprised of SGM (14% African American, 26% Latino/Hispanic, 4% Asian and Pacific Islander). Most had completed college (59%).

Participants had the lowest median scores for the subscale social pressure [12, IQR 10-14], followed by emotional relief [23, IQR=18-27], and followed by opportunistic [29, IQR=25-32] drinking.

Multivariable logistic regression models showed that higher SDS was associated with lower social pressure DRSEQ scores ($aOR=4.14$; 95%CI=1.72-9.99).

Higher CES-D ($aOR=2.65$; 95%CI=1.03-6.80) and being unemployed ($aOR = 3.80$; 95%CI 1.04-13.88) were associated with lower emotional relief DRSEQ-R scores. There were no significant correlates for opportunistic DRSEQ-R scores.

Conclusions: SGM had lower scores for at-risk emotional and social pressure situations, which may be important targets for HED interventions.

Findings highlight the need to address social determinants of lower DRSEQ-R, such as unemployment, to reduce HED and enhance HIV prevention and care interventions for SGM with AUD.

EPD0670

Increased HIV risk and less use of prevention among gay and bisexual men who have recently migrated to Australia: an analysis of national, behavioural surveillance data 2019-2021

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Background: Overseas-born gay and bisexual men (GBM) are overrepresented in HIV notifications in Australia. Length of residence may affect migrants' sexual behaviour and HIV prevention usage. English-speaking migrants may find it easier to access services in Australia.

To help strengthen HIV prevention, we assessed GBM by region of birth, length of residence in Australia, their social and sexual behaviours, and factors influencing HIV prevention uptake, testing and treatment.

Methods: Data were collected in the national Gay Community Periodic Surveys during 2019-2021. Canada, Ireland, New Zealand, the UK and USA were classified as high-income English-speaking countries. Overseas-born GBM living in Australia for <2 years were considered as recently-arrived; ≥ 2 years as non-recently-arrived.

Logistic regression models were used to identify social and behavioural factors that differentiated recently-arrived and non-recently-arrived GBM.

Results: Among 24,815 participants in 2019-21, 2,810 (11.3%) were from high-income English-speaking countries (excluded from further analysis), 731 (2.9%) were recently-arrived overseas-born GBM and 3,916 (15.8%) were non-recently-arrived migrants. Recently-arrived GBM were most likely to be born in Asia (36.1%) and Europe (21.1%). Recently-arrived GBM were younger ($aOR=0.95$, 95%CI=0.94-0.96, $p<0.001$), less likely to have full-time employment ($aOR=0.57$, 95%CI=0.47-0.71, $p<0.001$), and more likely to be a student ($aOR=1.47$, 95%CI=1.14-1.90, $p=0.003$). They were more likely to report consistent condom use with casual partners ($aOR=1.31$, 95%CI=1.02-1.68, $p=0.033$), but also more likely to be living with HIV, not on treatment and report condomless sex ($aOR=1.32$, 95%CI=1.01-1.74, $p=0.044$). 16.8% of recently-arrived and 12.7% of non-recently-arrived GBM reported casual sex with a risk of HIV transmission ($aOR=1.32$, 95%CI=1.01-1.74, $p=0.04$). Recently-arrived GBM had lower PrEP awareness ($aOR=0.50$, 95%CI=0.36-0.70, $p<0.001$) and PrEP use (25.6% vs. 35.1%, $p<0.001$). Levels of HIV testing were similar ($p>0.05$), but recently-arrived GBM were less likely to test at a general practitioner ($aOR=0.53$, 95%CI=0.41-0.68, $p<0.001$), and more likely to test at hospital ($aOR=3.35$, 95%CI=2.53-4.46, $p<0.001$), home ($aOR=2.27$, 95%CI=1.58-4.86, $p<0.001$) or community-based services ($aOR=1.35$, 95%CI=1.00-1.83, $p=0.049$).

Conclusions: Recently-arrived GBM reported more HIV risk and less PrEP use than non-recently arrived GBM and were less likely to test at GPs (which may be due to cost). It is necessary to enhance access to testing, PrEP and HIV treatment among recently-arrived GBM in Australia.

**EPD0671****Adolescent and young adult goal identification among young Black and Latinx MSM and transgender women at-risk for or living with HIV**

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Background: Adolescents at-risk and living with HIV are historically difficult to engage in health care. Collaborative goal setting has been associated with higher ownership in health care and lower anticipated healthcare stigma. Understanding goals that adolescents identify in collaborative goal setting with health coaches may have potential to promote engagement in HIV and prevention care services.

Methods: 102 Black or Latinx MSM and transgender women (TGW) adolescents (n=35) aged 15-19 and young adults (n=67) aged 20-25 were recruited between September 2017 – November 2021 across four US metropolitan areas (Baltimore, MD; Washington D.C.; Philadelphia, PA; Tampa, FL) and randomized to an 18-month motivational-based intervention that emphasized collaborative goal setting with a health coach.

Analyzed data included participant goals logged by coaches in a secure database, recorded responses to open-ended questions, field research notes, and conversations. Data was coded and discussed until coding reached redundancy. A conceptual analysis was used to quantify topics and themes related to goals.

Results: Most (90%) identified as cisgender male and 21% were living with HIV. Among adolescents, 86% identified one or more goals, versus 78% of young adults. Adolescent goals included themes of employment (50%), education (47%), values (30%), sexual health (27%) and general health (27%). Young adult goals included employment (51%), education (42%), health (42%) and mental health (34%). 14% of adolescents did not identify any goals, compared to 21% of young adults.

Adolescents without goals revealed fear of goal disclosure to parents and privacy concerns, feeling depressed, ungratifying sexual encounters, and lack of coach connection. Young adults without goals revealed barriers related to unstable cell phone service, lack of coach connection, and no response to coach messages.

Conclusions: Education and employment were unifying themes across both age groups. For collaborative goal setting to work, health coaches will need to address pri-

vacy and mental health barriers with adolescents, while addressing structural barriers (e.g., cell phone use) with young adults.

More work is needed to understand an adolescent's choice of goal, and how application of goals impacts engagement in HIV care or preventative services.

EPD0672**Improved meaningful inclusion of female sex workers in injectable PrEP trials in Uganda**

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Background: PrEP is a highly effective biomedical HIV prevention method among female sex workers (FSWs). Uganda was one of the seven (7) countries in sub-sahara Africa that was considered for Injectable PrEP trial among HIV negative female sex workers (FSWs) in four (4) sites targeting FSWs. BAYLOR -Uganda one of the Injectable PrEP site collaborated with Uganda Network of key population service organizations (UNESO) because of UNESO's strategic position as a network that brings together sixty (60) sex worker-led organizations to support in mobilizing FSWs to participate in a five years trial.

Description: UNESO mobilized 256 female sex workers who were screened for PrEP eligibility and 173 were approved and enrolled for injectable PrEP trial. Participants were screened for PrEP eligibility using a national screening tools.

Data on socio-demographics, behavioral and sexual risks were collected by interview to ensure retention and adherence, awareness on HIV prevention methods was created with emphasis of correct and consistent use of condoms.

Lessons learned: The prevalence of PrEP options (Injectable PrEP) awareness has significantly increased among sex workers and to other people including clients of sex workers who are in close contacts with especially female sex workers who participated in the trial.

Uganda as a country is second country after Zimbabwe in Africa to approve and adopt the use of Injectable PrEP (CAB-LA), For the 1st time ever, UNESO was engaged by Ministry of Health to participate in the review of PrEP guidelines to ensure that the sex worker issues are well presented and addressed in PrEP implementation.

Although Uganda has approved Injectable PrEP but it is still reluctant to implement with a claim that the drug is expensive to procure, therefore, sex workers led by UNESO together with other HIV actors have launched a campaign to advocate for availability of PrEP options for effective HIV prevention and the affected most vulnerable communities.

Conclusions/Next steps: Majority of sex workers and other communities are not aware of the approved PrEP options including Injectable PrEP. Therefore more Inter-



ventions to increase awareness among female sex workers are needed so as to create pressure for demand of the PrEP options implementation by the government of Uganda.

EPD0673

Data driven programming: using hot spot mapping data to improve case detection and linkage to HIV prevention and treatment services in Harare, Zimbabwe

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Background: Key Populations (KP) bear a disproportionate burden of HIV in Zimbabwe. Pangaea Zimbabwe AIDS Trust (PZAT) is building the capacity of public health facilities to provide KP friendly services to improve uptake of HIV prevention, care, and treatment services.

A hotspot mapping is an initiative to assess and quantify the needs of this population subgroup to scale up needed health and prevention services in the context of HIV, while reducing unnecessary burdens on the health system.

Description: From March 2022 to April 2022 PZAT supported the mapping of hotspots in Harare. Hot spots are geographic areas of high burden of the disease that continues to fuel the epidemic, and these include bars, brothels, hotels, sex dens, casinos, lodgings among other makeshift spots.

Hot spot mapping is a systematic cognitive approach to identify these locations where they can be reached with services. PZAT adapted the FHI360/LINKAGES hotspot profiling and listing tools.

Community Facilitators (sex workers, men who have sex with men, transgender people and people who inject and use drugs) were trained to implement the activity.

Data collection was done through small group dialogue sessions.

Lessons learned: There was a significant improvement in the uptake of HIV prevention, care, and treatment services after hotspot mapping as compared to the period before. Between October 2021 and April 2022, a total of 555 KPs were initiated on pre-exposure prophylaxis (PrEP) to prevent HIV infection representing an average of 93 initiations monthly.

Following the hotspot mapping exercise, between May and September 2022 a total of 1067 KPs were initiated on PrEP with a monthly average of 177 initiations.

Engaging the KP community is crucial in gaining an understanding of barriers and enablers to care among KP. Hotspot mapping informs interventions and preferred HIV services delivery models at community and facility levels.

Conclusions/Next steps: Hotspot areas are places of choice for the KP community as indicated by high numbers reached with interventions following the mapping exercise. Mapping outcomes allowed data driven programming to improve case finding and provides an excellent basis to implement HIV interventions. Designing HIV interventions for KPs that have built-in routine hotspot mapping is a high-impact action.

EPD0674

Empowering communities and creating second line leadership through Community Led Monitoring under the community system strengthening in India

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Background: Empowering the community is a critical component of HIV programs. The Community Led Monitoring Project (CLM) recognizes people affected by HIV as being key partners in the shared success of HIV Prevention, Care & Treatment programmes.

Keeping the community at the center of CLM, this paper aims to get a view of how empowered our Community Champions (CC) feel while working towards a shared goal of improving the comprehensive HIV service delivery.

Methods: A quantitative study was conducted using an Empowerment Tool which measures five components - Awareness, Voice & Participation, Accessibility, Personal Fulfillment and Social Inclusion. 85 Community Champions (CCs), who have been a part of CLM for more than 1 year were contacted to fill the survey, out of which 72 responded from 5 typologies; FSW, MSM, PLHIV, PWID and TG.

Results: As a result of CLM, nearly 98% of the respondents said that accessibility to HIV treatment has improved for the key population. 98.6% stated they felt a sense of satisfaction through their work. A key impact of CLM is also seen in the increased program knowledge of the community at large, where 100% of the respondents stated that there has been a significant increase in the awareness and knowledge about HIV among the beneficiaries over a period of time. CLM has also been instrumental in providing the community a voice and creating second line leadership in the process, wherein 98.6% have reported that they have been provided a platform to put forth their



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opinions and concerns. However, one area where more change is hoped, as the program progresses, is people feeling comfortable to openly discuss HIV.

Conclusions: Engaging the community in every step of project planning, assessments and implementation gives them an opportunity to be a part of effective HIV programs implementation for their own communities, in process empowering them to take a stand, voice their opinions and in strengthening community systems.

CLM has provided a platform to address the structural barriers that existed for them at the ground level. It proved to be a critical step towards creating a sustainable response to HIV.

EPD0675

Applicability and acceptability of differentiated HIV service delivery among men who have sex with men in Kenya: a qualitative study

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Background: Men who have sex with men (MSM) are at heightened risk for acquiring HIV because of biological, behavioral and structural vulnerabilities. Despite several interventions targeting MSM populations, a huge gap remains in reaching them to test and linking them to prevention, treatment and adherence services.

We conducted a cross-sectional qualitative study to explore perspectives on HIV differentiated service delivery (DSD) for MSM in Kenya.

Methods: The study was conducted in three counties in Kenya: Kisumu, Nairobi and Mombasa from July 2021 to July 2022. A total of 49 in-depth interviews were conducted with: MSM registered for ART (n=15) or registered for PrEP (n=15) and receiving services through community-led organizations, healthcare providers (n=8), programmers (n=5) and county policy makers (n=6).

The qualitative data were analyzed using Word and Excel to perform question and preliminary thematic coding and content analysis.

Results: MSM reported receiving quality healthcare and HIV treatment/prevention services at MSM facilities. Most reported that they were comfortable seeking services within community-led facilities because they were confidential and safe.

Compared to experiences at public facilities, almost all MSM currently had good relationships with the healthcare providers, who were trained on friendly, key populations service delivery. Healthcare provider attitudes affected MSM uptake of services. Policy makers, programmers and providers also reported that public facility pro-

viders are often not sensitized to the unique needs of key populations and expressed the urgent need for sensitization. Despite mostly positive experiences, some MSM reported shortages of commodities like test kits, condoms and lubricants.

MSM were interested in multiple forms of DSD including multi-month dispensing, home delivery and community-based delivery. However, some MSM were not in favor of community-based service delivery due to stigma.

Conclusions: For effective DSD models there is a need to train healthcare providers on key populations friendly service delivery. Community-led drop-in centers need to be well supported with commodities. Stigma and fear of lack of privacy may be a barrier to uptake of community-based DSD models among MSM.

Further exploration is warranted on how to provide services to MSM within the community in a way that is acceptable.

EPD0676

Differentiating profiles of sex work and transactional sex among women in Kisumu, Kenya

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Background: Sex work (SW) and transactional sex (TS) have been associated with HIV acquisition among young women in sub-Saharan Africa, with sexual exchanges occurring across a range of socioeconomic contexts and motivations. Heterogeneity in HIV vulnerability across overlapping types of sexual exchange has not been well defined, limiting appropriate and effective linkage to HIV prevention interventions.

Methods: Cross sectional screening data were captured in January 2017 as part of a cohort established in partnership with the US Military HIV Research Program and the Kenya Medical Research Institute/Walter Reed Project Clinical Research Center in Kisumu, Kenya. Women aged 18-35 years were screened into an HIV incidence study and completed a socio-behavioral questionnaire.

Latent class analysis (LCA) was used to classify women into discrete groups based on experiences of SW and other transactional sex in the prior 3 months in exchange for: money, gifts, food, school fees, substances, shelter/rent, and clothing.


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Results: A total of 1063 participants were screened, of whom 541 (50.9%) were sexually active women (median age: 27 [interquartile range (IQR) 23-30]). Transactional sex was common (77.2%), with women reporting recent exchange of sex for money (73%), gifts (20%), food (27%), and substances (18%); 44% reported selling sex as a primary or secondary occupation.

Three profiles of exchange sex were identified, each with distinct demographic, behavioral, and occupational characteristics (*Figure*): resource driven SW (exchange for money and other necessities, ~20% prevalence), commercial sex work (exchange for money only, ~54% prevalence), and sex comprising limited or no exchange (~26% prevalence).



Conclusions: LCA identified heterogeneities in patterns of SW and TS among women in Kenya, with profiles reflecting the different motivations and pathways by which women exchange sex. Implementation approaches that vary by intensity, duration and modality are needed to align interventions such as pre-exposure prophylaxis with the diverse needs of women who exchange sex.

EPD0677

Disparities across the PrEP continuum among key populations groups in South Africa: findings from Ritshidze's Community-led Monitoring

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Background: Reaching key populations (KPs) most at risk of HIV, including gay, bisexual, and other men who have sex with men (GBMSM), sex workers (SW), people who use drugs (PWUD) and transgender people (TG), with Pre-exposure Prophylaxis (PrEP) is critical to achieving prevention aims. To date, however, data on experiences accessing PrEP among KPs in South Africa has been limited.

Methods: The Ritshidze Community-led Monitoring Programme recruited KPs to participate in a cross-sectional survey in 7 provinces from July to September 2022 using

a community-based snowball sampling method. Multi-variable logistic regression models (significance level of $p < 0.05$) adjusted for age and province were used to assess differences in experiences between KP groups across the PrEP continuum of care.

Results: Of surveyed KPs, 5,060 (55%) indicated they access health services at public health facilities and were included in the analysis. Knowledge of PrEP, ever having been offered PrEP, and PrEP satisfaction were highest among TG and SW, followed by GBMSM, and lowest among PWUD (Table 1).

Adjusted models demonstrated that, compared to TG, SW ($\alpha OR = 0.67$, 95% CI [0.50, 0.89]), GBMSM ($\alpha OR = 0.60$, 95% CI [0.45, 0.80]), and PWUD ($\alpha OR = 0.14$, 95% CI [0.11, 0.19]) were all significantly less likely to know what PrEP is.

Compared to TG, GBMSM ($\alpha OR = 0.74$, 95% CI [0.55, 0.99]) and PWUD ($\alpha OR = 0.39$, 95% CI [0.29, 0.51]) were significantly less likely to have been offered PrEP. Only PWUD were found to be significantly less likely to be very satisfied with PrEP services compared to TG ($\alpha OR = 0.30$, 95% CI [0.15, 0.60]).

	Transgender people	Sex workers	Gay, bisexual, and other men who have sex with men	People who use drugs
Know what PrEP is	83.7% (391)	76.2% (787)	75.1% (943)	43.8% (805)
Among people not living with HIV, ever offered PrEP	31.8% (105)	31.1% (228)	28.8% (293)	17.5% (265)
Very satisfied with PrEP services	42.0% (29)	52.2% (93)	32.1% (68)	17.0% (24)

Table 1. Descriptive Statistics (% , n)

Conclusions: Despite wide availability of PrEP, the proportion of KPs being offered PrEP at public health facilities falls far below what will be needed to achieve overall PrEP coverage aims in South Africa, representing missed opportunities in HIV prevention.

PrEP satisfaction is also low across KP groups potentially pointing a need for improved person-centered approaches to PrEP. Educational outreach to drive PrEP awareness and demand may be of particular importance for PWUD.



EPD0678

Communication between healthcare providers (HCPs) and high-risk young men (HRYM) in the context of stigma: views from HCPs and HRYM in Zambia

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Background: Studies that have investigated client-provider communication in the context of HIV/STI service delivery have focused mainly on the views of sexual and gender minorities and on how individual-level factors influence communication challenges.

This study explored the views of both Healthcare Providers (HCPs) and High-Risk Young Men (HRYM) on the mechanisms through which stigma impacts communication between HRYM and HCPs in Zambia, and how this affects the quality of HIV/STI service delivery.

Methods: We conducted in-depth interviews with 21 HCPs (≥ 25 years old) and 20 HRYM (20–34 years old) purposively recruited from Lusaka with assistance from local partners (i.e., Centre for Infectious Disease Research in Zambia and Dignitate Zambia Limited) in 2021.

Interviews lasted 30–80 minutes, were conducted in English and were audio-recorded. Verbatim transcripts of audio files were iteratively coded and managed using Nvivo. Thematic analysis was performed using the inductive approach.

Results: The study discovered that lack of knowledge of HRYM and their priorities among HCPs, HCPs' loyalty to their culture and religion, the unwillingness of HRYM to open up to HCPs, and lack of trust in HCPs among HRYM engendered poor communication between HRYM and HCPs.

Moreover, some HCPs were uncomfortable talking to HRYM about their sexual orientation/behavior and vice versa. The above factors make establishing a good working relationship between HCPs and HRYM difficult, and negatively impact HIV/STI service quality.

Lack of knowledge on where to access friendly services and on HRYM priorities and needs impacted HRYM access to HIV/STI testing and treatment.

Conclusions: Key Population (KP) programs have failed to reach large populations of HRYM and HCP with information and sufficient engagement on sexual behavior that allows mutual understanding, relationship/trust-building, a re-examination of self-stigmatization by HRYM, and professional values by HCP.

Therefore, promoting an HRYM-friendly environment at health facilities and promoting HCPs' understanding of the health needs of HRYM are critical to ensure the delivery of quality HIV/STI services to HRYM in Zambia.

EPD0679

Integrating peer-led Problem-Solving Therapy with HIV prevention and treatment to address mental health issues among key populations: lessons from a pilot project in Harare, Zimbabwe

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Background: Mental health has been neglected in Sub-Saharan Africa, especially among Key Populations (KPs). KPs include female sex workers (FSW), men who have sex with men (MSM), people who inject drugs (PWID) and transgender (TG) and are at high risk for HIV acquisition. KPs experience significant stigma and discrimination, including in health facilities. This puts them at greater risk of undiagnosed common mental disorders and high risk of exclusion from the HIV prevention, treatment and care continuum.

A community-based peer-led Problem-Solving Therapy (PST) was implemented among KPs in Harare.

Description: Between January and September 2022, 30 Community Facilitators (CFs) including FSWs, MSM and TG peer lay cadres were trained to screen for common mental disorders (CMDs) and provide counselling to fellow KPs using the Friendship Bench model.

Trained CFs used the Shona Symptom Questionnaire (SSQ-14) to screen KPs for CMDs during HIV prevention literacy sessions in communities across 9 learning sites. Those who scored SSQ ≥ 9 were offered PST and referred if there was need. Those who answered yes to either the question on hallucinations or on suicide (red flags) were immediately referred to nurses at facilities.

Data were captured in a database and feedback from supervision meetings informed and strengthened continued implementation.

Lessons learned: 295 KPs were screened for CMDs using the SSQ-14. 180 KPs were offered PST and 73 returned for session 2, 27 returned for session 3, 12 returned for session 4 and 3 returned for session 5. 28 KPs were red flags, however only 10 were successfully referred to nurses at respective facilities. CFs embraced PST despite time demands

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that accompany integration of mental health into HIV prevention and treatment. KPs with red flags were not comfortable being referred outside their KP community, fearing stigma. The number of KPs returning after the first session dropped. CFs as the 'counsellors' require mental health support as they get overwhelmed.

Conclusions/Next steps: Strengthened KP friendly referral structures could increase the effectiveness of referrals. Integrating mental health care in HIV prevention, care and treatment interventions for KPs could help deliver effective and affordable solutions to bridge the mental health treatment gap, leading to improved health outcomes.

EPD0680

Travel burden and linkage to care among people with HIV in the Southern United States from 2005 to 2020

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Background: Timely linkage to care (LTC) is key in the HIV care continuum, as it enables people living with HIV (PWH) to benefit from HIV treatment at the earliest stage feasible. Even though travel burden has been a frequently cited barrier to optimal health outcomes among PWH, there is a paucity of evidence on its role in LTC.

Using South Carolina (SC) statewide electronic health records data, the current study aims to explore the association between travel burden and LTC.

Methods: According to the Centers for Disease Control and Prevention, timely LTC was defined as having at least one viral load or viral suppression record within 90 days after HIV diagnosis before the year 2018 and within 30 days after 2019. Travel burden was measured by driving time (in minutes) to any treatment healthcare facility. Generalized logistic regression models with the least absolute shrinkage and selection operator (LASSO) were employed to explore the association between travel burden and timely LTC, controlling for potential individual- and county-level confounders.

Results: From 2005 to 2020, 84.3% (3,680 out of 4,366) of PWH had timely LTC. LASSO selected 18 of the 53 (16 individual-level and 37 county-level) characteristics, and regression results revealed that PWH who were male (adjusted Odds Ratio (aOR): 0.64, 95% CI: 0.51 - 0.82), reported longer driving time (aOR: 0.35, 95% CI: 0.13 - 0.97), had more comorbidities (aOR: 0.65, 95% CI: 0.50 - 0.85) and lived in counties with a higher percentage of households with a same-sex unmarried partner (aOR: 0.45, 95%CI: 0.24 - 0.84) were less likely to have timely LTC.

However, those who were older (aOR:3.14, 95% CI: 1.89 - 5.23) and lived in counties with a higher percentage of households with a cellular data plan (aOR: 2.88, 95%CI: 1.04 - 7.97) were more likely to have timely LTC.

Conclusions: Travel burden from residence to healthcare facilities acts as a significant structural barrier to timely LTC. Concentrated and sustained interventions targeting underserved communities and the associated travel burden among newly diagnosed PWH who are younger, male, and have more comorbidities are needed to improve LTC and reduce health disparities.

EPD0681

"Let us educate you about us!" How the Black SGM community on Twitter facilitates and challenges HIV prevention with PrEP

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Background: In the United States, 1 in 2 Black men who have sex with men (BMSM) will acquire HIV in their lifetime. BMSM experience stigma at the intersection of minoritization based on race, sexuality, gender, and perceived or actual HIV status, contributing directly to higher rates of HIV and lower uptake of pre-exposure prophylaxis (PrEP). Social media can further reinforce and propagate stigma or, conversely, act to curb stigma.

We examined stigma barriers to PrEP on Twitter that can be targeted for intervention to increase PrEP uptake and thereby decrease HIV incidence among BMSM.

Methods: Using open-source software, we created targeted searches from Twitter's Application Programming Interface. Five sexual and gender minoritized (SGM) youth were trained to execute our Twitter search methodology. Tweets were iteratively sampled based on initial themes and evaluated by the youth to identify key phrases related to PrEP. Integrating these key phrases into our search parameters, 987 randomly sampled Tweets were inductively and deductively coded (Dedoose software v9.0.83) and analyzed thematically.

Results: Within our dataset, 12.1% of Tweets were stigmatizing regarding PrEP, 37.1% were stigma challenging, and 50.8% were neutral. Tweets frequently depicted white-led HIV organizations, pharmaceutical companies, and healthcare providers as racist perpetrators of HIV inequity among the Black community, including details of firsthand experiences with stigmatizations of PrEP in healthcare.

For some, such perceived and enacted stigma fostered a mistrust that conflicted with their reliance on these healthcare institutions and providers for HIV prevention. Twitter campaigns by and for BMSM acknowledged such



mistrust and promoted PrEP as an empowering mechanism to counter the impact of structural stigma on Black health. Tweets further revealed Twitter as a platform for the Black SGM community to educate each other on PrEP and how to best access it as BMSM. Conversely, others rejected PrEP as a white intervention.

Conclusions: Twitter serves as a platform for community-driven PrEP interventions and provides insight into stigma barriers to PrEP for BMSM. Future research should explore the Black SGM community wisdom found on Twitter, alongside the impacts of framing PrEP as a community-level resource led by BMSM to counter structural stigma.

EPD0682

Adapting an HIV stigma reduction training to address drug-use stigma in HIV clinics in Tanzania

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Background: HIV prevalence among people who use drugs (PWUD) in Tanzania is 4-7 times higher than in the general population, underscoring an urgent need to increase HIV testing and treatment among PWUD. Drug-use stigma within HIV clinics is a barrier to HIV treatment for PWUD, yet few interventions to address HIV-clinic drug-use stigma exist.

Guided by the ADAPT-ITT model, we adapted an evidence-based health-facility HIV-stigma reduction intervention to address drug-use stigma.

Methods: We began with formative research to inform initial training curriculum adaptation with 32 in-depth interviews: 18(11M/7F) with PWUD living with HIV; 14 with HIV clinic staff: 7(2M/5F) clinical and 7(3M/4F) non-clinical staff in Dar-es-Salaam, Tanzania. Data analysis was a 2-step process using thematic analysis: rapid qualitative analysis (RQA) to inform initial curriculum adaptation followed by formal coding using Atlas.ti. An initial draft curriculum was adapted and then refined through iterative steps of review, feedback and revision including a 2-day stakeholder workshop and external expert review.

Results: Four HIV clinic drug-use stigma drivers emerged as key to address in the adaptation.

1. Lack of awareness of the manifestations and consequences of drug-use stigma in HIV clinics (name calling, ignoring PWUD and denial of care);
2. Stereotypes (e.g. all PWUD are thieves, violent, could immediately quit using drugs if they wanted to);
3. Fear of providing services to PWUD (due to stereotypes that PWUD are dangerous);

4. Lack of knowledge about drug use (as a medical condition, availability of medical treatment and hope of recovery).

Five, 2.5-hour participatory training sessions were developed, including a panel session with PWUD and a session focused on actionable change.

Session Topics	Example Exercises
1: Create awareness of what stigma is in concrete terms & introduction to understanding drug use	Naming stigma through pictures; self-reflection; naming and classifying drugs
2: Understand and address stereotypes and fears of interacting with PWUD	What do people say, fear and do about PWUD?; Major concerns HCWs have about providing services to PWUD
3: Understanding drug use, addiction and co-occurring conditions & providing treatment and care for PWUD	Building understanding of addiction as a brain disease; Physical and psychological dependency; challenges PWUD face
4: Deepening understanding of drug use stigma: Building empathy and reducing distance	Listen to first-hand experiences from people who use drugs; Forms, Effects and Causes of drug use stigma (Problem tree)
Session 5: Working to create change	How to provide non-stigmatizing services to people who use drugs

Conclusions: Understanding context specific drivers and manifestations of stigma from the perspective of PWUD and health workers allowed for ready adaptation of an existing evidence-based HIV-stigma reduction intervention. Future steps include a pilot test of the intervention.

EPD0683

PnP + PrEP: methamphetamine use is associated with greater interest in event-driven PrEP among sexual minority men

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Background: Sexual minority men (SMM) who use crystal meth (CM) display some of the highest HIV incidence rates in the United States. Although SMM who use CM are as likely to use daily oral pre-exposure prophylaxis (PrEP), they have greater difficulties with PrEP adherence and persistence. Event-driven PrEP is a viable alternative dosing strategy that could reduce adherence demands in this high priority population.

Methods: A national sample of 1,201 SMM from the US was recruited from geo-social networking applications to complete a screening survey. We explored awareness of and interest in ED PrEP on a sample of HIV-negative or unknown-status participants and never used event-driven PrEP, 73% which used CM in the past 3 months. Multivariate log-binomial models examined correlates of awareness (i.e., having heard of) and interest in (i.e., being interested in) event-driven PrEP.

Results: As shown in the Table 1, having heard nothing or very little about ED PrEP was 17% less common in participants who reported recent CM use, after accounting for demographic and HIV risk indicators (aPR = 0.83, 95% CI 0.69 – 0.99).


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Conversely, recent CM use was independently associated with 12% greater interest in ED PrEP among those who reported recent CM use than those who did not report any CM use, after accounting for demographic and HIV risk indicators (aPR = 1.12, 95% CI 1.01 – 1.25).

Models	ED PrEP awareness (i.e., has heard of ED PrEP)				Increased in ED PrEP			
	Prevalence Ratio	95% CI	aPR	95% CI	PR	95% CI	aPR	95% CI
MetH Use past 3 months (ref= no)	0.77	0.66 0.9	0.83	0.7 1	1.15	1.04 1.3	1.12	1 1.3
Age Group (ref=20-29)								
24 or less			0.76	0.53 1.10			0.98	0.82 1.18
25-29			1.02	0.86 1.29			0.91	0.80 1.04
30+			0.74	0.61 0.90			0.99	0.91 1.08
Race/Ethnicity (Ref= White)								
Black			0.87	0.63 1.20			0.98	0.82 1.18
Latino			1.19	1.00 1.42			1.09	0.96 1.25
Other/Multiracial			0.98	0.75 1.28			0.98	0.89 1.08
Gender (ref= Cis)								
Trans- and/or non-binary person			1.04	0.79 1.36			1.01	0.88 1.16
PrEP use (ref= On PrEP)								
Not on PrEP			0.97	0.80 1.17			1.2	1.07 1.34
Sex in past 6 months (ref= no)								
Yes			0.94	0.75 1.18			0.87	0.76 0.99
Anal Sex in past 6 months (ref= no)								
Yes			1.27	0.88 1.83			1.08	0.9 1.29
Oral Sex in past 6 months (ref= no)								
Yes			0.92	0.76 1.12			1.04	0.95 1.14
Sex Work in past 6 months (ref= no)								
Yes			0.89	0.68 1.16			0.99	0.88 1.12

Table 1. Log-binomial models predicting awareness and interest in ED PrEP among CM-users.

Conclusions: Although ED PrEP remains poorly disseminated in the US, it may be well suited for SMM who use CM. Comprehensive approaches addressing PrEP uptake, adherence, and persistence among SMM who use CM are urgently needed to optimize HIV prevention efforts.

EPD0684

Barriers and facilitators to PrEP use among young people under the age of 24: a systematic review of experiences towards access, uptake and use

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Background: Worldwide young people aged 15-24 years remain disproportionately affected by HIV. Despite availability of pre-exposure prophylaxis (PrEP) for HIV prevention, structural, sociocultural, individual and socio-economic factors can impact access, uptake and use of PrEP among this population.

The purpose of this systematic review was to conduct a narrative synthesis of the barriers and facilitators to PrEP access, uptake and use experienced by young people.

Methods: A systemic search of databases (Pubmed, Scopus, Cochrane, Medline, CINAHL, JBI, EMBASE, Web of Science) was conducted. To be included studies had to have participants aged 24 or under, published in English in peer-reviewed journals, and contain information on barriers and facilitators to PrEP access/uptake/use.

Studies with quantitative and/or qualitative methodologies were included. Studies published prior to 2016 were excluded (aligning with 2015 World Health Organisation Guidelines).

Results: Searches yielded 8337 articles, of which a total of 22 papers met the inclusion criteria. Returned articles were only from two geographical regions the United States (USA) (12) and Africa (10).

Our synthesis showed three overarching areas impacting access and uptake of PrEP in young people:

1. PrEP knowledge, attitudes, and risk perceptions;
2. Attitudes and perceptions of family and society;
3. Health care systems and healthcare provider mistrust.

Despite differences in sociocultural contexts surrounding HIV and PrEP, young people in the USA and Africa experienced similar barriers and facilitators to PrEP access, uptake, and adherence.

However, cultural norms (e.g. gender roles) and systemic factors (e.g. healthcare insurance) further shaped how these barriers and facilitators impacted PrEP access, uptake and use.

Conclusions: There is a need for targeted HIV prevention strategies that consider how the different social, cultural, economic, and sexual developments can influence access and use of HIV prevention services.

The development of dynamic and adaptive strategies that can accommodate the needs of young people will help to improve access to PrEP working towards global goals for the reduction of HIV transmission.

EPD0685

ACON and West Ball HIV Campaign – co-designing HIV health promotion with LGBTQ+ people of colour from Western Sydney

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Background: As New South Wales (NSW) reaches UNAIDS' 95-95-95 targets, it's critical that HIV responses reach marginalised populations.

Overseas-born men who have sex with men (MSM) are disproportionately diagnosed with HIV compared to Australian-born MSM in NSW. Approximately 25% of new HIV notifications occur in Greater Western Sydney (GWS). GWS is highly culturally diverse: 40% are born overseas and 45.7% speak a language other than English at home. In addition, LGBTQ+ communities have complex social and sexual networks whereby mainstream gay health campaigns may not reach other LGBTQ+ people and their partners who are at risk of HIV.

ACON identified the need for culturally tailored HIV responses in GWS to increase sexual health literacy among culturally diverse LGBTQ+ people of all genders and sexualities.

Description: ACON partnered with West Ball in 2022, a Western Sydney community ballroom event that celebrates LGBTQ+ people of colour (POC). We developed a co-designed campaign targeting LGBTQ+ POC in GWS to promote HIV testing, prevention, treatment and ending stigma. Co-design ensured targeted communities could read themselves into the campaign.



The campaign was promoted at West Ball to 500 people, and targeted LGBTQ+ people in Western Sydney through social media.

ACON also partnered with SWSLHD to conduct pop-up testing at West Ball and promoted local sexual health clinics in GWS.

Lessons learned: Although the campaign ran over two weeks and only targeted GWS, its engagement was equivalent to ACON's major state-based Mardi Gras campaigns. This high engagement demonstrated that the campaign deeply connected with POC in GWS.

ACON conducted 8 DBS HIV tests, 18 STI tests and disseminated 300 safe sex packs at West Ball. Unlike LGBTQ+ communities in metro Sydney where ACON has spent 40 years building trust, many LGBTQ+ POC were not aware of ACON's services, resulting in fewer tests than expected. ACON reflected on new approaches to building rapport with communities that have historically been underserved.

Conclusions/Next steps: HIV campaigns should be co-designed with LGBTQ+ POC from GWS to reach these communities effectively.

However, HIV organisations need to develop tailored strategies to build long-term trust in our services for LGBTQ+ POC to improve access and outcomes.

EPD0686

Correlates of the duration between the first drug use to the first drug injection among people who inject drugs in Iran, 2020

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Background: Several factors contributed to the transition from non-injection to injection drug use. This study aimed to investigate the correlates of the duration between the first drug uses to the first drug injection among people who inject drugs (PWID) in Iran.

Methods: In this cross-sectional study, we used data from the fourth national bio-behavioral surveillance survey of Iranian PWIDs (N=2684) 2020, conducted in 11 major cities using respondent-driven sampling (RDS).

The time between the first drug use and the first injection was divided into two categories ≤ 7 (coded as 1) years and > 7 years (coded as 0).

In logistic regression, we examined the correlates of the duration between the first drug uses to injection initiation and reported adjusted odds ratio (AOR) along with 95% confidence intervals (CI).

Also, we showed the frequency and percentage of each reason for injection initiation in PWIDs.

Results: Of the 2,520 analytic samples, the duration between the first non-injection drug uses to injection initiation with the mean (SD) of 10.15 ± 7.57 . In 1,131 (44.8%) were seven years or less and 1,389 (55.1%) were more than seven years.

The following factors were associated with earlier injection initiation: less than 30 years of age (AOR: 2.18, 95% CI: 1.50 - 3.16), being single (1.55 [1.17 - 2.05]), being divorced, widowed, or having other partners except for the main partner (1.62 [1.23 - 2.14]), being unemployed (1.59 [1.25 - 2.02]), history of incarceration (1.34 [1.02 - 1.75]) and started sexual contact less than 18 years old (1.27 [1.03 - 1.56]).

Regarding the reasons for injection initiation, pleasure-seeking behavior [534 (23.3%)] and the role of peer drug users [665 (29.1%)] were the most prevalent reasons for starting of the injection.

Conclusions: Some demographic factors such as being younger, not being married, and being unemployed, also some behaviors including early sexual intercourse, may affect their injection initiation. Though, harm reduction (HR) services such as methadone maintenance therapy programs which may have a protective effect to prevent the risk of switching to injection drugs should consider these items to reduce the risk of transition from non-injecting to injecting drug use.

EPD0687

Suicide ideation, plan and attempt among Men who have sex with men in a low resource setting country: a cross-sectional survey from Kathmandu valley, Nepal

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Background: The prevalence of suicidal ideation thoughts, plans, and attempts is serious among men who have sex with men (MSM) worldwide. Depression and food insecurity are likely contributing factors. More research is needed in low-income countries to determine the effects of food insecurity and social and structural factors on suicidality among MSM.

Methods: A cross-sectional survey was conducted between October and December 2022 to explore the factors associated with suicidal ideation thoughts, plans, and attempts among Nepali MSM (N=250). Participants were recruited through respondent-driven sampling at the research office of the Blue Diamond Society (BDS), Kathmandu, Nepal. Bivariate and multivariable logistic regression was used to evaluate independent co-relates of suicidal behaviors of MSM.

Results: The prevalence of suicide ideation thoughts, plans, and attempts among MSM in this study were 42.4%, 31.2%, and 21.6%, respectively. The prevalence of suicide ideation was significantly greater in participants with a higher level of education (i.e., higher secondary and above) (AOR = 2.9, 95% CI = 1.4-6.1), whoever smoked (AOR



= 2.5, 95% CI = 1.2-5.3) and had depression (AOR = 5.7, 95% CI = 2.4-14.1). Moderate/severe food insecurity was associated with significantly increased risk for all three suicidal behaviors (ideation: AOR = 3.5, 95% CI = 1.6-7.7; plan: AOR = 3.7, 95% CI = 1.6-8.3; attempt: AOR = 2.2, 95% CI = 1.1-4.6). Additionally, participants who had studied higher secondary and above (AOR = 2.7, 95% CI = 1.2-5.7) and those who had depression (AOR = 2.2, 95% CI = 1.1-4.8) were higher in plans for suicide as well. And those who were younger than 25 years were significantly more prone to attempting suicide (AOR = 2.7, 95% CI = 1.3-5.8).

Conclusions: Nepali MSM has a higher rate of suicidal behaviors than the general population. Early detection and treatment of depression in MSM, facilitation of measures to improve their access to resources, and alleviation in their burden of food insecurity are crucial for reducing the prevalence of suicidal behaviors (ideation, plan, and attempt), which would, in turn, help to lower the suicide rates among MSM population in Nepal.

EPD0688

Leave no one behind: addressing HIV service needs of excluded migrant sex workers in Thailand

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Background: In Thailand, migrant sex workers (SWs) are not eligible for government-funded HIV testing, pre-exposure prophylaxis (PrEP) or antiretroviral treatment (ART). Their vulnerability is compounded by the illegality of sex work. There are tens of thousands of migrant SWs, including female (FSWs), male (MSWs) and transgender sex workers (TGSWs), from countries including Cambodia, Laos, Myanmar, and Vietnam.

Most are working in the major tourist hubs including Bangkok and Pattaya. Ending AIDS by 2030 will not be possible without addressing HIV service needs among these populations.

Description: SWING Foundation is a SW-led organization ensuring equitable access to HIV services for SWs. Since 2018, SWING has provided HIV/STI prevention, testing, PrEP and treatment services through Community Health Centers in Bangkok and Pattaya. Migrant SWs have recruited to reach nationals of their country who practice sex work in Thailand since sex work networks are often separate and distinct. Multiple funding sources were mobilized to ensure HIV testing services, PrEP, and ART.

Lessons learned: From 2018-2022, SWING tested 1,280 SWs with an overall case-finding rate of 10.2%, which was higher than the case-finding rate among Thai SWs (2% and 5% excluding FSWs). The highest case finding rate was found among male SWs (13%) followed by TGSWs (8.8%). Migrant sex workers diagnosed at SWING had a median

CD4 count of 424 cells/mm³ compared to 222 cells/mm³ in Thai public health facilities, and 100% of HIV-positive migrant SWs initiated ART. Among members of this high-risk population who tested negative, 18.4% accepted PrEP. By site, a lower proportion of migrant SWs in Bangkok tested HIV-positive than those in Pattaya (9.7% vs. 10.96%) but those HIV-positive were diagnosed with higher CD4 counts (467 cells/mm³ vs. 380 cells/mm³) and of those HIV-negative, a greater proportion accepted PrEP (22% vs 13%).

Conclusions/Next steps: Migrant SWs can reach their peers to prevent transmission and loss to follow up and ensure early treatment initiation, but policy support is needed to ensure high-risk migrant populations are included from essential HIV services. Domestic financing will need to be extended to cover the migrant population. Decriminalization of sex work will also be critical to enable access to HIV services for all.

EPD0689

Limited experience with HIV pre-exposure prophylaxis (PrEP) among fishermen in western Kenya: a qualitative analysis

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Background: HIV PrEP can effectively prevent HIV infection, but lack of knowledge hinders PrEP uptake, particularly among highly-mobile fishermen residing in a high HIV prevalence region of Kenya. The purpose of this qualitative study was to assess the PrEP knowledge among fishermen along Lake Victoria, Kenya.

Methods: We conducted 65 in-depth interviews (IDIs) with fishermen from 3 fishing communities in Siaya County. Fishermen were purposively sampled for IDIs based on age (<35 years) and beach landing site. IDI guides probed on knowledge, interests, and concerns regarding PrEP. IDIs were conducted in Luo, audio recorded, transcribed, and translated into English for analysis. Six researchers coded transcripts and analyzed PrEP uptake using framework analysis approach.



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Results: Most participants were >35 years (56%) and were married (83%). About half (48%) had attained some primary education or higher (52%). Over half (57%) had a monthly income below 10,000 Kenya shillings.

Though most participants had heard about PrEP as HIV prevention method, some incorrectly perceived it as post-exposure prophylaxis to be taken after potential HIV exposure. Fishermen who knew of PrEP were unsure of eligibility and when and how often it should be taken. Major barriers included storage, stigma and fear of disclosing to primary partner.

Conclusions: We found low knowledge and uptake of PrEP among fishermen despite its availability in health facilities. There is a need to create awareness of the importance of PrEP in this population.

EPD0690

Effects of intervention on methamphetamine use and mental health outcomes among patients on methadone who use methamphetamine in Vietnam

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Background: Methamphetamine use is a proven risk factor of mental health disorders. Evidence-based interventions (EBI) to reduce methamphetamine use have been tested in high-income countries, but not much in low-and-middle-income countries.

We assess the impact of two interventions on methamphetamine use and mental health among patients on methadone who use methamphetamine in Vietnam.

Methods: This analysis used interim data of a randomized clinical trial to explore the effectiveness of different combinations of EBI on methamphetamine use among patients on methadone treatment in Vietnam (STAR-OM R01DA050486). The parent study aims to recruit 600 participants from 20 methadone clinics in 2 largest cities in North and South of Vietnam.

The study intervention comprises 2 phases of 12 weeks. We used data from participants in the first 10 clinics who had completed the first 12 weeks of intervention.

Consenting participants with positive urinalysis or ASSIST score ≥ 10 were randomized into:

- 12 weeks of contingency management or
- 6 weeks of contingency management plus 6 weeks of group education.

Methamphetamine use is measured by twice weekly urinalysis throughout these 12 weeks. Mental health is measured at baseline and week 13 using a validated DASS-21 scale.

Results: Among 3834 screened patients, 343 were enrolled into the study and 318 (92.7%) stayed in the study after 12 weeks. At baseline, 198 (62.3%) tested positive with methamphetamine and 138 (43.4%) were at risk of having depression, anxiety, or stress; however, no association was found between methamphetamine use and mental disorders. At post-intervention, both methamphetamine use and mental disorder risk decreased significantly in the whole sample.

However, 94 participants (29.6%) maintained or increased their methamphetamine use, and 46 (14.5%) had an increased mental disorder risk. Participants who maintained or increased methamphetamine use were more likely to have an increased mental disorder risk (OR = 2.02, 95% CI: 1.02-3.99) after adjusting for demographic characteristics.

Conclusions: EBIs to reduce methamphetamine use may improve mental health of patients on methadone with methamphetamine issues. Additional interventions are needed to address persistent mental disorders.

EPD0691

Reducing stigma and empowering the community through Community Systems Strengthening (CSS): an initiative to ensure minimizing stigma and discrimination in India

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Background: HIV stigma and discrimination significantly impacts the health, quality of life, and well-being of PL-HIV and key populations. HIV-related stigma negatively affects people in different settings, including healthcare, presenting as a barrier to people accessing prevention, testing, treatment, and care services under NACP.

NACO has been undertaking proactive measures to address HIV-related stigma including community system strengthening with a specific objective of creating an enabling environment.

Description: Under the CSS, one of the core components is to increase capacities of community, community group and community based organisations on priority areas ranging from mobilization, linkages, advocacy including stigma and discrimination. The capacity building modules that have been developed under CSS based on the feedback of the communities have also focused on what is stigma, how to identify and methods to address the same.

Community led monitoring has also been highlighted as an essential activity with objective to strengthen community led response and to understand the needs and challenges including incidences of stigma and discrimination faced in availing the existing services by the key benefi-


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ciaries. The community master trainers and community champions identified and selected from within the community are undergoing a series of capacity building training programs to better equip the community to identify and meaningfully participate in redressal of issues including stigma.

Lessons learned: In the capacity building trainings, community, community networks, and community-based organizations are being provided information on the constitutional provisions and safeguards in the Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (Prevention and Control) Act, 2017.

It was also observed that the community demanded information and knowledge sessions on other aspects related to stigma and discrimination associated with their behaviour and gender identity.

Conclusions/Next steps: Moving forward, information and knowledge sessions will be incorporated into existing modules under CSS on topics relevant to KPs and PLHIVs. The topics identified are Article 377 on the decriminalization of homosexuality, the Transgender Persons (Protection of Rights) Act, 2019, NDPS Act, 1985 and Immoral Traffic (Prevention) Act 1956. It is envisaged that these trainings will empower and increase ownership of the communities for reduction of stigma and discrimination in India.

EPD0692

Challenges faced by adolescent girls in Uganda that affected timely delivery of HIV prevention services: observational findings from HPTN084-01 study at Kampala, MU-JHU site

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Background: Consistent use of efficacious biomedical HIV prevention products is key to reducing HIV incidence among adolescent girls in Uganda, in addition to behavioral interventions like risk reduction counselling. The HPTN 084-01 study was conducted in South Africa, Uganda and Zimbabwe to assess the safety, tolerability and acceptability of long-acting injectable cabotegravir (CAB-LA) for HIV prevention among cisgender adolescent females aged below 18 years.

We describe the Kampala, Uganda site (MU-JHU) experience on challenges faced by adolescents that affected timely receipt of their CAB-LA injections or oral PrEP offered in the trial.

Methods: Five CAB-LA injections were scheduled at study weeks 5, 9, 17, 25 and 33 followed by 48 weeks of oral TDF/FTC at quarterly visits. Throughout the study, participants received HIV counselling, risk reduction counselling and adherence support individually and in group sessions. Telephone calls or text reminders were sent prior to scheduled visits with home visits being done for missed

visits. Once traced by study staff, participants who did not adhere to their visit schedules shared their experiences which were documented in health visitor visit forms.

Results: Retention in this study was very high with only 3 of the total 17 participants enrolled (17.6%) registering a missed visit(s) as detailed in Table 1 below.

Challenges greatly affecting their study visits and PrEP use were:

1. Family disputes that led to relocation.
2. Mistreatment from stepmothers that motivated participants to run away and decide to marry early.
3. The urge to be independent from tough parents.
4. Negative rumors about oral PrEP in the communities.
5. Employers not permitting time off to attend study visits.

Participant	Missed CAB-LA visits	Missed oral TDF/FTC visits	Reason(s)
1	0	1	Family dispute and relocation
2	1	2	Family dispute, marry, relocation for job search.
3	0	3	Negative community PrEP rumors, relocation and employment challenges.

Table 1: Number of missed pre-exposure prophylaxis provision visits

Conclusions: HIV prevention service providers should tailor services to accommodate the socioeconomic challenges that female adolescents face which may hinder their adherence to PrEP refill visits. Community rumors, myths and misconceptions about PrEP products also need to be addressed.

EPD0693

Adaptation of evidence-informed retention strategies learnt from the antiretroviral treatment program for improved pre-exposure prophylaxis continuation among key and vulnerable populations in Shinyanga, Pwani and Kigoma, Tanzania

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Background: Current evidence suggests significantly higher HIV prevalence among Key and Vulnerable Populations (KVP) globally and in Tanzania compared to the general population. There are 1.7 million people living with HIV in Tanzania with an overall prevalence of 5%. World Health Organization recommends the use of oral pre-exposure prophylaxis (PrEP) among HIV-negative individuals at substantial risk of HIV to reduce new trans-



missions. Despite good PrEP uptake among KVP (female sex workers, men who have sex with men, people who inject drugs, vulnerable adolescent girls and young women and the sero-discordant couples), PrEP adherence (continuation) is challenging. We aimed to describe changes in uptake and continuation of oral PrEP among eligible KVP in Shinyanga, Kigoma and Pwani regions of Tanzania as a result of the implementation of evidence-informed PrEP retentions strategies. The analysis covers the period of September 2021 to September 2022.

Description: In April 2022, we adapted client-centered evidence-informed retention strategies to improve PrEP continuation (PrEP_CT) among KVPs in 232 health facilities. Client-centered strategies implemented include three-month dispensing of oral PrEP; extended linkage case management, using PrEP champions and peer educators; three boxes model (i.e. early tracing of missed appointment within three (3) days after scheduled appointment date); introduction of PrEP appointment counter book to track visits, call back and SMS reminders, outreach and flexible hours refills, use of map cue tool that provides additional information on the client's location and addresses to ensure traceability and follow up on their refill appointments.

Lessons learned: By September 2022, 6,290 KVP in these regions were using oral PrEP including 2,237 that were new users of oral PrEP and 4,053 were eligible for PrEP continuation. Out of the total PrEP users eligible for PrEP continuation by this reporting period, 3,310 (82%) continued their PrEP refills compared to the prior period of September 2021 when only 1,396 (41%) of the 3,426 users of oral PrEP continued with their refills.

Conclusions/Next steps: Implementing client-centered evidence informed retention strategies has helped to increase uptake and continuation of oral PrEP among KVP in these select regions of Tanzania, hence preventing occurrence of more HIV cases.

EPD0694

Engagement of Community Network resulted remarkable impact among PWID in the country

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Background: Recovering Nepal (RN) is a national federation of people who have a history of drug use and drug service organizations dedicated to resolving the problem of drug use in Nepal. RN began its work in 2001 as an improvised support group, organically formed out of sheer necessity, by individuals and activists living with HIV/TB who came from a drug user background to address the need for treatment, care, and support, as well as to use activism to advocate for access to HIV and drug use medicines.

Description: When Recovering Nepal came into existence, people who inject drugs (PWIDs) had the highest prevalence of HIV among all the KPs in Nepal.

The 2002 IBBS survey showed an alarming HIV prevalence rate of more than 68%. PWID faced HIV and Hepatitis C risks from both injecting and sex behaviors; Recovering Nepal had the challenging task of breaking the chain of HIV transmission amidst the rampant stigmatization faced by the drug users.

RN was legally registered in 2003 and started its initiation by advocacy for policy change. The advocacy efforts resulted in the allocation of resources in form of a DFID Grant for HIV response, the first grant rolled out in the country, targeting all KPs and PLHIVs.

Throughout the country HIV prevention, treatment, and care program was implemented in a fast-track approach where the community was directly engaged in policy-making, program designing, and implementation level, establishing the Bi and Approach.

Lessons learned: Meaningful community engagement had an impact by bringing many vulnerable groups to HIV testing and linkage to HIV care and treatment programs throughout the country. The government of Nepal was compelled to develop a National HIV Strategic plan starting in 2008, with a target to eliminate HIV with the commitment to Universal Health Coverage.

Conclusions/Next steps: HIV prevalence among PWIDs has decreased drastically from the first round in 2002 to 2020, from 68 to 2 percent, respectively moving towards the SDG goal.

This will not be possible without active, legitimate community networks. To achieve the SDG goal, there is a need for the continuation of community networks in new scientific development to HIV response.

EPD0695

Parent/guardians knowledge, attitudes and perceptions on long acting injectable cabotegravir (CAB LA) for HIV prevention and study participation in HPTN 084-01 study: tales from Mu-JHU, Kampala site

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Background: Adolescent girls and young women (AGYW) are vulnerable to HIV. Various factors namely; social, cultural, economic put AGYW at risk of acquiring HIV hence the need for HIV pre exposure prophylaxis (PrEP).

Several HIV biomedical PrEP products are approved like oral PrEP, Dapivirine vaginal ring and most recently long acting cabotegravir (CAB LA).

We share parent's/guardians knowledge, attitudes and perceptions on CAB LA and on study participation in HPTN 084-01 study following release of CAB LA results in the par-



ent HPTN 084 study. Noting parent's/guardian perceptions of PrEP will have an impact on whether adolescent girls will be allowed to access PrEP.

Methods: HPTN084-01 assessed the safety, tolerability and acceptability of long acting cabotegravir for HIV prevention among adolescents under 18 years in Uganda, Zimbabwe and South Africa. We describe the Kampala site experience.

MUJHU enrolled 17 adolescents and following release of CAB LA results, the study team disseminated findings to Parents/Guardians and sought their views on CAB LA through a dialogue on 11 Mar 2022.

Results: 11 out of 17 parents/guardians attended the dialogue, all eleven shared their views as follows:

1. Attitudes and perceptions about CAB LA included: causing; cervical cancer, barrenness, change in one's DNA, loss of body weight thus stigmatized as HIV positive in community, researchers injecting trial participants with the HIV virus and injections causing swellings in the buttocks muscle eventually causing deformation. Causing cancer and changing one's DNA were the most common perceptions (4 of 11).

2. Study participation will lead adolescents perceived as prostitutes, researchers take blood to sell and manipulate African genes.

These were addressed by providing accurate information to Parents/guardians during the group dialogue, and opportunities for one-on-one counseling for those who still had concerns. The most difficult perception to correct was fear of swelling of injection site. Counseling messages were developed to dispel myths, nurses reassured participants before the injection guiding them on what to do in case of swellings or pain.

Conclusions: Parents/guardian and community engagement sessions will be important during roll out of cabotegravir for adolescents to dispel any community myths and misconceptions about product for effective uptake.

EPD0697

The journey of blood in the HIV care continuum: working with point-of-care technologies for HIV viral load testing and early infant diagnosis in Papua New Guinea

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Background: Papua New Guinea (PNG) has a concentrated HIV epidemic. Challenges include ensuring equitable and timely access to HIV viral load (VL) testing and early infant diagnosis (EID), and significant mother-to-child transmission (~35%). To mitigate these challenges, in 2020 ACTUP-PNG pioneered PNG's first point-of-care (POC) VL testing and EID programme.

Through a new materialist analysis focusing on the journey of blood, our paper examines some consequences lying at the sociomaterial intersections of the programme.

Methods: This paper derives from 30 qualitative interviews conducted in English and/or Tok Pisin, with persons living with HIV (PLHIV), guardians of HIV-exposed infants and children living with HIV, healthcare workers and support staff.

Data collection occurred between November 2022 and March 2023. Interviews were digitally recorded, transcribed and translated into English and then analysed using a new materialist framework, with attention paid to the components and consequences of the space-time-matter entanglements that inform POC VL testing.

Results: Participants described the recent introduction of clinic-based POC testing and EID as transformative of receiving and providing HIV care, with health workers and peer counsellors saying it enhanced their job satisfaction and with PLHIV feeling encouraged to remain adherent. Central to this transformation is the journey of the blood extracted from service-users. In the centralized model, blood was taken, prepared and posted in batches to the national capital from across the country, with little known about when results would be returned.

Meanwhile, with POC testing, they appreciated that the clinic functioned as a 'one-stop shop' for same-day testing, treatment, and education; being able to observe where the blood was going encouraged them to evolve



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from passive recipients to active partners in HIV prevention and management with a growing understanding of VL and U=U.

Conclusions: By employing a new materialist lens, such as by considering materials such as machines and blood as social agents through their entanglement with space (e.g., the clinics) and time (e.g., turnaround time for results), we can learn about the social consequences of relational and contingent phenomena such as POC VL testing and think strategically about ways to support their long-term viability.

EPD0698

Evaluation of a randomized controlled trial of an online intervention to reduce HIV/STI risk and drug use-related harms among stimulant-using MSM in Malaysia

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Background: Chemsex drives the HIV epidemic among Malaysian MSM, but there are no harm reduction interventions for these high-risk men.

Methods: Between November 2021 and May 2022, a randomized controlled trial of an online harm reduction intervention (chemfunsupport.online) was conducted. Word-of-mouth referral and Twitter were used to recruit stimulant-using MSM. The online intervention involves virtual ASSIST- Brief Intervention provided by caseworkers trained by research team from University of Adelaide and University of Malaya.

Subsequently, participants in the intervention group used the Chemsex Care Plan to develop goals and self-manage their drug use. In contrast, participants in the control group were only given the WHO's Self-Help Guide on Strategies for Cutting Down or Stopping Substance Use. Subsequently, 6-week and 12-week follow-up online assessments were conducted to measure changes in drug use, stages of change (measured by URICA), and mental health (measured by DASS-21).

Little's MCAR Test was used to evaluate data missingness. Repeated-measure ANOVA and GEE tests were conducted to analyse the changes in outcome variables.

Results: Out of 154 stimulant-using MSM, 142 (92.2%) met the inclusion criteria, provided informed consent, and enrolled in the RCT. However, 114 participants (74%) completed the 6-week and 12-week assessments. At baseline, the majority of participants indicated moderate to heavy amphetamine use. There was no significant difference between groups across time on depression, stress and anxiety. In the intervention group, the risk of current amphetamine-type stimulant use reduced over time (mean changes = 14.23 / -70.1%) but the reduction was not sig-

nificant between groups. The mean number of days of methamphetamine use reduced over time, with greater reduction in the intervention group ($p=0.06$).

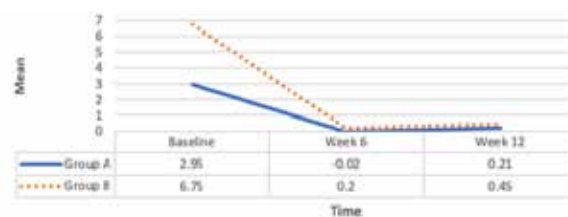


Figure. Estimated marginal mean of number of days of meth use in the past 30 days.

Conclusions: Due to the high attrition rate, the reduction in stimulant use was not statistically significant. Continual training and full-time employment of caseworkers, as well as social media engagement, are important to the intervention's implementation.

EPD0699

Quality of care for key populations at public health facilities in South Africa: findings from Ritshidze's Community-Led Monitoring

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Background: High quality of care, including safe and respectful care, is vital to retention in HIV services. Key populations (KPs) most at risk of HIV, like gay, bisexual, and other men who have sex with men (GBMSM), people who use drugs (PWUD), sex workers (SW), and transgender people (TG), face increased barriers to quality care and often face discrimination at health facilities, though few data exist on these indicators for KPs in South Africa. Better understanding gaps in quality service provision may allow for more targeted interventions to improve KP care.

Methods: The Ritshidze Community-led Monitoring Programme recruited KPs to participate in a cross-sectional survey in 7 provinces from July to September 2022 using a community-based snowball sampling method. Descriptive analysis was used to assess KP experiences at public health facilities.

Multivariable logistic regression models (significance level of $p<0.05$) adjusted for age and province were used to assess the relationship between KP identity and being denied services.

Results: 5,060 KPs (55%) indicated they access services at public health facilities and were included in the analysis. Overall, 14% ($n=686$) of KPs felt very safe and 13% ($n=636$) felt very comfortable using public health clinics.

Feelings of safety and comfortability were highest among SW (20% and 20%) and lowest among PWUD (11% and 9% respectively). Across KP groups, 14% ($n=641$) report service



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denials based on KP status. Service denials were highest among PWUD (20%, 388), then SW (13%, n=137), TG (10%, n=48), and GBMSM (6%, n=68).

As compared to GBMSM, all other KP groups were significantly more likely to be denied services because of their KP status (PWUD: aOR=4.41 95% CI[3.34,5.82]; SW: aOR=2.66, 95% CI[1.94,3.63]; TG: aOR=2.08, 95% CI[1.4,3.09]).

Conclusions: KPs are being denied services at public health facilities and report low levels of comfortability and security/safety accessing care.

Further work is needed to ensure that staff at public health facilities are equipped to provide high-quality care to KPs, with particular remediation needed to improve experiences for PWUD.

EPD0700

Healthcare barriers to pre-exposure prophylaxis among men-who-have-sex-with-men in the United Kingdom: a mixed-methods systematic review

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Background: Men-who-have-sex-with-men (MSM) represent a key group to target with HIV pre-exposure prophylaxis (PrEP), a key driver in the year-on-year reduction of HIV incidence in the UK and a vital part of the government's HIV action plan.

The uptake of PrEP among MSM in the UK has been staggered, and the objective of this systematic review is to characterise the unique institutional healthcare barriers that MSM face in relation to accessing, using and maintaining the use of PrEP.

Methods: We searched EMBASE, MEDLINE, PsycInfo, CINAHL and Web of Science with terms relating to "men-who-have-sex-with-men", "pre-exposure prophylaxis", "health services providers" and "attitudes" in the United Kingdom. Authors independently screened studies (n=590) and performed quality assessments of studies meeting the inclusion criteria (n=11) using CASP and STROBE checklists. Data were extracted, tabulated and analysed using a data-based convergent integrated approach, with quantitative data transformed into qualitative data and independent line-by-line coding. Codes were amalgamated through discussion and similar codes were thematically synthesised into superordinate and subordinate themes. Themes were tabulated and framed in the interpretive analysis.

Results: Superordinate and subordinate themes were generated from the 11 included studies (Table 1). Key barriers include mistrust of foreign health authorities, the pharmaceutical industry and scientific research, resulting from collective trauma. MSM perceived a lack of knowledge, training and cultural competency among healthcare professionals as a barrier, and demonstrated perceived and experienced stigma within the NHS.

Superordinate theme	Subordinate theme
Attitudes to health authorities	1) Trust in the NHS and domestic authorities 2) Mistrust of foreign and international authorities 3) Scepticism of public health strategies
Attitudes towards the pharmaceutical industry	1) Mistrust of motivation 2) Mistrust of rigour 3) Collective trauma
Attitudes toward the science industry	1) Collective trauma 2) Mistrust of rigour 3) Health literacy and communication
Attitudes to healthcare professionals	1) Advocacy and values 2) Stigma 3) Training and knowledge
Attitudes toward PrEP services	1) Privacy and stigma 2) Accessibility 3) Monitoring

Conclusions: We present a thematic framework for the barriers to the uptake of PrEP among MSM in the UK and recommend how NHS services may be improved to facilitate PrEP uptake, with implications for education, training and understanding of psychological processes underpinning the relationship between MSM and healthcare institutions.

EPD0701

An exploration of punitive drug laws on women and youths in relation to HIV risk environment: the INSPIRE Malaysia project

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Background: Harm reduction services have led to a decline in HIV cases among People Who Use Drug (PWUD) in Malaysia. However, the use of drugs continues to become problematic with chemsex practices. Social and policy factors create layers of vulnerability to HIV among women and youths. These sub-populations include not only PWUD among women and youth but also the spouses and children of male PWUD. The INSPIRE Project is a regional effort to advocate for better drug policies.

This study aims to explore how punitive drug laws have shaped the experiences of women and youth in navigating the risk environment in Malaysia.

Methods: Between September 2021 and February 2022, focus group discussions were conducted with four targeted groups:

- 1) Women Who Use Drugs (WWUD),
- 2) Youths Who Use Drugs (YWUD),
- 3) Female spouses of PWUD, and
- 4) Children of male PWUD.

Topics such as access to healthcare, social and legal needs, and experience with legal authorities were explored using in-depth semi structured interviews. Inter-



views were recorded and transcribed digitally. Emerging themes were identified and interpreted from the transcripts.

Results: A number of 19 participants participated in this study, including 6 WWUD, 5 YWUD, 6 female spouses and 2 children of male PWUD. WWUD reported that methadone and HIV treatment was withheld in prisons and the absence of drug treatment centres that cater for transgenders.

Female spouses have expressed, challenges to care for their children while PWUD were detained, hence became sole financial provider during their partners' bail-out and arrest. YWUD and female spouses shared similar narratives on harsh authorities' treatment of PWUD and PWUD's family.

Children of male PWUD reported unmet financial needs and deteriorating family relationships due to the incarceration of the other family member. There is a common belief among all groups that prison, lock-up and rehab will not help PWUD to recover.

Conclusions: Our study demonstrated that all groups of women and youth were impacted heavily from punitive drug laws. Findings from this study are critical to support advocacy work in Malaysia towards better drug policies that are centred around social and health rights of women and youths.

EPD0702

Breaking down barriers to engage businesses in helping bring a 'SAFE-ZONE' for migrant workers and surrounding communities in Vietnam

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Background: Following a data review of new HIV cases in the southern region of Vietnam, it was noted that new clients were largely being identified in industrial zones away from their home provinces.

Finding a way to better reach these migrant populations to both identify those already living with HIV and to also provide preventive services to this at-risk group is important to curb new HIV cases.

Description: The 'SAFE-ZONE' campaign is a communication intervention that helps to provide messaging for clients in industrial zones (primarily manufacturing, transportation and service sectors), working with employers and surrounding communities to connect them with community-based organizations who provide support for them and the approach also helps to build the skills of outreach workers to better communicate and engage them. After six months of implementation, the campaign has become one of the key interventions for not only reaching new clients but also connecting them

to HIV testing, as well as ARV or PrEP services. This work has been done in coordination with business leaders and supported by the Vietnamese Governance Confederation of Labor to formalize these relationships and activities between community-based organizations and businesses.

Lessons learned: The campaign was formally launched in Ho Chi Minh City, September 2022. Through December 2022, there have been events and activities held at 4 businesses and 1 residential area where workers' reside, reaching 11,372 total people. During this time, 667 clients were identified as newly diagnosed with HIV and linked to care and an additional 553 clients have been enrolled to PrEP services. Clients participating in surveys following events at those sites highly regarded the collaboration and desire to have more of these types of activities at least monthly from community-based organizations.

Conclusions/Next steps: By reaching clients, particularly those who migrate for work from other provinces, at their place of work, we have addressed a very common barrier to clients accessing and then receiving key services to help protect and ensure their health from HIV. Working with businesses and the government has helped to facilitate the implementation and success of this program.

EPD0703

Awareness of HIV Pre-exposure prophylaxis and experiences of PrEP use among key populations in the Democratic Republic of Congo

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Background: HIV Pre-exposure prophylaxis (PrEP) for key populations (KPs) is being scaled up rapidly in DRC and elsewhere in Sub-Saharan Africa, but little is known about determinants of PrEP use.

This study qualitatively explored PrEP awareness as well as barriers to and facilitators of use among KPs in Kinshasa, DRC.

Methods: Purposive sampling was used to recruit participants in five KP drop-in centers in Kinshasa. Individuals who were ≥18 years and had been evaluated for PrEP in participating centers over the past three years were included in the study.

From November 2021 through March 2022, 30 in-depth semi-structured interviews were conducted by trained research staff in French and Lingala to collect information about awareness of and willingness to use PrEP, experiences with PrEP, and barriers/facilitators of use.

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We coded interviews using a codebook informed by the socioecological framework and analyzed the data thematically.

Results: Respondents were 22-52 years old and included 13 sex workers, 11 men who have sex with men, 4 transgender and non-binary people, and 2 partners of people living with HIV. At the time of research, 16 people were using PrEP, 6 had stopped, and 8 never started PrEP.

All participants were aware that PrEP was available for use. Healthcare providers and social networks were the main sources of information and an important facilitator of PrEP uptake along with perceived HIV risk.

We found that benefits of PrEP use did not always outweigh perceived risks, as participants described both HIV-related stigma due to PrEP packaging and medication associated stigma ("why take medications daily if you are not sick?"). These stigmas and side effects were common barriers to PrEP initiation and adherence.

This consideration was different among people who used PrEP more regularly who felt that stigma was less of an issue compared with PrEP benefits.

Conclusions: High awareness of PrEP availability may indicate success in PrEP implementation programs in Kinshasa. Social networks facilitate PrEP use, but negative attitudes to medications and HIV stigma remain important barriers. Findings suggests the potential to leverage social networks and consider alternative packaging to overcome barriers and improve PrEP uptake in DRC.

EPD0704

Associations between psychosocial factors, virologic breakthrough and both objective and subjective measures of ART adherence among people with HIV in South Africa

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Background: Prior studies have demonstrated that psychosocial factors such as depression, anxiety, HIV-related stigma, and HIV non-disclosure may negatively impact ART adherence. However, many of these studies have relied on participant self-report of ART adherence.

This analysis compared the strengths of association between psychosocial factors, virologic breakthrough (VBT), an objective measure of adherence (ART drug levels in dried blood spots [DBS]), and a validated self-reported adherence (SRA) measure among people with HIV (PWH) in Cape Town, South Africa (SA).

Methods: Adult PWH from health clinics in Cape Town, SA on efavirenz-based first-line ART containing tenofovir disoproxil fumarate, who had an undetectable (<50 copies/mL) HIV viral load (VL), were prospectively enrolled in

an observational cohort study for 12 months. Sociodemographics and psychosocial factors were ascertained at baseline. Monthly study visits included SRA and blood collection for tenofovir diphosphate (TFV-DP) in DBS. High SRA was defined as $\geq 80\%$ in the past 30 days.

High TFV-DP was defined as ≥ 800 fmol/punch in DBS. Associations between psychosocial factors, instances of VBT (defined as ≥ 400 copies/mL) and lower vs higher SRA and TFV-DP levels were assessed using chi square tests of independence and independent samples t-tests.

Results: Across all timepoints $n=21$ (8.4%) individuals experienced VBT, which was associated with both lower SRA and TFV-DP ($\chi^2[1, N=248]=7.08$, $p=.008$) and ($\chi^2[1, N=250]=16.51$, $p<.001$), respectively.

Among the psychosocial and mental health factors assessed, greater levels of HIV stigma were associated with lower SRA ($\chi^2[1, N=248]=6.47$, $p=.007$), as was screening positive for substance use disorder ($\chi^2[1, N=248]=7.59$, $p=.004$).

Substance use disorder was also associated with lower TFV-DP levels ($\chi^2[1, N=248]=5.31$, $p=.015$).

Additionally, female gender and lower medication support were also associated with lower TFV-DP levels ($\chi^2[1, N=250]=6.67$, $p=.006$) and ($\chi^2[1, N=250]=4.40$, $p=.026$), respectively.

Conclusions: Suboptimal adherence, determined by both subjective (SRA) and objective (TFV-DP in DBS) measures, was associated with VBT and with psychosocial factors of HIV stigma, substance use disorder, and low medication support.

These data suggest that, based on available resources, clinics could make decisions about which tool to use for the clinical management of PWH.

Further, these findings support the need for interventions addressing stigma, substance use, and medication support, to enhance ART adherence and health outcomes.

EPD0705

Bringing access and innovation to the hands of people in the battle to control HIV in Vietnam: how D.Health is a tool reaching those hands and minds

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Background: In Vietnam, the vast majority of new HIV cases are affecting young, men who have sex with men, among other key populations. This group is also extremely technologically connected making the use of technology to reach out to this group highly promising.

Description: The D.Health application was originally launched in 2020 as a tool that helped to better inform people of community-based services related to HIV testing and referral to treatment and related health topics. This tool was co-developed with representatives from community-based organizations (CBOs) representing



key populations. Further updates support client appointments with CBOs, ordering HIV self-test kits, and a step-by-step walk through to help clients identify health services they can benefit from start to completion of a particular service chosen.

This application allows users to maintain a running record and also provides additional media/literature and even games to help build their health literacy.

Lessons learned: Since the launch of D.Health through December 2022, 86,457 visitors have accessed the site, 25,034 used the risk calculator function, 3,407 were newly diagnosed and linked to HIV care and treatment while 9,187 were enrolled to PrEP.

This process was supported by expert consultants from hospitals and the Ministry of Health. Three key lessons arise from this experience:

1. Set an expectation for your launch with a defined wire frame, functionality list, and design, tabling other noted improvements for future updates, if not you will perpetually delay the launch of your application;
2. Expect delays due to software and coding when field testing as well as seeking approvals from app store vendors (i.e. Apple Store and Google Play);
3. Ensure you maintain your IT support at launch to help address any immediate technical issues following launch and increased traffic use.

Conclusions/Next steps: Recognizing that the most affected group is more and more connected to technology, it is important to meet these young clients with tools that best reach them and engage them where they are. D.Health will continue to grow and adapt to the needs of this group, as one of several tools available to support clients' access.

EPD0706

Psychosocial correlates of condomless anal sex among young gay, bisexual and other men who have sex with men in Buenos Aires, Argentina

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Background: In Argentina, 64% of the new HIV cases among cisgender men in 2019-21 corresponds to condomless sex with other men, rising to 79.8% - 87.4% among those between 15-24 years old. The proportion of new acquisitions of HIV in sexual relations with other cisgender men increased 10% compared to 2013-15.

The objective of this study was to determine the prevalence of condomless anal sex (CAS) and its psychosocial correlates among HIV-negative young gay, bisexual and other men who have sex with men (GBMSM) from Buenos Aires, Argentina.

Methods: A sample of 143 cisgender HIV-negative GBMSM between 16 and 30 years old completed an ad hoc survey at the HIV testing service of a NGO, between April-September, 2022. Data was gathered on sociodemographic variables, sexual behavior, substance use and violence from family (psychological, verbal, physical and sexual). Chi-square tests, odds ratios (OR) and confidence intervals (CI) were calculated to explore correlates of insertive and receptive CAS.

Results: Median age was 22 (IQR=23-28), 38.5% were migrants, 78.9% identified as gays and 16.2% as bisexual, 7.7% (n=11) were engaged in sex work. In the last month, 54.5% reported receptive and 52.4%, insertive CAS with at least one partner.

Most participants (76.9%) used substances before or during sexual relations in the last three months, mainly alcohol (61.5%). Most of them (67.6%) experienced violence from family at least once, most frequently psychological (57.2%) and verbal (47.9%).

Receptive CAS was associated with verbal violence (OR=2.45, 95%CI=1.23-4.85), and substance use before or during sex (OR=2.22, 95%CI=1.00-4.92).

Insertive CAS was associated with engagement in sex work (OR=4.50, 95%CI=0.93-21.62), migration (OR=2.70, 95%CI=1.33-5.46), verbal (OR=2.27, 95%CI=1.15-4.48) and sexual (OR=3.09, 95%CI=1.26-7.59) violence.

Conclusions: Violence from family, substance use and intersectionality of stigmas may impact young GBMSM's ability to engage in condom use during anal sex. Preventive intervention strategies for this group should incorporate a more comprehensive and intersectional approach, including harm reduction and trauma assistance components.

EPD0707

Catalytic seed fund creating hope for behavioral change among key and priority populations in Uganda: experience from AIDS Information-Uganda

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Background: Adolescent girls and Young Women (AGYW) constitute a big proportion of Key populations (KPs) and Priority Populations (PPs) in Uganda yet face biggest burden of SRH/HIV/GBV challenges. Reports indicate HIV prevalence among Sex workers (SWs) at 35% compared to 5.4% national average, teenage pregnancy rate at 24% and GBV rate of about 23%.

In response, AIC supported by UNFPA provided AGYW catalytic seed fund to counter high risk behaviors such as commercial sex work.

Description: AIC partnered with City Authorities, district local governments (DLGs), mapped out KP hotspots in 14 target districts in 2020. 900 out of school AGYW at risk of

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sexual exploitation (SE)-majority identified as SWs aged 15 to 24 were mobilized and trained in SRH/HIV/ GBV prevention and economic empowerment (EE). 34 Groups (25 AGYW per group) successfully formed, supported to register Associations (CBOs), open bank account, develop business plans.

Memorandum of understanding signed between AIC and the group witnessed by DLG for mutual accountability and UGX4 Million given per group. 34 enterprises were started including 10 salons, 6 restaurants, 6 cereal dealers, 5 Tailoring, 2 retail shops, 3 Fashion shops and 2 Bakery shops.

Saving schemes were established where weekly group saving and soft loans were given to members. As a result, 30 AGYW returned to school, 15 sent their children or siblings back to school; 150 reported not engaging in SW anymore, busy running the established businesses.

Majority acquired life skills to demand for safer sex and over 200 inspired AGYW requested to join these groups. During COVID-19 travel ban, 2 groups were given travel permit to continue providing SRH services such as ARVs and condoms distribution, others hold leadership positions and indicate increased acceptance and respect at community levels thus some groups were recommended by districts to benefit from government and partner funding.

Lessons learned: The creativity and group cohesion indicates positive thinking, critical for influencing mindset change; therefore, targeted mentorship with minimal financial support is great stimuli for AGYW to realize their potential.

Conclusions/Next steps: With guided investment, catalytic funds can greatly improve the lives and livelihoods of AGYW at risk of SE.

EPD0708

Leveraging community networks through a digital platform to increase access to and uptake of health services for key populations in Mombasa County, Kenya

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Background: Triggerise uses behavioural science principles like nudges and reminders, we promote access to SRH and wellbeing services and products for adolescents and young people (AYP) through a free membership platform called Tiko.

AYP sign up to the Tiko platform, usually assisted by a community mobiliser, and then become eligible to access a range of free SRH services at local health facilities. We offer contraception and other HIV-related treatment and mental health (MH) services. Through a 36-month pro-

gramme undertaken in conjunction with the Elton John AIDS Foundation, we are integrating mental health care and HIV-related treatment into our existing SRH service infrastructure to serve 15- to 24-year-old AYP of all genders.

Description: By including MH care into our service offering, young people are better equipped to stick to their treatment plans if HIV-positive; decrease risky behaviours; and find the support they need at an interpersonal level through counselling and MH screenings.

Through Tiko, we partner with several CBOs to offer substantial free pathways to treatment and support to address high HIV numbers, linkage to prevention and treatment of HIV and addressing of mental health issues associated with long-term illnesses such as HIV.

Lessons learned: To date, 21,114 AYP have enrolled onto the Tiko platform in Mombasa through this programme. Our HIV testing options are split into self-testing at pharmacies and clinic testing with a healthcare professional. Out of 12,306 HIV tests, 10,328 chose to self-test, with less than 2,000 electing for assisted testing.

Several factors may contribute to this result: a desire to maintain a level of anonymity related to HIV stigma; the convenience of visiting a pharmacy over waiting for an appointment at a clinic; and the more casual association of visiting a pharmacy as opposed to clinics, which are more conspicuous.

1,945 MH services have been accessed. In total to date, 1,006 young people have been screened for depression, with 247 AYP screening multiple times.

Conclusions/Next steps: The huge uptick in testing has been because of offering AYP the option of taking HIV self-tests.

The numbers of ART and PrEP uptake and adherence are also steadily increasing.

EPD0709

The use of Social Media as a peer education strategy. A look at FSW intervention in Greater Kumasi under the WAPCAS Global Fund NFM III Project in Ghana

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Background: HIV prevalence among Female Sex Workers (FSWs) in Ghana is 4.6% (IBBSS 2019) as compared to 1.7% in the general population. The situation requires targeted intervention to prevent a possible spillage into the general population. The Ghana – West Africa Program to Combat AIDS and STIs (WAPCAS) therefore implements the Global Fund NFM III Project in selected districts in Ghana with the aim of scaling up quality HIV care cascade and addressing various human rights infractions that serve as barriers to accessing healthcare among Key Populations.

The project uses peer education strategy to reach the target groups with the intervention services. However, modern trends in sex work means traditional peer educa-



tion is not enough to reach all categories of sex workers. Hence the need to introduce social media intervention to reach cohorts who use social media platforms to operate through hook-ups.

Description: The Project engaged four peer educators under the Social Media intervention in the Greater Kumasasi site. These peer educators joined various hook up groups on social media platforms to provide education and share information on the intervention services available under the project. Peer Educators then produced monthly reports based on the unique individuals they directly interacted with and provided services. Through the Social Media strategy in Greater Kumasasi, 733 unique FSWs were reached in 2022. A total of 23,288 male condoms and 6585 lubricants were distributed. Prep services were provided to 38 FSWs and 23 HIV Self-test kits were distributed to them. 84 tested for HIV with two yields through Social Media intervention.

Lessons learned:

1. Social Media approach provides opportunity for projects to reach community members who may not be reached through traditional peer education strategy.
2. It helps Peer Educators to work without borders.
3. Also, it gives PEs the flexibility to work remotely.

Conclusions/Next steps: The social media strategy has proved very useful to the intervention. It has brought wider coverage and inclusivity under the project. It is therefore recommended that Key Population programs combine traditional peer education and Social Media strategy for optimum results.

EPD0710

Social support, structural adversity, and resilient coping among female sex workers living with HIV in South Africa: a cross-sectional study

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Background: Resilient coping can improve HIV treatment outcomes for marginalized populations, including cis-gender female sex workers (FSW). Understanding drivers of resilience among FSW is important to ensure support services are adequately tailored to those experiencing marginalization and adversity, who are at elevated risk of HIV treatment disengagement.

Methods: *Siyaphambili* was a randomized trial assessing adaptive differentiated strategies for optimizing HIV treatment outcomes among FSW living with HIV ($N=1,358$) in Durban, South Africa.

At baseline (2018-2020), we measured resilient coping using the 4-item Brief Resilient Coping Scale (BRCS, range: 4-20). Based on the response distribution, we distin-

guished FSW exhibiting low to moderate resilient coping (BRCS: 4-17) or highly resilient coping (BRCS: 18-20). We assessed social support's association with highly resilient (versus low/moderately resilient) coping using chi-square/Wilcoxon rank sums and used log-binomial regression to estimate prevalence ratios (PRs) and 95% confidence intervals (CIs) for the association between social support and resilience, adjusting for psychosocial, behavioral, and demographic factors associated with highly resilient coping in unadjusted analyses at the $p<0.1$ level.

Results: Overall, over a third of FSW (39%) had BRCS scores suggesting highly resilient coping. Compared to FSW with low to moderate resilient coping, highly resilient FSW exhibited significantly ($p<0.05$) higher prevalence of recent homelessness (11% vs. 7%), moderate-to-severe depression (37% vs. 31%), lifetime sexual violence (42% vs. 35%), heavy alcohol consumption (54% vs. 46%), and higher levels of social support (median score: 24 vs. 20). In multivariable analysis, highly resilient coping was associated with high levels of social support (Figure).

	Unadjusted models		Adjusted model [†]	
	PR	95% CI	aPR	95% CI
Social support				
Low to moderate (0-19)	REF	REF	REF	REF
High (20-24)	1.88***	1.58-2.18	2.00***	1.63-2.45

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

[†] Adjusted model included age (continuous), education (less than secondary/secondary or higher), recent homelessness (yes/no), lifetime physical and sexual violence (yes/no), heavy alcohol consumption (yes/no), and depression (mild or less vs. moderate or severe)

Table. Association of social support with high levels of resilient coping among FSW living with HIV in Durban, South Africa ($n=1358$).

Conclusions: Our findings suggest relatively high levels of resilient coping among FSW with access to social support in the context of violence and structural adversity. Enhanced social support among FSW living with HIV may be key to bolstering resilient coping and improving HIV treatment outcomes.

EPD0711

Sexual violence reported against Key and Vulnerable Population (KP) without condom

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Background: Sexual and gender-based violence (SGBV) is among the key drivers of the HIV/AIDS epidemic. They promote the spread of HIV among girls/women and boys/men and Key and Vulnerable Populations (KVPs) and affect every aspect of the HIV Care continuum including access to prevention, care, treatment and support services. Data also show that women adolescents especially key population groups such as Female Sex Workers (FSW), Men having Sex with Men (MSM), People Who Inject Drugs (PWID) and Transgender (TG) are disproportionately affected by the HIV/AIDS epidemic in Nigeria.

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The current state of insecurity in Nigeria, exacerbated preexisting vulnerabilities, deepening exclusion and poverty. Key and vulnerable populations and Persons living with HIV are among the most affected.

Methods: A total of 17,975 KPs were interviewed for the behavioral component of the study in 12 states. Behavioral data for the key population by typology was collected using a structured questionnaire adopted from previous structured questionnaire (IBBSS 2014) and improved upon using the Global Bio-behavioral survey guideline "blue-book" (2017). The quality assurance measures were put in place to ensure that the integrity of data was not compromised. Data collection was conducted on tablet using the survey CTO software apps which enables storage of data coming from field via cloud in real time.

Results: Data from IBBSS 2021 show that approximately 9% of FSW were forced to have sex in the last 12 months and 33% of them were without condom.

About 7% of PWID were forced to have sex in the last 12 months and 37% were without condom, and 16% of MSM were forced to have sex in the last 12 months and 36% were without condom.

Also, 15% of transgender were forced to have sex in the last 12 months and 55% of them were forced to have sex without condom.

Conclusions: Sexual violence against KPs remains a public health issue with forced unprotected sex (without condom) highest among TG. Hence, advancing Sexual and Reproductive Health and Rights (SRHR) is key to ending sexual violence among KPs towards HIV/AIDS epidemic control by 2030.

EPD0712

Where the world stands on reforming age of consent policies

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Background: Age of consent laws/policies can potentially prevent adolescents, including adolescents within key populations, from engaging in the decision-making process regarding their health by requiring them to obtain consent from a parent or guardian. Such policy barriers may curtail their sexual and reproductive rights, impede access to vital HIV testing and treatment services, and implicitly allow health systems to deprioritize the needs of adolescents.

Mapping and analyzing HIV-related policies is essential to ensure swifter and consistent progress towards global HIV targets. Here, we examine the national policy on age of consent policies by evaluating if adolescents can access HIV testing and treatment without parental consent.

Methods: Georgetown University's HIV Policy Lab (HIVPL), a collaboration with UNAIDS and others, tracks the adoption status of 33 globally recommended laws and policies

for 194 countries. In the HIVPL database, countries where the national policy does not require adolescents (aged 12 years and above) to obtain parental/guardian consent to access HIV testing and treatment, are considered to be in alignment with age of consent policy. Countries that impose age restrictions on adolescents and require them to obtain parental consent are considered to not be in alignment.

In this analysis, we map the alignment with age of consent best practices globally and highlight the existing exceptions and contradictions.

Results: Preliminary descriptive findings indicate that globally, only 24% of countries have adopted the recommended age of consent policies. The adoption rate varies across regions, with Asia and the Pacific and Eastern and Southern Africa having the highest rates (43% each) while none of the countries in Eastern Europe and Central Asia have adopted the policy.

Further, 26 countries have conflicting parental consent policies for testing and treatment: nine require parental consent for adolescents to access treatment but not for testing, while the remaining seventeen countries require parental consent for testing services but not for treatment.

Conclusions:

Eliminating parental consent for HIV testing and treatment is still needed in many countries. Tracking and analyzing the age of consent policies is an important reform so that adolescents can be empowered to make informed decisions about their health without unnecessary barriers.

EPD0713

Sexual health and rights advocacy among marginalized young women during the COVID-19 pandemic in the Global South

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Background: Young women and adolescent girls (15-30 years) are disproportionately affected by discrimination, sexual violence, unplanned pregnancy, and gender-based violence; even more so when they are at the intersection of multiple stigmatized identities. Nevertheless, sexual and reproductive health rights (SRH-R) services are often inaccessible due to costs, as well as lack of awareness and sensitivity by service providers.

This study explored the impact of the COVID-19 pandemic and how civil society organizations and communities adapted to provide SRH-R services to young women in Lebanon, Guatemala, Mozambique, Uganda and Nigeria.



Methods: Data was collected electronically by a team of 11 young female researchers and advocates from 5 different countries using the KoboCollect toolkit between October and December, 2022.

A mixed methods approach with surveys and interviews was used to investigate the lived experiences and perspectives of 227 young women identified primarily from existing networks and through chain-referral sampling.

Targeted populations were young women and girls: living with HIV; identifying as lesbian, bisexual, transgender, and/or intersex (LBTI); affected by displacement; and/or living with disabilities. Both in-person and virtual interviews due to COVID-19 disruptions were conducted.

Results: Several respondents (35%) were directly involved in implementing SRHR advocacy actions in their communities. A third (33%) of respondents described barriers in accessing SRHR services, including stigmatization for being sexually active. In particular, young women with disabilities and young LBTI women faced discriminatory attitudes from health care professionals.

The fear of contracting COVID-19 coupled with lockdown measures (including lack of transportation and diversion of resources) kept young women away from seeking SRHR services and left nearly half (46%) feeling the pandemic worsened accessing healthcare. Difficulty accessing contraceptives during the pandemic and associated unplanned pregnancies was identified as a key barrier among 65% of respondents.

Notably, sensitive counselling and cervical cancer screening was the least accessed SRHR services in all the included countries.

Conclusions: Our findings show that there is an ongoing need for joint initiatives to address a range of issues surrounding the current advocacy efforts around SRHR in order to attain high standards of health, and ensure equality, non-discrimination, privacy, and confidentiality for young women and girls.

EPD0714

Prevalence of HIV and effectiveness of a proximity community-based intervention for access to healthcare services in artisanal gold-mining zones in Mali (ANRS-12392 Sanu Gundo)

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Background: In Mali, artisanal gold-mining zones (AGMZ) are characterized by mass circular migration, convergence of key-populations and the lack of adapted healthcare services. This contributes to the potential risk of "bridging" infectious diseases including HIV.

We aimed to assess the extent of HIV in AGMZ and the effectiveness of proximity community-based services for early antiretroviral treatment (ART) initiation.

Methods: ANRS-12392/Sanu Gundo is an ongoing non-randomized interventional study launched in December-2020 in two Malian AGMZ (Diassa and Kofoulatiè). Community-based activities including HIV testing were offered during 5 months.

Demographic and activity-related characteristics were recorded during HIV testing. People newly diagnosed were either offered with proximity community-based HIV services including psychosocial and peer-support activities (intervention group); or referred to public clinics for classic care (control group).

Individual, behavioral and clinical characteristics were collected at different time points during 12 months. HIV prevalence was estimated. Effectiveness of the intervention on ART initiation one month after diagnosis (M1) was assessed using a Probit logistic model.

Results: Overall, 9,785 people were tested for HIV. Prevalence in both Diassa (1.51% [1.22%-1.87%]) and Kofoulatiè (2.15% [1.76%-2.64%]) was higher than the national prevalence (0.8% [0.6%-1.0%], UNAIDS).

Among the 170 people diagnosed with HIV, 81 (47.6%) were included in the control group and 89 (52.3%) in the intervention group. Data was available for 149 PLHIV at M1 (control: 70 and intervention: 79). Median age[IQR] was higher in the control group (40[31-50] years vs. 27[22-35], $p < 0.001$). Median viral load[IQR] at diagnosis indicated poorer health in the control group (2,503[839-103,330]copies/mL vs. 1,238[839-27,906]copies/mL, $p = 0.039$).

Probit estimation without confounders showed that PLHIV in the control group were 70.6% ($p < 0.001$) less likely to be on ART one month after diagnosis.

Including covariates indicated that early ART initiation was more likely for older PLHIV (13%, $p = 0.008$) and non-gold-miners (19%, $p = 0.006$).

The intervention effectiveness on early ART initiation persisted after adjusting for covariates (- 80.2% for control group, $p < 0.001$).

Conclusions: The Sanu Gundo intervention was effective for early ART initiation to improve linkage-to-care often disrupted by cyclical migration and the lack of adapted healthcare services. Community-based approaches can effectively promote access and retention in care to limit HIV dissemination.



EPD0715

PrEP knowledge and HIV risk among Queensland Tertiary students

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Background: As young adults enter university their patterns of sexual behaviours and condom use change which can impact sexual health and HIV related risks. However, little is known about young Australians HIV knowledge, risk, and awareness of HIV pre-exposure prophylaxis (PrEP).

This study investigated HIV knowledge, risk, and awareness of PrEP among Tertiary students studying in Queensland, Australia.

Methods: Using data from the 2019 Tertiary Students Sexual and Reproductive Health Survey, descriptive analysis was conducting to investigate HIV knowledge (12-items) and risk (41-items based on known factors that influence HIV risk) using cumulative scores.

Descriptive and logistic regression analyses were conducted investigating self-reported PrEP awareness across various groups of interest: men who have sex with men (MSM), student enrolment type (international and domestic) and age.

Results: The sample consisted of 4,291 respondents from over 10 different Queensland universities. Average HIV knowledge score (ranging from 0-12), was 9.8/12. The lowest correct response rates were for knowledge item 'You can take a pill every day to prevent getting infected with HIV' (20.5%).

Higher mean aggregated HIV risk scores (range 0-37/41) were observed among men who have sex with men (MSM) (6.2) compared to all other sexual identities (3.2). Self-reported PrEP awareness was found to be higher among men who have sex with men (MSM) (53.1%) compared to all other sexual behaviours (21.0%).

Domestic Australian-born students also self-reported higher PrEP awareness (22.4%) compared to domestic overseas-born (19.5%) and international students (17.0%). Logistic regression analysis indicated that PrEP awareness was associated with older age ($p < 0.05$), with 30-34-year-olds having the highest self-reported awareness (28.8%) and 18-19 year olds reporting the lowest awareness (12.2%).

Higher PrEP awareness was associated with being non-binary/gender-diverse ($p < 0.05$), and MSM ($p < 0.05$). Being an international student was significantly associated with lower odds of PrEP awareness ($p < 0.05$).

Conclusions: Our results indicate that while HIV knowledge is relatively high, awareness of biomedical prevention was limited. Increased HIV risk among MSM students, and lower awareness of PrEP among international students and younger students present opportunities for targeted promotion that will improve awareness and access and work towards Australia's goal of ending HIV transmission by 2025.

EPD0716

Social and economic vulnerability is associated with sexual violence and HIV status among Central American migrants in transit through Mexico

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Background: Migrants are at increased risk of HIV and other adverse sexual health outcomes, including sexual violence. Characteristics of the migrant population and environments in both, the origin and host countries increase their vulnerability for worsened health outcomes.

This study aims to assess social and economic factors associated with sexual health outcomes including rape, transactional sex, and HIV status among Central American migrants in transit through Mexico.

Methods: Between September and December 2022, we conducted a cross-sectional survey on health needs among migrants in transit in two Southern Mexican States with high tradition of reception of Central American migrants in transit to the United States.

We applied latent class analysis (LCA) to identify profiles of social and economic vulnerability using self-reported reported of migrant population during transit (food, shelter, healthcare, money, transportation, and legal).

We used logistic regression models to explore the association between class membership and rape, transactional sex, and HIV.

Results: 777 immigrant people completed the survey. Sexual assault and transactional sex were reported by 3.6% of participants. HIV prevalence was 2.6%.

By LCA posterior probabilities, we identified three classes of social and economic vulnerability:

1. Low vulnerability (29.7% of participants),
2. Food, money, and transportation (39.5%), and;
3. High social and economic vulnerability (30.8%).

Compared with migrants in class one, those in class two and three had higher odds of engage in transactional sex (OR= 7.9, 95% CI = 1.7 - 35.4, and OR= 6.28, 95% CI = 1.3-29.76, respectively). HIV status was also significantly higher among participants in class two and three when compared with those who presented lower levels of vulnerability (OR= 3.8, 95% CI = 1.3 - 11.4, and OR= 4.9, 95% CI = 1.6-14.8, respectively). Non-significant association between sexual violence and class membership was found.



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Conclusions: Results show that higher levels of vulnerability are associated with increased risk of engaging in transactional sex and HIV status among Central American migrants in transit through Mexico. There is a growing need of target interventions to improve sexual health outcomes among these growing populations.

EPD0717

Advancing a sustainable HIV response in vulnerable communities in the Dominican Republic by building capabilities in health science students and community leaders: lessons learned from a community-based participatory research training

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Background: Limited scientific evidence affects the response to HIV in Batey Cinco Casas (BCC), an underserved rural community of the Dominican Republic (DR). The community-based participatory research (CBPR) is an effective approach for the construction of community-level data for culturally appropriate strategies and proposals that improve the HIV response. Yet, the future generation of researchers are not suitably trained to work alongside community leaders (CLs) to properly identify and address the needs of underserved communities.

In response, a CBPR training and mentorship curricula was elaborated and implemented to develop CBPR research skills in CLs and health sciences students, to achieve sustainable evidence-based health projects.

Description: The Building Academic Capabilities and Knowledge with Underserved Populations (BACKUP) Project advanced a virtual inter-institutional formative platform for CBPR training. Between March and August 2022, health sciences students, from different local Dominican universities, together with CLs from BCC and other communities participated in 13 on-demand workshops delivered through a locally developed online learning platform.

Additionally, BACKUP Project provided a mentorship program in which five community research dyads (CRD), comprising 2 students and 3 to 4 CLs, worked collaboratively while receiving 1-hour weekly consultations and additional workshops for the development of their own CBPR project.

Lessons learned: CBPR capacities were developed in 35% and 73% of the health science students and CLs that initiated the training program, respectively. CBPR skills were increased in 80% of the health science students and 100% of the CLs that constituted the mentorship program. Four CBPR protocols were developed by the CRDs.

The implemented CBPR research proposal revealed potential bottlenecks that interfere with the access to HIV services in BCC and initiated the definition of evidence-based strategies to effectively improve HIV response in the community.

Conclusions/Next steps: A CBPR educational platform is a low-cost strategy and tool for academia-community partnerships to foster the development and implementation of health projects that promote community leadership and mobilization for sustainable HIV prevention initiatives.

Subsequent training programs should be employed to continue strengthening the capacities developed in the CLs of BCC to expand the model to other local underserved communities with the potential of applying it to other vulnerable global communities.

EPD0718

Access to condoms and consistent condom use among migrant people in transit in Central America: a cascade approach

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Background: In the last decade, the amount and composition of migrant flows moving across borders has changed globally. Migration can place people in situations of heightened vulnerability to HIV. To optimize access to prevention strategies for vulnerable populations is necessary to identify needs and barriers.

This study aims to characterize the use and access to condoms among migrant people in transit through three Central American countries.

Methods: Between September 2022 and January 2023, we conducted a cross-sectional survey on health needs among migrants in transit in Mexico, El Salvador, and Honduras. We used cluster analysis to identify profiles of potential condom users based on participant's self-reported sexual behavior.

To assess access to condoms, we used the "cascade of care" framework –sought, access, and consistent use of condoms. We used logistic regression models to assess predictors of access and consistent condom use.

Results: 343 migrant people reported sexual activity during transit. We identified three profiles of potential condom users:

1. Those who reported sexual encounters only with a steady partner (40%);
2. Those who had sex with a casual partner (13%), and;
3. Those who reported casual sex and other HIV risky behaviors (47%).

Sought of condoms for profile 1 was 35% and similar for profiles 2 and 3 (≈77%). Access was 35% 70%, and 67%, for profiles 1, 2, and 3, respectively. Among those who accessed condoms, 51% had free access (47%, 54% and 50%),

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and 49% paid for them. Consistent condom use was higher in Profile 3 (10%, 32% and 44%). Those who experienced discrimination (OR = 0.27, 95% CI = 0.08 - 0.91 $p < 0.05$) were less likely to access to condoms and those who needed money during transit were less likely to report consistent condom use (OR = 0.48, 95% CI = 0.24 - 0.96 $p < 0.05$).

Conclusions: Despite high access to condoms, consistent use is low among at-risk people. Negative experiences in passing countries could affect access to condoms.

Policies to improve access to universal and safe HIV prevention methods are needed to reduce the HIV vulnerability among people in transit.

EPD0719

Proportion and characteristics of studies including minors under the age of 18 who sell sex in sub-Saharan Africa from published systematic reviews of literature on female sex workers

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Background: Minors under age 18 who sell sex less often access some health services and more often engage in some risk behaviors compared to adult sex workers. However there is limited information about the proportion of studies with people who sell sex that include minors and the characteristics of these studies.

This is particularly important in sub-Saharan Africa, a region with high HIV prevalence and a young population.

Methods: Articles were identified from three systematic reviews of literature on female sex workers. The criteria for including articles in our analysis were:

1. Published in a peer-reviewed journal,
2. Written in English,
3. Included female sex workers as study participants (rather than for example clients or health workers);
4. Took place in a country in sub-Saharan Africa.

Information was extracted from the articles using a standard form that included whether minors <18 could participate in the study and study characteristics. Two reviewers independently extracted data from each article, and differences were resolved through consensus.

Results: Out of 68 articles, 26 did not specify whether any participants <18 were included. 20 articles (29%) included participants <18.

The studies that included minors who sell sex took place in 12 countries: Cameroon, the Central African Republic, the Democratic Republic of the Congo, Ethiopia, Guinea, Kenya (n=5), Madagascar, Mozambique, Nigeria, South Africa (n=4), Togo, and Uganda (n=2). 19 of the studies including minors were quantitative, and one used mixed methods. 16 of the studies were cross-sectional, and 4 were longitudinal.

One study involved an intervention.

In 16 studies, biospecimens were collected. 17 of the articles included the name of the ethics committee or institutional review board that approved the study, and 3 did not. Sampling methods included convenience sampling (n=8), venue-based sampling (n=5), snowball sampling (n=5), and respondent-driven sampling (n=2).

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Conclusions: There may be a need for additional studies with minors who sell sex that are longitudinal, use representative sampling methods, use qualitative methods, and evaluate interventions.

Sexuality, gender, relationships and sexual cultures

EPD0720

Intimate partner violence, depressive symptoms, and HIV risk behaviors among Latino sexual minority men in South Florida

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Background: Young (18-34) Latino sexual minority men (LSMM) are one of the only US populations in which HIV incidence is increasing and are more likely to be diagnosed at a later stage than other racial and ethnic groups. Miami, Florida, is the largest Latinx-majority city in the US and has the country's highest incidence rate of HIV. Previous research has shown SMM who experience intimate partner violence (IPV) have poorer mental health and reduced HIV resources, but there is little research on IPV in LSMM specifically. LSMM in Miami experience a confluence of compounding sexual minority, ethnic, racial, and immigration-related stressors that may lead to negative psychological outcomes and their associated HIV risk behaviors.

This study is among the first to illuminate the intricate relationships between IPV, mental health, and HIV risk in LSMM to inform future interventions for this under-sourced community.



Methods: Data comes from baseline survey data from n=150 HIV-negative LSMM in the ongoing ¡Adelante! study. These informed a multivariable logistic regression model analyzing associations between IPV, depressive symptoms, and levels of familism on PrEP uptake and recent (past 3 months) condomless anal sex (CAS). A mediation analysis examined the explanatory role of depressive symptomatology in these outcomes.

Analyses were adjusted for socio-demographic covariates, including educational attainment, housing, poverty level, and immigration status.

Results: Among the n=78 participants recruited thus far, nearly one-fifth (19%) reported experiencing homelessness in the past year, indicating significant social vulnerability in this sample. Prevalence of IPV (>50%) and depressive symptomatology (42%) was high. Additionally, among the 67% who reported CAS in the past 3 months, only 45% reported PrEP use.

Preliminary analyses suggest there are significant direct effects of IPV on PrEP uptake and depressive symptomatology on recent CAS and PrEP uptake. High levels of familism were associated with condom and PrEP use, suggesting strong familial cultural ties may be one important point of intervention to mitigate HIV risk in LSMM.

Conclusions: This study is among the first to highlight the role of IPV in elevating HIV risk behaviors among LSMM. Results suggest IPV-focused interventions may be efficacious in reducing HIV acquisition in this high-need community.

EPD0721

Factors associated with intimate partner violence among young women and men in KwaZulu-Natal, South Africa

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Background: South Africa has among the highest rates of intimate partner violence (IPV) and HIV prevalence rates globally. Although there is abundant research on the association of IPV and HIV, particularly against women with men as perpetrators, there is limited research on men who have experienced IPV.

To address this gap, we conducted an analysis of self-reported lifetime physical IPV (PIPV), emotional IPV (EIPV), and composite IPV (CIPV) by gender.

Methods: We administered 2,581 questionnaires focused on sexual behavior and violence as part of a prospective cohort study among adolescent girls and young women aged 15-24 years and adolescent boys and young men

aged 15-35 years in uMgungundlovu District, South Africa between August 2021-July 2022. Service delivery points included high schools, health facilities, youth zones, and technical vocational education training colleges. Descriptive analysis and multivariate logistic regressions were performed.

Results: Of the total participants, 16% (n=411) reported experiencing at least one form of IPV in their lifetime. Of 1649 women surveyed, 14.7% reported experiencing CIPV, 8.7% PIPV, and 9.5% EIPV. Of 941 men surveyed, 18.5% reported experiencing CIPV, 7.7% PIPV, and 14.4% EIPV.

Women who consumed alcohol 2-4 times per week and those who always experienced condom refusal from their partners were more likely to report experiencing CIPV (adjusted odds ratios (aORs)=5.17, 2.36; 95% confidence intervals (CIs): 1.55-17.29, 1.19-4.70), EIPV (aORs=9.28, 2.72; 95% CIs: 2.42-35.54, 1.30-5.68), and PIPV (aORs=5.27, 3.64; 95% CIs: 1.40-19.90, 1.68-7.87), respectively.

Men who reported high food insecurity and those who participated in transactional sex were more likely to report experiencing CIPV (aORs=4.29, 2.43; 95% CIs: 1.15-15.92, 1.39-4.27) and EIPV (aORs=5.34, 2.11; 95% CIs: 1.19-23.99, 1.02-4.33), respectively. HIV-positive men were more likely to report experiencing PIPV compared to HIV-negative men (aOR=7.17; 95%CI: 1.73-29.76).

Conclusions: We found differences in factors that may be interlinked with violence exposure affecting young women and men who experience IPV, with unacceptably high proportions of IPV across the board.

Our findings indicate the need for additional research and interventions targeted towards men who experience IPV, prioritizing those with high food insecurity and those who transact sex. For women, programs could focus on sexual health advocacy on condom use and counselling support.

EPD0722

Libyan women's attitudes, perceptions and knowledge of HIV: qualitative analysis of an open-ended question in a large online survey

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Background: HIV become a concern in Libya in 1988 when 400 children in El-Fatih Hospital acquired it, believed to be through blood products. Thereafter, various sources have indicated that there is an increasing trend towards sexual transmission and most Libyan women living with HIV have acquired it from their husband. Libya struggles with gender inequalities, impacting women's access to healthcare information, services and treatment.

The aim of this paper was to assess the Libyan women's attitudes, perceptions and knowledge of HIV.

Methods: A questionnaire recruited 1,101 Libyan women, either currently or previously married, 18 years old and above, across Libya. 93 provided written commentaries of which 86 were coded, analysed and synthesised.

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Thematic analysis identified five strands: Medical distrust, Influence of Islam, Stigma and ignorance, Lack of information and the Moral degeneration of women.

Results: Although the findings established that the women were aware of the burden of HIV in the country, numerous misconceptions and outdated information still exist. They perceived transmission through medical procedures such as dental work as higher risk than other routes. This questions whether this is reflective of the society's conservative outlook or that the information they have is remnant of the 1988 outbreak. It also highlights the lack of trust in the national healthcare system. The most distressing factor was that women were blamed for the increased prevalence of HIV.

Encouragingly, attitudes towards People Living with HIV were positive. They expressed sympathy and compassion as they remarked on the actual and perceived lack of quality of life of people living with HIV in Libya which is mainly due to stigma and ignorance.

The influence and impact of Islam is evident throughout, maintaining that Islam's moral guidance is the definitive preventative method.

Conclusions: This is the first paper that explores and presents the views, knowledge and concerns of HIV among Libyan women. It reveals great self-response and capacity of the women in articulating themselves and their determination for the younger generation to be more knowledgeable. There's a need to improve HIV information and reduce stigma in the country, ensuring that women are being reached.

EPD0723

Homelessness and HIV among LGBTIQ+ community in Kenya

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Background: The LGBTIQ+ community bear disproportionate burdens of HIV risk and HIV infection in Kenya. Structural and cultural obstacles, including homelessness, criminalisation, institutional homophobia and societal antipathy towards this population continue to challenge efforts to provide equitable access to effective HIV prevention and treatment.

Lack of shelter exposes this population to defaulting treatment, engaging in high risk behaviors that elevate HIV transmission and exposes them to violence, yet despite efforts for increasing status awareness and antiretroviral therapy (ART) uptake among this population very few have access to them as most don't have a permanent place to call home after being kicked out cause of their sexual orientation and/or gender identity.

Methods: The study catered to LGBTQ homeless youths aged between 18 and 24 years who were sheltered (in a housing program), unsheltered, or living with friends or chosen families. Quantitative data collection method

included a questionnaire regarding the types of services they have used in the last eighteen months as well as the quality of services, any barriers they experienced accessing services, and the types of services they liked to receive. Qualitative data was collected via focus group discussions and provided more nuance and detail to the participants' experiences of service utilization.

Results: Prior to the pandemic, only 6.6% of LGBTQ youth could not afford to pay house rent and risked being homeless or returning to their former rural dimension, giving up the possibility, even through work, to overcome total misery, by the end of 2021 the percentage had jumped to 37.5%.

Conclusions: Based on data from other nations around the world, we know that homelessness is one of the most pressing issues that LGBTQ young people face. Yet a lack of hard data in East African nations specifically has resulted in severe gaps in knowledge, leaving providers at a disadvantage when designing and delivering services to those most impacted which will help identify the root causes of homelessness among LGBTQ young people in Kenya and East Africa and equip policy makers, service providers, community leaders, and other stakeholders with the tools needed to more effectively prevent and end this issue.

EPD0724

Impact of Stigma on PrEP uptake among adolescent girls in 5 HIV high burden countries in Africa: a critical analysis

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Background: In Sub-Saharan Africa, adolescent girls made up over 80% of the 120,000 new HIV acquisitions in 2021. Despite the proven effectiveness of pre-exposure prophylaxis (PrEP) in preventing HIV transmission, it remains underutilised among adolescent girls in Sub-Saharan Africa due to stigma.

The study examined the presentations of PrEP stigma and their implications for PrEP uptake among adolescent girls in Nigeria, South Africa, Zimbabwe, Uganda, and Kenya.

Methods: We critically analysed selected published studies on Scopus, PubMed, ScienceDirect and Google Scholar to assess the impact of stigma on PrEP uptake among adolescent girls in Nigeria, South Africa, Zimbabwe, Malawi, and Kenya. The search terms utilised were 'PrEP', 'prophylaxis', 'HIV', 'stigma', 'adolescents', 'girls' and country names.

The analysis included studies that described the presentations of stigma and its impact on PrEP uptake among adolescent girls. Studies published in English between 2012 and 2022 were included in the analysis.



Results: Nineteen (19) articles met the inclusion criteria for the analysis. The analysis revealed that PrEP stigma had a consistent presentation and impact on adolescent girls in the five countries. HIV-related stigma is common with adolescent PrEP use as the similar pill appearance gives the perception of ART use and its associated stigma.

Adolescent sexuality stigma presents a challenge as PrEP use is perceived to be trying to hide 'bad behaviour' and promiscuity and is for mature adults and prostitutes. Cultural dissonance with premarital sex and gender norms shapes the adolescents' girls communication, acceptance and engagement with PrEP.

Stigma leads to less service-seeking behaviour, poor quality interactions with healthcare providers, denial of sexual activity, delimitation of safe sex practices, and increased risk of acquisition of HIV.

The perceived and experienced social devaluation heightens the psychological vulnerability, which impacts access to treatment and social support services, and limits PrEP acceptance and adherence.

Conclusions: This study highlights the importance of breaking barriers to HIV outcomes, such as empowering women and girls and eliminating stigma and discrimination, in achieving the 2030 target.

While awareness will improve the perception of community-level stigma, PrEP programmes can create safe communities for disclosure and empower advocates that encourage at-risk peers to take PrEP.

Descriptive, bivariate and multinomial logistic regression analysis were used to analyze quantitative data. Qualitative data was analyzed using deductive thematic content analysis.

Results: Almost all adolescents (91.0%) reported willingness to know their HIV status, however, only 48.1% had ever tested for HIV and 65.4% had received general education on HIV in the last three months.

Perceiving oneself as not being at risk of infection was the most common reason stated for not utilizing HIV testing. Being 15-19 and being out of school were predictive factors of HIV testing for males whereas being 15-19 and ever having sex were predictive factors for females.

Focus group discussions revealed that adolescents have negative perceptions, such as communal stigma and fear of knowing one's status, that prevent HIV testing.

Conclusions: Adolescent refugees face clear socio-cultural barriers that must be addressed to improve their access to HIV testing services. Their willingness to get tested for HIV is higher than ever being tested for HIV. Furthermore, adolescents' vulnerability to HIV is a gendered issue that disproportionately impacts females, especially in a refugee setting.

There is a need for innovative programs and impact-driven policies that address the barriers to HIV testing among adolescents through the lens of their intersecting experience as adolescents, refugees and either males or females.

EPD0725

A mixed method exploration of the factors and barriers associated with HIV testing among male and female adolescents in Mugombwa Refugee Camp, Rwanda

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Background: As of 2013, about 110,400 adolescents between the ages of 10-19 in sub-Saharan Africa died of HIV. In refugee settings, adolescents experience exacerbated vulnerability to HIV with an increase in sexual violence and a deficient emphasis on their right to SRH services. Mugombwa refugee camp in Rwanda is home to 11,304 refugees from the DRC, of which 18.4% are between the ages of 12-17. In 2022 between January and June, there were five cases of HIV among adolescents.

This study aimed to understand the factors and barriers associated with HIV testing among female and male adolescents.

Methods: This convergent parallel mixed-methods study took place in the Mugombwa Refugee camp. Simple random sampling was used to select 422 female and male adolescents between the ages of 10-19, of which 32 participants were purposively selected for focus-group discus-

EPD0726

Doubts about HIV self-test accuracy and fear of psychological trauma deter men's adoption of HIV self-test kits – A qualitative study in Eswatini

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Background: Despite an otherwise remarkable achievement in increasing HIV testing services in Eswatini, men continue to lag women in HIV testing. HIV self-test kits have been piloted as one HIV testing model to reach more men by bypassing the health facility, a key barrier for men using HIV testing services.

In this study we sought to understand men's perspectives regarding HIV self-testing in Eswatini.

Methods: We conducted in-depth interviews with 20 men, recruited from one rural community as well as men who presented themselves at an urban men's clinic, to assess their awareness and acceptability of HIV self-test kits as an alternative HIV testing service available to men in Eswatini.

This study is part of a larger research study examining men's overall HIV testing behaviors and their preferences for where HIV testing services are provided in Eswatini. All interviews were audio-recorded, transcribed and translated, and then analyzed using an applied thematic analysis framework.



Results: Men were aware of HIV self-testing as an option but had a number of concerns that prompted most to feel hesitant about adopting it.

Concerns men frequently expressed included doubts about the accuracy of the test, and their own technical competence to use the test-kit without supervision.

Men also expressed fears about the psychological trauma that could result from HIV+ status discovery without adequate pre- and post-HIV test counselling.

Overall, most men still prefer HIV testing services at the clinic because of the prompt linkage to care that occurs at the facility.

Conclusions: Our findings show overall general acceptance of HIV self-testing among men. However, valid concerns remain, especially regarding men's self-rated technical competence with using HIV self-test kits, the accuracy of the results, and worries about psychological trauma of HIV+ status discovery.

To allay men's fears, practitioners may consider ensuring adequate counselling and full demonstration of how to use test kits before HIV self-test kits are distributed.

EPD0727

Using community engagement approaches to increase PrEP uptake among adolescent girls and young women (16 – 29 years old)

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Background: Adolescent girls and young women (AGYW) in Eswatini are highly impacted by HIV. HIV incidence is seven times higher in AGYW 15 years and above (1.11%) as compared to males of the same age group (0.17%)

i. Pact's PEPFAR/USAID-funded Triple R project responds to the HIV prevention needs of priority populations, especially AGYW, to halt the spread of HIV and mitigate its impact on Eswatini.

i. Swaziland HIV Incidence Measurement Survey (SHIMS) 3: 2021

Description: Implemented in 20 Tinkhundla (districts), Triple R uses the 'community safe spaces' model and 'risk-based assessment' approaches to identify and link eligible AGYW to trained Life Mentors (LMs) who deliver HIV prevention messaging and link AGYW to high impact clinical and GBV services at the community level. A critical component of this approach is the combination of one-on-one and small groups mentorship utilizing evidenced-based job aids geared towards service uptake and social behaviour change (SBC). To address barriers to PrEP uptake, Triple R initiated additional activities to engage the broader community and create conducive environments for AGYW to take up the service. These included;

- PrEP campaigns (national, community and individual demand creation)
- Engagements with adolescent boys and young men (ABYM)

- AGYW caregiver sessions
- Engagement of community gatekeepers (traditional and faith-based leaders)

Lessons learned: Community engagement activities were executed between 2020 and 2022. Below is a table of results highlighting the rapid increase in PrEP uptake among AGYW 16 – 29 years compared to reach pre-intervention (2019):

Indicator	FY2018	FY2019	FY2020	FY2021	FY2022 (3 months only)
# AGYW initiated on PrEP	39	151	916	630	1679

Results demonstrate that community engagement approaches can have a positive impact on uptake of high impact services like PrEP for AGYW. Engagement of key community influencers (caregivers, ABYM and community leaders) increases community knowledge, acceptance, and support for use of available HIV prevention interventions.

Conclusions/Next steps: These findings indicate that future HIV prevention programming should move beyond engaging the primary target group. Project targets need to include key actors at the community level who have an impact on the agency of the vulnerable groups in question.

EPD0728

Unpacking gender equality and social inclusion across districts implementing the determined, resilient, empowered, AIDS-free, mentored and safe program in Zimbabwe; evidence for informed implementation strategy development, 2022

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Background: Zimbabwe Health Interventions (ZHI) is implementing the Determined, Resilient, Empowered, AIDS-Free, Mentored and Safe (DREAMS) program to reduce new HIV infections among adolescent girls and young women (AGYW).

The project conducted a gender equality and social inclusion (GESI) analysis to better understand the gendered dynamics, social norms, and power relations related to AGYW's HIV and gender-based violence (GBV) risk and access to services.



Methods: We conducted a qualitative cross-sectional study in 2022 in purposively selected DREAMS districts i.e., Mazowe, Gweru, Insiza and Mangwe. Participants included AGYW, adolescent boys and young men (ABYM), community and religious leaders, parents and caregivers, and key informants from implementing partners and government ministries.

Qualitative data were collected in Shona, Ndebele, and English using an in-depth interview guide, key informant interview guide and focus group discussion (FGD) guide. FGDs were audio recorded, transcribed, and translated. Thematic content analysis was used to analyze data, and assessment received ethical approval from Medical Research Council of Zimbabwe (MRCZ/A/2931).

Results: Thirty-four (34) FGDs and 40 key informant/in-depth interviews were conducted. Gender and generational inequalities characterize social relations between men and women, young and old generations, and people with disabilities.

Inequalities are rooted in patriarchal, cultural, and religious values, beliefs, and practices. Inequality manifests in household decision making, access to and control over assets, gender roles and responsibilities, participation in decision making, gender-based violence (GBV) and access and utilization of services.

It is also reflected in dreams and aspirations of adolescent girls and boys. The most negatively impacted people are women, especially adolescent girls; male and female youth; and people with disabilities. Increased rates of child marriage, artisanal mining, migration, drug, and alcohol use were HIV risk factors affecting AGYW.

Parental communication and support were suboptimal, and there was low uptake and appreciation of HIV pre-exposure prophylaxis (PrEP) by AGYW; this increases risk of HIV infection for AGYW.

Conclusions: The DREAMS project will use analysis findings to develop gender mainstreaming strategy, build capacity of service providers, engage cultural and religious gate keepers, develop women and youth agency, and ensure gender and generation equality outcomes and indicators are clearly defined.

EPD0729

Developing a gender-tailored HIV prevention program for transgender girls and other gender diverse youth 14-18 years of age in the United States

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Background: Despite data that suggests transgender youth assigned male at birth are at least as at-risk for contracting HIV as cisgender sexual minoritized boys, very little gender-affirming, tailored programming is available. This is particularly true for youth as young as 14 years of age, and at the national level.

Methods: To better understand the sexual decision making of transgender youth who were assigned male at birth, focus groups were conducted with 84 youth 14-18 years old who identified as transgender girls, non-binary or somewhere along the trans feminine spectrum, hereafter referred to as transgender youth.

Youth were recruited nationally, via social media, between December 2021 and February 2022. Data were collected in online, asynchronous, bulletin board-style discussions.

Results: When asked why they thought transgender youth might be at risk for HIV, many focus group participants mentioned the lack of inclusive sexual education, although some suggested that it might be more complex: "Education. We have no idea what applies to us, what doesn't apply to us, etc. I only know because of the Internet. Also, since queer youth tend to be more likely to be in poverty or homeless, the higher rate of HIV in those living in poverty/with homelessness crossed over here. They might engage in risky behavior just to stay alive." Although not all transgender youth experience gender dysphoria, some youth acknowledged that thinking about sex was sometimes difficult: "It's hard to feel sexy when there's things about your body you want to change." Youth also were able to describe positive sexual experiences: "As for sex, hearing my boyfriend gender me correctly and use my preferred name really heightened the positive impact of our relationship. This made me more open to disclosing my full sexual needs and made us more close as a couple."

Conclusions: Transgender youth are interested in gender-appropriate sexual education and HIV prevention programming. Topics that should be addressed include ways to connect sexually with others in ways that are gender affirming, as well as reasons why condom negotiation may be challenging (e.g., unstable housing) and potential strategies to mitigate this (e.g., the use of on-demand PrEP).



EPD0730

Adolescent girls and young women living with HIV/AIDS in Kenya and LGBTQI community

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Background: PHILIA MISSION KENYA (PM-KENYA) is a community based non-governmental organization started in 2014 to address health needs of adolescent girls and young women living with HIV/AIDS and LGBTQI community.

The organization envisions a world in which all AGYW and LGBTQI community have the opportunity to reach their highest potential.

Our mission is to improve lives in lasting ways by advancing integrated locally driven solutions for human development.

Description: The organization programs cut across 8 counties in Kenya namely – Nyeri, Nakuru, Homabay, Bungoma, Kitui, Siaya, Samburu and Kiambu.

Activities

1. Youth friendly centres to access reproductive health services such as health talks, promotion of condom use and provision for them and their partners.
2. Economic support through trainings and financial empowerment
3. HIV screening, testing and counselling.
4. School and community based HIV and violence prevention programs.
5. Strengthening families with social protection, school subsidies and parent/care giver programs.

Lessons learned:

1. There is increased uptake of HIV prevention methods such as condom use and abstaining due to the friendly youth centres where these services can be accessed easily.
2. Peer to peer health talks is reaching a wider population of AGYW/LGBTQI community as they identify easily with each other
3. Economic empowerment leads to improved livelihoods and healthy living.
4. Due to school subsidies literacy level has increased
5. Reduced new HIV acquisitions due to proper knowledge on HIV prevention.

Conclusions/Next steps: AGYW account for 74% of new HIV acquisitions in Sub-Saharan Africa and nearly 1000 AGYW get HIV every day.

Kenya is one of the countries with the highest HIV burdens in Worldwide. We have seen that Youth friendly centres and services reach out to larger population of AGYW/LGBTQI community than centres reaching out to general population.

My recommendation is to create/fund more programs and activities tailor-made for AGYW /LGBTQI specifically in order to reach out and give them the opportunity to reach their full potential.

This will also significantly reduce HIV new acquisitions among AGYW and LGBTQI community.

EPD0731

Prevalence and factors associated with risky sexual behaviors among female adolescents in Zambia

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Background: In sub-Saharan Africa, female adolescents are four times more likely to get HIV than boys; Zambia reports an HIV seroprevalence of 13.9% among women VS 8% among men. Adolescents are vulnerable for various adverse health outcomes due to lower perceptions of consequences of risky sexual behaviors (RSB). HIV/AIDS and unintended pregnancies continue to be major causes of mortality among adolescents in Zambia, necessitating public health action.

This study aims to explore the prevalence and factors associated with RSB among Zambian female adolescents.

Methods: RSB is defined as sexual activities which expose people to the risk of HIV, STIs and/or unintended pregnancies, this includes early sexual initiation, sex with multiple partners, having sexual intercourse while intoxicated, transactional sex, and unprotected sex.

Data on adolescent females, aged 15-19 (n= 3000), were obtained from the 2018 Zambia Demographic and Health Survey, an interviewer-administered, nationally representative survey that used multistage sampling. The study conducted multivariable logistic regression to explore the correlates of RSB.

Results: Of respondents, 49.7% reported ever having sexual intercourse and 35.3% (71.1% of sexually active respondents) reported engaging in RSB. The following RSB percentages were reported: intercourse before age 16 (25.1%), not using condoms at last intercourse (18.8%), engaging in transactional sex (3.1%), alcohol use at last intercourse (2.3%) and multiple sexual partners (0.9%).

Educational attainment and household wealth showed strong inverse trends with RSB and there were notably large geographic differences in RSB within Zambia (22.1% in Lusaka region versus 62.4% in Western province).

The multivariable results revealed that those who were older, employed, less educated, less wealthy, residing in Southern, Western and Northwestern provinces and those with no exposure to print media were significantly more likely to have engaged in RSB (AOR: 1.28-4.11, p<0.05). Among sexually active females, similar trends were noted except that younger, non-married adolescents without internet access were at higher risk of RSB.

Conclusions: This study has shown that over a third of Zambian female adolescents and over 70% of the sexually active females are at high risk of adverse reproductive health outcomes. Therefore, there is a need for more adolescent health programs targeting SRB.



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**EPD0732****Rising cases of HIV among young males aged 15-24 years in high HIV prevalent districts of Uganda**

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Background: The recent Uganda population-based HIV impact assessment indicated that HIV prevalence is nearly three times higher in young people aged 20-24 compared to those aged 15-24. Furthermore, data indicates that the number of young males acquiring HIV is rising. The number of young men living with HIV between the ages of 15-24 years increased from 40,000 in 2010 to 50,000 in 2021 while for young women they decreased from 130,000 to 120,000 in the same years.

The 'iKnow Kati' HIV awareness and prevention campaign 2022, held in Kampala and other districts with high HIV prevalence found a rise in HIV positive cases among young men compared to young women.

Description: Working in partnership with health providers, we targeted populations in fishing communities including female sex workers, fishermen, market women, truck drivers and young people. The campaign's activities included youth-friendly HIV testing services (HTS), prevention messages, testing and linkage to care, community drives, door-to-door mobilisation, and musical performances.

Lessons learned: During the week-long campaign, 621 people tested of which 43% were female and 57% male. Twice the number of males (4%) tested positive for HIV compared to females (2%). The percentage of young men attending these events and agreeing to HTS has increased since the start of the campaign in 2014. Youth-friendly services, targeted testing and entertainment events surrounding HTS were cited as reasons for the rise in male engagement.



Conclusions/Next steps: Our program demonstrated that young males are attending health services and accessing HTS which is identifying a rise in cases. Young men can effectively be reached for HTS in order to reduce the rising cases by making testing convenient and youth-

friendly. The next phase of the campaign will link treatment initiation and adherence to assess acceptance of diagnosis and retention in care.

EPD0733**Contraception choice and access among gender-diverse sex workers in South Africa: findings from Ritshidze's Community-Led Monitoring**

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Background: Access to one's preferred contraception is a vital component of quality sexual and reproductive health care and improves overall contraceptive use. Barriers to accessing contraception are common for marginalized groups at high risk of HIV such as sex workers and gender-diverse individuals, however, few studies have examined the effect of these overlapping identities.

Methods: Through the Ritshidze Community-Led Monitoring Programme, sex workers were recruited for a cross-sectional survey via community-based snowball sampling at sex work hotspots in 21 districts across 7 provinces in South Africa from August 2021- September 2022. Sex workers who reported ever having tried to access contraception at a public health facility (n=1,330) were included. Multivariable logistic regression models, adjusted for age and location, were built to assess differences in sex workers' ability to access their preferred contraception method by gender category (cisgender n=897, transgender n=208, and non-binary n=225). Differences in reasons for contraception non-access are described and assessed by gender groups using multivariable logistic regression.

Results: Overall, 24% (n=292) of sex workers could not access their preferred contraception. The most requested methods were the injection (50% n=660), pill (42% n=555) and internal condom (19% n=248). Adjusted models showed that both non-binary and transgender sex workers were significantly less likely to access their preferred contraception compared to cisgender sex workers (aOR 0.65, 95% CI: 0.44-0.96, and aOR 0.61, 95% CI: 0.42-0.89 respectively). Common reasons for non-access were contraception non-availability (37% n=107) and access denial for being a sex worker (32% n=92). Transgender sex workers were significantly more likely to be denied access based on sex work status than their cisgender colleagues (aOR 1.77, 95% CI: 1.06-2.96, p = .03).

Conclusions: Sex workers using public health facilities experience difficulties accessing their preferred contraceptive method due to stockouts and denial of services based on sex work status. These barriers are worse for transgender and non-binary sex workers who report significantly

higher levels of service denial. Discrimination against sex workers and gender-diverse individuals is compounding and must be addressed at public health facilities in order to improve integrated sexual and reproductive health care for these high-need populations.

EPD0734

"I think their relationships with each other changed ... I see the group as a sisterhood now.": self-efficacy, bodily autonomy and positive peer networks in an adolescent sexual health program

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Background: Comprehensive sexuality education (CSE) programming has the potential to drive demand for health services and impact on adolescent sexual risk behaviour and health outcomes. Goals for Girls (G4G), a cluster randomised controlled trial in Cape Town, South Africa, sought to evaluate the acceptability, feasibility, and impact of a sports-based sexual and reproductive health programme called 'SKILLZ' for female learners aged 14-17, as a supplement to the national CSE curriculum.

We report qualitative findings on the effects and impact of SKILLZ on participants as reported by participants, school teachers and principals and programme facilitators (SKILLZ Coaches).

Methods: G4G was implemented from 2017-2019, including 40 schools in a peri-urban setting. Focus group discussions with adolescent participants and Coaches, interviews with school principals and teachers, and a youth participatory action research (YPAR) sub-study were used to investigate acceptability and feasibility of SKILLZ.

Combined deductive and inductive thematic analysis of interviews and focus groups was used to understand factors influencing feasibility and acceptability, reasons for variability in participation within and between schools and the degree to which SKILLZ influenced health behaviours.

Results: Dominant themes from focus groups and interviews demonstrated that SKILLZ Coaches and the participatory learning medium were instrumental in creating safe spaces for expression, and a starting point for examining and discussing gender norms and expectations. Participants reported increased sense of empowerment, bodily autonomy and positivity, which was attributed to SKILLZ program content, Coaches' facilitation strategies and the supportive group environment.

Coaches observed female participants building "sisterhood" and a new sense of collective agency; principals and teachers also reported seeing positive changes in learner confidence and open communication about intimate relationships and sex.

Conclusions: Qualitative findings demonstrate SKILLZ intervention impact on participants' self-confidence, self-esteem, and empowerment to make healthier decisions, supported by the safe space created by near-peer Coaches. This model demonstrated the importance of building protective assets in the context of CSE programming for AGYW. SKILLZ is a promising model to address behavioural and social factors that improve or hinder the health and educational prospects of adolescent girls, a population facing complex social and structural determinants of HIV and SRH.

EPD0735

HIV disproportionately increases gender gap in civil status: a comparative cross sectional analysis

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Background: Women continue to be disproportionately affected by HIV/AIDS worldwide and in sub-Saharan Africa in particular. Prior research and interventions have focused more on social and structural determinants, directly linked to increased vulnerability to HIV women to infection. Civil status is an important aspect of quality of life in this population. However, reports on the impact of HIV disease on the civil status of people living with HIV (PLWHIV) are not common.

Methods: We compared sociodemographic characteristics of the general population with those of PLWHIV in Cameroon in 2018. The data for the general population was gotten the 2018 Demographic and Health Survey (DHS) while that for PLWHIV was gotten from a survey carried out in three regions of Cameroon during the same period. Chi square test was used to test for differences in age distribution, education level, and civil status between the general population and PLWHIV.

Results: The DHS and the PLWHA survey included 19742 and 2889 participants respectively, with mean ages (years) of 37±8 and 36±10, p=0.17. The proportion of women in the DHS and PLWHA surveys were 69.0% and 70.2%, p=0.35. While HIV positive men were more likely to be married compared with their counterparts in the general population (50.5% vs. 29.6%, p<0.001), HIV positive women were far less likely to be married compared with their counterparts (27.8% vs. 44.0%, p<0.00). Likewise, HIV positive women were more likely to be divorced compared with their counterparts in the general population (9.2% vs. 5.9%, p=0.03) as opposed to HIV positive men (5.0% vs. 3.7%, p= 0.07).



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Conclusions: As opposed to HIV positive men, HIV positive women were much less likely to be married and much more likely to be divorced compared to HIV negative women. This inequality in civil status could adversely impact the quality of life of HIV positive women and challenge the long-term benefits of antiretroviral treatment. Further research is needed to understand the determinants of this HIV associated gender gap.

Sexualities and sexual cultures: Meanings, identities, norms and communities

EPD0736

Human rights and decriminalization of sex work requires strategic planning and capacity building of sex worker organisations in the Asia-Pacific region

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Background: Sex worker organizations (SWOs) have a critical role to play in eliminating HIV among sex workers (SWs), their partners and clients. While effective strategies harnessing the reach and skills of SWOs have been developed, there has been little attention given to understanding SWO capacity needs for effective donor investment and sustainable programming.

Methods: A rapid assessment was conducted from October-December 2022 to investigate the capacity building needs of SWOs in the Asia-Pacific region. The methods included internet searches using key words relating to SWOs and a desk review of available documentation in this field.

Data obtained from 41 SWOs from 18 countries were analyzed in terms of current SWO programming and technical areas requiring capacity building or strengthening.

Results: Among the 41 SWOs researched, searches for individual strategic plans and capacity assessments found no results. SWO capacity to fund raise was the only articulated need that was found in the web-search. This appears to be directly linked to the lack of costed strategic plans which can serve resource mobilization.

This lack indicates that SWOs risk being donor-driven with negative implications for impact and sustainability. The criminalization of sex work results in a complex working environment.

The main reported challenges were:

- violence and harassment by police and clients (13 countries);
- stigma and discrimination regarding sex work (11 countries), and;

- lack of rights and criminalization of sex work (10 countries).

SWO programming has benefited from HIV funding and enabled some capacity development. Emerging priorities focus on human rights and decriminalization of sex work (21 SWOs).

This reveals a significant change in direction which requires capacity building.

Conclusions: Current SWO programming is largely donor-driven and risks inefficient use of scarce resources. Investment is needed to enable SWOs to develop their own capacity building assessments and costed medium-term strategic plans to provide clear directions, support their leadership, build capacity in priority areas to achieve greater efficiency and be able to mobilize the necessary resources to achieve impact and sustainability.

EPD0737

Distinctive psychosocial experiences of Australian-born gay men of Arab descent: a qualitative exploration

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Background: Despite a substantial body of public health research aimed at improving the lives of gay, bisexual, and other populations of men who have sex with men (GBMSM) in Australia, an important yet largely neglected sub-group remains those of diverse ethnic minority backgrounds, Australian- or overseas-born.

Although some data exist on the experiences of Asian, Pacific Islander, Indigenous, and Latin men, little attention has been paid to Arab men despite Arabic being the second most commonly spoken non-English language in Australia.

Therefore, we present the first study exploring key distinctive psychosocial experiences and coping strategies of Australian-born GBMSM of Arab descent.

Methods: One-on-one qualitative interviews were conducted virtually in Sydney, Australia between April and September 2022 with participants who had been invited through a mix of purposive and snowball sampling. Eleven interviews were then transcribed and coded in NVivo. A reflexive thematic analysis was adopted.

Results: All 11 participants (aged 25–59) self-identified as gay or queer men, with more than half being residents of Western Sydney, characterised by the highest concentration of Arab communities in Australia.

Participants were mostly Christian (n=8) and of Lebanese (n=9) background. More than half (n=6) had completed a postgraduate education and were full-time employed at the time of the interview (n=6).

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Five distinctive psychosocial themes were identified:

1. Non-disclosure and self-denial as basic survival instinct (*hiding to survive within homophobic and stigmatising cultural contexts*);
2. More sophisticated strategic disclosure (*'inviting in' versus 'coming out'*);
3. Navigating intersectionality (*cultural, religious and gay identities*);
4. Finding safe networks (*despite marginalisation from within mainstream gay communities*); and
5. Proactive self-acceptance and advocacy (*hope, acceptance and activism*).

Conclusions: Findings suggest an urgent need for intersectional understandings of Arab GBMSM with diverse cultural, religious, and gender and sexuality profiles in Australia. Recognition of this inter-twinned diversity in the context of self-identification and disclosure, social networking, and sexual practices is important in enabling more culturally appropriate, equitable, and inclusive public health promotion campaigns and support interventions to be co-designed with and for this hidden and much-neglected sub-group and their communities.

EPD0738

Gender roles, gender non-conforming stigma and HIV care: qualitative insights from men who have same-gender sex and health care workers in urban Ghana

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Background: Gay, bisexual and other men who have sex with men (GBMSM) experience health disparities, including an increased risk of HIV acquisition and lower access to HIV prevention and treatment services.

In Ghana, these health disparities are influenced by intersectional stigma and discrimination (ISD) related to sexuality and gender nonconformity, yet there is limited research on the role of gender in driving ISD in the daily lives of GBMSM.

This study examined gender dynamics and gender non-conformity in the Greater Accra and Ashanti regions, Ghana and how these shape the experiences and well-being of GBMSM.

Methods: We conducted a thematic analysis of qualitative data from the formative research phase of a trial to assess a multilevel intersectional stigma-reduction intervention to increase HIV testing among GBMSM. Focus group discussions (FGDs) and in-depth interviews (IDIs) were conducted among adult GBMSM (8 FGD/10 IDIs) and health care workers (HWs) (16 FGDs/8 IDIs). Analysis was guided by a gender constructs framework and a relational approach to gender. Verbatim transcripts were coded; matrices were developed to facilitate comparison within and across groups.

Results: We found:

1. Culture-specific gender norms influenced expectations of men and women regarding appearance, presentation, and responsibilities;
2. Gender nonconformity was situationally dependent on time, context, and place;
3. The rigidity of gender expectations has loosened over time, however, HCW participants still held unaccepting, though occasionally accommodating attitudes, toward Making conscious efforts to be more gender conforming as well as concealing sexual orientation were strategies to avoid anticipated stigma, ensure safety and receive quality health care.

Findings signal that although gender constructs are changing, the interplay between ISD, gender norms, expectations, and gender non-conformity has important implications for the health and well-being of GBMSM, including HIV prevention and treatment.

Conclusions: In Ghana, male gender nonconformity and its link to ISD is complex, context dependent, and evolving. Multi-level ISD-reduction interventions that are gender-transformative are needed to improve access to HIV testing and treatment for GBMSM.

**EPD0739****Vocational Skills Training – a gateway to empowerment of adolescent girls and young women at risk of acquiring HIV: lessons from Zimbabwe, 2022**

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Background: HIV remains a public health concern among Adolescent Girls and Young Women (AGYW) in Zimbabwe. Poverty is a key driver of new HIV acquisition as it drives AGYW to engage in transactional sex. Public-private sector partnership (PPP) is critical in promoting self-sustenance and financial independence through employment and self-help projects. Zimbabwe Health Interventions (ZHI) is implementing the Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) program to reduce HIV acquisition among AGYW.

ZHI partnered with accredited public and private training institutions and supported vulnerable AGYW with certifiable market informed technical skills.

Description: ZHI partnered with various training institutions including Zimbabwe School of Mines, Zimbabwe Red Cross Society, Joshua M. Nkomo Poly Technical College, Bulawayo Project Centre, Afritech and Pangani Vocational Training and trained 381 AGYW in market driven, male dominated trades between July 2022 and January 2023. The labor market assessment conducted in mid-2022 informed the program on in demand skills for each supported district. Purposive sampling was used in selecting AGYW with passion and those already engaged in basic technical skills training. The training approach was more hands-on practical learning with strong mentorship through internship or work-related attachment. The innovation was reported in one of the leading regional newspapers (The Chronicle):

<https://www.chronicle.co.zw/female-welders-ready-to-invade-male-dominated-field/>

Lessons learned: Out of the 381 AGYW enrolled for training, 79% have completed their courses. The skills training culminated in AGYW pursuing and refining skills with various companies and crafts people. Nine (2%) AGYW were absorbed into formal employment in retail, health, and mining sectors and 5 AGYW advanced to diploma level in Metallurgical engineering at Zimbabwe School of Mines (ZSM). Market assessment informs technical skills that promote economic empowerment of AGYW. Targeted selection of passionate AGYW or those with basic skills in a

particular trade is critical for training course completion. Support and mentoring of AGYW was critical in ensuring success of the technical skills training.

Conclusions/Next steps: ZHI will continue partnering with private and public institutions to promote access to services that promote income generation for AGYW leading to financial independence and contributing to reduction of new HIV acquisition and/or transmission.

EPD0740**Sexualised drug use (chemsex) among young gay men: experiences from a virtual HIV intervention programme in India**

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Background: Chemsex among young gay men is a growing concern in India and can possibly slow down India's progress to end HIV/AIDS by 2030. In an ongoing virtual HIV intervention programme in India, over 15 percent of the beneficiaries reported having chemsex.

While alleviated risk of HIV, STI and poor mental health among population with chemsex behaviour is well established, but little is known about their access to preventive health care services and support intervention in India.

Methods: This study uses NETREACH virtual HIV intervention routine programme data to analyse the socio-demographic pattern of young population (18-24 years) with chemsex behaviour and identifies key barriers in accessing HIV/STI prevention and treatment services. In-depth interviews were conducted with ten gay men who practice chemsex to explore their journey in accessing PEP/PrEP through a virtual HIV intervention programme.

Results: Gay dating apps such as Grindr and Blued are widely used not only for finding partners for sexual relationships but also, they act as an avenue for obtaining drug including chemsex invitation. Young unemployed gay men fall prey to older gay men with better economic standing for chemsex. Some young men require emergency help for PEP after chemsex but PEP in India is not easily available and is not part of national strategy for general use. Private health care providers play an important role in providing PEP and PrEP but access to these services is limited to metro cities.

Conclusions: While Europe and other western countries have support intervention around chemsex, there is no adequate evidence in India to plan programme intervention. A non-judgemental approach towards chemsex is one of the first steps in developing an understanding about chemsex phenomenon. Findings of the study reinforces the administration of PrEP and PEP for general use and generate evidence-based strategies to strengthen the prevention strategies in the national HIV programme.


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Desirable and engaging HIV testing: lessons learnt from co-designing prevention and treatment demand creation with men who have sex with men in South Africa

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Background: Despite advances in HIV testing, prevention and treatment, HIV prevalence and incidence in South Africa remain high, particularly among men who have sex with men (MSM), who remain under-served by existing interventions. Innovative methods to reach and retain both identifying and non-identifying MSM are needed.

Human-centered design approaches to demand creation and service delivery that are driven by MSM can help to meet this need.

Description: Co-created selectively identifying and non-identifying MSM, the Hook-up Service is an online demand creation platform that uses adverts on fun, engaging, relevant topics as a 'hook' to attract and engage users in accessing information on HIV services and linking to prevention or treatment in a discreet manner through an interactive communication journey. Multiple iterations of the service were designed and tested with MSM, who informed the language, voice-over, soundtrack and visual design of the intervention.

Supported by a network of peer supporters, NGOs and public health facilities, the Hook-up Service provides men with a confidential WhatsApp link to live support as well as links to HIV self-screening (HIVSS) and PrEP services.



Lessons learned: Adverts were promoted on various social media platforms (Instagram, Facebook, Twitter, Grindr) targeted to areas where programs and clinics were operating. Over a period of two months, adverts reached 690 male users [aged 18-49 years old], of which 54% accessed HIV information, 14% were linked to peer support, 5% engaged with HIVST services and 3% engaged with PrEP services. The topics that generated the highest traffic were traditionally taboo ones, such as anal douching.

Conclusions/Next steps: The Hook-Up Service platform appears to be effective in reintroducing HIV as a health priority and attracting MSM and facilitating engagement

with healthcare services. Willingness to engage in topics often seen as taboo within the mainstream healthcare system appeared to be particularly appealing as an entry point for further engagement.

Social and behavioural aspects and approaches to COVID-19

EPD0742

A mixed methods approach to understanding the perceived risk and biopsychosocial impact of the COVID-19 pandemic on people living with HIV and pre-exposure prophylaxis users in Nebraska

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Background: COVID-19 public health preventive measures resulted in movement restrictions and disruption in healthcare services, including HIV-related services. People living with HIV (PLWH) may be more vulnerable to the pandemic's impact due to immune suppression and low socioeconomic status than people without HIV. Thus, understanding the impact of the pandemic on PLWH and people at risk of HIV, particularly pre-exposure prophylaxis users (PrEP users), is imperative. The pandemic's impact on PLWH has not been thoroughly studied, and whether PLWH may be more impacted than PrEP users is inconclusive.

This research aimed to apply an explanatory sequential mixed-methods design to assess and understand the perceived risk of COVID-19, biopsychosocial impacts, and lived experiences of the pandemic among PLWH and PrEP users in Nebraska.

Methods: The biopsychosocial model guided this mixed-methods research. Eligible criteria included 1) ≥19 years; 2) Nebraska resident; 3) English Language proficiency; 4) HIV diagnosis or PrEP prescription. In the quantitative phase, participants (N=150, PLWH=100, PrEP users=50) completed an electronic survey. Quantitative data analyses included descriptive statistics, logistic regression, and negative binomial. For the qualitative phase, selected participants (N=28, PLWH=19, PrEP users=9) from the quantitative phase participated in semi-structured one-on-one interviews. Qualitative data were recorded verbatim, transcribed, and analyzed using thematic analysis.



Results: Quantitatively, the perceived risk of COVID-19 was moderate in both groups. However, age 19-30 years versus 31-50 years (0.70; 95% confidence interval [CI], 0.53-0.93) and 19-30 years versus >50 years (0.17; 95% CI, 0.04-0.68) increased the odds of lower perceived risk and higher history of COVID-19 infection among PLWH respectively. Psychological impacts were low, but assessment scores were higher among PLWH compared to PrEP users. Food insecurity, age, and marital status predicted biopsychosocial impacts among PLWH. There were no significant predictors among PrEP users.

Qualitative data revealed that experiences with food insecurity, financial constraints, COVID-19 exposure, COVID-19 vaccine side effects, and movement restrictions were the main drivers of the pandemic's impact.

Conclusions: Overall, PLWH experienced more biopsychosocial impact than PrEP users. Food insecurity, financial constraints, COVID-19 exposure, COVID-19 vaccination effects, and movement restrictions contributed to these impacts. Future research on the long-term impact of the pandemic is recommended.

EPD0743

Understanding the religious and cultural determinants of COVID-19 vaccine hesitancy in South African communities: implications for current and future pandemics and rollout of vaccines

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Background: Despite access to COVID-19 vaccines, South Africa ranks 20th in Africa in the number of administered vaccine doses/100 people. Conspiracy theories and concerns about the origins of COVID-19, and the development and effects of COVID-19 vaccines are some factors that have impacted on uptake of these vaccines.

This study investigated the role of religious and cultural beliefs as potential barriers to the uptake of COVID-19 vaccines in a semi-urban community in South Africa.

Methods: Using mixed-methods in this sequential explanatory study design, data were collected between March-November 2022 in a township in Gauteng, South Africa. For the survey, convenience sampling was used to recruit 400 men and women ≥ 18 years who were vaccinated (1/3) and unvaccinated (2/3) against COVID-19. Subsequently, semi-structured qualitative interviews were held with a subsample of 20 survey participants.

Data were collected on experiences and opinions of vaccines with a focus on communication, political influence, religious and cultural beliefs. Adjusted risk ratios (aRRs) comparing demographic, religious and cultural factors

between vaccinated and unvaccinated participants were obtained from a multivariable logistic regression. A thematic analysis was performed with qualitative data.

Results: Majority (n=280; 70%) of the participants identified their gender as male; 265 (66%) were Christian, and half (n=200; 50%) completed secondary school. Vaccine hesitancy was associated with ages 18-25 (aRR=1.38; 95%CI 1.14-1.66) and 26-35 (aRR=1.34; 95%CI 1.09-1.60). Being of a traditional African religion (aRR=1.24; 95%CI 1.05-1.47), agreeing with groups that were against vaccination (aRR=1.28; 95%CI 1.07-1.54) and not accessing information on COVID-19 from healthcare providers (aRR = 0.63; 95%CI 0.41-0.97) were also associated with vaccine hesitancy. The main reasons for vaccine hesitancy from the interviews related to advice of religious and traditional leaders, reliance on natural remedies for prevention or treatment, scepticism about vaccine efficacy, knowledge about negative experiences among those vaccinated, and risk perception.

Conclusions: This study highlights that religious and traditional leaders, as gatekeepers to communities, influenced vaccine uptake and that younger people were more hesitant. Thus, vaccination programs must integrate the religious and sociocultural factors that influence individuals' decision-making process.

EPD0744

Expressed psychosocial needs in youth living with HIV in Botswana during Covid-19

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Background: COVID-19 pandemic has had a significant impact on the mental well-being of youth living with HIV (YLWH). With up to one in three of these young people exhibiting signs of mental illness, Botswana, one of the nations with the highest rates of HIV prevalence among youth aged 16-24, is not exempt. Studies have found higher levels of stress, anxiety, and depression in this population as a result of the interruption of healthcare services and fear of contracting COVID-19. We therefore explore the types of concerns YLWH report needing support with in their daily lives during Covid-19.

Methods: This qualitative study was a secondary data analysis of records from a pilot of a youth led lay counselor-based intervention study in Botswana, called Safe Haven, targeting YLWH with Co-morbid symptoms of depression or anxiety during Covid-19. This was based on the Friendship Bench lay counselor problem solving therapy intervention from Zimbabwe. There were 8 lay counsellors and 106 youth participants, and each client had between 1 and 6 sessions. Codes were then applied by two coders with sub-codes created deductively; discrepancies were adjudicated by a third party until consensus.


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Results: There was a total of 176 sessions transcribed and five categories of problems identified from 106 participants (61% were females; 16-24 years old). The most common type of problem mentioned (34%) was lack of mental health support, such as a significant decrease in counseling sessions and support group meetings. One in four types of problem was related to medical issues (24%) (not being able to attend checkups and shortage of medication). The third most frequently mentioned problem was substance abuse (19%). Less frequently mentioned challenges included stigmatization (12%) and social isolation (11%) affecting relationships.

Conclusions: Findings from the study indicated the need for support to YLWH during the pandemic. It is crucial to use technology as part of an integrated plan to continue providing mental health care during crises like COVID-19 as the absence of mental health support was the most reported challenge. To help YLWH deal with some of the problems that arise during a pandemic, problem-solving techniques for common stressors should also be offered.

EPD0745

The impact of limited access to HIV treatment and medical care on the morbidity and mortality of underprivileged children living with HIV (CLHIV) during the COVID-19 pandemic, 2020-2021

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Background: Between 2020 and 2023, Indonesia reached 6,727,609 confirmed COVID-19 cases with 160,772 deaths (WHO, 2023). 52.2% of Indonesians who were in poverty faced the greatest challenges. The pandemic highlighted the limitations of Indonesia's healthcare system, especially for the vulnerable 50,282 PLHIV and 2,866 CLHIV (Pusdatin, 2020).

This study aims to examine the impact COVID-19 restrictions and limited access to healthcare have on the morbidity and mortality of HIV, with data supported by Lentera Anak Pelangi (LAP).

Description: LAP is an organization supporting underprivileged CLHIV in Indonesia since 2009. In this study, LAP observed data on 100 CLHIV from 2019-2022. Key factors affecting the conditions of CLHIV were:

1. Access to ART, which included medical examinations, availability of ARV, the management of VL, opportunistic illnesses, and medical emergencies
2. The restriction of COVID-19 protocols: isolation and inability to accompany sick children hindered families' willingness to access medical care
3. The economic challenges reduced the families' ability to provide sufficient nutrition and care for CLHIV
4. Deaths and illnesses of primary caregivers increased the vulnerability of CLHIV.

Lessons learned: The average VL reached the highest level in 2020. Average CD4 declined from 2020-2022, caused by the number of CLHIV who were sick.

1. Ten CLHIV died in 2020-2021 (33.3% of the total number of LAP's beneficiaries who died between 2009-2022 (30 CLHIV)
2. Eleven CLHIV changed ARV regimens, mainly due to poor adherence.
3. Six children stopped medication.
4. The number of children hospitalized in 2020-2021 decreased due to key factors described earlier.



Figure. Observation based on average VL, CD4 and HB data.

Year	ARV Regimen 1 → ARV Regimen 2	Stopped Medications	Hospitalization	Mortality
2019	1	1	25	3
2020	4	3	10	6
2021	7	3	11	4
2022	5	1	19	0

Table 1. CLHIV with ARV regimen changes, stopped medications, hospitalization and mortality.

Conclusions/Next steps: Based on the study, we found the following conclusions:

1. Disruption in healthcare and access to ART increased the morbidity and mortality of CLHIV.
2. The extended period of COVID-19 protocols caused loss of income, exacerbated by illness and death in the families, which significantly reduced the ability to care for CLHIV adequately.
3. When ARV medications were unavailable, children too young to understand the implications of stopping ART were freed from obligations to take the medications. Such changes require time and effort to improve again.

**EPD0746**

PrEP beyond HIV: decision making about HIV pre-exposure prophylaxis among Australian gay and bisexual men during the COVID-19 pandemic

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Background: Throughout pandemic restrictions (2020 - 2021), the majority of Australian gay and bisexual men (GBM) who use HIV pre-exposure prophylaxis (PrEP) substantially reduced their use. We investigated how Australian GBM discussed their decision making about PrEP use during the COVID-19 pandemic.

Methods: Semi-structured interviews were conducted via phone/Zoom between August 2020 - October 2021 among 30 Australian participants. This study uses data from 22 HIV-negative participants. Interviews explored PrEP use before and during the pandemic, including reason for changes to use. Data were analysed thematically.

Results: Age of HIV negative participants ranged from 23 - 77 years. Almost all identified as male (n=21) and gay (n=19), and most had ever used PrEP (n=16). Participants' decisions about using PrEP during pandemic restrictions were mostly driven by decisions about sexual behaviour. However, participants discussed a range of additional reasons for decision making around PrEP.

These included related to pandemic restrictions (e.g., cost (i.e., saving money); and having a single (monogamous) sexual partner), and experiences and beliefs about the toxicity of antiretrovirals (ARVs) used for PrEP (e.g., reducing medication, reversal of kidney function and bone mineral density side effects, and giving the body a 'rest').

Some participants continued daily PrEP throughout pandemic restrictions despite avoiding sex at these times. Some discussed pivotal elements of PrEP such as maintaining consistent ARV blood concentrate levels for when they recommence sex.

However, other affective relationships with PrEP were also described, including a general sense of security and protection it granted, and maintaining established habits during the uncertainty of the pandemic, such as daily PrEP dosing. Some participants remarked on the possibility of ARVs providing protection against COVID-19. Participants' provided insights into the myriad of relationships GBM have with PrEP beyond HIV prevention.

When discussing decisions around PrEP use during the pandemic, some participants revealed more affective reasons that go beyond sex.

Conclusions: These findings highlight the complex relationships that GBM have with PrEP beyond and tied-up with HIV prevention. There is benefit in continuing to understand reasons for and the context of changes to PrEP use, especially as new dosing regimens and technologies become available.

EPD0747

Longitudinal virtual cohort follow-up to enhance COVID-19 vaccination uptake among most at-risk populations in the Lango Subregion in Northern Uganda

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Background: Coronavirus disease (COVID-19) was associated with increased morbidity and mortality, especially among immunocompromised, like people living with HIV. Majority of these are located in rural parts of the country which also incidentally have the least health service coverage.

We present our lessons from a longitudinally followed-up virtual cohort composed of the elderly and people living with comorbidities on the uptake of the COVID-19 vaccine in the rural areas of the Lango subregion in Uganda.

Description: The Lango Subregion in mid-northern Uganda rolled out an accelerated mass COVID-19 vaccination program between March -July 2021 as part of the measures to increase vaccine uptake among the most at-risk sub-populations. This campaign included interpersonal communication and media (radio), augmented with virtual cohorts to drive demand and completion of COVID-19 vaccination.

The virtual cohort was formed by identifying and registering phone contacts of all elderly and other people living with HIV and other comorbidities and uploading them onto an open-source messaging platform called Rapid-pro.

The messaging covered behavioral, motivational, and informational content as well as reminders about the second vaccination dose schedule and referral to vaccination centers to enhance COVID-19 vaccination uptake among immunocompromised populations where each individual received five messages at an interval of two days.

Lessons learned: 575 (Males-241; Females-334) beneficiaries were enrolled in this virtual cohort. These received 2,875 mobile health messages within ten days of a rigorous campaign with each beneficiary receiving five messages. As a result, the vaccine uptake for a single dose increased by 68 (12%) to 507 (88%) hence a 76% increment. Further still, 9 (2%) of some of these beneficiaries went on to take a booster dose among this target population.

Conclusions/Next steps: Telehealth approaches integrated into mainstream primary health care quickly allayed public health fears and provided reassurance and a 24/7 consultation point to the public, hence increasing the uptake of vaccination services.



EPD0748

"Meth has changed the game": impact of the COVID-19 pandemic and methamphetamine use on people living with HIV and other sexually transmitted and blood borne infections in Manitoba, Canada

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Background: In Manitoba (MB), Canada, recent data (2021) showed a concerning syndemic of increasing numbers of people newly diagnosed with HIV and other co-occurring STBBI's such as syphilis and gonorrhea, along with increasing injection methamphetamine use. The COVID-19 pandemic was the inflection point that amplified socioeconomic inequities and resulted in a cascade of negative health outcomes among people living with HIV (PLHIV) and people who inject drugs (PWID) in MB.

Service providers who work with PLHIV in MB were asked to provide their perspectives on barriers and facilitators to engagement in care, the impact of the COVID-19 pandemic on HIV care, and suggestions for policy, structural or programmatic changes to improve health outcomes for PLHIV in MB.

Methods: This study draws upon in-depth interviews with 27 service providers, conducted virtually from October 2022–January 2023. The researchers used purposive sampling to yield a diverse sample of service providers including nurse practitioners, public health nurses, clinicians, pharmacists, social workers, program managers, and health education facilitators.

Results: Service providers reported that despite some successes in linking PLHIV to care, PLHIV, particularly PWID, continue to face structural and systemic barriers that limit treatment access and uptake. Service providers, too, feel the pressures of an under-resourced and taxed health care system, where providing care to PLHIV demands they "go above and beyond".

Our findings show the COVID-19 pandemic has exacerbated this situation, with participants reporting experiences of burnout, increased stress, frustration with the health care system, and concerns about inadequate resources to meet the needs of PLHIV, leaving many to operate in an unsustainable "crisis" mode. While many service providers are shifting their practices to meet the changing demographic of newly diagnosed PLHIV, they discussed the ur-

gent need for more adaptive policies and coordinated strategies to provide flexible and individualized care to "meet people where they are at."

Conclusions: Our results show that an already precarious public health care system, when challenged with the COVID-19 pandemic, has limited capacity to respond to the growing HIV crisis in Manitoba. Significant investments are needed in HIV health care, social support systems, harm reduction programs and addictions treatment services.

EPD0749

"Our Lives Matter": understanding the impact of COVID-19 on mental and physical health, access to HIV services, and resource security among Black and Latino MSM in California and New York

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Background: There is a dangerous convergence of two pandemics that has disproportionately affected marginalized racial (Black and Latino) and sexual minority men, HIV and COVID-19. The COVID-19 pandemic disrupted HIV treatment and prevention services, with the full impact of that disruption still unknown.

Few studies have examined the intersection of antiretroviral adherence, social isolation, healthcare access and other social determinants during the pandemic among Black and Latino MSM. Missing from the literature is an understanding of the negative impact of the pandemic on the mental and physical health, access to HIV services, and resource security among this population.

The purpose of this study is to explore the impact of these intersecting issues among Black and Latino MSM living in California and New York.

Methods: In this qualitative descriptive study, we utilized in-depth, individual, semi-structured interviews as the primary source for data collection. Data were collected between August 2021 and December 2022 from 41 participants in California and New York. Interviews were recorded, transcribed verbatim, and analyzed using thematic content analysis.

Results: Participants ranged in age from 19–65 years. The majority described their gender as male (93%) with the remaining identifying as other. Black participants comprised the majority of the sample (73%), with Latinos accounting for 25%. Increased weight gain due to physical inactivity during the pandemic negatively impacted participants' body and self-image.

Narratives indicated a sense of general hopelessness, despair, anxiety and depression, which were amplified by the social isolation experienced from COVID-19 shelter-



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in-place orders. Engagement in HIV services was complicated by medical provider HIV stigma, the racial justice protests of 2020, and fear of contracting COVID-19.

Resource security was negatively impacted by unemployment resulting in food and housing insecurity—leaving some to rely on government assistance or engaging in survival sex.

Conclusions: These findings suggest the cumulative effect of the COVID-19 pandemic and the resulting shelter-in place orders negatively impacted participants' mental and physical health, access to HIV services, and resource security. Interventions and other public health programs that address these intersecting issues are urgently needed to increase sustainable engagement in HIV prevention and care among Black and Latino MSM in the U.S.

EPD0750

Social, economic, and food insecurity among people living with HIV in Kenya during coinciding public health and environmental emergencies: a mixed methods study

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Background: In response to the emergence of COVID-19 in March 2020, the eastern African country of Kenya implemented several strategies focused on reducing physical movement and social interactions. During the same time period, Kenya experienced widespread regional floods which resulted in the displacement of communities and agricultural loss.

This study aimed to characterize economic instability and food insecurity among people living with HIV in Kenya during the coinciding public health and environmental emergencies.

Methods: This study leveraged a mixed methods formative research approach through the Academic Model Providing Healthcare program. Study participants included people living with HIV in Busia and Trans Nzoia counties in western Kenya. The quantitative component included a telephone, interviewer-administered survey among 200 people living with HIV.

Quantitative data were analyzed using Poisson regression with robust variance. The qualitative component included in-depth interviews with 40 people living with HIV; and qualitative data underwent a thematic analysis. All data were collected between October 2020 through December 2020.

Results: Among participants, 81.1% reported being severely food insecure; 66% reported losing most or all of their income since March 2020; and 56.2% reported having less social support since March 2020. Severe food insecurity was associated with major income loss since March 2020 (aPR:1.29;95%CI:1.06,1.57; p-value:0.011) and loss of social support since March 2020 (aPR:1.22;95%CI:1.05,1.43; p-value:0.012).

Three main themes emerged from the qualitative analysis:

1. Compounding effects of COVID-19 and flooding on food and economic insecurity may be early indicators of downstream barriers to HIV treatment outcomes, and;
2. Microfinance groups may not have mitigated socioeconomic consequences of COVID-19 and flooding because of unexpected income loss and limits on gathering and displacement, and;
3. Social support may have contributed to improved mental health and medication adherence among microfinance members.

Conclusions: In the context of coinciding public health and environmental emergencies, people living with HIV in Kenya experienced widespread economic challenges. Programmatic efforts to support HIV treatment disbursement, coverage, and adherence alone are not sufficient during an economic crisis affecting food insecurity. Integrating ART dispensing effort alongside interventions to support food security for people living with HIV may be an opportunity to improve ART adherence and reduce mortality during a widespread emergency.

EPD0751

Enabling a people living with HIV (PLHIV) digital mentors community, responsive to changing models of health care access in NSW

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Background: The COVID-19 pandemic has compelled innovative solutions for administering disease control while maintaining and enhancing health service delivery. Digital safety, literacy, technology access, and age are barriers to engagement with COVID-19 responsive digital health trends. Over half of all PLHIV in NSW are aged over 55 years, and it is essential to ensure that PLHIV in NSW are engaged with their health as they age and can access digital health services safely, comfortably, and in ways that effectively meet their health needs.



Addressing digital barriers for this population of PLHIV in NSW reduces social isolation, and improves quality of life, and connection.

Description: Positive Life NSW (PLNSW) created "Digital Mentors", pairing participants together one-on-one in a monthly social group. Established peer mentors work with less digitally conversant mentees to improve digital literacy and understanding.

This program also provides group-based education related to accessing and participating in digital health programs and other government systems digitally augmented in response to COVID-19 (such as telehealth, counselling support, and myGov).

Providing digital safety, literacy, and quality of life education including online safety, scam awareness and recognition, and developing online connections raises participant understanding of the digital world.

By utilising the Australian Government E-safety initiative "BeConnected" platform, Digital Mentors works within a national digital literacy educational standard. PLNSW sources free devices for participants requiring access to technology.

Lessons learned: Program participants gain confidence to participate in the digital world and are supported to develop and grow their skills to enable their participation in digital health and government systems resulting in increased knowledge. PLNSW have developed a peer based, low-entry, no cost, and information driven program to improve quality of life and health system navigation in a relaxed, community driven social setting that supports individual adult learning at their own pace.

Conclusions/Next steps: Government and health systems are more complex and increasingly rely on digital literacy and advanced technology. Peer-based programs develop innovative initiatives with community, developing, growing and supporting PLHIV digital literacy to actively improve health outcomes and ensure ageing PLHIV can navigate and access health services and are ensuring equity and that no-one is left behind.

EPD0752

Antiretroviral supply disruption contributed to depression and anxiety among Indonesian men who have sex with men (MSMs) and Transwomen/Waria (TGWs) during early COVID-19 pandemic: cross-sectional study

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Background: The early pandemic was a distressing period, more so for marginalized groups such as MSMs and TGWs in Indonesia. Few studies reported the impact of HIV prevention program delivery in Indonesia and its downstream impact on the mental health of the key population. This study aims to fill in that gap.

Methods: An online cross-sectional survey was conducted between 30 September and 31 October 2020 through consecutive snowballing sampling partnering with community groups in Jakarta, Bandung, Yogyakarta, and Bali, Indonesia.

Analysis was limited to adult MSMs and TGWs. Depression and anxiety were measured using the appropriate subscales of the 21-items Depression, Anxiety, and Stress Scale (DASS-21) with cutoffs ≥ 14 and ≥ 10 respectively.

Other variables included demographics, socioeconomic status, disruption to HIV prevention programs and antiretroviral therapy (ART) supply, and fear of COVID-19 score (range 8-40).

Analyses include descriptive analysis for prevalence and multivariate logistic regression to identify risk factors of depression and anxiety.

Results: The final analysis included 1,855 participants, including 1,644 (88.6%) MSMs and 211 (11.4%) TGWs. The median age was 28 (IQR 25-33) years old and 85.9% were unmarried. As many as 238 (12.8%) did not finish high school while 522 (28.1%) had higher education; 22.6% were unemployed while 21.6% had monthly income over IDR 3 million (approx. USD 200). There were 665 (35.8%) participants on ART, 189 (10.2%) faced ART supply disruption. Depression and anxiety prevalences were 23.6% and 23.6%, respectively. TGWs faced higher risk of anxiety (aOR 1.59, 95%CI 1.11-2.27), although not depression, compared to MSMs. Participants with difficulty accessing ART faced higher risk of depression (1.83, 1.28-2.61) and anxiety (1.84, 1.38-2.63) compared to those not on ART. Each incremental score of COVID-19 fear increased the risk of depression (1.11, 1.08-1.14) and anxiety (1.11, 1.09-1.14). Meanwhile, each incremental year of age reduced the risk for depression (0.97, 0.95-0.99) and anxiety (0.96, 0.94-0.98).



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Conclusions: There was considerable prevalence of depression and anxiety among Indonesian MSMs and TGWs during the early pandemic period. HIV-positive MSMs and TGWs faced higher risk due to disruption to ART supply. Resiliency in the HIV program needs to be strengthened to prepare for future disruptive events.

EPD0753

COVID-19 vaccination and people living with HIV in Thailand: information needs, decision-making, vaccine seeking patterns, determinants of uptake, challenge and solutions

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Background: People living with HIV (PLHIV) are at an increased risk of severe health outcomes due to COVID-19 and are recommended to receive COVID-19 vaccine. However, vulnerable communities, especially men who have sex with men (MSM) have not been prioritized in the national vaccination programs and face unique challenges inherent in COVID-19 vaccine access.

Methods: Between January-December 2022, Adam's Love (<http://adamslove.org/thailand/>) conducted a mixed-methods research assessing COVID-19 vaccine decision-making behaviors among PLHIV, encompass physiosocial aspects of their COVID-19 acceptance and explore solutions to vaccine service access and delivery. Findings from in-depth interviews and focus group discussions among PLHIV, community workers, healthcare providers at HIV care clinics and major vaccination centers informed the quantitative questionnaire with survey responses collected through online and offline channels.

Results: The qualitative sample included 42 PLHIV, including 39 MSM and three TGW, median age was 30 years [IQR 25 – 31]. Qualitative findings shed light on critical role of HIV care providers in PLHIV's decision-making regarding COVID-19 vaccine acceptance. Considering oneself immunocompromised and desire to avoid contracting COVID-19 were key factors influencing vaccine acceptance. Preference for Messenger RNA (mRNA) over available inactivated and viral vector vaccine, fear of death and side effects were primary vaccine hesitancy reasons. Majority (30/42) expressed vaccine uptake challenges and the need to be prioritized in vaccination programs. Total 240 PLHIV (75.25% MSM, 9.90% TGW and 14.85% heterosexual), mean age 32 years (SD 7.11) responded to the survey.

All had initiated ART, and 18% had CD4 count <350 cells/mm³. Quantitative findings validated the qualitative findings. Most participants (72.95%) reported consulting

HIV care providers prior to receiving vaccine. COVID-19 vaccine safety for PLHIV was the most commonly discussed issue.

Fear of HIV stigma was primary reason to not disclose HIV status at the inoculation centers among majority PLHIV (58.62%). mRNA vaccine was the most desired (38.68%), although few participants (5.91%) did not want to receive COVID-19 vaccine.

Conclusions: HIV providers played critical role in PLHIV's information needs and HIV/COVID-19 vaccine journey. Vaccine preferences drove vaccine-decision making. PLHIV expressed strong need to be prioritized in vaccination programs to overcome challenges including fear of stigma and discrimination.

EPD0754

Quality of life and its associated factors among people living with HIV co-infected with SARS-CoV-2 in France: COVIDHIV study

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Background: Among people living with HIV (PLWHIV) co-morbid conditions, including COVID-19, could favor important impairment of the quality of life(QoL).

This study aimed to assess the quality of life and determine factors associated with each dimension among PLWHIV co-infected with SARS-COV-2 in France.

Methods: This cross-sectional was study conducted using baseline data from PLWHIV co-infected with SARS-COV-2 included in the COVIDHIV cohort from March 2020 to March 2022. Quality of life was measured using the PROQOL-HIV scale consisting in four dimensions: Physical Health (PHS), Emotional Distress (ED), Social Relationship (SR), Treatment Impact (TI). Scores ranged from 0 to 100 (best QoL).

Multivariate linear regression was used to determine the factors associated with each dimension of QoL.

Results: Of the 371 participants were included in this study, 64.7% were male, their mean(±SD) age was 52(±12). The mean(±SD) score of the QoL dimensions was 76.7(±21.1), 79.2(±23.6), 67.3(±27.4), and 83.9(±16.5) for PHS, SR, ED, and TI dimensions, respectively.

Multivariate analysis were adjusted for age and duration between the COVID-19 confirmation and the inclusion in the cohort.



1. PHS dimension was associated with being professionally active ($\beta=5.00$, 95%CI[1.0;8.9]), C stage of CDC classification ($\beta=-7.6[-12.0;-3.3]$), number of COVID-19 symptoms ($\beta=-2.7[-3.0;-2.3]$).

2. SR dimension was associated with being professionally active ($\beta=5.5[0.27;11.0]$), living with a partner ($\beta=5.3[0.59;10.0]$), C stage of CDC classification ($\beta=-7.7[-13;-2.1]$), number of COVID-19 symptoms ($\beta=-1.7[-2.2;-1.2]$), perceived vulnerability to COVID19 ($\beta=-6.8[-12;-2.0]$), history of respiratory diseases ($\beta=-12.0[-21.0;-2.4]$), tobacco use ($\beta=7.0[-13;-0.83]$).

3. ED dimension was associated with female gender ($\beta=-10.0[-16.0;-4.8]$), being professionally active ($\beta=7.8[2.1;13.0]$), being born in metropolitan France ($\beta=12.0[7.1;18.0]$), living with a partner ($\beta=6.9[1.8;2.0]$), detectable HIV-RNA ($\beta=-12.0[-22.0;-1.7]$), having received COVID-19 prevention instructions ($\beta=-7.5[-14.0;-1.1]$), Tobacco use ($\beta=-8.7[-15.0;-2.1]$).

4. TI dimension was associated with being born in metropolitan France ($\beta=1.6[1.6;9.2]$), detectable HIV-RNA ($\beta=-10.0[-17;-3.0]$), number of COVID-19 symptoms ($\beta=-0.67[-1.0;-0.30]$), perceived vulnerability to COVID19 ($\beta=-3.9[-7.7;-0.07]$), history of psychiatric disorders ($\beta=-6.7[-12.0;-1.4]$), COVID-19 reinfection ($\beta=-9.9[-19.0;-0.79]$).

Conclusions: This study showed that among PLWHIV co-infected with SARS-COV-2, the dimensions of QoL were impaired at baseline, particularly in the ED dimension. The findings of the study should be useful to clinicians caring following-up PLWHIV co-infected with SARS-COV-2.

EPD0755

Effects of COVID-19 on food insecurity among female sex workers living with HIV in Nairobi, Kenya. Mixed method study

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Background: Kenya's food security data for 2021 shows that 24.8% of the population is underweight, 68.5% suffer from moderate food insecurity while 25.7 % suffer from severe food insecurity compared to 11% globally. The female sex workers (FSW) data shows that 98% suffer from moderate to severe food insecurity, yet they are not a priority to the government due to engaging in sex work, termed illegal by the constitution of Kenya.

In 2020 March, introduction of movement restrictions and night curfews to curb COVID-19 by the government saw closure of many night clubs and hot spots, most of which were business avenues for FSW. This resulted in low income hence many FSW reported not able to afford meals for days.

This study was done at the sex workers outreach program (SWOP) to assess the effects of COVID-19 on food security among the FSW living with HIV.

Methods: In 2022 March, a cross sectional survey was carried out among 225 FSW living with HIV and seeking HIV services from SWOP in Nairobi. The six-item food security module was used for data collection. A retrospective chart review for the same study participants was done and data on Ante Retro-viral Therapy (ART) adherence, viral loads, ART appointment adherence, body mass index for the last one year extracted.

Results: The study data showed, 56% (n=126) FSW suffered from moderate food insecurity, while 37.3% (n=56) suffered severe food insecurity. Chart review data was compared before and during Covid-19. Data showed that missed opportunities for viral load sample collection had increased by 36.7% (n=55). 21.3% (n=48) FSW had missed more than one appointment compared to 5.3% (12) before COVID-19, 42.7% (n=96) had reported poor pill adherence, STI had increased by 23.5% (n=53), Pregnancy termination by 3.5% (n=8). There was significant association; between moderate food insecurity and poor pill adherence at $p < 0.000$, and severe food insecurity with missed appointments at $p < 0.003$.

Conclusions: Presence of Covid-19 impacted on FSW finances, which led to food insecurities. As a result, HIV care services utilization was impeded. Hence policy makers, need to research and put future measures to mitigate such.

EPD0756

A novel Community Engagement package to recruit and retain participants to a Phase III Covid-19 vaccine trial during an active COVID-19 wave in northern Uganda

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Background: Community engagement is widely regarded as a critical tool in dictating pace and success of recruitment and retention of participants in clinical trials. However, there is little to no information about community engagement experiences for Covid-19 Vaccine trials especially in rural research setting in developing countries. We described the community engagement approaches that were used to support recruitment and retention to a Phase III Covid-19 vaccine trial at the SICRA site Northern Uganda.

Description: Community engagement approach.

In January 2022, we recruited participants for a clinical trial study. A special community engagement package of uniqueness of the area was designed with the following approaches;

1. Pre-study:

- Strategic meetings with key community stakeholder, Health center in-charges and community gatekeepers.



- Training and commissioning village health team (VHTs) and instituting Community Advisory Board members (CAB) to interpret the dynamics of the community. Feedback obtained from the meetings was incorporated into the general community engagement plan.

2. Active study:

- Briefing sessions on study procedures were conducted and members interested in participating were invited for detailed study information before signing consent forms.
- To maintain retention, we continuously engage with participants on weekly basis through telephone calls and Community mobilizers were recruited to support in linkage.

Lessons learned: Achievement: Full enrolment was achieved within two weeks and retention rate by January 2023 is at 97%. Community research literacy has been established evidenced by overwhelming demand from the community members to participate in available clinical studies.

Conclusions/Next steps: **Conclusions:** A multi-phased approach to community engagement which engages the community based on their levels of influence offered tremendous support in building confidence among the community members and rapidly address barriers to recruitment and retention in the study.

Recommendation: While designing Community engagement approaches, sites should diagnose the awareness levels of their target communities and design approaches that are appropriate to them.

EPD0757

Learning from COVID 19 inspired ART client management innovation: a comparison of retention and viral load suppression between 1 and 3 months dispensation at ART initiation in Zambia

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Background: COVID 19 pandemic posed a threat to the gains that were made in HIV treatment programs. HIV treatment programs require that newly diagnosed People Living With HIV (PLWHIV) are dispensed 1 month or less of ARVs to enable them receive adherence counseling frequently in order to achieve optimal retention in the long run. The Zambian ministry of health promoted 3 Multi-Month Dispensation (3MMD) to newly diagnosed PLWHIV in March 2020 to mitigate the risk of COVID 19 infection. After more than 2 years of implementation, the question on whether this undertaking did produce desired treatment outcome comparable to those under standard of care begs to be answered.

Methods: The USAID DISCOVER-Health Project, implemented by JSI, used retrospective data from a cohort of PLWHIV initiated on ART in December 2021, in Ndola district. Data analysis was done to compare proportions of retention in care and viral load suppression at 12 months between clients dispensed 1 and 3 months of ARVs at initiation. Retention was defined as proportion of clients with less than 30 consecutive days without ART at any point during follow-up, while suppression was defined as having <1000 copies per mL at 12 months in care.

Results: Of the 241 who were initiated on treatment in December 2021, 146 were females while 95 were males, with mean age of 35 years. At ART initiation 44% received 1 Month Dispensation (1MD) while 56% were supplied 3 months. Retention in care rates at 12 months was higher in the 3MMD at 90% compared to the 1MD at 82%. Viral load suppression at 12 months was at 96% for the 1MD compared to 97% for the 3MMD.

Conclusions: The 3MMD was capable of producing the desired treatment outcome comparable to those under 1MD, with retention in care performing better than the 3MMD. This finding is important to countries like Zambia that are trying to simply further HIV management and provide person centered care. With continuity in treatment being better in 3MMD than 1MD, 3MMD may have an important role to play in ART care in the first critical year.

EPD0758

Central Dispensing Unit (BonoloMeds) as a differentiated model of medicine distribution in Lesotho: improving adherence to anti-retroviral treatment (ART) during COVID-19

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Background: Lesotho is an HIV-burdened country with over 340,000 people affected and about 220,000 currently enrolled for ART. The integration of ART services into primary healthcare facilities has left healthcare workers in these facilities overburdened with high volumes of clients. The covid pandemic exacerbated this burden, with many healthcare workers off ill and clients reluctant to collect medication from facilities for fear of contracting the virus.

One of the strategies implemented by Right ePharmacy, supported by Right to Care (NPC), USAID and the Ministry of Health, included the external packaging of chronic repeat medicines via a Centralized Dispensing Unit (CDU) and dispatching of these medicine parcels to alternative pick-up points (PuPs) outside of facilities. PuPs can include alternative counters at facilities, private pharmacies, and Collect & Go Smart Lockers.

Successfully launched by Right ePharmacy in Maseru, the total BonoloMeds solution was rolled out from concept to implementation in just 60 days, and its early success provides evidence that a healthcare gap has been filled in the small mountain nation.



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Description: Through this program, a CDU model (Bono-loMeds) was established in Maseru, Lesotho, with a network of 21 PuPs. BonoLoMeds serves 8 health facilities, allowing the decanting of HIV and other chronic clients to the program.

This means clients only return to their facilities every 6-12 months for clinical evaluation and re-scripting, alleviating the client burden on these facilities.

Lessons learned: Since its inception, BonoLoMeds enrolled more than 10,000 clients with rapid uptake for HIV patients. Alternative PuPs allow clients to collect medication outside of clinic queues quickly.

Previously, manual systems in primary health clinics often resulted in stock-outs and clients not always receiving their medication on time.

Conclusions/Next steps: The CDU as a differentiated model of medicine delivery has proved effective in increasing ease of access, adherence, and retention of treatment, particularly during COVID-19. Client and commodity tracking has improved due to integrated Warehouse Management Systems and Electronic Medical Records systems with a centralized data repository allowing faster and more efficient programme decisions. This is key to reducing the impact of COVID-19 and other potential pandemics.

EPD0759

The house, the street, and the pandemic: violence in times of Covid-19

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Background: The coronavirus disease 2019 (COVID-19) pandemic, in its multiple confrontation perspectives, required a series of measures to contain the accelerated transmission of the virus, including social isolation. However, such measures, despite their significance, induced increasing trends of various forms of violent events.

Thus, we aim to describe the expressions of violence based on the perceptions of healthcare professionals (HCPs) and community health agents (CHAs) in Salvador, Bahia.

Methods: This study is part of a project entitled "Expanding testing, quarantine, e-health, and telemonitoring strategies for fighting the COVID-19 pandemic—TQT COVID-19," in a health district of high social vulnerability in the city of Salvador. In this research—linked to the formative research phase performed between December 2021 and February 2022—field diaries, 22 semi-structured interviews and four focus groups with CHAs and HCPs (x participants) were analyzed to reveal narratives of the main shared experiences and violent manifestations.

The project was approved by the Research Ethics Committee of the Institute of Collective Health, Federal University of Bahia.

Results: The results showed a perception of resurging expressions of domestic violence and within-family relationships; an intensification of urban conflicts and violent situations in areas dominated by drug trafficking linked to the dynamics of the pandemic; occurrence of violent events within healthcare services often related to COVID-19 demands, including those directed at human healthcare resources; and increased feelings of fear and insecurity among CHAs and HCPs in their daily routine.

Conclusions: We observed perceptions of intensifying dynamics of violence historically experienced by different population groups, whether in the intimacy of domestic relationships or the complex sociability of public spaces, with multiple impacts on health services.

EPD0760

COVID-19 vaccine uptake among people with HIV in South Carolina

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Background: High coverage of COVID-19 vaccination is one of the most important strategies to control the ongoing COVID-19 pandemic. The vulnerable population, including people with HIV (PWH), have an elevated risk for severe outcomes after COVID-19 acquisition. Therefore, high coverage of the COVID-19 vaccine in PWH is pressing and has been recommended or prioritized in many countries.

This study aims to investigate the COVID-19 vaccine uptake and associated factors among PWH.

Methods: This retrospective population-based cohort study used data from an integrated electronic health record (EHR) database in South Carolina. Individuals were classified as: partially vaccinated if they receive one dose of Pfizer-BioNTech or Moderna vaccines; fully vaccinated 14 days after they received either two doses of Pfizer-BioNTech or Moderna vaccines or a single dose of Janssen; and boosted vaccination if they receive the booster dose. The multinomial regressions were conducted to examine the associations of demographics, comorbidity burden, HIV markers, and the four vaccination statuses.

Results: Among a total of 16,755 PWH, 55.3% were vaccinated, including 24.8% who received a booster dose, 20.7% fully vaccinated, and 9.79% partially vaccinated. Compared to the non-vaccine group, the fully vaccinated group was more likely to occur among older individuals (odds ratio [ORs]: 1.27-1.47), Blacks (OR:1.39; 95%CI: 1.24-1.55),



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individuals with a higher comorbidity burden (OR:2.00; 95%CI: 1.80-2.21), have a higher percentage of retention in care (OR:4.24; 95%CI: 3.73-4.81), and have a higher CD4 count (>350 vs <200: OR:1.34; 95%CI: 1.13-1.58). Higher levels of the most recent viral load (200-10000 vs <200: OR:0.82; 95%CI: 0.75-0.89) were less likely to be fully vaccinated. Similar risk factors were observed when comparing the partially vaccinated and no-vaccine groups. Among the booster-vaccinated group, all the factors were associated with the outcome.

Conclusions: Although comparable with other studies, the COVID-19 vaccine coverage is still low among PWH. To address the disparities in vaccine uptake, more efforts are merited for certain populations, such as younger PWH, and individuals with poor immunodeficiency, in order to promote health equity and better inform clinical management and guidelines.

Implementation science and scale up of HIV testing

EPE0761

Improving case finding efficiency through use of machine learning in Kenya

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Background: Case finding in Kenya faces multiple challenges. As Kenya approaches its first 95 target, the overall positivity rate among the remaining population is below 1%. Moreover, testing volumes face downward pressure due to supply disruptions and a desire to redeploy resources.

Given these trends, a team in Kenya developed and deployed a machine learning risk profiling model to maximize yield from scarce testing resources.

Methods: Using client-level data captured by electronic medical records (EMR) from June to November 2022, we applied supervised machine learning algorithms to predict the probability clients would test positive for HIV. Although data was available from earlier periods, client behavioral variables were available from June 2022. The dataset included 167,511 test results, of which 5,718 (3.4%) were positive. Of approximately 70 variables, 30 were dropped because data was missing for most observations or because of zero variance.

To address missing data among remaining variables, we generated three versions of the dataset and modeled each separately: Rules-based imputation, using mean and mode; Modeled imputation, with Multiple Imputations using Chained Equations (MICE); No imputation.

For each, we added binary flags to indicate if the value was present or missing in the original record. We applied a train-validate-test split with 60-20-20 proportions. All imputation parameters were calculated based on the 60% subset alone to avoid leakage.

Predictor variables included demographic data and behavioral variables, plus location-specific estimates of risk factor prevalence. We applied XGBoost, Random Forest, and AdaBoost algorithms, implemented in R, each with a comprehensive hyperparameter grid search.

Results: The XGBoost model performed best among all model types (AUC 87.8). The model successfully concentrated positive tests among high-risk scores: 75% of all positive tests occurred among the 18.6% highest risk scores.

Table 1 shows comprehensive results.

Risk category	Number of Tests	Cumulative Percent of All Tests	Number of Positive Tests	Positivity Rate	Cumulative Percent of Positive Tests
Highest Risk	1,876	5.6%	572	30.5%	50%
High Risk	4,350	18.6%	286	6.6%	75%
Medium Risk	12,681	56.4%	228	1.8%	95%
Low Risk	14,594	100%	57	0.4%	100%

Conclusions: The implementation of machine learning improves care providers efficiency by maximizing yield while minimizing the number of tests performed. This implementation supports Kenya's continued progress to control the HIV epidemic in an efficient and responsive manner.

EPE0762

Using peer-staff pairing to improve HIV viral load testing among people who use drugs receiving ART services in Medication-Assisted Therapy (MAT) clinics in Dar es Salaam

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Background: Viral load (VL) testing is a key component to monitor HIV viral suppression among people on antiretroviral treatment (ART). In Dar es Salaam in 2022, 82% of people who use drugs (PWUD) on ART received routine VL testing compared with 94% of general population clients. This abstract describes improvements in VL monitoring among PWUD receiving medication-assisted therapy (MAT) in Dar es Salaam through staff and peer stakeholder's engagement.

Methods: We conducted a review of 283 MAT PLHIV files at three MAT facilities in Dar es Salaam. We reviewed available client ART and MAT logbooks and electronic databases to pinpoint reasons for lack of VL testing. Triangulation of CTC2 cards and CTC2 data base was done to review discrepancies. To improve completion of VL testing, we paired mentored MAT clinic peers with MAT-ART nurses to facilitate weekly tracking of defaulters to improve client return to care.

We conducted the mentorship/orientation of health care providers (HCP) on VL guideline use and proper documentation and tracking of eligible clients who missed VL sample collection. Twelve MAT staff, four from each of the three MAT clinics received on-site mentorship concerning the proper use of data collection tools. MAT ART clients who moved to other facilities without proper documentation were identified, tracked and information was corrected in the client's files and database.

Results: Analysis of the available data revealed poor documentation of HIV client outcomes, such as silent transfers, MAT defaulter status, non-adherence to VL guide-



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lines, and lack of supervision, that compromised routine VL testing for PWUD on ART. The new tracking intervention improved such that 25 (65.7%) of 38 eligible clients who defaulted from April to September 2022 were returned to care from the previous 38% return rate reported. Completion of routine VL improved from 82% in April to 94% in September across MAT clinics in Dar es Salaam.

Conclusions: On-site mentorship, document review, and peer-staff pairing to track defaulters are essential components to strengthen VL testing among PWID. Incorporating stakeholders in identifying problems and solutions to implementation bottlenecks yield effective results in HVL testing among the PWUD living with HIV.

EPE0763

Validation of a high throughput next generation sequencing assay for HIV drug resistance genotyping

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Background: Globally, the number of people living with HIV on antiretroviral treatment (ART) reached 28.7 million in 2021. To ensure the effectiveness of treatment, WHO issued guidelines and action plans for systematic surveillance of HIV drug resistance (DR), including monitoring HIVDR to dolutegravir. Currently, Sanger-based sequencing is the primary technology for HIVDR detection and surveillance. However, it has limitations, including low throughput, high cost, and less sensitivity in detecting variants below 20%.

In this study, we assessed illumina-based next generation sequencing (NGS) technology on its accuracy, precision, reproducibility, and sensitivity compared to the Sanger sequencing method.

Methods: PCR amplicons of HIV protease, reverse transcriptase (PRT), and integrase (INT) genes from 48 WHO-EQA and commercialized analytic samples representing 8 major subtypes and recombinants (>89% of HIV coverage) were generated using ThermoFisher HIVDR genotyping kit and sequenced with illumina Nextera-Xt kit.

NGS sequences were compared with Sanger sequences and analyzed statistically to assess accuracy, precision, reproducibility, and variants detection at 10%, 15%, and 20% thresholds.

Results: Both PRT and INT NGS sequences from 48 amplicon samples exhibited overall >99.5% accuracy (CI 99.5-100%) compared to Sanger sequences. For detecting HIVDR mutations, NGS had 99.7% agreement in PRT and 100% in INT with Sanger sequencing. For precision, NGS produced an overall 100% (ranged 99.8-100%) similarity within 8 replicates from each 12 samples. With the same

8 replicates of 12 samples, NGS generated almost identical data in PRT (99.6%) and INT (99.9%) between 3 independent runs ($p=1$). In a 96-sample run, NGS generated an average of 30mb data and 33,157 reads coverage per sample, which is sufficient for variant calls.

In this sample panel, NGS detected an average of 2.15 and 4.77 more variants in PRT, 1.85 and 4.35 more in INT at 15% and 10% threshold compared to the Sanger sequencing at 20% threshold, respectively.

Conclusions: We successfully validated illumina-based NGS for HIVDR genotyping with high accuracy and precision compared to Sanger sequencing.

The validated NGS provides a higher throughput, potentially lower cost at scale, and sensitive sequencing method for detecting a full spectrum of HIVDR mutations, which can strengthen current HIVDR surveillance to guide effective ART regimens.

EPE0764

Assisted HIV self-testing effectively reaches key populations in Western, Southern and Eastern Provinces of Zambia

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Background: HIV case identification in Zambia remains a challenge, particularly among high-risk groups such as key populations (KPs) due to stigma and fears of criminalization. HIV self-testing (HIVST) was introduced in 2017 to improve access for these high-risk groups.

We describe the use of HIVST among KPs in Zambia, as well as subsequent linkage to HIV care and treatment.

Methods: From October 2021 to September 2022 the Community Impact to Reach Key and Underserved Individuals for Treatment and Support (CIRKUIITS) project conducted community distribution of HIVST kits via 13 KP safe spaces in Eastern, Southern, and Western Provinces of Zambia. CIRKUIITS implemented community health worker (CHW) assisted HIVST among KPs, including female sex workers (FSWs), men who have sex with men (MSM), transgender people (TG), and people who inject drugs (PWID). All positive test results were confirmed, per the national algorithm, and linked to antiretroviral therapy (ART).

We conducted a retrospective cohort analysis of routinely collected KP-subpopulation disaggregated HIVST data using secondary analysis to examine uptake of assisted HIVST among KPs and linkage to ART and pre-exposure prophylaxis (PrEP).



Results: From October 2021 to September 2022, 1,747 KP clients were tested using CHW-assisted HIVST with 97% (1,689/1,747) results returned overall; 97% were returned among FSW, 95% among MSM, 97% among PWID, and 98% among TG (Figure 1).

HIVST identified 7.2% (122/1,689) of the results as positive, and all clients were linked to ART after confirmation of their HIVST results (100% linkage). Of the 1,567 clients testing HIV-negative, 10% (162/1,567) were initiated on PrEP.

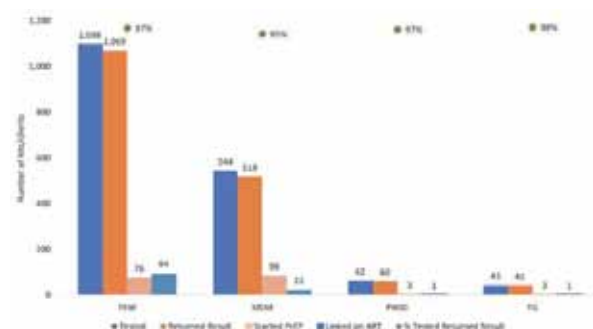


Figure 1. KP assisted HIVST, linkage on ART and PrEP initiation (Oct 21 - Sep 22).

Conclusions: Assisted HIVST improves uptake and return of results among KPs in Zambia, with notably high linkage to ART and moderate linkage to PrEP. Assisted HIVST may be instrumental in reaching KPs with HIV testing services and enhancing both results return and linkage to treatment and prevention services.

EPE0765

High HIV prevalence among sexual partners with risk of intimate partner violence: results from index testing implementation in Zambia

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Background: As Zambia nears HIV epidemic control case-finding approaches, such as safe and ethical index testing (SEIT), can identify people living with HIV, but may pose risk of intimate partner violence (IPV).

We report on IPV risk and HIV status among sexual partners elicited via SEIT.

Methods: Community-based HIV services for are supported in the Eastern, Southern, and Western Provinces. People living with HIV were offered SEIT, with elicitation of sexual contacts and screening for IPV risk. Contacts who posed IPV risk to index clients were not followed up immediately; instead, index clients received support and

counselling on IPV. We used program data to analyze SEIT clients, their sexual partners, and IPV risk from October 2021 to November 2022. Differences between categorical variables were assessed using chi². Logistic regression was used to identify risk factors for IPV.

Results: Between October 2021 and November 2022, 3,216 index clients were offered SEIT; 3,193 (99%) accepted with 5,625 sexual partners elicited. Among these, 5,191 (92%) were screened for IPV and 646 (12%) indicated risk of IPV, including 34% of females and 66% of males. Among screened sexual partners, 3,036 (58%) were tested for HIV. Of those, 394 (13%) had IPV risk while 2,642 (87%) did not; HIV-positivity rates were 42% and 33% in these groups ($p < 0.001$), respectively (Figure).

HIV-positivity was significantly higher in female sexual partners with IPV risk than without (50% vs. 36%, $p = 0.001$). In male sexual partners, HIV-positivity rate was 37% among those with IPV risk versus 32% among those without ($p = 0.073$). Sexual partners with IPV risks were more likely to test positive for HIV (overall OR=1.44 $p = 0.001$, female OR=1.76 $p = 0.001$, male OR=1.29 $p = 0.074$).

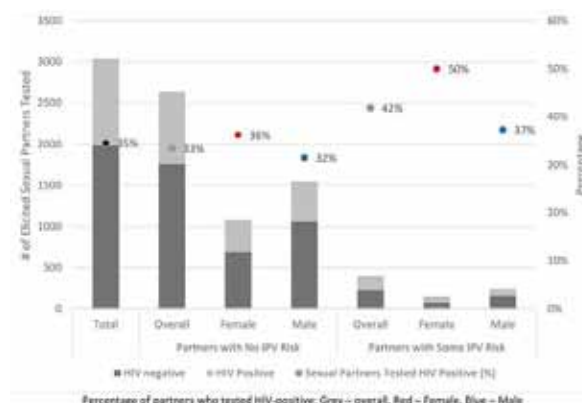


Figure. HIV-positive proportion among sexual partners of index clients by intimate partner violence risk and gender, Oct'21-Nov'22.

Conclusions: In Zambia, we found IPV risk was significantly associated with HIV acquisition overall and among females when stratified by gender. Further interventions to mitigate HIV and IPV are needed.

**EPE0766**

Closing the HIV testing gaps among children and adolescents through orphaned and vulnerable children programs in Western Province, Zambia

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Background: In Zambia, children and adolescents remain at risk of HIV infection due to social, cultural, and economic vulnerabilities, but HIV testing, and treatment coverage is lower in this population compared to adults. Community-based testing initiatives, such as index testing of biological children of women living with HIV (WLHIV) and HIV testing for beneficiaries of Orphaned and Vulnerable Children (OVC) programs, have been the key case finding strategies to reach undiagnosed children. We gathered HIV testing lessons learned from 2 years of OVC program implementation in Western Province, Zambia.

Description: Western Province has many hard-to-reach settlements where flood plains and sandy terrain hinder access to health facilities. The U.S. President's Emergency Plan for AIDS Relief, through the U.S. Centers for Disease Control and Prevention (CDC Zambia) and partners, began implementing OVC services in Western Province in October 2020.

OVC program, in collaboration with local community partners, strengthened access to HIV testing service through home-based community testing. Further, all vulnerable children and adolescents (aged <18 years) (VCA) were paired with case workers residing in the same communities for personalized support.

Case workers ensured that OVC enrollees and their families had a documented HIV status and played a key role in active community follow-up and testing of children and adolescents born to WLHIV.

Lessons learned: Collaboration with local community partners, for home-based HIV testing, eliminated the need to travel through flooded terrain, resulting in an increase in the proportion of VCA with a documented HIV status from 71% (2,456/3,442) in 2021 to 94% (15,761/16,772) in 2022. Enlisting local case workers facilitated better community follow-up of WLHIV, increasing the contribution of OVC districts to family index testing in Western Province from 12% (1,274/10,331) in 2021 to 45% (3,595/8,078) in 2022, identifying 308 children living with HIV out of 4,869 index tests (6% positivity), and linking 91% (281) to treatment.

Conclusions/Next steps: OVC programming increased HIV testing access among VCA in hard-to-reach Western Province. CDC Zambia will, therefore, continue scaling up OVC services and explore other cost-effective initiatives to mirror OVC support in non-OVC sites in order to further reduce the pediatric HIV testing gap.

EPE0767

Retesting for HIV among individuals on ART during community-based distribution of HIV self-tests – a mixed-methods study in rural Zimbabwe

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Background: As testing and treatment scale-up in Africa, retesting among people living with HIV (PLHIV) who know their status is increasing. We nested an investigation of retesting among PLHIV on ART in a trial comparing community-led with programme-led distribution of HIV self-tests (HIVST).

Methods: In community-led and programme-led arms, for four weeks HIVST distribution was done by communities or paid distributors respectively. Four months post-distribution, we conducted a survey to evaluate individual-level testing/treatment/prevention outcomes.

We determined prevalence of self-testing while on ART and used logistic regression to determine predictors, adjusting for confounders and clustering (random effects). Additionally, we conducted in-depth interviews with distributors (n=13) and PLHIV on ART who retested (n=11). Interviews were analysed using Framework Analysis.

Results: Among 11,150 surveyed participants, 1,292 were on ART during HIVST distribution, including 671 (51.9%) in the community-led arm. Retesting on ART was common (327/1,292, 25.3%). Young men were more likely than young women to retest on ART, adjusted OR 5.3 (95% CI 1.65-17.08) and 2.28 (1.26-5.28) for 16-19 and 20-29 age groups respectively (Table), p-value for interaction=0.04.

	Retesting n/N (%)	Adjusted OR (95%CI)	p-value	
Programme-led arm	151/621 (24.3)	1		
Community-led arm	176/671 (26.2)	1.2 (0.85-1.7)	0.29	
None/primary education	132/653 (20.2)	1		
Some secondary education	80/265 (30.2)	1.25 (0.88-1.79)	0.22	
Secondary education complete	115/374 (30.7)	1.21 (0.87-1.70)	0.26	
Married or cohabiting	214/797 (26.9)	1		
Never married	52/127 (40.9)	1.3 (0.80-2.12)	0.28	
Widowed/separated/divorced	58/361 (16.1)	0.63 0.44-0.91	0.01	
Household food insecurity – No	101/471 (21.4)	1		
Household food insecurity – Yes	213/781 (27.3)	1.69 (1.26-2.26)	<0.001	
Results showing interaction between age and gender:				
Age group	Retesting n/N (%)	AOR (95% CI)		p-value
		Women	Men	
16-19 years	27/61 (44.3)	1	5.30 (1.65-17.08)	0.005
20-29 years	67/168 (39.9)	1	2.58 (1.26-5.28)	0.01
30-39 years	89/348 (25.6)	1	1.62 (0.95-2.77)	0.08
40-49 years	100/388 (25.8)	1	1.07 (0.65-1.79)	0.78
50+ years	44/326 (13.5)	1	0.99 (0.5-1.99)	0.99

Table.



Qualitative interviews suggested that re-testers understood the potential for false negative results. They re-tested because of:

- Belief that HIVST had role in determining if treatment was working: "...a negative or faint positive result means your body's soldiers (immune system) are good";
- Confirming previous HIV diagnosis,
- Opportunity to disclose HIV status to partner/family/friend;
- Social responsibility to support an important community-based program, with fear of future exclusions if declined,
- Fear that HIVST refusal could be interpreted as disclosure of HIV status. Easy HIVST availability facilitated re-testing.

Conclusions: Community-based distribution of HIVST is associated with high levels of retesting among people on ART. Understanding drivers of retesting can enable programmes to develop more appropriate communications and interventions that meet the needs of people on ART.

EPE0768

Lesson learned of community based screening as part of differentiated HIV testing for female sex workers in Eastern Indonesia

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Background: GF ATM currently support HIV program targets Female Sex Worker (FSW) in Indonesia for 2022-2023. The purpose of HIV prevention program for FSW is to reach and provide HIV information, link them to HIV testing and treatment.

The program conducted in 131 districts divided into 3 regions. This lesson learned will be focusing on region 3 which is in Eastern Indonesia.

Description: Yayasan Kerti Praja as SR work with 18 local NGO in 55 districts in Region 3 which include Kalimantan, East Java, Bali, West and East Nusa Tenggara, Sulawesi, Maluku and Papua. In each districts there are peer leaders who are outreach worker that comes from FSW community. PLs reach FSW, mobilizing, link them to HIV testing services and further link them to treatment and support.

In 2022, community based screening (CBS) using Oral Fluid Test (OFT) is introduced as alternative of health service based HIV testing. In term of CBS, PL should assist their client in using OFT and if the result is reactive, PL will help the client to do confirmatory test in health services and access treatment.

Lessons learned: During 2022, 3310 FSWs conducted CBS and 2% (65) has reactive result. 54% (35) of reactive result willing to conduct confirmatory testing in health services and all were tested reactive, 26 (74%) of them received ARV treatment.

Challenges in conducting CBS in East Indonesia:

- Late distribution of OFT;
- Complicated and unsupported report system through SIHA-CBS;
- Lack of districts stakeholders' knowledge regarding differentiated testing impacts on their support;
- Limited training for SSR and PLs regarding CBS.

Conclusions/Next steps: Although number of FSW received CBS still limited however there are possibilities that CBS has better opportunity in linking FSW to ARV treatment. To improve the implementation, support from PR IAC and Ministry of Health in terms of OFT logistic and reporting system is essential.

Massive information on differentiated HIV testing strategies to local stakeholders is needed to gain support and comprehensive trainings for PLs could improve in its implementation.

Lastly involving more community such as peer educators might also improve the uptake of CBS program.

EPE0769

Achievement of last mile HIV epidemic control: determining the number-needed-to-test to identify one person living with HIV among key populations in Zambia

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Background: As Zambia nears HIV epidemic control, it is critical to identify the remaining people living with HIV and link them to care. Finding undiagnosed individuals can be difficult and costly, especially among key populations (KPs). To efficiently maximize HIV case identification, we aimed to determine the number of persons needed-to-test (NNT) to identify one person living with HIV among KPs in Zambia.

Methods: The Community Impact to Reach Key and Underserved Individuals for Treatment and Support (CIRKUIITS) project implemented community-based HIV testing services in 12 districts across Eastern, Western, and Southern Provinces from October 2020 to September 2022. CIRKUIITS recruited 135 peer community health workers (CHWs) from KP communities, including female sex workers (FSWs), men who have sex with men (MSM), transgender people (TG), and people who inject drugs (PWID). KP CHWs were trained in HIV testing services and psychosocial counselling, then deployed to provide services in a peer-to-peer approach. KP-CHWs used index testing, social network testing, and mobile HIV testing modalities to reach KP clients. Routinely collected HIV testing aggregated data was stratified by KP sub-type and analyzed.



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Results: A total of 11,237 KP clients were screened for HIV risk and offered HIV testing, with 22% (2,434/11,237) testing positive (NNT 4.6:1) (Figure 1).

Of KPs tested, 66% (7,426/11,237) were FSWs of whom 1,753 tested positive (24% yield, NNT of 4.2:1); 30% were MSM (3,306/11,237) of whom 588 tested positive (18% yield, NNT of 5.6:1); 2% (220/11,237) were TG of whom 47 tested positive (21% yield, NNT of 4.7:1); and 2.5% (285/11,237) were PWID of whom 46 tested positive (16.1% yield, NNT of 6.2:1).



Figure 1. Number needed-to-test ratios among key population sub-types in 3 supported provinces in Zambia.

Conclusions: HIV positivity yield remains high among KPs in Zambia, and NNT is lowest among FSWs. Understanding NNT may innovate HIV programming as it provides insights into individual communities, which can help improve program planning and efficiency.

EPE0770

Non-reporting of intimate partner violence among index case testing clients: experience from Malawi

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Background: Screening for intimate partner violence (IPV) and provision of services to IPV survivors is essential in index case testing (ICT). Several studies in sub-Saharan Africa including Malawi have reported high IPV prevalence. However, IPV is rarely reported during routine IPV screening and follow up among ICT clients.

We retrospectively explored the occurrence of IPV among clients who had accessed ICT services at facilities supported by Partners in Hope, a Malawian, Christian, non-governmental, medical organization and PEPFAR-USAID partner.

Methods: Between July-August 2022, we enrolled ART clients (≥18 years) across 15 facilities, who were on ART for ≤12 months and had received ICT services as new ART-initiators. We used the WHO survey for gender-based violence to measure IPV in domains of physical, sexual, emotional-

abuse and controlling-behaviors in the past 12 months. To understand reasons for IPV non-reporting, we randomly selected a sub-set of surveyed-clients who had experienced IPV and healthcare-workers who provided ICT services, for in-depth interviews (IDIs). We used constant-comparison methods to analyze IDIs.

Results: We enrolled 149 client-participants, 72% female, 59% married, mean age 34 (IQR: 25-40) years. IPV prevalence (last 12 months) was 71% (95%CI: 0.63%-0.78%); 76% (95%CI: 0.67%-0.84%) among females and 57% (95%CI: 0.40%-0.72%) among males.

Controlling-behaviors (66%) was the most common form of IPV, followed by physical-(40%), emotional-(34%) and sexual-abuse (21%). Twenty-two percent related the IPV event to the HIV diagnosis.

We analyzed 24 IDIs (15 clients, 9 healthcare-workers). Only two clients (13%) had reported IPV to a healthcare-worker. Major reasons for IPV non-reporting were lack of knowledge about IPV reporting structures and services, concerns about needing much time to discuss IPV with healthcare-workers, and limited privacy at facilities. Healthcare-workers attributed IPV non-reporting to lack of private space for IPV screening, high workload among ICT staff, and clients' unwillingness to present IPV experiences immediately after HIV diagnosis.

Conclusions: IPV prevalence was high among recent Malawian ART initiators, including men, but IPV is often not reported during routine ICT screening and follow up. Multiple client- and health systems-level barriers to IPV reporting must be addressed urgently, given IPV's adverse impact on HIV and other health outcomes.

EPE0771

HIVST demand creation via social media can reach unreached populations and increase awareness and uptake in Kenya, Nigeria and Uganda

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Background: HIV self-testing (HIVST) has been proven to be effective in increasing demand for HIV testing among populations that are at risk of HIV acquisition. We piloted various social media platforms to disseminate messages on HIVST especially among younger audiences of 15-24 years in Kenya, Nigeria and Uganda. Messages included



where to purchase the kits, how to conduct a self-test, where and how to report test results, importance of linkage and where to seek for digital support in case of questions.

Description: Using human centered design, demand creation messages were developed, and appropriate social media platforms identified based on preference of our target populations. Messages on HIVST were placed on social media platforms including Facebook, Instagram, Twitter, YouTube and Google advertisements.

The Pulsar Social Listening and Monitoring Tool was used to refine social media campaigns weekly, based on online conversations and demographics of the target segments. Social media analytics were used to collate data.

Lessons learned: Between April – December 2022, 7,085,985 individuals were reached through Facebook and 6,154,712 through Instagram. There were 878,037 twitter profile views while Google adverts reached 17,753 individuals. Facebook and Instagram were most popular in for Kenya, Instagram in Nigeria and Facebook in Uganda. Live social media sessions with influencers and HIVST experts yielded the highest views and engagements.

Digital content such as stories, videos, animations and slide had high audience reach. Sponsored social media with click through links result in better audience targeting as they reach audiences in our target geographies and ages compared to organic posts that reach the general public.

Conclusions/Next steps: Social media can be effectively used to reach individuals with messages on HIVST. Individuals can be made to act by clicking through links to detailed information, access videos on use of HIVST kits, engage in live sessions with experts and influencers to have their questions answered, as some of the innovative ways of utilizing social media to create awareness and spur desired behaviour.

Using social media allows for access to information in modalities that are desirable for users and can reach wider audiences compared to traditional demand creation such as distribution of information materials.

EPE0772

Uptake of clinic-based HIV treatment and prevention services following HIV testing at and referral from private pharmacies in Kenya

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Background: HIV testing at private pharmacies has the potential to support linkage to either HIV treatment or prevention services. In many settings, however, few pharmacy providers are formally trained to deliver HIV testing and support linkage to care services.

We examined uptake of HIV antiretroviral treatment (ART) and pre-exposure prophylaxis (PrEP) services among individuals who completed HIV testing at and were referred from private pharmacies in Kenya.

Methods: Trained providers at 20 private pharmacies in Kisumu County offered clients purchasing sexual/and reproductive health-related products (e.g., emergency contraception) testing for HIV.

Eligible study participants were ≥18 years and self-reported behaviors associated with HIV risk (e.g., sexual partners of unknown HIV status). Enrolled participants completed HIV rapid diagnostic testing and were referred to free ART or PrEP services at nearby public clinics based on their test results. One month following referral, we called participants to assess if they initiated the recommended service.

Among clients that tested negative and were referred to PrEP services, we used Poisson regression models to explore participant characteristics associated with PrEP initiation and reported prevalence ratios (PRs).

Results: In July 2022, we called 1500 participants that completed pharmacy-based HIV testing and were referred to clinic-based HIV services from March-June 2022; we reached 76% (1180/1500) of participants called. The median time of follow-up since referral was 71 days (IQR 53-92). The majority of participant reached were female (63%, 742/1180) and few tested HIV-positive (4%, 42/1180). ART initiation among participants referred was 90% (38/42), while PrEP initiation among participants referred was 9% (100/1138). Participant characteristics significantly associated with PrEP initiation included having casual sexual partners (PR 1.94, 95% CI: 1.29- 2.92) and previous PrEP use (PR 2.68, 95% CI: 1.45-4.97).

Conclusions: Private pharmacies in Kenya may be well-equipped to facilitate linkage to clinic-based HIV treatment services among clients who test HIV-positive but



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might need more support to facilitate linkage to clinic-based PrEP services among clients who test HIV-negative. More research is needed on ways to better engage private pharmacies in the delivery of HIV prevention services, including the development of models for direct delivery of HIV prevention services in this setting.

EPE0773

Contribution of Index Testing to HIV case finding compared to different testing modalities under AIS implementing sites in Myanmar

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Background: HIV/TB Agency, Information, and Services (AIS) Activity with the support of USAID/PEPFAR prioritize service delivery to areas and key populations with the highest HIV prevalence in five states and regions in Myanmar. AIS and implementing partners are providing HIV Testing Services (HTS) in 39 sites using different modalities including facility-based testing, using the social network strategy and referral through peer educators, community-based testing through mobile teams and peer educators, provider-initiated testing and counseling (PITC) with private general practitioners, and Index testing using voluntary partner notification.

Description: In late 2020, AIS identified index testing as an evidence-based, innovative, effective case-finding strategy among key populations and their partners. Technical tools, products, and services were developed by AIS and its partners. AIS then delivered training and refresher training for index testing to new and existing partners and HIV index testing was first introduced and started implementation in Oct 2020.

Lessons learned: From Oct 2020 to Oct 2022, AIS and partners provided HTS using different modalities to a total of 69,285 clients and identified 6,270 PLHIV linked to treatment with a 9% positivity rate. Facility-based testing, tested 42,553 clients with 4237 positive cases identified with a 10% positivity rate, community-based testing tested 17,657 cases and 1,286 positive cases identified with a 7% positivity rate, and private general practitioners tested 7493 and 311 positive cases identified with a 4% positivity rate respectively.

Implementation of index testing in 25 sites offered index testing to 4705 PLHIV. 3414 contacts were elicited, 2929 accepted index testing, and 1582 received index testing. 436 HIV-positive cases were identified, with a 28% positivity rate demonstrating the index testing as the highest case-finding modality.

Conclusions/Next steps: Index testing contributes significantly to HIV case finding among key populations and their partners compared to other testing modalities. To accelerate HIV case finding through ethical index testing,

AIS will need to undertake qualitative and quantitative research to learn and improve the uptake and linkage to index testing. There is a need to ensure field coaching and assist partners in supervision, reporting, and advocate stakeholders to adopt index testing as a key HIV case-finding strategy to amplify at the national level.

EPE0774

Implementation of online reservation application to reach the unreached at high risk of HIV during the COVID-19-imposed lockdown in Nepal

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Background: Meeting Targets and Maintaining Epidemic Control (EpiC) Nepal introduced the online reservation application (ORA) system MeroSathi in Nepal as part of an innovative initiative in August 2018 to reach hidden populations at risk of HIV infection and link them with HIV services virtually.

This abstract highlights findings from the scale-up of MeroSathi during the COVID-19-imposed lockdown beginning in March 2020 restricting project's traditional field outreach. Pre- and post-lockdown data are analyzed for number of reservations, risk-assessment, and HIV-positive testing.

Description: During the pandemic, EpiC Nepal promoted MeroSathi among its clients at risk of HIV through social media campaigns and mobilization of social media influencers. Virtual hotspots across social media and dating applications were identified/used to educate beneficiaries on HIV prevention.

The risk assessment game, in the form of a quiz, helped beneficiaries self-assess their level of HIV risk (high, medium, and low or no risk) through an automated risk-categorization system with 6-14 questions on KPs' sexual history and behavior, after which, beneficiaries booked recommended HIV services at their preferred location, date, and time.

Lessons learned: From October 2020 to September 2021, MeroSathi received 6,425 bookings and 3,734 (58%) clinic visits for HIV services uptake. Of these, 1,143 tested for HIV, with 95 (8.3%) testing HIV positive, and 88 (92.6%) linked to treatment.

Before COVID-19 (October 2019-March 2020), 447 clients accessed ORA, 343 completed the risk assessment (36% high risk, 44% medium, 17% low), 374 tested, and 24 (6.4%) tested HIV positive (83.3% yield among high risk; 12.5% medium; 4.17% low); in the COVID-19 period (April-September 2020), 4,665 clients accessed ORA, 7,777 completed the risk assessment (54.8% high risk; 30.9% medium; 11% low), 1,292 tested, and 80 (6.2%) tested HIV positive (82.5% yield among high risk; 15% medium; 2.5% low).



Notably, during the pandemic, the project saw a tenfold increase in online booking for HIV services through MeroSathi and a threefold increase in the HIV case-finding.

Conclusions/Next steps: EpiC Nepal will work with the Government to scale up MeroSathi nationally so that all KPs at high risk can access confidential and quality services through their preferred clinics.

EPE0775

Acceptability of HIV self-testing and community-based testing approaches among never tested / high risk men who have sex with men in Ulaanbaatar

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Background: With only 40% of people living with HIV diagnosed in Mongolia, there was a need to introduce new and innovative approaches like HIV Self-testing (HIVST), community-based testing (CBT) and demand generation virtual interventions among high risk, non-identifying key populations. The HIV epidemic among men who have sex with men is concentrated (7%, IBBS 2019) in the country.

Methods: MSM reported as first time or infrequent testers (last test >6 months ago) were considered. An oral fluid HIVST kit was used. Apart from distributing HIVST kits through peer networks, a virtual platform called test4ub.org was used for clients to make an appointment to visit a dedicated testing site or receive HIVST at places of their preference with support from peer counsellors without coming to a facility. Participants were interviewed with questionnaire before and after the test to assess acceptability.

Results: Total of 1342 people received HIV testing service (HTS) with new approaches (62% HIVST, 38% CBT) between 9 April 2021 - 30 June 2022. 14% were first time and 86% were repeated testers. 80% received HTS at places of their preference. A total of 221 people registered through test4ub.org and out of which 29 (13%) showed up for HTS. After receiving test, 97% of MSM gave ≥7 points on a scale 1-10 for satisfaction for both approaches.

Preference for repeat testing was higher with HIVST (77%) than CBT (40%) while only 7% still prefer facility-based testing. More than 60% of participants would like to test for HIV once in 3 or 6 months with new approaches because it was quicker and more convenient.

Conclusions: HIVST and CBT approaches are highly appreciated and accepted by MSM community and existing peer outreach network along with virtual approaches could be a feasible way of delivering test kits to the community to be able to achieve the UNAIDS 95-95-95 targets.

EPE0776

Performance of oral versus blood-based HIVST cascade in Nigeria: unitaid-funded STAR programmatic experience

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Background: As of August 2022, six HIV Self-testing (HIVST) have been prequalified by WHO (one oral fluid-based (OFB) and 5 blood-based (BB) products). In Nigeria, Ora-Quick HIVST kit was approved in 2019 while 4 additional BB HIVST kits were approved between 2020 and 2021.

Jhpiego Nigeria implemented the Unitaid-funded STAR project between March 2020 and October 2022 testing several distribution models.

Methods: The STAR project trained private and public facility service providers, community-based organizations and implementing partners on both oral and BB products and provided reporting tools. Between January 2021 and October 2022, OFB products were deployed for use in 12 Nigerian states and across facility, Key Population One-Stop-Shops, community and private pharmacies while BB products were deployed and used in community and private pharmacy models between July and October, 2022. Individuals with reactive HIVST were referred to a health facility for confirmatory testing and antiretroviral therapy (ART), individuals with negative results were referred to receive Pre-Exposure prophylaxis (PrEP). Information on HIVST distribution, reported results, confirmatory HTS, ART and PrEP linkage were documented in relevant register, aggregated and reported on DHIS2.

Results: From January 2021 to October, 2022, a total of 183,814 oral-based HIVST kits were distributed, 180,745 (98.3%) results were reported, 4729 (2.6%) HIVST reactive, 4,533 (95.9%) of them attended confirmatory HTS, 4,389 (96.8%) were confirmed and 4,346 (99%) linked to ART, 17013 (9.7%) of negative Self-test users started on PrEP. Between July and October, 2022, a total of 16,211 blood-based HIVST were distributed, 15,697 (96.8%) results were reported, 121(0.8%) HIVST reactive, of which 63 (52.1%) attended confirmatory HTS, 61 (96.8%) were confirmed and 61 (100%) linked to ART. 792 (5.1%) of negative Self-test users started on PrEP.

Conclusions: Similar cascade performance of blood- and oral-based HIVST self-test users in Nigeria with the exception of attendance at confirmatory testing which was poorer for BB self-test users.

We observed very high linkage rates for both, BB and OFB HIVST users and high uptake rates for both, treatment and care as well as for PrEP.



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**EPE0777****Comparing online and traditional service use models among key populations in Liberia**

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Background: In Liberia, key and vulnerable populations account for most HIV cases, with the prevalence of HIV among men who have sex with men at 37.9%, transgender people at 27.6%, female sex workers at 16.7%, and people who inject drugs (PWID) at 14.4%. Traditional (offline) services are the main modality of HIV service provision, but stigma and discrimination toward key and vulnerable populations deter these groups from accessing services.

The FHI 360 Meeting Targets and Maintaining Epidemic Control (EpiC) Liberia project, through PEPFAR and USAID funding, piloted the use of QuickRes, a (KP)-friendly and safe online application that allows clients to determine service needs and book appointments online.

Description: We reviewed HIV testing data from July 2021 through September 2022 and used a two-service model z test to compare population type and case finding between those who booked HIV testing online and those who were linked to HIV testing offline.

Lessons learned: Among the beneficiaries who were referred and booked HIV testing services online (n=1,062), 78% were KP and 22% were general population. For those who received HIV testing services offline (n=136,130), 70% were general population and 30% were KP. Case finding among those who booked via online platform was 20.8% compared to 5.3% offline (95% CI: 10.2-20.9).

Conclusions/Next steps:

- Online platforms are an alternative to linking individuals to HIV testing, including KP who may prefer online to offline due to stigma.
- Although currently online screening and booking for HIV testing services represent a fraction of overall testing, it reaches those at higher risk for HIV acquisition and therefore should be scaled up.
- Working with peer outreach networks may help promote the use of online platforms to increase the number of clients accessing online services.

EPE0778**Public health response interventions to HIV recent infection: results from a quasi-experimental analysis assessing the impact of triaging index testing services by recency status on index testing volume in Eswatini**

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Background: Use of HIV recent infection surveillance provides a unique opportunity for targeted, facility-level interventions. Since 2019, Eswatini's HIV-1 Recent Infection Surveillance (EHRIS) offers recent infection testing in routine HIV testing services. Health facilities with ≥4 recent infections/month receive facility-based interventions. We evaluated the impact of triaging of index testing services by recency status of the index patient on volume of index testing services.

Methods: In September 2020, 9 of 127 facilities offering HIV recent infection testing offered accelerated index testing services to patients with recent infections and their partners within 7 days of diagnosis while those with long-term infections received services within 30 days as per standard of care.

We used difference-in-difference with synthetic control design using "synth" package in R to compare predicted average trends in the synthetic control to observed average trends in intervention facilities to approximate the effect of the intervention on uptake of index case testing.

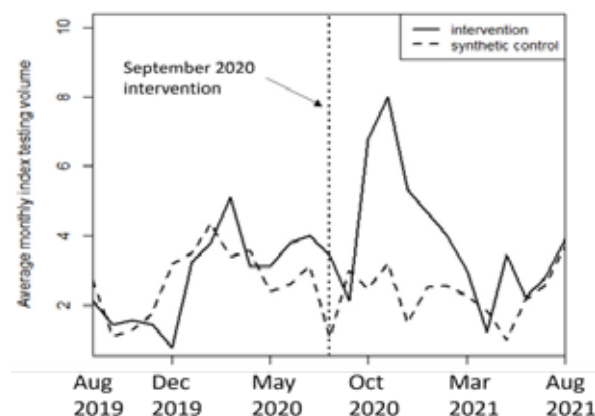


Figure. Trends in index testing volume before and after triaging of index testing services intervention (September 2022) in Eswatini: average of 9 facilities receiving intervention vs synthetic control.

Results: The nine intervention health facilities included 3 hospitals, 2 public health units, and 3 clinics across 3 regions. The synthetic control was constructed from a weighted average of 6 out of 112 facilities with non-missing data (1 hospital and 5 clinics across 3 regions).



Between August 2019–July 2020, monthly average index testing volume averaged 2.8 indexes in the intervention clinics (IQR 0–4) and 2.7 in the synthetic controls.

Following September 2020 interventions, we observed an acute and short-lived increase in index-testing volume in intervention facilities but not the synthetic control. At maximum (December 2020), intervention clinics averaged 2.7 times the index testing volume compared to the synthetic control, with differences observed until April 2021.

Conclusions: Targeted, facility-based interventions implemented as a response to recent infections in Eswatini led to a rapid, substantial, but ultimately non-sustained increase in index-testing volume. Future work will evaluate models of intervention to have sustained effect.

EPE0779

Preferences for HIV testing among youth in sub-Saharan Africa: a systematic review of discrete choice experiments

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Background: In designing and implementing HIV prevention interventions for youth, it is pertinent to understand youth needs, values, and preferences for HIV prevention services. The discrete choice experiment (DCE) is a stated preference technique for eliciting individual preferences over hypothetical alternative scenarios increasingly used in health-related applications to identify health service and program delivery preferences.

The objective of this study was to conduct a systematic review to characterize the application of DCEs in identifying youth preferences for HIV testing in sub-Saharan Africa (SSA).

Description: We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for this review. We searched five databases up to December 2022. Eligible studies were required to utilize DCE, have an HIV testing outcome, target young people aged 10–24, and be conducted in SSA.

We summarised the evidence and methodological characteristics of the DCEs using inductive content analysis. Meta-analysis was not possible due to the heterogeneity of the data and methods.

Lessons learned: A total of 82 studies were identified, of which 10 (12%) were selected for analysis in this systematic review. Four of the studies were conducted in South Africa, the remainder in Malawi (2), Nigeria (1), Zambia (1), Zimbabwe (1), and Kenya (1).

Across the studies, the attributes and attribute levels used in the DCEs were identified through literature research, qualitative research, or policy document analysis. The attributes with significant relative effects on preferences were age, sexual activity status, and gender.

Overall, the cost of testing was one of the strongest drivers of preference, with participants preferring free or very low-cost testing. However, in six of the studies (60%), participants were willing to trade off other attributes, such as cost, and HIV testing type, to gain confidentiality.

Conclusions/Next steps: Understanding and incorporating youth preferences in HIV testing is essential to increase the reach and uptake of HIV testing services and programs. Data from DCEs can provide valuable insights into the variations in what, how, and where young people want HIV testing services. The variations in preferences can inform the development of youth-centered services to maximize HIV testing uptake in SSA.

EPE0780

Community Link: a national program to distribute 200,000 free HIV self-test kits through local community organizations to reach the undiagnosed in Canada

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Background: Community Link is a national program supported by the Government of Canada that aims to distribute 200,000 HIV self-test kits for free through local community-based organizations (CBOs) across Canada to reach all key population groups.

This study describes the kits distributed and the population groups reached from the first 10 weeks of implementation.

Methods: The program was advertised through HIV networks via direct outreach, newsletters and social media. Kits were distributed to HIV/AIDS and Indigenous CBOs, harm reduction centres, mobile distribution units, and pharmacies as well as through various testing events. Participants could access between 1–5 test kits per interaction and were encouraged to distribute them to friends, family, or sexual partners. An 8-item anonymous survey was administered to participants who picked up a kit. The survey contained questions asking about demographic information (age, gender, sexual orientation), previous testing behaviour, and secondary distribution. Binary logistic regression was conducted to determine if rates of first-time testers and secondary distribution varied by demographics.



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Results: In the first 10 weeks of the program, over 37,500 HIV self-test kits were distributed to 144 CBOs across Canada, with 2,425 self-test kits being accessed. Approximately one-third (36%) of participants were first time testers. Half (51%) of those who received two or more kits intended to share with friends, family, or sexual partners. Binary logistic regression showed that people under 24 years old (OR=2.62, 95% CI=1.80, 3.83) and women (OR=1.67, 95% CI=1.18, 2.35) had greater rates of first-time testers while non-binary individuals (OR=0.32, 95% CI=0.12, 0.86) and gay/lesbian individuals (OR=0.24, 95% CI=0.15, 0.39) had lower rates.

Among key population groups, gbMSM (OR=0.19, 95% CI=0.10, 0.34), African/Caribbean/Black individuals (OR=0.71, 95% CI=0.41, 1.23), and Indigenous Peoples (OR=0.36, 95% CI=0.19, 0.67) all had lower rates of first time testers, while people who use drugs (OR=1.30, 95% CI=0.53, 3.23) had higher rates than the non-key population reference group.

Conclusions: At this stage of implementation, the Community Link program is reaching people who use drugs, women and younger individuals. As the program scales and implements, further monitoring and evaluation over the next 4-6 months will highlight effectiveness in reaching all key populations across Canada.

EPE0782

Coverage of early infant diagnosis in Liberia - a quality improvement experience

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Background: The global goal for an HIV free generation with elimination of mother-to-child transmission of HIV (eMTCT) requires a robust EID coverage and effective linkage to treatment at country and global levels. Liberia has an average program EID coverage of 21% (GF performance framework) and a positivity rate of 6-8% among exposed babies born to pregnant women visiting the antenatal clinics. Success with EID and elimination of mother to child transmission of HIV has been hampered by weak health systems following a prolonged civil war and the aftermath of ebola viral disease epidemic.

We share experiences on a quality improvement effort on EID at a high-volume public health facility in Monrovia-Liberia.

Description: The eMTCT team of the National HIV Control Program (EID) partnered with YALE University to set up a quality improvement team. Routine program data was used to establish baseline and to define the quality improvement aim and duration of effort from April 2020 to June 2021.

Staff of the antenatal clinic, labor and delivery were trained on quality improvement concepts and fish bone analysis exercise done to understand the local problem context and to test suggested quality changes using the plan, do, study and act (PDSA) cycle.

A monthly review meeting followed by a weekly hands-on learning schedule was established to monitor the impact of the changes and to adjust lessons on an ongoing basis. schedule ANC clinic, labor & delivery, EPI, ART clinic.

A root cause (fish bone) and stakeholder analysis were conducted, the best interventions (training, integrating HIV testing, treatment and EID into ANC and EPI services instead of the ART clinic) were design, a test of change was initiated appropriately (PDSA).

Lessons learned: Knowledge on eMTCT, use of guidelines and record keeping increased significantly among the participating staff. Midpoint EID coverage increased from 12% (16/113) at baseline to 60% (47/78) and progressed at month 14 to 95% (64/67) at the end of June 2021.

Conclusions/Next steps: Quality improvement effort can contribute to scale up of EID coverage. The lessons should be scaled up across the country tremendously improved EID coverage.

EPE0783

I'm Ready 5,000: effectiveness of mobile app to distribute free HIV self-tests across Canada to reach the undiagnosed with HIV

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Background: With the introduction of Canada's first HIV self-test to the market, understanding how to implement self-testing is crucial to reaching the 10% of people living with HIV who remain undiagnosed in Canada. The I'm Ready program provides access to free HIV self-tests for home delivery or pick-up through a private and convenient mobile app.

This study describes the main outcomes of the program and examines its ability to reach first time testers from key population groups.



Methods: This study analyzes the first 5,000 participants who completed a pre-test survey through the *I'm Ready, Test* app between June 2021 and November 2022. The survey collected information on social determinants of health and previous testing behaviour. Binary logistic regression models were created with social determinants of health (e.g., age, gender, sexual orientation, ethnicity, region) predicting the rate of first-time testers compared to people who had tested before.

Results: Most participants were under 35 years old (71%), male (66%), had greater than a high school education (75%), were employed full time (58%), and lived in very large urban areas (58%).

Of the first 5,000 participants, 4,429 (89%) ordered a test kit and 1,929 (44%) of those submitted a test result to the app. To get kits, 57% requested kits to be delivered to their home while 43% preferred to pick them up at a participating community-based location.

Binary logistic regression showed that the 18-24 age group (OR=3.30, 95% CI=2.88, 3.78), women (OR=1.61, 95% CI=1.40, 1.84), transgender individuals (OR=2.10, 95% CI=1.29, 3.42), those living in small and rural areas (OR=1.67, 95% CI=1.19, 2.34), and those living in the Atlantic provinces (OR=1.29, 95% CI=1.06, 1.58) all had elevated rates of first time testers.

Of the 44% of the sample who submitted test results, 16 participants entered positive test results.

Conclusions: The *I'm Ready* program provides a convenient, confidential, and flexible way to increase access to HIV self-testing.

The app has been especially effective at reaching first time testers who are younger adults, women, transgender, and living in small and rural areas who may have limited access to HIV testing.

EPE0784

Implementing social networking strategy to reach men with mobile jobs: lessons learned from an HIV clinic in Malawi

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Background: Malawi has made great strides in reaching UNAIDS 95-95-95 targets by achieving 88-98-97 as of December 2020. Case identification remains the greatest challenge in achieving epidemic control. To address this, targeted case identification methods are needed to reach hard to reach populations such as men and youth. Lighthouse Trust ART clinic implemented a social networking strategy (SNS) targeting men in 9 facilities in Lilongwe, Malawi.

Description: The SNS program aimed at recruiting minibus "call boys" and Kabaza bicycle and motorcycle taxi operators at the minibus depot surrounding the clinics.

We also identified recruiters in the clinic from recently tested high-risk men who tested negative for HIV and men who tested positive.

Recruiters must be comfortable talking about HIV and knowledgeable about HTS and testing locations. The recruiters were trained on general SNS, their role as a recruiter and ways to approach their peers for HIV testing. Recruiters were given "coupons" that allows the clinic to link the contact with their recruiter.

The contacts are to bring the coupons to the clinic for testing within 10 days of receiving the coupon. Contacts that tested positive were linked to care and those who are HIV negative, but high risk were screened for PrEP eligibility.

The contacts were also offered to become recruiters. Transport reimbursement for contacts is provided when the contacts report to the clinic for HIV testing.

Lessons learned: We identified a total of 217 recruiters between March-December 2022. Most were call boys and Kabaza taxi drivers identified from the bus depot. From the clinic we identified recruiters who were road construction workers, street vendors, guards, gardeners, mechanics and DJs. The recruiters found a total of 1227 contacts for HIV testing. Of those 832 (68%) came to the facility for testing and overall yield was 15%.

Conclusions/Next steps: With such a high yield, SNS is an effective method on identifying high-risk men with mobile jobs to be tested for HIV. Majority of the men identified are day laborers, therefore the transport reimbursement is essential to encourage the men to come to the clinic for HIV testing.

EPE0785

Effectiveness and operational feasibility of integrating facility-based primary distribution of HIV Self-Testing into the national testing program: Results from an implementation pilot in Uganda

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Background: HIV Testing Services (HTS) programs are operating within increasingly complex environments with more limited resources. National programs are considering how to effectively manage declining testing yields as more people living with HIV (PLHIV) are on treatment, disparities in testing coverage among different population groups and challenges with linkage, retention and re-engagement in care. HIV Self Testing (HIVST) has been recommended for integration into testing programs to generate efficiencies. In Uganda, HIVST has been prioritized for secondary distribution at Antenatal Care and direct distribution in communities. The Ministry of Health (MOH) identified key evidence gaps and opportunities where HIVST could be leveraged to strengthen case finding efforts.



Methods: An implementation pilot was conducted between September and December 2022. Primary HIVST distribution was implemented at OPD and postnatal care (PNC) across 16 public health facilities using both oral- and blood-based kits.

Activities conducted included developing training materials, data tools, training service providers and conducting periodic mentorships and supportive supervisions. Implementation model included group health talk and demonstration, private space for testing onsite and interpreting results, and support with linking to post-test services. Confirmatory testing was offered to clients reporting a positive HIVST. Comparative analysis was done for service uptake in conventional HTS versus HIVST, and oral-based versus blood-based HIVST.

Results: A total of 2,411 kits were distributed, representing 52% of total tests (4,675) conducted between conventional HTS and HIVST. Observed increase in access to HTS for men from 41% (conventional HTS) to 43% (HIVST). Despite slightly lower positivity rate for HIVST (3%) compared to conventional HTS (5%), there were higher ART initiation rates for HIVST (90%) compared to HTS (85%).

Similar uptake of oral- (51%) and blood-based (52%) HIVST across gender and age. Similarly high (90%) ART initiation rates for both oral- and blood-based HIVST.

Conclusions: Integration of both oral- and blood-based HIVST implementation at OPD and PNC is feasible. HIVST distribution leads to increase in ART initiation which is high program priority.

Additional analysis indicates efficiencies on the Human Resources for Health by freeing up health care worker time to other priority activities. MOH should prioritize scaling up facility based primary HIVST distribution.

EPE0786

Effect of an integrated intervention on outcomes of early infant diagnosis of HIV services in the Volta and Oti regions of Ghana: an implementation research

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Background: Proven interventions exist, yet over 900 babies of HIV-infected mothers still get infected every day with less than half of them receiving life-saving antiretroviral therapy. Ghana has one of the highest mother-to-child transmission of HIV (MTCT) rates, yet uptake and utilization of early infant HIV diagnosis (EID) remain low.

The purpose of this study was to assess the effect of an integrated intervention on key outcomes of EID.

Description: A quasi-experimental trial was implemented for 8 months between February 1, 2019, and September 30, 2019. The intervention sites deployed the full intervention package (iEID) of peer mentors, community champions, laboratory couriers and a web-based mobile app, whereas the active comparator (aCOM) had only peer mentors and community champions and the standard-of-care (SoC) implemented the standard EID services. HIV-infected women (≥ 28 weeks gestation) presenting for antenatal care or delivery and their infants were assigned to the iEID (full), aCOM (partial) or SoC (control) arms and followed up to 12 weeks postpartum. Using a mixed-effect Poisson regression, the main outcomes were the number of eligible infants who started prophylaxis and the number of mother-infant pairs who stayed in EID care at 6 and 12 weeks after birth. The Ghana Health Service Ethics Review Committee [GHS-ERC007/10/18] gave their approval for the study.

Lessons learned: A total of 223 women (14-45 years) with a mean age of 30.83 (± 5.55) years and 224 infants were enrolled. Women in the SoC group were slightly younger. Most of them (74.9%) were newly diagnosed during the last antenatal clinic sessions and had been enrolled in PMTCT (98.65%). Mother-infant pairs in the iEID were 8% (aRR: 1.08, 95% CI: 1.01-1.17, $p = 0.048$) more likely to initiate prophylaxis and 38% (aRR = 1.38; 95% CI: 1.12-1.69; $p = 0.002$) more likely to access EID at 6 weeks compared to infants in the SoC arm.

Conclusions/Next steps: An integrated intervention improved infant prophylaxis initiation, retention of mother-infant pairs in EID care, and significantly reduced laboratory turnaround times. The intervention has the potential to find HIV-infected babies quickly and start them on ART to improve their health.

EPE0787

Experiences using HIV self-testing among gay, bisexual men and other cisgendermen who have sex with men: qualitative results of a blood-based HIV self-testing study in Argentina

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Background: At the moment HIV self-testing (HIVST) is not available in Argentina. However there is a need to better understand the experiences of potential users among key populations in Latin America and the Caribbean to inform decisions on future implementation. In March 2022, a feasibility and acceptability study of HIVST was conducted among transgender women (TGW) and gay, bisexual and other cisgender men who have sex with men (GBSM) attending an HIV testing service at an NGO in Buenos Aires.

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Methods: Initially, 149 GBMSM were provided with three HIVST kits to be performed on a monthly basis after an initial demonstration and training and a first negative HIVST.

Their median age was 26 (IQR: 23-31), 91.8% had secondary education or higher. Median number of sexual partners during the last six months was 5 (IQR 3-7); 21.9% mentioned having used drugs in the last six months and 18.4% were engaged in some form of sex work in the last six months.

Upon completion of the study, eight GBMSM were randomly invited to a focus group conducted over Zoom and only four participated (Ages: 31, 30, 27 and 24).

An additional one on one interview was performed with a participant having tested positive throughout the study.

Results: HIVST was acceptable among GBMSM, being cited as a convenient and easy-to-use tool. Even the participant who received a positive result expressed that had it not been for the HIVST he might have waited much longer to retest for HIV, delaying treatment initiation. Nonetheless, the need to have referral helplines for users who happen to test positive was highlighted.

Difficulties in obtaining blood samples decreased with practice and participants were confident that they were able to use the device and interpret its results correctly. The written instructions, complemented by the explanation in supporting videos, appeared to be sufficient for most users.

Conclusions: HIVST is a combination prevention strategy that could greatly benefit a population facing stigma and discrimination across HIV services like GBMSM. Nonetheless, its implementation should not be to the detriment of post-test counseling and early access to HIV care and treatment.

Description: MOH conducted a proof of concept implementation pilot to demonstrate the operational feasibility and efficiencies from using innovative and optimized HTS approaches to increase the number of PLHIV identified and effectively linked to care. The optimization package included HIV Self Testing, Index Client Testing including Partner Notification Services and Social Network Strategy, and risk screening. Between October and December 2021, targeted HTS optimization trainings and mentorships, data quality assessments and support supervisions were conducted at the selected ten pilot sites from two regions of Bunyoro and Ankole, HTS providers were fully mentored and capacitated. Compared HTS performance for the pilot facilities before and after to assess the impact of the pilot implementation.

Lessons learned: A total of 482 PLHIV were identified during the implementation, an increase from 425 before the pilot with an increase in 13% linkage. Remarkably, 92% of the total tested were aged 20+ with 100% linkage to care. The percentage of clients accessing HIVST kits through directly assisted approaches increased by 32% whereas unassisted increased by 8% and still noted 100% increase of the clients with positive HIVST results. Noticed increase in yield across different testing modalities like APN from 31% to 34% with an increase in linkage from 71% to 80%.

Conclusions/Next steps: The scale up of optimized HTS approaches increases testing yield and coverage across key and priority populations while generating efficiencies in the program such as reduced commodity consumption. The MOH should prioritize scale up of the HTS optimization package in Uganda.

EPE0788

Optimizing HIV Testing Services to reach the first 95: findings and lessons from a pilot programme in Uganda

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Background: Uganda has achieved significant progress in identifying and linking people living with HIV (PLHIV) to care. Of the estimated 1,400,000 PLHIV, 89% are aware of their status, of which 82% are on ART. Identifying and linking PLHIV to care remains a major limiting factor to national ART scale up. National testing yield has stagnated below 3%. The MOH adopted a targeted HIV Testing Services (HTS) approach to increase testing coverage across key populations and geographies. Despite the development of a national plan for rolling out this approach, uptake and scale up have been sub-optimal.



Implementation science and scale up of prevention

EPE0789

Optimizing the introduction and scale-up of the dapivirine ring in low- and middle-income countries: global stakeholders' perspectives on implementation and costing needs, assumptions, and gaps

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Background: Sub-Saharan African countries plan to introduce and scale up new longer-acting HIV pre-exposure prophylaxis (PrEP) methods. We consulted global stakeholders involved in PrEP policy and programs to synthesize lessons learned from oral PrEP that can inform and accelerate implementation plans for the monthly dapivirine vaginal ring (PrEP ring).

Methods: In January–April 2021, we interviewed representatives from global health organizations conducting HIV prevention and oral PrEP policy, programming, and research on strategic approaches for PrEP ring delivery, integration, costing, budgeting, and financing. Two coders inductively analyzed the transcripts.

Results: Overall, 27 stakeholders from 15 organizations consented to participate, including funders (n=4), representatives of multilateral and policy organizations (n=2), nongovernmental organization staff implementing PrEP (n=5), and research and university partners (n=4). We identified five thematic areas to inform strategic PrEP ring implementation:

1. The importance of increasing choice;
2. Communicating effectively about product efficacy and effectiveness;
3. Service delivery adaptations, including demedicalized provision and integration into HIV services and women-centered non-HIV services (e.g., family planning);
4. Avoiding recapitulation of oral PrEP-associated stigma by generalizing messaging and service points, and;

5. Streamlining implementation plans to simultaneously prepare for the introduction of other new PrEP methods in the pipeline.

We further identified three cost-related barriers to planning for PrEP ring implementation:

1. Historically, incomplete knowledge of introduction and actual unit costs have hampered planning;
2. Budgetary allocation and forecasting activities are impeded by persistent data gaps and/or underestimation of costs related to human resources, facility and provider training, communication and demand creation, health service integration, monitoring and evaluation, supply chain, and laboratories, and;
3. Innovative public-private partnerships and co-financing could help, but insights on how such schemas would operate were minimal.

Conclusions: Lessons learned from oral PrEP can inform advancements in implementing, costing, and financing the expansion of longer-acting PrEP products, including the PrEP ring. Although service integration is theoretically promising, empirical examples of successful integration are needed to inform policy, planning, and implementation. Innovative costing partnerships and approaches will remain elusive until numerous data gaps are filled.

EPE0790

Measuring the impact of peer-worker-to-client ratio on the success of the needle and syringe program in Abia, Gombe, and Oyo states, Nigeria

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Background: The needle and syringe program (NSP) for People Who Inject Drugs (PWID) in Abia, Gombe, and Oyo states under the National Aligned HIV/AIDS Initiative (NAHI) grant relies on community facilitators (CF) from the community of drug users to provide HIV prevention, testing, treatment services, and distribution of sterile needles, syringes, and injection paraphernalia to their peers to prevent needle sharing and the spread of blood-borne diseases.

The 2018 national drug use impact survey indicates that over half the population of injecting drug users in Nigeria share needles and syringes and the 2019 NSP pilot study conducted by the government of Nigeria indicates that a total of 38% of PWID in the three states reported sharing needles and syringes.

Description: The NSP program of the NAHI grant commenced in July 2022 with CFs providing sterile injection paraphernalia to recruited PWID in three states. An assessment of needle sharing among PWID across the states informed a target distribution for the 13,502 PWID to be reached over a period of 18 months. A total of 27 CFs were recruited from communities of PWID in the 3 states to facilitate access to their peers.



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Lessons learned: From the targets for distribution, each CF was expected to reach about 500 PWID within the stipulated period on the project with services at least once a month to guarantee adequate access to services. Between July and September 2022, the CFs recruited 3008 (22.3%) PWID and reached them with services indicating that the workload affected the CF's ability to recruit and service at least 30% of the estimated target.

Further investigation revealed that target achievement would improve if the ratio of CF to PWID improves from 1:500 currently to 1:200. This projection meant that each actively engaged CF could reach 200 PWID monthly ensuring equitable access to services by the end of the project.

Conclusions/Next steps: The NSP is the first in the country and promises to reform the harm reduction intervention in Nigeria in the near future. It is essential to continuously monitor the program and address hindrances to equitable access to services for PWID on the NSP for greater improvement.

EPE0791

Pilot randomized controlled trial of a web-based decision support tool to reduce decision conflict for HIV pre-exposure prophylaxis

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Background: Black communities continue to experience disproportionate burden of HIV infection despite the availability of effective HIV pre-exposure prophylaxis (PrEP). Research evidence shows that PrEP-eligible Black clients experience decision conflict – a state of uncertainties on which course of action to take in the light of multiple options – when offered HIV PrEP. Decision support interventions can reduce decision conflict; facilitate choice of value-based option, and ultimately enhance adherence to the chosen option. A web-based decision support tool (DST) for HIV PrEP exist but the effectiveness in reducing decision conflict and improving PrEP adherence has not been established.

The objective of this pilot study was to obtain data to optimize the design for an adequately powered definitive effectiveness trial, and to evaluate the potential impact of PrEP DST on decision conflict and decision regret.

Methods: The trial was conducted between May 2020 and Nov 2021. PrEP-eligible Black participants were recruited from various PrEP providers in the Greater Toronto Area. Participants were randomized into the PrEP DST intervention or CATIE website intervention.

Key outcomes were trial feasibility and the acceptability of Dried Blood Spot (DBS) collection for PrEP adherence measurement. Decision conflict and decision regret outcome measure were assessed at baseline and at 14 or 30 or 60 days post intervention.

Results: Thirty-seven participants (18 in intervention arm and 19 in control arm) were recruited into the trial. Pre-specified success criteria for feasibility were met for participants' recruitment ($\geq 90\%$ of target) and retention ($\geq 90\%$ at 14 days, $\geq 80\%$ at 30/60 days post intervention); acceptability of intervention ($\geq 80\%$ accessed both the DST and CATIE website); and acceptability of DBS collection for PrEP adherence measurement ($\geq 65\%$ of participants).

Compared to participants exposed to CATIE website, participants in the PrEP DST arm had lower decision conflict and decision regret scores post intervention.

Conclusions: This trial confirms the feasibility of conducting effectiveness trial for PrEP DST, and the potential of the tool to reduce decision conflict and decision regret. However, it also highlights the importance of the structural barriers that could affect participation in surveys and dried blood spot collection for PrEP adherence measurement.

EPE0792

Lessons learned from the Mobile Link program- a theory-based SMS intervention to improve the health of female entertainment workers in Cambodia

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Background: The Mobile Link intervention is a mHealth research project that utilizes mobile phone technologies to engage Female Entertainment Workers (FEWs) in Cambodia and link them to the existing HIV and Sexual Reproductive Health (SRH) services via Short Message Services (SMS) or Voice Call (VC). It was designed to:

1. Develop the Mobile Link intervention for young FEWs and test the feasibility of collecting data from FEWs through SMS and VC
2. Evaluate the efficacy of the Mobile Link intervention at the individual and venue level for increasing the uptake of HIV testing, condom use, and the utilization of comprehensive SRH care services
3. Determine the cost-effectiveness of the Mobile Link intervention for FEWs compared to the standard outreach, care, and treatment services.

Description: The Mobile Link was designed for 27 months, six months for the intervention development, 15 months for the trial, and six months for evaluation. It was implemented in Phnom Penh and three other provinces and involved 600 FEWs. A series of formative studies were conducted to develop message content, and feedback workshops were conducted to validate the content.



Six hundred messages were developed. One hundred eighty messages were delivered to 300 participants via SMS and VC through phone operators using a message delivery platform within the 60-week intervention. Base-line, mid-line, and end-line interviews were conducted to assess the effectiveness and effectiveness of the intervention.

Lessons learned: Although the Mobile Link intervention was not cost-effective, it successfully engaged all stakeholders in formulating the messages, designing the mHealth intervention, implementing the model, and evaluating the efficacy. FEWs within the intervention group had more contact with outreach workers and received escorted referrals more often than those in the control group. Participants within the intervention group also experienced less forced drinking at work.

Conclusions/Next steps: The Mobile Link intervention is linked to an increase in escorted referrals. A mHealth intervention and linkage to services for FEWs can play a role in increasing their access to services. This intervention can be adapted to address the health issues of other HIV key populations in low- and middle-income countries.

EPE0793

Acceptability of a telehealth PrEP care intervention for young men who have sex with men and transgender women in California and Florida

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Background: Given the COVID-19 pandemic, telehealth has received increased attention as a means to provide PrEP to people who may benefit from it, particularly those who face challenges in accessing conventional clinical services, by potentially offering greater convenience and privacy.

Methods: From February through September 2022, 229 men who have sex with men and transgender women in California and Florida ages 18-27 years were enrolled in a randomized controlled trial comparing PrEPTECH, a telehealth intervention offering a fully virtual pathway to PrEP, to referral to publicly available resources.

We examined responses at 90-day follow-up to questions about PrEPTECH acceptability to understand participants' experiences.

Results: Among 229 enrolled participants, 116 were randomized to the intervention arm, and 85 completed a mid-point follow-up survey at least 90 days after enrollment. Among these participants, mean age was 23.6 ± 2.8 years, 8.2% identified as transgender female, 56.9% identified as Black/African American or Hispanic/Latinx, and 58.6% spoke a language other than English at home. 66.7% definitely would recommend PrEPTECH to a friend

who wanted to start PrEP, 54.3% strongly agreed that PrEPTECH improved their access to health care services for PrEP, 76.2% strongly agreed that PrEPTECH is private and confidential, and 63.4% strongly agreed that PrEPTECH is fast and convenient compared to other forms of getting PrEP. The mean system usability score, a standard scale for evaluating web applications, was 70.2 out of 100, which is considered above average.

Responses to free text questions highlighted that PrEPTECH increased participants' knowledge and confidence in their ability to obtain PrEP and was valued for ease of use, discreetness, responsiveness, and convenience.

Areas for improvement included decreasing reminder frequency, offering more personalized support, and providing better integration with pharmacy services. Some participants expressed a preference for an app- rather than a web-based platform.

Conclusions: Young men and transgender women of color who used PrEPTECH found it user-friendly, convenient, and private, suggesting telehealth is a promising approach for increasing access to PrEP in this population. PrEP telehealth interventions should consider user preferences for platform functionality and ensure strong partnerships with clinical, pharmacy, and community-based PrEP navigation services to support continuous care.

EPE0794

Dedicated Sunday service hours at government-run HIV treatment facilities boosts HIV pre-exposure prophylaxis enrollment in Vietnam

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Background: The USAID-supported Meeting Targets and Maintaining Epidemic Control (EpiC) project in Vietnam supports HIV pre-exposure prophylaxis (PrEP) at public health facilities. In 2020, client feedback highlighted some potential PrEP clients were unavailable or hesitant to present at a public HIV treatment facility during business hours for fear of being assumed HIV-positive.

Community outreach workers and site staff were consulted before two sites for Sunday PrEP were selected. We sought to understand if the addition of dedicated PrEP hours on Sunday increased PrEP enrollment at these facilities.

Description: Data were reviewed from November 2020 to November 2022 to determine the contribution of dedicated PrEP Sunday service hours to overall enrollment at two project-supported district-level facilities, one each in Ho Chi Minh City (HCMC) and Tay Ninh. Public sector Sunday hours were suspended in Tay Ninh in March 2022 when a private clinic offering PrEP during weekends opened nearby. Sunday hours continued in HCMC.


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Lessons learned: During months with active Sunday hours, several PrEP enrollees at the two facilities came on Sunday (HCMC: 41.6%, Tay Ninh: 39.4%). During the review period, average monthly enrollment was also higher in months with Sunday hours than those without, (HCMC: 41.1 vs 12, Tay Ninh: 25.9 vs 6.8) though additional project strategies and COVID-related service disruptions also contributed to this difference. Clients also selected Sunday hours for follow up (HCMC: 33.2% of follow-ups, Tay Ninh: 23.4% of follow ups).



Figure. PrEP enrollments at Hoa Thanh District Health Center and Thu Duc District General Hospital.

Conclusions/Next steps: Sunday PrEP helped increase PrEP enrollment at reviewed facilities. The sheer volume of PrEP enrollments during these dedicated times and increase in PrEP clients demonstrate this approach provided a favorable environment for PrEP enrollment and that PrEP programs must consider the timing and environments that are conducive for potential clients to access services.

EPE0795

Strategies to optimize integration of PrEP into harm reduction services for people who use drugs: perspectives from healthcare workers in Kampala, Uganda

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Background: Integrating pre-exposure prophylaxis (PrEP) delivery for people who use drugs (PWUD) into facility- or community-based harm reduction programs may optimize service provision and reduce HIV acquisition in this

key population. Healthcare workers (HCWs) providing PrEP or other harm reduction services offer important insight into potential challenges and strategies for optimizing service integration.

Methods: Between March 2021-September 2022, semi-structured in-depth interviews were conducted with HCWs experienced in PrEP or harm reduction service provision for PWUD in Kampala, Uganda. Thirty HCW interviews were conducted across five program sites. HCWs represented a range of cadres including clinical officers, nurses/nurse counselors, medical doctors, psychologists, social workers, and counselors.

Harm reduction services included needle syringe programs and medication-assisted treatment. Interviews were audio recorded, translated, and transcribed verbatim. Grounded in the Consolidated Framework for Implementation Research, directed content analysis of transcripts was used to identify HCW perspectives on strategies for integrating PrEP and harm reduction services.

Results: HCWs were knowledgeable about PrEP, recognized the importance of PrEP for HIV prevention among PWUD, and were willing to prescribe PrEP. Offering the "whole package" of services in one setting addresses key challenges to service utilization identified by PWUD enrolled from program sites.

Healthcare workers believed strategies to integrate PrEP into harm reduction services *prioritized client needs and resources* and provided a *relative advantage* when compared to existing delivery via HIV clinics within public health facilities. Transportation costs for clinic visits were perceived as prohibitive for many PWUD.

Therefore, HCWs were most enthusiastic about community-based PrEP integration strategies that would take "services to clients where they are" and address client concerns around stigma experienced in facilities.

Other strategies to overcome transportation barriers included community-based refill models and availability of long-acting PrEP. Strategies to reduce stigma barriers included *engaging peers* in delivery approaches, believing this could facilitate creation of a more "friendly" environment that improves service utilization.

Conclusions: Healthcare workers viewed integration of PrEP into harm reduction services as an effective strategy to increase overall uptake of HIV services for PWUD, especially when delivered in a community setting, such as at drop-in centers providing services for PWUD.

**EPE0796**

Results of the end-line evaluation of a PrEP demonstration project among MSM and TGW in Myanmar

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Background: Though HIV prevalence in the general population reduced from 0.9% (in 2000) to 0.6% (in 2017) in Myanmar, prevalence in KP remains high, 34.9% in PWIDs, 8.8% in MSMs and 8.3% in FSWs (UNAIDS, 2021). Myanmar committed to implement a range of prevention strategies including introduction of PrEP to the key populations.

Description: A demonstration project introduced PrEP to MSMs and TGWs in two clinics in Yangon with the funding support from USAID HIV/AIDS Flagship (UHF) project in July 2020. Peer outreach workers were trained for demand creation, client recruitment, counseling and provision of services. The end-line evaluation is done by monitoring data and in-depth interviews to PrEP users and service providers.

Lessons learned: A total of 1,814 clients were initiated PrEP as of December 2021. The uptake of PrEP was higher in TGWs (93%, 223/241) than that of MSM (72.5%, 1681/2320). At the study end-point, 46.2% (n=837) continued PrEP, 33.4% (n=605) discontinued and 20.5% (n=372) were found lost to follow up. Kaplan-Meier analysis showed 72.8% (1279/1757), 50.5% (579/1146) and 33.6% (n=175/520) continued PrEP at 3-month, 6-month and 12-month follow-ups respectively. The 3-main reasons were identified as the top reasons for discontinuation of daily PrEP among 667 episodes of PrEP discontinuations. Those were "don't wish to take daily medication" (33%), "don't think it is necessary" (23%) and "concern about clinic follow-ups" (21%).

HIV seroconversion was found in 15 clients. Among those, 8 positives were detected within the 60 days of PrEP initiation.

Conclusions/Next steps: The prevention of HIV was effective by taking PrEP, excluding the seroconversion within 60 days after taking PrEP, in MSM and TGWs population in Myanmar. The uptake to PrEP was higher in TGWs than those of MSMs. The clients expressed that they did not want to continue PrEP mainly due to their unwillingness to take daily PrEP and perception of unnecessary daily use due to the changes in their risk behaviors.

More studies should be done to find out other alternative clients prefer PrEP options to increase uptake and adherence.

EPE0797

Peer PrEP referral + HIV self-testing delivery for PrEP initiation among adolescent girls and young women in Kenya: a mixed-methods pilot study

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Background: Uptake of daily oral HIV pre-exposure prophylaxis (PrEP), a highly effective intervention, remains low among adolescent girls and young women (AGYW). Most AGYW initiate PrEP through informal peer referral, which may be enhanced with formalized referral and peer-delivered HIV self-testing (HIVST) kits.

Methods: We pilot tested a peer PrEP referral + HIVST delivery model among AGYW in Kiambu County, Kenya (CT.gov: NCT04982250). We recruited AGYW using PrEP (i.e., "peer providers") from public healthcare clinics, trained them (one-day) on HIV prevention interventions, including HIVST and PrEP use, and ways to support peer linkage to clinic-based HIV services. Eligible peer providers were ≥16-24 years, HIV-negative (self-reported), and using PrEP for ≥3 months.

Following training, peer providers were encouraged to refer 4 peers (i.e., "peer clients") to PrEP and received HIVST kits (n=8, 2/peer) to support referral. We completed questionnaires with peer providers and clients one month following training; our primary outcome was PrEP initiation among peer clients.

We also conducted focus group discussions (2 with providers, 3 with clients) and identified participants' perceived intervention facilitators and barriers.

Results: Between March and July 2022, we trained 16 peer providers (median age: 23 years, IQR 21-24). The providers reported delivering the intervention to 55 peer clients, 30 (55%) of whom contacted study staff for follow-up. Among the peer clients (median age: 21 years, IQR 19-22), most (93%, 28/30) reported at least one behavior associated with HIV risk (e.g., sexual partner of unknown HIV status). At follow-up, most peer clients had initiated PrEP (provider report: 80%, 44/55; client report: 87%, 26/30). Additionally, most peer clients used at least one HIVST kit (provider report: 96%, 53/55; client report: 97%, 29/30). Perceived intervention barriers included supporting peer client HIVST without demonstration kits and PrEP stigma. Facilitators included close peer networks and peer clients' motivation to remain HIV-negative.



Conclusions: A formalized peer PrEP referral + HIVST delivery model supported PrEP initiation among AGYW in Kenya, demonstrating the potential for peer-delivered HIV prevention service delivery models.

Future models should address PrEP stigma reduction in the peer provider training and provide HIVST demonstration kits to support peer client HIV testing.

EPE0798

Greater preference and continuation of event-driven pre-exposure prophylaxis (ED-PrEP): a prospective cohort in Can Tho city, Viet Nam

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Background: Pre-exposure prophylaxis (PrEP) was introduced in Vietnam in 2017, but data on PrEP preference and continuation beyond 3 months are limited. This study evaluated PrEP preferences and continuation to inform national-scale-up in Vietnam.

Methods: We conducted a prospective cohort study in Can Tho – a central city of Mekong River Delta region in Vietnam. Between May 2020 and April 2021, individuals who were eligible for PrEP were invited to participate in the study. All consenting individuals were followed up until 31 Dec 2021.

Event Driven (ED)-PrEP and daily PrEP were made available to all participants. PrEP continuation was defined as the proportion of participants who come back for refills or self-report on PrEP. Descriptive and Cox regression analysis was conducted using STATA.

Results: There were 926 PrEP initiators participated in the study. Median age was 24 years old, and most were men (92.7%). Overall, 72.7% participants chose daily PrEP and 27.3% participants chose ED-PrEP.

The median follow-up time was 284 days (IQR 102–367) among PrEP initiators: 214 days (IQR 60–323) for daily PrEP and 363 days (IQR 319–389) for ED-PrEP initiators. Continuation rates were 72.6% and 99.2% at 3-months, 64.5% and 99.2% at 6-months and 43.1% and 99.4% at 12-months, for daily and ED-PrEP respectively.

At study end, 261/926 (28.2%) patients were lost-to-follow-up, 186/926 (20.1%) discontinued PrEP and 479/926 (51.7%) were still on PrEP. Loss-to-follow-up occurred mostly within 3-months of enrolment (159/261 or 60.9%) and majority were among daily PrEP group (259/261 or 99.2%).

Factors associated with continuation of daily PrEP were having sex \leq 2 times/week (aOR 2.05, 95% CI 1.46–2.86, $P < 0.001$), having sex without condom with people at HIV

risk in past 6-months (aOR 1.44, 95% CI 1.03–2.03, $P = 0.034$), and anticipated barriers to PrEP at baselines (aOR 1.38, 95% CI 1.00–1.89, $P = 0.047$).

Conclusions: PrEP continuation was greatest among those opting for ED-PrEP, further supporting its role as an important option for young MSM with high HIV risk who were enrolled in this study.

These findings support the scale-up of ED-PrEP and inform national programme in improvement of daily PrEP delivery through more differentiated service delivery options.

EPE0799

Adverse childhood experiences are associated with high HIV acquisition risk and low PrEP uptake among pregnant and postpartum women in Kenya

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Background: Adverse childhood experiences (ACEs) impact health outcomes later in life, including sexual behaviors. Few data exist on the relationship between ACEs and behaviors associated with HIV acquisition. We evaluated the relationship between ACEs, HIV risk, and PrEP uptake among pregnant and postpartum Kenyan women.

Methods: We utilized data from an ongoing longitudinal cohort study (NCT03070600), evaluating perinatal PrEP use in Kenya. Pregnant women were enrolled and offered PrEP in pregnancy and followed through 9 months postpartum at 20 public clinics.

We measured ACEs using the Adverse Childhood Experiences International Questionnaire (ACES-IQ); scores ≥ 6 denoted high ACEs. HIV risk was determined using a risk score developed and validated among Kenyan pregnant women (high risk: scores > 6 corresponding to 8.9 new HIV diagnoses per 100 person-years). PrEP uptake was defined as taking PrEP pills anytime during pregnancy through 9 months postpartum. We used Poisson regression models, clustered by facility to assess associations between high ACEs, HIV risk, and PrEP uptake.

Results: Overall, 873 women were included in the analysis with a median age of 26 years (IQR 22–30). Most were married (92%); 39% were unaware of their partner's HIV status. Median ACEs-IQ score was 4 (IQR:2–6).

Nearly a third (29%) of women had high ACEs, most commonly household violence (73%). Nearly half (45%) had high HIV risk and 22% took PrEP during pregnancy or postpartum.

Women with ACEs had a trend toward higher frequency of high HIV risk compared to those with lower ACEs (PR:1.3, 95% CI:0.99–1.7; $p = 0.06$), which was statistically significant among older women > 24 years ($p = 0.01$). PrEP uptake did not differ by high vs. lower overall ACEs score



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(PR:1.2;95%CI:0.8-1.7; $p=0.34$), however PrEP uptake was 30% lower among women exposed to household violence during childhood (PR:0.7,95%CI:0.6-0.8; $p<0.001$).

Conclusions: Among this cohort of perinatal Kenyan women, ACEs were common and associated with high HIV risk into adulthood. PrEP uptake was substantially lower among women who experienced household violence in childhood.

Interventions that reduce violence could disrupt pathways to HIV risk later in life and potentially improve utilization of HIV prevention services like PrEP in this population.

EPE0800

Using continuous quality improvement to build resilient VMMC services during weather induced emergencies in Chikwawa district, Malawi

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Background: In 2022, cyclones Ana and Dumako caused severe flooding in Chikwawa district in the southern region of Malawi district, reducing the capacity to sustain health care services including Voluntary Medical Male Circumcisions (VMMC). Flooding exacerbated the existing impacts of the COVID-19 pandemic. Potential VMMC clients were displaced to camps, roads were washed away and impassable, safe water was scarce, and structures, including health care facilities that provide VMMC services, were damaged.

Despite these obstacles, the USAID-funded VMMC project 'EMPOWER' met its objectives. The project engaged relevant stakeholders and re-strategized using a Continuous Quality Improvement (CQI) approach.

Description: The project employed the Deming / Plan Do Study Act (PDSA) quality management cycle to optimize its implementation model tailored to the circumstances. The cycle was used to systematically *identify* challenges, *analyze* the pattern of flooding disasters, and *develop* VMMC service provision strategies to fit those circumstances.

Strategies employed included:

Development of disaster preparedness plans, closure of sites in flood-affected areas and intensification of VMMC services in less-affected areas;

Locating community mobilizers and providing VMMC services close to camps;

Increasing focus on schools through VMMC champions; and working through female sex workers (FSW) in hotspot

areas to boost. EMPOWER also created demand for VMMC services among the *Chewa* traditional rites "*dambwe*", who valued VMMC.

Lessons learned: During the cyclone in January 2022, the project had only offered services to 799 clients (10.6% of the quarterly target). With the resilience strategies, 5,323 clients (71% of the quarterly target) accessed services between February and March 2022. As a result, EMPOWER project achieved an even better quarterly performance both as percent and actual VMMCs in Quarter two of FY22 (6,122 VMMCs, 81% of target,) than in Quarter two of FY21 (5,251 MCs, 70% of target). The EMPOWER project achieved 101% (26,300) of annual target.

Conclusions/Next steps: Systematic use of CQI helped with project implementation during a disaster and contributed to improved results and outcomes for clients. Disaster management plans, good communication within the project and with stakeholders, and flexibility ensured resilience during disaster response. Working with stakeholder to identify opportunities within a disaster is key to unlocking underserved populations.

EPE0801

Involving female sex workers in demand creation for Voluntary Medical Male Circumcision (VMMC) services in Chikwawa district, Malawi

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Background: Jhpiego implements a USAID-funded EMPOWER Voluntary Medical Male Circumcision (VMMC) project in Chikwawa district, collaborating with and strengthening the capacity of a local organization, the Catholic Health Commission (CHC). Jhpiego's CDC-funded Gateway project works with seven Female Sex Workers (FSWs) support groups and over 640 registered FSWs in the Nchalo trading center. FSWs were identified in a unique collaboration between EMPOWER and Gateway, who subsequently created demand for VMMC among their clients and other men in the Chikwawa district. Two FSWs formed parallel groups to drive demand for VMMC services. Using a referral card or a phone call, FSWs referred their clients to the Montfort VMMC clinic.

Description: Between 2021 and 2022, EMPOWER Project utilized 113 community mobilizers (CMs), of whom 44 (40%) were females, assigned to VMMC clinics / sites in their catchment areas. Among the 44 female CMs, 35 (85%) were FSWs. The project used a two-day MOH-Health Education Unit (HEU) training curriculum for CMs to train the FSWs on VMMC demand creation. FSWs were given Interpersonal Communication (IPC) tools that contained

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structured VMMC messages, including HIV risk reduction, better hygiene for men, and cervical cancer risk reduction for women. FSWs created demand for VMMC services as they interacted with men and other women. Every two weeks, FSWs received a stipend and airtime based on the number of clients they mobilized and contributed to VMMCs at EMPOWER supported sites.

Lessons learned: Between October 2021 and September 2022, Community Mobilizers contributed 48% of the 26,546 male circumcisions (MCs) performed. In the same period, the FSWs at Nchalo contributed 27.6% (1080) of the 3,915 clients who received VMMC services at Nchalo. The project achieved 101% (26,300) of annual target for the period between October 2021 and September 2022.

Conclusions/Next steps: The use of FSWs to generate demand for VMMC is both feasible and effective. The Ministry of Health and VMMC implementing partners (IPs) should increase women's awareness and participation in VMMC demand generation, including FSWs. FSWs are already working with men who are the target for VMMC services. Collaborate where synergies across programs exist.

EPE0802

Pharmacist perspectives on the implementation of pharmacist-initiated PrEP in California

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Background: Pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) are essential components of HIV prevention and critical tools for ending the AIDS epidemic. However, despite 10 years of PrEP availability in the US, access to and uptake of PrEP has been lacking. In 2019, California passed Senate Bill 159 (SB159) allowing pharmacists to prescribe up to 60 days of PrEP, as well as PEP. We conducted a statewide survey among California pharmacists assessing the extent which pharmacist prescribing of PrEP/PEP had been implemented.

Methods: California pharmacists were recruited to participate in an online survey through professional pharmacist organizations from October-December 2022.

The survey was guided by the Consolidated Framework for Implementation Research, and asked participants about demographics, knowledge / attitudes toward PrEP/PEP, and barriers and facilitators to PrEP/PEP prescribing

[AD1]. Pharmacists were compensated \$20 for participation and entered into prize drawings for completing the survey.

Results: Of 2,593 survey responses, 919 (35%) were valid (not duplicates or bots). Among these pharmacists (mean age: 39; 64% female), 84% were currently practicing, and of these, 11% reported working in a pharmacy that could initiate PrEP under SB159. Most pharmacists had heard of PrEP (92%) and SB159 (72%), but only 27% had training on PrEP/PEP provision.

While pharmacists reported mixed results with respect to their knowledge and ability to prescribe PrEP, most believed that pharmacist-initiated PrEP and PEP provision was important (96%) and were willing to provide PrEP (81%).

Some pharmacists reported that it would be difficult to conduct the required HIV testing (37%), identify a provider for referral after prescribing a 60-day supply of PrEP (34%), and to assess client eligibility for PrEP (26%). Common barriers to pharmacist PrEP/PEP prescribing were lack of staff time, and appropriate reimbursement for counseling and expanded client care services.

Conclusions: Despite enthusiasm for prescribing of PrEP/PEP among pharmacists, and the urgent need to expand PrEP/PEP access, implementation in California pharmacies remains limited and may be hindered by policy-level and organizational-level barriers.

Efforts to streamline training and initiation requirements and expand implementation through timely reimbursement are key to leveraging the potential of pharmacists to help end California's HIV epidemic.

EPE0803

Incentivized peer referral to increase reach of pharmacy-delivered PrEP and PEP services: findings from a pilot study extension

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Background: As oral HIV pre-exposure prophylaxis (PrEP) is expanded beyond public HIV clinics in Kenya, a key priority is increasing public awareness of its availability in new venues. In a recent pilot study of private pharmacy-delivered PrEP services, nearly half of participants heard about PrEP at pharmacies through informal word-of-mouth referral. During a six-month study extension, we implemented incentivized peer referral to understand clients' willingness to refer peers to pharmacy PrEP services and the population reached with this demand creation strategy.



Methods: Trained pharmacy providers at 12 pharmacies in Kisumu and Kiambu Counties, Kenya delivered HIV PrEP and post-exposure prophylaxis (PEP) services to eligible clients ≥ 18 years.

At follow-up visits, PrEP clients could take up to 5 referral slips to distribute to peers. For each referred peer that completed PrEP/PEP screening at the pharmacy, the referrer received 100 KES (~\$0.80 USD) of airtime.

We report the demographics of pharmacy PrEP clients that engaged in peer referral and the acceptability of peer referral among those referred, which we measured using 5-item Likert-type items based on constructs of the Theoretical Framework of Acceptability (TFA).

Results: From January-July 2022, pharmacy providers delivered PrEP/PEP to 831 clients, 130 (16%) of whom were referred by 77 referrers. Most referred clients classified their referrer as "a close friend" (80%, 104/130) and initiated PrEP (94%, 122/130). Referrer and referee demographics were similar, with ~50% male and <25 years, ~80% unmarried, and ~45% reporting recent transactional sex. Prior to being referred, most referees had heard of PrEP (78%, 101/130) but few had ever taken it (15%, 19/130).

Among referees that initiated PrEP, any continuation was 71% (87/122). Acceptability of peer referral among referees was high, with 98-100% agreeing/strongly agreeing that they liked being referred (TFA: affective attitude), that it was easy to follow through on the referral (TFA: burden), and that peer referral was a good way to connect people to PrEP services (TFA: perceived effectiveness).

Conclusions: Incentivized peer referral is a promising implementation strategy for engaging individuals with HIV risk in pharmacy-delivered PrEP services. More research is needed to assess cost-effectiveness and further optimize this intervention.

EPE0804

HIV self-testing as an entry point to PrEP services in Nigeria

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Background: In November 2021, the World Health Organization recommended HIV self-testing (HIVST) as an approach that could simplify and support pre-exposure prophylaxis (PrEP) delivery, especially in the context of COVID-19. In Nigeria, PrEP is initiated along with facility HIV testing services coupled with testing for HIV breakthrough diagnosis before PrEP refills. Frequent facility visits combined with long waiting times were some of the

barriers to PrEP services uptake. The Unitaid-funded HIV Self Testing in Africa (STAR) project was implemented by Jhpiego Nigeria between 2020-2022. We aim to analyze the impact of HIVST in enhancing PrEP uptake.

Methods: The analysis covers data collected from January 2021 to October 2022 and across 14 states. Clients were provided with HIVST and those who were non-reactive received additional laboratory investigations including confirmatory HTS prior to PrEP initiation. PrEP was provided for eligible individuals from both general and key populations.

At enrolment, eligible clients received counselling on the benefits of immediate enrolment for PrEP. PrEP (combination of 300 mg of TDF and 300 mg of 3TC once daily) was then dispensed for 3 months supply. PrEP was stopped once the discontinuation criteria was met. All relevant demographic and clinical indicators were recorded in HIVST and PrEP registers.

Results: A total of 200,025 HIVST kits were distributed in multiple states and across multiple service delivery models (facility, KP one stop shops, private pharmacy and community). A total of 196,442 (98.2%) reported results, 4,850 (2.5%) were HIVST reactive, 191,592 (97.5%) were HIVST non-reactive. Of these a total of 17,805 (9.3%) clients were initiated on PrEP.



Conclusions: The analysis shows that HIVST could be an effective entry point to promote access to and de-medicalize biomedical HIV prevention and PrEP delivery in Nigeria.

EPE0805

Rethinking DREAMS completion: comparison of approaches in the Zimbabwean context

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Background: In 2021, PEPFAR released guidance introducing more comprehensive criteria for an adolescent girl or young woman (AGYW) to complete DREAMS, and simultaneously emphasizing a public health approach to saturating the vulnerable population of AGYW. Zimbabwe is nearing DREAMS saturation in 10 districts under the former definition of completion, finishing the primary package plus at least one secondary service. As the country implements new guidelines in 2023, we assessed the impact of the new criteria on our ability to maintain saturation among AGYW going forward.

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Description: We examined needs assessment data to estimate the number of services required for AGYW by age and district to complete DREAMS according to new guidance. To see how many AGYW would complete DREAMS in 2023 assuming the same budget level, we applied service delivery data from 2022. We estimated outcomes prioritizing either AGYW with higher needs who require more services, or those with lower needs who require fewer services. We modeled the results forward for 2023 to determine the impact on saturation levels.

Lessons learned: In 2022, AGYW completing the primary package received an average of 1.4 secondary services; analysis of preliminary quarter 1 data shows that AGYW needed, on average, 2.5 services to complete using the new definition. Modeling demonstrates reductions in the number of AGYW who would complete DREAMS and in overall saturation. We found significant differences in completion and saturation depending on whether the program prioritizes highest need (39,701 would complete with 32 districts at saturation) or lowest need AGYW (84,683 would complete with 39 districts at saturation). Using previous completion guidance, 95,780 AGYW would complete DREAMS with 41 of 48 districts at saturation.

Conclusions/Next steps: With current budgets, new completion criteria will reduce the number of AGYW that complete DREAMS in 2023. The new criteria may inadvertently incentivize programs to prioritize low-needs AGYW to achieve saturation. In the Zimbabwean context of high needs among AGYW, the requirement to deliver all services needed by an AGYW in order for her to complete DREAMS is at odds with program objectives to reach the most vulnerable AGYW.

EPE0806

Offering provider and client convenience and efficiency in Zimbabwe with a digital workforce application for VMMC e-referrals and monitoring post-surgical self-care

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Background: Zimbabwe's health system experiences healthcare worker attrition and an overburdened workload for those remaining in the system. PSI and Population Solutions for Health (PSH) co-created a digital workforce app (WFA) to increase operational efficiencies in voluntary medical male circumcision (VMMC) programming for demand creation, client mobilization and referral, post-operative follow-up and adverse events (AE) management.

Description: Since October 2021, PSH piloted WFA, which facilitates community-clinic e-referrals and provider-monitored virtual post-op follow-up care in 5 clinics in 5 provinces. 35 community-based mobilizers registered cli-

ents interested in VMMC into WFA, which issued e-referral codes to be redeemed at VMMC clinics to reduce mobiliser time spent escorting clients in-person to the VMMC clinic. 22 clinicians activated virtual post-op follow-ups for clients through WFA. Standard WFA 2-way messaging via WhatsApp or zero-rated SMS engaged with clients daily for post-op follow-ups for 12 days and then weekly through day 42 post-op, prompting proper wound care, bandage removal, and reporting of AE symptoms.

Providers monitored clients interacting with WFA which automatically notified them by SMS if clients reported AE symptoms or concerns, requested provider follow up, or did not reply to prompts.

Lessons learned: WFA demonstrated strong uptake along demand and service cascades. Clients redeemed 15,616/32,658 (48%) e-referral codes issued. 14,750/23,660 (62%) VMMC clients opted for virtual post-op follow up through monitored self-care in WFA, with 8,138/14,750 (55%) retained in the system for monitored self-care through day 7 post-op. Of 8,138 retained for self-care through WFA, 83% reported "I'm OK" after receiving prompts for reporting AE symptoms, 3% requested repeat instructions from WFA, 4% reported complications and 10% reported concerns for provider follow-up, resulting in providers directly contacting their clients for possible in-person review and management.

Conclusions/Next steps: The WFA increases VMMC services efficiency and convenience for community-clinic referrals and post-op follow services, and for clients and providers by reducing time, travel and transport from in-person follow-ups. WFA is versatile and adaptable for other health services and provider needs along any care continuum.

EPE0807

Sex worker-led health service delivery is effective and needed for reaching unreachable sex workers in Thailand

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Background: The HIV epidemic in Thailand is driven by key populations including sex workers (SWs) who are female (FSW), male (MSW) and transgender (TGSW). SW – particularly TGSW and MSW – have high HIV incidence and are in need of comprehensive HIV services. Those who have never received an HIV test are particularly vulnerable since they are not aware of their HIV status.

Description: SWING, which supports 3 community clinics in Bangkok and Pattaya, is the only community-based organization in Thailand implementing the sex worker-led health service (SWLHS) delivery model to provide HIV/STI prevention, testing, pre- and post-exposure prophylaxis



(PrEP/PEP) and treatment services. Trained SWs use their contextual knowledge and connections, and work with owners and managers of brothels, bars, saunas, and massage parlors, to reach SWs both online and offline. SWING's clinics are where SWs work, offering no-cost HIV services at flexible hours.

Lessons learned: SWING tested 7,453 SWs in 2020, 4,431 in 2021, and 7,487 in 2022. Approximately 20-25% had never received an HIV test. Annual case finding rates among new testers ranged from 10%-15% among MSW, 6%-12% among TGSW, and 0.8% to 3.6% among FSW. Case finding rates for repeat testers were lower than those newly tested: 3%-6% among MSW, 4%-6% among TGSW, and 0.4% to 1.65% among FSW.

Additionally, CD4 counts at diagnosis among SWs at diagnosed at SWING were higher (393-497 copies/mL) than CD4 counts observed in national health facilities (222 copies/mL). 96% of HIV-positive clients initiated antiretroviral treatment. 100% of those receiving viral load testing were virally suppressed.

Conclusions/Next steps: SWING testing data demonstrate the value of a sex worker-led model in reaching previously untested populations of high-risk sex workers. As demonstrated by the higher average CDC counts by SW diagnosed at SWING, the data also validate the effectiveness of the SWLHS model for early case finding and treatment. This model needs to be scaled up - particularly in other urban settings - in Thailand to allow equitable access to services and maintain epidemic control.

EPE0808

The Insika project creates economic resilience opportunities for adolescent girls and young women exposed to HIV

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Background: The Ready, Resourceful, Risk-Aware (Triple-R) project, AKA Insika Ya Kusasa, is supporting the Eswatini government to prevent new HIV infections and reduce vulnerability for orphans and vulnerable children (OVC), adolescent girls, and young women (AGYW). This is achieved through the implementation, of risk-based interventions that increase social-economic resilience among OVC, AGYW, and their caregivers, and increase their uptake of high-impact HIV, sexual and reproductive health, family planning, and gender-based violence services, to reduce HIV risks, poverty, and inequality, by generating sustainable economic strengthening opportunities.

Description: The livelihoods comprehensive package in the Eswatini Insika project encompasses capacity building on entrepreneurship and employability streams, coaching and linkages, savings and lending, and start-up support services. AGYW are recruited into either stream based on their livelihoods' goals, educational background, and interest, and from either stream, are recruited into savings and lending groups.

Targeted start-up in-kind business capital support is provided to AGYW participating in the entrepreneurship stream, following the completion of a curriculum with skills-building sessions. AGYW further receive tailored mentorship on how to achieve their goals. They are also linked to auxiliary services for further support around their goals.

Lessons learned: A total of 34212 AGYW were enrolled into the Livelihoods project in the year 2022. Of these 600 received start-up packs. After 6 months, 570 (95%) of the businesses were still operational and 120 (21%) were already making a profit.



Figure. Insika adolescent entrepreneurship cascade FY 22.

Conclusions/Next steps: The Insika livelihoods project support effectively provided capital for AGYW to start their businesses to build their economic resilience and reduce their vulnerability. Though only 21% were making a profit after 6 months, the majority (95%) were still active and expected to make a profit.

Through mentorship support, this intervention is envisioned to empower AGYW to be economically resilient and reduce their vulnerability to HIV and other social problems resulting from economic instability.

EPE0809

Acquiring and maintaining approvals for syringe services program implementation in rural counties in Kentucky (USA): a qualitative exploration

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Background: Few studies have explored syringe services program (SSP) implementation in rural contexts in the United States and how advocates navigated complex community relationships to achieve and maintain support for the provision of harm reduction services. In Kentucky, state law requires that SSP implementers first acquire approval for program implementation from three entities: the Board of Health at a local health department, county fiscal courts (i.e., the governing body at the county level), and city councils.

Better understanding how advocates acquired and maintained these approvals may inform SSP scale up in other rural jurisdictions.

Methods: In late 2020, we conducted in-depth interviews with eighteen persons involved with rural SSP implementation in Kentucky to explore their experiences acquiring and maintaining approvals for SSP implementation.

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Results: Participants explained that the authorizing legislation for SSP implementation in Kentucky created a layered process in which three bodies had to approve SSP implementation. As a result, sustained educational activities among community members and persons who voted to approve SSP implementation (i.e., voting authorities) about harm reduction services was essential for acquiring and maintaining support for SSP operations in rural Kentucky. Champions for rural SSP implementation had commonalities; many had public health backgrounds and were trusted community members. Humanizing substance use via sharing personal and lived experiences was described as a key component for achieving support for rural SSP implementation.

Conclusions: Our findings make an important contribution to the scientific literature by demonstrating how SSP proponents in rural counties navigated a layered approval process for SSP implementation and complex relationships with community members and voting authorities. Future work is needed to identify strategies for developing community-level understandings of harm reduction services in rural communities with diverse constituencies.

EPE0810

Process mapping to support delivery of long-acting injectable cabotegravir for HIV pre-exposure prophylaxis within public health systems: the ImPrEP CAB Brasil study

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Background: Although long-acting injectable cabotegravir (CAB-LA) PrEP has proven efficacious for HIV prevention in clinical trials, additional research is needed to evaluate effective implementation in real world settings. The ImPrEP CAB-Brasil study will evaluate the feasibility, acceptability, and effectiveness of delivering same-day CAB-LA for HIV prevention in six PrEP public health clinics. Process maps are a diagrammatic representation of organizational processes and are widely used in healthcare quality management and improvement; however, literature is sparse in describing their use to incorporate clinical innovations into routine practice. We used process mapping to operationalize plans for integrating injectable PrEP with existing oral PrEP services.

Description: We used a four-step approach to process mapping: preparation, mapping and analyzing, customization and co-creation, and validation. We first conducted individual interviews with study sites health professionals. Based on these interviews, we created initial pro-

cess maps, customized for each site. Then, we held online meetings with health professionals and peer educators from each site who were encouraged to provide honest and constructive opinions during the discussions, especially about possible barriers/risks to planned models of service delivery.

Finally, we asked the same personnel to validate revised process maps and to ensure there were no missing steps. We applied Business Process Management discipline using Bigazi Modeler Software, version 4.0.

Lessons learned: We created three process maps for each site to describe the initial CAB-LA PrEP user visit, follow-up visits and laboratory flow (18 maps total). Main challenge identified during the process was the duration of visits due to great number of laboratory and HIV counseling steps for the same-day PrEP delivery.

Solutions proposed included:

1. Use of point-of-care HIV rapid tests instead of laboratory tests, which sites expressed the need for additional training to perform it;
2. More staff performing counseling.

Two sites identified the need to expanding clinic hours for the project to better serve the study population, also contributing to oral PrEP scale-up.

Conclusions/Next steps: Process modeling was a powerful tool for planning an injectable PrEP implementation study within Brazilian Public Health System. Continuous monitoring of the implementation of mapped processes will help identify further barriers and solutions to CAB-LA PrEP delivery.

EPE0811

Strategies for scaling up effective programs that meet the HIV prevention needs of adolescent girls and young women beyond the health sector in five sub-districts in South Africa

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Background: Beyond Zero developed and implemented a multi-level intervention providing community-based HIV prevention programs for adolescent girls and young women (AGYW). Services are delivered through sub-recipients in 5 subdistricts in South Africa.

Description: The initial step in the intervention design involved service mapping conducted jointly with the target AGYWs in each sub-district, including focus group discussions and stakeholder mapping. The AGYW defined "where, when, and how they preferred to access services offered." Acceptable locations for service delivery included mobile trucks, door-to-door campaigns, community halls, pop-ups in malls, and community safe spaces. Effective demand creation strategies preferred and designed collaboratively with the AGYW included pop-up events, community events, sporting tournaments, and social gatherings.



A core package of HIV prevention services is provided at each site under the supervision of a professional nurse, with bidirectional referral pathways to local clinics. These include sexual and reproductive health and rights, condoms and lubricants, HIV testing services (HTS) including HIV self-testing, TB screening, STI screening, HIV pre-exposure prophylaxis (PrEP), antiretroviral therapy (ART), and linkage to care. All services are in line with national policy guidelines, with Quality Assurance (QA) procedures, e.g., HIV rapid test QA, Good Pharmaceutical Practices, and onsite data verification.

Lessons learned: The inclusion of AGYW in the program design improved access to services by identifying acceptable locations for service delivery and practical demand-creation activities in each sub-district. Between April to December 2022, more AGYW were reached by prevention services in the community vs. facilities (HTS, initiated and retention on PrEP). Figure 1 summarizes the data by quarter.

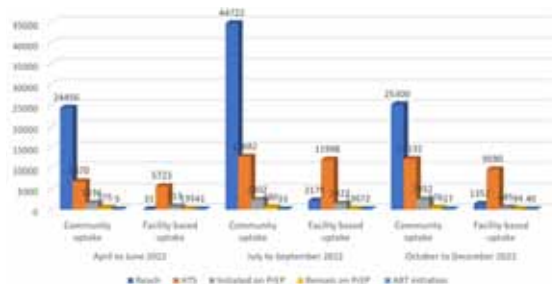


Figure. AYP biomedical services uptake: Q1 to Q3 2022.

Conclusions/Next steps: Our data demonstrate that the involvement of AGYW in the design of service delivery models within the context of each community is important in effectively scaling up programs (HTS, PrEP, and ART) that meet the HIV prevention needs of AGYW beyond the health sector.

EPE0812

High-risk behaviors and factors for acquiring HIV and sexually transmitted infections among adolescent girls and young women in five sub-districts in South Africa

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Background: Adolescent girls and young women (AGYW) are disproportionately at risk of acquiring HIV. Beyond Zero implemented a multi-level intervention providing community-based HIV prevention programs for AGYW through sub-recipients in 5 subdistricts in South Africa. The current study describes the high-risk behavior and self-reported sexually transmitted infections (STI) among AGYW accessing these services between April 2021 to March 2022.

Methods: This is a cross-sectional study analyzing routinely collected programmatic data. All AGYW accessing HIV prevention services are assigned a unique identifier and screened for HIV risk behavior, offered HIV testing, pre-exposure prophylaxis, and other prevention commodities, or linked to structural prevention programs or antiretroviral therapy if indicated. No personal identifying information is captured in the database. Data were descriptively analyzed for HIV risk behavior and self-reported STI symptoms.

Results: 156 975 unique AGYW were reached with a defined package of prevention services (mean age 20.2 years). 44.9% were in high school; 7.8% were in tertiary education; 1.3% were employed; 34.5% were not in any form of employment, education or training; and 11.3% preferred not to say. 61.7% lived in a household receiving a social grant; while 4% lived in a child-headed household. 67.6% were sexually active; with 15.8% of these reporting having a sexual partner 5 or more years older than their age; 54.5% were worried about HIV infection; and 47.4% did not know the HIV status of their partner. 5.9% had more than one sexual partner in the previous 6 months; 7.5% had a partner who had other sexual partners; 55.5% did not use a condom at the last sexual encounter; 1.5% reported that their partner had an STI, and 1.2% reported having STI symptoms in the previous 6 months. 80.3% knew their HIV status, with 1% reporting testing positive for HIV. 2.1% reported having sex in exchange for money or goods in the last 6 months.

Conclusions: This study underscores the increased vulnerability of AGYW in South Africa and the need for sustained interventions that meet the HIV prevention needs of AGYW beyond the health sector and address the remaining structural challenges and barriers to reduce HIV incidence among this group.

EPE0813

Integration of PrEP for pregnancy and postpartum women (PrEP-PP) in antenatal and postnatal care in South Africa: results from an implementation science study

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Background: Pregnant and breastfeeding women (PBFW) in South Africa are at high risk of HIV acquisition and vertical transmission. The national pre-exposure prophylaxis



(PrEP) guidelines were updated to include at risk PBFW in October, 2021. Despite updated guidelines, PrEP availability for PBFW remains limited.

Methods: Between March 2022- March 2023, we evaluated the acceptability and feasibility of integrating PrEP into ante- and postnatal care, after training and mentoring health care workers (HCW) at 8 high HIV prevalence clinics in Cape Town, South Africa. Staff training included: didactic training followed by 2-hour practical training, bi-weekly mentorship by study nurses and counsellors for 6 months, support for monitoring. In-depths interviews were conducted to provide insight into lessons learnt. Results were analysed using the RE-AIM framework.

The primary outcomes were number of HCWs trained and clinics implementing per guidelines. Secondary outcome included number of PBFW initiating and persisting on PrEP at 3-months.

Results: We trained 229 HCWs (including nurses, counsellors, data clerks, pharmacists) of which we mentored 38 nurses/midwives and 13 HIV counsellors to actively provide or counsel PBFW on PrEP.

All 8 clinics trained were still providing PrEP to PBFW at the end of mentorship. In 6-months, of 8072 HIV-negative pregnant women in care, 671 started PrEP (8%) and 195 (29%) continued at 3-months. 70 postpartum women started PrEP and 10 (15%) continued on PrEP at 3-months.

Facilitators included: community PrEP knowledge, motivated managers, available ART-trained nurses and counsellors and provision of mentorship with practical training.

Barriers included: staff shortages and high turnover, overburdened ART-trained nurses, limited integration of maternal and child health care postnatally (resulting in limited postpartum HIV testing).

Conclusions: We identified important facilitators and barriers to integration of PrEP into ante- and postnatal care. Facilitators included brief mentorship of both nurses/midwives and counsellors, and provision of practical training (in addition to didactic training).

Barriers included limited HIV testing of breastfeeding mothers negatively affecting PrEP effectiveness. Integrating PrEP was relatively acceptable by PBFW and relatively feasible from a provider standpoint; however, persistence was low over time. Action is needed for better access to PrEP by ensuring fixed and regular testing of postpartum women.

EPE0814

Preliminary learnings from TelePrEP – Vietnam's first large-scale telehealth program

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Background: Over 60,000 individuals in Vietnam have enrolled in pre-exposure prophylaxis (PrEP) since services were first introduced in 2017. During the 2021 COVID-19 Delta surge, the Ministry of Health (MOH) Vietnam Administration for HIV/AIDS Control (VAAC) and partners rapidly adopted remote PrEP delivery approaches to ensure continuity of HIV preventive care. During this period, 81% of clients indicated desire to continue receiving remote PrEP services. This provided a foundation for initiating Vietnam's first large-scale telehealth PrEP program, "TelePrEP," which addresses barriers to in-person delivery of PrEP.

Description: The USAID/PATH STEPS Project assisted VAAC to design the TelePrEP pilot program through

1. Formulating a TelePrEP pilot protocol and securing MOH approval;
2. Developing technical requirements for providers/clinics;
3. Creating standard operating procedures for TelePrEP service delivery;
4. Creating an application for client-provider interaction and module on the national PrEP reporting system;
5. Training providers and managers;
6. Developing demand generation activities and tools to promote TelePrEP; and
7. Designing a pilot evaluation to inform scale-up.

In June 2022, STEPS supported VAAC to pilot TelePrEP at four key population-led private clinics (Glink and Galant in Ho Chi Minh City; Glink and Alo Care in Dong Nai) and one public clinic at Dong Nai Center for Disease Control. Current PrEP clients are reached through TelePrEP, mobile-PrEP or facility-based PrEP depending on preference.

Lessons learned: From June–December 2022, 3,490 PrEP clients at the five sites were offered the option of transferring to TelePrEP. Of these, 218 (6.2%) have transitioned to TelePrEP (91% aged <35 years old). Clients cited increased convenience, reduced travel times, and improved adherence to PrEP as key benefits of the model, and indicated that TelePrEP should also be offered to new PrEP users to reach more clients who cannot regularly access in-clinic PrEP.

Conclusions/Next steps: The initial results from TelePrEP mark a milestone in Vietnam's efforts to increase the accessibility of PrEP, which historically has been difficult for certain populations to access, including those living far from clinics or facing other barriers to attending in-per-



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son visits. Evidenced-base scale-up of TelePrEP alongside other differentiated PrEP models will be essential for ending AIDS in Vietnam.

EPE0815

Programmatic review of the national scale-up of the HIV oral pre-exposure prophylaxis to public health facilities in South Africa: progress, challenges, and lessons learnt

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Background: South Africa commenced implementing oral PrEP in June 2016, initially focusing on sex workers, men who have sex with men, and adolescent girls and young women. In 2019, South Africa undertook a data-driven approach to scale up oral PrEP services across all public health facilities in an effort to reduce HIV transmission. The oral PrEP implementation targets were informed by population distribution, HIV incidence, prevalence rates (disaggregated by age, and gender), and oral PrEP uptake and continuation data from early PrEP implementation.

Description: A review of PrEP programmatic data was conducted to determine the coverage of public health facilities providing PrEP, and the profile of clients taking up PrEP (age, gender, patterns of use). In addition, NDoH conducted facility visits in 4 provinces to evaluate the models of PrEP delivery, the package of services delivered with PrEP, and the integration of PrEP with existing HIV prevention and SRH services. Interviews with PrEP providers and PrEP clients were also conducted. As of November 2022, of the 3,456 public primary healthcare facilities in South Africa, 2,607 (75%) are currently providing PrEP.

Lessons learned: By November 2022, 792,434 individuals were initiated on PrEP. The majority of PrEP clients are women (75%), aged between 15 to 34 years. Oral PrEP services were delivered using various delivery models, influenced by facility type, human resources, and PrEP client demographics. The package of services provided with oral PrEP varied across facilities with many providing comprehensive SRH services. PrEP providers and clients highlighted successes and areas of improvement to further strengthen PrEP delivery within public health facilities.

Conclusions/Next steps: The review provided valuable insights into the status of PrEP provision and uptake. The high rate of oral PrEP initiation observed amongst women is encouraging and showed that women regarded oral PrEP as a viable HIV prevention method. In addition, the feasibility of integrating oral PrEP into SRH and primary care was demonstrated, thus providing a framework for the integration of other PrEP biomedical HIV prevention products. The experience of South Africa in scaling up oral PrEP in public facilities provides valuable insights for other countries and the introduction of other PrEP products.

EPE0816

Differentiated service delivery for pregnant and breastfeeding young mothers living with HIV to prevent mother to child transmission: lessons learned from an ART clinic in Malawi

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Background: The syndemic of early motherhood and HIV may increase the vulnerability of adolescent mothers and their children, especially in resource-constrained settings. Lighthouse provides special differentiated service delivery (DSD) intervention for pregnant and breastfeeding (PBF) adolescents living with HIV (ALHIV) to prevent mother-to-child transmission (PMTCT) and address multiple challenges affecting young mothers who are pregnant or have children.

Description: The "teen moms" DSD is for ALHIV aged 13-24 who are either pregnant or have a child <24 months. These ALHIV meet monthly on Saturdays for ARV refills, viral load (VL) management, sexual and reproductive health (SRH) services, cervical cancer screening, gender-based violence (GBV) care, and psychosocial counseling. The children are provided nutritional supplements. The health care providers conduct health talks for various topics such as SRH and GBV awareness. The PBF ALHIV are also offered economic empowerment opportunities.

Transitioning out of the program happens when they reach age 24 or the child have turns 2. Some of the transitioning are trained to become mentors of the program.

Lessons learned: Lighthouse Trust Tisungane Family Clinic in Zomba, Malawi has over 7000 clients alive on ART of which 398 are ALHIV. Of these, 44 (11%) are pregnant or breastfeeding and enrolled in the DSD. As of December 2022, all have remained in care and the VL suppression was 95%. Since the inception of the program, none of the exposed children acquired with HIV.

However, the ALHIV experience unique challenges that affect them even after transitioning out of the program. Over 80% are single mothers who conduct transactional sex as a source of income. In addition, majority (70%) did not disclose their status to their sexual partners. Most of the school-aged girls (80%) do not return to school after delivery. Skills training is a priority interest to them and many are reluctant to transition to adult-care due to loss of peer-support.

Conclusions/Next steps: The teen mom DSD is an effective PMTCT intervention, and it provides an opportunity for the PBF ALHIV to have peer support. However, these young women and their children require comprehensive, ongoing support to ensure an improved quality of life.

**EPE0817**

High-risk behaviors and factors for acquiring HIV among men who have sex with men in nine districts in South Africa

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Background: Men who have sex with men (MSM) are disproportionately at risk for acquiring HIV. Beyond Zero developed and implemented a multi-level intervention providing community-based HIV prevention programs for MSM delivered through sub-recipients in 9 rural districts in South Africa.

The current study describes the prevalence of risk behaviors at enrollment for MSM who accessed HIV prevention services between April 2021 to March 2022.

Methods: This is a cross-sectional study analyzing routinely collected programmatic data. All MSM accessing HIV prevention services offered are assigned a unique identifier and screened for HIV risk behavior, offered HIV testing, pre-exposure prophylaxis, other prevention commodities, or linked to structural prevention programs or antiretroviral therapy if indicated.

No personal identifying information is captured into the database. Data were descriptively analyzed for HIV risk behavior and self-reported STI symptoms.

Results: Between April 2021 to March 2022, 73 441 unique MSM were reached with a defined package of prevention services (mean age 31 years). 78.4% reported unprotected sex with a casual partner in the last 6 months; 41.1% reported having multiple concurrent sexual partners; 54% reported a history of alcohol and substance use related to sexual activity; 20.4% engage in transactional sex; and 13.2% reported a previous history of STIs. 11.4% had encountered stigma and discrimination which negatively impacted access to services; 8.3% had experienced intimate partner violence. 28.3% did not know their HIV status; 10.8% did not know the associated risks with different sexual activities; and 42.3% did not use lubrication during sex.

Conclusions: The conclusions from this study include that there is a high-risk and underserved population of MSM in the rural districts of South Africa, and the need for sustained interventions that meet the HIV prevention needs of MSM beyond the health sector and address the remaining behavioral and structural challenges and barriers to reduce HIV incidence among this group.

These data further highlight the need to better characterize the risk factors for HIV prevention and appropriate targeted combination packages of HIV interventions, including biomedical, behavioral, and structural approaches to mitigate HIV risk among these men.

EPE0818

High-risk behaviors and factors for acquiring HIV among transgender people in four districts in South Africa

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Background: Transgender people ("trans" people) are disproportionately at risk for acquiring HIV. Beyond Zero developed and implemented a multi-level intervention providing community-based HIV prevention programs for "trans" people delivered through sub-recipients in 4 rural districts in South Africa.

The current study describes the prevalence of risk behaviors at enrollment for "trans" people who accessed HIV prevention services between April 2021 to March 2022.

Methods: This is a cross-sectional study analyzing routinely collected programmatic data. All "trans" people accessing HIV prevention services offered are assigned a unique identifier and screened for HIV risk behavior, offered HIV testing, pre-exposure prophylaxis, other prevention commodities, or linked to structural prevention programs or antiretroviral therapy if indicated. No personal identifying information is captured into the database. Data were descriptively analyzed for HIV risk behavior and self-reported STI symptoms.

Results: Between April 2021 to March 2022, 4 218 unique "trans" people were reached with a defined package of prevention services (mean age 28.5 years). 60.4% reported unprotected sex with a casual partner in the last 6 months; 8.7% reported having multiple concurrent sexual partners; 30.9% reported a history of alcohol and substance use related to sexual activity; 13.1% engaged in transactional sex; and 4.5% reported a previous history of STIs. 7.8% had encountered stigma and discrimination, which negatively impacted on access to services; 10.4% had experienced intimate partner violence. 21.3% did not know their HIV status; 13.2% did not know the associated risks with different sexual activities; and 37.4% did not use lubrication during sex.

Conclusions: The conclusions from this study include that there is a high-risk and underserved population of "trans" people in the rural districts of South Africa.

These data further highlight the need to better characterize the risk factors for HIV prevention and appropriate targeted combination packages of HIV interventions, including biomedical, behavioral, and structural approaches to mitigate HIV risk among "trans" people.



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**EPE0819**

Feasibility, acceptability, and uptake of remote PrEP care in a real-world setting

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Background: Pre-Exposure Prophylaxis (PrEP) can dramatically reduce HIV infections when taken consistently. However, disparities in PrEP uptake and continuation persist. Remote PrEP follow-up visits may help mitigate structural and practical barriers to PrEP access and facilitate PrEP maintenance.

This study assessed feasibility, acceptability and uptake of remote PrEP care among clients, most of whom are Black and/or Latino MSM, in a real-world clinical setting in the United States.

Methods: From February to December 2022, study staff approached (n=225), screened (n=161), and enrolled (n=60) PrEP program clients at initial and follow-up PrEP visits. Clients who agreed to screening completed a survey that included demographics, comfort-level with specimen self-collection and telehealth visits, ability to receive/send specimen collection kits by mail, and reasons they may or may not be interested in receiving PrEP care remotely. Enrolled participants were those who elected to receive a specimen collection kit by mail and complete a telehealth visit in place of their next three quarterly follow-up visits. Clients were not charged for any PrEP-related care (in-person or remote).

Descriptive statistics included mean and range for continuous variables and frequencies for categorical variables. Bivariate analyses were conducted in R and assessed the relationship between demographic characteristics and enrollment status.

Results: Screened clients were majority white-Hispanic (72.5%) and Black (9.7%). Ninety-eight percent were male and most (62.7%) chose in-person rather than remote PrEP continuation. Clients who were screened but did not choose remote PrEP continuation were less likely to have a stable address than those choosing the remote strategy (p=0.04). Clients choosing in-person care also reported less comfort completing an electronic health assessment and self-collecting specimens than clients choosing remote care (p=0.02; p=0.04 respectively).

Convenience was the most common reason for choosing remote care. Preference for human interaction and discomfort self-collecting blood samples were commonly reported reasons for choosing to continue in-person care.

Conclusions: We demonstrate the feasibility and acceptability of remote visits for PrEP continuation among diverse clients served by a real-world clinic. This mechanism of PrEP delivery may be most appropriate for clients with few barriers to PrEP access and high desire for flexibility in PrEP care.

EPE0820

Effectiveness of a mHealth intervention with short text messages to promote treatment adherence among Mexican people living with HIV: a randomized control trial

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Background: UNAIDS in its latest report has registered over 37.6 million people living with HIV (PLWHIVA) globally in 2020, of whom only 27 million are estimated to have access to antiretroviral treatment. Adherence to treatment is a fundamental pillar to prevent the progression of the disease and increase the healthcare client's life quality. Adherence promotion has been addressed from various approaches, one of which has been reminders with short text messages (Short message service, SMS) that have shown efficacy in various studies.

Thus, we hypothesized that an mHealth type intervention will improve adherence to antiretroviral treatment in adult clients living with HIV compared to standard care.

The objective of this study was to implement and evaluate the effect of the mHealth-type intervention on adherence to antiretroviral treatment in adult clients living with HIV compared to standard care.

Methods: Randomized controlled trial whose universe was the clients who received care at the HIV Unit of the Hospital Civil Fray Antonio, Guadalajara, México. A sample calculated at 40 healthcare clients for each group (intervention and control). Clients who acquired HIV and are starting antiretroviral treatment (ART), whose age is greater than 18 years and who have a mobile device were included in the study. The messages consisted of appointment reminders and adherence and motivational messages over a six-month period.

Results: The intervention group showed greater adherence to treatment than the control group (96% vs 92% p<0.0001). In addition, this group of individuals showed various improvements in their clinical characteristics compared to the control group; among them, lower viral load (141cop/mL vs 2413cop/mL, p< 0.0001) and the tendency to a greater number of TCD4+ lymphocytes (399 vs 290cell/uL, p<0.1526).

These findings allows us to reject the null hypothesis and accept that the intervention improved the adherence of clients who received it compared to standard care.

Conclusions: The results confirm that an mHealth intervention impacts ART adherence, therefore it is important to implement programs based on mobile electronic health which reduces the barrier of distance and increase the healthcare client's commitment to their treatment.

EPE0821

Sustaining HIV service delivery among key populations amidst donor transition: implications for the 90-90-90 country targets

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Background: With eight years remaining to the target end-date 2030, challenges persist within country efforts to realize an HIV/AIDS free generation. This is particularly true for HIV services extended to key populations that were initially not part of the routine standard of HIV care in Uganda.

We explored the experiences of implementing HIV services among key population in the era of donor transition of support in Uganda and its implications to national level ambitions of realizing the 90-90-90 targets in Uganda.

Methods: An exploratory qualitative study was conducted between November 2021 and January 2022 in three districts representing three regions of the country that received donor support. Interviews were conducted among a purposively selected sample of 25 health managers and providers. Data was collected using audio recorders with analysis conducted following a thematic content analysis technique.

Results: Challenges and facilitators to the sustainability of HIV services among key populations were identified. Some donor-supported HIV services were not aligned well with routine standards of HIV care and hence faced challenges to integrating into service delivery post-transition, disruptions of the community component due to the inability to absorb community linkage facilitators who worked with KPs from project contracts to government payroll, unique service utilisation and patient centred care demands for KPs were unmet in routine services due to human resources shortages, variations in the supply of some commodities unique to KP prevention programs which were not often included in the health facility medical supplies received from national medical stores among others. The facilitators included accelerated testing and treatment during times of donor support, improvements in quality of care and health systems strengthening through addressing inherent bottlenecks such as demand side barriers.

Conclusions: Realising the benefits of health systems strengthening after transition calls for critical assessments of health systems capacities and current gaps impeding service access and utilisation among key populations so as to design appropriate strategies for sustainability post-transition.

EPE0822

The impact of community-based Quality Improvement (QI) intervention on viral load (VL) suppression among children and adolescents living with HIV(CALHIV), at Lira Kato HCIII, Agago District

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Background: The Ministry of Health (MOH) standards requires that >95% of CALHIV (0-19) in care should attain Viral Load suppression in order to achieve better quality of life, Viral Load suppression among CALHIV remains a big challenge across the country with suppression at 86% as of June 2022. At Lira Kato HCIII the Viral load suppression as of December, 2021 was 67% which is below the MOH standard. This was attributed to, poor adherence, lack of care giver support, child headed families, elderly caregivers, and unstable family.

Description: Methodology: Through data review and gaps identified, the facility QI team instituted community QI projects with support from USAID LPHS Acholi project to address the associated gaps. CALHIV were grouped into cells of Modified Community Client Led ART Delivery (Modified CCLAD) in their respective villages and supported to select a cell leader, who visits each the non-suppressed child weekly and the suppressed monthly; for psychosocial support, home based Intensive Adherence Counseling (IAC) and Directly Observed Therapy (DOTS) is provided, caregivers meetings are also held.

Results: VL suppression among CALHIV improved from 67% in December 2021 to 93% in June 2022.

Discussion: Engaging the community structures, MCCLAD attachment improved community interactions. The routine weekly visits by cell lead helped in monitoring adherence through DOTS and management of emerging new challenges.

Lessons learned: Provision of psychosocial support, Directly observed Therapy, home-based IAC coupled with ART literacy to the caregivers is an effective intervention in adherence and achieving Viral load suppression.

Conclusions/Next steps: Attachment of the Children and Adolescents living with HIV to Modified Community Client-Led ART Delivery, provision of Directly Observed Therapy, community Intensive Adherence Counseling & caregivers' meetings should be embraced and scaled up to other facilities.



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EPE0823

The effect of the Universal Test and Treat policy uptake on CD4 count testing and incidence of opportunistic infections in Cameroon: retrospective analysis of routine data

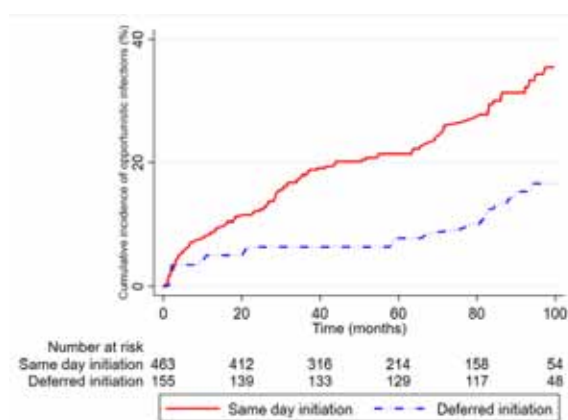
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Background: Cameroon started implementing in 2016, the 'universal test and treat' (UTT) guidelines to fast-track progress towards the 95-95-95 ambitious targets to end the HIV epidemic. We aimed to evaluate the effectiveness of this novel approach on the quality of care and health outcomes of people living with HIV (PLHIV).

Methods: A retrospective cohort design was conducted at The Nkongsamba Regional Hospital, using routine clinical service delivery data to measure uptake levels of UTT and CD4 testing, and to compare the incidence of opportunistic infections (OI) between PLHIV initiated on ART based on the "Universal Test and Treat" strategy and those initiated on ART based on the standard deferred approach. Kaplan Meier plots were used to compare OI events between the pre-UTT and post-UTT eras. The Cox regression model was used to screen for factors independently associated with the risk of acquisition of OI.

Results: The uptake of the UTT policy increased from 39.1% to 92.8% while baseline CD4 count testing reduced drastically from 89.4% to 0.4% between 2016 to 2020 respectively. The median delay in ART initiation declined significantly from 21 days (IQR: 9 – 113) in the pre-UTT era to the same day of diagnosis (IQR: 0 – 2) in the UTT era ($p < 0.001$). The incidence of OIs reported was over five times higher among PLHIV initiated under UTT than those in the pre-UTT era [$aHR = 5.55$ (95%CI: 3.18 – 9.69), $p < 0.001$].



Conclusions: The UTT policy has been effectively rolled out and has contributed to improved access to rapid and immediate ART initiation, but a higher incidence of OIs was observed with a rollback of baseline CD4 testing. We advocate for a return to routine baseline CD4 measure-

ment for a reliable assessment of the immune status before immediate ART initiation, to identify unmasking OIs and better fine-tune the UTT approach.

EPE0824

Characteristics of a target product profile for HIV cure: ex vivo and in vivo gene therapy

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Background: In 2020, the International AIDS Society spearheaded development of a combination therapy target product profile (TPP) for HIV cure. Since 2021, the HIV Cure Africa Acceleration Partnership has expended these efforts to include a TPP for ex vivo and in vivo cell and gene therapy-based cures. The TPP highlights the minimal and optimal characteristics for future cure products, as well as the required infrastructure.

Description: In September 2021, HCAAP convened a diverse group of 33 stakeholders, representing 11 countries, to launch the development of a consultative TPP development process. A second feedback cycle was held in January 2022, leveraging expertise within the Global Gene Therapy Initiative. A series of clinical scenarios were posed to the group to further test different minimum target thresholds.

This feedback informed a multi-stakeholder consensus survey, open for responses for two months (October-November 2022). With a 47% response rate, the initial survey revealed consensus on half of the TPP variables. Where consensus was not achieved – all related to clinical efficacy and safety/tolerability – a second and final survey was disseminated in late January.

Lessons learned: Stakeholders generally agreed on the optimum targets, while debating the minimum targets more extensively. First, stakeholders emphasized that in vivo and ex vivo therapies are points on a single continuum. While they strongly agreed that the aspirational goal is a single shot in vivo gene therapy, it is nonetheless beneficial to envision the current ex vivo paradigm in resource-limited settings to involve PLHIV in the process and establish a development pipeline now, prior to implementation of in vivo therapies. A recurring theme was whether to compare the TPP against the current treatment paradigm. In order to establish a pathway that leads to curative interventions for all, the TPP allows for initial breakthrough therapies that may not be immediately scalable in resource-limited settings. Stakeholders agreed that non-clinical, enabling criteria should be considered to guide product success, outside of the existing TPP variables.



Conclusions/Next steps: Intended to provide continuous guidance for the direction of the HIV cure strategies, the TPP will be updated regularly as gene therapies and technologies are optimized and as accompanying diagnostic technologies and biomarkers emerge.

EPE0825

Intensive Monitoring improve access to pediatric dolutegravir and viral suppression among younger children living with HIV in Nampula province, Mozambique

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Background: Pediatric treatment optimization has improved HIV outcomes for children worldwide. However, for children living with HIV (CLHIV) below 20kg, poor palatability of the pediatric formulation of lopinavir and ritonavir (LPV/r) can lead to poor health outcomes, and by the end of 2021, only 68% of CLHIV aged 0-4 years had viral load (VL) suppression in Nampula Province in Mozambique.

The introduction of pediatric formulation of dolutegravir (pDTG) by the Mozambique Ministry of Health (MOH) in late February 2022 presented an opportunity to overcome this challenge.

Description: ICAP at Columbia University worked in collaboration with MOH at national and subnational level to support pDTG roll-out to CLHIV below 20kg at 59 health facilities (HF) in Nampula Province, including data review to inform the provincial distribution plan, training and mentoring of providers, weekly monitoring of transition among CLHIV attending each HF and monthly monitoring of pediatric formulations and regimen consumption per HF.

Intensive monitoring enabled timely feedback to HF teams on missed opportunities, to readjust stocks and provide targeted technical assistance for HF with slow transition.

We present VL data for the pre- and post-implementation periods to assess preliminary results among CLHIV age 0 to 4 years.

Lessons learned: By March 2022, 64% of CLHIV had already transitioned to pDTG and by May 2022 virtually all CLHIV (99.2%) were on a pDTG-based regimen.

Data from the pre-implementation phase (Dec 2021-Jan 2022) showed that of the 5,179 CLHIV with a VL result, 3,547 (68%) had VL suppression, while post-implementation data (Oct-Nov 2022) indicated 83% (4,922/5,937) had VL suppression, an increase of 22.1%.

Conclusions/Next steps: Close monitoring, timely support for supply chain issues and technical assistance enabled rapid transition to optimized regimens among this vulnerable population, leading to early changes in viral suppression among young CLHIV.

EPE0826

Scaling up rapid linkage to HIV treatment in Los Angeles County using a learning collaborative approach

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Background: The County of Los Angeles Department of Public Health, Division of HIV and STD Programs (DHSP) set a goal to increase the percentage of clients who achieve viral suppression (viral load <200 copies/mL) within 3 months of receiving a positive HIV test result from 55% in 2019 to 70% by 2025.

DHSP's Ending the HIV Epidemic (EHE) plan included the "Rapid and Ready Program (RRP)," a multi-prong strategy to enhance HIV services for newly diagnosed HIV clients including county policy updates, guidance to support rapid appointments, Rapid ART, and additional navigation services. DHSP and CAI's Technical Assistance Provider-innovation network (TAP-in) partnered to strengthen and scale RRP using a learning collaborative approach.

Description: The learning collaborative, grounded in implementation science (IS), was delivered over 9 months to scale up Rapid ART across 7 clinics in Los Angeles.

In the initial stages, two tools were created to standardize and guide the RRP:

1. Diagram highlighting key drivers of sustainable rapid linkage and ART,
2. Capacity assessment detailing current service provision against key drivers.

These tools helped design a learning collaborative that supported clinics in implementing changes necessary to provide rapid appointments and Rapid ART within 2 days of referral.

Learning sessions, action plans, action period webinars, implementation tools (including REDCap for data collection), and monthly coaching comprised the collaborative and supported the clinics in implementing RRP.

Lessons learned:

1. Addressing system-wide facilitators and barriers to implementation at the health department level – financing, medication procurement, client eligibility, contracts – are key to creating an environment for Rapid ART scale up.



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- Evaluation results showed clinic implementation teams found all key components of the learning collaborative helpful to integrating Rapid ART into existing programs, highlighting their synergistic impact on system change and implementation at the clinic level.
- Preliminary data shows that linkage to care within 7 days increased 15% in participating clinics.

Conclusions/Next steps: This learning collaborative is a model to address enduring gaps in linkage to HIV treatment using IS frameworks and tools, which have a practical application in clinical care settings for adoption and scaling of new services across a large and diverse county.

EPE0827

Optimized differentiated service delivery model for children living with HIV: experience from Mwanza, Tanzania

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Background: Achieving optimal treatment outcome among children living with HIV (CLHIV) is a complex challenge. Optimized services to address the needs of CLHIV are necessary to reach the last mile in achieving and sustaining viral load suppression (VLS). In fiscal year 2022(FY22), ICAP supported delivery of differentiated services for CLHIV below 15 years attending pediatric Saturday clinics in Mwanza.

We aim to describe changes in appointment adherence (AA), viral load coverage (VLC) and viral load suppression (VLS) among CLHIV.

Description: Preclinic preparations were done by expert clients who prepared list of appointments and conducted appointment reminders through phone calls. CLHIV files were sorted according to eligibility for various interventions including HIV viral load (HVL) test, adherence counselling, disclosure, antiretroviral therapy (ART) refills, and treatment optimization.

Clinical consultations were preceded by psychosocial sessions provided by health care workers and trained peer educators focusing on disclosure and adherence, followed by HVL sample collection. CLHIV were screened for opportunistic infections, offered appropriate management or prophylaxis and optimal ART regimen. Saturday clinics were equipped to provide edutainment materials and children's games.

We analyzed programmatic data to show changes in the proportion of CLHIV with AA, HVL test results, and VLS as the final outcomes of interest between the first quarter of FY22 (October-December 2021) and the last quarter (July-September 2022).

Lessons learned: CLHIV adherence to clinic appointments was already high and further increased from 95% (3,202/3,377) to 99% (3,335/3,376). The proportion of CLHIV with documented viral load test increased from 89% (2,834/3,194) to 96% (3,038/3,153). Viral load suppression among CLHIV increased from 93% (2,680/2,870) to 96% (2,862/2,989) by the end of the last quarter.

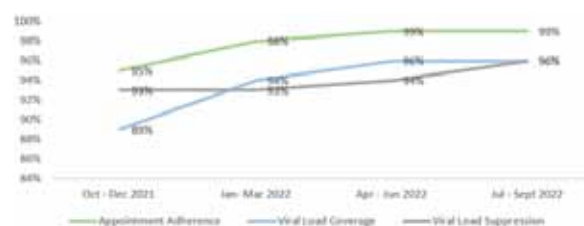


Figure. Appointment adherence, viral load coverage and viral load suppression trend.

Conclusions/Next steps: We have demonstrated how differentiated service delivery models targeting the specific needs of CLHIV have contributed to improved appointment adherence, coverage for viral load testing and viral load suppression.

EPE0828

Cervical cancer screening positivity rate, clinical management and outcomes for women screening positive using visual inspection with acetic acid and cervicography in Manicaland and Midlands provinces, 2022

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Background: Zimbabwe has high cervical cancer (CC) burden of 19% and mortality rate of 64%. Zimbabwe uses Visual Inspection with Acetic Acid and Cervicography (VIAC) for CC screening. Zimbabwe Health Interventions (ZHI) supports government of Zimbabwe to optimize CC screening and treatment among women living with HIV (WLHIV).

Routine program data for Manicaland and Midlands provinces showed low VIAC positivity of 3% (target 5-25% for WLHIV) and treatment coverage of 78% (target=90%) between October 2020 and September 2021.

We assessed VIAC positivity rate and clinical management in Manicaland and Midlands provinces.

Methods: We conducted a retrospective cohort study using VIAC and CC management data for period October 2020 to September 2021.


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Two samples were used i.e.:

1. A representative sample drawn from 48,000 women VIAC screened to measure positivity rate, and;
2. All 1,763 VIAC positive women to assess clinical management. Kobo-based tool was used to abstract data from facility registers, and data were analyzed using STATA. Study was covered by Medical Research Council of Zimbabwe approved non-research determination protocol (MRCZ/E/159).

Results: We analyzed data for 2,454 out of 48,000 women screened through VIAC. About 82% (2,007/2,454) were HIV positive, median ages were 40 and 38 years for HIV positives and negatives respectively. Most (64% and 77%) of HIV positive and negative clients respectively were married. VIAC positivity was 5.9% and 3.4% among HIV positive and negative women screened for the first time, and 3.2% and 5.6% for repeat visits respectively.

Overall, 89.1% (1,571/1,763) of VIAC positive women received treatment. Most (41%) of those treated received thermo-coagulation. Overall, 43.1% of clients received treatment on day of screening, and 77.4% within 30 days. Six-month post-treatment coverage was 3.8%.

Conclusions: VIAC positivity among women living with HIV screened for the first time was 5.9%, within the expected 5-25%; combining data for new and repeat visits in routinely collected data therefore lowered positivity rate. Cervical cancer treatment coverage was high, and turnaround time from diagnosis to treatment met national standards. Post-treatment coverage was suboptimal. We recommend continued implementation of quality improvement initiatives, capacity building of clinicians, and optimization of post-treatment review of clients.

EPE0829

Favorable effect of differentiated models of care on retention in care and viral suppression among adults on antiretroviral treatment: retrospective cohort study in Zambézia Province, Mozambique (2016-2021)

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Background: Differentiated service delivery (DSD) models have been implemented in Mozambique to de-congest health facilities, and promote retention of persons living with HIV (PLHIV) in care.

This study evaluated the effects of two frequently used DSD models (Community Adherence Groups [CAG] and Three Multi-Month Dispensing [3MMD]) on retention in care and viral suppression.

Methods: A cohort study using routine patient-level data was implemented among adults (≥ 15 years) enrolled in ART services between October 2016-September 2020 and eligible for the DSD models, in 147 health facilities (HF) in Zambézia Province. Propensity score matching was used to match PLHIV in CAG to those in 3MMD.

Conditional logistic regression models measured associations between the DSD model and 12-month retention (pick-up within 59 days after last scheduled visit) and viral suppression (viral load $< 1,000$ copies/mL, measured within one year after DSD model enrollment), adjusting by HF location (rural vs urban), DSD model and their interaction.

Results: Data from 46766 PLHIV were collected; 31340 (67%) female, 30512 (65%) registered at rural HF, median age at DSD eligibility 30 years (IQR 24-38). From this cohort, 38118 (82%) PLHIV enrolled in 3MMD, 3129 (7%) in CAG; 5527 (12%) were not included in any DSD. A matched population of 4936 PLHIV were included in retention analysis, and 1610 in viral suppression analysis. The overall 12-month retention was 93% and 94% in the 3MMD and CAG groups, respectively. Viral suppression was 86% overall, 83% for 3MMD and 89% for CAG. In rural areas, the odds of being retained at 12 months was 1.5 times higher for PLHIV in CAG compared to 3MMD (OR 1.50 [95%CI:1.14-1.97], $p=0.003$). PLHIV in CAG in rural areas also had higher odds of being virally suppressed (OR 2.03 [95%CI:1.43-2.88], $p<0.001$). There were no differences among PLHIV in urban areas.



Conclusions: In this cohort, most PLHIV were enrolled in the quarterly dispensation model. Retention in care and viral suppression was high for both models, but advantages were seen for CAG among PLHIV attended in rural areas. Targeted models considering area of service delivery can contribute to maintaining PLHIV in the continuum of care.

EPE0830

Effectiveness of differentiated service delivery models in treatment continuation of ART clients in Manicaland and Midlands provinces, Zimbabwe, 2021

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Background: Differentiated Service Delivery (DSD) is a client centered approach that simplifies and adapts HIV services to reflect clients' preferences and expectations while reducing unnecessary burdens on the health system. There is paucity of data on treatment continuation of clients on antiretroviral therapy (ART) enrolled in each DSD model.

We explored effectiveness of DSD models in treatment continuation of ART clients in Manicaland and Midlands provinces of Zimbabwe.

Description: A retrospective cohort study was conducted among ART clients in Manicaland and Midlands provinces for the period January to December 2021. Eleven Tier 1 (more than 1000 ART clients) and Tier 2 (500-1000 ART clients) sites with functional Electronic Patient Monitoring System (EPMS) were purposively selected. EPMS exports were obtained from sites, and clients who were active on ART as of 1 January 2021 were included.

Data on DSD models were abstracted from facility registers using Kobo and linked with EPMS exports. Stata was used for data analysis and study was covered by Medical Research Council of Zimbabwe approved protocol (MRCZ/E/159).

Lessons learned: 19,030 clients were active on ART as of January 2021 and 16% were in DSD models. In December 2021, 29% of clients were in DSD models. Median ages for clients in Community ART Refill Groups (CARGs) was 51 (IQR 44-49), Facility Club 49 (IQR 41-56), Fast Track 47 (IQR 40-53), Family Refill 43 (IQR 35-51), Adolescent Clinic 17 (IQR 13-21) and Conventional Care 41 (IQR 33-49).

Duration of clients on ART before January 2021 ranged from 5 to 9 years. Most clients in DSD models were enrolled in the Fast-Track model (9.8% and 18% in January

and December 2021 respectively). After 12 months of follow up, those in conventional care had higher attrition (12.3%) than those in Fast Track (4.5%), Adolescent Clinic (8.6%), Family Refill (2.2%) and CARGS (0.2%).

Conclusions/Next steps: Clients in DSD model models had better treatment continuation than those in conventional care. The Fast-Track model was the most common but with inferior treatment continuation compared to other models. We recommend continued roll out of DSD models with superior treatment continuation across all sites as appropriate.

EPE0831

Clinical outcomes of adult clients enrolled in two differentiated antiretroviral refill models in Democratic Republic of the Congo

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Background: Differentiated service delivery (DSD) of HIV antiretroviral (ARV) drugs provides clients options for accessing ARV refills potentially supporting treatment continuation. The Meeting Targets and Maintaining Epidemic Control (EpiC) project in Sakania, Democratic Republic of the Congo, implemented the facility-based fast-track model and out-of-facility private pharmacy model (PPM). Adult clients (18 to 65+ years of age) established on treatment could receive three- or six-month ARV dispensation directly from the health facility pharmacy in between annual clinical reviews (fast-track) or at one of four private pharmacies, returning to the health facility annually for clinical review (PPM). The PPM, a new approach where clients return to the health facility only annually, may raise concerns around care and treatment continuity.

Methods: The fast-track model was implemented in April 2021 and the PPM in May 2021 in three health facilities, and both continued until November 2022. Viral load coverage (VLC) – proportion of eligible clients who receive a viral load (VL) test – and viral load suppression (VLS) – proportion of clients who receive a VL test result of <1000 copies/ml – were compared among clients enrolled in the two models. Routine health facility PEPFAR data were analyzed.

Results: Between November 2021 and October 2022, VLC among clients in the fast-track model was 57.92% (2,095/3,617). Among clients in the PPM, VLC was 61.14% (214/350).

Observed difference in VLC was significant among female clients between the two models (58.41% vs. 65.70% respectively; p-value<0.01), but not among male clients (57.10% vs. 54.55%).



VLS among clients in the fast-track model was 92.08% (1,929/2,095), and 93.46% (200/214) in the PPM. Observed differences were not significant between models nor by sex.

Conclusions: Clinical outcomes among clients in out-of-facility DSD models with only annual interaction with health facilities are not inferior to facility-based models, and the PPM should be offered as another option for clients established on treatment.

Research is needed to understand barriers to VL testing among male clients enrolled in DSD, along with the enablers of accessing VL testing among females enrolled in the PPM and barriers among those in the fast-track model to inform additional strategies to improve VLC among all clients in DSD.

EPE0832

Healthcare provider experience of administering long-acting lenacapavir for people with HIV with heavy treatment experience engaged through a compassionate use program in the United States

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Background: Lenacapavir (LEN) is a first-in-class long-acting HIV-1 capsid inhibitor approved for treating people with heavy treatment experience (HTE) living with multi-drug resistant HIV-1 in combination with other antiretrovirals. Prior to regulatory approval, LEN was accessible only through clinical trials and a manufacturer-sponsored compassionate use (CU) program.

To understand potential barriers and facilitators to real-world use, we explored health care provider (HCP) experiences administering LEN through CU.

Methods: Eleven US CU requests were approved by 11/2022. From 12/2022-1/2023, in-depth interviews were conducted with US-based HCPs who treated at least one individual with LEN. Interviews were conducted virtually, audio-recorded, transcribed and analyzed using rapid qualitative analysis.

Results: Six HCPs treated 6 individuals: 4 with LEN six-monthly subcutaneous injections preceded by 2 weeks of oral loading, and 2 with weekly oral dosing only (due to temporary clinical hold on injectable LEN). Four themes emerged (Table 1):

1. Expectations for LEN;
2. Facilitators and barriers of LEN integration into clinical practice;
3. Perceptions of outcomes;
4. Learnings for scale-up. Prior to administration, HCPs reported muted expectations for clinical outcomes due to LEN's investigational status, although motivated to access LEN given limited options.

HCPs observed that HTE PWH lacked optimism about LEN due to advanced disease status and past difficulties achieving viral suppression. After administering LEN, HCPs highlighted the ease of LEN's twice yearly, subcutaneous injections, facilitating integration into existing workflows. Potential challenges included: limited HCP and PWH LEN clinical knowledge, and variable adherence to optimized background regimens (OBRs). OBR selection was straightforward, guided by resistance and tolerability profiles. LEN yielded positive outcomes, with few side effects, rapid viral suppression, and reports of improved OBR adherence motivated by LEN-associated treatment success. When asked about real-world scale-up, HCPs noted concerns about insurance coverage and a need for HCP- and PWH-facing training materials.

Theme	Relevant quotes
Expectations for LEN	<p>"I did not expect that we were going to suppress him in any meaningful way. But it was just really a shot in the dark and then whatever game we got, I want to take it." - HCP005</p> <p>"we need a Hail Mary here" - HCP001</p> <p>"we didn't know what to expect because it was like I said, I mean, this was truly our last option [...] we just had our fingers crossed" - HCP003</p>
Facilitators and barriers of LEN integration	<p>"...the every six month administration is huge... less taxing for the clinic as well" - HCP002</p> <p>"we have facility with injectable type drugs, and it's kind of already sort of part of our workflow to deal with that kind of situation" - HCP001</p> <p>"...her virus was still responsive to [specific ARVs] ...we just maintained that as the anchor I guess you could say. And then just adding on other things kind of as a salvage regimen type of thing." - HCP001</p>
Perception of HTE PWH outcomes	<p>"...the fact that [HTE PWH receiving injectable LEN] got to undetectable is, you know, very impressive... and so I think it's a really potent, good drug... [HTE PWH receiving injectable LEN] loves it" - HCP002</p> <p>"she took those three tablets of lenacapavir, her T cells went up...to 92.8%. Which I know it doesn't mean that she's cured or anything, but it's a significant increase" - HCP004</p> <p>"All I can say is, I think it's a miracle drug." - HCP005</p>
Learnings for LEN scale up	<p>"I think many providers are very hesitant to jump to products like this too soon. But I think that the risk of that outweighs it, that if you wait too long, then you run into this patient where they're resistant to everything. So I think maybe some kind of like cases or example patients of who is this appropriate for" - HCP003</p> <p>"[The manufacturer] can do a lot to alleviate that, the appropriately placed communications and education of how to how to afford it, when to prescribe it, how to administer it, and how easy it is to get access to if needed" - HCP005</p>

Conclusions: After initial uncertainty, HCPs expressed enthusiasm for LEN for people with limited treatment options; HCPs also identified a need for additional resources to support real-world use of LEN.

**EPE0833****Consistency of multi-month antiretroviral therapy dispensing and association with viral load coverage and suppression among pediatric clients in Mozambique**

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Background: Multi-month dispensing (MMD) of antiretroviral therapy (ART) has increased dramatically in recent years among children. However, little is known about consistency of MMD receipt over time and its association with virological outcomes.

Methods: We conducted a secondary analysis of individual-level data from routine HIV services at 16 high-volume facilities in Gaza and Inhambane provinces. Children <15 years living with HIV with clinical visit September 2019–August 2020 were enrolled. Data were abstracted on clinical history, visits, ART pickups, and viral load (VL) monitoring from enrollment through August 2021.

We analyzed the proportion of children ever receiving 3-month MMD, proportion receiving consistent MMD (3 month supply at all pickups the following year), and VL coverage and suppression (<1,000 copies/mL) after transition to MMD.

Results: In total, 4,383 children were included in analysis, 82% of whom ever received MMD during the study period. Older children were significantly more likely to have received MMD. Compared to ages 0–4 years, children 5–9 years had 3.8 times the odds of receiving MMD (95% CI: 3.2–4.6), and those ages 10–14 years had 7.6 times the odds of MMD (95% CI: 6.1–9.6). Among children ever receiving MMD, 40% received consistent MMD, primarily children ages 10–14 (48%). Of children with 12 months of follow-up on MMD (N=1851), 40% had a VL within that year. In a model adjusted for age and sex, consistent MMD was significantly associated with lower odds of having a VL (0.8, 95% CI: 0.6–0.9). Of children with VL, 185 (21%) had an unsuppressed VL result ≥6 months after first MMD; this was most common among children ages 0–4 (37%). Children with an unsuppressed VL were significantly less likely to receive consistent MMD (17% versus 33% of those virally suppressed).

Conclusions: While most children received MMD, fewer than half received MMD consistently. More information is needed on drivers of dispensing practices, including service implementation gaps (such as stockouts), client/provider preferences, and clinical contraindications for MMD. Those who received consistent MMD were significantly less likely to have a VL; attention is needed to ensure children with fewer visits still receive timely VL monitoring.

EPE0834**Continuity of treatment interventions impact on appointment-completion in Mubende region, Uganda, 2022**

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Background: Regular clinic appointments for people living with HIV (PLHIV) are key for clinical services, including antiretroviral therapy (ART) refills. In Mubende Region (Uganda), monthly reports from the District Health Information System (DHIS 2) indicated high missed appointment rates during January–May 2022.

We examined the impact of continuity in treatment (COT) interventions on appointment completion.

Methods: We purposively selected seven high-volume clinics that provided ART to ≥20% of a district's total PLHIV on ART. The COT intervention included: weekly data reviews, appointment reminders, same-day phone call follow-up and home visits by community resource persons a day after missing an appointment.

We retrospectively reviewed attendance registers comparing pre-intervention (January 3–May 15), and intervention (May 16–July 31) time-periods.

We analyzed weekly rates of missed appointments as a proportion of PLHIV who did not complete appointments by close of the week out of those scheduled. Analysis was by segmented regression of interrupted time series with Newey-West standard errors to accommodate for serial autocorrelation.

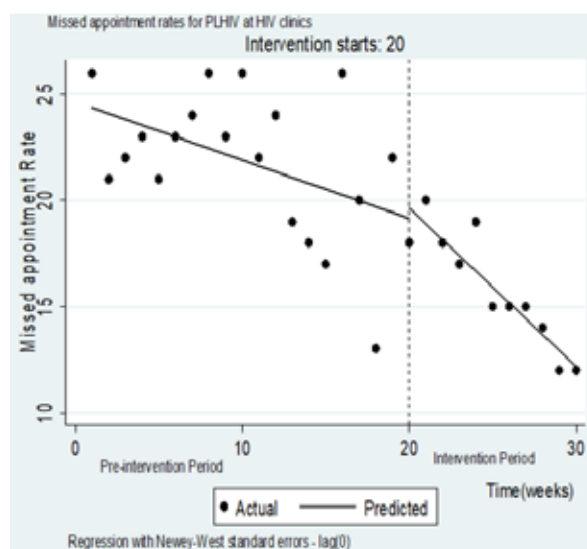


Figure: Time series of rates of missed appointments in Mubende region, Uganda, from January 3 - July 31, 2022.

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Results: During pre-intervention, 26% of PLHIV (516/1,985) missed appointments; weekly missed appointment rates were stable across weeks (-0.3%; 95% Confidence Interval [CI]: -0.58, 0.03; $p=0.08$). During intervention, 17% of PLHIV (296/1,741) missed appointments.

At the start of intervention (May 16-22), there was a non-significant level increase in missed appointment rate (0.5%; 95% CI: -3.89, 4.85; $p=0.82$).

Across weeks, the missed appointment rate declined significantly compared to pre-intervention period (-0.5%; 95% CI: -0.8, -0.1; $p=0.015$). Overall, the missed appointment rate declined by -0.7% per week (95% CI: -0.9, -0.5, $p<0.0001$) during intervention period.

Conclusions: The COT interventions improved PLHIV appointment completion. Data-focused interventions, regular data reviews, pre-appointment reminders and missed appointment follow-ups will help to improve COT in Mubende Region and beyond.

EPE0835

Assessment of the awareness of Undetectable=Untransmissible (U=U) messaging among people living with HIV in six regions in Tanzania, 2022

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Background: People living with HIV (PLHIV) who achieve an undetectable viral load by taking antiretroviral therapy (ART) as prescribed are unlikely to sexually transmit the virus, this message is commonly known as Undetectable = Untransmittable (U=U). There has been global movement to promote U=U to address HIV treatment as prevention, continuity of care, and reduce HIV-related stigma. U=U message has been implemented to varying degrees across selected regions in Tanzania but lack data on the reach of U=U messaging among PLHIV.

Methods: A cross-sectional, facility-based survey was rapidly conducted between August- September 2022 in six regions in mainland Tanzania and Zanzibar. A total of 106 out of 703 health facilities were randomly selected. From these, 1,198 PLHIV aged 18 years and above were identified and participated in the structured exit-interviews to assess awareness (i.e., ever heard) of U=U message. Modified Poisson regression models accounting for facility clustering were used to assess correlates of awareness. We estimated prevalence ratios (PR) and their corresponding 95% confidence intervals (95% CI).

Results: Overall, 31% of PLHIV had ever heard of the U=U message. The majority of PLHIV (75%) were exposed to U=U message through health facilities. The likelihood of U=U message awareness was higher in Kigoma compared to Dar es Salaam region [aPR: 1.76, CI:1.22-2.53] and among PLHIV aged 25-49 years [aPR:1.35, CI:1.08-1.67] compared to those aged 18-24 years. PLHIV with no formal education were less likely to be aware of U=U messaging [aPR: 0.45, CI:0.30-0.67].

Conclusions: Our results serve as a baseline to inform and evaluate the programmatic scale-up of U=U among PLHIV in Tanzania. This assessment demonstrated low exposure to U=U messaging among PLHIV especially among young adults and with no formal education which points to the need for stronger U=U promotion through diverse communication channels.

EPE0836

Modelling the potential impact of scaling-up point-of-care HIV viral load testing on the HIV epidemic and drug resistance in Papua New Guinea

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Background: Scaling-up point-of-care (POC) testing for early identification of unsuppressed HIV viral load (VL) is recommended by the WHO and could improve health outcomes in Papua New Guinea (PNG), where HIV prevalence and drug resistance are high. Mathematical modelling was used to assess the potential impact of scaling-up POC VL testing on the overall HIV and the prevalence of drug resistance (DR) in PNG.

Methods: A compartmental model was created to simulate the HIV epidemiology among people aged 15 years and older in PNG, from 1994 to 2030. Four VL testing scenarios were compared:

1. Central laboratory testing (reference case);
2. Continued POC VL testing at current ACT-UP PNG study sites;
3. Expanding POC VL testing coverage with twice the number of people having access, and;
4. Expanding POC VL testing coverage with three times the number having access.

Preliminary data from the ACT-UP PNG study informed adherence counselling effectiveness and annual POC VL testing rate. We assumed no change in the rate of drug resistance detection.



Results: Under Scenario 1, 86.2% of those on antiretroviral therapy would be virally suppressed, and 7,990 people would experience virological failure in 2030. The number experiencing virological failure in 2030 was estimated to reduce to 6,744 (15.6% decline), 5,656 (29.2% decline) and 4,821 (39.7% decline) people for scenarios 2, 3 and 4, respectively. Between 2022 and 2030, scenarios 2, 3 and 4 led to reductions of 555 (4.1%), 1106 (8.1%) and 1,590 (11.7%) new drug-resistant cases averted compared to scenario 1, respectively. In 2019, 9.9% of all people with HIV were estimated to have DR. In 2030, POC VL testing would reduce DR prevalence among people with HIV from 21.2% in scenario 1 to 20.6%, 20.0% and 19.5% in scenarios 2, 3 and 4, respectively.

Conclusions: Scaling up point-of-care viral load testing would reduce the incidence of virological failure and slow the growth of drug-resistant HIV in PNG, improving health outcomes for those living with HIV. Further studies are required to fully understand the impact and overall cost-effectiveness of POC VL scale-up and to examine the impact of drug-resistance testing for HIV in PNG.

EPE0837

Mobile units improve HIV testing, ART initiation and treatment continuation among men who have sex with men in Nampula Province, Mozambique

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Background: Key populations (KP) have reduced access to HIV prevention and care and treatment (C&T) services in Mozambique. To improve access and outcomes among KP in Nampula, particularly men who have sex with men (MSM), ICAP worked closely with provincial health authorities (DPS/SPS) and KP-led community partners to implement community-based HIV prevention and C&T services.

Description: Since September 2020, ICAP has collaborated with DPS/SPS and the KP-led community organization Lambda, to offer community-based HIV prevention and C&T services integrated with general health services for MSM, through mobile units (MU). The MU teams provide services at geographic locations selected to reach KP, including KP venues in communities near 13 health facilities (HF) in 10 districts, and the Lambda office, where services are integrated with peer support and health literacy workshops. These locations are within catchment areas and data are reported through the HF. Lambda peer educators work within MSM groups and at gatherings to create demand and escort MSM clients to MU during day and night services.

Lessons learned: Between April-September 2021 and April-September 2022, there was a 41% (207/147) increase in HIV testing, a 62% (791/489) increase in case identification, a 73% (390/226) increase in antiretroviral therapy (ART) initiation and a 124% (2,627/1,174) increase in the number of MSM living with HIV currently receiving treatment through all service delivery models. During the same periods, the MU contribution to HF performance increased from 19% (94/489) to 38% (301/791) in HIV testing, 12% (18/147) to 27% (55/207) in case identification, 7% (16/226) to 25% (98/390) in ART initiation and 14% (163/1,174) to 21% (562/2,627) in treatment continuation.

Conclusions/Next steps: Adapting service delivery models to respond to clients' needs and bring services closer to them is essential to reach KP. Implementing MU at the community level improved access to health services for MSM in Nampula.

The involvement of KP-led organizations is essential to understand needs and preferences, support service design, and create demand for services.

EPE0838

Peer-led differentiated support services and HIV treatment outcomes among people living with HIV in China: a propensity-score matched study between 2006-2021

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Background: Community-based organizations (CBOs) deliver peer-led differentiated support services to people living with HIV (PLHIV). Systematic reviews have found peer-led differentiated support services can improve HIV treatment outcomes, however few studies have been implemented to evaluate impact on mortality using long-term follow-up data.

We aimed to evaluate associations between receipt of peer-led differentiated support services and HIV treatment outcomes and survival among PLHIV in China.

Methods: We performed a propensity score matched retrospective cohort study using data collected from the Chinese National HIV/AIDS Comprehensive Information Management System for PLHIV in Wuxi, China between 2006-2021.

PLHIV who received adjunctive peer-led differentiated support for at least 6 months from a local CBO (exposure group) were matched to PLHIV who only received routine clinic-based HIV care (control group). We compared differences in HIV treatment outcomes and survival between these two groups using Kaplan-Meier curves.

We used competing risk and cox proportional hazards models to assess correlates of AIDS-related mortality (ARM) and all-cause mortality. We reported adjusted sub-distribution hazard ratios (aSHR) and hazard ratios (aHR) with 95% confidence intervals (CIs).



Results: A total of 860 PLHIV were included (430 in exposure group, 430 in control group). Exposure group was more likely to adhere to antiretroviral therapy (ART) (92.1% vs. 83.7%, $P<.001$), remain retained in care 12 months after ART initiation (93.5% vs. 76.1%, $P<.001$), and achieve viral suppression 9-24 months after ART initiation (93.7% vs. 89.3%, $P=0.048$) compared to control group. Exposure group had significantly lower ARM (1.8 vs. 7.0 per 1000 person-years, $P=0.01$) and all-cause mortality (2.3 vs. 9.3 per 1000 person-years, $P=.002$), and significantly higher cumulative survival rates ($P=.002$). Exposure group had a 72% reduction in AMR (aSHR=0.28, 95%CI: 0.09-0.95) and a 70% reduction in all-cause mortality (aHR=0.30, 95%CI: 0.11-0.82).

Conclusions: Receipt of peer-led differentiated support services correlated with significantly improved HIV treatment outcomes and survival among PLHIV in a middle-income country in Asia.

The 15-year follow up period in this study allowed us to identify associations with survival not previously reported in the literature. Future interventional trials are needed to confirm these findings.

EPE0839

Remind me, track my mood and I will adhere to treatment

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Background: The KidzAlive@Home app aims to improve adherence among children and adolescents living with HIV (C/ALHIV) using a mHealth approach. The app targets children and adolescents who are newly diagnosed, on treatment, and/or non-adherent, and features reminders for medication and mood tracking. Caregivers can access a daily report of the child's progress. This mHealth intervention addresses forgetfulness and limited knowledge to improve health outcomes for C/ALHIV.

Description: Period: July 2020 to present

Setting/Location: Households in KwaZulu-Natal, South Africa.

Structure: Ideation and App design for promoting adherence at home for C/ALHIV using their primary caregiver's (PCGs) smartphones.

Activities:

- Focus group sessions were conducted with PCGs and healthcare workers (HCWs) to gather relevant data on self-management barriers.
- Design of app prototype with wireframes and high-fidelity designs, tested and feedback informed API and data dashboard development.
- User Acceptance Testing with 12 participants for feedback before beta testing.
- Beta testing the minimum viable product with 50 households for 12 weeks.

Lessons learned: Limited focus on promoting adherence among C/ALHIV in existing mHealth apps. Need for developmentally appropriate mHealth interventions. Lack of mHealth examples to benchmark for this population.

Best Practices: Evidence-based design and evaluations critical in mHealth app development. Core development must include key stakeholders (children, PCGs, HCWs). KidzAlive@Home app demonstrates that incorporating child-centred and interactive features can promote adherence; therefore improving outcomes.

Conclusions/Next steps: The KidzAlive@Home app is a cutting-edge solution that tackles the crucial challenge of adherence among C/ALHIV. The app utilises a child-centred, psychosocial approach, leveraging technology to empower C/ALHIV to take control of their own health. It addresses the need for a bridge between the clinic and home, providing appropriate reminders, tracking emotional well-being, and physical health, and promoting overall health outcomes. The app highlights the significance of designing mHealth interventions that are developmentally appropriate and based on evidence, leading to improved adherence and health outcomes for children and adolescents.

The fun interactive features of the app empower children and adolescents to play an active role in their health and has the potential to improve the quality of life for this population. "Remind me, track my mood and I will adhere to treatment."

EPE0840

Theoretical preferences for long-acting injectable ART among mobile men living with HIV in Malawi: a qualitative study

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Background: Long-acting injectable (LAI) antiretroviral medications may be an ideal treatment option for highly mobile people, including mobile men living with HIV (MLHIV) in sub-Saharan Africa, who experience challenges with ART engagement. We explore mobile MLHIV preferences for a theoretical LAI option in Malawi.

Methods: We conducted a qualitative sub-study embedded within two trials (ENGAGE and IDEAL) aimed at improving ART outcomes among MLHIV in 24 health facilities in Malawi. Eligibility criteria were: MLHIV; ≥ 15 years; and not actively on ART at time of enrollment. We conducted in-depth interviews with men who self-reported being mobile during the 6-month study period (defined as at least one trip of three nights or more), derived from trial follow-up surveys.

We used a stratified sampling frame and randomly selected mobile men by study arm, geographic region, and self-reported ART experience during the trial (i.e., started



and retained on ART during parent trial or not). Interviews included a description of a theoretical, bimonthly LAI and questions about client preference for LAI or oral ART. Interviews were translated, transcribed, coded in Atlas.ti, and analyzed using framework analysis.

Results: We interviewed 29 mobile MLHIV from 1 July to 30 August 2022, median age 36 (IQR:31-41); 34% attended any secondary school; all had previously initiated oral ART. Nearly all participants (26/29) expressed a theoretical preference for LAI over daily oral ART because they believed LAI would reduce the risk of forgetting pills (n=16), general pill fatigue (n=6), unwanted disclosure (n=5), and logistical challenges of traveling with oral ART (n=4). Of the three men who preferred oral ART, the most common reason was fear of side effects from a new medication.

Most men were not concerned about injection site reactions (19/26); however, some (7/26) said long-lasting pain might change their preference, especially if it prevented them from working.

Conclusions: Mobile MLHIV who experienced treatment interruption expressed strong theoretical preferences for LAI ART.

Further research is needed on how to expand access to LAIs, including those in resource-constrained settings, and how to best implement LAI among harder to reach populations such as mobile men who struggle with daily oral ART.

EPE0841

Lessons learned from pilot implementation of Cryptococcal Meningitis (CM) care package for people with advanced HIV (AHD) in Delhi, India

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Background: AHD refers to people living with HIV with CD4 <200 cells/mm³, WHO HIV Stage 3/4, or age below 5 years. In India, 35%-40% of people living with HIV register in care with CD4<200 cells/mm³ and are more susceptible to OIs like CM. To address this, the National AIDS Control Program (NACP) included AHD management packages of care in National guidelines in 2021. However, these packages are yet to be adopted at ART centres.

In September 2022, the CM AHD care package was piloted at a Centre of Excellence in Delhi to inform national implementation via documented learnings and create standard operating procedures.

Description: Cryptococcal antigen lateral flow assay (CrAg LFA) and CM medications (fluconazole, flucytosine, L-AmB) were donated to the facility. Operational protocols and reporting systems were created, and healthcare workers were trained. Adults with AHD were tested us-

ing CrAg LFA, and accordingly given CM management/prophylaxis. Prevalence, uptake, health outcomes, and implementational challenges were documented utilizing aggregate data reported by the facility. Within four months, 1,504 people living with HIV underwent CD4 testing, of whom 255 (17%) had CD4 <200 cells/mm³. 122 (48%) of these 255 people with AHD were screened via Serum CrAg LFA, with 2 testing positive and receiving fluconazole prophylaxis.

Lessons learned: Linking people with CD4<200 cells/mm³ to CM screening was challenging due to long turnaround times (TAT) of CD4 tests, inability to schedule a quicker revisitation, and difficulty tracking people with pending tests during visitation. For mitigation, tracking mechanisms were strengthened by distinguishing AHD records using stickers and separate stacks, and assigning staff roles for client-tracking. Pre-test counselling was improved to encourage faster screening. AHD-tracking line lists were created to optimize reporting and ensure follow-up.

Conclusions/Next steps: While the pilot is ongoing, preliminary data and learnings suggest that differentiated care for people with AHD in India would be beneficial. The national scale-up of the recommended AHD package should be accompanied by capacity building, defined modus operandi, incorporation of AHD metrics in national reporting systems, and procurement of optimal commodities.

Additionally, strategies to reduce TAT of CD4 testing and optimize physical and virtual client tracking should be explored.

EPE0842

Client preference and viral suppression rate among PLHIVs enrolled to community based differentiated ART refill group models in Ethiopia

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Background: Differentiated service delivery (DSD) is a person-centered approach to HIV service delivery. As part of the USAID/PEPFAR-funded Community HIV Care and Treatment (CHCT) activity, Project HOPE provides technical assistance to local implementing partners to adopt two community-based DSD models: peer lead ART distribution (PCAD) and Health extension professional managed ART refill group (HEP_CAG) to simplify HIV care and treatment service in Ethiopia.

This abstract summarizes client preference and viral suppression status among clients enrolled in these two models.

Description: Demand creation was conducted at community and health facility levels and eligible clients were enrolled into PCAD or HEP_CAG models from Oct 2020 to


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Dec 2022. Peer leaders and HEP collected the drugs on behalf of group members, distributed the drugs, and conducted adherence assessments during refills. The ComCare application was used for electronic data collection and data quality checking.

Prospective comparative analysis was conducted to see client's model preference and viral load suppression status using Excel and STATA software version-13.

Lessons learned: A total of 15,321 clients enrolled in PCAD and HEP_CAG. Of these, 11,834 (77%) were females. 10,372 (68%) (95% CI: 67.9 to 68.1) of the clients were recruited from community sources and the rest (4,949, or 32%) (95% CI: 31.9 to 32.1) from health facilities.

More than half (9,056 or 59%) (95% CI: 58.9 to 59.1) of the clients preferred and enrolled in PCAD and the rest (6,263, or 41%) (95% CI: 40.9 to 41.1) preferred HEP_CAG.

One third (4,794, or 31%) were from Amhara region, followed by 3,705 (25%) Addis Ababa; 3,680 (24 %) Oromia; 1,602 (10%) Gambela and 1,540 (10%) SNNP.

Recent viral load test results were available for 4,289 clients; of these, 2,470 (58%) were from PCAD and 1,819 (42%) were from HEP_CAG. The results were suppressed for 4276 clients (99.7%). The suppression rate was 99.8 % for PCAD and 99.5% for HEP_CAG clients.

Conclusions/Next steps: Results showed that more clients preferred PCAD than HEP_CAG and high viral load suppression rates were observed for both groups.

We recommend the scale up of community-based DSD models to improve adherence, retention and attain high rate of viral suppression towards epidemic control in Ethiopia.

EPE0843

Improving multi-month dispensing of antiretroviral therapy at the Mulago most at risk populations initiative clinic, Uganda

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Background: Multi-month-dispensing (MMD) of antiretroviral therapy (ART) as a differentiated service delivery strategy has been shown to reduce frequency of appointments for stable patients at health facilities, cut expenses, improve continuity of treatment (CoT) and reduce facility workload. In Uganda, people living with HIV with viral load suppression (VLS) <1,000 copies/mL are eligible for MMD.

With funding from CDC-PEPFAR, the Infectious Diseases Institute (IDI) supported the Mulago Most-at-Risk-Populations Initiative (MARPI) clinic, which serves key populations, to improve weekly proportion of clients given MMD.

Description: We analyzed data submitted for May - September 2022, weeks 26 - 44 from the Uganda CoT dashboard to monitor weekly trends in the proportion of clients visiting and receiving MMD at MARPI. At inception, we designed and rolled-out a tool for evaluating reasons for not achieving the MoH 90% MMD target. During weeks 26-44, the IDI technical team conducted biweekly supportive supervision visits. Initial strategies introduced during Week 30 included: weekly reminders for clinicians to give MMD to all eligible patients (suppressed VL and >3-months on ART); continuing MMD while waiting for viral load test results; and offering MMD to PLHIV returning after interruption in treatment with a follow-up VL test at 3 months.

Later strategies introduced during Week 37 included: pharmacy dispenser double-checking reasons for denied MMD on patient's prescription form before PLHIV exits the facility; and considering MMD for PLHIV with concurrent illnesses or non-communicable diseases on case-by-case basis.

Lessons learned: A total of 2,196 PLHIV attended MARPI clinic during the review period. Of these 68% were female, on average weekly attendance was 120 PLHIV, and VLS rate was >90%.

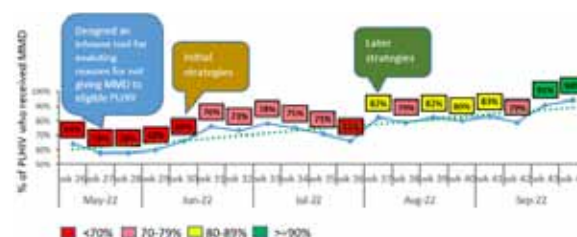


Figure. Weekly proportion of PLHIV at MARPI clinic who received MMD.

Conclusions/Next steps: MMD at Mulago MARPI clinic improved as a result of a combination of strategies. Continuous supportive supervision was vital to ensure quality of implementation. These innovations will be brought to scale at other IDI supported sites.

**EPE0844****Operation triple zero (OTZ): Implementation of an asset-based approach to improve viral load suppression among adolescents and young persons in Kenya, 2017-2021**

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Background: According to the Kenya Population-based HIV Impact Assessment (KENPHIA) 2018, only 70.6% of the 99,860 adolescents and young people living with HIV (AYPLHIV) were aware of their status, and among these, 93.1% were on treatment, and 79.2% had achieved viral load suppression (VLS).

Asset-based models focus on adolescent strengths and promote an intrinsic desire to achieve good health outcomes among AYPLHIV.

Operation Triple Zero (OTZ) is anchored on this principle and encourages adolescents to achieve zero missed appointments, zero missed medication, and to attain zero viral load (VL).

We describe results of viral suppression, adherence and retention among AYPLHIV 10-24 yrs enrolled in OTZ, 2017-2021.

Methods: Data were abstracted from OTZ registers at 20 health facilities. We analysed baseline and endline VL, re-suppression and sustained suppression rates.

We tested for the independence of proportions for categorical variables using Pearson's Chi-square test and compared characteristics at baseline (enrolment to the OTZ program) to the end-line using the McNemar Chi-square test.

Results: Of the 1569 AYPLHIV enrolled in OTZ at the 20 early adopter sites, 1372 (84.4%) had complete records of age, sex, OTZ enrolment dates, and follow-up viral load results. Of these, 53.1% were females.

The median age was 15.9 years [interquartile range, 10-20 years]. Overall VLS improved from a baseline of 72.7% to 88.5% ($p < 0.001$). Retention in care was 94% compared to baseline of 63%. AYPLHIV in OTZ reporting satisfactory adherence had higher VLS (93%) than those with non-satisfactory adherence (68%), $p < 0.001$.

Of the 958 AYPLHIV who were virally suppressed at baseline, 92.4% (885) sustained viral suppression through 2021. Sustained suppression was comparable between females and males (91.9% and 92.9%, respectively). AYPLHIV on once-a-day dosing of Dolutegravir (DTG) or Atazanavir (ATV/r) had 100% sustained suppression.

Of the 282 viremic AYPLHIV at baseline, the re-suppression rate was 78.3%. AYPLHIV on Lopinavir and those reporting satisfactory adherence had a higher re-suppression rate of 82% and 87%, respectively.

Conclusions: Implementing the asset-based OTZ program improved adherence, retention, and viral load suppression among AYPLHIV at early-adopter sites. This strategy has a potential of accelerating progress towards achieving and sustaining of epidemic control for AYPLHIV.

EPE0845**Accelerating achievement of the 95-95-95 targets using a paediatric and adolescent matrix of interventions**

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Background: Although South Africa has made progress towards achievement of the 95-95-95 targets in the overall population, a notable gap in HIV testing and treatment of children and adolescents remains.

Within the public sector, HIV treatment services are provided through approximately 3 500 primary health care clinics and community health centres. In order to reach the 95-95-95 targets, minimum standards of care for children living with HIV (CLHIV) need to be explicitly defined, prioritized, communicated and implemented at scale in all health facilities, and monitored across facility, district and provincial levels.

Description: Consultations were held with national and provincial officials, partner organizations and clinicians aimed at identifying key interventions to improve case finding and treatment of CLHIV. The output of the consultation was the Paediatric and Adolescent HIV Matrix of Interventions (MOI) that is aligned to the 95-95-95 strategy (Table 1). Detailed standard operating procedures (SOPs) outlining how each intervention should be implemented and monitored have also been developed.

Cascade		Setting	High Level Intervention	Age groups			
				0-4	5-9	10-14	15-19
1 st 95	Case Finding	Facility (Or mobile clinics)	Key entry point testing	X	X	X	X
			Index Testing	X	X	X	X
		Community	Community-based screening and referral for testing	X	X	X	X
2 nd 95	Linkage to Care	Facility	Linkage to care through the use of Lab Results for Action Datasheets	X	X	X	X
			Digitisation of PCR Positive results	X	-	-	-
		Facility & Community	Community health worker Tracking and Tracing/recall for ARV initiation	X	X	X	X
3 rd 95	Retention & Viral Suppression	Facility	Child, Adolescent and Family Care Days	X	X	X	X
		Facility & Community	Community-based psychosocial support	X	X	X	X
			Community Health Worker Tracking and Tracing for those with missed appointments for re-engagement in care	X	X	X	X
		Facility & Community					

Table 1: The Paediatric and Adolescent HIV Matrix of Interventions

Lessons learned: The MOI has assisted in focusing, standardising and co-ordinating interventions implemented by multiple stakeholders. To date improvements against the 95-95-95 targets remain modest, in part as a result



of the COVID-19 pandemic. Although key interventions should be implemented across all facilities, some interventions have proved difficult to implement without additional support and resources provided by partner organizations.

Conclusions/Next steps: The MOI provides a standardised framework for implementing evidence-based, proven strategies focused on identification, strong linkage systems, and improved retention and viral suppression. It provides the basis for ensuring standardized implementation and for holding health facilities and partner support organisations accountable for ensuring improved outcomes for children living with HIV.

EPE0846

Pediatric advanced HIV disease landscape: outcomes from an assessment in Uganda

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Background: Despite significant progress in scaling up antiretroviral therapy (ART) to adults, and guidance from the World Health Organization (WHO) on a package of care for children and adolescents with Advanced HIV Disease (AHD), global momentum in pediatric AHD remains limited, with fatal outcomes.

Description: In July 2022, the Uganda Ministry of Health (MoH), with support from the Clinton Health Access Initiative through funding from Unitaid, undertook a landscape assessment to evaluate adoption of the WHO recommendations, identify adoption and implementation hurdles, and develop recommendations for investment in pediatric AHD.

The assessment involved interviewing MoH officials, healthcare workers (HCWs), and facility administrators at 10 sites across eight regions, selected based on availability of AHD services, volume of clients, availability of electronic medical records, and representation across all levels of care. In addition, data was abstracted from health records of pediatric clients at the selected health facilities.

Lessons learned: CD4 testing was available at all sites, with low utilization; baseline screening at 43.6% for newly initiating pediatrics. Screening for cryptococcal infection amongst adolescents was low. For treatment, while all sites offered first-line TB regimens and 60% offered second-line regimens, dose adjustment was a challenge for most HCWs. Reporting tools did not include other opportunistic infections thus making it difficult to assess their screening and management. All sites offered pre-ART services, routine adherence assessment, and counseling but tests for drug toxicity monitoring were mostly only

available at a fee to clients. Regarding prevention, there was non-uniformity and limited clarity on the availability, awareness, and utilization of azithromycin, and fluconazole prophylaxis. TB preventive therapy was available although HCW's prescription of pyridoxine was inconsistent. Lastly, some HCWs were not aligned on the timing for Bacillus Calmette-Guérin (BCG) vaccination. among neonates with HIV.

Conclusions/Next steps: Implementing the WHO STOP AIDS package of care for children and adolescents with AHD to fidelity will require addressing HCW knowledge gaps in knowledge and improving monitoring and evaluation systems to track implementation.

EPE0847

Uptake of screening services and prevalence of cervical cancer among women living with HIV (WLHIV) in military health facilities in Uganda

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Background: Cervical cancer is the leading cause of cancer-related deaths among women in Uganda. Women living with HIV (WLHIV) have a six-fold higher risk of developing cervical cancer compared with women without HIV. In Uganda, Human Papilloma Virus (HPV) prevalence is highest among the WLHIV at 30-100%.

Therefore, it is vital to integrate HIV and cervical cancer screening programs at implementation levels. By April 2021, the project target was to screen 3,796 eligible WLHIV aged 15-49 years across 12 supported military health facilities, from a pool of 6,087 WLHIV. The Uganda military HIV program conducted cervical cancer screening and management training at 12 high volume health facilities in March 2021.

The screening program commenced in April 2021 with visual inspection using Acetic acid (VIA) and HPV DNA detection tests as the two screening methods. Thermocoagulation coagulation was the primary treatment method.

Description: This was a retrospective records review of WLHIV, aged between 15-49 years and who were screened at 12 facilities between April 2021 to September 2022. We analysed data on demographics, clinical status, cervical cancer screening results and their management using proportions/percentages.

Lessons learned: Over 18 months, 5,124 WLHIV were screened from which a random sample of 2,450 (47.8%) was taken. Among these were 1,733 (70.8%) WLHIV aged 25-39 years and 9 (0.4%) aged 15-18 years. Only 198 WLHIV had HPV-DNA tests done because of its limited availability. Of these, 33 (16.7%) had positive results and 2 (6%) had precancerous lesions on further analysis with VIA. Of the 2,252 WLHIV who were screened with VIA, 56 (2.5%) had precancerous lesions. 54 (93.1%) of the WLHIV with precancerous lesions were treated immediately after VIA



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using Thermocoagulation while 4 (6.7%) WLHIV with suspected cancerous lesions were referred for more specialized healthcare services.

Conclusions/Next steps: This assessment shows high uptake of cervical cancer screening services and that treatment of precancerous lesions can be done using low-cost methods by trained personnel. HIV programs should emphasize integration of cervical cancer screening for timely identification and treatment of WLHIV with precancerous lesions. Scaling up HPV-DNA testing services would result in a more effective screening program because of the higher positivity rates.

EPE0848

Accelerating PrEP services uptake through a mobile application among key populations: learnings from a pilot project in Uganda

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Background: Key populations (KPs) face several barriers to accessing pre-exposure prophylaxis (PrEP), including lack of awareness and understanding of PrEP, stigma, and discrimination, and limited access to health information for decision making. A survey conducted in Uganda found that only 22% of key populations were aware of PrEP, and 57% reported facing stigma and discrimination when seeking healthcare.

We share insights on how a mobile phone application was integrated in PrEP services delivery among KPs for information dissemination, access support and medication adherence.

Description: The Medical Concierge Group, a digital health company and consortium partner on the USAID-funded Social Behavioral Change Activity designed a mobile application to support key populations accessing PrEP services in Uganda.

The App provides information on PrEP, facilitates linkage to care, sends reminders on PrEP adherence, and allows direct user interaction with a doctor through a chat feature. The app was initially rolled out to KPs in 3 western Uganda districts from July to September 2022.

Lessons learned: With a total 426 downloads, the app was well received by 47.4% male and 17.6% female users as a convenient way to access information on PrEP. Through the chat feature, 695 health inquiries were responded to by a doctor from 139 (32.6%) users resulting in 99% linkage to PrEP centres.

The majority (22%) of users were 24-28 years of age, 29-33 (12%), with only 6 individuals over 49 years of age (1.4%). 80% sought information on the closest PrEP centre, with 7% seeking knowledge on PrEP.

Conclusions/Next steps: These findings demonstrate the potential of mobile technology to address barriers to accessing PrEP and improve health outcomes for key populations in low-income settings.

The app's success highlights the importance of considering innovative solutions to improve access to healthcare for vulnerable populations and increase the number of people accessing PrEP.

EPE0849

Mobile phone text reminders and voice call follow-ups to improve community retail antiretroviral pharmacy refills; lessons from Lango Sub-region in Northern Uganda

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Background: Community retail Pharmacy drug distribution points (CRPDDP) were implemented in the Lango sub-region as part of the Ministry of Health's response to improving access and adherence to antiretroviral treatment (ART). Clients received their ART refills from nearby local pharmacies as such the need for continuous engagement through mobile phone appointment reminders and health messages.

We share learnings from implementing mobile text reminders and voice call follow-ups among ART patients enrolled in the CRPDDP program in northern Uganda.

Description: A retrospective data review of electronic medical records from four pharmacies allocated for CRPDDP in Lira and Apac districts of Lango sub-region in Northern Uganda was done from January to August 2022.

The process involved collecting phone contacts of eligible clients from the health facility appointment register and uploading them onto a messaging platform customized by Rapid-pro. Client information including code name, phone number, next appointment date and the pharmacy for ART refill, was collected and kept confidential.

Contacts received appointment reminder messages and other messages on positive living. Routine voice call follow-ups were performed to ensure that ART was picked up from the refill pharmacy.

Lessons learned: In total 1,354 clients were reached from the four allocated pharmacies found in urban centers. 972 clients received short message service (SMS) appointment reminders, and 382 were followed up through voice calls. The majority (75%) of the clients returned for refills on the appointed date, 20% returned within four days after the appointment date, and the remaining 5% needed follow-up where they reported that they were not in the district by the appointment date due to other engagements.

Conclusions/Next steps: The use of mobile text reminders and voice call follow-ups can improve the attendance of community retail pharmacy refills.



EPE0850

Assessing the additional benefit of Tuberculosis Preventive Therapy among people living with HIV/AIDS on Dolutegravir-based antiretroviral therapy in two North Central states in Nigeria

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Background: Tuberculosis (TB) is the leading cause of morbidity and mortality among People Living with HIV/AIDS (PLHIVs), accounting for 214,000 deaths globally in 2020. Tuberculosis Preventive Treatment (TPT) has been associated with a decrease in TB disease among PLHIV, while Dolutegravir (an integrase strand inhibitor) is associated with improved viral suppression and a decrease in co-morbidities.

This study aims to investigate if TPT confers additional protection against TB susceptibility in PLHIV who have been on a Dolutegravir-based regimen (DBR) for at least 6 months.

Methods: A retrospective cross-sectional comparative analysis of data was carried out between two tertiary treatment facilities: one in Nasarawa State (Dalthatu Araf Specialist Hospital - facility A) and the other in the Federal Capital Territory (National Hospital Abuja - facility B). A total of 2460 PLHIV from facility B were on DBR only without TPT, while facility A (the control) had 4688 PLHIV on DBR and TPT (isoniazid was used).

All clients in this study from both facilities had been on a DBR for at least 6 months and did not have active TB at the beginning of the review period.

Data was analyzed using Excel in the Microsoft 365 Office application to see if TPT had any additional benefit in terms of TB susceptibility for PLHIVs on a DBR. Data for FY 22 (October 2021–September 2022) was used.

Results: During the review period, 5 (0.2%) of the 2460 PLHIV in facility B developed active TB, 2443 (99.3%) clients were eligible for VL and had viral load results, and 2387 (97.1%) were virally suppressed. All the clients with concomitant TB disease were virally suppressed (VL <1000 cc/mL).

Of the 4688 PLHIV in facility A, 14 (0.29%) developed active TB, 4668 had viral load results, and 95.4% (4453 clients) were virally suppressed, while 78.6% (11 of 14) of the clients with concomitant TB disease were virally unsuppressed (VL >1000 cc/mL).

Conclusions: The findings suggest that Tuberculosis Preventive Therapy did not show additional protection against TB for PLHIV on DBR, which may be associated with non-suppression.

Additional study is recommended to further review the protection conferred by TPT among PLHIV.

EPE0851

Optimization of a stepped care intervention for adolescents and youth living with HIV in Kenya using continuous quality improvement

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Background: The Data-informed Stepped Care study is a cluster randomized controlled trial testing provision of a differentiated care program (Stepped Care) across 24 HIV care clinics in Kenya, aimed at improving retention in care for youth living with HIV (YLH).

We describe adaptations to Stepped Care implementation made by health providers to optimize uptake and delivery.

Methods: Between May and December 2022, we conducted continuous quality improvement (CQI) meetings with providers to adapt Stepped Care delivery at 12 intervention sites in 3 counties (Kisumu, Homabay, and Migori). Guided by plan-do-study-act (PDSA) processes, providers identified challenges and proposed targeted adaptations to improve intervention reach, adoption, acceptability, feasibility, and fidelity.

Providers also completed surveys to quantify implementation perceptions. CQI meetings were audio recorded and analyzed using the Framework for Reporting Adaptations and Modifications-Expanded (FRAME) to categorize the level, context, and content of planned adaptations and determine if adaptations were fidelity consistent or inconsistent.

Results: Providers, including nurses (N=14) and clinical officers (N=35), participated in 72 CQI meetings. Providers were a median age of 34 years (IQR: 30 – 38) and mostly female (53%). A total of 65 adaptations were made (23 unique). The majority of adaptations were context-specific, related to implementation, and consisted of improving documentation addressing scheduling challenges (election climate or reaching in-school YLH), or clinic workflow.

Primary reasons for adaptation were to increase reach among YLH who did not attend clinic with caregivers, lacked updated contact numbers or phones, or were un-



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reachable because they were in school. Adaptations to addressing challenges with reach included reminder calls to caregivers to attend visits with YLH, collaborating with schools to ensure in-school YLH attend their appointments, and addressing transportation challenges.

Providers also adapted to mobile delivery to improve adoption and feasibility of counseling sessions, and improved fidelity by adapting processes for assessing levels of care and ensure YLH received correct services.

Conclusions: Adaptations identified by providers targeted availability of resources and aimed to reduce barriers to service access unique to YLH. Adaptations that optimize implementation and promote integration into routine practice can inform future scale-up and scale-out of Stepped Care to other settings.

EPE0852

Evaluation of the implementation of cervical cancer screening among Women Living with HIV (WLHIV) in Nasarawa State, North Central Nigeria

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Background: Cervical cancer is the second most common cancer in women in Nigeria. HIV predisposes (by six folds) clients to pre-invasive lesions, which gradually develop into cancer. Early detection and treatment are the primary prevention approaches to cervical cancer control. This necessitates the need for prompt screening of Women Living with HIV (WLHIV).

The study evaluated the prevalence of pre-cancerous lesions and treatment uptake among WLHIV.

Methods: This cross-sectional study involved the review and analysis of cervical cancer screening data across 26 facilities providing cervical cancer screening services in Nasarawa State between October 2021 and September 2022 and evaluated the prevalence of pre-cancerous lesions among WLHIV. Visual inspection with Acetic Acid

(VIA) and Lugol's Iodine (VILI) staining methods of screening were utilized, and corresponding treatment of pre-cancerous lesions using thermal ablation was done.

Results: A total of 4302 WLHIV aged 25–49 years were screened for cervical cancer, of which 172 (4.0%) screened positive. Approximately 93.6% (161/172) received pre-invasive treatment with thermal ablation, while 6.4% (11/172) were referred for the Loop Electrosurgical Excision Procedure (LEEP).

Of those referred for LEEP, 1/11 (9.1%) was confirmed with cancer and is currently undergoing treatment; 3/11 (27.3%) turned out to be precancerous and had thermal ablation; 4/11 (36.4%) were non-cancerous and treated for opportunistic disease; 1/11 (9.1%) had an inconclusive result and was rescheduled for a Pap smear; and 2/11 (18.2%) died prior to treatment.

The cervical cancer screening positivity rate across the healthcare facilities ranged from 0.0–11.9%, with the highest rates being 11.9%, 11%, 8.4%, and 7.1% in Akwanga general hospital (GH), Obi GH, Dalhatu-Araf Specialist Hospital, and Federal Medical Center Keffi, respectively.

Conclusions: The implementation of cervical cancer screening in the HIV program provides the opportunity for early detection and treatment of precancerous lesions, potentially reducing the burden of cervical cancer among WLHIV.

This study points out the need for a strategic scale-up of cervical cancer screening services and highlights the need for further studies to explore the reasons for the high incidence in high-burden facilities and their respective LGAs to guide targeted interventions.

EPE0853

Differentiated service delivery model preferences among clients enrolled in decentralized delivery of ARVs in Lesotho

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Background: Decentralized service delivery (DSD) of HIV antiretroviral (ARV) drugs is necessary for person-centered care. Out-of-facility DSD models may improve convenience for clients accessing ARVs by bringing services closer and reduce burden on service providers. Right to Care (RTC) Lesotho, through the FHI 360-led Meeting Targets and Maintaining Epidemic Control (EpiC) project, implemented the BonoloMeds program for out-of-facility DSD of ARVs in Maseru, Lesotho.

Methods: BonoloMeds included three DSD models – private pharmacies, unmanned automated lockers, and health posts – and was implemented in 11 health facilities from May 2021 to October 2022, offering clients established on treatment ARV refills through 14 private pharmacies, eight lockers, and 10 health posts.



Private pharmacists were trained on ARV dispensation and adherence counseling. A toll-free support number was available for clients accessing refills through lockers. Health posts were in rural areas with no available pharmacies where community health workers dispensed ARVs. Health facilities sent ARV prescriptions to the BonoloMeds central dispensing unit, where ARV parcels were packaged and sent to selected pick-up locations. Clients received SMS messages for pick-up reminders. A one-time pin was sent to clients accessing lockers.

We analyzed routine data on uptake by model, sex, and age. Chi-square test was used to determine strength of the observed difference.

Results: RTC enrolled 7,290 (71.56% [5,217] female; 28.44% [2,073] male) clients for ARV refills through private pharmacies (64.98% [4,737]), automated lockers (33.73% [2,459]), and health posts (1.29% [94]). A larger percentage of females chose private pharmacies (68.20% vs. 56.87% among males), and a larger percentage of males chose automated lockers (41.92% vs. 30.48% among females). Most clients were 25 years and older (97.9%; 7,137), with 2.1% (153) 24 years and younger. Among those 24 years and younger, 54.90% selected automated lockers and 44.44% selected private pharmacies. Among those 25 and over, 65.42% selected private pharmacies and 33.28% selected automated lockers.

P-value for the observed differences was <0.001.

Conclusions: Model preference differs by sex and age groups. Providing different DSD options allows for individuals to enroll in models that best suit their needs. Further research is needed to understand preferences among youth and men to better tailor DSD models.

EPE0854

Implementation of Automated Medication Dispensing Systems to increase access to ARVs for PLHIV – Early lessons from a multi-cohort study in Eswatini

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Background: While Eswatini is one of first countries to achieve the UNAIDS 95-95-95 HIV targets, the HIV prevalence and incidence in adults remains high at 27% at 1.4% respectively. Innovative approaches to service delivery are required to scale up of people-centric care, and to ensure sustainable access to HIV prevention and treatment

services for all people living with HIV especially for the underserved, the marginalized and the vulnerable and at-risk populations even in the face of disruptions to the health system such as the SARS-COV-2 pandemic.

We share early lessons from the implementation of an automated medication dispensing system (AMDS) in Eswatini, called LulaMeds™, as an approach to reduce barriers to accessing anti-retroviral medication for people living with HIV and medication for non-communicable diseases.

Description: The Ministry of Health, in collaboration with the President's Emergency Fund for AIDS Relief, implementing partners and stakeholders introduced, LulaMeds™ at four health facilities in two regions of Eswatini. Eligible patients were enrolled onto the LulaMeds™ by healthcare workers trained on the system to access their medications from the system. The initial phase implemented ART medications but subsequent phases will incorporate non communicable disease medications.

Lessons learned: Between February to October 2022 a total of 2,797 adult clients on ARV treatment had been successfully enrolled and 4,684 parcels loaded into the LulaMeds™. 1262 (64.8%) were women, 1161 (59%) aged between 35 – 49 years, and 1861(97.1%) on a dolutegravir-based regimen. Eighty four percent of expected parcels were picked up on time through the LulaMeds™. All parcels not picked up from the cabinets (n=747, 16%) were collected at the dispensary. 46% of dispensed medications were 3–5 months packages while 35% were for 6+ months.

Conclusions/Next steps: AMDS to provide a convenient method of medication pick-up, including a 24/7 access, and reduce health worker burden.

Lessons from the implementation study will inform recommendations for scale-up the approach, improved future designs, and people centeredness for delivery of ART, an expanded and integrated package of medications and commodities for HIV prevention, non-communicable disease (NCD), and reproductive health. Time saved through ADMS implementation ensures that healthcare workers provide more attention to the complicated clients.



EPE0855

Lessons learned from operational planning for pDTG introduction and scale-up in Lao People's Democratic Republic

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Background: In line with the World Health Organization's (WHO) recommendation, in 2022, Lao People's Democratic Republic (PDR) adopted pediatric Dolutegravir (pDTG) into its guidelines for infants and children older than 4 weeks and weighing between 3kg and 20kg. Pediatric clients living with HIV have unique needs and require tailored care.

As a result, beyond achieving national adoption, a well-coordinated approach was required to ensure effective introduction and service delivery. We document the approach and lessons learned from pDTG introduction in Lao PDR.

Description: In 2022, Lao PDR's Center for HIV/AIDS and STIs (CHAS) introduced DTG 10mg scored dispersible tablets (pDTG). This resulted first from establishing consensus amongst clinicians, implementing partners, and key stakeholders. CHAS played a coordinating role, leading critical activities including quantifying commodity need, developing job aids for health workers, training health-care workers (HCWs), and monitoring rollout progress.

Lessons learned: Inclusion of guidance on pDTG usage in the guidelines provided HCWs with prescriptive direction. Ahead of product arrival, dosing wheels were distributed to all ART sites. Training HCWs on the dosing wheels and providing them with job aids built their capacity to recommend pDTG to clients and enabled rapid transition once eligible clients were seen.

Holding semi-annual workshops for HCWs, policymakers, and partners was critical for a coordinated pDTG rollout strategy. Iterative training sessions for HCWs ensured capacity-building and increased confidence to transition eligible children. Training sessions clarified that viral load testing constraints should not delay transition to pDTG.

Finally, addressing both clinical and market concerns from HCWs was crucial to increasing pDTG access. Leveraging existing HIV pharmacovigilance architecture, HCWs were able to monitor and report any adverse drug reactions. Based on this approach, CHAS distributed pDTG to all (12) ART sites in October 2022 and has achieved an active transition of 45% of eligible clients to date (31 January 2023).

Conclusions/Next steps: Lao PDR's approach in implementing pDTG highlights the critical role operational planning plays in achieving effective and rapid transition through national adoption, provision of capacity-building training, and ensuring commodity availability. Countries yet to introduce pDTG can leverage best practices and lessons learned from Lao PDR's implementation model.

EPE0856

Evaluation of retention in HIV care with multi-month dispensing (MMD) of antiretroviral treatment: a "living" systematic review and meta-analysis

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Background: The 2021 WHO guidelines recommend 3-6 monthly antiretroviral treatment (ART) refills for clinically established populations (e.g. >6 months) on ART. During the COVID-19 pandemic, eligibility criteria for multi-month dispensing (MMD) were expanded (e.g. <3 months on ART). "Living" reviews use ongoing updated evidence to evaluate high priority questions and maintain relevancy as the field moves.

Adding to evidence from MMD in 2022, we conducted a "living" systematic review and meta-analysis to assess interventions that implemented extended MMD intervals in populations both established and non-established on ART.

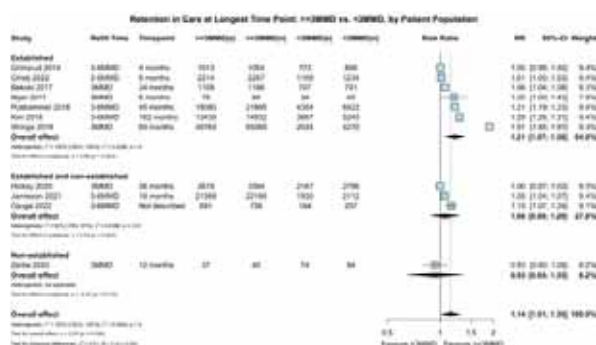
Methods: We searched seven databases and references through October 2022. Eligible studies included adults and children living with HIV in low- and middle-income countries. The main outcome was retention in HIV care. We conducted pairwise meta-analyses comparing the reduced frequency strategy ($\geq 3\text{MMD}$) to the standard of care ($<3\text{MMD}$), using random-effect models and cluster adjusted estimates for cluster randomized controlled trials (RCTs). We assessed risk of bias using the Cochrane tool in RCTs and the Newcastle-Ottawa Scale in cohort studies.

Results: Eligible studies included 38 comparative trials (14 RCTs and 24 observational studies). Among included studies, $\geq 3\text{MMD}$ was associated with increased retention among those established on ART compared to $<3\text{MMD}$ (RR 1.21 95% CI 1.07-1.38).

There was no difference in retention for $\geq 3\text{MMD}$ vs $<3\text{MMD}$ among studies assessing both established and non-established patients combined and those assessing



only non-established patients (RR 1.06 95% CI 0.88-1.29; RR 0.93 95% CI 0.88-1.29, respectively), though there were few studies for evaluation in these groups.



Conclusions: Consistent with previous findings, there was improved retention in ≥ 3 MMD for those established on ART; inclusion of those not established on ART suggests equivalent retention as MMD eligibility expands, though additional research is needed. A "living" review approach allowed us to extend our research question and incorporate new evidence representing less established populations as it emerges.

EPE0857

Child/adolescent-centric differentiated care to enhance clinical care and viral load suppression among children and adolescents living with HIV, Andhra Pradesh, India 2022

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Background: Low rates of viral load suppression (VLS) among children and adolescents living with HIV (C/ALHIV) remains a challenge globally. Andhra Pradesh (AP; second highest HIV burden state, India) had a VLS rate of 65% (2754 of 4211) among C/ALHIV on antiretroviral therapy (ART) (Sept 2021).

Secondary analysis of program data indicated sub-therapeutic (age/weight) dosage of ART due to lack of weight monitoring or proxy pill pick up were significantly associated with low VL.

Description: Based on the solutions identified during in-depth consultations with caregivers, stakeholders, and district program managers, we conducted 35 comprehensive health camps for C/ALHIV at ART centres and decentralised sites between October 2021 and September 2022, reaching all C/ALHIV with unsuppressed viral load. Health camps focussed on clinical and nutritional assessment; assessment of ART regimen/dosage; aligning ART refill dates with family members and counselling of care-

givers to improve treatment continuity and adherence, and specimen collection for those due for viral load testing. During these camps, we also oriented outreach staff on essential aspects of care for A/CLHIV for sustainable follow up in future.

Lessons learned: Of the 1,457 C/ALHIV with unsuppressed viral load, ART regimen/drug dosages were modified in 283 (19%) who were not receiving age/weight appropriate regimen/dosages. Pill pick-up dates were aligned for 319 (22%) C/ALHIV whose family members were also receiving ART, but pill pick-up dates not aligned. VL specimens were collected for 266 C/ALHIV due for viral load testing. 246 outreach staff from 13 districts of AP were oriented.

Of the 76% (1109/1457) eligible C/ALHIV who underwent VL testing, 817 (74%) were virally suppressed, improving overall VLS from 65% to 86% (3621 of 4211 C/ALHIV) through September 2022.

Conclusions/Next steps: It is feasible to improve VLS and other health outcomes in A/CLHIV through systematic approaches and child friendly services. Child/adolescent-centric differentiated services, including regular clinical monitoring; age-appropriate counselling, particularly addressing health/ HIV related concerns among adolescents; and involvement of caregivers are critical to enhance clinical care and VLS among C/ALHIV.

EPE0858

Early effect of transitioning children to dolutegravir-based regimens on viral load suppression in Malawi

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Background: Malawi adopted a public health approach of transitioning people living with HIV to dolutegravir-based regimens as first-line antiretroviral therapy (ART) regardless of viral suppression (VS) status. VS in children has remained suboptimal compared to adults. In 2021, the country rolled out a pediatric formulation (10mg film-coated tablet) of dolutegravir (pDTG) in children <20 kg. We evaluated the impact of transitioning children <20 kg to pDTG on VS in Malawi.

Methods: We analyzed routine retrospective program data from electronic medical record systems pooled across 169 healthcare facilities in Malawi supported by the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF). We included children <15 years who weighed <20 kg and received ART between July 2021 and June 2022. Using descriptive statistics, we summarized the distribution of demographic and clinical characteristics, ART regimens, ART adherence using pill count (good adherence defined as



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missing no more than two ARV doses in a month at the last follow-up visit), and VS (<1000 copies/mL). We used logistic regression to identify factors associated with post-transition VS, adjusting for demographic characteristics, initial ART regimen, guardian type, adherence, and pre-transition viral load.

Results: 2,468 CLHIV were included, 55.3% (n=1364) of whom were <60 months old. 90.4% (n=2230) had been on non-DTG-based ART before pDTG was available. Before the transition to pDTG, 62.7% (n=1398) of these had a viral load (VL) test result; 62.1% (n=868) achieved VS. 99.9% (n=2227) of the CLHIV transitioned to pDTG-based regimens (without change in nucleoside backbone).

Six months after the transition to pDTG, 52.9% (n=1179) had good adherence, and 38.6% (n=860) had routine VL test results; 81.4% (n=700) achieved VS. In a multivariate analysis, good adherence and pre-transition VS were associated with post-transition VS: adjusted odds ratios 2.79 (95% CI=1.65-4.71) and 5.32 (95% CI=3.30-8.57), respectively.

Conclusions: VS was achieved in most children tested within the first six months after the pDTG transition. However, adherence was suboptimal in this group, and VL testing at six months post-transition was limited. Interventions to improve VL testing and enhance good adherence are needed in children to continue progressing towards the 95-95-95 UNAIDS goals.

EPE0859

Understanding the reasons for disengagement to antiretroviral treatment: learnings from the re-engagement drive of opted out PLHIV in Vihaan Program of Rajasthan, India

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Background: Achieving the targets of 95-95-95 with revised strategies of test and treat policy, retention in treatment, and treatment adherence is essential to end the AIDS epidemic as a public health threat by 2030. Lost-to-Follow-Up (LFU) from treatment is a primary concern towards achieving the second 95 and third 95, contributing to around 10 % of the active care on treatment.

Among LFU, some clients voluntarily disengage/Opted-Out of the treatment for various reasons, including the quality of services.

Description: A re-engagement drive was conducted for Opted-out clients from June to December 2022 through 17 Care and Support Centers in Rajasthan state, India. During the drive, 158 clients were interviewed to understand the reason for self-disengagement from the lifelong ART treatment and their responses were recorded. During the field-level drive, the Outreach workers and peer counselors contacted the opted-out PLHIV through Care & Support Program.

Lessons learned: A total of 64 clients disengaged within six months, and 94 clients after six months of treatment initiation. The reasons for discontinuation from treatment were multifactorial, including personal, health system related, drug-related and external.

The contribution of individual factors was 34% (sense of well-being, dependents like orphans/children/widow/elderly/specially-abled/bedridden/single women, self-stigma), external factors 35% (daily wage/truck drivers, cultural belief influenced by exorcist, accessibility of ARTC due to lack of public transport, poverty, society and family pressures), health system 24% (poor counselling and behaviour of health care providers) and drug-related related side effects 7%.

Conclusions/Next steps: Lifelong engagement with ART treatment is influenced mainly by personal and external factors that lead to self-disengagement. The learnings supported increasing the focus on alternative service delivery strategies like strengthening peer counselling addressing personal, cultural & social aspects, linkage with social protection and welfare schemes, multi-month drug dispensation, and periodic re-engagement drives, which can increase retention & adherence to treatment leading to achieving the second 95 and third 95.

EPE0860

Effect of quality improvement initiative on viral load re-suppression of children and adolescents living with HIV: the case of Kolfe Keraniyo sub-city in Addis Ababa, Ethiopia

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Background: In low- and middle-income countries, virological non-suppression among children and adolescent living with HIV (CALHIV) continues to be the major causes in treatment failure and mortality. Antiretroviral therapy adherence and the underlying virological suppression are both impacted by behavioral and mental health issues, however data in developing countries is limited.

The aim of the study was to evaluate HIV the effect of quality improvement (QI) on virological suppression in Kolfe Keraniyo sub-city, Addis Ababa among adolescents and children living with HIV.

Methods: One QI initiative designed to improve viral load re-suppression of adolescents and children living with HIV was purposefully selected. There were 32 adolescents and children with high viral load as a baseline put under this QI initiative in January 2022.

These CALHIV were followed for 10 months and the trends of viral load re-suppression (less than 50 copies/ml) were evaluated using run in uninterrupted time series.


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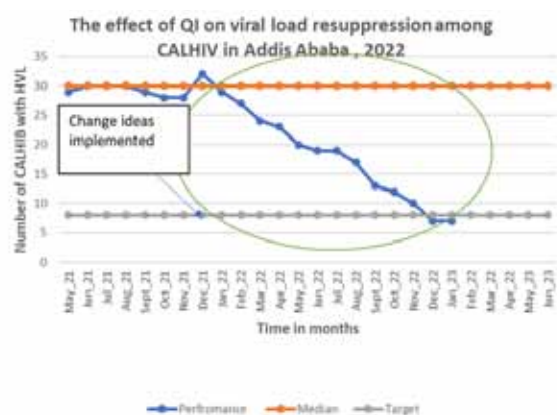
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Results: During the implementation period, the number of CALHIV with high viral load decreased from 32 to 8 showing that the QI initiative improved viral load re-suppression of 24(75%) CALHIV from January 1, 2022, and December 31, 2022. As the graph below shows, there appeared 12 consecutive data points below the median indicating the presence of a non-random signal: two of them lay below the target set by the QI initiative and the last data point ended up below the target indicating QI initiative had led to improvement



Conclusions: Quality improvement initiative was effective in improving viral load re-suppression among adolescents and children living with HIV. A quality improvement initiative embedded within clinical management has improved the viral load re-suppression in public health facilities in Addis Ababa, Ethiopia.

Thus, using local innovative ideas such as QI initiatives, we can bring changes that can be scaled up at a national level.

EPE0861

Improved treatment outcomes using family-centric care among PLHIV, Nagaland, India-2022

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Background: Nagaland is a state in north-east India with a hilly terrain and an estimated HIV prevalence of 1.36% in 2021. With the long travel distance to Antiretroviral treatment (ART) centres as a barrier, nearly 20% of ART pickups are by proxy and usually by family members. To better systematize family member proxy pick-ups and improve quality of care, we initiated a family centric package of care by grouping families as a unit to align ART refill dates, engage family members as treatment supporters, and improve adherence and HIV-1 viral load suppression (VLS) rates.

Methods: We initiated a family centric care (FCC) intervention in two high volume ART centres that account for 6% of ART patients in Nagaland. Counsellors at these ART centres systematically identified family members and allotted unique identification numbers to the family unit. We analysed the family size, proportion of families without aligned pill-pick-up dates, HIV VLS rates (<1,000 copies/ml). We calculated the proportion of Viral Load Coverage (VLC: defined as number of patients with viral load within the last 12 months) and VLS rates after three months of FCC for each family unit and compared the difference in proportion between family units with two and >2 family members.

Results: From February to September 2022, we identified 942 families accounting for 27.4% (1,914/6,986) of the patients accessing ART from the two ART centers. The majority, 87% (819/942), were part of a two-member family, predominantly couples without children. Pill-pick-up dates were aligned for 660 (74%) families.

After 3 months of FCC, VLC was 57% (66/161) and 84% (687/819); VL suppression was 86% (57/66) and 91% (62/68) among >2 member and two-member family units respectively. The difference in VLC was significant among two-member compared to >2-member family units [diff: 27%; p<0.0001].

Conclusions: We observed increased viral load coverage among two-member family units compared to >2 family units in high volume ART centres as. It was easy to reach out to family units without children (majorly two-member family units) for VLC. Family Centric Care may be considered as a possible strategy to enhance VLC, and other HIV program indicators.

EPE0862

Feasibility of implementing advanced disease management package as part of routine, standard of HIV care at ART centres in Mumbai, India

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Background: Although the advanced HIV disease (AHD) care package reduces morbidity and mortality in people with AHD (WHO stage 3 or 4 and /or CD4 count <200 cells/ μ L or age <5 years), it is not fully implemented in India. We assessed the feasibility of implementing the complete WHO advanced disease management (ADM) package of care as part of routine HIV care under the programmatic setting in antiretroviral therapy (ART) centres of Mumbai.



Methods: We implemented the ADM package in 17 ART centres from November 2020 to December 2021. ADH patients >9 years, both new to care and treatment experienced were enrolled. We trained the existing ART centres' staff on identification of ADH patients, ADM package and patient flow. ADM package components included rapid ART initiation (within a week), Anti-TB treatment (ATT) initiation, cotrimoxazole prophylaxis, TB Preventive therapy [TPT, excluded active TB patients (n=280) and those completed TPT prior to enrolment (n=1186)] of negative TB screen, TB_LAM screening (excluded active TB patients), cryptococcal antigen (CrAg) assay (excluded children <10 yrs.), and ART adherence counselling. We used point of care test (POCT) for TB (LAM) and cryptococcus (CrAg) screening.

Results: We enrolled 64% (2,804/4,334) of patients with ADH into ADM package of care using existing staff. Of the enrolled, 67% were males, median age was 43 years, median CD4 count was 137 cells/mm and 79% (2,217/2,804) were treatment experienced. 90% (528/587) of treatment new were rapidly initiated on ART. Nearly 86% (1,157/1,338) and 97% (2,733/2,804) received TPT and Cotrimoxazole prophylaxis respectively. Of the eligible 99% (2,508/2,524) and 96% (2,690/2,804) were screened for TB and cryptococcal infection by TB-LAM and CrAg assay respectively. 7% (171/2,508) were TB-LAM positive, and 92% (157/171) initiated on ATT. One percent (25/2,690) were serum CrAg positive, and 92% (23/25) were referred for CSF CrAg (1/23 positive). At the end of 12 months, 88% (2,485/2,804) enrolled in ADM package were alive.

Conclusions: Implementing of ADM package is feasible in routine setting with the existing patient flow without additional staff at ART centres. Availability of point of care tests demonstrated additional diagnostic and clinical management capabilities among patients with ADH.

EPE0863

Perceptions of cabotegravir + rilpivirine long-acting (CAB+RPV LA) from people living with HIV (PLHIV) in the CARLOS study

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Background: CAB+RPV LA administered every 2 months is a complete long-acting HIV-1 maintenance regimen. CARLOS is a non-interventional, multicenter, prospective study in PLHIV receiving CAB+RPV LA in routine care in Germany.

Here, we present Month 6 (M6) data on treatment satisfaction, preference, and implementation from the perspective of PLHIV.

Methods: Clinical characteristics were collected from medical records. HIV Treatment Satisfaction Questionnaire status version (HIVTSQs) and exploratory outcomes relating to participants' CAB+RPV LA experience, including preferences, were assessed through optional surveys administered at baseline and/or M6. All results were based on observed data.

Results: Participants had a median age of 42.0 years (n=351), and 95% (n=333/351) were male sex at birth; the most prevalent comorbidities were mental/behavioral (41%) and metabolic disorders (27%). Before LA treatment, participants reported (always/often) experiencing anxiety relating to adherence requirements (30% [n=96/325]), a daily reminder of HIV-status (28% [n=92/325]), and fear of disclosure of HIV-status (21% [n=67/325]).

In PLHIV completing HIVTSQs at baseline and M6, mean (SD) HIVTSQs score improved by +6.0 (10.8, [p<0.0001]) from 54.9 (10.2) to 60.9 (6.5) at M6, driven mainly by treatment "convenience," "lifestyle fit," and a "wish to continue" current treatment.

Most participants reported that coming into the clinic every 2 months and the time spent in clinic per injection was "very"/"extremely" acceptable (86% [n=220/255] and 92% [n=234/255]). Treatment difficulties reported at M6 included pain/soreness from the injection (54% [n=138/256]) and travel/holiday schedules (17% [n=43/256]). At M6, CAB+RPV LA was preferred by 99% (n=253/255) of participants vs. prior daily oral therapy (<1% [n=1/255]); 1/255 (<1%) reported no preference. Supporting reasons for treatment preference are shown in the Figure.

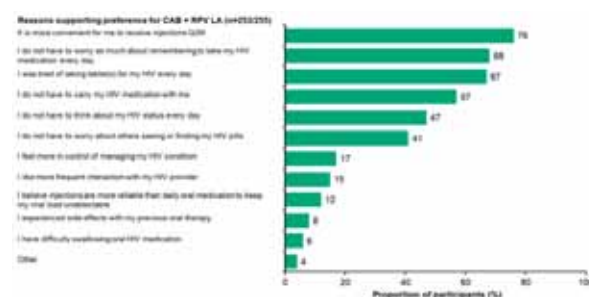


Figure. Supporting reasons for preference of LA injectable HIV medication or daily oral therapy at M6*.

Conclusions: Treatment satisfaction improved with switching from daily oral therapy to CAB+RPV LA; most participants preferred LA therapy over daily oral therapy at M6, primarily due to "convenience," "adherence concerns," and "pill fatigue".

EPE0864

Factors associated with tuberculosis preventive therapy completion among people living with HIV in Siaya County, Kenya

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Background: In 2016, Kenya rolled out a rapid results initiative targeting enrolment of 90% of people living with HIV (PLHIV) on tuberculosis preventive therapy (TPT). Clients were initiated on the six-month course of isoniazid preventive therapy (IPT) to reduce the morbidity and mortality risk of active tuberculosis infection.

We evaluate factors associated with IPT completion among clients in Siaya County, Kenya.

Methods: This is a retrospective cohort study using client records routinely captured at 119 U.S. Presidents Emergency Plan for AIDS Relief (PEPFAR)-supported facilities between October 2016 and June 2020. All PLHIV initiated on IPT during this timeframe were included. Variables of interest included, age, duration on ART and facility level, while adjusting for sex, year of IPT initiation, sub-county, and WHO stage of HIV disease.

Multivariable logistic regression analyses were done to investigate factors associated with TPT completion. Adjusted odds ratios (aOR) and corresponding 95% confidence interval (CI) are presented.

Results: A total of 52,842 (90.9%) clients were initiated on IPT of whom 63.3% were female, 29.5% were aged 25 – 34 years and 35.9% received services at a level 2 health facility. Most clients 50,466 (95.5%) completed TPT. Clients had significantly higher odds of TPT completion if they were on ART for more than 12 months compared to those on ART for 12 months or less [aOR= 2.64 (95% CI 1.68 - 4.14)]. The odds of completion were higher for those initiated at level 2 compared to level 4 facilities [aOR= 1.82 (95% CI 1.35-2.44)].

The odds of TPT completion with age 15-19 as the reference were significantly higher for age-groups under 15 years [aOR= 1.95 (95% CI 1.51-2.51)], 25-49 years [aOR= 1.81 (95% CI 1.42-2.31)], and 50+ years [aOR= 3.35 (95% CI 2.42-4.64)].

Conclusions: Findings suggest better TPT completion among those on ART for more than twelve months, age groups under 15, 25 to 49 years, 50+ years and among those initiated at lower level health facilities. Targeted interventions for clients aged 15 to 19 years and those initiated at level 4 sites may further improve completion rates to 100%.

EPE0865

The rescue model may improve continuity of treatment for people living with HIV (PLHIV) in hard-to-reach areas: results from catholic relief services in Western Province, Zambia

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Background: As we move towards epidemic control, it is important that PLHIV on anti-retroviral treatment and ART are retained in care. There is an urgent need to develop strategies that maintain PLHIV on treatment despite challenges posed by their geographical location. We implemented the Rescue Model, designed to improve ART services through client-centred strategies and approaches in hard-to-reach areas within communities that are cut off from health services because of floods in the Western Province of Zambia.

Methods: A total of 29 sites, with ≥150 recipients of care (ROCs), which are usually cut off every December – August, after the rainy season, were selected. From the mapping process, 127 strategic outreach sites, called Community Rescue Points (CRPs), were set up, and 132 lay persons, called Community ART Agents (CAAs) were identified to champion community mobilization for ART services. The CAAs and facility clinical staff were trained to provide these services from October 2021 to September 2022.

They used available transport to reach out to ROC in cut-off communities, which included oxcarts, banana boats, and dugout canoes, and where these were unavailable, staff braved the floods by walking through them.

Results: From October 2021 to September 2022, the number of people receiving ART increased from 7,352 to 7,866. We reached 48% (n=3,747) of 7,826 ROCs through the CRPs. Viral load coverage improved from 67% (4,532/6,764) to 82% (5,806/7,080). Viral load suppression maintained at 96% (5,574/5,806) and Viral load sample rejection reduced from 2% (44/2,153) to 0.4% (16/3,895).

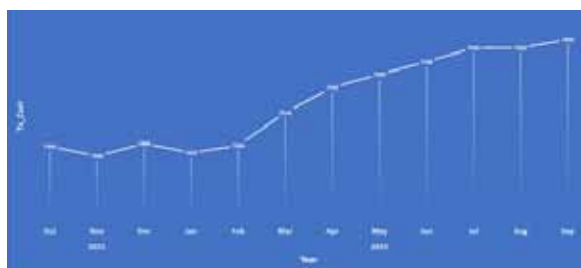


Figure 1. Total number of clients receiving ART in the rescue sites (2021 - 2022).

Conclusions: The Rescue model reached ROCs with ART treatment; viral load coverage and suppression increased. Client travel time and cost are reduced by ART refill provision closer to their homes. Therefore, this model may be beneficial in settings with similar challenging terrains to retain clients on ART.



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EPE0866

Scale-up of routine viral load testing among key populations in Eswatini

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Background: Eswatini is achieving UNAIDS' 95-95-95 targets and reporting 97% viral load suppression (VLS) among all clients on antiretroviral therapy (ART), though expanding access to viral load (VL) testing is particularly important for key populations (KPs), whose data are not available (UNAIDS 2021).

This analysis presents data and solutions to reach the 95% benchmark for viral load coverage (VLC) and VLS among KPs receiving ART services at two KP-led community centers (KP-CC), through the PEPFAR/USAID-funded Meeting Targets and Maintaining Epidemic Control (EpiC) project implemented by FHI 360 in Eswatini.

Description: Routinely collected data for KPs from October 2020 through September 2022 were analyzed. We assessed the VLC, calculated as KPs with a documented viral load test result (VLTR) among those on ART and eligible to test as per national guidelines, and VLS, calculated as KPs with VL below 1,000 copies among those with documented VLTR.

Among KPs, only half had a documented VLTR between October and December 2020; 81% reached VLS. A case management guide was then developed for ART and VL monitoring.

A team was tasked with addressing the gaps along the pre-analytic, analytic, and post-analytic stages of VL monitoring to scale up VLC and improve VLS. ART counseling frequency and depth was based on KP risk segmentation and adherence barriers.

Eligible KPs were line-listed and contacted to collect VL samples at the KP-CC or at community through full-blood or dried-blood spot (DBS), depending on supply availability. Pending VLTR were tracked through a laboratory focal person; non-virally suppressed KPs were offered enhanced ART-adherence counseling.

Lessons learned: Between October and December 2020 and July and September 2022, increases were observed among KP in VLC from 51% to 71% and VLS from 81% to 99% (Table 1). VLC was negatively affected by long turnaround time staff shortages and equipment downtime.

Period	Eligible for viral load testing	Documented viral load test result	Virally suppressed	VLC	VLS
Oct-Dec 2020	41	21	17	51%	81%
Jul-Sep 2022	298	213	211	71%	99%

Table 1. Quarterly Viral load coverage and suppression, Eswatini

Conclusions/Next steps: Interventions were successful in increasing VLC and VLS among KPs. Laboratory bottlenecks prevented VLC from reaching the benchmark; hence, more investments are needed to address gaps at the analytic level.

EPE0867

A mobile application to assess time in clinic for persons living with HIV

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Background: Long client waiting time directly impacts client satisfaction and may lead to lower retention in care. We developed an application to measure client time in the HIV clinic.

Methods: We track client time spent in routine HIV care at GHEKIO, in Port-au-Prince, Haiti, using standard clinic procedures. At the beginning of each visit, a QR code was printed containing each client's clinic ID, which the client carried with them, and which was scanned into the app to register client time at three stations:

1. Vital signs,
2. Physician visit, and;
3. Check-out.

Stations (1) and (3) captured the start time at the station while (2) captured the start and stop time. Clinic staff were trained to collect data using the app.

We report total client time in the clinic, including waiting time, for sample client visits from February 15 to April 29, 2022.

Results: A total of 440 visits were tracked using the app; of these data, 341 visits passed the data quality checks and were analyzed. The median total time in clinic, from check in to check out, was 173 minutes (IQR: 138, 228). The median time from vital signs to physician visit was 76 minutes (IQR: 45, 108), approximately 44% of the total clinic time. The median time of a physician visit was 28 minutes (IQR: 20, 38), approximately 16% of the total clinic time. The time between physician visit and transportation reimbursement was 57 minutes (IQR: 32, 104), approximately 33% of the total clinic time (Figure 1).



Figure 1. Median client time spent at a routine HIV clinic visit.



Conclusions: With the use of a real-time app to monitor client time in the clinic, we have documented that the majority of time is spent waiting for services. These data can be used to inform staff and facilitate efforts to reduce waiting time, which may positively impact client outcomes.

EPE0868

Impact of a social media peer support group on ART adherence, self-efficacy and medical independence skills among Kenyan youth living with HIV: the mPACT pilot study

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Background: Digital health approaches have potential to improve HIV care self-management among youth living with HIV (YLWH). We conducted a pilot cluster randomized trial of a facilitated social media peer group for YLWH in Kenya.

Methods: The mPACT study enrolled YLWH (ages 16-24) attending HIV services at 8 public-sector clinics in greater Nairobi, Kenya. YLWH were offered usual care (control) or interactive support groups (N=10-20) delivered via WhatsApp or Telegram with weekly scheduled messages that were facilitated by YLWH and supervised by an HIV counselor for 6 months (intervention).

At enrollment, 6- and 12-months follow-ups, self-administered questionnaires assessed depression, anxiety, self-efficacy to take daily medication, social support, stigma, ART information, motivation, and behavioral skills (IMB), ART adherence, and readiness to self-manage HIV care.

Results: We enrolled 138 YLWH. Among 134 (intervention:68, control:66) who completed 12-month follow-up (97%), median age was 21 years (interquartile range [IQR]:18-23), 59% were female, 51% were in school, and 62% lived with a parent/caregiver. Median time on ART was 6 years (IQR:1-12).

By 6-months follow-up, intervention participants showed a trend toward higher self-efficacy than controls (Coefficient(β)=3.5, 95% Confidence Interval[CI]:-0.12-7.10, $p=0.058$), and higher ART adherence ($\beta=4.4$, 95%CI:0.75-8.03, $p=0.018$).

By 12-months follow-up, intervention YLWH showed higher "medication management" scores – a component of care transition readiness – than controls ($\beta=0.09$, 95%CI:0.03-0.16, $p=0.003$).

We found no significant baseline differences between study arms for social support, mental health, IMB, or stigma. Across all participants, having higher self-efficacy at 6-months was associated with higher transition readiness ($\beta=0.004$, 95%CI:0.001-0.006, $p<0.001$) and ART adherence ($\beta=0.04$, 95%CI:0.002-0.09, $p=0.039$) at 12-months. YLWH with higher IMB scores at 6-months had higher ART

adherence scores at 12-months ($\beta=0.08$, 95%CI:-0.004-0.17, $p=0.062$). YLWH experiencing depression or anxiety at 6-months had non-significant lower ART adherence at 12 months (p -values<0.10). Stigma was lower by 12-months vs enrollment in both groups ($p<0.05$), declining more substantially among intervention participants (intervention:27.4%, control:19.5%).

Conclusions: Kenyan YLWH receiving the peer-led social media mPACT intervention had higher self-efficacy, ART adherence, and care transition readiness compared to those receiving usual care. Associations between self-efficacy, IMB, and mental health with later ART adherence and transition readiness highlight potential mechanisms for interventions supporting youth HIV care.

EPE0869

What drives gaps in viral load monitoring and re-suppression after treatment failure? A multi-state analysis examining contributing client and provider behaviours in Zambia

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Background: Routine HIV viral load (VL) monitoring is critical for responding to treatment failure; however, significant gaps persist in HIV treatment programmes. These gaps may result from provider (e.g., not checking when indicated, visit intervals) or client (e.g., loss to follow-up [LTFU]) behaviour.

Methods: We examined a cohort of adults on antiretroviral therapy for >6 months who had an unsuppressed VL (>1000 copies/ml) at 24 clinics in Zambia between August, 2019 and November, 2021 using electronic health records. We conducted multi-state analyses to longitudinally examine care dynamics relative to timing of repeat VLs (due at clinic visits >90 days after initial VL), retention in care (i.e., LTFU, >60 days late for visit), and re-suppression, stratifying by regimen at cohort entry (TDF/FTC/DTG [TLD] versus TDF/FTC/EFV [TLE]). We repeated analyses to assess switch to second-line therapy in individuals with consecutive unsuppressed VLs.

Results: 8380 individuals (55.4% female; median age 36.5 years [IQR 43.4-29.7], TLD 54.1% versus TLE 45.9%) had an elevated VL. After one year, 13.9% (CI 13.1-14.6%) were LTFU, 80.7% (78.8-82.6%) had a repeat VL, and 5.4% (4.9-6.1%)



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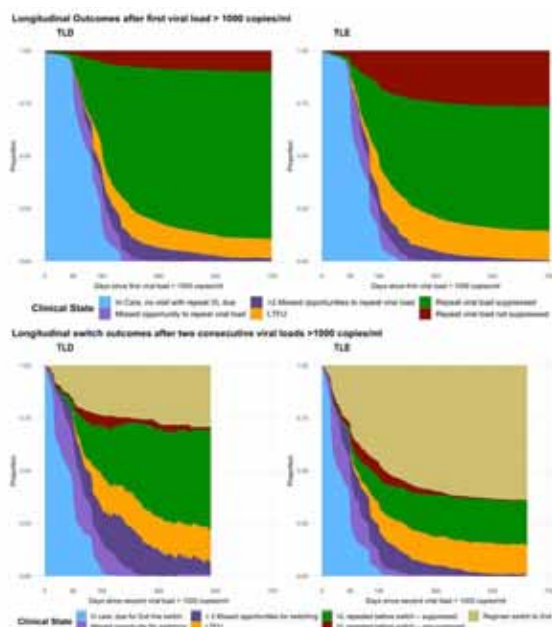
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had return visits but no repeat VL. Among those with repeat VLs, 89.4% (88.6-90.2%) on TLD versus 69.3% (68.8-69.8%) on TLE re-suppressed. Comparing those with consecutive unsuppressed VLs after one year on TLD versus TLE, 27.6% (23.2-33.0%) versus 60.0% (57.3-62.8%) had their regimen changed, 44.3% (37.3-54.2%) versus 21.5% (18.7-24.8%) had a third VL repeated, 16.4% (12.3-21.9%) versus 13.4% (11.6-15.5%) were LTFU, and 11.7% (7.9-17.2%) versus 5.2% (3.7-7.3%) had visits with no regimen change or repeat VLs, respectively.



Conclusions: Client (i.e., LTFU) and provider (e.g., prolonged visit intervals, missed opportunities) factors contribute to delays in timely VL monitoring and second-line switch. Individuals on TLD versus TLE re-suppressed and were switched at different rates. Strategies addressing both client and provider behaviors are required to optimize response to treatment failure.

EPE0870

An innovative approach to improving viral load demand creation and testing coverage in health facilities in the Western region of Ghana

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Background: In 2020, UNAIDS established the 95-95-95 goal of 95% of all people living with HIV to know their HIV status, 95% of all people diagnosed with HIV to receive sustained antiretroviral treatment (ART), and 95% of all people receiving ART will achieve viral suppression. Attainment of the third 95% remains a huge challenge to the National HIV response of low and middle-income countries (LAMICS). Most of the research and programmatic attention has focused on above-site and individ-

ual-level barriers to access. This approach has not sufficiently recognized facility-based challenges. According to a 2019 study by the USAID Ghana Strengthening the Care Continuum Project, implemented by JSI Research & Training Institute, Inc., over 50% of low viral load coverage was caused by poor facility-based viral load management practices, provider oversight, and multi-month dispensing, without alignment to viral load due dates. Here we illuminate a strategic approach to addressing this critical programmatic gap in Ghana's Western Region.

Description: The Project designed a "person-centered viral load management plan" (PVLM) as an addendum to ART client' folders. This was a major component of the Project's Quality Improvement (QI) activities.

From October 2021 to October 2022, a team of facility-based service providers and QI project officers conducted quarterly assessments facility-based viral load coverage and viral load management culture, in 21 ART sites in the Western region

Lessons learned: The intervention was successful and resulted in a significant improvement of viral load coverage and suppression. Data from Ghana's national electronic e-Tracker HIV service database showed that viral load testing coverage improved from 54% in December 2016 to 90% for all eligible clients by December 2022. There was a corresponding increase in viral suppression from 64% in December 2020 to 95% in December 2022.

Conclusions/Next steps: Viral load is not only a key determinant of a successful HIV treatment program, but also is key to achieving the 3rd 95%. Closely monitoring facility- and provider-based challenges and developing person-centered viral load management plans are effective strategies to achieve higher viral load coverage and suppression. The results of this intervention can inform national level policy and management for scaled implementation.

EPE0871

Saturation of tuberculosis preventive therapy among people living with HIV, Mumbai, India

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Background: Tuberculosis (TB) is a common opportunistic infection among people living with HIV (PLHIV). India's National AIDS Control Programme (NACP) recommends six months Isoniazid TB preventive therapy (TPT) for all PLHIV through single window service mechanism at antiretroviral therapy (ART) centres. Interruption of TPT was observed in approximately 40% of those initiated on TPT in other country program settings.



Methods: ART centre staff from 20 ART centres in Mumbai were trained on four symptom (4S) TB screening and contraindications for TPT initiation among PLHIV. All eligible PLHIV were initiated on Isoniazid (INH) 300 mg with pyridoxine 50 mg for six months.

Secondary data from routine program TPT registers was compiled and analysed for TPT initiation and completion rates by age and gender between April 2017 and September 2022.

Under program settings, we assessed IPT initiation and completion rates among all PLHIV on ART including children eligible for IPT and described reasons for TPT interruption in Mumbai. We used chi-square to determine if there is association of age group, gender and duration of ART on TPT completion and initiation rates.

Results: 36,808 PLHIV were eligible for TPT. Overall, 78% (28790/36808) were initiated on IPT. Of the 28,790 PLHIV initiated on IPT, the majority, 90% (25930/28790), completed the six-month TPT course.

Among 2,860 (10%) who did not complete the course, 40% (1149/2860) defaulted, and TPT was interrupted in 44% (1262/2860) due to medical and adverse events. Among those who stopped TPT, 10% (123/1262) were diagnosed with TB and started on anti-TB treatment, 22% (276/1262) experienced an allergic reaction, 7% (91/1262) experienced side-effects due to INH, 57% (726/1262) PLHIV had discontinued during COVID-19 pandemic and 4% (46/1262) refused to continue TPT.

Age, gender, and antiretroviral therapy (ART) status were not significantly ($p > 0.05$) associated with IPT initiation and completion rates.

Conclusions: We achieved high TPT completion rates in programmatic settings in which ART Centre staff were trained on TPT initiation procedures.

EPE0872

Systematic review of person-centred care interventions for persons living with HIV in low and middle-income countries

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Background: Person-centeredness — a multi-dimensional family of practices that prioritizes experiences, needs, and preferences of the whole person — has underappreciated promise for improving the effectiveness of services for

persons living with HIV, particularly in public health settings. Prior evidence on person-centeredness in low-and-middle countries (LMICs) has focused on health systems design to increase accessibility and appropriateness of services.

We conducted a systematic literature review to analyze the type of interventions acting on patient-provider interactions and their effectiveness in improving outcomes in LMICs.

Methods: We searched Embase, Medline, CINAHL, PsycINFO, the Cochrane Library, Web of Science, and selected conferences (e.g., IAS) up to July 2022. We included studies of any design focusing on patient-provider interventions guided by the Integrative Model of patient-centeredness (Scholl et al., 2014).

We screened secondary references and conducted iterative, targeted searches of additional identified patient-centered intervention types. Two independent reviewers screened all studies, extracted study characteristics, HIV cascade outcomes, patient experience, and other outcomes, and adjudicated discrepant results through study group consensus.

Results: We screened 6,234 records and included 30 studies: 17 observational studies, 8 RCT, and 5 other designs. Most studies were from Africa (27). Categories of intervention types included (not mutually exclusive): individualized counseling and patient-centered communication (14); provider education and training (14); providing friendly and welcoming services (11); training patients in empowerment and communication skills (6); provider sensitization training (6); additional patient outreach (5); and feedback to healthcare workers regarding patient concerns and evaluation of service quality (3).

Among the 9 studies reporting patient experience using quantitative and qualitative measures (e.g., patient satisfaction, patient-provider communication/relationship, perceived quality of care), all reported positive effects. For HIV care cascade outcomes, we observed null and positive results on HIV care cascade outcomes.

Conclusions: A range of approaches that target patient-provider interactions in public health HIV service settings demonstrate effectiveness in improving patient experience but inconclusive results on HIV care cascade outcomes.

Additional work is needed to better understand the mechanisms through which person-centred interventions operate. Consistency in defining and measuring interventions acting on patient-provider experience can improve research and synthesis on this topic.

**EPE0873**

Mobilizing Operation Triple Zero (OTZ) in the Democratic Republic of the Congo (DRC): using youth-driven programming, self-care, and virtual support communities to improve youth treatment continuity and viral suppression (VLS)

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Background: Low VLS among youth persists in the DRC: VLS ranged from 33% (males 1–4 years) to 93% (females 10–14 years) in September 2020. OTZ is successfully used in Kenya to improve adolescent adherence and VLS. The US-AID/Integrated HIV/AIDS Project in Haut-Katanga adapted OTZ for DRC to improve youth treatment adherence, continuity, and VLS.

Description: Using human-centered design, we worked with adolescent support group members to co-adapt Kenya's OTZ model. Under our model, three age-stratified OTZ club types were created: youth under-10 and youth 10–14 years (added focus on HIV status disclosure) and adolescents 15–18 years (added focus on positive peer prevention).

Each club member committed to the three zeros: zero missed appointments, zero missed treatment doses, zero viral load. Additional commitments by specific clubs included zero unprotected sex and zero self-stigma.

We integrated virtual support components with each club sending daily reminders/support messaging and peer facilitators sending appointment reminders and missed appointment follow-ups via using WhatsApp or SMS. We piloted this model at three high-volume facilities from May 2021–September 2022, assessing its impact on treatment and viral load (VL) outcomes.

Lessons learned: 110 and 140 youth enrolled in six OTZ clubs in fiscal year 2021 and 2022, respectively. Improvements were observed across all tracked outcomes between fiscal years—self-reported adherence and continuity (77% to 90%); VL coverage (53% to 90%); and VLS (71% to 94%)—with two- and three-fold increases in members with active VL counts and suppressed VL, respectively (table).

WhatsApp/virtual messaging facilitated accountability and on-demand support for club members, improving outcomes. Peer facilitators and members leading follow-up and peer prevention campaigns empowered them to collectively manage health goals. Medical directors' involvement in OTZ meetings was critical for active, sustained facility engagement.

	FY21 (May–Sept 2021)	FY22 (Oct 2021– Sept 2022)
# Operation Triple Zero club members	110	140
# members with zero missed refill appointments (%)	85 (77%)	126 (90%)
# members with zero missed doses (%)	85 (77%)	126 (90%)
# members with active viral load results (% coverage)	58 (53%)	113 (90%)
# members with suppressed viral load (% suppression)	41 (71%)	106 (94%)

Conclusions/Next steps: Results showed our adapted OTZ model is feasible and effective in improving clinical outcomes for youth. HIV program implementers should scale this model across DRC to address persisting issues of sub-optimal pediatric VLS.

EPE0874

The impact of client-initiated clinic appointment strategy on 12-month retention in HIV care in rural Malawi: an uncontrolled interrupted time series analysis

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Background: Differentiated service delivery (DSD) models are a promising approach to attaining the UNAIDS 95–95–95 targets by 2030. In June 2021, the Malawi Ministry of Health with support from Kamuzu University of Health Sciences (KUHeS) introduced a client-initiated clinic appointment (CICA) strategy in Ntcheu district, Malawi.

The CICA strategy allows individuals who are stable on ART to choose their preferred next clinic date with the aim of empowering the clients to participate in healthcare decisions and enhance retention in HIV care.

Methods: We conducted a quasi-experimental study using an uncontrolled interrupted time series analysis to evaluate the effect of implementing CICA on 12-month retention in ART services.

We analyzed a subset of data on adults aged 15 years or older from the ART registers at 13 health facilities that were implementing the CICA strategy in the district.

We fitted a generalized linear regression model with a negative binomial distribution to account for the over-dispersion of data.

We performed a Linear Mixed-Effects regression to account for the clustering of data due to the repeated measurements over time. We calculated an immediate-level change and the subsequent change in slope over time following the introduction of CICA.

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Results: The estimated mean 12-month retention in June 2021 was 76.8% (CI 71.1%–81.7%). Prior to implementing the CICA strategy the proportion of patients retained was increasing at a rate of 4.5% monthly (95% CI: 2.05%–6.32%, $p < 0.001$). Immediately after the introduction of CICA, the estimated rate ratio of client retention increased by 24% (95% CI: 15.2% – 36.9%, $p < 0.001$).

Subsequently, there was a monthly increase in retention of 11.9% (CI: 9.7%–13.5%, $p = 0.02$) compared to the monthly trend before CICA.

Conclusions: Our results provide compelling evidence that 12-month retention in ART services increased over time since the introduction of CICA. When allowed to participate in healthcare decision-making, clients feel empowered and obliged to honor their decisions.

While additional data is needed to support causal links to the CICA model, this is a promising development in efforts to achieve the global goal of ensuring that 95% of people living with HIV are consistently on treatment by 2030.

EPE0875

Give it to me, my wife go use am: perception and acceptability of female condoms among adults living in rural communities in Southern Nigeria

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Background: In Nigeria, there is a high prevalence of HIV/AIDS, with a concurrent low rate of condom use. HIV-related infections account for most deaths among women between 15 and 49 years. Furthermore, about 8 out of every 10 women with HIV is by having unprotected sex with an infected male partner.

This study aimed to explore the perception and acceptability of female condoms among adults in rural communities in southern Nigeria.

Methods: This was a qualitative study conducted across four rural communities with high HIV prevalence in southern Nigeria and data were collected by conducting FGDs. Responses were transcribed from speech to text using express scribe software. Texts were analyzed and general themes developed from responses discussed and reported with direct quotes. Thereafter, an awareness session was held to correct misconceptions on Contraceptive use.

Results: The findings of our study revealed that the majority of participants had never heard of female condoms, and those who had were not familiar with how to use them. Participants also reported that they were not comfortable discussing the use of female condoms with their partners, due to cultural and societal norms that view the use of such contraceptives as a sign of promiscuity. Additionally, participants reported that they were not aware of the availability of female condoms in their communities. Main facilitators for usage and acceptance of

female condom by men included the convenience of use, curiosity and enhanced sexual sensation as they echoed: "Give it to me, my wife go use am."

Women possessed reduced capacity to negotiate condom use with their partners, thus men opted to encourage usage by their spouses.

Conclusions: The findings of the study highlight the need for increased education and awareness-raising campaigns on the use and benefits of female condoms in rural communities in Nigeria. This includes providing information on how to use female condoms, their availability, and addressing cultural and societal barriers that may impact their acceptability.

Female condom offers better promises in the fight against HIV/AIDs in Nigeria if the availability of the female condom is buffered up and the benefits are scaled up.

EPE0876

Implementing nGage: a pre-implementation study of barriers and facilitators implementing an evidence-based social network support intervention for Young Black Sexual Minority Men living with HIV in the United States

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Background: In the United States, young Black sexual minority men (YBSMM) ages 18–35 bear the highest burden of HIV and experience the poorest outcomes along the Continuum of Care. Although improving social support is a common focus of clinic-based services for people living with HIV (PLWH), few clinic-based programs for YBSMM involve organic support confidants—members in YBSMM's existing social networks who can offer the types of social support that help men navigate life's complexities, including the potential stressors of living with HIV. As such, involving social network members is a practice innovation that requires additional research to understand staff perspectives on contextual implementation barriers and facilitators.



Methods: We conducted a sequential explanatory mixed-methods study with staff from five organizations in Chicago (n=2) and Alabama (n=3) participating in a Hybrid Type I trial of Project nGage, an evidence-based intervention that leverages social network members to promote retention in care and viral suppression for YBSMM aged 18-35. In phase one, N=64 staff completed a closed-ended survey with items on organizational culture, implementation climate, COVID-19 impact, and research support derived from the Consolidated Framework for Implementation Research (CFIR). Site-level means were calculated, which informed a purposive sampling frame and CFIR-informed focus group protocol.

Focus groups were conducted at each site with N=39 frontline, leadership, and implementation staff. Seven coders conducted Rapid Qualitative Analysis to further contextualize site-level and cross-site implementation facilitators and barriers.

Results: Quantitative results indicated that all sites had high implementation readiness, with strong commitments to supporting YBSMM living with HIV. Site-level means showed differences in implementation climates, with Alabama sites reporting strong implementation leadership and rewards for using EBPs, and Chicago sites reporting higher organizational stress. In qualitative analysis, staff at all sites viewed nGage as an innovative way to meet men's social support needs but raised human resource concerns.

Additional qualitative results contextualized site-level differences in organizational communications, outer setting barriers to engaging YBSMM, and in staff and patient stressors resulting from COVID-19.

Conclusions: Pre-implementation findings showed organizational variation in inner and outer setting domains that may shape implementation. These data highlight the need for site-specific implementation strategies.

Global and national financing, economic evaluation and sustainability

EPE0877

Community-led financing for HIV&AIDS response. Innovative, sustainable 21st-century financing model - based on the AIDS support organization (TASO) Uganda's success story

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Background: While funding for HIV/AIDS, from all sources in Uganda, consistently increased from 2004 to 2010, it has largely plateaued in the last 10 years, with a fear of dropping due to competing global priorities. In Uganda, up to 35% of total spending on health is used for HIV services, and of this over 86 % is estimated to come from international funding - and in-country resources at 8.6% (by government) and 8.3% (private sector - including OOP and private corporations) respectively.

The fiscal liability to maintain HIV services for all those who need them is estimated to be 1.8% of Gross Domestic Product (GDP). And with growing numbers of patients on ART, the projected costs of comprehensive HIV care and treatment services will increase considerably.

Description: There is a growing concern that the current financing mechanisms for HIV programs in Uganda are not only outdated funding models but unsustainable. UNAIDS Global AIDS Strategy 2021-2026 - End Inequalities, End AIDS, prioritizes community-led responses as critical for ending the AIDS epidemic and addressing long-entrenched systemic inequalities.

We present lessons from implementing innovative, 21st-century financing models by the AIDS Support Organization (TASO) Uganda, Africa's pioneer HIV&AIDS community-led organization, established in 1987 in Uganda".

Lessons learned: In 2020, USAID/Uganda awarded TASO a 5-year project to implement one of the USAID Local Partner Health Services Ankole & Acholi Activity Uganda transition awards. QED/ Uganda Learning Activity (ULA) sub-contracted Deloitte Uganda to provide capacity-building services to TASO for the development of a revenue diversification/business development plan.

The plan outlined three fundamental goals that by 2027:

1. Reduce donor dependence ratio from 97% in 2020 to 50%;
2. Increase private sector contribution from <1% in 2020 to 20%; and
3. Increase internally generated income from 3% in 2020 to 30%.



Conclusions/Next steps: Community-led HIV financing mechanisms through diversification is one critical strategy for sustainable financing in the context of increased domestic mobilization.

All local organizations should develop and implement a resources diversification plan as a key step to domestically sustaining HIV/AIDS response with the possibilities of projected external funding reductions.

EPE0878

Setting the right price for financing HIV prevention services: a costing analysis to increase reimbursements from the Thai National Health Security Office to community-based organizations

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Background: Community-led HIV testing and treatment support in Thailand have historically been externally funded, but substantial progress has been made to sustain these services domestically under the HIV prevention fund administered by the National Health Security Office (NHSO). Key Population-led Health Service (KPLHS) organizations are currently separately reimbursed for each client reached, tested, and retained in services, but these reimbursements do not cover the full operational costs of the KPLHS organizations.

Description: Mahidol University with support from EpiC/FHI360/USAID conducted a costing analysis to calculate unit costs for reaching clients, providing HIV tests, and providing PrEP or referring to ART. Four KPLHS organizations reported on service delivery and related expenditures for each service – including labor and capacity strengthening, travel, management costs and service promotion, VAT, and a 5% margin for profit – for all clients served in a single fiscal year across the 20 provinces where these organizations operate.

Unit costs for each service were combined to calculate total costs for three bundled service packages based on differentiated client needs: non-PrEP users, PrEP users, and PLHIV.

Lessons learned: The current NHSO reimbursement of THB 1,800 (~USD 50) does not cover community-led PrEP, ART and adherence support, which are critical for Thailand to end AIDS by 2030.

This analysis led to the development of a costed menu of services differentiated to suit the needs of non-PrEP users

(THB 2,151 [USD ~62]), PrEP users (2,566 [~USD 73]), and PLHIV clients (THB 9,180 [~USD 262]). The menu provides detailed information to address domestic financing gaps.

Conclusions/Next steps: The study provided NHSO and other stakeholders with actionable data for decision-making and policy development to support the sustainable financing of HIV services. NHSO now plans to revise budgeting to ensure adequate domestic financing of HIV prevention and treatment support services provided by KPLHS organizations. Implementation of revised pricing will need to be monitored and advocacy continued to ensure its passing since support remains fragile for KPLHS in Thailand – and globally.

EPE0879

Sustaining key population-led HIV services as international donor funding declines: fragile success in domestic financing and social enterprise development in Thailand

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Background: Key population-led health services (KPLHS) organizations have substantially contributed to Thailand's HIV response. Data from Oct. 2021–Sept. 2022 show that 47% of case finding among KPs under the national HIV prevention fund was through KPLHS organizations under the USAID/PEPFAR EpiC project.

Additionally, four out of five PrEP clients nationwide are receiving services from these organizations. As donor funding decreases, these services need to be sustained by financing from the national health system or social enterprises by the organizations themselves that generate income.

Description: EpiC KPLHS partners developed a pathway to sustainability in 4 steps:

- Consensus building among national stakeholders to increase domestic financing and agreed steps for implementation;
- Demonstration of a social contracting mechanism for financing certified and accredited KPLHS organizations through reimbursement from the National Health Security Office (NHSO);
- Increasing available domestic financing to scale up and sustain KPLHS organizations based on rigorous costing data to ensure adequate reimbursement to cover operational costs for these organizations, and;
- Diversifying sources of financing to cover declining donor funding of KPLHS operations.



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These options included future strategic and business planning on resource mobilization, social enterprise incubation, and expanding KPLHS sites to polyclinic status, which allows them to access a broader menu of government reimbursements.

Lessons learned: Since 2016, public sector expenditures for KP-led HIV services have increased significantly in the past five years. By 2023, between 40–60% of several KPLHS organizational budgets were supported by the Thai National Health Security Office (NHSO). However, this funding is fragile and has met with some resistance among government stakeholders who question the role of KP-led organizations in providing some HIV clinical services.

Simultaneously, several KPLHS organizations have initiated social enterprises and polyclinics that show early promise in diversifying funding sources by generating income that can be channelled back into HIV services.

Conclusions/Next steps: The sustainability and domestic financing of HIV services requires long term planning, advocacy, implementation science, cost analyses, and business acumen. While domestic government investments in KPLHS can be successful, it remains necessary to continue to provide data and advocacy on the value of KPLHS investments so that skeptical stakeholders can be convinced.

EPE0880

Trends in PEPFAR key populations budgets and expenditures 2020-2023

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Background: In 2021, key populations (KPs) most at risk of HIV and their partners made up 70% of new HIV cases globally. Accordingly, among large funders of HIV programming like the President's Emergency Plan for AIDS Relief (PEPFAR), it is critical to understand trends in planned funding (budgets) for KPs and whether actual spending (expenditures) is aligned with what is budgeted.

Methods: PEPFAR data were accessed for countries with budgets for 2020-2023 (n=49) and analyzed by UNAIDS-defined regions. For the subset of PEPFAR countries with both budget and expenditure data available for 2020-2022 (n=45), descriptive analysis and t-tests were used to assess differences in the percent of KP budget spent as compared to the total percent of country budget spent.

Results: The percent of budgets allocated to KPs varied by region (Figure 1a) and budget trends and expenditure trends did not always align (Figure 1a & 1b). In 2023, the percent budget allocated to KPs was lowest in Eastern and Southern Africa (4.40%) and highest in Asia (50.50%). Comparing budgets to expenditures, the median percent KP budget spent (87.9% - IQR 41.8) was similar to the total budget spent in 2020 (85.5, IQR 18.3), and less than the percent total spent in 2021 (KP: 75.8% - IQR 29.4, Total: 87.3%,

14.8) and 2022 (KP: 87.1% - IQR: 23.7, Total: 93.7%, IQR: 5.6). This difference was only statistically significant in 2021 (t = -3.24, df = 45, p<0.05).

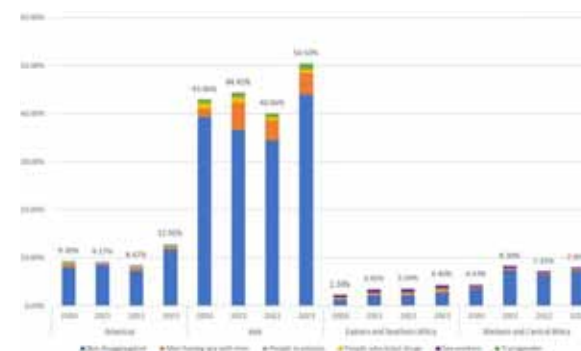


Figure 1a. Percent (%) of overall budget allocation to key populations 2020-2023.

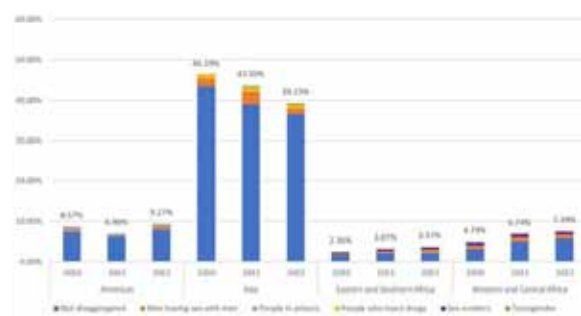


Figure 1b. Percent (%) of overall expenditures associated with key populations 2020-2022.

Conclusions: Even in regions with more generalized epidemics, PEPFAR KP budgets are proportionally small considering the relative burden of HIV incidence among KPs, but trending upwards over the last several years. It will be important to monitor underspending of KP budgets moving forward to ensure budgeted dollars are reaching the intended populations.

EPE0881

Where did the money go in 2019 to 2021? Findings from the National AIDS Spending Assessment Report

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Background: The financial burden on domestic economies in Sub-Saharan Africa to combat the AIDS pandemic is considerable, and despite large increases in domestic public spending by governments in low-income countries, majority of them rely heavily on external sources. Despite the current global recession in developed nations that give technical and financial assistance to Ghana, there is an urgent need to adequately monitor HIV and AIDS resource flows and track their appropriate deployment. To achieve this, the National AIDS Spending Assessment (NASA) was conducted in Ghana for 2019, 2020 and 2021.

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The aim of the study was to analyse expenditure patterns of HIV related services from public and private sector organizations, including bi and multilateral organizations.

Methods: The NASA allows for the systematic and exhaustive accounting of the level and flows of financing and expenditures. It captures all HIV and AIDS spending according to the categories in the national strategic plan.

Most of the key sources of data were obtained from stakeholders involved in HIV and AIDS using a questionnaire developed by UNAIDS and the results obtained using the Resource Tracking Tool developed by UNAIDS.

Results: Total expenditure on HIV and AIDS activities in Ghana increased from US\$88,648,568 in 2019 to US\$107,280,242 in 2020 (21% increase) and a further increase to US\$ 127,828,300 in 2021 (19% increase). Contributions from international organizations amounted to 42%, 40% and 41% in 2019, 2020 and 2021, with public funds increasing from 33% in 2019 to 34% for 2020 and 2021.

Most of the funds accrued in the three years were spent on HIV Care and Treatment (58% in 2019, 58% in 2020 and 65% in 2021). Total expenditure on prevention programmes was below 10% of the total HIV expenditure for the three years.

Conclusions: The study gives an estimate of the functional flow of application and distribution of funds for the three years which will aid with prioritization of interventions for the country. Additionally, efforts must be in place to increase the funds allocated to prevention programmes.

EPE0882

Long-term impacts of loss of PEPFAR support on HIV services at sub-national level in Eastern Uganda: a qualitative study

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Background: In 2017, PEPFAR sought to better align its aid with HIV burden at sub-national level in Uganda under the 'geographic prioritization' policy. Support was withdrawn for 241 facilities in 10 districts in Northern and Eastern Uganda on account of 'low HIV burden' defined as having an HIV prevalence of less than 1%. There is a paucity of data on the medium to long-term impact of this funding policy change.

We retrospectively assessed the perceived long-term impact of loss of PEPFAR support on HIV services in Eastern Uganda between 2018 and 2021.

Methods: We conducted a qualitative case-study of four districts in Eastern Uganda (Luuka, Bulambuli, Budadiri Amuri) between February and June 2022. In-depth interviews were conducted with national-level health ministry officials ($n=14$), district health teams ($n=24$), representatives of PEPFAR implementing organizations ($n=11$) and HIV clinic managers ($n=26$). Data were analyzed inductively by thematic approach.

Results: District and facility-level participants indicated that between 2018 and 2020, lost PEPFAR investments in HIV programming were not replaced by the national government or alternative external donor. As a result, community outreach activities ceased after withdrawal of HIV workforce allowances which impeded defaulter tracing in the community.

Facility-level participants reported increased loss to follow-up of adult and pediatric clients, declining viral load suppression rates (particularly among pediatric clients) and increased reports of patient deaths in the community. District health teams in Luuka and Bulambuli indicated that their district HIV prevalence more than doubled (2.2%) in December 2020 (based on the national HIV prevalence survey) when compared to the pre-PEPFAR exit phase in 2017.

Conclusions: District and facility-level participants perceived the long-term impact of loss of PEPFAR support and the delay by the recipient government in replacing this aid to have negatively impacted the HIV care continuum and reversed gains in HIV epidemic control in Eastern Uganda. Replacing PEPFAR investments in HIV programming (e.g. community outreaches) is critical to attainment of 95-95-95 targets in Eastern Uganda.

EPE0883

Aligning PEPFAR investments with health equity goals

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Background: Substantial HIV prevention and treatment gaps remain among vulnerable populations, including adolescent girls and young women (AGYW), children, and key populations (KP). PEPFAR prioritizes health equity for these groups as outlined in the Fulfilling America's Promise to End the HIV/AIDS Pandemic by 2030 Strategy. Understanding resource allocation to these populations will be critical for future planning and alignment of investments with health equity goals.

Description: Routine PEPFAR budget data from U.S. government fiscal years 2022 to 2023 was used to analyze site-level investments allocated to three beneficiary groupings: KP, AGYW, and children. Programmatic results and expenditures were used to better understand impact of data consistency and reporting on results.

Lessons learned: Although PEPFAR funding attribution for vulnerable populations represents less than a quarter of total funding, there has been an overall increase in funding in recent years, from \$594 million in FY22 (22% of overall budget) to \$667 million in FY23 (26%). Total funding attribution is higher for AGYW (11%) and KP (10%) than children (5%), with higher proportions for each group in specific program areas (Figure 1).



Triangulation with other data sources indicated that, while total resources for the vulnerable groups are likely underestimated due to attribution flexibilities within PEPFAR planning tools, documented growth in resources from FY22 to FY23 may be primarily due to improved attribution over time and, within the prevention space, scale up of PrEP services for vulnerable populations.



Figure 1. In FY23, PEPFAR funding for priority vulnerable populations totals \$735M (22% of total budgets), with higher attributions varied by program area for key populations (prevention and testing), AGYW (prevention and socioeconomic), and children (care & treatment and testing). Excludes commodities and USG management and operations; Includes site-level program funding only.

Conclusions/Next steps:

Improved accuracy and specificity of financial data coupled with funding benchmarks aligned with gap analysis for priority populations, and active tracking of resource use will be critical in moving forward PEPFAR's health equity goals.

EPE0884

Private sector financing to sustain health systems for orphans and vulnerable children (OVC) in Lagos State through the ICHSSA 2 project

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Background: Over the past three decades, the HIV/AIDS epidemic in Nigeria has resulted in a sizeable population of orphans and vulnerable children (OVC), and the increase in vulnerable populations has been accelerated by the COVID-19 pandemic. To date, international and domestic support for HIV/AIDS and OVC has been significant in supporting both prevention and response, but financing gaps remain. The reduction of children's vulnerability to poverty is contingent on strategic investment that is closely coordinated between stakeholders.

There remains a notable disparity between contributions by different actors. The NASA 2012/2014 shows foreign funding accounts for 71-82% targeting HIV and OVC interventions. OVC funding has been fragmented between different units of government, which has prevented proper

aggregation of total sums. The Integrated Child Health and Social Service Award (ICHSSA-2) is a PEPFAR/USAID funded project in Lagos State to mitigate the impact of HIV/AIDS on OVC and their households implemented by Association for Reproductive and Family Health as the prime, Project HOPE and FHI360.

Description: Until recently, the private sector has not made significant contributions to financing OVC interventions in Nigeria. To increase private sector financing, Project HOPE implemented a rapid private sector financing drive for in-kind and financial support from private sector actors in Nigeria, including ACCESS Bank, Honeywell Foods, Nestle Foods, Airtel Nigeria, and LDS, directed at supporting vulnerable households to be resilient and increase the wellbeing of OVC in Lagos.

This partnership has leveraged cash donations as well as in-kind donations such as nutrition support and household supplies that have uplifted the economic status of OVC and their households. As a result, 52,162,743 Naira were mobilized for OVC from private sources.

Lessons learned: Aligning OVC support needs within the interest of previously untapped private sector actors is critical in building alliances towards achieving social impact investment in OVC households. Private sector organizations are critical sources of financing for the HIV/AIDS response, and health financing strategies should include tailored plans to engage these actors.

Conclusions/Next steps: The project is now using this approach as an advocacy tool to government and other private sector bodies to encourage more health financing in OVC programming in Nigeria

Costing, cost effectiveness and affordability

EPE0885

Cost-effectiveness of treating anal pre-cancerous lesions among gay, bisexual and other men who have sex with men living with HIV

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Background: Gay, bisexual and other men who have sex with men (GBM) with HIV have a 40- to 80-fold increased risk of anal cancer compared with the general population. The precursor to anal cancer is high-grade squamous intraepithelial lesion (HSIL).


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We have previously reported that routine HSIL screening and treatment in GBM with HIV is unlikely to be cost-effective in Australia using current screening methods. However, we estimate that approximately 5% of GBM with HIV have HSIL diagnosed serendipitously after colonoscopy or other medical procedure involving the anal canal. We aimed to evaluate whether HSIL treatment would be cost-effective among this population.

Methods: A Markov model with an annual cycle length was developed to compare the costs and health outcomes associated with treating HSIL diagnosed serendipitously in GBM with HIV aged ≥ 35 years in Australia. We assumed a healthcare system perspective over a lifelong time horizon. Costs and quality-adjusted life-years (QALYs) were discounted at 5% per year. Sensitivity analyses were conducted by varying the values of key model inputs within plausible ranges. Cost-effectiveness was defined as having an incremental cost-effectiveness ratio (ICER) less than AUD 50,000/QALY gained.

Results: Following implementation of HSIL treatment, anal cancer incidence in the study population was estimated to drop by 18% (from 256 to 211 cases/100,000 person-years). The ICER for HSIL treatment relative to no treatment was AUD 28,200 per QALY gained. In one-way sensitivity analyses, the estimated ICER becoming slightly greater than AUD 50,000 per QALY gained when we assumed men with no HSIL/HSIL/localised anal cancer had a low quality-of-life, or the cost of living with HIV was high – See Figure. In probabilistic sensitivity analyses, HSIL treatment had >99% probability of being cost-effective.

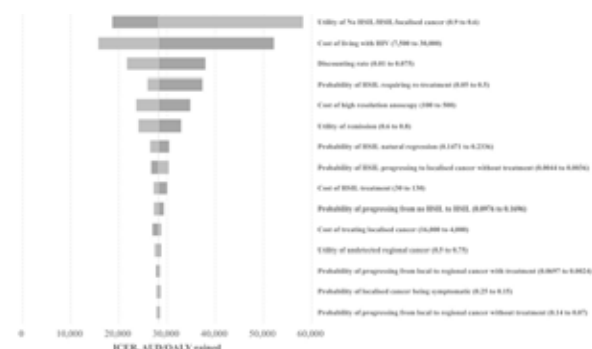


Figure. Tornado plot showing results of one-way sensitivity analyses.

Conclusions: In Australia, treating HSIL diagnosed serendipitously among GBM with HIV aged ≥ 35 years is likely to cost-effectively reduce anal cancer incidence.

EPE0886

Cost-effectiveness of three different Pre-Exposure Prophylaxis (PrEP) regimens for HIV prevention in Mexico

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Background: Pre-exposure prophylaxis (PrEP) can be cost-effective in populations at high risk of HIV. While PrEP is the standard of care in Mexico, evidence of its cost-effectiveness is lacking.

Therefore, we analysed the cost-effectiveness of PrEP among men who have sex with men (MSM) and transgender women (TGW).

Methods: We developed a Markov model to examine the impact of scaling up PrEP through government and community clinics in MSM and TGW 15 years at high risk of HIV.

Primary analysis evaluated generic emtricitabine-tenofovir disoproxil fumarate (F/TDF), branded emtricitabine-tenofovir alafenamide (F/TAF), and long-acting cabotegravir (CAB-LA) versus no-PrEP. Secondary analysis assessed F/TAF and CAB-LA versus F/TDF.

The model was analysed from the healthcare perspective in a 15-year horizon (2022-2036). Incremental cost per quality-adjusted life-year (QALY) was compared against the national cost-effectiveness threshold (CET) of \$10,165 per QALY gained. We varied key parameters in sensitivity analyses.

Results: Annual costs of F/TDF, F/TAF and CAB-LA were \$1,384, \$2,220, and \$1,384, respectively. If PrEP was scaled-up at 30% coverage and 80% uptake, F/TDF would avert 57,150 HIV transmissions and yield 138,892 incremental QALYs with an additional cost of \$60 million compared with no-PrEP. F/TAF and CAB-LA would avert 55,000 HIV transmissions, achieving 134,018 and 133,951 incremental QALYs with additional \$1.6 and \$1.2 billion costs, respectively. Compared with no-PrEP, the incremental cost-effectiveness ratio (ICER) of F/TDF, F/TAF and CAB-LA were \$4,427, \$12,216, and \$8,955 per QALY gained, with an 89%, 30% and 63% probability of cost-effectiveness (figure 1), respectively. F/TAF and CAB-LA were dominated by F/TDF. Results were robust to sensitivity analyses.

Compared with F/TDF, CAB-LA was cost-effective at a maximum price of \$788 and in populations with higher HIV incidence.

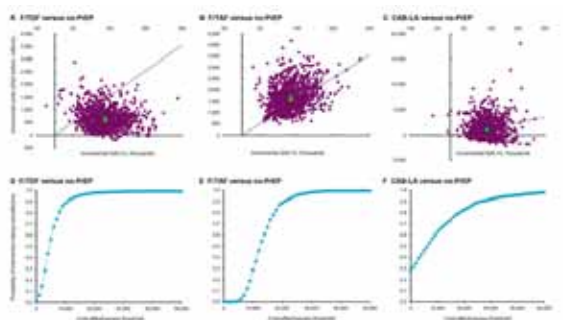


Figure 1.

Conclusions: PrEP scale-up can have a substantial public health impact in Mexico over the following 15 years. To be cost-effective over F/TDF, CAB-LA should be half the F/TDF price.

EPE0887

Understanding the cost of pharmacy-delivered HIV pre- and post-exposure prophylaxis services in Kenya: findings from a pilot study

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Background: In many low- and middle-income countries, private pharmacies are often the first point of access to healthcare services. However, the delivery of most HIV services is currently limited to public clinics. Public-private partnerships may expand access to HIV prevention services, but service expansion costs remain unknown.

Methods: In Kenya, 12 private pharmacies participated in a pilot study where they delivered oral HIV pre- and post-exposure prophylaxis (i.e., PrEP and PEP) drugs and associated counseling services. Pharmacy clients ≥ 18 years who met inclusion criteria on a PrEP/PEP prescribing checklist were delivered PrEP/PEP services for free (provided commodities by the Kenya Ministry of Health). We conducted microcosting and provider surveys to estimate the resources that pharmacies used for PrEP/PEP service deliv-

ery and the financial costs (i.e., all costs except donated commodities and overhead fixed costs) in USD from the provider perspective.

Additionally, in surveys with pharmacy pilot clients and providers not engaged in the study, we asked about their willingness to pay for or deliver PrEP/PEP services using free public commodities.

Results: From 2/2022-7/2022, 881 eligible pharmacy clients received PrEP (n=694) and/or PEP (n=163) services. From 3/2022-6/2022, we completed surveys with 40 pharmacy providers not engaged in pharmacy-delivered services. The financial cost of pharmacy-delivered PrEP was \$1.52 USD per initiation and \$1.38 USD per continuation visit. Most survey clients (83%, 575/694) reported they were willing to pay for pharmacy PrEP services (median amount: \$3.30 USD per visit, IQR \$1.60-4.10). All pharmacy providers reported they were willing to deliver PrEP services (median cost: \$1.60 USD per visit, IQR \$1.20-\$2.40) as well as long-lasting injectable PrEP services (median cost: \$1.60 USD per injection, IQR \$1.50-\$2.40). The financial cost of pharmacy-delivered PEP services was \$1.36 USD per visit (IQR \$1.34-\$1.37). All pharmacy providers stated willingness to deliver PEP services (median cost: \$1.60 USD per visit, IQR \$0.80-\$2.40).

Conclusions: When PrEP and PEP commodities for service delivery are provided for free, the financial costs of pharmacy-based delivery are below perceived costs regarding willingness to pay or deliver services.

These findings suggest that the delivery of HIV commodities in private pharmacy settings could potentially be sustained by client out-of-pocket payments.

EPE0888

Cost-effectiveness of antiretroviral therapy adherence interventions in people living with HIV/AIDS: a systematic review of decision analytical models

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Background: Although safe and effective antiretrovirals (ARVs) are readily available, non-adherence to ARVs is highly prevalent among people living with HIV/AIDS. Different adherence-improving interventions have been developed and examined through decision-analytic model-based health technology assessment.


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This systematic review aimed to review and appraise the decision analytical economic models developed to improve ARVs adherence in people with HIV/AIDS.

Methods: The review protocol was registered on PROSPERO (CRD42022270039), and reporting followed the PRISMA checklist. Relevant studies were identified through searches in six generic and specialized bibliographic databases, i.e., PubMed, Embase, NHS Economic Evaluation Database, PsycINFO, Health Economic Evaluations Database, and EconLit, from their inception to 23 October 2022. The cost-effectiveness of adherence interventions is represented by the incremental cost-effectiveness ratio (ICER).

The quality of studies was assessed using the quality of the health economics studies instrument. Data were narratively synthesized in the form of tables and texts. Due to the heterogeneity of the data, a permutation matrix was used for quantitative data synthesis rather than a meta-analysis.

Results: Fifteen studies, mostly conducted in North-America (8 of 15), were included. The time span of the studies ranged from a year to a lifetime, and they were funded by both public and private organisations. Ten studies followed the microsimulation, four employed Markov, and one utilized the dynamic model.

The most commonly used interventions reported include smartphone-based (5 of 15), nurse-involved (2 of 15), directly-observed-therapy (2 of 15), and others that involved multi-components (6 of 15). In four studies, interventions gained higher quality-adjusted-life years (QALYs) with cost-saving and gained QALYs at a lower ICER.

Similarly, the interventions in 11 studies were more effective but at a higher cost, with overall ICER well below the acceptable threshold mentioned in each study, necessitating careful interpretation before implementation.

The studies were graded as high quality (13 of 15) or fair quality (2 of 15), with some methodological inconsistencies reported.

Conclusions: Counselling and smartphone-based interventions are the most effective strategies that have the potential to reduce the chronic adherence problem significantly. Decision models can be improved further by addressing inconsistencies in model selection, data inputs incorporated into models, and uncertainty assessment methods.

EPE0889

Cost-effectiveness of dolutegravir compared with efavirenz for prevention of perinatal transmission in women presenting with HIV in late pregnancy in Uganda

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Background: Dolutegravir (DTG) has proved to be more efficacious, tolerable, and safer than efavirenz (EFV) among mothers living with HIV and their infants in Uganda. However, no study has evaluated the cost-effectiveness of a DTG-based antiretroviral therapy (ART) for preventing perinatal transmission (PT) in women who present with HIV in late pregnancy.

Therefore, this study assessed the cost-effectiveness of DTG-based ART compared to the existing standard of care (EFV-based ART) for preventing PT among pregnant women initiating ART in late pregnancy in Uganda.

Methods: We used data from a randomized open-label trial (DoPHIN-2) and a two-part cost-effectiveness model composed of a short-term decision tree to estimate the PT rate and costs and an individual-based 3-state Markov model (HIV, AIDs, Dead) to estimate the long-term costs and health outcomes from the Ugandan payer perspective using a lifetime horizon and a 1-year Markov cycle.

The main outcomes were the mean annual costs in US dollars (\$), disability-adjusted life years (DALYs), and incremental cost-effectiveness ratio (ICER).

Both the deterministic and probabilistic sensitivity analyses were conducted to assess parameter uncertainty. All costs were reported in 2022 US dollars, and costs and DALYs were discounted at an annual rate of 3%.

Results: Compared to the EFV-based ART, the DTG-based ART was associated with fewer mean annual costs (\$279 vs. \$471) and DALYs (0.33 vs. 0.56), leading to an ICER of \$851 per DALY averted. In the incremental analysis, the DTG-based ART dominated the EFV-based ART, i.e., it was less costly and more effective. These results were robust to deterministic and probabilistic sensitivity analyses.



Conclusions: The DTG-based ART is a highly cost-effective strategy compared with the EFV-based ART among women initiating treatment in the third trimester of pregnancy in a low-income setting. Given the favorable health benefits and cost savings associated with the DTG-based ART, this study supports the recommendations to use DTG as first-line therapy for pregnant and breastfeeding mothers and their children.

EPE0890

Analysis on the costing the adoption of Kenya's HIV test and treat guidelines, and its implication on the economic growth

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Background: The analysis guides MoH policy on the use of ARVs outlining eligibility for ARV use, regimen selection and monitoring for effectiveness within WHO recommendations. Guidelines are developed and reviewed in line with local and international evidence and take into consideration public health use of ARVs by the WHO. On this basis, Kenya builds a comprehensive HIV resource needs that corresponds to meet the 90-90-90 targets towards ending AIDS by 2030. The cost analysis estimates provision of ARVs as treating/prevention therapy.

The paper investigates implication on ARV use on economic growth within the national guidelines. The process involves costing HIV test and treat guidelines and compares with the current costs, then analyzing costs implications on the Economy.

Methods: Provider perspective is used adopting program areas/activities costed. Micro-costing approach integrating activity-based costing is used. The exception on this approach was non-medical costing which proportionate allocations based on existing literature on program cost.

Results: The 2015 HIV data estimates total cost for implementing the new guidelines at US\$ 438 million. Key cost drivers were ARVs cost at US\$ 159 million, non-biomedical at US\$ 154 million and laboratory cost at US\$ 43 million. Total cost increased marginally in the period 2016/2017 to 2019/2020 explained by ARVs trends caused by ARVs regimen change over the period.

The estimates of the second scenario (referred to as Standard Intervention) assumed the guidelines were implemented 100%.

Estimated total cost for implementing Standard guidelines was US\$ 526 million in the period 2019/2020. Key cost drivers were ARVs cost at US\$ 185 million, non-biomedical at US\$184 million, laboratory cost at US\$ 50 million.

Total cost increased linearly throughout the period, given operational HIV programmes, reduced mortality rates, high suppression levels and drop on incidence rates towards 2030 targets.

Conclusions: With interventions working, escalation of cost is expected in future due to inclusion of more PLHIV on care enhanced by reduction in HIV related mortalities. Inclusion of PrEP and PEP as HIV prevention measures significantly impact HIV incidence rate (lower) that is consistent with growth in HIV prevalence rate. These high policy interventions towards acceleration of prevention measures thus reducing ARVs costs.

EPE0891

Economic evaluation of HIV infection rency at four health facilities in Bangkok, Thailand

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Background: Implementing a rapid test for HIV recent infection (RTRI) can inform effective targeted HIV prevention strategies to achieve epidemic control. While the RTRI and recent infection testing algorithm (RITA), which combines RTRI with viral load (VL) testing, have been implemented in several countries, costs of implementing them have not been reported.

We evaluated costs and outcomes of the implementation of RTRI and RITA in routine HIV testing services at four Bangkok Metropolitan Authority health facilities from October 2021 through September 2022.

Methods: Sites were purposively selected based on the number of RTRI-recent cases, VL testing facility (on-site/off-site), and facility type (hospital/health center). We used case surveillance (CS) data (client registration, clinical data) collected routinely through the national AIDS program to verify eligibility: newly diagnosed HIV positive clients ≥13 years, ARV initiated ≤28 days, known HIV positive status for less than 1 month.

Enrolled clients with RITA recent infections were those who tested RTRI recent with viral load (VL) ≥1,000 copies/ml. RITA long-term (LT) infections were RTRI-LT or RTRI-recent with VL <1,000 copies/ml. Cost data were collected retrospectively from data systems and staff interviews using an ingredient-based costing approach.

Results: The use of CS to verify eligibility for RTRI improved the proportion of RTRI-recent from 3% (Range: 1-7%) to 13% (Range: 7-22%), corresponding to almost 75% in cost



savings. Approximately 24% of RTRI-recent cases (Range: 0-29%) had suppressed VL and were reclassified as RITA-LT. The estimated total economic costs of implementing RTRI and RITA were \$6,177 and \$7,487, respectively. RTRI test kits were the main cost drivers followed by personnel, VL tests, and training & meeting. The average costs per RTRI-recent and RITA-recent were \$158 and \$242, respectively. The addition of VL test to improve classification of recency status costed about 53% more on average (Range: 41-86%). A separate analysis showed that on-site and off-site VL testing facilities were comparable in cost.

Conclusions: Use of CS improved the predictive value of RTRI-recent and reduced costs. Integrating RITA into routine HIV services incurred higher costs than RTRI which may help inform cost-effective options for programs in limited resource settings.

EPE0892

Optimal use of PrEP to reduce HIV incidence by 90% by 2030 in a low incidence setting

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Background: Although the 2020 HIV cascade of care (CoC) targets were practically reached among men who have sex with men (MSM) in the Republic of Cyprus (CoC: 92%-88%-93%), it is unknown whether this population is on track to meet the 2030 HIV incidence reduction target (e.g., 90% reduction in 2030 compared to 2010). Additionally, Pre-Exposure Prophylaxis (PrEP) is currently unavailable and its outcomes (reduction in HIV incidence and cost of implementation) have not been quantified yet.

This work studies the optimal implementation of PrEP to help achieve the 2030 HIV incidence reduction target in Cyprus through a cost-effective strategy.

Methods: A mathematical model was used to simulate HIV transmission among MSM. The MSM population was stratified based on risk behaviours reported in the EMIS-2017 study (high risk=15.1%/medium risk=28.7%/low risk=56.2%). The model was calibrated to match the trajectories of the HIV CoC in years 2015-2020.

Data on costs of HIV diagnosis, antiretroviral treatment, oral PrEP, and clinical management were collected. The cost per averted infection for different scenarios was calculated.

Results: Reaching the 95-95-95 target in 2030 would not be enough to reduce HIV incidence by 90%. To meet the 90% HIV reduction target, PrEP should be expanded to both high and medium risk MSM and be accompanied by behavioral interventions after 2025. In this low HIV incidence population (estimated at 5.92 per 1000 person-

years in 2020), PrEP on demand is a cost-effective intervention only if its median use is limited to up to 8 months per year per eligible MSM.

Conclusions: Due to the small size of the high-risk MSM group, limiting PrEP only to this population is not effective. To achieve HIV incidence reduction, both high and medium risk MSM should be on PrEP by 2030. However, the optimal trade-off limit between PrEP use and cost in this low incidence setting is 8 months per eligible MSM per year.

EPE0893

Impact of price subsidy strategy in promoting uptake of HIV self-testing kits in Abuja, Nigeria: a pilot implementation

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Background: HIV self-testing (HIVST) is an HIV testing approach that may appeal to hard-to-reach individuals who require frequent HIV testing. Although HIVST kits have become available in pharmacies outlets, majority of people still find it hard to purchase HIVST kit due to the high cost. To increase access, tackle pricing policies and promote uptake of HIVST in Abuja, we implemented price subsidy on HIVST kits at the pharmacy outlets.

Methods: Society for Family Health conducted a pilot implementation between April - December 2022 in Abuja, Nigeria. Sixty pharmacies were recruited using the eligibility criteria which includes: registered with the Pharmacy Council of Nigeria, stocking or willing to stock HIVST and provide data on units sold per month. From September to December 2022, subsidized blood based HIVST kits were gotten from JHPIEGO and distributed to pharmacies already stocking oral fluid based HIVST kits at a retail price of N500 (1.10USD).

The data from baseline and follow-up implementation were analysed quantitatively through the total number HIV test kits sold before and during the subsidy.

Results: Our findings showed that there was increase in the sales of HIVST kits during the subsidy period. Prior to the subsidy (from April to August 2022), pharmacies sold a total of 207 oral fluid HIVST kits at the rate of 1,500 - 2,500(3.31USD - 5.51USD) while from September to December (period of subsidy), the pharmacies sold a total number of 365 Oral fluid HIVST kits and 569 blood based HIVST kits at the rate of N500 (1.10USD).

Conclusions: While HIVST has become an acceptable method of testing due to the confidentiality and privacy it provides, high cost of HIVST kits hinders uptake. The introduction of price subsidy on HIVST made a remarkable impact in improving the demand and uptake of HIVST among priority audience, those in hard-to-reach areas, undeserved communities, and the general populations.



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**EPE0894****Economic evaluation of scaling up HCV testing in men who have sex with men living with HIV and using PrEP in Taiwan**H.-J. Wu^{1,2}, S.T.F. Shih¹, T.L. Applegate¹, R.T. Gray¹¹Kirby Institute, UNSW Sydney, Sydney, Australia, ²National Cheng Kung University, Department of Public Health, College of Medicine, Taiana, Taiwan, Republic of China

Background: HIV prevention and care services (e.g., HIV treatment or pre-exposure prophylaxis, PrEP) provide a good opportunity to engage men who have sex with men (MSM) in HCV diagnosis and prevention in hospitals in Taiwan, where the majority of tests of HCV are conducted. Point-of-care (POC) HCV testing is known to improve HCV diagnosis and treatment uptake, but its cost-effectiveness is poorly understood. This study aims to estimate the cost-effectiveness of scaling up of HCV POC testing among MSM who are on HIV treatment or PrEP in the hospital setting in Taiwan.

Methods: We developed a compartmental deterministic model to evaluate different POC testing strategies among MSM in Taiwan. The model was calibrated with available local data and used to conduct a scenario analysis of different POC testing: POC HCV antibody testing (POC Ab), reflex RNA testing (reflex RNA), and POC RNA testing (POC RNA). POC testing strategies were scaled up over 2022-2024.

Results were compared to a status-quo scenario over 2022-2030. We estimated the costs using an ingredients-based costing approach for POC scenarios in 2021 US Dollars (\$), converting from New Taiwan Dollar if necessary using Purchasing Power Parity.

Modelling outcomes included numbers of HCV infections, lifetime health care costs, quality-adjusted life years (QALY) and incremental cost-effectiveness ratios (ICERs) from a health care perspective, with a lifetime horizon and 3% annual discounting rate.

Results: Scaling-up POC testing among MSM who are on PrEP or HIV treatment could achieve a reduction of new HCV infections between 12.2% by POC Ab and 32.2% by POC RNA over 2022-2030 compared to status quo (corresponding to 5,521 to 8,588 infections averted).

Compared to status quo, additional \$66,252,457, \$192,523,892, and \$48,687,786 lifetime costs were required by POC Ab, reflex RNA, and POC RNA testing scenarios, respectively. the ICERs were \$ 36,506/QALY in the POC Ab scenario; \$64,170/QALY in the reflex RNA scenario and \$8,247/QALY in the POC RNA scenario.

Conclusions: POC testing could potentially prevent additional HCV infections among Taiwanese MSM. POC RNA testing is likely to be the most cost-effective and impactful strategy among the testing scenarios studied.

EPE0895**Determining the cost to provide an essential or comprehensive package of HIV interventions to key populations in Kenya**M.I. Khan¹, U. Kioko², C. Schutte¹, P. Bhattacharjee^{3,4},K. Mangold¹, W. Nduku⁴, M. Oindo⁴, J. Boit⁵, J. Musimbi⁴¹Genesis Analytics, Health Practice, Johannesburg, South Africa, ²Private Consultant, Nairobi, Kenya, ³University of Manitoba, Institute of Global Public Health, Winnipeg, Canada, ⁴Partners for Health and Development in Africa, Nairobi, Kenya, ⁵The National AIDS and STI Control Programme, Ministry of Health, Nairobi, Kenya

Background: The purpose of this study was to determine the total resources needed to provide a package of HIV prevention and support services to Key Populations (KP) in Kenya. Key population estimates are 197,096 female sex workers (FSW), 61,650 MSM, 26,673 people who inject drugs (PWID) and 4370 transgender people.

The Kenya AIDS Strategic Framework II 2020-2024 recommends scaling high-impact interventions in priority geographies for KPs, emphasising the need for accurate unit costs and resource needs for 47 counties.

Methods: The study used an Excel based Resource Needs Model to estimate the required resources to scale-up the delivery of an essential and comprehensive package of services to KPs over five years. The study computed structural and support interventions at the national and county levels as a proportion of the total resources required for implementing the package of interventions.

Desktop research and secondary data based on studies conducted in Kenya was used to adjust the annual costs to 2021 equivalent values as a baseline and inflation calculations assisted in projecting between 2021 to 2025.

Results: Kenya will need \$148.64 million to provide the essential package and \$289.75 million for the comprehensive package over five years to all KP groups.

Interventions	FSW (\$ Million, 5 years)	MSM (\$ Million, 5 years)	PWID (\$ Million, 5 years)	Transgender People (\$ Million, 5 years)	Total, 5 years (\$ Million)
Behavioural	38.02	13.51	3.53	0.67	55.73
Biomedical	12.85	5.12	13.16	0.96	32.09
Structural	5.13	1.23	0.63	0.08	7.07
Programme Management	39.01	9.32	4.79	0.63	53.75

Table 1: Resources needed for essential package

Interventions	FSW (\$ Million, 5 years)	MSM (\$ Million, 5 years)	PWID (\$ Million, 5 years)	Transgender People (\$ Million, 5 years)	Total, 5 years (\$ Million)
Behavioural	38.02	13.51	3.53	0.67	55.73
Biomedical	81.28	37.22	28.77	0.96	148.23
Structural	6.84	2.03	1.02	0.08	9.97
Programme Management	52.01	15.42	7.76	0.63	75.82

Table 2: Resources needed for comprehensive package

Amongst both the essential and comprehensive packages, FSWs will require the highest share of resources (62%) followed by MSM (22%), PWID (14%) and Transgender people (1%).

Conclusions: Following this study a national assessment should be undertaken to understand resource need gaps and advocate for the allocation of domestic and international resources to meet the needs of key populations.

EPE0896

Economic assessment and evaluation of Medically Assisted Therapy (MAT) services in six counties in Kenya

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Background: In Kenya, there is an estimated 23,978 people who currently inject drugs (PWID). The HIV prevalence rate for PWID is about 18.3% compared to the general population which stands at 4.9%. This is attributed to high-risk injecting and sexual behaviour among the PWID population. The government of Kenya introduced MAT using Methadone in 2014. In line with PEPFARs strategic direction on the journey to self-reliance, the Government of Kenya and respective county governments have been slowly but steadily taking over key components of MAT, commonly referred to as Opioid Substitution Therapy (OST) service provision.

The aim of this study was to generate key information from an economic perspective that would guide stakeholders on the nature, levels, and models of investments for sustainable implementation and scale-up of OST services in the country.

Methods: The study was conducted in eight sites in six counties in Kenya: Nairobi, Kilifi, Kiambu, Mombasa, Kwale and Kisumu. The counties were selected due to their high burden of injecting drug use.

The study used an ingredients approach to cost MAT/OST services, whereby all the inputs were listed and their contribution to the overall cost tallied. The direct and indirect costs for each service delivery step were computed separately.

Results: The cost of providing methadone treatment ranged from \$1.19-\$1.36 per day, translating to an average monthly cost of \$45.00-49.42. Assuming the client continued with treatment for a year, the mean cost across all the sites would be \$544.86 (range, \$309.58-\$1,363.92) per person per year for 80mg per dose.

The medical cost for no action that the government should anticipate if MAT services were not provided to PWID/PWUD would be \$368,504.50.

Conclusions: The unit costs generated in this study provide important information for policymakers who must consider the cost of methadone maintenance treatment relative to other policy options. The costs will reduce to \$64.64 for PWID and \$71.34 for PWUD if the number of visits were reduced to 7 in a year. This is an important consideration for ensuring a sustainable transition from methadone to the new alternative strategy of using buprenorphine-naltrexone regimes.

Health systems, health systems strengthening and partnerships

EPE0897

Community Advocacy and Partnerships in Expanding Cabotegravir Long-Acting (CAB-LA) Access: lessons for innovators, regulatory bodies, donors, and governments

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Background: The introduction of cabotegravir long-acting (CAB-LA) is primed to transform prospective HIV prevention and treatment efforts. However, in early 2022 its manufacturer ViiV Healthcare [ViiV] announced they would not pursue a generic license for CAB-LA, a potentially significant impediment to its affordability and access in key geographies in the HIV response. AfroCAB Treatment Access Partnership (AfroCAB), a global network of HIV community leaders sought to address this concern through worldwide advocacy efforts.

Description:

- In March 2022, AfroCAB released a widely cited statement endorsed by almost 200 organizations and individuals globally, demanding rapid pursuit of CAB-LA generic licensing by ViiV.
- ViiV immediately indicated they were now "open" to CAB-LA generic licensing, albeit at a prospective price AfroCAB deemed grossly unaffordable, releasing another statement reiterating these concerns and related demands.
- AfroCAB established a community-led Advocacy Platform to identify national and global actions to facilitate CAB-LA access and convened a gathering of stakeholders from the WHO, Medicines Patent Pool (MPP), the Clinton Health Access Initiative, and global community leaders to outline a path forward in June 2022.
- At the Montreal AIDS 2022 conference, after months of intense advocacy, ViiV and MPP announced a voluntary licensing agreement for CAB-LA.



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Lessons learned: The potential failure of CAB-LA access at a crucial time in the HIV response underscores the need for meaningful community partnerships.

The CAB-LA Advocacy Platform has exemplified this – it collaborated closely with community organizations, implementing partners, innovators, and governments, providing invaluable community-centred inputs to expediently understand, communicate, and rectify early salient barriers to CAB LA entry through coordinated and cohesive decision-making and action by all stakeholders, a role that is replicable in the introduction of all future HIV products.

Conclusions/Next steps: With the advent of paradigm-altering HIV products on the horizon, now more than ever, decision-making from manufacturers, donors, and policymakers must prioritize the community's demands and needs.

Establishing, involving, and investing in community partnership models to amplify community interests through dialogue will be critical for future HIV products to quickly reach the communities most in need.

EPE0898

National public health institutes (NPHIs) as sustainable homes for HIV gains

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Background: National public health institutes (NPHIs) can play essential roles in ending the HIV epidemic and building upon vertical systems, such as those for HIV. The U.S. Centers for Disease Control and Prevention (CDC) is the NPHI for the United States and is a leading global partner in ending the HIV epidemic and supporting country governments to develop NPHIs.

Description: NPHIs provide essential public health functions such as disease surveillance, assessment of population health status, public health workforce training, coordination of reference laboratories, public health research, and outbreak response.

These functions complement Ministry of Health led HIV responses and extend across the public health system.

Lessons learned: CDC's experiences with NPHI development and HIV programs may inform approaches to leveraging an integrated approach to NPHI development to sustain gains in the fight against HIV.

The International Association of National Public Health Institutes has defined core NPHI functions, and the three below highlight opportunities for HIV programming.

- **Evaluation and analysis of health status:** As hubs of public health data, NPHIs provide a comprehensive picture of the nation's health status. Through incorporating HIV data and transitioning HIV surveillance and data systems into horizontal systems, an NPHI

can provide an assessment of HIV in the overall health context, avoiding the need for parallel and duplicative efforts. This creates a sustainable home for HIV surveillance within a broader public health architecture.

- **Public health surveillance, problem investigation, and control of risks and threats to public health:** NPHIs generate and analyze incoming information to inform decision-making and response activities during emergencies. This supports stopping outbreaks quickly so that HIV programs continue without interruption.
- **Human resource development and training:** By informing national public health workforce needs and housing field epidemiology training programs, NPHIs address dynamic workforce requirements at national and sub-national levels relevant to HIV control.

Conclusions/Next steps: As countries consider how to sustain progress in ending the HIV epidemic, these lessons learned may inform how countries incorporate NPHIs as part of their sustainability plans for HIV programs.

EPE0899

Impact of Integrated Sample Transportation (IST) system on the viral load testing programme in Zimbabwe, 2020-2022

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Background: Sample transportation is key in ensuring timely patient diagnosis through timeous transportation of samples from the collecting facility to the testing lab and results back to the facility. Suboptimal sample transportation systems results in failure of disease management programmes due to poor testing rates and suboptimal access to testing.

Zimbabwe fully operationalised the integrated sample transportation system (IST) in August 2021 to try and improve Viral load and Early Infant Diagnosis (EID) testing coverage as we work towards achieving the UNAIDS 95 95 95 targets.

Description: The IST is a sample transportation model that caters for all samples regardless of type and disease programme. It ensures that all samples requiring a test are transported in an efficient and coordinated manner. The Zimbabwe IST system employs a hub and spoke model to ensure all the 1660 facilities have access to testing and timely relay of results.

Samples are picked by trained riders from collection facilities to testing facilities and results back to requesting facilities. The system has been operationalised throughout the country and is operating at 92% saturation rate.

Lessons learned: The Zimbabwe IST system has resulted in efficient transportation of samples hence increased confidence in the whole diagnostic system.

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There was an 81% increase in total number of samples transported since full operationalisation of IST. Pre and post analytical turn around time of viral load results reduced from an average of 20 days to 5 days. Rejection rates of viral load samples reduced from 5% to less than 1%. Viral load testing coverage increased from 44% in 2018 to 71% in 2021 due to the introduction of IST and electronic results returning mechanisms.

Conclusions/Next steps: The integrated sample transportation has proved to be a viable system in transporting biological samples and support disease programmes to achieve set targets. It has also proved to be a cheaper model compared to the parallel, fragmented approach. It is therefore recommended that the system be extended to other programmes like Anti-Microbial Resistance where a one health approach needs to be adopted and have samples from all sectors transported efficiently for the success of the programme.

EPE0900

HIV PrEP policy design in Brazil: five years of experience and actual challenges

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Background: In 2018, the Brazilian Public Health System (SUS) began offering HIV pre-exposure prophylaxis (PrEP) based on demonstrative studies, and drew a policy design prioritising specialised HIV services that already offered ART. Since then, it is trying to overcome challenges in expanding the number of PrEP users, by increasing the number, type and model of health services delivery; diversifying prescribers; simplifying protocols; and, creating demand among key populations.

Description: This is a descriptive case report of Brazil's national PrEP policy design, that offers oral PrEP, universally and free of charge, to around 50,000 users, monitored in 566 public pharmacies (actual and disaggregated data available on PrEP national dashboard: <https://www.gov.br/aids/pt-br/assuntos/prevencao-combinada/prep-profilaxia-pre-exposicao/painel-prep>).

In 2018, PrEP services selection criteria focused on specialised ART services, centred on physicians as prescribers. Over the last five years, and in the midst of the COVID pandemic, policy adjustments to expand PrEP rollout included: nurse-led prescriptions; inclusion of Primary Health Care and private services; and follow-up simplification. Last year, updated guidelines included adolescents over 15 years old and on-demand PrEP modality. It should be noted that, in the last five years, the conservative Brazilian political context made it impossible to carry

out communication and health education campaigns openly aimed at key populations. Nevertheless, PrEP users increased from 10,035, in 2019, to 48,643, in 2022.

Lessons learned: The current offer of PrEP in SUS is heterogeneous. On one hand, it took advantage of the consolidated ART network to start its distribution; on the other hand, it is flawed in having partly disregarded the classic HIV prevention approach, strongly anchored in peer education, social marketing, health communication and a service model centred on the user's need.

Conclusions/Next steps: Today, main national policy efforts involve the "de-medicalization" of biomedical prevention strategies, both with regard to where and who prescribes.

The aim is to diversify care modalities, whether through extramural actions or telehealth and, mainly, in the development of more aggressive communication and social participation campaigns centred on sex workers, trans, young and black people.

In addition, Brazilian policy continuously supports demonstrative projects, now focusing on injectable PrEP.

EPE0901

Mpox in people living with HIV: national strategic actions in the Brazilian epidemic scenario

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Background: In 2022 the epidemiological scenario of monkeypox disease worldwide in 119 countries demonstrated 83,212 confirmed cases (69 deaths). Brazil was identified as the country with the highest mortality worldwide until December 2022, with a total of 10,398 confirmed cases. It was observed that 34.6% reported living with HIV and 10.5% had active STI. 381 were hospitalized, of these 16 were admitted to the ICU. And 15 related deaths so far, mostly in immunocompromised people.

Description: The Ministry of Health, through technical areas of public health emergencies, and assistance and treatment of HIV/AIDS, in a joint national response, analyzed the importance of international technical reports of monkeypox cases among people living with HIV/AIDS in which manifestations of clinical severity and hospitalizations occurred with immune status of CD4-T count lower than 200 cells.

In order to intensify adequate surveillance and management of cases in an epidemic context, interconnected activities were carried out, namely, the national webinar of the Health Surveillance on 'Advanced AIDS' to the HIV health units care network; in addition to reviewing evidence and national dissemination of technical recommendations with criteria for early identification of clinical severity factors, and management of suspected cases of Mpox disease; early ART offer in the 'same-day ART' rec-



ommendation; and identification of criteria for offering PrEP in those with suspected Mpox and HIV-negative status. It also promoted the dissemination of materials with language of reach to priority populations, focusing on individual prevention measures.

Lessons learned: Joint and interprogrammatic construction of all government sectors involved and organised social movements is considered to be the key action in development, effective communication for the most affected population segments; as well as implementation of strategic recommendations for prevention and control of new cases in the surveillance and comprehensive care network; in the context of Mpox transmission present itself with potential for opportunistic disease.

Conclusions/Next steps: Despite a decreasing trend worldwide, there is still a worrying incidence in Brazil. Strategic actions implemented in HIV/AIDS care services should be monitored in parallel with the epidemiological curve of the disease, with a scenario considered as a pattern of endemicity and maintenance of the circulation of Mpox virus.

EPE0902

Trends in Universal Health Service Coverage Index (SCI) for sub-Saharan African countries supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), 2000-2019

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Background: The 2022 PEPFAR Five-year Strategy committed to the plan's goals to strengthen health systems and sustain the HIV response. The SCI as defined by the World Health Organization (WHO), measures health system strengthening through coverage of essential health services and progress towards sustainable development goals (SDG) 3.8.1 and 3.8.2.

We examined the infectious disease and service capacity and access sub-indices of SCI for PEPFAR-supported and non-PEPFAR supported low-income countries in sub-Saharan Africa between 2000 and 2019.

Methods: SCI and population data from countries in sub-Saharan Africa were filtered for low-income countries using World Bank income groups. Countries were grouped by whether or not they received PEPFAR funding and weighted average SCIs were computed for each group.

Results: Baseline averages were assessed in 2000 and follow-up averages were assessed in 2019. Baseline SCI within PEPFAR-supported countries increased more quickly than in countries not supported by PEPFAR (20 to 42, 110% vs. 20 to 37, 81%).

This was also observed for the infectious disease sub-index, which increased from 5 to 44 or 725% within PEPFAR supported countries compared to an increase from 5 to 38 or 640% in countries not supported by PEPFAR.

The service capacity and access sub-index increased from 16 to 19 (20%) in PEPFAR-supported countries while in countries not supported by PEPFAR it decreased from 20 to 19 (7%) between baseline and follow-up.

Conclusions: PEPFAR aims to contribute to long-lasting, sustainable, and country-led HIV response through strengthening health systems. Findings from this analysis suggest that since PEPFAR support began in these sub-Saharan African countries, there have been notable improvements in the essential health services coverage as measurable through changes in SCI.

Future studies should explore the relationship between PEPFAR's strategic investment in health systems and the impact on health systems strengthening as measured through changes in the SCI sub-index on capacity and access.

EPE0903

The National Prevention Database (NPD) helps drive HIV prevention and case finding in Cambodia

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Background: The estimated number of people living with HIV in Cambodia in 2021 was 74,000, with 10,000 undiagnosed. To move from the current 84% who are aware of their infected status to 95% requires data-driven interventions and collaborative efforts. HIV transmission in Cambodia is highest among key populations (KPs) who account for 77% of new infections (Asian-Epidemic-Modeling 2021[MJ1]). With support from the Global Fund and the National Center for HIV/AIDS, Dermatology, and STD (NCHADS), four community-based organizations (CBOs) implemented HIV prevention and testing services in 20 provinces.

Initially, CBOs used different data collection tools and database systems and reported only aggregate data to NCHADS, making it impossible to perform more granular data analysis and data-driven discussion.

Description: In 2018, NCHADS, with technical assistance from the USAID/PEPFAR-funded EpiC project and other stakeholders, initiated, and established the national prevention database (NPD) with standard indicators, data collection tools, and reporting templates. The NPD uses DHIS2 to track individual-level KP data from CBOs and allows HIV positive KPs to be linked to the national anti-retroviral therapy (ART) surveillance database. The NPD allows NCHADS to customize dashboards and reports to reflect national standard indicators, sub-national and donor reports with detailed granular analysis of the HIV



prevention and testing cascade by reach, and testing modality. It includes hot-spot GIS-mapping-data linked with prevention data. In 2022, the NPD reported reaching 94,142 unique KPs: 82,825 tested for HIV; 2,198 screened HIV reactive; 2,182 confirmed HIV positive; and 2,174 enrolled in ART.

Lessons learned: The detailed KP prevention and testing data include different modalities of reach and recency testing linked to hot-spot GIS mapping in the NPD. This allows NCHADS to have routine data-driven discussions to identify key challenges and improve HIV prevention and testing. The NPD informs AEM projection for HIV and KP size estimations.

Conclusions/Next steps: The NPD is a unique and comprehensive database that collects, stores, analyzes, and visualizes detailed information of KPs and HIV-related services across the country in real time. Granular data generated from the NPD is essential for Cambodia to improve HIV prevention efforts and strengthen new case finding to reach the 95% target.

EPE0904

Putting adolescent girls and young women at the centre of Sexual Reproductive Health and Rights (SRHR) services through community-led Service Referral Networks (SRN): lessons from DREAMS RISE Program Zimbabwe, 2022

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Background: Determined, Resilient, AIDS-free, Mentored, and Safe (DREAMS) program evaluations demonstrated that a layered approach is more effective at mitigating HIV risk among adolescent girls and young women (AGYW) than a single intervention. DREAMS project recorded low uptake of sexual reproductive health rights services (SRHR) among AGYWs 15 to 24 years. An engagement with AGYWs informed Services Referral Network (SRN) to promote bi-directional referrals between community and health facilities.

The SRN, led by DREAMS referral facilitators (DRF) comprising AGYW, DREAMS Ambassadors, and healthcare workers uses a networking methodology to support vulnerable AGYW to access SRHR services. We assessed the effectiveness of this model in improving SRHR service access by AGYW.

Methods: We conducted a cross-section analytic study using routine DREAMS program data between October 2021 and September 2022. Comparing SRHR referral completion and confirmations rates between AGYWs 15-24 years referred to health facilities with the SRN model and those who do not have.

Data were extracted from the DHIS2 database, de-identified, and cleaned before analysis using Ms. Excel. Univariate and multivariate analyses were used to estimate the effectiveness of the model. The assessment was covered by the Medical Research Council of Zimbabwe-approved non-research determination protocol (MRCZ/E/254).

Results: A total of 28,572 AGYW 15-24 years referrals for SRHR were reviewed of whom 7,897 (30%) were from health facilities with SRN models. AGYWs referred to health facilities implementing the SRN model were more likely to access SRHR services compared to their counterparts in non-SRN sites [AOR 2.1; (95%CI 1.9-2.2) p=0.000]. Referral confirmation rate for PrEP [AOR 2.2; (95%CI 1.8-2.7), p=0.0001], STI screening [AOR 2.3; (95%CI 1.9-2.8), p=0.0001] and HIV testing services [AOR 1.3; (95%CI 1.2-1.5), p=0.0001] was high among AGYWs referred to health facilities implementing the model while there was no significant difference for AGYWs referred for family planning services [AOR 1.1; (95%CI 0.9-1.2), p=0.7].

Conclusions: AGYW referred for SRHR services at health facilities implementing the SRN model were more likely to access services compared to non-SRN sites.

We recommend the expansion of the SRN model to all districts through the recruitment and deployment of DRFs across all health facilities to optimize referral completion and ASRH service access.

EPE0905

Evaluating a pharmacy-based HIV service delivery program in South Africa: a qualitative assessment of implementation using the Consolidated Framework for Implementation Research (CFIR)

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Background: Despite free PrEP and ART in South Africa, stigma, long queues, and human resource challenges have hindered uptake and retention, particularly among hard-to-reach populations. Pharmacy-based delivery models offer an alternative mode of service delivery with potential to reach new clients.

Expanding ART/PrEP Innovation Consortium (EPIC) sought to increase access to HIV services via select independent pharmacies across South Africa. Guided by the Consolidated Framework for Implementation Research (CFIR), we assessed the feasibility, acceptability, and appropriateness of EPIC.

Methods: EPIC ran from August 2019-December 2020 and included 776 pharmacy healthcare workers across 9 South African provinces trained to deliver HIV services supported by physicians prescribing medications via telehealth con-



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sultations. Sixty-two in-depth interviews were completed from October 2020–February 2021 with pharmacy staff, EPIC clients, physicians, consortium members, and regulatory and donor stakeholders to qualitatively evaluate program implementation. Deductive coding was guided by CFIR to facilitate assessment across domains.

Results: Acceptability of EPIC was high across stakeholders; within the CFIR outer setting, clients appreciated the convenience and confidentiality EPIC offered, but noted that other sexual health needs were not met by the program, while challenges obtaining prescribing permits hindered service delivery (Figure). In the inner setting, adequate staffing, space, and technological capacity were seen as crucial to implementation, with higher-resourced pharmacies reporting higher compatibility with existing workflows. Self-efficacy of pharmacy staff to deliver services was critical, with pharmacists reporting increased self-efficacy due to telehealth consults with doctors. Client out-of-pocket costs were seen as a key barrier to engaging vulnerable populations in the EPIC program and maximizing program impact.

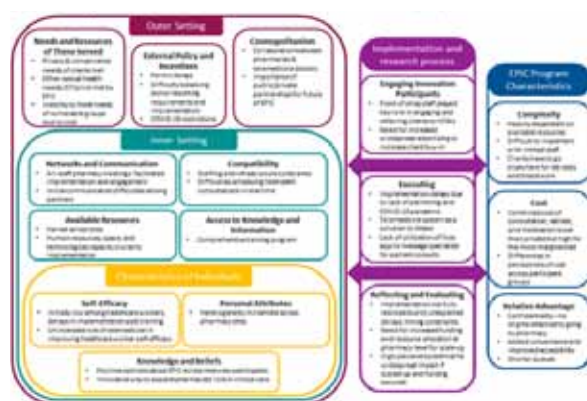


Figure. Key findings from the qualitative assessment of the Evaluating PrEP/ART Innovation Consortium (EPIC) program implementation organisation into Consolidated Framework for Implementation Science (CFIR) domains and relevant constructs.

Conclusions: While perceptions of EPIC were generally positive, significant implementation obstacles posed challenges to program success and future scale-up. Moving forward, there is an urgent need for the de-medicalization of PrEP delivery with a focus on diversifying the cadres of healthcare workers able to provide critical PrEP services.

EPE0906

Transforming ART service delivery through key population leadership for dismantling structural barriers to HIV care—Experience from Andhra Pradesh, India

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Background: Globally, prevention and treatment gaps for HIV/AIDS remain highest for key populations (KP). KPs are best served when KP-led organizations actively design their programs to address inequities. In January 2020, Andhra Pradesh (AP) Government provided antiretroviral therapy (ART) services through a female sex workers (FSW) community-based organization (CBO) as a step towards community-led integrated programming and sustainability.

Description: We oriented the CBO staff on standard operating procedures on ART refill and routine monitoring of People Living with HIV (PLHIV); tracking and tracing; decentralized specimen collection for viral load (VL) test; and recording and reporting into national information management system.

With an overall aim of ensuring treatment continuity and durable VL suppression, we focused on publicizing U=U (undetectable equals untransmittable) messaging to garner the power of treatment adherence, reduce stigma, and create an enabling environment.

Lessons learned: During January 2020 to November 2022, CBO provided care to 405 FSW PLHIV, including 21 lost-to-follow-up who opted to re-engage in care due to community-led-services. Two-year retention of PLHIV linked to CBO was 98% (397/405). VL coverage increased from 21% to 92% and suppression from 77% to 94% ($p < 0.05$) respectively.

During COVID pandemic surge (March–June 2021), CBO could extend its scope and additionally enrolled non-KP PLHIV (576) for ART refills who still continue to avail ART services without any hesitancy, with 95% retention and 93% VL suppression.

Of the total 981 KP and non-KP PLHIV enrolled, CBO facilitated social entitlements for 412 and nutrition/ration support for 25 PLHIV by leveraging district administration. Based on the results, this intervention has been adopted as national policy for amplification and currently is being scaled up to other 29 NGOs/CBOs in AP.

Conclusions/Next steps: Community-led service delivery, including U=U messaging and social security improves ART continuity and VL suppression, by addressing key barriers related to equity, stigma and discrimination. This model facilitated normalization of perceived barriers and stigma as reflected by continued access of services by non-KP from the CBO for ART as well as overall health



and social needs. Therefore, such models have potential to transform and mainstream KP community-led programming through key population leadership for an inclusive service delivery, to close the equity gaps.

EPE0907

Breaking the silos and building synergies through community led monitoring - a community based approach to improve comprehensive HIV service delivery in India

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Background: Community-led monitoring (CLM) is a technique initiated by networks of Key Populations, PLHIV, where they gather quantitative and qualitative data about HIV services. CLM's focus is on getting inputs from recipients of HIV services in a routine and systematic manner so that this information can be translated into targeted action and change.

The objectives are to enable and empower the larger community to assess, monitor and demand quality services through CLM, to improve access, availability, quality and utilization of HIV services by amplifying enablers & barriers and co-solutioning and to instill accountability in the health system towards better service provisioning.

Description: CLM was piloted in three, high HIV burden states of Maharashtra, Delhi and Telangana from May 2020 to September 2022.

One round of CLM comprises 5 Stages;

1. Orientation of all key stakeholders and training of Community Champions;
2. Gather information & analysis;
3. Co-create Solutions;
4. Engage with key stakeholders for actions, and;
5. Track and Showcase Success.

The initiative also contributes to the assessment of performance and service quality, the identification and addressing identified barriers such as access, stock outs, and stigma and discrimination. It ensures that the data is integrated in the monitoring systems and response time is minimal, through real-time access to data collated and analyzed to support decision making by the concerned authorities.

Lessons learned: Throughout the implementation, across the 3 States, 2 rounds of CLM were completed, where 240 Community Champions were trained on the overall NACP guidelines, 445 action points were identified based on the service beneficiaries' feedback and resolved 208 action points.

Further, 84 best service providers were identified doing extraordinary work to provide quality service to beneficiaries. Through CLM, the CC's worked collaboratively across the HIV Prevention, Care & Treatment and TB programmes.

Conclusions/Next steps: Based on the learnings of the pilot initiatives, CLM is designed to accelerate and support the efforts of the National AIDS and STD Control Programme Phase-V in institutionalizing the community engagement and meaningful participation at the most granular level. CLM demonstrates that community monitoring can be productive, collaborative, and solutions oriented.



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**EPE0908****Healthcare workers' experiences and perceptions of the mpox response: an international cross-sectional survey**

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Background: Following the COVID-19 pandemic, near-simultaneous global mpox outbreaks began in May 2022 and were declared a public health emergency of international concern by the World Health Organization in July 2022. We explored the experiences of HCWs at multiple sites in five WHO regions during the mpox response.

Methods: A cross-sectional online survey was disseminated to HCWs and researchers between August and October 2022 by an international research network. It covered:

knowledge and confidence around mpox management; outbreak preparedness; workload; risk assessment; and perceptions of moral distress and injury. Descriptive analyses were conducted.

Results: Of 1231 respondents, 62.7% (n=773) were HCWs directly involved in mpox care, of whom 83.3% were doctors. 69.3% were based in the WHO European region, 25.4% the Americas and 2.4% the African region.

Before the outbreak, 29.9% had never heard of mpox and 28.6% initially misdiagnosed mpox. By the time of the survey, perceived competence had increased with 48.3% feeling very or extremely confident in recognising and treating mpox. 21.4% experienced > 25% increase in workload due to mpox in the first 4 weeks of a case within their country and 39.7% reported longer working hours.

53.8% received no outbreak management training and 40.7% were not at all/only slightly satisfied with public health agency support. Only 22.3% cited smallpox/mpox vaccine access in their country as entirely/mostly adequate. One-third experienced some level of moral distress with 20.7% expressing less likelihood to remain in healthcare.

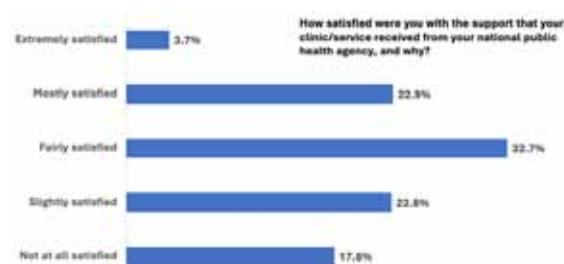


Figure 1.

Conclusions: Many HCWs at the onset of the global mpox outbreak had poor knowledge of mpox and did not feel adequately supported by national public health agencies. This culminated in an increased workload and high prevalence of moral distress. The mpox outbreak has highlighted that workforce challenges persist in global emergency preparedness, necessitating urgent policies and interventions to strengthen HCW capacity and well-being.

**EPE0909****Integrating quality improvement in the Nigerian national clinical mentorship program (NCMP)**

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Background: Quality Improvement (QI) methods have proven to be an approach to problem-solving, especially in the health sector. The Federal Ministry of Health (FMoH) in partnership with the US Centers for Disease Control (CDC) implemented a National Clinical Mentorship Program (NCMP).

The NCMP program identified mentors who had both technical expertise and experience in the field of HIV/AIDS at both national and State levels to support the coordination of the HIV/AIDS response in their states with the collaboration of the State governments and Implementing partners.

Description: 19 National Clinical Mentors (NCMs) and 170 State Clinical mentors (SCMs) received a 5-day training between June 2022 and January 2023 on basic QI training and application in the HIV public health programs.

The Model for Improvement (MFI) was chosen as the QI methodology for the training. Pre- and post-training assessments were done for the participants to assess knowledge gain. The participants were expected to implement QI projects across multiple facilities providing ART services in the states they support.

The SCMs report to their respective NCMs in the states. Virtual mentoring sessions are scheduled with the clinical mentors to support ongoing QI projects and help them with challenges.

Lessons learned: Basic QI training was completed in 5-batches for all the clinical mentors. Average knowledge gain increased from 55% pre-training to 95% post-training. Over 30 QI projects have been started in over 30 ART-providing facilities across 19 states in the country. Additionally, over 50 facilities have started QI teams to review processes and results in ART service provision.

Conclusions/Next steps: The efforts to achieve sustainable HIV epidemic control require capacity at sub-national levels to identify quality gaps and to support root-cause analysis and development of site-specific ap-

proaches to closing the gaps. The NCM programs provide the opportunity to continue to build and support capacity at the facility level.

There is also a need to fully integrate Quality Improvement methodology into the HIV program in Nigeria. The National Clinical Mentors are in a prime position to be the agent of change. Building the capacity of Clinical mentors in Quality Improvement is that first step required in the integration.

EPE0910**Liberia's national roll-out of HIV/ syphilis dual-tests: insights gained from implementing a training-of-trainers' model**

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Background: Historically, training for healthcare providers in Liberia has been implemented using a classroom-based approach where 2 providers attend a central-level training. In 2020, the National AIDS and STI Control Program (NACP) adopted a new HIV testing algorithm for antenatal care, including the utilization of the HIV/Syphilis dual-test as the first screening test.

To scale-up this new program and reach national coverage in a timely and effective manner, NACP decided to test the feasibility and sustainability of a Training-of-Trainers (ToT) model.

Description: The ToT model involves lead trainers from NACP training County Master Trainers (CMTs) who are responsible for providing on-site training and mentorship at assigned facilities. Across the 3 counties, a total of 28 CMTs were trained. Routine program data showed that CMTs trained 1,404 providers across 160 health facilities. To assess providers' knowledge on syphilis screening and treatment, a comprehensive facility survey was implemented in August 2022 at 48 randomly selected facilities following 8-months of implementation.

Out of 129 providers interviewed, 88% (113/129) correctly interpreted syphilis-positive test results; 97% (125/129) would correctly treat syphilis positivity with benzathine-penicillin-G. Additionally, 93% (87/94) would use the dual-test as the first HIV screening-test.

Lessons learned: Utilizing a ToT model demonstrated that CMTs were able to reach more than four times the number of providers than would be reached in a classroom-based model (1404 compared to 320).



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Furthermore, this approach tackled challenges faced by staff attrition, ensuring knowledge is retained as all providers are trained. Additionally, on-site training led by CMTs took place concomitantly and allowed NACP to rapidly expand coverage of dual-testing. The ToT model also promoted ownership of the maternal syphilis program at the sub-national level, building capacity, and allowing NACP to leverage county staff for other HIV service delivery activities.

Conclusions/Next steps: As NACP expands dual-testing nationally, the ToT model should be utilized due to:

1. Demonstration of strong provider knowledge,
2. The ability to reach all providers engaged in HIV services, and;
3. Building sub-national level capacity ensuring sustained support. Succinctly, countries looking to adopt dual-testing at national scale should consider utilizing a ToT model, emulating findings from Liberia's success.

EPE0911

Enhancing treatment outcomes and expediting young women's employment through public-private partnerships: USAID Tumikia Mtoto project experience in Nairobi and Kiambu counties, Kenya

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Background: HIV and AIDS remain a burden to Kenya in achieving its Vision 2030, especially, its social pillar with 42% of new HIV cases being amongst adolescents and young people (15-24 years). Due to limited employment opportunities, Adolescent Girls and Young Women (AGYW) have few professional options, with some turning to transactional sex for survival. USAID Tumikia Mtoto is a DREAMS and OVC project that works to reduce the risk of HIV among AGYW and to improve the welfare and protection of children affected by HIV and AIDS.

The success of OVC project implementation continues to depend on leveraging stakeholder engagement. It informs sustainability strategy, fosters openness, enhances targeting, and boosts effectiveness, political viability and accountability

Description: Through existing partnerships with Nairobi and Kiambu county governments, USAID Tumikia Mtoto project conducted stakeholder mapping and analysis using an inhouse tool. The project updated stakeholder directory, and supported local implementing partners in developing stakeholder engagement plan. The project further developed MOU with ten private and five public agencies. The MOU guided the roles, communication, and monitoring of the partnerships

Lessons learned: Forty-two stakeholders were mapped and characterized based on their level of interest and influence. The number of Children and Adolescents Living with HIV enrolled increased from 4207 to 6248 after MoU

formalization within six months to 6595 in December 2022. More than 3001 AGYW were linked for vocational training, apprenticeship, business development and internships. Through the partnerships, 405 AGYW were trained in construction skills including plumbing, electricals, and painting.

As a result, 87 AGYW are gainfully employed and making at least USD 7 per day; while another 186 are currently undergoing internships. In collaboration with the Boda Boda Association of Kenya (BAK), 146 AGYW are undergoing Motorbike riding training after which BAK will link them to mobile App delivery services. Through the government Ajira Digital, 1522 AGYW were trained in Digital Marketing and e-commerce, 33% are already earning.

Conclusions/Next steps: Engagement of multiple stakeholders is critical to the long-term success of projects. The project will continue to devote time and resources to accomplish this objective while ensuring stakeholder satisfaction in order to synergize efforts and reach more AGYW.

EPE0912

The Global Gene Therapy Initiative: towards access and sustainability

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Background: Advances in genome engineering with potential to provide a one-time CURE have been proposed as a means to replicate the stem cell transplant approach that has cured five patients from HIV. Over 40 cell and gene therapy trials to treat HIV infection are currently open in high-income countries but none in sub-Saharan Africa, a region with 67% of the world's population living with HIV.

The Global Gene Therapy Initiative (GGTI) was founded in 2020 to close the gap in gene therapy development and ensure access and sustainability in low- and middle-income countries (LMIC).

Description: Formation of GGTI was a grassroots effort across international networks to connect patients, patient advocates, specialists, clinicians, scientists, commercial gene therapy developers, gene therapy investors, regulators, policy makers and funders across five continents who participate as volunteers.

Starting in Nov 2020, planning/information sharing through virtual weekly meetings has addressed barriers to gene therapy development and access. GGTI performs its work through advocacy for appropriate research, clinical development, capacity-building, community adoption and regulatory pathway guidance.


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Lessons learned: Membership identified target areas of activity required to bridge the divide in gene therapy development and sustainably support the long-term development and delivery of gene therapies in LMIC. Addressing the barriers, GGTI aims to enable conduct of phase I/II clinical trials in two LMIC, Uganda and India, by 2024 using current ex vivo gene therapy products.

The proposed HIV gene therapy product for use is under phase I/II trial in the US. The partnership of diverse expertise in GGTI and collaborating funders has enabled initial capacity building in sustainable workflows in gene therapy manufacturing for technology transfer to place-of-care. Uganda is being used as a test-case for implementation of genetic engineering governance infrastructure in partnership with the WHO.

Conclusions/Next steps: This work directly addresses clinical applicability of gene therapies in LMIC. Advances required to make gene therapies accessible and sustainable in LMIC will benefit patients everywhere by creating a roadmap for technological innovation to lower price, a regulatory framework to facilitate safety and international collaboration, and an advocacy community driven by the needs of the patients gene therapy is intended to serve.

EPE0913

Implementation of active surveillance for histoplasmosis in sentinel sites in an endemic area of Honduras, Central America

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Background: The USAID-funded HIV Care and Treatment Project, implemented by IntraHealth International, is tasked with improving capacity of health workers to prevent, detect, and manage HIV-associated opportunistic infections (OI) in Central America. Considered an endemic area for *Histoplasma capsulatum*, causing disseminated histoplasmosis in people living with HIV, with associated mortality 44%. Limited access diagnostics and healthcare contributes to higher mortality rates in low- and middle-income countries. In Honduras the disease presents challenges for surveillance and reporting due to the absence of histoplasmosis surveillance registers, sentinel sites, and inter-institutional cooperation.

Description: To establish sentinel sites, the Project coordinated with health regions and cooperative agencies to understand diagnostic capacity and laboratory needs to inform programmatic strengthening and decision-making. Diagnostic technologies were transferred to two sites that received on-site training on the use of enzyme immunosorbant assay (EIA) for the detection of histoplasmosis antigen in urine samples.

The screening tool considered the following criteria: CD4 under 200 cells, new on ART, and suspected clinical risk by an infectologist. Total 139 users were screened with a yield of 12%. All clients diagnosed received follow-up after their diagnosis, and one person died.

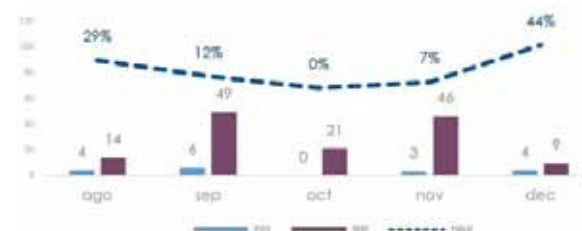


Figure. Histoplasmosis test at sentinel sites in Honduras, Central America FY22.

Source: Sentinel site data.

Lessons learned: Strengthened health services, such as improved surveillance of OI, training and supply of diagnostic tests supported by cooperative agencies and institutionalization of the service by the central government.

The implementation of this less invasive and complex urine diagnostic test meant a more efficient response time (3+ months to less than one week); thereby accelerating timely clinical follow-up for clients along with treatment of histoplasmosis and other OI.

Conclusions/Next steps: It is possible to establish a national / regional surveillance system for histoplasmosis in Honduras, leading to new diagnoses.

Further research is needed to understand whether the availability of histoplasmosis diagnostics at sentinel sites can reduce histoplasmosis-associated mortality in people living with HIV.

EPE0914

Decentering whiteness in Australia's HIV response

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Background: New South Wales (NSW) has seen significant declines in HIV notifications among Australian-born gay, bisexual and other men who have sex with men (GBMSM). However, data has shown little decrease in notifications among overseas-born (OSB) GBMSM.

Organisations in Australia responsible for HIV prevention programs and research have often placed emphasis on increasing health literacy and health access for OSB GBMSM, without examining how existing structures and governance have historically led to the exclusion of multicultural voices and experiences within HIV responses. Australia's largest LGBTQ organisation, ACON, has developed a comprehensive Multicultural Engagement Plan (MEP) 2021-24, to address how we work with and for multicultural LGBTQ people, to bring about systemic change and centres multicultural voices within our work – especially within HIV responses.



Description: The Plan was led by an internal working group of staff with lived experience and an external advisory panel of experts (researchers, community leaders and government).

Extensive community consultation was conducted with 55 stakeholders including community members and professionals working in the HIV, LGBTQ and multicultural sectors. Of the participants, 74% were from a non-Anglo/European background, 46% were women, 40% were men and 14% were non-binary. Of the women, 13% were transgender, and of the men, 14% were transgender.

The Plan was directly informed by the findings from these consultations and centred the voices of multicultural and migrant LGBTQ communities.

Lessons learned: The consultations revealed several barriers when accessing wider HIV support services and programs in Australia, including:

- Traditional or 'white' approaches in organisations that lack cross-cultural understandings of sexuality and gender.
- Lack of LGBTQ-friendly interpreter services for community to discuss HIV and sexual health in language.
- Lack of capacity-building and training for organisations to better support multicultural LGBTQ communities.

The Plan utilises antiracist principles to create a framework that centres multicultural community participation and empowerment within HIV program design and delivery, with a significant goal to end HIV transmissions for all.

Conclusions/Next steps: ACON's MEP provides a roadmap for HIV organisations within predominantly white high-income countries to challenge their systems and governance to ensure our responses equitably reach all in our communities, especially those from multicultural and migrant backgrounds.

EPE0915

Community System Strengthening (CSS) under National AIDS Control Programme in India: new paradigm for strengthening collaborations and engagement of community towards the HIV response

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Background: Communities being at the center of the HIV/AIDS response in India, strengthening community systems to achieve strategic outcomes has become the key priority for India to achieve target of ending HIV/AIDS epidemic by 2030.

The foundation of CSS is to *mobilize, link, collaborate and coordinate* with all Key Populations, PLHIV including Youth and health systems with objectives: Support an enabling environment; Demand generation for prevention, testing, care and support programs and Community monitoring for effective, quality programme delivery.

Description: Based on NACP phase-V guiding principle, CSS is implemented with a defined strategic modification involving concentrated focus on capacity-building of communities resulting in strengthened leaderships, institutionalization of Community-led-Monitoring (CLM), strengthened linkages and stakeholder engagement leading to zero stigma and discrimination by 2030. Therefore, community is engaged through platforms anchored within national program.

Community from all typologies are engaged through constitution of Community Resource Group (CRG) at National level, State level across 35 States, and Districts CRG in 600+districts under leadership of NACO and State AIDS Control Society.

Further, to break the Silos and Build Synergies, total of 100+ Master-trainers from Community were trained in last year while through CLM, structured feedback is collected by Community Champions (CC) wherein identified issues are discussed and actions are co-created by service-providers along with key beneficiaries.

Lessons learned: Ensuring community participation anchored by National Program resulted in active involvement of community, shared responsibilities among service beneficiaries and service-providers. Further, through CRG, scope has been developed for timely community recommendations and inputs, e.g., capacity-building and leadership development along with finalization of Guidelines, CSS framework, state action-plans and program evaluations leading to enhanced program outcomes and ownership. Community field intelligence through CCs and CRG have contributed towards finalization of community centric and demand driven strategies.

Conclusions/Next steps: Going forward, the national program will engage CC per typology in more than 600+ districts of India. It is envisioned that this engagement of the community through the CCs and CRG at the most granular level will enhance community driven rights-based approach to reach the last mile which will value add in scaling up and complimenting National HIV Program.

**EPE0916****Reaching the last mile of HIV epidemic control in Zambia by engaging key populations with innovative service delivery approaches**

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Background: Zambia is nearing HIV epidemic control with progress towards UNAIDS goals at 89-98-97. However, this progress is not the same among key populations (KP) despite having a higher risk of acquiring HIV. KP access to health services is limited by criminalization, stigma, and discrimination.

To bridge this gap, innovative approaches are needed to engaged KPs in care. University of Maryland-Baltimore implemented community-based approaches by establishing KP safe spaces to provide comprehensive HIV services.

Description: We sub-granted three KP Civil Society Organizations to implement an integrated differentiated services delivery (iDSD) model by establishing 13 safe spaces across three provinces. To provide non-discriminatory services, 240 clinicians and peer navigators were trained in KP sensitivity, safety, and security.

Safe spaces were equipped to provide HIV testing, prevention, and treatment; and screening and treatment for STIs and TB. KP peer navigators trained as lay psycho-social counselors identified KP in communities, offered HIV educational messages, prevention, and testing, and linked them to safe spaces for prevention and care services. We analyzed aggregated data from October 2021 to September 2022 on HIV services offered via iDSD.

Lessons learned: HIV combination prevention services were provided to 18,223 KP; 31% MSM, 61% FSW, 5% PWID, and 3% TG. Of these, 39% (7,143/18,223) were tested for HIV with 23% (1,642/7,143) testing HIV-positive (28% MSM, 68% FSW, 2% PWID and 2% TG); the positivity yield varied among KP sub-type from 13%-28%, and each subpopulation was reached using the testing modality that was best suited for them.

In addition, over 3,177 KP self-tested, and 4,015 sexual and other contacts of KP living with HIV were elicited for HIV testing.

Overall, 1,620 KPs have been linked to HIV treatment and 1,931 retained on HIV treatment. Of KP who tested negative for HIV, 2,417 were initiated on PrEP (38% MSM, 56% FSW, 3% PWID and 3% TG).

Conclusions/Next steps: Partnership with KP CSOs and implementation of the iDSD model contributed to enhanced HIV case finding and reaching KPs who typically have limited access to HIV services.

These approaches may offer an acceptable and sustainable healthcare model that bridges the gap for equitable access to healthcare for KPs.

EPE0917**Bundled laboratory tests at the time of hospital admission to close gaps in delivery of advanced HIV care in Zambia**

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Background: HIV-related mortality remains unacceptably high in sub-Saharan Africa and is most common in those with advanced HIV disease (AHD). The World Health Organization guidelines feature a stepwise approach beginning with CD4 count assessment, to identify and intervene on AHD with evidence-based interventions.

Because of roadblocks identified in implementing this approach, we pilot tested a 'bundled' approach, whereby all advanced disease diagnostic tests were performed at once, rather than stepwise, at a referral hospital in Zambia.

Methods: Between May and December 2022, at a University Teaching Hospital in Lusaka, we provided a laboratory bundle to 136 newly admitted patients living with HIV, regardless of reason for admission, signs, or symptoms of AHD. The bundle included CD4 count, sputum (or stool) TB Xpert, TB LAM, and serum cryptococcal antigen.

To evaluate the intervention, we enrolled a sample of 70 bundle-receiving patients and reviewed their hospital file at discharge/death for the presence of laboratory results, diagnosis of tuberculosis (with LAM) and Cryptococcus (with CrAg), and prescription of co-trimoxazole and anti-retroviral therapy (ART).



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These indicators were compared using Chi² test, with a sample of 68 patients assessed just prior to the introduction of the intervention.

Results: Blood samples (95.7%) were more successfully obtained than urine (78.6%) or sputum/stool (69.2%). When samples were obtained, the percentage with results was 80.0-88.0% for all lab tests with median turnaround times (from collection to resulting) of 1-2 days.

In-patients enrolled during the intervention had a CD4 <200 (43.2% of sample), results for CrAg (12.0% to 96.0%), and LAM (52.0% to 96.0%; both P<0.05) increased compared to beforehand.

However, the proportions treated for TB/Cryptococcus, discharged on CTX if CD4 was <350, and prescribed ART at discharge did not significantly change.

During focus group discussions clinicians reported strong satisfaction with the bundling approach as provided them all the results at once within the first two days of admission.

Conclusions: Bundling the AHD lab package increased coverage of LAM and CrAg among patients with CD4 200 and was feasible to implement. Despite having no immediate impact on clinical care, bundling labs may reduce time to diagnosis and treatment of opportunistic infections.

EPE0918

Cross sectional study for assessment of biomedical waste management practices at HIV care settings in India, 2021-2022

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Background: Pathogens and toxic chemicals in Biomedical waste (BMW) pose serious health risks for waste collectors, patients, and health care workers. Hence the current BMW management practices at HIV care settings in India were assessed.

Methods: Total 95 HIV care facilities were assessed for BMW practices and necessary records were reviewed. Knowledge among BMW handlers were also assessed with the help of pre tested questionnaire after obtaining informed consent.

BMW storage areas at these facilities were assessed based on its location, freeness from loose litter, spillages, pets and Vermin, secured restricted access, separation from food preparation area. Based on these parameters, storage areas were categorized as Appropriate and In-Appropriate.

Sanitary measures at waste storage areas were assessed pertaining to availability of functional lights, exhaust fans, clear warning signs and functional water supply. Based on these parameters, sanitary measures were cat-

egorized into Adequate, Moderate and Inadequate. BMW Record keeping practices were assessed based on completeness, reporting to pollution control authorities, accident logs, annual Health check-up and immunization of involved persons, record of recyclable waste.

Based on these parameters, record keeping practices were categorized into three categories: Adequate, Moderate, Suboptimum. Data was analyzed with SPSS 28.0

Results: Overall biomedical waste collection practices were assessed at 86 facilities. Color coded bins were observed across 56 (77.8%) centers and practice of waste segregation at 46 facilities.

Overall 55/95 (58%) storage areas were appropriately located. Adequate, moderate and inadequate sanitary measures were observed at 4, 31 and 60 storage areas respectively.

None of the facility was found to have adequate record keeping practices. Suboptimum and moderate record keeping practices were observed at 60 and 35 facilities respectively.

BMW knowledge assessed among 81 handlers was as follows: Airborne infection control (35.5%), Systematic sequence for wearing/removing Personal Protective Equipment (45%), BMW management Sequence (79%). Past one year needle stick injury was reported by 5 handlers and 63 were vaccinated for Hepatitis B and Tetanus toxoid. Formal training for waste disposal was reported by 70% handlers.

Conclusions: Formal training of BMW handlers is needed. There should be strengthening of hospital infection control committees to improve BMW practices in India.

EPE0919

Bringing it closer to the recipients of care: the effectiveness of point of care hospital inpatient services at Queen Elizabeth Central Hospital, Malawi

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Background: Early diagnosis of advanced HIV disease (AHD) is critical in reducing mortality. Umodzi Family Center (UFC) ART clinic is located at Queen Elizabeth Central Hospital (QECH) in Blantyre, Malawi. Care of inpatient clients with AHD and of those newly diagnosed with HIV was a challenge at QECH; inpatient clients would be shuttled to a distant UFC for services, which was uncomfortable and risky. To avoid moving sick patients, UFC established AHD care within the QECH wards.

Description: QECH medical department allocated a room (room 7C) in the medical ward for inpatient HIV care. UFC seconds a nurse, expert client, HIV diagnostic assistants

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and a part-time clinician to the room providing diagnostic tests (HIV testing, CD4 count, urine LAM and serum CrAg tests), ART services (ART initiation, emergency drug refills) and HIV prevention services (PEP). Services provided are monitored and evaluated by UFC.

Lessons learned: From January to December 2022, there were 60,698 admissions with 12,558 (21%) HIV tests done. A total of 372 (3%) inpatient clients tested HIV positive and 311 (84%) were linked to care.

We conducted 679 CD4 tests to ascertain risk of AHD. Of these 288 (42%) had CD4 <200 while 391 (58%) above >200. Cryptococcal Antigen in serum was tested in 384 inpatient clients (positive in 21 (5%)) and urine LAM was tested in 348 clients (positive in 66 (19%).

In total, 395 inpatient clients received ART emergency supply and PEP was provided to 20 individuals.

Conclusions/Next steps: Inpatient HIV services in room 7C have been established as a model of care providing timely and low-barrier access for inpatient clients to AHD diagnostic services and ART initiation.

Our data shows that inpatient clients admitted in the hospital have a very high proportion of AHD, and point of care testing services are urgently needed to support immediate diagnostic and therapeutic decisions.

EPE0920

Sexual gender based violence cases among children aged 10-14years longitudinal follow up on linkages and referrals

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Background: Gender-based violence against children is a crime against *girls and boys* that "undermine the health, dignity, security and autonomy of its victims. Survivors of gender-based violence suffer devastating short- and long-term consequences to their physical and mental health. Children may experience severe physical injuries, unwanted pregnancies and exposure to HIV or other sexually transmitted infections.

Description: UTJ in collaboration with the Nakuru county of Health initiated a prospective 6 months' intervention from October 2021 to July 2022 to strengthen referrals and linkages between GBV stakeholders. The interventions entailed linkages with the hospital GBV center and the nearest police stations with most of the survivors passing through the police GBV desk. Children's department, Children's Homes, Community through Nyumba Kumi and Chiefs and the law Courts.

Data was collected from the SGBV Register, and Physical Medical Examination findings, facility Post Rape Care Forms, Kenya Police Medical Examination P3 Forms, OB Numbers.

Lessons learned: There was a total of 31 survivors of sexual gender-based violence age 0-14years. 61% (19/31) accounted for rape, 26% (8/31) accounted for sexual assault while 13% (4/31) accounted for attempted rape cases. 77% (24/31) reported to the health facilities within 72 hours. 87% (27/31) having a HIV test. 88% of those tested were initiated on PEP.

All the survivors (100%) were screened for STI and 81% (25/31) of those screened were treated for STIs. For Linkages and referrals, 94% (29/31) were reported to the police desk and referred to the Health facility with 62% of them obtaining the Kenya police OB numbers. 3% of the cases were referred from the community.

Conclusions/Next steps: To eliminate GBV there is a need to enhance community awareness while mentoring healthcare service providers and stakeholders through continuous medical education on the history taking of GBV cases. Sensitization on the Chain of Custody and Preservation of evidence for forensic analysis is a very important aspect to ensure that perpetrators serve justice.

It is also recommended that all cases be tracked through documentation and linkages to various legal departments e.g police and social security. Establishing a GBV PSSG will also help combat post-traumatic stress disorder.

EPE0921

Primary healthcare (PHC) readiness on back-referral policy in human immunodeficiency virus (HIV) services provision

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Background: The Indonesian National Health Insurance Scheme (*Jaminan Kesehatan Nasional*, JKN) uses a gatekeeper system to control costs and rationalize care. Cases with no complications must be treated thoroughly by public or private PHC providers. Only cases that require specialist care can be referred to hospitals. A previous study on the JKN 2018 claims data indicated that 80% of HIV patients were treated in hospitals comprising 75% outpatient and 25% inpatient services.

The research questions were whether the gatekeeping function fail to work properly, or whether the patient with HIV insisted to utilize hospital services.

Finally, are PHCs ready to fully treat HIV patients with no complications?



Methods: We conducted a study to healthcare providers in 16 municipalities using a mixed method fielded between April and November 2022. An online survey was first administered to 147 PHC providers, 722 PHC workers, and 561 PLHIV.

Then, a focus group discussion and in-depth interview were conducted with 181 respondents comprising of municipal health officials, medical doctors in PHC, HIV program administrators, JKN administrators, people living with HIV (PLHIV), and peer groups of PLHIV.

Descriptive and thematic analysis was undertaken to identify factors associated with an improved referral system.

Results: We found that 62%, 76%, 46%, and 1% of PHC providers were consecutively able to provide HIV counseling, testing, treatment, and viral load (VL) tests. However, there were some constraints in fulfilling those services because reagents were reported stockouts in some areas. Thus, PLHIV were referred to hospitals.

In addition, we also found that 64%, 68%, and 54% of PHC staff have received training on HIV counseling, testing, and treatment, respectively.

In contrast, out of those staff who provided HIV services; 15%, 34%, and 9% have not received the relevant training, respectively. We also found that private providers had considerably less training rate compared to public ones.

Conclusions: We conclude that not all PHC providers are ready to implement a back-referral policy.

We recommend that the government should strengthen the staff competency, both in public and private PHC, and ensure no constraint of supplies of reagents before requiring back-referral.

EPE0922

Access to antiretroviral therapy for people ≤ 19 years after Russia's full-fledged military invasion of Ukraine

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Background: Following Russia's full-scale invasion of Ukraine on February 24, 2022, approximately 13% of all ART sites in Ukraine were damaged or destroyed.

As of December 1, 2022 there are 116,469 individuals on ART, including 2463 people under the age of ≤ 19 in Ukraine.

The war imposes a disproportionate burden on HIV-infected people, particularly those under the age of ≤ 19 , who may lose access to ART medications as a result of active hostilities, damage/destruction of ART sites, and significant migration abroad.

We compared the proportion of people aged 19 receiving ART two months before and ten months after Russia's full-scale invasion of Ukraine to assess the impact of the war on access to ART.

Methods: Based on data from the National HIV Monitoring Registry, a comparison of the proportion of people aged 19 receiving ART on December 1, 2021 and December 1, 2022 was conducted.

Results: As of 12/01/2021, 125 823 people were receiving ART, 3033 of whom were under the age of ≤ 19 , 116469 were receiving ART as of 12/01/2022, and 2463 were under the age of ≤ 19 . The proportion of people aged 19 receiving ART as of 12/01/2022 ($n = 3033$, $p_{2022} = 2.41$ per 100 people receiving ART; 95% CI: 2.33 to 2.50) is statistically significantly lower ($p < 0.0001$) than the proportion of people aged ≤ 19 who were on ART as of 12/01/2021 ($n = 2463$, $p_{2021} = 2.11$ per 100 people on ART; 95% CI: 2.03 to 2.20).

Conclusions: The proportion of people aged ≤ 19 receiving ART 10 months after the full-scale invasion begins is lower than two months before the invasion begins.

The main reasons for the decline could be restrictions on access to ART as a result of active hostilities and a significant level of out-migration of young people.

Other factors, such as decreased adherence to ART and fewer new HIV cases among young people, may also contribute to the decrease, but more research is needed.

EPE0923

Growth and launch of the Glink Academy, Vietnam's first HIV peer-to-peer learning and incubation initiative

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Background: Business start-up and growth is a challenge for key population (KP)-led organizations in Vietnam. Glink Academy, initiated by Glink KP-led social enterprise (SE) and the USAID/PATH STEPS Project (STEPS), provides peer-to-peer training, learning, and mentorship to support the sustainable growth KP-led SEs and clinics.

Description: Beginning in 2014, the USAID/PATH Healthy Markets Project (2014-2021) supported Glink community-based organization to grow a prominent KP-focused health business through establishing seven clinics, registering as an SE, and initiating models of integrated, person-centered healthcare for LGBTQI+ and other KPs. In late 2021, Glink and STEPS held a series of design sessions to conceptualize and formulate a new initiative, "Glink Academy," focused on further leveraging the Glink platform to inspire the KP community in healthcare sector business development.

To initiate this process, STEPS and Glink assessed KP-organization capacity-strengthening needs and identified five key areas of support that Glink Academy could deliver to peer organizations based on these needs:

1. Offering tailored trainings and individual coaching/mentoring,
2. Convening a business learning forum and mentor network,

3. Designing communications activities on diverse business topics,
4. Developing start-up resources and tools, and;
5. Initiating an innovation grant.

Lessons learned: Since its launch in March 2022, Glink Academy has become a leading peer learning and incubation platform for KP-organizations in Vietnam through diverse activities including five "Business Innovation Talks" convening experienced entrepreneurs and innovators to share their business experiences, three trainings on business strategy, and engagement of over 30 business experts to provide advisory services and mentoring to Glink Academy members.

Glink Academy and STEPS also delivered intensive coaching and hands-on support in brand development, legal registration, and business planning to four new KP-led health businesses, including Vietnam's first-ever transgender-owned clinic. These businesses plan to fully open in 2023 and will fill critical gaps in KPs' access to quality healthcare.

Conclusions/Next steps: Though at early stages, Glink Academy exemplifies a transformative KP-led model for peer learning and incubation.

Further advancement of the Glink Academy will help diversify and expand a network of community-friendly health organizations in Vietnam that are positioned to deliver high-quality, inclusive health services for the KP community in Vietnam.

EPE0924

Leveraging change management and leadership capacity development programs to unlock HIV/TB and cervical cancer service delivery performance improvements with the government-to-government funding mechanism in Southern Province of Zambia

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Background: Since 2012 the Government of Zambia and CDC Zambia have engaged in a process to transition PEP-FAR's support for HIV service delivery implementation in Southern Province from international and local NGOs to Southern Provincial Health Office (SPHO).

The objective is to demonstrate programmatic advantages of embedding change management and leadership capacity development in G2G HIV mechanisms managed by provincial health offices.

Description: In 2020 Southern Provincial Health Office partnered with a local NGO, Avencion, to implement interventions.

1. Change Management: Facilitated the team to identify challenges experienced in managing HIV programs and how these impact decision-making and morale. Tools

and skills were shared to improve their experience as program managers and linked program goals to core motivations of individuals.

2. Leadership & Teamwork Capacity: Focused on uncovering root causes of gaps which negatively impacted program performance. Self-identified key performance indicators (KPI's) linked to improving team, communication and monitoring and measured progress every six months (see table for KPIs).

3. Client-Centric Care Tools: Training at provincial, district and health facility teams to use storytelling, empathy, and how to identify root causes of Client issues.

4. Bi-directional Learning Exchanges with Other Provincial Health Offices: Facilitated learning exchange visited between Southern, Western and Luapula provinces to understand context specific challenges.

Lessons learned: PHO management team at provincial level improved leadership and change management key performance indicators from an average baseline of 24% in 2020 to 82% by end of 2021.

In 2022 Southern Provincial Health Office received an award by the Ministry of Health as the best performing province in achieving HIV program targets of 95-95-95.

Self-identified Key Performance Indicators	Baseline 2020	Score 2021	Variance
Hold regular performance review meetings	25%	100%	75%
Monthly management meetings	25%	70%	45%
Integration of Zambian government and G2G mechanism funded staff	20%	40%	20%
Regular program coordination meetups	25%	80%	55%
Structured weekly management, planning and activity meeting	25%	100%	75%
Learn to critique ideas & help one another	40%	90%	50%
Workplan with clear tasks for each team	25%	100%	75%
Monthly meetings with program officers presenting previous month activities and plan for next month	25%	60%	35%
Encourage staff to seek advice and consult on things they do not know	10%	90%	80%
Defined communication process	20%	70%	50%
Totals	24%	80%	56%

Data Source: baseline survey and end-line surveys conducted during training session.

Conclusions/Next steps: When provide tools and skills for leadership, teamwork and change management, provincial health offices operating using a G2G mechanisms can outperform international implementing partners and local non-government organizations in managing HIV programs and providing direct service delivery.



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**EPE0925****Increasing access to methadone in West Virginia: integrating HIV, hepatitis and substance use advocacy in the Appalachian United States**L. Storrow¹, R. Sutphin², M. Reynolds³, D. Rowan⁴¹Community Education Group, Charleston, United States,²West Virginia Rural Health Association, Barboursville, United States, ³WVU Rockefeller Neuroscience Institute, Morgantown, United States, ⁴The University of North Carolina at Charlotte, School of Social Work, Charlotte, United States

Background: From 2021 - 2023, Community Education Group (CEG) and the West Virginia Rural Health Association (WVRHA) led advocacy and public education around the syndemic of HIV, viral hepatitis, and substance use disorder in West Virginia (WV), a state in the Appalachian region of the United States.

West Virginia has the highest rate of drug overdose deaths in the United States. HIV and Hepatitis C are both on the rise, with injection drug use being the primary risk factor. In 2021, the U.S. Centers for Disease Control and Prevention (CDC) called a local HIV outbreak in Kanawha County, WV the "most concerning HIV outbreak" in the country. Despite the dire epidemiology, WV officials have not embraced best practices. In 2021, the legislature significantly restricted syringe programs. For years, the state has barred new opioid treatment programs (OTPs) from opening and providing methadone.

Description: OTPs are the only facilities that can provide FDA-approved medication for opioid use disorder, including methadone. Considered the gold standard for treating opioid addiction, methadone is highly effective in curbing opioid cravings.

To overturn the moratorium, CEG and WVRHA hosted workshops at statewide conferences, held a day-long policy summit, and earned media attention in significant statewide newspapers. Advocates and medical providers met with WV legislators to discuss HIV and hepatitis trends, targeting this education toward leadership of the WV Health and Human Resources Committees.

Lessons learned: Based on interviews with legislators and lobbyists, CEG and WVRHA's advocacy efforts were critical in securing multiple affirmative votes over the course of two years to overturn the OTP moratorium. Framing repeal as a factor that would contribute to reducing overdose deaths and a measure that would support economic competition was politically strategic and helped generate support with more conservative, Republican lawmakers. Engagement with lawmakers around this topic built relationships and momentum to engage on other policy topics related to HIV prevention and drug policy.

Conclusions/Next steps: Even in a conservative, challenging political environment, advocates were able to build relationships and find common ground to advance policy change. Next steps are to integrate methadone usage and other syndemic services into existing substance use clinics.

EPE0926**Using flow cytometry to improve pediatric leukemia diagnosis in Mozambique**C. Mudenyanga¹, F. Amodo², E. Mongo³, D. Mutsaka¹, V. Monteiro⁴, A. Sigauque³, F. Matola², R. Chissumba³¹Clinton Health Access Initiative, Maternal and Child Health, Maputo, Mozambique, ²Hospital Central de Maputo, Serviço de Hemato-Oncologia, Maputo, Mozambique, ³Instituto Nacional de Saúde, Centro de Investigação e Treino em Saúde da Polana Caniço, Maputo, Mozambique, ⁴Instituto Nacional De Saúde, Centro de Investigação e Treino em Saúde da Polana Caniço, Maputo, Mozambique

Background: Routine leukemia diagnosis is through microscopic identification of pathological blood cells in patients with abnormal Full Blood Count (FBC) scattergrams and severe leucocytosis. Accuracy and timeliness of results is prone to many variables that could lead to incorrect diagnosis. Mozambique has a significant burden of pediatric cancers accounting for significant burden with a high frequency of HIV-associated cancers. Improved diagnostic access and leukemia surveillance are thus needed.

Flow cytometry was implemented to improve acute pediatric leukemia differential diagnosis linked with timely treatment initiation. The implementation was to determine the feasibility of flow cytometry in leukemia diagnosis instead of only microscopy.

Description: Instituto Nacional de Saúde (INS) introduced flow cytometry for leukemia differential diagnosis using the BD FACS Canto II equipment in 2020. Clinical and technical trainings on identification of suspected leukemia cases were conducted in 7 of the 11 provinces namely Inhambane, Nampula, Zámbezia, Tete, Cabo Delgado and Sofala.

Clinical staff at the regional referral hospitals were trained by the pediatric oncologist from Maputo and laboratory staff were trained on pathological cells identification and interpretation of FBC scattergrams by biomedical scientists from INS. Suspected pediatric leukemia cases (0 - 14 years) had samples collected at regional hospitals and sent to INS for flow cytometry testing.

Results were available to the Oncologist within 24 hours of reaching the INS laboratory enabling timely leukemia-type specific treatment of cases.

Lessons learned: 171 suspected cases were tested from January 2020 to December 2022. 89 patients were male and 82 were female.

Of these patients 88 (51.5%) had leukaemia (42 female and 46 male). Two patients with leukaemia (2.27%), were HIV-1 infected. Three years mortality was highest (53%) among children aged 5-10 years.

Mortality was highest among acute myeloid leukaemia cases (52%) although B acute lymphoblastic leukaemia was the most common cancer (45%). Other leukemias namely T acute lymphoblastic leukaemia and mixed phenotypes were diagnosed.



Conclusions/Next steps: Flow cytometry for leukemia differential diagnosis is feasible in Mozambique enabling linking leukemia-specific cases to specific treatment with potential improved survival. Flow cytometry could revolutionise leukemia diagnosis especially among pediatric HIV patients and is more accurate in leukemia diagnosis compared to microscopy alone.

EPE0927

Bridging the Gap through partnership: engaging private sector improves PMTCT service coverage in India: experience from Global Fund supported Ahana project in India

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Background: India is aiming to achieve EMTCT by 2026 and saturation of pregnant women with HIV testing is the first step towards achieving EMTCT of HIV. While the country has an elaborate public health system to reach out to the pregnant women coming for the services in the public sector, there is an estimated 20-25 percent out of 29 million annual pregnancies catered by the private sector in the country.

Project Ahana funded by The Global Fund engages private sector to ensure HIV testing and recording those for the country EMTCT response.

Description: Complementing the effort in the public sector towards expansion of HIV testing, a fourfold approach was introduced to engage and integrate private sector effort to country's overall EMTCT programme.

- Mapping of all private entities,
- Carrying out service assessment of the facilities,
- Establish programme engagement with the hospital towards HIV testing and reactive linkages and;
- Report HIV testing information to national database.

Lessons learned: Project Ahana adopted a cascaded approach, with:

- 19,044 hospital mapped for potential engagement,
- Assessment carried out in 19,016 hospitals with
- 6,708 hospitals assessed as ANC service providers, and;
- 4210 hospitals engaged in the project during the period of Jan, 18 to Sept, 22.

These engaged hospitals then starts reporting back with the HIV testing information as well as aligning for any HIV reactive cases needs confirmatory testing at Govt. ICTC centre and followed up with ART linkages.

Approximately 12% testing has been carried out in private sector and a 20 percent of overall HIV reactive cases have been reported through the private sector.

Conclusions/Next steps: There is a strong coordination established with the private health facilities contributing towards attaining EMTCT. Over the years Plan India evolved private sector strategy to map, assess and engage more and more private health facilities.

While there is a long way to go and a complete saturation of all cases in the private facilities, the intervention suggests, that EMTCT can be possible only through a public and private partnership approach.

EPE0928

Addressing structural barriers to HIV care using Society Tackling AIDS through Rights (STAR) methodology among vulnerable households in Southern Nigeria

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Background: There is recognition that individual risk factors can only partially explain vulnerability to HIV infection, and that a wider range of socioeconomic and cultural factors must be taken into account. This understanding has been applied to addressing obstacles to accessing HIV services. While structural interventions aimed at contextual factors related to HIV care have shown to be effective, they have not been widely implemented in Nigeria.

This paper illustrates how understanding contextual barriers and rights analysis helped define 'systems strengthening' interventions and compel their implementation.

Methods: The Center for Clinical Care and Clinical Research (CCCRN) implementing a USAID- funded Integrated Child Health Social Service Award (ICHSSA) carried out a study on the status of Child Rights Law (CRL) implementation and perception of women rights in HIV care among community leaders in February 2021.

Focus group discussions, in-depth interviews and community dialogue were used to explore prevailing structural barriers to HIV care aimed at addressing them among men, women and children. Qualitative data was collated and analysed. The feedback along with other forms of engagement e.g. sensitization meetings with women groups and targeted advocacy to community leadership were used to shape the long-term women issues of farmland ownership, and STAR facilitators engaged with Akwa Ibom State University of Technology where women were supported with improved agricultural seedlings in September 2021.

Results: A long standing customary law that deny women direct access to farm land in Ikot Ebo was amended, 20 indigent women were given plots of land (100 hectares each) from the community land to farm crops of their choice; they also got direct improved seedlings support from the State University.

After one season of farming on the land, 95% of the women have indicated they would feed their households from the crops, 76% of them would return their children who dropped out-of-school back to school; and 81% would spend on their health costs.



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Conclusions: The lift of ban on farmland which has granted access to women is self-sustaining. This approach when managed effectively has the potential to address both individual and structural barriers to HIV Care in resource limited communities.

EPE0929

Boosting HIV detection in high-risk communities through community-based campaigns

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Background: Low health literacy and poor health-seeking attitudes are common barriers to the early detection of HIV in high-risk and deprived communities in Nigeria. Elix Drive Africa adopted a community-based campaign strategy to overcome these barriers and boost HIV detection in one of such communities.

Description: In October 2022, Elix Drive Africa (EDA) held an awareness campaign and conducted on-site screening of HIV/AIDS in a community with a high record of drug and substance use, and poor sexual health practices. The campaign was held in partnership with the Virological Institute of Nigeria (VIN) and the Centre for Integrated Health Programs (CIHP). It was publicized by means of social media, town crying, and letters of invitation to churches in the community.

The campaign was staffed by health professionals, non-health professionals, and community volunteers, and campaign data was captured in a register and managed according to the Nigeria data protection regulation (NDPR).

Lessons learned: 1,350 participants were screened for HIV/AIDS. 14.3% of the participants tested positive for HIV. Of this number, 73.7% of persons who tested positive were between the ages of 18 to 40 while the remaining 26.3% were between ages 41 to 55. Consent was received from newly diagnosed PLWHA to link them to care and follow up with them quarterly.

While 77.2% of diagnosed persons accepted the diagnosis and consented to arrangements for enrollment into care, the remaining 22.8% were referred to the nearest "heart-to-heart" counselors for counseling as they journey towards accepting the diagnosis. Only 19.69% of newly diagnosed persons were successfully initiated on antiretroviral therapy.

Adequate publicity, the participation of community volunteers, and collaborations with major stakeholders were the key enablers of the successful implementation of the campaign.

Conclusions/Next steps: HIV/AIDS detection rates can be effectively increased in high-risk communities through community-based awareness campaigns and on-site testing. By involving community volunteers, adopting

community-centric publicity, and collaborating with key stakeholders, detection rates for HIV in high-risk areas can be increased towards achieving zero transmission of HIV in Nigeria by 2030. The follow-up data will supply useful information on the effectiveness of linkage to care from the time of detection.

EPE0930

Beyond the rhetoric: Introducing a community engagement tracking tool for improved HIV differentiated service delivery

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Background: A differentiated service delivery (DSD) approach to HIV services is a powerful tool against the epidemic, ensuring that services are tailored and centered on recipients of care (ROCs). Hence, amplifying the voices of ROCs in national DSD policy and programming is critical.

Tracking meaningful community engagement requires effective tools that capture nuanced definitions of community engagement.

Description: The Community Advocacy Network (CAN), a group of national networks of people living with HIV (PLHIV) coordinated by the International Treatment Preparedness Coalition (ITPC), developed a conceptual framework and a 19-indicator tracking tool defining community engagement across three levels (policy, program and community) and three areas (design, implementation, and monitoring & evaluation (M&E)). Building on a three-month pilot, ITPC and seven CAN members rolled out the tool in Cameroon, Democratic Republic of Congo, Eswatini, Ghana, Kenya, Rwanda and Senegal.

With support from ICAP CQUIN—and in consultation, with government, health facility, community, and other national stakeholders—they collected data retrospectively, between July and November 2022. The retrospective data spanned the year prior to data collection.

Lessons learned: On average, across all countries, community groups were engaged in DSD policy and programming at all levels, with opportunities for higher community engagement: 55% at policy level, 51% at program level and 59% at community level.

Similarly, on average, the level of community engagement ranged by areas: 65% at design, 51% at implementation and 45% at M&E. Across all indicators, on average, community engagement was highest in DSD policy validation exercises (79%) and service provision at health facilities (77%).

Conversely, average ROC involvement in DSD impact assessments was low (5%) as was involvement in DSD M&E activities (38%).



Conclusions/Next steps: The multi-country rollout of this tracking tool, and comparative analyses, offer insights into successful areas and persisting gaps in the engagement of PLHIV in shaping national DSD policy and programming. These highlight the need for continued national multi-stakeholder consultations and community advocacy for greater community engagement.

EPE0931

Optimizing efficiency in large scale surveillance survey through the use of electronic data collection applications – lessons from the 2020 integrated biological and behavioral survey in Nigeria

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Background: Data management, including data collection is a vital part of any research intervention Prior to the 2020 IBBSS, Nigeria has had three previous rounds of the study (i.e.2007, 2010 and 2014), all of which were implemented using paper –based instruments (questionnaire) for field data collection.

The 2020 IBBSS was the first in Nigeria to be fully automated using technology, thereby promoting systemic efficiency.

Methods: Paper based typology questionnaires, comprising of biological and behavioral variables, were reviewed by the study technical team, and the finalized questionnaires were configured into the virtual automated data collection app.

The application has various quality control logics like the "Relevant", "Constraint", and "Skip" commands, whose settings were enabled to function in both online and offline settings. Each KP typology has 2 interviewers and 1 laboratory scientist who were provided with android tablets for data collection.

Collected and reviewed data were submitted real-time from the field to the back-end server at the central study room, with a team of a data officers eye-balling the data on real time basis.

Results: Electronic data capture was used to instantly digitize documents, which was instantly retrievable and readily available for running data summaries, including descriptive.

The logic commands helped in reducing data errors, for example the "Relevant" command limited the range of possible responses, and allowed only relevant options to be available to a respondent.

Electronic data management allowed integration of modular workflows with complex branching logic, non-linear navigation, randomized elements, multi-media and GIS functions to track field activities real time. Geo-points coordinate also improved the tracking of locations where interviews were conducted.

A rapid comparison of forms completed by different enumerators to identify data outliers and abnormalities for timely solution.

Conclusions: Quality evidence generation through data is critical to development planning. A comparison of paper-based data collection with electronic data collection showed that direct data entry via android was faster, data auditing was easier and efficient, accuracy optimized and omissions avoided. Delayed data turnaround times and late error detections were circumvented.

With numerous advantages, electronic data management has the potential to up-scale surveillance and strengthen operational efficiency without compromising quality.

EPE0932

Utilizing the model for improvement framework to improve index testing offer rate in Nigeria

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Background: Index testing is one of the most efficient strategies to identify children living with HIV. Several guidelines recommend index testing (genealogy testing) be offered to all newly diagnosed individuals. Health system strengthening activity, using a standard quality improvement (QI) framework was implemented by the PEPFAR through USAID-funded Accelerating Control of the HIV Epidemic in Nigeria (ACE) Project to improve the offer rate of index testing. We assessed the outcome of this initiative.

Description: The model for improvement framework was used in the design of a 12-week quality improvement initiative at four health facilities in Akwa Ibom State, Nigeria. These facilities had <50% genealogy offer rate (i.e. the proportion of clients offered genealogy testing) as of beginning of August 2022.

In the "Plan" phase, focused group discussions conducted for healthcare workers showed limited knowledge among services providers, unstructured clinic flow and documentation gaps as the top three barriers to index testing services delivery. During the "Do" phase, training was conducted for healthcare workers; service and documentation flow within the facility was established; and



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documentation on paper records were compared with electronic records to identify actual service gaps. Weekly genealogy offer rate was plotted on a run-chart during the "Study" phase.

Lessons learned: At the beginning of the implementation, the total gap for missed opportunities in genealogy was 14,476 clients in the participating sites. After 12 weeks of quality improvement, genealogy offer rate increased from 32.5% to 98.3% (Figure 1). A total of 22 HIV-positive children (males=8; females=14) were identified from the genealogy testing.



Figure 1: Weekly progress across four large-volume comprehensive ART treatment health facilities in Akwa Ibom with less than 50% genealogy offer rate.

Conclusions/Next steps: Health system strengthening approach improved genealogy offer rate and the facilities intends to spread this learning to other components of the index testing cascade.

EPE0933

Lessons learned from implementation of integrated point-of-care testing for HIV early infant diagnosis and viral load monitoring in Malawi: a model for limited resource settings

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Background: Malawi has successfully scaled up integration of HIV early infant diagnosis (EID) and viral load (VL) testing on Point of Care (POCs) devices, a shift from centralized testing on large equipment at laboratories located in urban areas. This has led to significant reduction in test results turn-around time and ART initiation from 56 days and 38 days to just 1 day for mPima EID and GeneXpert VL, and 3 days for GeneXpert EID. Proportion of infants initiated on ART within two months of birth has also improved by more than 50%^{[1][2]}.

Description: Introduction of POC EID and VL was in two phases, following two successful feasibility studies conducted between 2015 and 2017.^{1,2} Phase one was EID testing on Abbott mPima. Phase two was EID and VL testing

on Cepheid GeneXpert. GeneXperts were readily available in Malawi and were used for tuberculosis testing. Currently, there 25 Pima and 48 GeneXpert sites across the country. These are supported with trainings, routine supervision and mentorship, supply chain, waste management, quality assurance and connectivity.

Lessons learned: Malawi's successful shift to POC for EID and target VL is widely appreciated as a best practice example and there are lessons learnt worth sharing. Introduction of POC technology decongested molecular laboratories and partly helped address the gap in laboratory personnel.

We also learnt that stakeholders' engagement from the outset is critical. Stakeholders were engaged at each stage of implementation, thereby setting the intervention on a path to sustainability.

In addition, supervision and mentorship are critical to ensure quality POC testing. Testing errors on GeneXpert and mPima were usually high soon after training but declined after mentorship.

Furthermore, POC testing saved money for Ministry of Health and stakeholders by using existing infrastructure. Lastly, data management is crucial to ensure timely data visibility at decentralized system. Routine data on indicators such as TATs, rates of ART initiation and device functionality were used for decision making through-out the implementation.

Conclusions/Next steps: POC EID and VL have significantly improved patient care in Malawi. Governments across similar contexts would benefit from insights on Malawi's experience in the roll out of POC testing interventions.

EPE0934

The use of Quality Improvement (QI) interventions in improving viral load (VL) test access in East Acholi region, Northern Uganda

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Background: Viral load (VL) testing is a routine monitoring test for all persons living with HIV (PLHIV). According to the Ministry of Health Uganda (MoH), it should be conducted six months after ART initiation then every after twelve months. At least 95% coverage is considered optimal.

In February 2022, 18,128 (73%) of the 24,704 of the clients had accessed viral load testing in the four districts in East Acholi sub-region (CPHL/PIRS Feb 2022 data). A root cause analysis conducted in the four districts revealed forgetfulness, long distance and lack of transport to the facility, knowledge gap and over-representation as the major factors for the sub optimal access to Viral load testing.

The aim of this study is to demonstrate how implementation of interventions using a quality improvement approach led to improved viral load testing in Eastern Acholi.

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Methods: Initiated quality improvement (QI) at forty (40) health facilities, site specific data on viral access among Persons Living with HIV was reviewed; Establishment of VL work improvement teams (WITs); Use of the Electronic medical records and audit tools to generate line lists of all eligible clients; Chart audits, attachment of VL stickers to flag clients eligible for a VL test, and offered clients' literacy through health education sessions.

Community Linkage facilitators were assigned to conduct physical follow up and door-to-door mobilization; laboratory teams were supported to perform facility and community VL bleeding even at flexi-hours (late evenings, weekends); documentation journals were opened; weekly review of data, discussions for quick emerging learnings; phone mentorships and monthly technical physical support.

Results: Cumulatively, 23,716 VL samples were collected by August 30, 2022, leading to 96% VL test coverage among PLHIV in East Acholi sub-region, translating to viral suppression rate of 91% up from 73% coverage in February 2022.

Conclusions: A community bound, flexible and resilient system, effectively overcame barriers to VL test access among PLHIVs and improved treatment success rate.

Recommendation:

- Timely institution of QI initiatives during healthcare services provision and ensure adequate monitoring to realize better outcomes.
- Tailor VL testing to clients' needs such as offering flexi-hours services.

EPE0935

Change management and leadership development for integrating and sustaining a vertical, donor-funded program

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Background: The overall goal of the project was to support the Ministry of Health and Child Care in Zimbabwe in integrating and sustaining the Voluntary Male Medical Circumcision program. It is now transitioning from a vertical, donor-funded and partner-implemented program to a Ministry-led and operated HIV prevention service within the health system.

Our intervention supported collaboration with the MoHCC, its partners, donors, and other stakeholders, working with district health teams to:

1. Identify integration and sustainability challenges and opportunities.
2. Resolve challenges, leverage opportunities, and integrate the VMMC program with the HIV prevention program.
3. Ensure it can be sustained within the mainstream health system.
4. Strengthen capacity within the health system to manage similar changes in the future.

Description: Our project used LEAD (Leadership & Engagement for Improved Accountability & Delivery of Services), a framework that employed a systematic and iterative process, involving continual problem diagnosis, action planning, implementation, and evaluation.

The process built capacity for change management through a series of workshops for peer learning and exchange, meetings, trainings, coaching, and mentoring during the planning cycle.

Lessons learned:

- The sharing of budgets and plans by implementing partners with key stakeholders will increase transparency and facilitate optimal use of resources. The way this is achieved in practice will vary by district.
- Flexibility around the use of donor-funded vehicles, fuels, and supplies - rather than adhering rigidly to program-specific restrictions - is needed to strengthen the health system.
- Integration is not limited to service delivery. It also means incorporation of the vertical health service into subnational management structures, strategic information, and quality assurance.
- Decentralization of service delivery and management are opportunities for greater program ownership, increased accessibility, enhancing trust between providers and clients, and increased timeliness of services.
- Greater transparency around donor funding plans and budgets is needed, along with less siloing of resources into specific health programs.
- External capacity strengthening support to subnational teams should be gradually withdrawn. Periodic follow-up by independent facilitators can ensure teams are able to apply, integrate, and sustain the skills they have learned.

Conclusions/Next steps: The LEAD Framework is applicable and flexible for use by other health programs to strengthen subnational leadership and governance.



EPE0936

Vulnerability and dissavings among recipients of HIV care in Zimbabwe: a call for social protection integration action

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Background: Social and structural determinants affect access to HIV care, contributing to losses across the cascade of care and reduce patient outcomes. However, financial, food vulnerability, and dissavings experienced by people living with HIV (PLHIV) on antiretroviral therapy (ART) are not routinely monitored in HIV programs.

Our objective was to establish the burden of food and financial vulnerabilities on ability to access and adhere to ART among PLHIV enrolled on ART in 15 HIV high-burden districts of Zimbabwe.

Methods: Financial/social vulnerability (lack of food, transport funds, clinic fees) and dissavings (taken out loan, withdrawn savings, sold assets, reduce food consumption, taken child out of school) were self-reported on impact of ability to access or adhere to HIV treatment, assessed through the HIV client satisfaction surveys (CSS) by Zimbabwe Network of People Living with HIV. These were administered monthly among adult recipients of HIV care in 15 districts.

Data were collected on mobile phones using CommCare application by trained Community HIV & AIDS Support Agents. Data was analysed descriptively using STATA V15.1

Results: From Aug-Sep22, 1383 recipients of HIV care completed the CSS of whom, 911 (65.9%) were female. The median age of respondents was 47 years (IQR:37-51yrs)

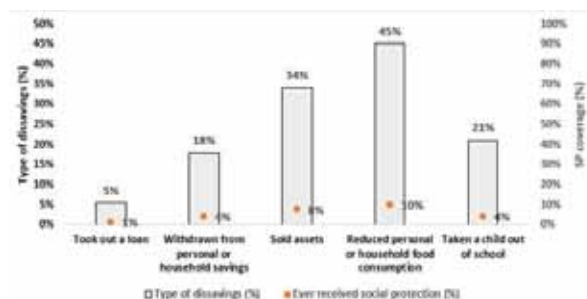


Figure. Dissavings experienced by recipients of HIV care and social protection coverage (N=1383)

The majority, 60% (830/1383) experienced at least one form of dissavings, most frequently reported being reduced food consumption (45%; 624/1383). Clients with large households and residing in urban areas reported higher rates of food vulnerability or dissavings.

Conclusions: The majority of recipients of HIV care experience dissavings and vulnerabilities that impact their ability to access or adhere to HIV treatment. Integration of social protection interventions into routine HIV care and treatment has the potential to minimize socio-economic vulnerability and eliminate catastrophic costs for improved treatment outcomes, particularly in urban areas where dissavings and vulnerability are highest.

EPE0937

Gender-based violence case identification among clients increases access to assisted Partner Notification Services (aPNS) in coast region, Kenya

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Background: Index testing intervention may expose clients to Adverse Events (AE) thus contributing to low acceptance of assisted partner notification services (aPNS), low elicitation of sexual contacts, and failure to attain UNAIDS goals. Intimate Partner Violence (IPV) inhibits individuals' access to testing services and HIV status disclosure. Thirty-four percent (34%) and 13% of women aged 15-49 have disproportionately experienced physical and sexual violence respectively by the age of 15 compared to men (KDHS, 2023). Prior to the program, there were no clear strategies for IPV screening and AE monitoring during aPNS. The project sought to assess whether GBV identification among clients increases access to aPNS.

Description: A Training Needs Assessment (TNA) on IPV identification, LIVES provision, and AE monitoring was conducted. Training plans were designed to respond to the needs of target counties. LIVES training was conducted for 427 HIV Testing Services (HTS) providers, nurses, and clinical officers using the WHO curriculum. Out of 427 service providers, 83 HTS providers were identified to offer aPNS, and reach sexual contacts of index clients. Emphasis on ethical and safe index testing was made through close monitoring and supervision of providers. IPV screening and AE monitoring tools; registers; protocols and job aids were disseminated to providers.

Lessons learned: All TNA respondents had limited knowledge of the provision of services. The proportion of clients accepting aPNS was high at 4642 (90%) in four Sub National Units; Kilifi (1190) at 26%; Kwale at 838 (18%); Taita Taveta at 892 (19%) and Mombasa at 1722 (37%). Out of 4642 clients screened for IPV, 185 (4%) disclosed violence and only two (1.1%) reported AE. All clients who disclosed IPV were offered the LIVES package. The contribution of positive clients accessing aPNS to the overall program performance increased from 7% in October 2021 to 16% in September 2022. The aPNS yield increased from 11% in October 2021 to 25% in September 2022. AE monitoring is now integrated into Community Advisory Boards.

Conclusions/Next steps: Integration of skilled GBV identification, provision of LIVES, and close monitoring of AE can improve HIV status disclosure and yield in aPNS.



EPE0938

The associations between ART use and violence among women living with HIV across 11 countries in sub-Saharan Africa

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Background: One in three women experience violence globally, and this is higher among women living with HIV. Violence has been associated with lower HIV testing and higher HIV incidence among women.

In this study, we aim to understand ART use and the associations with violence and national gender-based violence protections among women living with HIV in sub-Saharan Africa (SSA) in the COVID-19 era.

Methods: This study used data from the People Living with Stigma Index (PLHIV) 2.0 study from 11 countries in Sub-Saharan Africa including Angola, Benin, Burkina Faso, Cote D'Ivoire, Ghana, Kenya, Nigeria, Mauritania, Lesotho, Togo, and Zimbabwe. Study implementation was led by networks of PLHIV in each country between 2020 and 2021.

Interviewer-administered socio-behavioral questionnaires were used to collect self-reported measures among 10,555 cisgender women living with HIV. Multilevel logistic regression with random slopes were used to assess the associations between ART use and violence.

Results: Among participants, 2.9% reported history of sexual violence; 1.6% reported having a partner prevent them from seeking health services; and 6.5% reported experiencing physical violence due to HIV status.

Current ART use was lower among women who had experienced sexual violence (aOR:0.34;95%CI:0.25,0.47), partner inhibition of seeking healthcare(aOR:0.30;95%CI:0.20,0.45), and physical violence(aOR:0.57;95%CI:0.47,0.73).

Associations of ART use with all violence measures remained significant in settings with and without gender-based violence protections (Table 1).

Conclusions: Violence is a barrier to ART use and therefore a barrier to improving morbidity and mortality among women living with HIV in SSA. Despite the presence of national policies for gender-based violence protections, violence remains prevalent and associated with lower ART use among women living with HIV across legal settings. Policy adoption alone is not sufficient for reducing violence affecting women living with HIV and improving HIV outcomes. Enforcement and accountability mechanisms as well as violence reduction, education, and support interventions should be implemented alongside policies.

	No Gender-based Violence Protections					Gender-based Violence Protections				
	Total n(%)	n	ART %	aOR 95% CI	95% CI	Total n(%)	n	ART %	aOR 95% CI	95% CI
Violence	224	114	1.66	0.6	0.21-1.65	353	185	2.27	0.6	0.21-1.65
Sexual violence	118	58	0.71	0.23	0.12-0.43	265	105	1.53	0.38	0.23-0.63
Partner prevented from seeking care	3.80	186	3.30	1.27	0.53-3.07	9.13	477	8.38	3.28	1.63-6.61
Physical Violence due to HIV status										

¹Multilevel logistic regression model with random intercepts and adjusted for age, education, relationship, time from HIV diagnosis, PEPFAR country, HIV prevalence among adults, HIV prevalence among women. Models stratified PEPFAR region.

Table 1. ART use and associations with violence, stratified by gender-based violence protections.

Integration of HIV services with other health and support services

EPE0939

Relationship between seminal HIV-1 RNA shedding and genital schistosomiasis in HIV-positive men receiving antiretroviral therapy (ART) along the south shoreline of Lake Malawi: a prospective pilot study

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Background: Male Genital Schistosomiasis (MGS) remains an ignored complication of urogenital schistosomiasis (UGS) associated with eggs and pathologies in genitalia of men from endemic areas especially Sub-Saharan Africa. This has also been hypothesized to increase seminal shedding of HIV-1 RNA.



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We aimed to assess the impact of MGS on genital HIV-1 RNA shedding by longitudinally measuring HIV-1 RNA levels in men established on long-term ART comparing those with and without a diagnosis of MGS.

Methods: Following optimisation of the GeneXpert® HIV-1 RNA assay for use with seminal fluid, we analysed 76 paired plasma and semen samples collected from 31 men over 12 months, comprising 15 with and 16 subjects without MGS. Study visits occurred at 0, 1, 3, 6 and 12 months. A diagnosis of schistosomiasis was based on *Schistosoma* positivity using eggs by microscopy of filtrated urine, semen, seminal sediment, POC-CCA test or by testing PCR of seminal sediment or urine at one or more time points. MGS was diagnosed by egg positivity on semen microscopy or PCR of seminal sediment. All subjects were blindly treated with a single dose of praziquantel at each study visit.

Results: Across the study population, HIV-1 RNA was detected in 7/76 (9.2%) seminal samples and 29/76 (38.2%) plasma samples. Among all participants, 5/31 (16.1%) showed HIV-1 RNA detection in one or more seminal samples, with 3/5 (60%) showing HIV-1 RNA detection in semen only with levels up to 400 copies/ml. Three participants were in the MGS positive group.

Two participants showing HIV-1 RNA in seminal fluid from the MGS negative group, also had concomitant HIV-1 RNA detection in plasma.

Conclusions: We found no notable difference in the pattern of genital shedding in seminal compartment of HIV-1 infected men established on ART with and without a diagnosis for MGS following treatment with praziquantel. Further prospective studies with bigger sample size are required to evaluate the definitive role of MGS and that of STIs in enhancing HIV-1 RNA shedding in this population, investigate the infectiousness and drug resistance profile of seminal HIV-1 RNA, and determine how the introduction of dolutegravir -based ART across Africa may impact on the findings.

EPE0940

Intimate partner violence, depressive symptoms, hazardous alcohol use, and social support among people with HIV initiating HIV care in Cameroon

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Background: Intimate partner violence (IPV) has been associated with poor mental health among people with HIV (PWH) globally. Social support may be a strategy to foster mental health among PWH.

The objectives of research were to estimate the prevalence of four types of IPV among PWH initiating HIV care in Cameroon; assess the relationships among IPV, depression, and hazardous alcohol use; and identify the extent to which the relationships among IPV, depression, and hazardous alcohol use varied by IPV type or level of social support.

Methods: Structured interviews were conducted with 426 PWH initiating HIV care in three urban HIV treatment facilities in Cameroon in 2019-2020. Log binomial regression analyses were used to estimate the association between four types of IPV (controlling behavior and physical, sexual, and emotional IPV) and symptoms of depression or hazardous alcohol use, separately by IPV type and level of social support (low vs. high).

Results: Over half (54.8%) of respondents experienced moderate/high levels of controlling behavior, 42.0% experienced emotional IPV, 28.2% experienced physical IPV and 23.7% experienced sexual IPV. Emotional and physical IPV were associated with greater prevalence of depressive symptoms among those with low social support (emo-

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tional IPV: aPR 1.9 [95% CI 1.0, 3.4]; physical IPV: aPR 1.8 [95% CI 1.2, 2.8]), but not among those with high social support (emotional IPV: aPR 1.0 [95% CI 0.7, 1.6]; physical IPV: aPR 1.0 [95% CI 0.6, 1.6]). Controlling behavior was also associated with greater prevalence of depressive symptoms. This relationship did not vary meaningfully by level of social support (low: aPR 2.4 [95% CI 1.2, 4.9]; high: 1.7 [95% CI 1.0, 2.7]). Emotional IPV, physical IPV, and controlling behavior were associated with a greater prevalence of hazardous alcohol use, with moderately larger effect estimates among those with high compared to low social support. Sexual IPV was not associated with depressive symptoms or hazardous alcohol use.

Conclusions: Services to screen and care for people experiencing IPV are urgently needed among PWH in Cameroon.

Future research to identify barriers, feasibility, acceptability, and organizational readiness to integrate IPV and mental health services into HIV care settings is needed.

EPE0941

Factors influencing integration of mental health screening and treatment into HIV care settings in Cameroon: a qualitative study of HIV clinic staff's perspectives

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Background: Mental disorders are common among people with HIV (PWH) and associated with poor HIV outcomes, including suboptimal adherence to antiretroviral therapy (ART) and poor retention in care. Despite high prevalence of unmet mental health needs among PWH, evidence-based mental health screening and treatment

remains limited at HIV treatment in low-resource settings. This study's objective was to explore factors that influence integration of mental health screening and treatment into HIV clinics in Cameroon.

Methods: Cameroonian study staff trained in qualitative data collection conducted 14 in-depth interviews (IDIs) with clinic staff at three urban HIV treatment clinics in Cameroon. Interviews were recorded and transcribed. French transcripts were translated into English.

We conducted thematic analysis as outlined by Braun & Clarke on 14 IDIs with providers to understand factors that influence integration of mental health screening and treatment.

Results: Providers discussed the lack of standardized mental health screening processes in HIV treatment facilities and felt ill-equipped to conduct mental health screening without access to tools or protocols. Providers described that low community awareness about mental health and mental health-related stigma affected their ability to effectively integrate mental health screening into HIV care.

Limited physical space to screen clients in a private setting and high clinic volume affected providers' capacity to screen clients for mental health disorders. Providers indicated that better coordination and communication would be needed to support client referral to mental health care, when indicated.

Despite these barriers, providers reported being motivated to screen clients for mental health disorders and believed that mental health service provision will improve quality of care and HIV treatment outcomes. All providers said they would feel more confident screening for mental health disorders with additional training and resources. Providers recommended community sensitization, hiring or training more health staff to conduct mental health screening, and leadership buy-in at multiple levels of the health system to support sustainable integration of mental health screening and service provision into HIV clinics in Cameroon.

Conclusions: Providers reported enthusiasm to integrate mental health services into HIV care but needed more support and training to do so in an effective and sustainable manner.

**EPE0942****High rates of uncontrolled hypertension among adults receiving integrated HIV and hypertension care with aligned multi-month dispensing in Malawi**

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Background: Integrated care with aligned multi-month dispensing (MMD) of antiretroviral therapy (ART) and anti-hypertensive medications may reduce burden of care for people living with HIV, but actual alignment of dispensing and impact on blood pressure (BP) control are not well understood.

Methods: We surveyed adults (≥18 years) on ART and antihypertensives receiving integrated care for both conditions at 8 healthcare facilities (7 of which provide antihypertensives free of charge) in Central and Southern Malawi from July 2021 to April 2022. Respondents were asked about frequency of visits for care and antihypertensive medication refills.

We characterized dispensing and alignment of ART and antihypertensive medications, and used descriptive and bivariate analyses to explore associations with uncontrolled hypertension (defined as 2 or more readings in the prior year with systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg).

A random subset of participants with uncontrolled hypertension were selected for collection and analysis of medical chart data on antihypertensive medication adjustments over the prior year.

Results: We surveyed 464 people receiving integrated HIV-hypertension care (median age 54 years [IQR 48-60], 58% female), all but five (1%) of whom reported aligned dispensing of medications. Most (63%) of those with aligned dispensing had 3-month dispensing (3MD), 31% had 4MD or 6MD, and 6% had 1MD or 2MD.

Among the 362 individuals with ≥2 BP readings in the prior year, 77% (n=278) had uncontrolled hypertension, and this was associated with shorter refill intervals: 81% of those with 3MD or shorter had uncontrolled hypertension, versus 67% of those with 4MD or longer (p=0.007).

Of 149 participants with uncontrolled hypertension who had detailed chart reviews, only 10% (n=15) had antihypertensive medications added, discontinued, and/or switched over the past year.

Conclusions: Uncontrolled hypertension was common among Malawian adults receiving integrated HIV and hypertension care with aligned MMD, and was associated with shorter refill intervals, but very few medication changes. In Malawi and similar settings, integrated care with aligned multi-month dispensing is promising for chronic comorbidity care, but more work is needed to

understand factors determining uncontrolled hypertension and to introduce feasible interventions for effective hypertension management, including optimizing clinician training.

EPE0943**Developing and pre-testing a digital decision-making app for smoking cessation among HIV-care providers**

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Background: Diagnosis and continuous care of chronic conditions such as HIV infection present potential teachable moments for delivering smoking cessation interventions. The prevalence of cigarette smoking among people with HIV is often higher (>50%) than that observed among the general population. In the United States (US), Australia, and the United Kingdom markets, there are currently over 500 available mobile-based smoking cessation smartphone applications (apps) where the end user is the smoker interested in quitting, not the healthcare provider offering those services.

Thus, we designed a user-friendly app, Decision-T, for healthcare professionals to provide effective and time-efficient smoking cessation counseling to their patients. Once developed, the app was pre-tested among a sample of HIV-care providers.

Methods: We developed the Decision-T app based on the transtheoretical algorithm for smoking cessation following the 5-A's model. We employed a mixed-methods approach among 18 HIV-care providers recruited from Houston (US), for pre-testing the app.

Each provider participated in three mock sessions where they were asked to use the app, follow the built-in algorithm for providing personalized smoking cessation counseling and recommend pharmacotherapy to research staff members acting as patients.

We measured the average time providers spent at each session and assessed the app's accuracy by comparing the cessation treatment offered by the HIV-care provider using the app to that chosen by a tobacco specialist who designed the case.

The system usability scale (SUS) was used to quantitatively evaluate the app's usability. Qualitative analysis of individual in-depth interview transcripts was used to further assess the app's usability.

Results: Providers' average age was 42.0 (±12.26). Most of them were females (83.3%), African Americans (55.6%), and nurses (33.3%). The average time for completing each mock session was 5 minutes-17 seconds. The participants achieved an overall average accuracy of 88.89%. The average SUS score achieved was 87.5 (±10.26).

After analyzing the transcripts, five themes (app's contents are beneficial and straightforward, design is easy to understand, user's experience is uncomplicated, tech is intuitive, app needs improvements) emerged.

Conclusions: The Decision-T app can potentially increase HIV-care providers' engagement in offering smoking cessation behavioral and pharmacotherapy recommendations to their patients briefly and accurately.

EPE0944

Providing integrated comorbidities care in HIV clinics and in the community for older people living with HIV in Cameroon and Senegal: two year experience of the VIHeillir project

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Background: The success of antiretroviral therapy (ART) has increased life expectancy of people living with HIV (PLHIV), thus exposing them to a growing risk of age-related diseases. The proportion of PLHIV over 50 years in both Cameroon and Senegal is nearly 25%.

The success of ART can be jeopardized by non communicable diseases (NCD) while quality of life can deteriorate quickly without proper management.

Description: Since 2021, in Cameroon and Senegal five HIV care services have been integrating screening, diagnosis and treatment for hypertension, diabetes, hepatitis B and C and cervical cancer during routine visits of PLHIV over 50 years (OPLHIV).

Simplified algorithms have been produced with local experts. Health staff and community workers have been trained. Point of care tests for screening as well as generic drugs for NCDs at lower cost were made available.

OPLHIV were referred to community for follow up of cardio-metabolic parameters (blood pressure, capillary glycemia and weight), group education, adherence support and prevention activities (sport, gastronomic workshops).

Lessons learned: Intensive education and follow-up is needed for effective integration of comorbidities management in HIV care. There is little awareness by health staff and OPLHIV of the impact of comorbidities on quality of life.

NCD screening tests should be free: tests' cost, even if low, remains a barrier to full implementation of the screening package.

While adherence to ART is good amongst OPLHIV, adherence to comorbidities drugs should be negotiated at every visit; costs and lack of literacy on these diseases being the major causes of non adherence.

Involvement of associations of PLHIV together with associations of people with chronic diseases or older people creates a dynamic of skills exchange, very rich in transfer of competencies.

Due to transport fees, fear of stigmatization and low referral by health staff, OPLHIV are not the majority attending the community activities, which are open to everyone older than 50 years, but those participating find them very useful and rewarding.

Conclusions/Next steps: Screening of functional impairments will be integrated in clinics; patients will be referred consequently to community for prevention.

Associations will develop new activities to respond to decline in function of older people.

EPE0945

Preferences for hypertension care among people living with HIV in Malawi: a discrete choice experiment (DCE)

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Background: Hypertension is the most common non-communicable disease diagnosed among people living with HIV (PLHIV) in sub-Saharan Africa.

However, little is known about client preferences for hypertension care, including priorities and trade-offs involved in care-seeking.

Methods: We performed a discrete choice experiment in Malawi with PLHIV and hypertension. Participants were asked to select between two care scenarios, each with 6 attributes: distance, waiting time, provider friendliness, individual or group care, antihypertensive medication supply, and antihypertensive medication dispensing frequency (three vs one month).

Eight choice sets (each with two scenarios) were presented to each individual with the assumption that care for HIV and hypertension was integrated. Mixed effects logit models quantified preferences for each attribute.

Estimated model coefficients were used to predict uptake of five pairs of scenarios representing hypothetical models of HTN care.



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Results: Between July 2021 and April 2022 we enrolled 501 adults from 14 facilities, median age 54 years (IQR 49-60), 58% female, with median of 4.5 years (IQR 3-7) on antihypertensives. Participants were on ART for a median of 11 years (IQR 6-15), with 99% virologically suppressed (<1000 copies/mL).

Participants strongly preferred seeing a provider alone vs in a group (OR 15.4, 95%CI 13.6-17.4) (Figure, Panel A), but 66% and 51% of respondents would choose group hypertension care over individual care if the facility had other favorable attributes (Panel B, choice scenarios 1 and 2). Three-month vs monthly dispensing (OR 4.7; 95% CI 4.1-5.3), and high vs low stock of antihypertensives (OR 3.8; 95%CI 3.3-4.2) were also strongly preferred.

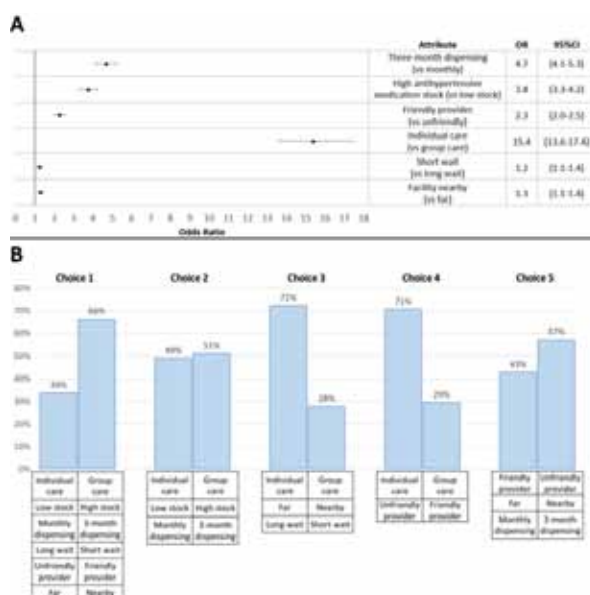


Figure. Strength of preferences for 6 attributes of hypertension care (panel A) and predicted uptake of five pairs of scenarios representing hypothetical models of HTN care (panel B) in Malawi.

Conclusions: Preferences for individual care were strong in this population, but participants would theoretically accept group care if other facility/care attributes were favorable. Multi-month dispensing of antihypertensives as well as reliable drug supply were also prioritized. These findings have implications for the scale-up of integrated HIV-hypertension care in Malawi and similar settings.

EPE0946

Prescribing methadone before release from prison predicts linkage to HIV care among incarcerated men with HIV and opioid use disorder following release from prison in Malaysia

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Background: Transitioning from prison to the community is dangerous for people with HIV (PWH) and opioid use disorder (OUD), including discontinuity of care and increased morbidity and mortality.

Initiating medications for OUD (MOUD), such as methadone, and antiretroviral therapy (ART) for HIV before release can reduce risks during this transition.

Methods: A prospective clinical trial comparing methadone to no methadone was conducted for 296 male PWH and OUD from 2010 to 2014 in Malaysia's largest prison. Participants were allocated to pre-release methadone or not initially by randomization and later by choice. Linkage to HIV care was prespecified as a secondary trial outcome and defined as CD4 cell count, viral load, or clinic visit. Linkage to care was assessed using Cox proportional hazards modeling. Data for the covariates was obtained at the time of prison release.

Results: Among the 296 participants, 218 were allocated to methadone and 78 to no methadone. The median age was 39 years (range: 22-58). Potential independent variables were theorized with the Behavioral Model for Vulnerable Populations for healthcare utilization.

The dependent variables were linkage to HIV care at 90 and 365 days post-release. Independent variables predictive of linkage to HIV care at 90 days included receipt of pre-release methadone (aHR: 1.67, 1.01-2.78, $p=0.048$), having ever been prescribed ART (aHR: 1.76, 1.11-2.78, $p=0.016$), and CD4 count <350 cells/mL (aHR: 1.57, 1.03-2.39, $p=0.034$). At 365 days, independent predictors of linkage to HIV care included being prescribed pre-release methadone (aHR: 1.76, 1.21-2.58, $p=0.003$), having ever been prescribed ART (aHR: 1.64, 1.11-2.43, $p=0.013$), increasing age (HR: 1.03, 1.01-1.06, $p=0.004$), and time since study start (aHR: 0.98, 0.97-0.99, $p=0.004$).

Variables not predictive with linkage included education, ethnicity, being married, risk-reduction counseling, depression, pre-incarceration hospitalization, and self-reported HIV symptom severity.



Conclusions: Being prescribed methadone before release from prison for men with HIV and OUD predicted linkage to HIV care over the course of one year. International guidelines should endorse MOUD for incarcerated persons with HIV and OUD to facilitate HIV care outcomes.

EPE0947

Facilitators of and barriers to implementing a peer-led depression screening intervention: a qualitative study among transgender women living with and at risk for HIV and healthcare providers in Thailand

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Background: We explored facilitators and barriers related to implementing a peer-led depression screening intervention for transgender women at the Tangerine Clinic, a transgender-led sexual health clinic in Bangkok, Thailand.

Methods: A peer-led depression screening intervention using the Patient Health Questionnaire-2 (PHQ-2), followed by the PHQ-9 if PHQ2 symptom reported, was implemented from October 2021-January 2022. Focus group discussions (FGDs) and in-depth interviews (IDIs) were then conducted to assess factors that impacted feasibility and acceptability of implementing the screening intervention, and social norms around mental healthcare.

Interview guides and qualitative coding were informed by the Consolidated Framework for Implementation Research (CFIR) to assess patient and staff needs and resources, related beliefs, and screening-related feasibility. FGDs and IDIs were transcribed and analyzed using the content analysis approach.

Results: One FGD included 7 transgender women living with HIV and another included 9 transgender women without HIV. IDIs were conducted with 12 transgender women and 11 healthcare providers (e.g., peer counselors, nurses, physicians). All transgender respondents agreed that mental health was a critical challenge within their community due to frequent experiences of rejection by family and friends, gender-based violence, and structural discrimination.

Transgender women, regardless of HIV status, identified similar benefits from the peer-led depression screening, including increased access to mental healthcare as part of a comprehensive transgender-competent care package.

Facilitators of implementation included using the PHQ-2/PHQ-9 as a simple, brief screening tool, having transgender peer counselors on the provider team, and dedicated clinic space for counseling. Providers stressed the benefits of implementing a peer-led screening, capacity building for mental health services (e.g., counseling, cognitive behavioral therapy), and having a psychiatrist at the clinic on a weekly basis. Transgender women and providers identified costs of psychiatric treatment as a barrier.

Other barriers for transgender women included perceived stigma towards mental healthcare and anticipated stigma in healthcare settings.

Conclusions: Implementing a peer-led depression screening intervention at a Thai transgender-led sexual health clinic was feasible and acceptable among clients and providers. Barriers to implementation must be addressed in order to enhance and expand mental healthcare integration that is tailored to the needs of this population.

EPE0948

Preliminary results from integrating interpersonal psychotherapy groups in DREAMS initiatives for AGYW in Zambia

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Background: In Zambia, adolescent girls and young women (AGYW) face multiple economic and social challenges, including unequal gender norms, stigma, and lack of resources, which limit access to and engagement with health services. Additionally, low-income AGYW are more susceptible to living with depression than men.

To address the dual risk of acquiring HIV and the burdens of depression among AGYW, we integrated mental health services into the comprehensive HIV prevention Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) initiative in the Southern and Western Provinces.

Methods: We implemented interpersonal psychotherapy groups (IPT-G) between October and December 2022 to help AGYW identify the underlying triggers of their de-



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pression. DREAMS mentors were trained as mental health facilitators to help guide AGYW through 8-10 weeks of structured sessions. AGYW enrolled into DREAMS were screened with the call-to-action (CTA) form.

Anyone who scored >5 was further screened with the Patient Health Questionnaire (PHQ-9); if they scored >9, they were counselled and enrolled in IPT-G. Scores of 9-14, 15-19, and 20-24 indicated moderate, moderately severe, and severe depression, respectively.

A burden-rating tool was administered to track weekly symptoms. Midline and endline assessments were conducted at weeks 4 and 8 to assess progress or deterioration of symptoms. AGYW with a score of >5 at endline were referred to health facilities for further mental health assessments and treatment.

Results: A total of 722 AGYW were screened using the CTA form; 73% (530/722) scored >5 and were further screened with the PHQ-9 tool. Of these, 99% (527/530) scored >10; 60% (317/527) had moderate depression, 38% (199/527) had moderately severe depression, and 2% (11/527) had severe depression. Four of the depressed AGYW were living with HIV and 5 were pregnant; additionally, 24 showed suicidal tendencies and were excluded from IPT-G sessions and referred for further care at the health facility.

Conclusions: Among DREAMS AGYW in Zambia, depression is highly common and mental health services are greatly needed. Integrating services such as IPT-G into the existing DREAMS initiative with already well-known mentors improves access and provides AGYW with a safe environment for addressing mental health needs and coping with depression.

EPE0949

Incorporating quality of life into care for people living with HIV (PLHIV): developing a consensus tool of health and social Patient Reported Outcome Measures (PROMs) for clinical and community services

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Background: Achieving health and quality of life (QoL) outcomes for people with HIV is increasingly a mix of clinical and community initiatives. Developing an agreed common short battery of Patient Reported Outcome Measures (PROMs) may enhance shared care, strengthen partnerships across services, and improve monitoring of QoL and other PROMs. Currently there is no consensus on the PROMs that could be recommended for use across

clinical, community and research settings in Australia.

The aim of this study was to identify a small set of PROMs using an adapted Delphi consensus process with HIV peer, community, clinical, research and policy collaborators.

Methods: Drawing on a literature and Australia policy review, 147 PROMs were refined into an initial recommended list of 48 social and health PROMs. The Delphi consensus process consisted of 3 rounds, where participants in PLHIV peer, community, clinical, research and government settings were asked to rate how important, appropriate and feasible each PROM was in their work.

A final consensus meeting discussed the proposed structure, content and implementation of the outcome set.

Results: At the end of Round 1, 24 PROMs achieved consensus across the participant group (n = 40), which was further refined to 17 PROMs after Round 2 (n = 34). After Round 3, participants identified greater preference for 6 PROMs across the group to be included in the outcome set.

Following the final consensus meeting, the resulting set of recommended PROMs includes a building block structure, with a "Group A" group of six preferred PROMs (20 questions), consisting of measurement tools that focus on QoL, physical, psychological, and social wellbeing, treatment satisfaction and disclosure concerns. A set of 10 "Group B" optional PROMs could be used in addition to measure broader outcomes, depending on the specific context.

Conclusions: Achieving consensus on a recommended set of outcome measures for use across community, clinical and research settings is a novel undertaking, with the aim to unify and ensure consistency between settings in individual, program and population outcomes monitoring.

Future implementation of consensus-based tools may ensure that we can better support holistic person-led care, and evaluation of shared care models.

EPE0950

Integrating cervical cancer screening into outpatient HIV services for women living with HIV in a Malaysian Tertiary Teaching Hospital

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Background: Cervical cancer (CC) is the most common, yet preventable cancer affecting women living with HIV (WLWH). HPV self-testing was introduced in our centre in 2020. We initiated efforts to integrate HPV self-testing into outpatient HIV services from November 2021 – December 2022.


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Here, we used the Consolidated Framework for Implementation Research (CFIR) model to describe the challenges, and lessons learned thus far.

Description: A medical chart review among age-eligible WLWH in active care (2020-2021, n=171) found that although 73% of WLWH had ever had CC screening, only 12 (9.5%) had HPV DNA testing. The pre-implementation phase focused on improving the inner setting and addressed CC screening knowledge and practice gaps among healthcare providers (HCPs) in the HIV clinic and WLWH. Structural gaps in clinic were concurrently enhanced by ensuring availability of necessary equipment and posters to facilitate screening orders and referrals. Two outcomes were consistently evaluated in all phases, namely CC screening engagement and screening uptake. We periodically explored reasons for the lack of engagement and screening with WLWH and providers to inform improvements to be performed.



Figure. Cervical cancer screening engagement and uptake.

Link to image: https://drive.google.com/file/d/1itYtcS-626EnzndZEFzZa2jXY44THn_H/view?usp=sharing

Lessons learned: Tailored training to address knowledge and practice gaps and structural improvements to facilitate screening orders only marginally improved screening uptake. Constant engagement with HCP and reminders on patient cards were required to encourage discussions on CC screening between WLWH and HCPs.

The addition of a dedicated staff to assist with implementation, in a busy clinic setting allowed for a point of communication for HCPs and WLWH and improved screening engagement and uptake. Timely evaluation and understanding the reasons behind poor uptake allowed for tailoring of strategies to improve the implementation process.

Conclusions/Next steps: HPV screening uptake increased threefold in the last 1 year. Future work to address facilitators and barriers to CC screening among WLWH is needed to increase screening uptake.

EPE0951

Facilitators and barriers to the integration of substance use screening and linkage to care among people living with HIV in a tertiary care hospital in Malaysia

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Background: Substance use (SU) disorders are common among people living with HIV (PLWH) and contribute to suboptimal antiretroviral adherence and quality of life. Malaysia has punitive laws against individuals who possess and use substances which may pose challenges to the integration of SU screening in healthcare settings. This pre-implementation study aimed to explore facilitators and barriers to the integration of SU screening and linkage to mental health care into routine HIV care at a tertiary care hospital in Malaysia.

Methods: PLWH receiving care at Universiti Malaya Medical Centre, Malaysia, between June 2021-Dec 2022 were invited to participate in the study. Participants with and without history of SU were recruited. SU status was ascertained using Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) questionnaire (≥ 4 =positive). A semi-structured interview guide developed using the Consolidated Framework for Implementation Research was used to explore the facilitators and barriers to the integration of SU screening and linkage to care as part of routine HIV care. Thematic analysis was used to analyse the data using Dedoose.

Results: Twenty one individual interviews were conducted with PLWH (median age=38 years; males=19). Nine screened positive for SU and five were engaged in mental health care. Participants noted that the criminalization of SU in Malaysia will be a crucial barrier to SU screening and linkage to care. Societal, healthcare professional and self-stigma towards substance use was also raised as barrier to SU screening and linkage to care.

Readiness and motivation to change among substance users was raised as barriers to linkage to care. Participants brought up that a clear explanation on the rationale of screening and integration of the screening for all healthcare clients by the healthcare provider (HCP) prior to screening will be helpful in facilitating the uptake of the SU screening.

Conclusions: Our findings suggest that ensuring privacy and confidentiality of SU disclosure and SU stigma reduction were important strategies to facilitate the integration of SU screening into HIV care in addition to having good HCP-PLWH rapport.

**EPE0952****Identification of strategies to enhance the provision of holistic services across three community-based organizations in Seattle**

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Background: Addressing social determinants of health within HIV services may improve HIV outcomes and health equity.

Community-based organizations (CBOs) are indispensable in providing holistic support to historically underserved communities, yet strategies supporting integration remain a key knowledge gap.

In a community-academic partnership, we applied a systematic consensus-building approach to identify, prioritize, and characterize strategies supporting three CBOs' goals to enhance holistic services and address health inequities.

Methods: We applied nominal group technique (NGT) methods with each CBO to generate a list of strategies which aligned with conditions CBOs deemed necessary for successful integration (community engagement, positive work environment, data, inclusive and accessible environment, and staff learning).

Staff evaluated each strategy's perceived feasibility and effectiveness using 5-item Likert Scales (Feasibility: 1=Very hard to do with current resources to 5=Very easy; Effectiveness: 1=Large negative impact to 5=Large positive impact).

To inform implementation prioritization, we generated Go-Zone plots, i.e., scatterplots comparing strategies' feasibility and effectiveness scores divided into quadrants using the mean for each dimension.

Afterwards, we mapped strategies to thematic clusters from Expert Recommendations for Implementing Change (ERIC) and Consolidated Framework for Implementation Research (CFIR) constructs.

Results: The process generated 118 strategies with mean perceived feasibility and effectiveness scores of 3.35 (range=3.23-4.57) and 4.67 (range=4.64-5.0), respectively. Higher feasibility-higher effectiveness strategies (n=33) most commonly aligned with the following eight ERIC clusters and corresponding CBO-defined conditions in parentheses: engaging consumers (n=9; community engagement, inclusive/accessible environment), training and educating stakeholders (n=10; positive work environment, community engagement, staff learning, data), developing stakeholder interrelationships (n=6; community engagement, work environment, inclusive/accessible environment), and supporting clinicians/staff (n=5; work environment, inclusive/accessible environment).

These strategies most frequently mapped to the structural characteristics, organizational culture, staff capability, and assessment of recipient needs constructs from CFIR.

Conclusions: This community-driven implementation science approach generated strategies perceived as highly feasible and effective for enhancing holistic services and advancing health equity related to engaging communities, building positive work environments and organizational cultures (through training, developing stakeholder interrelationships, and supporting staff), and optimizing organizational structures to use data effectively and create accessible services. Strategy mapping highlights the need to test strategies that support systems-strengthening for CBOs and community engagement.

EPE0953**Healthcare provider perspectives on integrating HIV- and cancer-related service delivery in Malawi, Zimbabwe and South Africa**

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Background: In East and Southern Africa, siloed service delivery for cancer and HIV care makes provision of care difficult for clinicians and exacerbates barriers to accessing care for clients with concomitant HIV and cancer. Developing strategies to integrate HIV care in cancer treatment centers may improve service delivery and overall client outcomes.

Description: We assessed cancer care provider attitudes toward integrated care as a first step to developing strategies to link siloed care pathways. We administered a questionnaire to healthcare providers and support staff at tertiary cancer referral centres in Malawi, Zimbabwe, Uganda, and South Africa. Topics assessed included: level of concern about aspects of clinical care people with concomitant cancer and HIV, beliefs related to HIV, antiretroviral therapy (ART) and integrating HIV care delivery into cancer care, and barriers to integrating HIV service delivery into cancer treatment delivery.

Lessons learned: 195 providers participated, representing the majority of eligible staff; (87%) directly provide cancer care. Over 50% of respondents reported they were more

concerned about survival, treatment complications, co-morbidities, and drug-drug interactions in cancer clients with vs without HIV. Most agreed that knowing cancer clients' HIV status, ART status, and ART regimen would facilitate better care, should be considered in cancer care decision-making, and that coordinating HIV and cancer care would improve treatment outcomes (Figure 1).

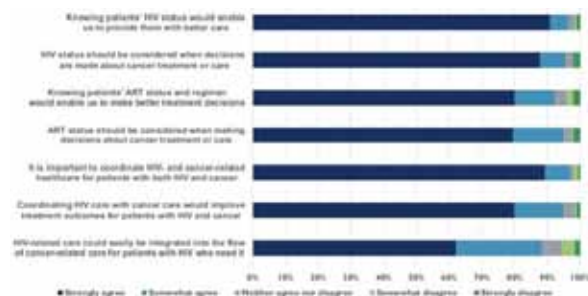


Figure 1. Cancer care provider beliefs about HIV, ART and integrated care (N=195).

Overall, respondents were optimistic that HIV-related care could be easily integrated into cancer care provision. The most-frequently endorsed barriers to integrated care were workspace limitations, disruptions to workflow, availability of staff, and cost to the hospital and to clients.

Conclusions/Next steps: Cancer care providers reported overall positive attitudes toward care integration. Additional research to elucidate service delivery pathways and contextualize barriers to integrating care are critical next steps to optimize joint HIV and cancer care delivery.

EPE0954

Integrating COVID19 professional-use diagnostics in sexual and reproductive health services: lessons learned from implementation in Zimbabwe

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Background: COVID-19 services are poorly defined in Africa. Here we consider feasibility and reach to people at risk for severe disease when COVID-19 rapid antigen tests (CV19-RDT) were added to community-based sexual and reproductive health (SRH) service platforms in Zimbabwe.

Description: Funded through Unitaids/STAR 3ACP Project, symptom screening and CV19 RDT testing were integrated from April-Dec 22, into:

- Five standalone HIV testing clinics (New Start) in Harare, Chitungwiza, Bulawayo, Gweru and Masvingo.

- 12 sex worker Clinics (Sisters) in 12 cities/towns, nationwide.

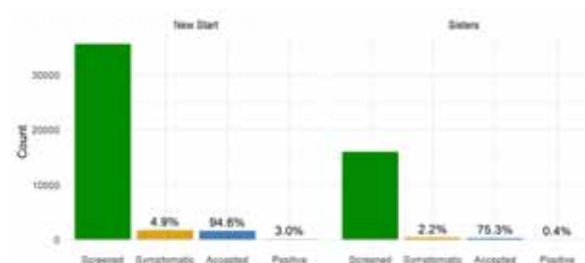
Trained clinic staff integrated symptom screening (10 COVID-19 symptoms) and testing (SURE STATUS Ag kits) within SRH clinical delivery, recording details electronically.

Lessons learned: 51,580 SRH service clients received symptom screening (Table 1), with 1917/2100 (91.3%) symptom-positive participants agreeing to test, of whom 51 (2.7%) were CV19-RDT positive. Both platforms had mostly female clients of similar age. A higher proportion of New Start participants were >50 years and reported COVID-19 symptoms. Acceptance of CV19-RDT if symptomatic was high.

Pre-existing risk factors for severe COVID-19, including HIV, were likely under-reported (< 5% New Start clients with any risk factor, data not collected within Sisters). Reported vaccination was high in Sisters (76%) which promoted vaccination, but much lower among New Start and with a high rate of missingness.

Characteristics	New Start (N= 35,579)	Sisters (N= 16,001)
Median age (IQR)	32 years old (24, 40)	32 years old (26, 38)
Age >50 years old	2,764 (7.8%)	181 (1.1%)
Female	25,197 (70.8%)	16,001 (100.0%)
Vaccinated	14,471 (40.7%)	12,149 (75.9%)
Unknown vaccination status	15,855 (44.6%)	23 (0.1%)
Symptomatic	1,740 (4.9%)	360 (2.2%)
Unknown symptom status	287 (0.8%)	2 (0.0%)

Table 1: Profile of screened participants



Conclusions/Next steps: COVID-19 testing integration in SRH services was feasible, with high participation. Identifying infectious clients contributes to infection control and surveillance, but young age and low reporting of co-morbidities limited therapeutic potential from early detection.



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**EPE0955****Inpatient navigation model to improve delivery of advanced HIV disease package for hospitalized adults with HIV in Zambia: a randomized pilot trial**

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Background: People admitted to public hospitals in Africa often experience gaps in care because inpatient health systems are complex and clinical staff are too overwhelmed with other duties to provide required support. As a result, caregivers act as support providers; however, they are often ineffective advocates due to lack of familiarity with the health system and low health literacy. We piloted an inpatient navigator model to reduce gaps in providing the advanced HIV disease (AHD) package.

Methods: Four experienced HIV community health workers (CHW) were trained as inpatient navigators at the referral hospital in Lusaka. We prospectively enrolled newly hospitalized adults living with HIV aged ≥18 years and randomized them 1:1 on whether or not they received navigators while hospitalised. Navigators counselled and oriented inpatients and caregivers to the hospital system, tracked inpatient activities, and linked patients to nearby outpatient HIV clinics for care after discharge.

Outcomes were receipt of recommended AHD services including labs, prophylaxis, and treatments based on patient files reviews, and qualitative assessment of feasibility and acceptability of the model through interviews with hospital staff, inpatients, caregivers, and navigators.

Results: From May-December 2022, 74 inpatients were enrolled; 36 were assigned navigators. Median age was 42 years, 55.4% were women, 81.9% were on ART, 53.7% had HIV-RNA <40 copies/ml, and 59.5% had AHD, with these characteristics matched between those assigned and not assigned navigators (all $P>0.05$).

During hospitalization (median 8 days) navigators met caregivers 94.3% of the time and were present at discharge/death 50% of the time. The most common navigator activities were counseling (94.4%), lab sample delivery/results tracing (91.7%), and caregiver orientation (86.1%). At discharge patient navigation was associated with increased laboratory test results, including CD4

(100% versus 74.3%, $P=0.001$), increased prescription of co-trimoxazole when CD4 was <350 cells/mm³ (47.6% versus 0%; $P=0.002$), and a trend towards increased prescription of ART (76.2% versus 50.0%; $P=0.110$). Interviews with staff revealed high acceptability and feasibility of navigators.

Conclusions: The navigator model is feasible and highly acceptable. It has the potential to improve inpatient HIV care as it helped close gaps in implementing physician orders, and communication between hospital staff and inpatients/caregivers.

EPE0956**HIV care providers' support for tobacco use cessation for people living with HIV**

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Background: Tobacco use among people living with HIV (PLHIV) compromises antiretroviral treatment and increases the risk of cardiovascular and other non-AIDS-related malignancies. Providing support to PLHIV to quit tobacco use has the potential to mitigate these risks and improve health outcomes.

We examined whether HIV care providers support tobacco cessation for PLHIV, and assessed barriers to providing tobacco cessation counseling and products.

Methods: This formative qualitative investigation was conducted as part of a larger study seeking to integrate tobacco use cessation into HIV care in western Kenya.

We conducted 22 key informant interviews with HIV care providers and managers and 4 focus group discussions ($n=28$) with PLHIV who were recruited from 20 clinics. The interviews and discussions were audio-recorded. Audio files were transcribed and translated from the local language into English, then inductively coded by three researchers and analyzed using a framework approach to describe the nature of tobacco cessation support and associated barriers.

Results: PLHIV rarely disclose or are not screened for tobacco use status unless a provider is prompted by a complaint or clinical finding. PLHIV reported that despite having the desire to receive support from providers to quit tobacco use they did not disclose their tobacco use behavior due to fear of negative reactions from their providers.

However, both providers and PLHIV were aware of the negative impact of tobacco use on HIV treatment and overall health outcomes. Providers cited several barriers

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ers to screening for and providing cessation support for PLHIV. These barriers included workload pressure, lack of job aids, tobacco use screening not included as a performance indicator, the lack of a referral system for cessation support, lack of adequate counseling skills and knowledge to address tobacco use, and finally, competing priorities from other health concerns.

Conclusions: PLHIV are not routinely screened for tobacco use status in western Kenya despite the knowledge of the negative impact of tobacco use on ARV treatment and overall health outcomes.

Providers may need to be trained and equipped with additional skills and resources in order to integrate the Kenyan national guidelines on tobacco cessation as part of routine HIV care.

EPE0957

Integrating mental health screening into HIV care: a steppingstone to holistic health in Vietnam

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Background: In Vietnam, the COVID-19 pandemic has raised awareness about the need for mental health services. Global data demonstrate the intersection of HIV, key population (KP) status, and mental health (MH), and the higher likelihood of MH issues among people living with HIV (PLHIV) and KP members, which can negatively affect their ability to seek services and adhere to treatment.

We aimed to address MH needs among clients at public HIV treatment facilities and KP-led clinics supported by the Meeting Targets and Maintaining HIV Epidemic Control (EpiC) project by integrating MH screening into routine visits.

Description: A needs assessment was conducted to determine mental health challenges and support needs among PLHIV on antiretroviral treatment and clients taking pre-exposure prophylaxis (PrEP).

Results were used to develop a training curriculum for providers on common MH disorders among PLHIV and KP members and how to recognize and screen individuals using validated tools.

Lessons learned: Health staff (44) and community lay providers (14) were trained to complete screening for MH and substance use issues in May 2022. Between June and November 2022, 16,024 PLHIV and PrEP clients in 21 clinics in five provinces were screened with the patient health questionnaire 4 (PHQ-4).

Fewer clients were identified as at risk of having MH issues (117/0.7%) than expected, with wide variation among sites (0.4% to 8.5%). Clients identified as at risk received sec-

ondary screening with other validated tools, including the patient health questionnaire 9 (PHQ-9), the generalized anxiety disorder 7 (GAD-7) and the alcohol use disorders identification test (AUDIT-C).

Among them, depression (mild: 40.2%, moderate: 33.3%, severe: 6.8%) and anxiety (mild: 38.5%, moderate: 28.2%, severe: 8.6%) were most common. Of the 117, 32 (27.4%) manifested hazardous alcohol use.

Conclusions/Next steps: Integration of MH screening into HIV prevention and care can increase identification of MH issues, and improve counseling and referral to specialized treatment.

Substantial variation in initial screening results in Vietnam and a lower-than-expected proportion of clients identified with MH issues suggest the need for tailored coaching and mentoring. Sites with part- or full-time professional MH staff may be more efficacious in screening, counseling, and referral.

EPE0958

Differentiated HIV services for key populations: the new initiatives by NGO in delivery HIV self-testing and other support services in Malaysia via the JOM TEST programme a.k.a JOM TEST 2.0

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Background: The HIV epidemic in Malaysia predominates in urban centres and among the key populations of FSW, MSM, TGW, and PWID. The DHKSP program was established in 2019 under recognition by MOH Malaysia as a national HIV program with an aim to reduce the transmission and impact of HIV among the KP in the country to scale up HIV prevention, testing, and treatment adherence services.

Part of the differentiated services under the DHKSP program is the JOM TEST Program, the first HIV Self-Testing pilot study conducted in Malaysia for 1 year from November 2020 to October 2021 for people vulnerable to HIV infection to do self-testing (using both oral fluid and blood-based) in the comfort of their home. It's a service user-centred platform, with a diverse team of highly trained and knowledgeable professionals, tailored to the community's needs.

Description: A total of 3,005 have registered in the program, up to October 31st 2021, only 2,868 participants showed their interest in the study with 1,077 having done the testing and successfully updated their results via the website. Within the study period, we have reached the MSM population reported as the most participated in the study with 77.34%, whereby the TG/Non-Binary population were reported as the least. The participants' age ranged between 20-24 and 25-29, 45% and 27% respectively, are among the highest compared to the rest.

Lessons learned: The pilot study has proven that HIVST was able to reach key populations who are hard to reach by community health workers and up to 50% of first-time



testers. Therefore, both MAC and MOH recognise the necessity to increase the choice of HIV testing modality in Malaysia through HIVST and its implementation.

Currently, both MAC and MOH are working on the Policies and Procedures of the National HIV Self-Testing Guidelines where the JOM TEST platform will be the recognise as the national HIVST platform linking to services in both public and private healthcare facilities.

Conclusions/Next steps: The JOM TEST 2.0 is the new interphase implemented with the integration of other health and support services such as Online Mental Health Screening and Chemfun Online Intervention.

EPE0959

HPV Vaccine uptake among adolescent girls 10-14years living with HIV in four counties of Baringo, Laikipia, Nakuru and Samburu -Kenya

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Background: Cervical cancer is a global killer and predominantly affects HPV unvaccinated HIV positive women more than those who are HIV negative or vaccinated. The call by WHO to eliminate cervical cancer by 2030 through targeting 90% vaccination for adolescent girls before the age of 15years continues to yield efforts. The Human Papillomavirus (HPV) vaccine has offered a great promise to reduce the cervical cancer burden among women. However, access to HPV vaccination remains sub optimal in Kenya due to lack of knowledge and perceived negative opinions in the communities.

This study aimed to investigate HPV vaccine uptake amongst adolescent girls 10-14 years within USAID Tujenge Jamii (UTJ) sites.

Methods: UTJ is USAID-funded activity collaborating with Ministry of health Kenya to implement the HIV program. The activity conducted a sensitization on HPV vaccination to health providers and adolescent champions through cervical cancer prevention literacy module.

The Adolescent champions are graduates of adherence clubs tasked with providing psychosocial support to newly identified HIV-positive adolescents and young people, providing support to members, coordinating adherence clubs, and overseeing various club activities.

There was need to accelerate HPV vaccination among adolescent girls on care. Data was then reviewed retrospectively after the intervention across the four supported counties.

Results: Before 2021, there was no data about the adolescent girls on HIV care who had received HPV vaccine. Between October 2021 to September 2022, a total of 681 adolescent girls 10-14 years were mapped and mobilized to HPV vaccination services. This resulted in HPV vaccine uptake of 67.1% (457/681) with Nakuru County at highest uptake of 73.5% (368/501), 61.8% (42/68) for Baringo County, 49.6%(41/83) for Laikipia County and 20.7% (6/29) achievement for Samburu county.

Conclusions: Awareness creation and availability of HPV vaccinations can improve uptake of HPV vaccination among adolescent girls even in resource limited settings. programs to increase HPV vaccine uptake should be tailored to effective interventions and sound practices needed to enable further reduction in the incidence of cervical cancer.

EPE0960

Prevalence and predictors of mental health illness after digital self-screening among adolescents and young adults accessing care in Nairobi, Kenya

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Background: Growing evidence indicates that around half of all adolescents and young adults living with HIV (AYALWHIV) experience mental health difficulties in Africa. Despite this, less than 1% receive routine mental health screening.

We evaluated the prevalence of mental illness and associated psycho-social determinants of mental health among AYALWHIV within an ongoing study focused on mental health self-screening within HIV clinics in Nairobi Kenya.

Methods: Between August 2022 and January 2023, we enrolled AYALWHIV aged 15-24 years accessing care from eight clinics. We excluded those who were pregnant, had not received disclosure of their HIV status and had pre-existing mental illness or acute stage 3 or 4 HIV disease. We utilized a self-administered survey tool that screened for; General anxiety disorder (GAD) using GAD7, Depressive illness using Patient health questionnaire- 9 items (PHQ9), Post-traumatic stress disorder using the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5) and substance use using Screening to Brief Intervention (S2BI).

We also collected socio-demographic data and psycho-social data. Regression analysis was used to investigate associations between psycho-social determinants and screening results.

Results: We enrolled 268 AYALWHIV; 50.0% (134) were female. The mean age was 19.2 years (S.D. 2.7) while the mean age of disclosure of HIV status was 12.2 years (S.D. 3.4). Over half, (57.1%) of participants reported that one or both parents were deceased.

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Over a third (37.7%), of participants, screened positive for at least one of the four conditions investigated while 15.7% screened positive for one mental health illness PTSD was most prevalent at 18.3%, followed by depressive illness (16.8%), substance use (14.1%), and GAD (12.7%). Suicidal ideations were reported by 39.2%.

Males were almost three times $OR=2.98$ ($p=0.008$) more likely to screen positive for substance use. Having experienced stigma was independently associated with all four mental illnesses ($OR=4.50$, $95\%CI$ (2.45, 8.26).

Conclusions: Findings suggest that mental health illness is prevalent among AYALWHIV accessing HIV services. HIV-related stigma may act as a predictor of poor mental health. Innovations such as self-screening may increase the identification of mental illness and consequent access to care among AYALWHIV.

EPE0961

Mental health morbidity among clients seeking pre-exposure prophylaxis, nonoccupational post-exposure prophylaxis, antiretroviral therapy services at two key population-led private clinics in Vietnam

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Background: Key populations (KP) and people living with HIV (PLHIV) have elevated risk of mental health (MH) morbidities which can reduce overall wellbeing and impact care-seeking. The USAID/PATH STEPS Project supports KP-led one-stop shop (OSS) private clinics to make MH care more accessible through integration within routine healthcare and HIV antiretroviral therapy (ART), nonoccupational post-exposure prophylaxis (nPEP) and pre-exposure prophylaxis (PrEP) services.

Description: All clients at two KP-clinics in Ho Chi Minh City are screened for MH using an online screening form or provider-led tools including DASS21, AUDIT-C and Functioning Suicide Risk screening, and ASSIST.

Clients exhibiting mild or moderate symptoms are offered individual counseling as part of PrEP/ART/nPEP and other OSS services. Clients with more severe MH symptoms are counseled and referred to expert psychiatric care, while continuing to receive supportive counseling at the clinics.

During PrEP/nPEP/ART follow-up visits, clients are offered MH re-screening, in-clinic counseling, psychoeducation, and assistance in developing personal action plans for managing their MH conditions. MH-focused online and offline communications are implemented to boost MH awareness and care-seeking.

Lessons learned: From December 2021–December 2022, 7,074 individuals received MH screening, of whom 14% presented with a MH condition and 94% received counseling and treatment. The most common condition was anxiety (10.2%), following by stress (6.5%) and depression (3.0%). This pattern was similar across all three client types, though PrEP users exhibited more consistent levels of anxiety and stress (6.0% and 5.9%, respectively).

MH morbidity was highest among ART users (31%), followed by nPEP (27%) and PrEP (10%) users ($p<0.001$). ART, nPEP and PrEP users were 7.6x, 6.3x and 1.8x more likely to have MH conditions than other clients, respectively ($OR = 7.6, 6.3, 1.8, p<0.001$). Only PrEP and ART users presented with moderate or severe MH symptoms, with 47%, 40%, and 23% exhibiting symptoms of depression, stress, and anxiety, respectively.

Conclusions/Next steps: We found MH morbidity to be high overall but highest among ART and nPEP users, suggesting that further integration of MH within these services is essential for strengthening quality of care. Private-sector OSS clinics play a critical role in addressing MH and underlying barriers to PrEP/nPEP/ART uptake and adherence.

EPE0962

Capacity building and advocacy for integration of SRH/HIV/GBV service provision in Uganda

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Background: The Foundation for Male Engagement Uganda (FOME) chairs the Civil Society Advocacy Coalition for Integrated SRH/HIV/GBV in Uganda. The coalition is supported by funding from United Nations Population Fund (UNFPA) Uganda country office through the AIDS Information Center (AIC).

The objective of the coalition is to build capacity and advocate for the integration of SRH/HIV/GBV into service provision and national documents like national policies, plans, programmes, and strategies.

Description: The CSO Advocacy Coalition for integrated SRH/HIV/GBV developed a strategy to engage key policy and decision-makers in the government of Uganda, to make commitments to prioritize and include issues of SRH and HIV in Ugandan documents and service provision. The coalition met with the Ministry of Gender, Labour and Social Development, the Ministry of health, and the Ministry of Education; commitments were made and documented this gave a basis to build the capacity of health workers and demand for the integration of SRH/HIV/GBV.

The coalition also engaged in building health workers' capacity in the areas of what integrations entail, various integration models, such as the kiosk model, supermarket



model, and mall model. While some Due to the advocacy efforts of our coalition, the government of Uganda organized the first National Symposium on Integrated SRH/HIV/GBV in 2021.

Lessons learned: The Civil Society Advocacy Coalition for Integrated SRH/HIV/GBV has gained a number of lessons below:

- District health officers have commended the integration of SRH/HIV/GBV and urged the government of Uganda, through the Ministry of Health, to implement the integration in all government health facilities
- On matters pertaining to the integration of SRH/HIV/GBV, the coalition is consulted by government ministries, departments, and agencies (MDAs) as well as development partners.

Conclusions/Next steps: Capacity building of health workers in integrated SRH/HIV/GBV was an effective way for them to appreciate integration and be able to serve their clients better.

Some health workers reported that providing integrated SRH/HIV/GBV services has helped them to improve their relationships with their clients. Continuous sensitisation of health workers, policy and decision makers, and beneficiaries of integrated SRH/HIV/GBV will help to end HIV in Uganda by 2030.

EPE0963

Improving health outcomes among adolescents living with HIV: comprehensive service delivery contributes to nearly universal viral suppression among ALHIV in Imphal, India

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Background: The PEPFAR orphans and vulnerable children (OVC) programme operates in 33 districts across India achieving 88% viral load suppression among 4281 adolescents living with HIV (ALHIV) as of September 2022. Achieving universal viral suppression among this vulnerable group will require additional innovative approaches that address adolescent-specific challenges and general health and wellness.

Methods: In January 2021, we launched an Adolescent Friendly Health Centre (AFHC) in Manipur, India, to provide comprehensive and inclusive care by delivering HIV, sexual and reproductive, and mental health services to ALHIV (10-17 years). Peer counsellors provide client-centred counselling and ART adherence support.

Additionally, community-based ART refill groups are offered to stable ALHIV, and virally unsuppressed ALHIV receive intense case management and ART home delivery.

Results: From January 2021-December 2022, the AFHC registered 290 ALHIV. The median age was 16 years; 51% were female, 69% had lost one parent (22% both parents) and 77% had HIV-positive caregivers. At registration, of the 284 with viral load data, 91.5% were virologically suppressed. All individuals received treatment adherence support (regardless of suppression status), adolescent health counselling and tuberculosis screening.

Additional services included nutritional support (72%), opportunistic disease management (34%), life skills courses (13%), social protection services (11%) and educational support (7%). As of December 2022, 222 (76.6%) remained active in the program. An additional 24 graduated (defined as achieving 18 years of age, 8.3%), 23 migrated (7.9%), 19 dropped out (6.5%) and 2 died (0.7%).

Among 201 who had a repeat viral load assessment, viral suppression increased from 89% to 97% ($p < 0.01$). This included 20 of 22 ALHIV (91%) who were virally unsuppressed at baseline and achieved viral suppression.

Conclusions: Peer led community-based service delivery that includes additional general health and wellness services (such as nutritional support and general life skills) in addition to HIV-related services may be critical for achieving universal HIV viral suppression in vulnerable ALHIV. With this model, we were able to achieve near 100% viral suppression rates among those retained in our program compared to 88% in our general OVC program in India. Additional efforts will be needed to support retention of all ALHIV.

EPE0964

Can self-sample collection increase uptake of HPV testing among HIV and key populations? Findings from a pilot program in Kenya

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Background: Cervical cancer is the second-leading cause of cancer incidence and leading cause of cancer deaths in Kenya. The World Health Organization has recommended human papilloma virus (HPV) testing as the primary screening method for cervical cancer. The Ministry of Health, Kenya, is assessing various approaches for HPV testing scale-up in Kenya. A HPV testing Rapid Results Initiative (RRI) was implemented to assess the feasibility of a sample referral mechanism from health facilities to central national laboratories.

We present the findings from the RRI, focusing on screening approaches and outcomes.

Methods: The RRI was implemented in two counties in Kenya in 2021-2022, targeting eligible women at HIV and key populations clinics. HPV samples were collected either by self or by a clinician. Samples were referred and analyzed at the Kenya Medical Research Institute and National

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Cancer Reference Laboratories. We compared screening statistics based on HIV status and sample collection approaches.

Results: Of 3,123 samples analyzed, 50.0% (1,280) were from HIV positive women, 24.1% (752) were of unknown HIV status. The mean age of screened women was 38.9 (S.D 8.1) years. Sixteen percent (486/3,123) were self-collected samples while the rest were clinician collected.

Uptake of self-collection was 3.6% (46/1,280) among HIV positive women, 23.9% (439/1,839) among women with negative or unknown HIV status ($p < 0.001$). HPV positivity was 28.3% (362/1,280) among HIV positive women and 22.6% (416/1,839) among women with negative/unknown HIV status ($p < 0.001$).

Invalid sample rate was 3.0% (74/2,506) among the clinician-collected samples and 2.9% (14/486) among the self-collected samples ($p = 0.906$).

Conclusions: Uptake of self-sample collection was higher among women with negative/unknown HIV status compared to HIV positive women.

We found no significant difference in sample quality between self-collected and clinician-collected HPV samples. Since self-sample collection is more acceptable among women, understanding reasons for low uptake by HIV positive women can inform future program interventions.

EPE0965

Integration and scale-up of HPV vaccination among adolescent girls living with HIV in 11 regions on the mainland of Tanzania and Zanzibar

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Background: Cervical cancer continues to kill one person every two minutes globally, mostly among girls and women in Sub-Saharan Africa. The Tanzania MOH vaccination schedule includes 2 doses of HPV vaccine for all girls aged 14, and 3 doses of HPV vaccine for all girls aged 14 living with HIV. HPV vaccine procurement is funded by GAVI; PEPFAR offers HIV care and treatment funding and technical assistance.

We demonstrate how the PEPFAR platform offers a prime opportunity to amplify the reach of HPV vaccination using lessons and insights from Tanzania as a case study.

Description: In October 2021–September 2022, HPV vaccination was integrated into comprehensive HIV care for eligible adolescent girls living with HIV (AGLV) in 11 regions in Tanzania mainland plus Zanzibar.

In collaboration with the Government of Tanzania, the integration occurred through four PEPFAR implementing partners and the U.S. Centers for Disease Control and Prevention.

Partners liaised with healthcare facility staff and local government structures to identify and reach AGLV within facility catchment areas. Facilities used government tools to track, document, and call them for vaccination.

Lessons learned: During May–September 2022, 1,649 AGLV were eligible for HPV vaccination, 1,529 (93%) of them received the first dose, 428 (28%) received the supplemental-dose and 29 (6.8%) received the second dose. The low second-dose uptake was largely due to the 6-month interval between doses. Therefore, implementation efforts focused on reaching-out to the girls through phone calls and physical tracking.

Challenges included misinformation about HPV vaccines, ART clients on multi-month dispensing requiring callbacks, difficulty in tracing girls attending boarding schools in different regions, and general lack of awareness of HPV vaccines among parents/caregivers and teachers.

Opportunities to improve uptake include expanding the age eligibility and leveraging HIV prevention programs to widen the reach.

Conclusions/Next steps: It is feasible to introduce HPV vaccination using integrated service delivery models through the PEPFAR platform. This offers equitable service provision and improved vaccine uptake by adolescent girls. PEPFAR partners are working with the Government of Tanzania on context-appropriate strategies to address challenges and leverage opportunities in the integrated delivery of HPV vaccination.

EPE0966

Assessment of readiness of health systems to decentralize HIV testing and treatment services in 5 countries of Eastern Europe and Central Asia (EECA)

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Background: Decentralization of health services is a widely debated issue. In HIV sector, decentralization is considered an essential strategy to ensure adequate response to the epidemic. EECA region is characterized with the concentrated epidemic among key populations, that face significant disparities and barriers in access to essential services. Efforts to improve policy and strategy towards adjusting service delivery modalities are essential. For these purposes we conducted the study aiming to understand the readiness of health systems to decentralize HIV testing and treatment services. To achieve the aim, we set the following objectives:



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- What health system functions influence decentralization and what are the areas for improvement;
- What external factors influence decentralization;
- What enabling and disabling factors exist that facilitate or hinder the decentralization.

Methods: The study was conducted in 2022, in 5 countries - Georgia, Armenia, Kazakhstan, Kyrgyzstan and Moldova. The study applied an analytical case study design and framework-based mix-method approach using desk review, secondary analysis of the quantitative data and in-depth-interviews.

The study used Framework-Based Coding to simplify and standardize the analysis of the data.

Results: Major findings of the analyses suggest that following factors proved to be important:

- Differentiated service delivery modalities are critical in ensuring sustained access in the process of decentralization;
- Development of health management information systems and building the links between HIV and wider health data-systems are essential;
- Introduction and development of governance and leadership structures, plays a crucial role in the decentralization.
- Development of supportive legal framework for the implementation of the decentralization is vital.

Further, external, and internal accountability, external technical assistance and political commitment are identified as major facilitators of decentralization.

Conclusions: Decentralization of HIV testing and treatment services is consensually evaluated as a required intervention, to contribute to primary public health outcomes of timely detection and expanded and improved access to HIV treatment.

Models of decentralization of treatment services may differ, countries should consider the needs of PLHIV and KP, national context, including health system environment, as well as influencing internal and external factors in selecting the optimal decentralization modality.

EPE0967

Cultural care peer support network and land-based therapies

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Background: Peer support is an evidence-informed method to support people accessing treatment and care for addictions and chronic illness, such as HIV. Incorporating culturally appropriate peer support networks into standard care delivery will improve health policies and systems for people living with HIV (PLWH).

Description: The development of a Peer Support Network in Saskatchewan, Canada, has provided access to cultural connections, traditional ceremonies, and land-based activities (medicine-picking, camping, canoeing) to assist PLWH in urban and on-reserve Indigenous communities. Peers and Elders/Knowledge Keepers guided the cultural activities and program direction.

After four land-based trips in the summer of 2022, 17 peers participated, 3 peers participated in multiple trips, and 14 peers carried on to receive Peer Support Training certification. The peer certification training was offered in December 2022 by Wellness Wheel Medical Outreach Clinic, providing peer-led self skills training on communication, respecting boundaries, managing referrals, and harm reduction practices.

Lessons learned: In sharing circles, peers spoke about the transformational impact these experiences provided for their healing journeys. Sharing peers' stories can deepen the understanding of those living with addictions, mental health challenges, systemic abuse and the ongoing impact of intergenerational trauma and colonization.

Partnerships with community leadership, health staff, and urban clinical teams provide an opportunity to impact the HIV care cascade outcomes for PLWH by supporting clients within the circle of care to navigate healthcare settings and community supports.

The Wellness Wheel Peer Support Workers report their impact working with PLWH: *"This work is so rewarding... [clients] have said that if it wasn't for me helping them, they wouldn't have anyone"*.

Conclusions/Next steps: Integration of peer support work into clinical services, with compensation and professional recognition within the standard of care, is a best practice for providing culturally appropriate care for PLWH. Peer support helps move clinical care from a disease-centric to a person-centric model, integrating social support services in standard healthcare.

EPE0968

Building Back Better Health Systems - only possible with supportive supervision and mental health resiliency trainings for frontline health workers: results from baseline survey

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Background: The frontline healthcare workforce (HCWs) is each country's greatest asset in identifying, preventing, and treating diseases of public health concern. With COVID-19, burnout of HCWs has resulted in a huge exodus widening the gap and leaving more communities vulnerable to current (HIV/AIDS) and new diseases such as Mpox and Ebola. HCW burnout can have enormous consequences on the quality of service, irreversible erosion of trust, and huge HCW shortage in health systems.

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Description: Project HOPE conducted mental health and resilience training program (MHRTTP) in 70+ countries and trained more than 70,000 HCWs using the train the trainer model. The training content was adapted from NYC Health and Hospital's The Healing, Education, Resilience, and Opportunity for NY frontline health workers (HERO-NY) curriculum for global consumption.

We took the health systems approach by identifying local mental health partners, advocating for the mental health of HCWs, translating into the local language, and conducting the training using pre- and post-assessment tools.

Lessons learned: Mental health is part of overall health was the common theme of these training to create awareness among HCWs. The scarcity of mental health services for HCWs, stigma, and lack of coping mechanisms were the common themes from the baseline survey.

Mental health staff shortage, budget for mental health, time constraints for frontline HCWs were some other barriers identified during pre-assessment.

Conclusions/Next steps: Engaging local mental health experts, adapting globally available training courses, developing wellness initiatives, and applying a sustainable approach were a few highlights of the program.

Acknowledgement of HCW burnout and its potential long-term negative consequences on themselves and their communities should be prioritized by donors such as PEPFAR.

Methods: Naïve Bayes Classifier (NBC) and Support Vector Machine (SVM) algorithms were applied to match and de-duplicate records in the link log and demographic data for SWs registered at Sisters 2017-2019 (N=40,507). The Python record linkage toolkit was applied to pre-process, index and link the demographic and link log data sets. 85% of the data was used for training the algorithms and 15% for testing and validation.

Performance evaluation and validation were done to measure the precision, recall, accuracy and F1 score (used to compare performance of two classifiers) of the algorithms.

Results: 3,240/40,507 (8%) sex workers registered had >1 registration. 1826/3240 (> 50%) of the duplicate records were in Harare followed by Bulawayo 477/3240 (>14%), both high-volume sites. Smaller sites had <100/3240 (<0.03%) to no duplicates as low volumes at these sites increase chances of being identified as a repeat client.

Of duplicate SWs, 0.7% (23/3240) had reported having visited Sisters clinic before. SW mobility contributed to duplication with SWs registering as new at different facilities.

The SVM algorithm performed better than NBC with precision of 95.5%, recall of 1, accuracy of 99.9% and an F score of 0.9778 while NBC had precision of 94.1%, an accuracy of 99.9%, recall of 1 and an F score of 0.9706.

High evaluation results of the validation process could be due to the use of deterministic approaches for the record linkage process, which is best suited for classical datasets (not much overfitting or underfitting) and the ability of the SVM to handle data non-linearity.

Conclusions: The unique identifier code is effective in minimising duplication with less than 10% duplicates in the data. Routinely implemented, the SVM model could de-duplicate key population records to improve accuracy. Future work can focus on implementing biometric authentication techniques to further strengthen de-duplication efforts.

Innovations in data collection, monitoring and evaluation

EPE0969

Deduplicating sex workers registered in the Sisters' programme (2017-2019) and assessing the effectiveness of a unique identifier code in deduplicating key populations data

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Background: Within Zimbabwe's nationally-scaled sex work programme (Sisters), sex workers (SWs) are registered on the link-log at first visit with demographic information and a newly-assigned personalised unique identifier code (UIC). No identification document is required, leading to potential duplications. We de-duplicated SWs registered between 2017-2019 and assessed UIC effectiveness in KP data-deduplication.



EPE0970

A limited number of census tracts are associated with greatest risk for MPOX transmission: implications for outbreak management

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Background: In response to the global MPOX outbreak of 2022, public health authorities focused place-based health interventions on commercial sex venues. To inform alternative strategies, we conducted an anonymous, community-led, online survey on other places where people meet for sex among queer and trans residents of New York City (NYC).

Methods: Participants were recruited through geo-targeted online ads from September to November 2022. We recorded census tract identifiers for participants' homes and for venues they had sexual or prolonged physical contact in (SVs) during the preceding four weeks. For analysis, NYC census tracts were grouped into community districts (CDs). These range in population from approximately 50,000 to 200,000.

We calculated coverage – the proportion of the study sample that could potentially be reached through two strategies: In Strategy A, CDs were ranked by number of participants who live in them. In Strategy B, CDs were ranked by number of SVs. In both strategies, a limited number of top-ranked CDs were targeted. We present estimates with bootstrap confidence intervals.

Results: The survey was completed by 1494 participants (1226 cisgender men, 67 cisgender women, 39 transgender men, 29 transgender women, 106 non-binary persons). Nearly two thirds (66%) were gay identified, and 15%, bisexual. Overall, 39% of participants reported attend-

ing 768 venues (40% private residences; 11% sex parties or dark rooms, 35% dance parties, concerts, and sports games; 14% other).

To achieve 33% coverage, Strategy A would need to be implemented in 5 (95% CI: 4 – 5) CDs, and Strategy B in 3 (2 – 3). For 66% coverage, these figures would be 14 (12 – 14) and 11 (9 – 11), respectively.

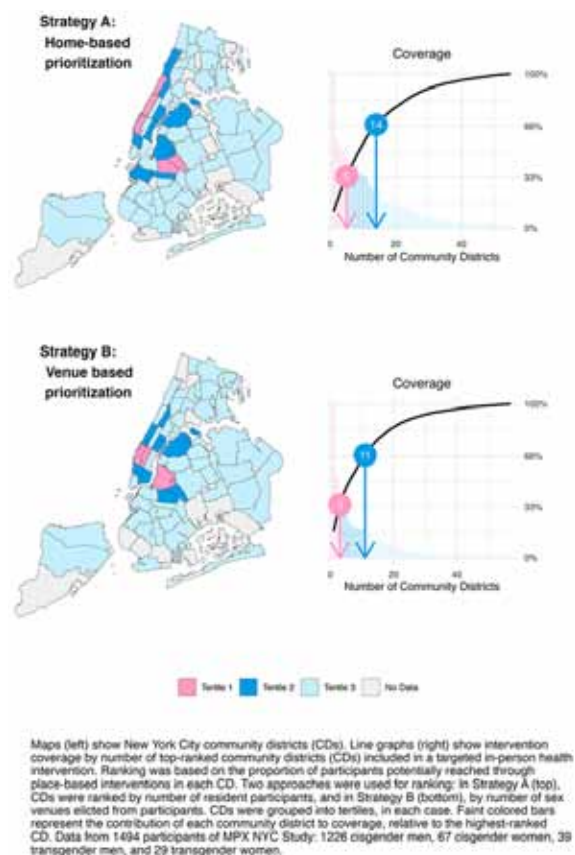


Figure. Targeted interventions in 11 community districts could reach 66% of study population.

Conclusions: Collecting spatial data on group sex is feasible. Through the use of these data, it is possible to devise venue-based intervention strategies that achieve high coverage while focusing on a limited number of CDs.

**EPE0971****Data utilization by health facility teams to inform Continuous Quality Improvement projects facilitates improved HIV program outcomes in Malawi**

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Background: Use of data to strengthen programme implementation is a critical part of the HIV response. While data can be used to inform policy and programming objectives, it is important for data to also be used at the health facility level to improve program implementation. In 2019, Partners in Hope (PIH) in Malawi developed a system where data are utilized through an iterative process between Clinical and Monitoring and Evaluation (M&E) teams at the health facility and central office level to improve program implementation.

Description: PIH is a Malawian, non-governmental organization, supporting HIV Care and Treatment at 123 health facilities across 9 districts with PEPFAR/USAID funding. Every month, facility based statistical clerks with oversight from clinical leads ensure HIV program data are collected, reviewed and submitted to the central level M&E team for further cleaning and consolidation.

Consolidated data are then re-shared back to the facility using an Excel dashboard presenting a visual overview of program results in graphical format. During monthly data review meetings, clinical leads and facility teams review performance and identify gaps through the dashboard.

In 53% of PIH facilities, Continuous Quality Improvement (CQI) projects were implemented based on priority areas for improvement. Examples of recently successful CQI projects include improving HIV status ascertainment in one large STI clinic in Mulanje district, which increased the HIV testing rate by 37% between Oct 2021 to March 2022 and improving high viral load management in one large clinic in Chikwawa district, which increased the number of follow-up viral load samples taken after adherence counseling for those with initial high viral loads by 50% from December 2021 to April 2022.

Lessons learned: Strong data management and review systems at all levels increase the ability of staff to own, interpret and improve HIV program implementation. Data dashboards can be used to identify gaps, design CQI interventions and track progress to optimize performance.

Conclusions/Next steps: Once annually, PIH teams will meet to review dashboard visualizations and indicators making recommendations for revisions to ensure data is responsive to initiatives at facility level. The CQI methodology will also be scaled-up to 100% of facilities.

EPE0972**Lessons and data insights from programmatic improvements of early infant diagnosis across CDC-supported regions in Tanzania, 2021-2022**

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Background: Early diagnosis and initiation of antiretroviral therapy (ART) is critical to reduce morbidity and mortality among children with HIV (CLHIV). As part of early infant diagnosis (EID), the World Health Organization recommends testing of HIV exposed infants at 4-6 weeks after birth and again at 9 and 18 months for those who had tested negative and continuing to breastfeed. Latest updates from 2019 national report showed that EID coverage before two months of age in Tanzania was low (58%). We aimed to describe several programmatic strategies and data use efforts to improve EID coverage in select regions of Tanzania.

Description: The U.S. Centers for Disease Control and Prevention (CDC) supported the Government of Tanzania to improve EID coverage in 11 geographic regions by:

1. Training and mentoring healthcare workers,
2. Integrating EID commodities into supply chain plans at regional levels, and;
3. Convening national and regional quarterly meetings for program and supply chain monitoring.

Additionally, CDC-supported regions started to monitor two EID indicators in fiscal year (FY) FY2021 through an innovative data use tool, CTC Analytics. The tool produces automatically generated, near-real time aggregated data.

We analyzed data from FY2021-FY2022 on 2-months and 12-months EID indicators defined as having EID samples taken within 2-months and 12-months of birth respectively.

Lessons learned: The 2-months EID coverage increased from 72% to 87%, corresponding to a reduction in the number of CLHIV unreached for 2-months EID from 7,004 to 3,854. Additionally, the proportion of CLHIV with 12-months EID coverage also increased from 92% in FY2021 to 94% in FY2022, but the absolute number of CLHIV not reached for EID within twelve months increased from 1,580 to 1,728.

This increase of absolute numbers is likely reflective of strengthening the use of individual-level data and improvements in data quality practices at the facilities.

Conclusions/Next steps: Our analysis demonstrates improvements in EID coverage within 2-months and 12-months but attribution to the implemented activities cannot be ascertained with the current data.



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Nevertheless, the enhanced strategic programmatic focus on EID, including through near real-time data use, is a promising approach to further evaluate.

EPE0973

Feasibility of an mHealth initiative integrating civil birth registration (Unique Civil Identification Number) into the Health Information System through the Pediatric HIV Care Services in Zambézia Province, Mozambique

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Background: In December 2018, Mozambique passed legislation (law no. 12/2018) allowing for electronic civil registration, and a phone-based registration system was introduced. In September 2021, Friends in Global Health, in collaboration with the Ministry of Health, Ministry of Justice, and UNICEF piloted civil registration in health facilities using mobile health (mHealth) initiative in Zambézia Province, aiming to scale up pediatric civil registration, a potential means to identify duplicated HIV care registration.

Description: In each of four pilot health facilities, caregivers of children were referred from Maternal and Child Health (PMTCT) and Pediatric HIV service entry points to trained staff who completed the child's birth record notification via a mobile phone-based registration system, after which a unique civil registration number was generated.

For children living with HIV (CLWH), this number was transcribed in the medical record and entered into the electronic tracking system.

Lessons learned: Between September 2021–November 2022, 8131 children (up to 13 years of age) arrived at the service entry points. The proportion of children registered was 75% (6095/8131); 41% (348/852) among CLWH.

Delays in registration were seen as health staff struggled to manage registrations when multi-tasking for other clinical care duties, and technical difficulties with the phone-based system (Figure).

During the pilot, 64% (224/348) of CLWH who received their registration number were entered in the electronic medical record database; the remaining were registered in a database other than those from the pilot health facilities.



Figure. Cascade of civil registration among children (0 - 13 years of age): total (a) and children with HIV (b) from 4 pilot health facilities in Mozambique between September 2021 and November 2022.

Conclusions/Next steps: Although many children were registered through this collaborative pilot, technical inconsistencies, registration delays and clear task delineation need to be addressed before expanding the strategy. Lessons learnt from this project would inform the design of mHealth systems used to improve the identification of silent transfers of individuals in HIV care.

EPE0974

Data Quality Assessment of PEPFAR Priority Indicators in Kenya conducted in November 2021

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Background: KASFI premised on the Constitution of Kenya stipulates the right to highest attainable standard of health to its citizens. Monitoring and evaluation of interventions is critical to demonstrate the effectiveness of HIV programs backed by data. The 2021 DQA established levels of improvement achieved by previous DQAs and utilization of the revised M&E tools.


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Methods: January to March 2021 was the review period. Facilities sampled were 303. Indicators were selected across the HIV cascade. Data was collected using the e-DQA tool. The DQA exercise was conducted by 21 teams in 10 days. Participants signed confidentiality agreements and no demographic data was collected.

The objectives were: Establish quality of data reported nationally, identify discrepancies between numbers re-counted and reported and validate site level data aggregation and reporting process.

Results: Majority, 251 (90%) facilities staff were trained on revised M&E tools. Of the 278 facilities 69 (25%) paper-based, 43(15%) electronic; and 151 (54%) both paper and electronic systems. Many 242 (87%) facilities had data quality assurance SOPs and 258 (92%) validate data before submitting reports. Numerous, 262 (94%) facilities understand reporting guidelines on the reportable indicators, reporting deadlines, and report submission. Client files abstracted scored more than 95% data concordance shown in the table below:

Indicator	Registers	MOH 731	KHIS	DATIM
PMTCT_ART	2,926	97%	101%	95%
PMTCT_HEI_POS	2,885	102%	95%	98%
TX_NEW	5,771	5,731	6,690	6,264
TX_CURR	342,861	318,140	343,058	343,176

Conclusions: The HIV service delivery data is high quality. HIV medical records were in good order and filed appropriately. The files were easily retrievable and required information available. Staff were knowledgeable, helpful, and are reporting accurately and maintaining coherent records. Number of clients tested for HIV, most health facilities had good concordance of 90% to 110% for MOH 731 and KHIS. Facilities that underreported did not add number of clients tested in PMTCT and outreaches. Most facilities, 97%, 95% and 92 % reported availability and use of the revised M&E tools. NASCOP to emphasize real-time updating of all M&E tools to improve documentation.

EPE0975

Improving HIV viral load results turnaround time in Burundi with Ibipimo, an innovative, locally-developed, and interoperable electronic data platform

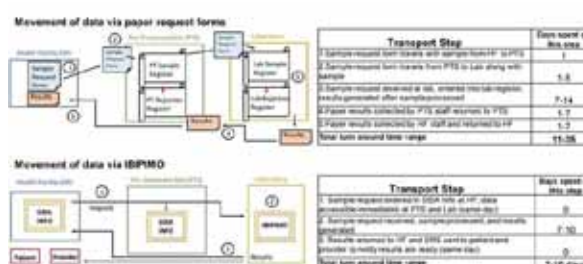
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Background: Burundi has experienced challenges implementing a data system that provides visibility into the operation of the viral load (VL) cascade. Collection and storage of supply chain, patient management, and laboratory data has been fragmented across disconnected electronic platforms, limiting programmatic analyses, data-driven decisions to optimize clinical management, and identification of programmatic issues associated with VL scale-up.

Additionally, lack of interoperable systems leads to high turnaround time (TAT) of VL test results due to time spent manually entering data and hand-delivering paper-based forms.

Description: Ibipimo is a web-based laboratory data platform developed and managed by USAID implementing partners to improve the VL cascade in Burundi. It is active in all labs and covers 156 health facilities (HF) representing ~73% of patients on ART. Ibipimo is integrated with two national systems, DHIS2 (population health database) and SIDAInfo (electronic patient management system). HFs use Ibipimo to request VL tests electronically, reducing data entry time. Ibipimo tracks sample movement between HF, pre-treatment site, and laboratory, enabling immediate results return to HF and patient/provider SMS notification of available results.



Lessons learned: A TAT analysis of HFs using paper request forms revealed that time from VL sample leaving HF to results returned to HF ranged from 11-35 days (Figure 1), of which manual documentation of requisition



and results at the laboratory was a major contributor, ranging from 7-14 days. A comparative assessment of HFs connected to Ibipimo found that TAT decreased to 7-10 days.

Conclusions/Next steps: Ibipimo is a locally-developed solution that has been associated with decreased VL samples and results TAT, allowing stakeholders timely access to decision-making information.

The next phase of Ibipimo implementation will include:

1. Expanding access to Ibipimo at all HFs,
2. Connecting Ibipimo to supply chain data systems, and
3. Connecting Ibipimo to point of care platforms for early infant diagnosis of HIV.

EPE0976

Social impacts of multi-city HIV prevention research participation among sexual and gender expansive individuals in Kazakhstan

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Background: Sexual and gender expansive (SGE) individuals in Kazakhstan are disproportionately affected by HIV while stigma and discrimination pose ethical and practical challenges for research needed to develop locally safe and effective HIV prevention approaches.

Although researchers are tasked with ensuring that risks of research participation are reasonable in relation to benefits, research risks and benefits—including negative (NSIs) and positive social impacts (PSIs) on personal relationships, social status, health, and other aspects of life—among SGE populations has not received substantial attention.

We examined NSIs and PSIs of HIV prevention research participation among SGE individuals in Kazakhstan.

Methods: SGE individuals from Almaty, Astana, and Shymkent were recruited into a U.S. National Institute on Drug Abuse-funded HIV prevention trial [NCT02786615]. Using a previously published social impact questionnaire, we assessed PSIs and NSIs at follow-up visits.

Here we analyzed responses from 579 individuals who completed a total of 2648 follow-up visits over the 36-month study period (February 2019–February 2022).

Results: PSIs and NSIs are plotted in a raster format (Figure 1). NSIs were rarely endorsed, with 9 (2%) participants reporting at least one NSI during the study. NSIs included 'trouble with friends, family, or acquaintances' (1%) and

'other' (1%). By contrast, PSIs were endorsed extensively, with 515 (89%) participants reporting at least one PSI during the study. The most endorsed PSIs were 'gained knowledge' (87%), 'improvement in HIV-related issues' (86%), and 'improvement in life' (80%).

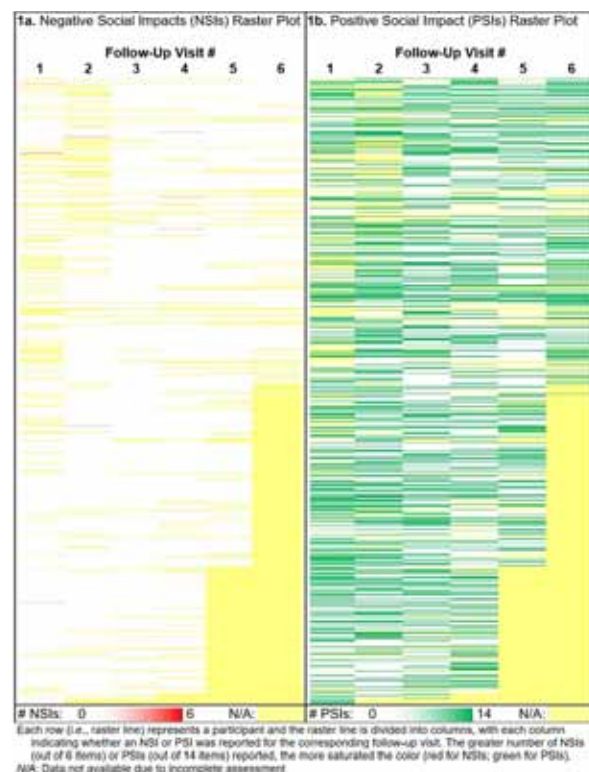


Figure 1. Raster plots of negative and positive social impacts of HIV prevention trial participation among SGE individuals in Kazakhstan (N=2648 follow-up interviews).

Conclusions: Our findings demonstrate the potential for HIV prevention research to promote PSIs for SGE individuals experiencing stigmatization and discrimination.

In addition, continued assessment of social impacts is warranted to help researchers identify specific steps/procedures that are likely to minimize NSIs and foster PSIs. Finally, future research should address NSIs, particularly interpersonal challenges among network members, within HIV prevention research so as to minimize risks and burdens of participation.

**EPE0977**

Using Prevention Self-Assessment Tool (PSAT) to develop action plans and optimise technical assistance for key populations programmes: the case of South to South Learning Network in Kenya

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Background: In 2020, Kenya joined the South-South Learning Network (SSLN), an initiative of the Global Prevention Coalition (GPC), whose aim was to promote peer-to-peer learning and sharing of information on HIV prevention among 15 African countries. Despite ongoing efforts to control the HIV epidemic, Kenya still faced challenges in identifying programmatic gaps, developing action plans, and determining technical assistance (TA) needs for key populations, such as female sex workers (29%), people who inject drugs (18%), and men who have sex with men (18%), who continued to account for high HIV prevalence. This paper focuses on how Kenya used the UNAIDS-recommended Prevention Self-Assessment Tools (PSATs) to address these challenges and improve collaboration, action planning, and technical assistance (TA) for programs targeting key populations.

Description: After joining the South-South Learning Network (SSLN) in 2020, Kenya nominated Country Champions representing various constituencies including donors, implementers, government, National AIDS Commission (NAC), development partners, civil society organisations, community based organisations, and community networks. These champions, along with the Key Populations (KP) Technical Working Group (TWG), used the UNAIDS-recommended Prevention Self-Assessment Tools (PSATs) to self-evaluate the KP programme looking at programme management, programme implementation, and programme outcomes. The country team assessed each element of the program through a consultative process and identified gaps in areas such as budgeting, integration of sexual health services, addressing mental health needs, budget monitoring, and legal reform for action planning. Later the South to South Learning Network facilitated a discussion with the country based on the PSAT findings to further refine the gaps identified.

Lessons learned: The PSAT process was successful in promoting ownership of the national HIV prevention programme through co-development of a learning agenda, country action plans, and technical assistance plan. Nominating champions across all constituencies also led to a more collaborative and engaging experience in shaping the HIV prevention agenda. Additionally, through participating in the learning events organised by SSLN, Kenya leveraged this opportunity to learn and share promising best practices in KP programming.

Conclusions/Next steps: Kenya is now embarking on conducting a second round of self-assessment using the PSAT to compare progress made since 2020 and prioritise further programme improvement and TA areas.

EPE0978

Client cohorting, community outreach, and on-site sample preparation increase HIV viral load coverage in Western Zimbabwe, 2022

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Background: Adult and pediatric viral load (VL) coverage in Chegutu, Kadoma, and Mhondoro districts of Mashonaland West province in Zimbabwe ranged from 80.2% to 87.8%, below the PEPFAR program target of 95% within 3 months. Contributing factors include limited reminder systems for routine VL and long turn-around times (up to 3 months). In June and July of 2022 Zimbabwe Ministry of Health and Child Care (MOHCC) Quality Improvement Unit implemented pragmatic interventions to better identify clients needing annual VL, efficiently collect and process specimens, and improve documentation of results in these three districts.

Description: VL interventions in the three districts included:

1. Reviewing and organizing clients' charts by cohorts using month of antiretroviral therapy initiation;
2. Flagging clients without current VL results using designated stickers;
3. Increasing proactive contacting of clients to attend VL collection in collaboration with community health workers; and
4. Using mobile laboratory equipment to collect and prepare both plasma and DBS samples on-site prior to transporting and processing at central laboratories.

Clients could choose between sample collection at facility or during community outreach closer to their homes, including as part of differentiated service delivery models, such as community and family ART refill groups.

Lessons learned: On-site sample processing increased number of samples suitable for VL testing at central laboratories. Turn-around time between laboratory and facility decreased from an average of 90 days to 1 day. The availability of dedicated VL mobile phones at facility level improved turn-around time. Overall, after 2 months implementation the proportion of clients with a current VL increased by 5% - 16% across the three districts, resulting in each district achieving coverage within reach of the 95% target (Table 1).



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	Q2, 2022	Q4, 2022	
District	Baseline	Achievement	% Improvement
Mhondoro	80.2%	96.7%	16.5%
Sanyati	87.8%	93%	5.2%
Chegutu	81.1%	92%	10.9%

Table 1: Comparison of Viral Load Coverage in Three Districts in Western Zimbabwe Before and After Implementing, Client Cohorting, Community Outreach, and On-site Sample Preparation, 2022.

Conclusions/Next steps: An intensive two-month effort reorganizing existing program resources improved VL coverage and resulted in more timely feedback on viral suppression. Augmenting routine quality improvement efforts with periodic catch-up campaigns increases program performance.

EPE0979

Community perspectives on mapping and size estimation of key population in virtual space

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Background: With the advent of affordable smartphones and internet, key population (KP) groups are increasingly using the virtual space for accessing clients and partners. It is important to identify, map and estimate their numbers for planning to reach out to them with HIV/AIDS services. Getting their perspectives on the nature and extent of use of digital technology would help in developing appropriate methods of mapping and size estimation of KPs in virtual space.

Methods: This exercise was aimed at listening to the community of female sex workers (FSWs), men who have sex with men (MSM) and transgender on how they operated in the virtual space and determine how to map and estimate their number. Community consultations were conducted in sub-urban Mumbai through one-on-one interactions (among 45 members) and small-group discussions (15 members in each group).

Results: Mobile phones and WhatsApp were extensively used by FSWs for soliciting customers and sharing photographs. A large proportion of MSM used virtual space exclusively, while some continued to frequent cruising sites like toilets, local trains, and truck halt points for accessing clients and partners.

It was evident that the Covid pandemic accentuated the use of mobile phones, dating apps and other social networking apps. Most MSM preferred to use the Grinder App to search for partners who were available within a short distance and could be reached quickly.

On the other hand, transgender used "Blued" dating app, followed by Planet Romeo and Grinder in that order. With increased use of virtual space, MSM and transgender had

moved from having sex in open and desolate places to the privacy of lodges, hotels, and homes. MSM recommended that researchers could log on to different dating apps at different geographical locations and times to know the number of active users for further estimation of numbers.

Conclusions: Community listening exercise was very useful in identifying factors that need to be considered in mapping and size estimation of KPs in virtual space, including which dating apps to include, multiple usage behavior (multiple apps, virtual vis-à-vis physical sites), the possibility of conducting interviews in physical settings, urban and rural divide in virtual presence, etc.

EPE0980

Deploying eHealth to facilitate community verbal autopsy for HIV mortality surveillance: lessons from Nigeria

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Background: Most developing countries do not have comprehensive systems to collect and report mortality events. World Health Organization in 2012 recommended verbal autopsy (VA) as a reliable alternative method for ascertaining causes of death (COD) in countries with inefficient national civil registration and vital statistics system.

We describe Nigeria's experience in deploying an integrated data management system comprising the electronic medical record (EMR), National Data Repository (NDR), Open Data Kit (ODK) suite and other communications technologies like Zoom, and electronic messaging to implement mortality surveillance (MS) of persons living with HIV.

Country-level multistakeholder collaboration led by the HIV Division of Nigeria's Federal Ministry of Health integrated HIV MS into existing HIV eHealth system.

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Description: HIV MS was rolled out in three phases from August 2021 –September 2022: planning, personnel training, and site assessment/activation. Clients reported dead through routine programme from participating facilities EMR on the NDR were enlisted for VA if the death occurred less than six months ago.

Upon death notification, the community tracker contacted persons familiar with the deceased to administer the 2016 WHO VA tool (using ODK) physically or virtually (via Zoom, Skype, Microsoft Teams with consent forms shared, signed, and returned electronically). The VA data are analyzed using SmartVA-Analyze to generate the COD based on the International Classification of Diseases Standards (Version 10).

Lessons learned: HIV MS has been activated in 168 facilities across 18 states, and 2,081 VAs were conducted as of September 2022. The roll-out of community VA was possible due to the government's leadership and use of technology. VA is easily accessible to deceased PLHIV relatives/caregivers through eHealth system overcoming physical barriers like distance and hard-to-reach areas.

Although the eHealth technologies are only compatible with digitally literate interviewers who administer the tool, they are easy to use and should be tested before adoption. Data from VA is used to identify the leading COD among PLHIV, to formulate preventive interventions, and to influence policies.

Conclusions/Next steps: Nigeria embraced technology to roll-out VA and the next steps include scale-up of VA data collection in all treatment facilities across 36 states of Nigeria.

Methods: We pulled relevant variables for all 1.9M clients on ART in Nigeria as of October 2022 from the National Data Repository (NDR). This includes the state and Local Government Area (LGA) of the treatment facilities and the state and LGA of residence. We used the 2022 SPECTRUM PLHIV estimate as the denominator of the treatment coverage calculation by state. We compared the number persons on treatment by the 2 different methodologies to assess treatment coverage by LGA of facility and LGA of residence.

Results: 72,198 (3.8%) of 1,905,399 persons reside outside the state where they receive treatment. The difference in ART coverage by state of the treatment facility and residence range from 0.0% in Akwa-Ibom state to 18.9% in FCT and 28.7% in Yobe state. ART facilities are located in 593 (76.6%, n = 774) LGAs while persons on ART reside in 768 (99.2%) LGAs. The percent difference in the number of persons on ART by LGA of treatment facility and LGA of residence range from 0.0% in Ngala LGA of Borno state to 45500% in Faskari in Katsina state.

Conclusions: Accurate determination of HIV treatment coverage and coverage gap at subnational levels is critical to correct monitoring of UNAIDS 95:95:95 goals. Variations exist between the number on treatment based on location of treatment facility compared to number on treatment based on place of residence. HIV prevalence from NAHS was determined with households (residence) as primary sampling unit, thus public health programs should consider the determination of treatment coverage using clients' residence instead of location of facility where client is receiving treatment.

EPE0981

Comparative analysis of ART coverage by place of residence and place of treatment

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Background: Nigeria conducted a Population-based HIV Impact Assessment (PHIA) survey (NAHS) in 2018. Subsequent annual estimates of PLHIV have been determined using the UNAIDS SPECTRUM software. Treatment coverage is determined by comparing the number of persons on treatment with the number of estimated HIV burden in the area.

We compared treatment, coverage calculated using number on ART by location of residence of ART clients, with the traditional method of using the number on ART in treatment facilities in the geographic area to see if there is any variance in the data.

EPE0982

Prediction of disengagement from HIV care using routinely collected medical record data and machine learning

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Background: A proactive approach to identifying and supporting People Living with HIV (PLHIV) at risk of disengaging from HIV care, HIV viremia, medication non-adherence, or future mortality could be a powerful tool to realize the full potential of treatment as prevention and achieve '95-95-95' goals. Utilizing routinely collected electronic medical record (EMR) data from two regions in Lake Zone, Tanzania, we developed a predictive machine learning algorithm to identify in-care PLHIV who may be at future risk for poor treatment outcomes.



Methods: The longitudinal dataset spanned January 2018–October 2021, included data from 383 facilities, and had 3,151,817 unique visits from 218,316 PLHIV. Model formulation: We quantified individual outcomes by generating a proportional disengagement outcome, defined as experiencing high viral load (>1000uLmL), medication adherence (according to number of pills dispensed and attendance to next scheduled clinic visits), and/or death. Data were partitioned into 8 six-month batch periods, with each participant contributing one summary observation per batch.

Model verification: The final batch (June 2021–October 2021) was used for assessing model performance. Static sociodemographic features were included, alongside dynamic variables like change in weight, WHO clinical stage, and pregnancy, which were regressed against time with coefficients used as functional variables for each batch. Bagged regression trees, sampling on participant IDs, were conducted for 1,000 bootstrap samples.

Results: The final model used seven static variables and nine dynamic variables. The model achieved an AUC of 0.863, with a 85.56% sensitivity and 74.70% specificity for prediction at the optimal threshold, overperforming industry-standard mixed-effects model.

Relative variable importance, measured via sum of goodness of split for variables as primary or surrogate splits, listed time since initiating antiretroviral therapy, age, and change in weight as the most important variables for prediction.

Conclusions: These findings demonstrate the feasibility of proactively utilizing routinely collected EMR “big data” to identify in-care PLHIV at-risk for future poor outcomes. This approach respects computational constraints of practitioners and researchers, offers model interpretability, and permits practitioners to make routine predictions.

We present a promising solution to harness routine data to reasonably target constrained resources towards PLHIV with higher disengagement.

EPE0983

Identifying efficiency estimates and associated factors for HIV testing, treatment, and viral load suppression programs in 25 PEPFAR-supported countries, 2016–2021

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Background: As the global community strives to reach the UNAIDS 95–95–95 goals and realize health equity in a resource-constrained environment, every dollar must count. We identified efficiency estimates of HIV programs supported by the U.S. President’s Emergency Plan for AIDS

Relief (PEPFAR) at the country- and implementing partner-levels, as an innovative approach to assessing productivity and accountability.

Methods: Using stochastic frontier analysis, we estimated efficiencies or ideal outputs given a set of inputs, while allowing for technical inefficiency; outputs constituted data on the number of beneficiaries reached, while inputs included implementing partner expenditures for HIV testing, treatment and viral load suppression (VLS) measures from 25 PEPFAR-supported countries from 2016 to 2021.

We conducted time-series regression analyses to estimate the factors associated with efficiency, after controlling for differences in country contexts, potential shocks from the COVID-19 pandemic, and other potential confounders.

Results: Between 2016 and 2021, PEPFAR-supported programs significantly decreased in efficiency at identifying individuals newly tested positive for HIV (73.0% to 56.8%, p-value<0.001), but also demonstrated improved efficiency for ensuring that people living with HIV (PLHIV) start and remain on treatment (65.5% to 76.2%, p-value<0.001) and ensuring PLHIV reach VLS (45.8% to 87.6%, p-value<0.001). Regression analyses revealed that PEPFAR-supported programs with a larger share of index HIV testing were more efficient at maintaining treatment cohort growth and supporting clients to reach VLS. Partners providing both testing and treatment were more efficient at HIV case finding.

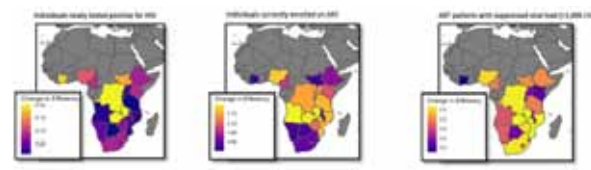


Figure 1. Change in estimates of efficiency for newly identifying PLHIV, treatment cohort growth and reaching viral load suppression for 25 PEPFAR-supported country programs*, 2016 to 2021.

Conclusions: Efficiencies gained in maintaining treatment cohort growth and VLS over time could suggest responsive HIV programs and improved financial stewardship; decreased efficiencies in case finding could suggest more resources are needed to find individuals. As this is the first known study of this kind, further research is needed to establish baselines and assess efficiency.

**EPE0984****Machine learning for identifying treatment interruption among people living with HIV in Nigeria: challenges and lessons**

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Background: HIV programs continue to report high rates of interruption in treatment (IIT) among clients receiving antiretroviral therapy (ART), and there is no systematic way of identifying those at risk of IIT. Interventions for re-engaging people who have interrupted treatment are reactive and expensive.

The objective was to develop a machine learning (ML) model to identify clients at risk of IIT among people newly enrolled on ART; integrate the model into the routine information system; and ascertain health worker perceptions and use of the model's output for case management.

Methods: Program data collected from January 2005 through February 2021 was used to identify characteristics associated with IIT and develop a ML model using boosting tree and extreme gradient boosting to identify individuals at risk of IIT among PLHIV receiving ART in Nigeria. Individuals were defined as IIT if they did not return for a refill within 28 days of their scheduled follow-up visit date.

The model was applied to all new individuals enrolled on ART from July to August 2022. Output was shared weekly with health care workers at selected facilities.

Results: After cleaning, complete data for 136,747 clients were available for analysis. The percentage of IIT cases decreased from 58.6% before 2017 to 14.2% during October 2019 through February 2021. Rates of IIT were higher among clients who were sicker at enrollment.

Several models were initially developed; the selected model (positive predictive value: 79.1%; sensitivity: 76.3%; and specificity: 94.4%) was successfully integrated into the national electronic medical records database. Variables significantly associated with IIT rates were pregnancy, breastfeeding, and facility characteristics (location, service level, and service type).

During field testing, the majority of users provided positive feedback on the model's ability to identify high-risk individuals early, but in this limited testing time some had mixed views regarding the usefulness and application of ML.

Conclusions: Despite initial challenges, we successfully developed and deployed a ML model into Nigeria's routine HIV/AIDS information system. There was a high level of acceptance of the ML model among staff but continued training is needed to ensure all health care workers understand the benefits.

EPE0985**Applying machine learning methods to improve quality of HIV people monitoring data in Vietnam**

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Background: In 2022, Vietnam started building the individual-based national HIV case surveillance (CS) system, which brings together data from multiple sources to monitor people living with HIV from HIV diagnosis until death. A key issue for the national HIV CS system is duplicated people records which are reported from different systems. To resolve this issue, we applied deterministic and probabilistic algorithms to match and deduplicate HIV people records in the national HIV CS system.

We evaluated the potential algorithm by comparing performances suggested deterministic and probabilistic algorithms the potential algorithm by comparing performances among suggested deterministic and probabilistic algorithms.

Description: First, we standardized people's identity data to overcome mismatch values across the different historic treatment data sources used to monitor HIV people in different treatment facilities. Fixed-term terminologies were mapped with standardized data dictionaries, and free text values were checked for spelling errors.

Then, we used a deterministic algorithm based on the "pattern matching characters" technique to classify people records into three categories: unique, suspected, and confirmed duplicates.

We also used the "Fellegi-Sunter" probabilistic algorithm to match and deduplicate people records.

Lessons learned: Among 100,000 raw records of people, major errors included missing values (e.g., the national identity card number) and spelling errors (e.g., double vowels, missing consonants, or an incorrect number of characters). The deterministic algorithm returned an accuracy range of 80-90% based on users' verification of the actual data.

The probabilistic algorithm returned a higher accuracy rate of 94-99% in the testing environment, where we used mock-up data with similar characteristics to actual data. The probabilistic algorithm is currently being deployed with actual data; thus, its accuracy rate is not yet known.

Conclusions/Next steps: Our work provides a reliable foundation for the management of HIV/AIDS data. While both deterministic and probabilistic methods returned good results, the probabilistic algorithm proved to be a more promising technique in the testing environment. Next step, we plan to apply the probabilistic method to actual data from the Vietnam.



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EPE0986

Using electronic tools for optimization of data management within the determined, resilient, empowered, AIDS free, mentored and safe program in Matabeleland South, Midlands, and Mashonaland Central Provinces of Zimbabwe, 2022

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Background: The HIV response is dynamic and new innovations are sought to mitigate and control the pandemic and optimise interventions. The Zimbabwe Health Interventions' Determined, Resilient, Empowered, AIDS free, Mentored and Safe program generates substantial routine and non-routine, aggregate and client-level data. In addition to routine program data, the program conducts operations research and deep dives, and data were traditionally collected using paper tools which was inefficient, prone to errors and expensive for the program. The program adopted KOBO toolbox as the digital tool for electronic data collection. We introduced KOBO toolbox in January 2022 to facilitate automated data collection, analysis, and visualization

Description: Kobo collect is an open-source tool for mobile data collection in humanitarian emergencies and other challenging field environments. We used KOBO for data collection for the labour market assessment, Gender Equality and Social Inclusion (GESI) analysis, sentinel site survey and the Site Improvement through Monitoring Systems (SIMS). Data were collected and shared daily, and every subunit could review their performance and outcomes. The national and regional teams were able to track data collection and visualise outputs of data aggregated daily

Lessons learned: Kobo collect significantly reduced the time spent and cost of printing data collection tools. Using KOBO made USD3.3 cents per page savings and took 2.5 times less Turnaround Time for data collection having removed procurement and data entry time.(eg 3000 by 12-page questionnaires at \$1 for 30 is \$1200, and procurement turnaround time (TAT) takes a minimum of 4 weeks) (Collecting non-routine data for rapid assessments and operations research took an average of 10 weeks, ie 4 weeks for tools procurement plus 4 weeks manual data collection and 2 weeks for data entry compared to just 4 weeks when using KOBO). It enabled the teams to review collected data in real time thereby facilitating real time correction of any errors and programmatic decision making. It also reduced transcription errors associated with paper-based data collection and capturing.

Conclusions/Next steps: KOBO greatly improved data collection, analysis, visualisation, and the turnaround time for operations research, deep dives, and evaluations. This has facilitated expedited generation of data for near real time decision making for continuous program

EPE0987

The value of measuring outcomes of HIV advocacy: utilising a novel and participatory approach for advocacy evaluation

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Background: Informed civil society activism and advocacy have driven change throughout the HIV epidemic, and remains essential now for a sustainable, comprehensive epidemic response. The Coalition to build Momentum, Power, Activism, Strategy & Solidarity in Africa (COMPASS), is an innovative, data-informed and audacious North-South collaboration of civil society organizations working in the global North and in East and Southern Africa; to advocate for truly comprehensive, effective programs that lead to epidemic control.

It can however, be difficult for advocates as well as funders and partners, to demonstrate how their efforts contribute to real, but incremental impact on the HIV response; largely due to a lack of tools to assess the impact of HIV advocacy.

Description: Within the Monitoring, Evaluation, Results and Learning hub under COMPASS, Pangaea Zimbabwe AIDS Trust (PZAT) and AVAC developed the COMPASS Campaign Outcomes Assessment Tool (C-CAAT) which recognizes the unique and collaborative characteristics of advocacy; and enables civil society advocates to track processes, outcomes, and improve impact.

Since 2019, COMPASS partners have utilized the tool on a bi-annual basis to identify the key outcomes and setbacks of their HIV advocacy through consultation and group discussion amongst individuals working on the same campaign. Using guiding questions in the C-CAAT, group members conduct self-assessments towards set advocacy goals. This is followed by rating the significance, influence, and durability of the outcomes; and to substantiate each rating with an explanation.

The information generated from using the C-CAAT on COMPASS has fed into semi-annual reporting; and promoted learning, and refinement of advocacy strategies; leading to improved health outcomes, programs and funding for HIV.

Lessons learned: The use of standardised tools like the C-CAAT enables simplified evaluation of advocacy efforts, and data use to improve impact and demonstrate value to stakeholders and funders. Describing advocacy, activism, impact, and wins requires a common language for evaluating accomplishments.



Conclusions/Next steps: It is important to monitor HIV advocacy using simple tools. The C-CAAT enabled advocates to substantiate the impact of advocacy in the field of HIV.

The sustainability of the advocacy network in sub-Saharan Africa depends on civil society capacity to achieve, measure and effectively showcase their results.

EPE0988

HIV Info 4.0: Initial results of the implementation of a national HIV case surveillance system in Vietnam

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Background: Vietnam has a complex ecosystem of digital health tools used to support the HIV epidemic and program monitoring. This report provides initial results of the implementation of an interoperable HIV case surveillance system with individual-level data and a centralized database, namely HIV INFO 4.0.

This system automates data analysis and visualization with the goal of assisting in the identification of HIV active transmission clusters or gaps in implementation strategies to inform rapid response and, potentially, monitor progress toward the Joint United Nations Program on HIV/AIDS' 95-95-95 targets.

Description: The HIV INFO 4.0 system, which was upgraded from a case reporting system, includes six modules used by health workers from commune to national level to transfer and manage HIV data. This is interoperable with other electronic HIV testing and treatment information systems to monitor a person from HIV diagnosis until death, including key sentinel events, such as recency testing results, treatment initiation and continuity, regimen changes, viral load and CD4 test results, diagnosis and treatment of tuberculosis, hepatitis B and C, and death. Since April 2022, using a decentralized approach, the national level government held trainings and provided technical assistance to provincial centers for disease control (CDCs).

Then, provincial CDCs organized trainings and provided technical assistance to health workers within their provinces to implement HIV INFO 4.0 nationwide.

Lessons learned: By December 2022, because of the decentralized approach, the leadership of the Government of Vietnam, and the partnership between government and non-government organizations, HIV INFO 4.0 has been deployed in 63/63 provinces (100%), 546/705 districts (77%), 4,716/10,599 communes (45%), 658/1,125 HIV testing and counseling sites (58%), and 134/208 confirmatory labs (65%).

The system currently includes 367,402 HIV cumulative cases nationwide with 22,600 suspected duplicates which are being verified. The interoperability with the two treatment systems successfully connected treatment data of 84,600 HIV INFO 4.0 cases. The result is the HIV INFO 4.0 is the largest national centralized HIV database in Vietnam.

Conclusions/Next steps: HIV INFO 4.0 has been quickly deployed, continues to be expanded in Vietnam, and interoperates with key treatment systems. Next steps include establishing interoperability with more systems and verifying potentially linked records.

EPE0989

Streamlining data needs in PEPFAR: a DREAMS example from Zimbabwe

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Background: Zimbabwe's DREAMS program uses PEPFAR's standard eligibility criteria to screen adolescent girls and young women (AGYW) 10-24 and refer those that are eligible for enrollment. Data from 448,952 screening events over two years reflected eligibility rates consistently exceeding 95% across the three DREAMS age bands, 16 districts, nine screening partners, and three entry points.

However, screening and data entry are costly, requiring at least 25 full time equivalent positions each year. They also incur a psychological cost to AGYW, who are asked sensitive personal questions at first contact with partners.

Screening also incurs opportunity costs for health facility staff, who must balance screening and service delivery. Here we examine whether screening improves recruitment of eligible AGYW.

Methods: We conducted a pilot in five districts. Partners stopped screening AGYW, referred all age-eligible AGYW who have not already been in DREAMS for enrollment, and monitored eligibility using data collected at enrollment. We compared eligibility rates before and after the pilot in pilot and control districts.

Results: Analysis of preliminary quarter 1 data demonstrates no significant change in eligibility rates either before or after the pilot, or between pilot and control districts after the pilot.

In pilot districts, eligibility changed no more than 1 percent compared to baseline rates. The difference in eligibility in the pilot and control districts was also only 1 percent. Eligibility rates remained similar across age bands, with a 1 percent difference between the pilot and control districts in the critical 10 to 19 ages. The screening and data entry process is estimated to take between 12 and 18 minutes per AGYW.

Assuming 12 minutes per AGYW, eliminating screening for just one quarter in five districts reduced labor requirements by 2.4 person/years.



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Conclusions: In the Zimbabwean context of high AGYW vulnerability, screening is an unnecessary cost to the DREAMS program, AGYW, and health facility staff. Reducing the data burden and streamlining reporting systems associated with screening would improve the efficiency and sustainability of PEPFAR's DREAMS program in Zimbabwe.

EPE0990

Effect of commcare and power bi integration to unified data management system in community HIV program for impactful decision making in Ethiopia

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Background: Unified Data System (UDS) is an integrated data capturing tool through CommCare using a mobile App for USAID community-based HIV programs. More than 30 local and international partners were using their own non-digital data collection and reporting systems. Previous systems didn't allow timely data collection, cleaning, analysis, and data use.

In 2018, Project HOPE started the UDS to ensure real-time data entry, analysis, data visualization on the Power BI dashboard, and timely reporting and decision-making at all levels in the community.

Description: Project HOPE designed the UDS on an open-source application, CommCare. CommCare allows data collection on a mobile and web application with an offline capacity. More than 1000 user accounts were created for community and facility health workers.

Access to the web application was created for supervisors, coordinators, and managers. Multiple trainings and ongoing technical support were provided to users. Community health workers enter data while providing HIV services to their clients and allow two-way referrals among community and facility health workers.

Multiple interactive visual dashboards were developed on Power BI that simplified performance monitoring and reporting to USAID. A retrospective analysis was conducted to summarize the outcome of UDS utilization using the UDS data and Power BI dashboard visuals.

Lessons learned: Between Oct 2020 to Dec 2022, a total of 44 CommCare modules were developed and 1,015 mobile and 434 web accounts were created. The training was provided for more than 1,449 users on data entry, cleaning, analysis, and dashboard utilization.

A total of 1,975,886 individual data was entered into UDS App and live data was displayed for 12 major thematic areas with 122 slide displays. A dashboard link is shared with 30 implementing partners and users from the donor. All implementing partners are regularly using UDS for their performance monitoring, reporting to USAID and PEPFAR's DATIM system, and timely decision-making at all levels.

Conclusions/Next steps: UDS facilitated the delivery of standardized HIV services, improved program data quality, and promoted data use. Therefore, we recommend the wider application of digital platforms like UDS helps to strengthen and support community-based HIV service delivery in resource-limited settings.

EPE0991

Digitizing the monitoring of quality improvement activities to strengthen quality of care for people living with HIV in nine sub-Saharan African countries: EGPAF's QI-PM application

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Background: HIV programs in Sub-Saharan Africa have been highly successful in institutionalizing and scaling up quality improvement (QI) to expand access to and improve quality of HIV services. Digital health technology needs to be harnessed in order to increase the use and impact of QI data.

To that end, EGPAF developed the Quality Improvement Project Monitoring (QI-PM) application to digitize the formerly paper-based process of monitoring QI projects at EGPAF-supported health care facilities.

Description: QI teams at health care facilities in Sub-Saharan African countries enter data about their site's QI projects, including the changes to be tested and results of key indicator performance, into the QI-PM web or mobile application available for iOS or Android.

Data in the application is periodically updated by the health care facility QI teams, who use the application's in-built data visualizations to track how the QI project contributes to changes in key performance indicators over time.

Lessons learned: From 2017 through December 2022, teams from nine countries entered 1,151 QI projects into the QI-PM application. Projects aim to improve performance on 157 key performance indicators and strengthen the quality of services across 35 programmatic areas that span the HIV continuum of care.

Descriptions of 1,515 changes tested by 282 health care facilities were documented in QI-PM. By implementing QI-PM, QI teams have more efficiently documented the activities and results of QI projects at health care facilities, and effectively utilized digital data management platforms to store and visualize QI data.

This work has culminated into a centralized, multi-country repository of data on QI tested changes that informs improved quality of services offered to people living with and affected by HIV while fostering cross-country exchange of promising practices.

Conclusions/Next steps: The QI-PM application can be feasibly implemented by health care facilities across countries to digitize QI. Future integration of the application with a major data management platform, such as



DHIS2, could make QI-PM even more accessible to facilities across the globe seeking an easily adoptable solution to digitize tracking of QI projects related to HIV and other fields.

EPE0992

Evaluating the effect of comprehensive care model for HIV on AIDS hospitalizations: a retrospective study in Mexico, 2012–2022

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Background: Since 2006 Mexico started to offer specialized care for people living with HIV (PLWHIV) through the Comprehensive Hospital Care Services model (SAIH for its initials in Spanish). Evaluations of the performance of this healthcare model are lacked.

This study aims to evaluate the performance of the SAIH model on HIV hospitalization length, recovery, and mortality.

Methods: We analyzed data on HIV hospital discharges of the Ministry of Health (MoH) between 2012 and 2022. We compared trends in the length of hospitalization, discharge for improvement, and mortality in both service delivery models, using Pearson's chi-squared test of independence for proportions and analysis of variance and covariance for hospitalization length.

Using a propensity score matching approach, we paired HIV healthcare clients served in SAIH and non-SAIH facilities based on variables that included demographics, clinical information, and facility characteristics. We used proportional hazards models to evaluate the effect of the SAIH model on outcomes of interest.

Results: In the period analysis, we identified 91,478 hospital discharges in 463 MoH hospitals (403 Not SAIH, 60 SAIH). 44% of HIV hospitalizations occurred at SAIH facilities. Hospitalization length was shorter in SAIH facilities (6.5 days vs. 8.4 days at non-SAIH) (P value = $<.05$).

The proportion of discharges due to recovery was higher in SAIH facilities (85% vs. 72%, P value = $<.05$), and mortality was lower (11% vs. 21%, P value = $<.05$).

Being treated in a SAIH facility was associated with an increased hazard ratio of discharged due to improvement ($HR = 1.28$, 95% $CI = 1.19 - 1.38$, $p < 0.05$) and a reduced risk of mortality ($HR = 0.75$, 95% $CI = 0.63 - 0.89$, $p < 0.05$) compared with those treated at a non-SAIH facility.

Conclusions: Our study shows evidence of the positive effect of the SAIH program on key indicators of quality of care: hospitalization length and mortality. Data also suggests that the SAIH model also improves AIDS screening and timely detection.

EPE0993

Monitoring HIV prevention services for key populations in El Salvador

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Background: In El Salvador, most new HIV infections occur among key populations (KP); including men who have sex with men (MSM), and transgender women (TGW). Reducing new HIV infections among KP involves offering people-centered HIV services with sufficient coverage and quality. The HIV prevention cascade is a novel and useful approach to monitoring HIV prevention services and guide decision-making for their improvement.

Description: The Ministry of Health introduced structural changes to its Health Information System to:

- Improve the identification of KP attending HIV services;
- Assess the risk of HIV infections among KP, and;
- Ensure the longitudinal follow-up of KP across the HIV prevention continuum.

Data were collected in standardized forms, and dashboards were developed to generate the KP prevention cascades.

Lessons learned: In 2021, there were 50,543 estimated MSM (45,282 HIV-negative and 5,261 with undiagnosed HIV) and 1,606 estimated TGW (1,399 HIV-negative and 207 with undiagnosed HIV) in need of an HIV test.

The HIV testing coverage was 43.5% among MSM and 52.3% among TGW, with positivity rates of 2.4% and 3.8% among MSM and TGW, respectively. 21,489 MSM and 808 TGW had an HIV-negative result. However, 11,542 of those MSM (54%) and 453 (56%) of those TGW were identified at substantial risk of HIV.

Among the HIV-negative MSM and TGW followed-up in care (i.e., with a second HIV test within 12 months after the initial test), there were 73 and 4 new HIV cases, respectively.

The positivity rates of the follow-up HIV test were 2.4% (48 cases) among MSM at substantial risk and 1.0% (25 cases) among those at non-substantial risk. In contrast, the positivity rate of the HIV follow-up test among TGW at substantial risk (1%, 2 cases) was lower than that of TGW at non-substantial risk (1.2%, or 2 cases).

Conclusions/Next steps: The HIV prevention cascade shows limited coverage of HIV testing and a considerable number of avoidable HIV infections among KP followed-up in prevention services.



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The implementation of PrEP, HIV self-testing, and the monitoring of HIV prevention continuum of care will help El Salvador to address prevention needs. Improving the assessment and recording of substantial risk variables is needed.

EPE0994

A protocol for progress: assessing USAID's PEPFAR expenditure reporting data quality

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Background: In an effort to improve transparency and accountability, all recipients of PEPFAR country operational planning funding have provided detailed expenditure reporting (ER) since 2014.

USAID routinely uses this data to inform strategic planning and partner management. Instituting a more robust and routine assessment of ER data quality will allow USAID to ensure high-quality data is available to understand program costs today, and plan future resources amidst a changing epidemic landscape.

Methods: USAID developed a mixed-methods protocol for assessing ER data quality across dimensions of timeliness, completeness, adherence, integrity, validity, and reliability. A desk review across 53 countries and 477 mechanisms, triangulated ER with program monitoring and human resources data (HRH) to identify issues of alignment and adherence to financial classification guidance.

Semi-structured interviews were then conducted with partner financial and program experts, Agreement Officer Representatives, and USAID financial leads in two pilot countries to gather more information regarding organizational process, stakeholder roles, and experience of data reporting, as well as review partner-specific flags from desk reviews.

Findings and recommendations were developed for USAID headquarters, USAID in-country teams, and each partner to inform continuous quality improvement.

Results: The DQA Protocol identified themes between key informant interviews and patterns in data quality flags of ER and HRH submissions. These similarities were seen across partner types (i.e. local vs international), between countries, and across stakeholders (i.e. USAID staff and Partner staff). Stakeholders identified similar challenges in process and timeline for data collection and submission. Between mechanisms and countries, partners used similar approaches for translating accounting data into PEPFAR expenditure reporting, with desk reviews identifying opportunities for clarified guidance and refined standard operating procedures.

Conclusions: High quality data is essential to meaningfully interpret resource use and inform strategic budgeting. USAID's adaptable protocol for assessing data quality is a useful tool for identifying issues and providing specific

and actionable recommendations for improved data submissions. Results from this study will be used to target quality improvement, including clarification of guidance and technical assistance to both USAID in-country teams and partners to ensure reliable, valid, and complete data in alignment with program realities, financial classifications, and tool requirements.

EPE0995

Incubating innovation through transdisciplinary implementation science: testing and taking program innovations to scale in Zimbabwe

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Background: The 'know do' gap leads to preventable HIV-related morbidity and mortality through suboptimal program implementation. Implementation science (IS) provides a range of theories, methods and frameworks (TMFs) to ask and answer questions about how to deliver what works with greater speed, appropriate fidelity, efficiency, and relevant coverage. However, evidence-based models of how to embed rigorous IS within routine HIV programs are lacking.

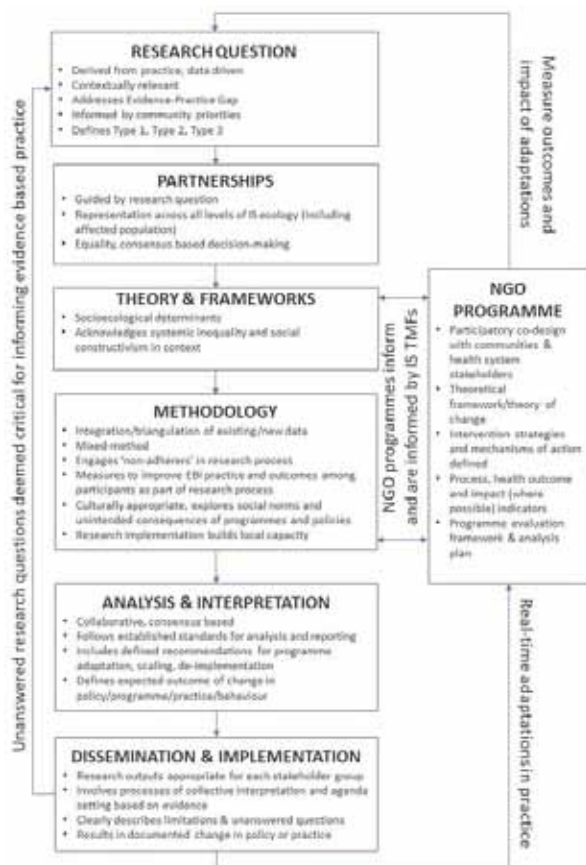
Methods: An operational extended RE-AIM framework to address dynamic context to embed mixed-methods implementation science in a large scale community- and facility-based HIV programs was developed.

Routine data were analysed to identify relevant research questions to target priority geography, age and sex disaggregated groups. Multidisciplinary research teams were assembled to design and implement relevant a rigorous IS 'whole system' ecological project approach.

Research findings were disseminated across all health system levels and iterative modifications made to program implementation in real time.

Results: From 2020-2023 an operational framework for embedding IS was developed and tested a sub-national HIV program in 15 Districts of Zimbabwe. Low performance PEPFAR indicators, transdisciplinary IS teams of implementers, researchers, health system stakeholders and recipients of care conducted data integration exercises, participatory co-design of solutions, modelling and solution implementation. Incubator learning phase IS projects tested and refined process and outcomes on program performance.

Multiple iterative cycles demonstrate improved program fidelity and performance and identification of innovations and job aides for community- and facility-based health care workers which have become national standard-of-care.



Conclusions: The use of an operational framework to embed mixed-method IS within routine programs improved HIV program performance through evidence-based prioritisation of identifying the most vulnerable in context, improving fidelity of processes, and design of context-relevant interventions.

Use and adaptation of this transdisciplinary IS model in routine HIV programs has the potential to strengthen fidelity of EBIs, generate innovations and improve equity of HIV programs.

EPE0996

Quantifying PEPFAR's investments in health system support and health system strengthening

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Background: Strong health systems will be critical to address remaining gaps in achieving the UNAIDS 95-95-95 goals and sustaining the HIV response in the long-term. While the PEPFAR program has made significant investments in health systems, understanding and differentiating between inputs and activities that support health systems from those that strengthen health systems can support future planning for long-term sustainability and transition of PEPFAR programs.

Description: Routine PEPFAR expenditure data from US government fiscal years (FY) 2020 to 2022 was used to estimate health systems investments, disaggregated by sys-

tems support versus strengthening. Health systems support investments were defined as filling gaps or providing inputs into the system to produce better short-term HIV outcomes (PEPFAR salary support to clinical and ancillary staff, and expenditures on site-level technical assistance and lab support).

Health systems strengthening (HSS) investments were defined as improving functionality of the HSS building blocks for more equitable and sustained improvements across HIV services and outcomes (PEPFAR above-site programming).

Lessons learned: Of the total \$4.1 billion in FY22 PEPFAR expenditures, \$1.5 billion (38%) were spent on systems support and \$315 million (8%) on systems strengthening.

Systems support expenditures were largely driven by investment in human resources for health (\$560.8M). Across PEPFAR operating units, investments in health systems strengthening ranged from 2% to 31% of total expenditures, with steady or declining expenditures in 12 out of 28 operating units between 2020 and 2022.

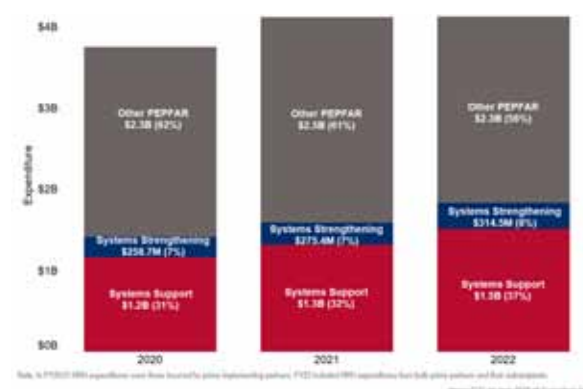


Figure. Funding for health systems strengthening at the global level has remained steady over time.

Conclusions/Next steps: PEPFAR resources remain largely focused on supporting rather than building sustainable systems. Dedicating greater resources to systems strengthening to build long-lasting, sustainable, and country-led systems may improve PEPFAR's ability to contribute to reaching and maintaining epidemic control, and build resilience in health systems, with implications beyond HIV programs.



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**EPE0997****Here we go NGO - role of the non-governmental sector in the HIV response and implications for transdisciplinary implementation science: a scoping review**

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Background: Non-governmental organisations (NGOs) have been central actors in the HIV response since the start of the HIV epidemic, though the role of NGO sector is broad and poorly defined. In this scoping review, we explore recent evidence on the role of the non-governmental sector in the HIV response.

Methods: We conducted a scoping review to identify existing evidence of the role of the non-governmental sector in the HIV response.

The primary research question was: What is known about the role and contribution of the non-governmental sector in the HIV response from January 2015 to July 2022?

We followed established methodological frameworks for conducting scoping reviews through a five-step procedure using the PRISMA Extension for Scoping Reviews.

Results: We identified 1,211 peer-reviewed abstracts and 692 were advanced to a full-text review, 38 met the inclusion criteria and a further 39 were identified through pearling.

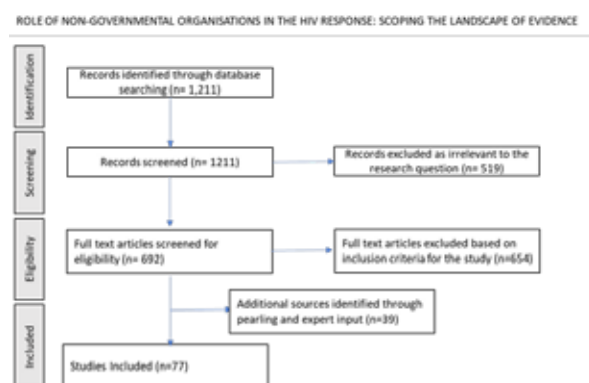


Figure 1. PRISMA flow diagram of the research process.

We found three key themes of recent contributions of the non-governmental sector to the HIV response:

1. *Catalysts*: advocacy and activism for marginalised and key populations;
2. *Implementers*: providers of direct provision and technical assistance, and;
3. *Evidence Users-and-Makers*: translation of evidence-based practice at scale.

There is limited representation of local NGOs, as co-producers of scientific evidence. Less than 25%(16/77) of articles reviewed had NGO-affiliated first authors.

Conclusions: Transdisciplinary implementation science (IS) frameworks provide an opportunity to optimise the contributions of the non-governmental sector through the use of IS theories, methods and frameworks to improve evidence-based practice at scale and generate evidence required to reach and maintain HIV epidemic control.

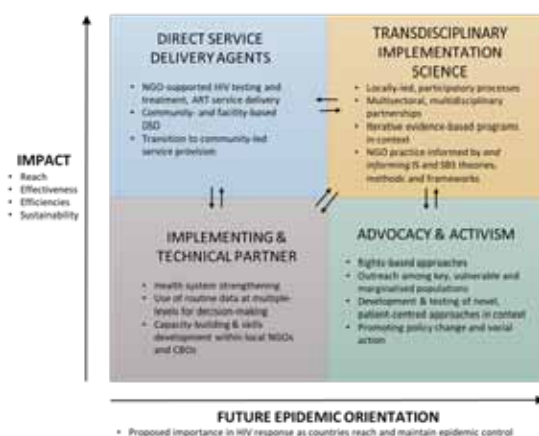


Figure 1. Typology of roles of NGOs for optimizing national HIV responses towards attainment and maintenance of HIV epidemic control. The vertical axis represents impact of NGO activities interventions upon national HIV program performance in terms of reach, effectiveness, efficiencies and sustainability. The horizontal axis represents importance for the future of the HIV epidemic as countries seek to reach and maintain epidemic control. NGOs as primary implementing and technical partners. Adapted from Anderson (150) and Geng (151).

EPE0998**Optimization of digital platforms to improve quality of health care systems. A case of Acholi sub region, Northern Uganda**

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Background: Digital health is changing the outlook of health care systems across the globe with varying dimensions of provider and patient empowerment to make decisions and provide client centered care.

In Acholi sub region, a number of digital platforms have been established including, the use of smart phones to report process indicators, zoom meetings, google sheets, WhatsApp messaging, short messaging system (SMS), Electronic Medical Records (EMR), PEPFAR in country reporting systems (PIRS), HYBRID, Digital Information System (DIS), dashboards, and client audit tools. Despite the availability of these known digital platforms for data management, their utilization for real time data analytics and patient level management in the Acholi sub region has remained sub optimal due to; un-availability of software, knowledge gap among front-line health workers, limited or no source of electricity in some facilities, poor monitoring and evaluation frameworks, limited data use and minimal support from the leadership. The aim of the study is to document innovations to optimized use of digital platforms and how this improved the quality of health care among patients in Acholi sub-region.

Methods: USAID LPHS Ankole and Acholi Activity, coordinated with other regional IPs, to provide computers, engaged health unit management boards to install elec-

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tricity, strengthened capacity of health care workers on data systems through mentorships, recruited data clerks at 70 facilities to support operationalize the systems, data review, cleaning and analytics. Supported weekly facility data review meetings and sharing with the facility leadership to guide planning and activity implementation. Facilitated software installations and upgrades to improve result transmission, and synchronization to central national databases.

Results: Reporting rates improved from 45% in January 2022 to 98% in December 2022, data quality and data concordance from 66% to 92%. Improved interruptions on Treatment rates among PLHIV enrolled on ART from 4% to 2.4%, TB treatment success rate from 79% to 83% and digital solutions were used to profile 35% of non-suppressing children by December 2022.

Conclusions: Digital technology is critical for real time data capture, aggregation, analytics and provision of client-centered care. There is need to invest in digital technology for real time data capture, analytics and decision making.

EPE0999

To deliver data as a public good, the governance structure matters as much as the data systems - lessons learned from establishing a Digital Health Division (DHD) in Malawi

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Background: Global enthusiasm for digital health is on the rise, however available resources are not sufficient to realize the potential of digital health for HIV. There are questions about what types of systems architecture, policies, and governance are optimal and how scarce resources can best be used to meet local needs.

We summarize experiences and lessons learned through establishing and implementing Malawi's first Digital Health Division (DHD), and articulate the best practices that have led to success in aiding Malawi achieve its HIV goals.

Description: The Kuunika project was launched in 2015 in collaboration between the Gates Foundation, the Ministry of Health (MOH), district-level authorities, and a consortium of technical partners. The overarching goals of the project were to increase the supply of HIV data, increase demand for data, and increase the use of data for decision making.

Core project activities focused on strengthening HIV data governance, linking fragmented systems, and capacitating health workers and decision makers to use data. A key focus was ensuring that design processes for enterprise architecture and interoperability were government-led.

Lessons learned: The Malawian DHD was established in partnership with the National Statistics Office (NSO) and an intersectoral Data for Development (D4D) group. This broad engagement informed the design and development of the enterprise architecture and interoperability layer that allows information systems to share information via a secure platform. Newly interoperable systems include provider and facility registers, tuberculosis, maternal health, and HIV.

The established governance mechanisms allowed for the MOH to oversee and manage digital public goods for HIV, launch the National Digital Health Strategy, develop a Digital Health Stakeholder's Work Plan, and finalize Data Access Sharing Procedures.

Conclusions/Next steps: Data is a public good for the health system, not a service provided by the system solely to generate reports or satisfy funder requirements. The strength of Malawi's DHD stems from its utility to stakeholders including NSO, the Division of HIV/AIDS, facility-based providers, and outbreak response teams.

Indeed, the well governed DHD was capable of nimbly responding to the SARS CoV-2 pandemic and more recently a Cholera outbreak. This framework has proven effective in Malawi and could be broadly adapted.

EPE1000

Enhancing USAID HIV data quality assurance through the use of algorithmic and digital health solutions

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Background: To monitor USG contributions towards HIV epidemic control, PEPFAR established a data reporting system known as DATIM. The system houses standard indicators, called MER data, that are routinely used to inform programming, resource allocation, and identification of challenges. Given the importance of this data, USAID pays significant attention to enhancing data quality assurance.

These efforts include an advanced anomaly detection tool for remote monitoring of data quality developed in collaboration with USAID's Data.Fi project and a Data Quality Monitoring Application (DQMAApp) for an efficient, on-site deeper investigation into root causes of data anomalies.

Description: The anomaly detection tool applies two types of algorithms; Recommender Systems, which identifies patterns across facilities and HIV indicators and flags values that are inconsistent with globally observed patterns, and Time Series, which identifies extreme values based on historical and seasonal trends. Through the DQMAApp, USAID investigates previously flagged anomalies by comparing primary and secondary data sources and



identifying breach of compliance with a specific technical standard for a sample of records randomly selected. Based on LQAS methodology, DQM findings are generated from comparison between the number of records meeting the acceptability criteria with the "decision rule" number that follows either a stricter (90%-95%) or a less strict criterion (75%-80%).

Lessons learned: Comprehensive data quality assessments which have dominated PEPFAR programs and entail patient-level data reviews in all PEPFAR-supported sites require exceedingly high levels of effort and are relatively infrequent. As such, USAID needs additional tools to guide continuous quality improvement. The Data Anomaly Detection tool offers an easy-to-use process tailored for MER data with no data preparation required by the user to apply sophisticated anomaly detection algorithms. Its findings directly inform targeted data quality reviews supported by the DQMAApp digital solution and facilitate more regular data quality assurance and improvement activities.

Conclusions/Next steps: Data-driven decisions and well-targeted investments depend on strong data infrastructure and processes that generate high quality data. We find that the machine learning and digital solutions we developed and apply across USAID PEPFAR programs allow us to more efficiently and routinely identify and address data quality issues

EPE1001

A rapid coverage survey (RCS) for evaluating key population programs at local level

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Background: Engaging key populations (KPs) is pivotal to achieving epidemic control, and many countries have developed interventions specifically for them. Current approaches for measuring local program coverage and impact are inadequate; they rely on complex and expensive large-scale biological and behavioral surveys, that are done infrequently, or routine service data which have several limitations.

Description: To provide programs with actionable data in a timely manner, FHI 360 and the EpiC project developed and piloted a simple rapid coverage survey (RCS) that can be used to regularly assess reach with the minimum package of prevention interventions, HIV risk behaviors, HIV testing behaviors, and treatment uptake among HIV-positive KP members. Representative samples of Female sex workers (FSWs) and men who have sex with men (MSM) were recruited from venues in six provinces in Nepal using multi-stage cluster sampling. We assessed markers of program success, cost of the survey, and time for administering the survey.

Lessons learned: Participation rates were high: 93% (range: 78-100) among FSWs and 98% (range: 96-100%) for MSM. More than 75% of KP individuals at the venues were under 39 years of age; 59% of the FSWs were in sex work for less than three years and would have been missed in surveys conducted every five years. There were variations in all key markers of program performance across the six provinces (Table 1).

A total of 65% of FSWs and 58% of MSM reported having their last HIV test within three the months prior to the survey. Respondents reported stigma, discrimination, and exposure to physical and sexual violence. Planning and implementation of the survey was completed over a 12-week period. Data collection was conducted by the implementing agencies, and each interview lasted an average of 10 minutes.

Population	Access to prevention % (Range)	Access to free condoms % (Range)	Condom use at last risky sex % (Range)	Know HIV status % (Range)
FSW	86 (62-100)	88 (70-100)	92 (87-97)	89 (79-96)
MSM	93 (75-100)	94 (81-100)	87 (73-100)	95 (88-99)

Table 1. Distribution of key markers of program performance.

Conclusions/Next steps: This brief and inexpensive survey was successfully implemented by local partners with limited external support. It generated a rich body of data on uptake of essential HIV services and HIV risk behaviors to guide planning and evaluation of KP programs.

EPE1002

Improving the precision of subnational AGYW risk estimates in South Africa and Côte d'Ivoire

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Background: Globally, adolescent girls and young women (AGYW) are at disproportionate risk of HIV. While many countries have implemented population-based household surveys to assess HIV risk factors, these surveys are typically representative at the first subnational administrative unit.

To plan, implement, and monitor HIV prevention interventions, initiatives such as the Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) program must quantify the number of at-risk AGYW at lower geographical levels.

Methods: We implemented a small-area estimation (SAE) approach to estimate HIV risk prevalence. We analyzed data on AGYW ages 10-14, 15-19, and 20-24 from the 2017-2018 Côte d'Ivoire Population-based HIV Impact Assessment and the 2017 South Africa National HIV Prevalence,



Incidence, Behavior, and Communication Survey. We considered DREAMS eligibility criteria, including risk factors related to sexual behaviors (e.g., transactional sex), school enrollment, and orphanhood. We estimated the proportion of AGYW who exhibited at least one risk factor relevant for their age band at the regional level.

Using the R emdi package, we modelled survey-based risk prevalence estimates as functions of predictors from auxiliary datasets.

Results: The national risk prevalence from survey data for AGYW ages 10-14, 15-19 and 20-24 was 33%, 59%, and 32%, respectively, in Côte d'Ivoire, compared to 16%, 34%, and 39% in South Africa. There was substantial regional variation; risk estimates for AGYW 20-24 ranged from 8% (Woruba) to 40% (Abidjan) in Côte d'Ivoire and 19% (Free State) to 50% (Northwest) in South Africa.

In both countries, district-level HIV prevalence estimates (from the UNAIDS Naomi model, further calibrated to Thembisa outputs in South Africa) was the best performing auxiliary covariate. Incorporating district-level HIV prevalence estimates resulted in overall adjustments in district-level risk by 0-3% in Côte d'Ivoire and 1-17% in South Africa.

Conclusions: Spatial interpolation techniques exist for estimating health indicators in small administrative areas, however, program managers require approaches that can be easily replicated and updated to inform annual planning. We describe a basic area-level model for improving the precision of HIV risk estimates among AGYW at the district level. Characterizing risk can help HIV prevention programs target interventions most likely to impact HIV incidence reduction.

EPE1003

Using open health information exchange framework to develop Vietnam's national HIV case surveillance system architecture

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Background: One of the core technical measures of Vietnam's National Strategy to End AIDS by 2030 is to develop a national HIV case surveillance (CS) system. The result of a landscape assessment on HIV health information systems in Vietnam showed that:

1. There were siloed multiple disparate systems;
2. No longitudinal patient records with limited patient data connection, leading to data duplication and inaccuracies, and;
3. There was no centralized database to collate longitudinal clinical information of people living with HIV (PLHIV). This abstract describes how a system architecture was

developed to enable the CS system to centrally collect HIV patient data from various sources, including testing, case reporting, and treatment data.

Description: The CS system architecture was developed based on OpenHIE and tailored to the Vietnamese context. Open-source frameworks and international standards, such as OpenHIM, HAPI Fast Healthcare Interoperability Resources (FHIR), and OpenSearch dashboards, were applied to create a centralized database and component layers for interoperability and data management.

The Vietnam HIV case profile is designed as the data structure of the centralized database. Data quality was assured through using functions built to clean data, de-duplicate data, and merge datasets.

Lessons learned: The component layers for interoperability were an effective solution for establishing a centralized database for PLHIV, introducing interoperability between discrete HIV data sources to establish full HIV case profiles, and improving the quality of data inputs into the system. Before storing centralized database, data quality is checked at each interoperability layer stage, and patient matching algorithms are used.

Conclusions/Next steps: The development of an overall system architecture using OpenHIE may have solved problems related to data quality and achieved the de-duplication of CS data in Vietnam. This system architecture could be applied for other chronic or infectious disease surveillance systems.

Impact of COVID-19 on HIV prevention, testing and treatment (including financing)

EPE1004

Preferred models of clinical service delivery for HIV pre-exposure prophylaxis (PrEP) users in the COVID-19 era: a discrete choice experiment among men who have sex with men (MSM) in Australia

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Background: HIV prevention services were forced to adapt because of COVID-19 and lockdowns. We investigated effects of clinic adaptations on PrEP users and quantified their preferences for future implementation of PrEP services.

Methods: Between October-2022 and January-2023, we conducted an online cross-sectional survey in Australia among PrEP-using men who have sex with men (MSM)



aged ≥ 18 years. We investigated impacts of COVID-19 on HIV prevention and quantified preferences for hypothetical models of PrEP service delivery using a discrete choice experiment. Participants were shown six scenarios comprising options across six attributes: clinic type, clinic location, consult frequency, services, STI sampling location, and cost. Multinomial logit models estimated the magnitude of preference for each level, presented as utility coefficients.

Results: The 415 respondents (median age=36, IQR=30-45) mostly identified as gay (81.9%) and used daily PrEP (69.9%). Due to COVID-19 lockdowns, 53.3% of participants had more difficulty getting sexual health appointments, 35.7% found it more difficult to get PrEP, and 54.5% had fewer HIV/STI tests. Most (87.0%) were satisfied/very satisfied with phone consults, 81.6% satisfied/very satisfied with video, and 93.0% were satisfied/very satisfied with in-person consults.

The attributes of clinical service delivery which most influenced preferences were: cost, type of clinic, and frequency of consults. PrEP users preferred: GP clinics with expertise in LGBTQ+ health; in-person consults; 3-monthly visits; inclusion of HIV/STI testing, PrEP, and general healthcare; HIV/STI testing at external pathology providers; and no cost (utility coefficients in Figure 1).

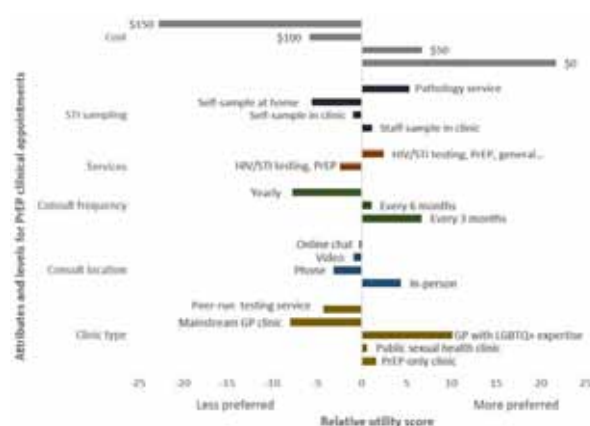


Figure 1. Relative utility scores for each feature level. Positive scores represent choices participants preferred, and the magnitude of utility scores represent the influence of attributes on participants' choices.

Conclusions: Adaptations to clinical services due to COVID-19 precipitated efficient new ways of delivering healthcare, and these changes were acceptable to MSM. Looking to the future of PrEP clinical service delivery, on average MSM preferred low-cost, frequent appointments at clinics with expertise in LGBTQ+ health. This suggests that there remains an appreciation of face-to-face clinic-based approaches but that multiple models of service delivery can be successful.

EPE1005

Compounding factors that affected viral load scale-up and viral load coverage in Kenya, before and during the COVID-19 pandemic

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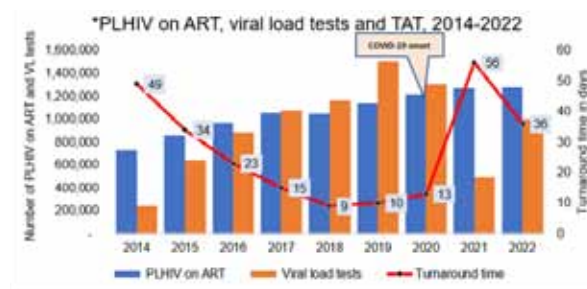
Background: Viral load (VL) testing among people living with HIV (PLHIV) receiving antiretroviral treatment (ART) is key to measuring progress towards achieving the last 95 in the 95:95:95 global goal. Kenya scaled-up VL testing through a network of ten national laboratories which were also used for COVID-19 testing after the first case was reported in March 2020. We compared VL testing before and during COVID-19 pandemic.

Methods: Retrospective data on VL testing volumes and mean turnaround time (TAT) from sample collection, laboratory testing to results release, were abstracted from the national VL dashboard for 2014-2022.

Additionally, data on proxy viral load coverage (VLC) - number of clients with documented VL test results divided by eligible clients on treatment in previous reporting period, for 2020-2022 were abstracted from the PEPFAR Panorama dashboard. Frequencies and trend analysis were performed.

Results: During VL testing scale-up (2014-2019), the number of ART clients increased from 727,072 to 1,138,386 while VL tests increased from 240,008 to 1,502,950 (Figure 1).

This dropped to 496,131 tests in 2021 but recovered to 1,003,125 in 2022. The mean TAT fell from 49 to 10 days between 2014 and 2019. This rose to 56 days in 2021 but recovered to 36 days in 2022. The proxy VLC dropped from 1,022,869 (89%) in 2021 Quarter One (Q1) to 337,751 (27%) in 2022 Q2 before recovering to 624,819 (49%) in 2022 Q4.



PLHIV: People living with HIV, ART: Antiretroviral therapy, TAT: Turnaround time, VL: Viral load

Figure 1. Number of people living with HIV on antiretroviral therapy, viral load testing volumes and turnaround time in Kenya, 2014-2022.



Conclusions: Reduced VL testing during the COVID-19 pandemic disrupted monitoring of viral suppression among PLHIV which impacted quality of care. The disruption could have been compounded by staffing and commodity constraints, and increased laboratory equipment breakdown due to additional COVID-19 testing. Careful consideration on using VL testing platforms and staff for other disease testing in addition to VL testing and ensuring commodity security could be made to avoid such program impacts during a pandemic.

EPE1006

Identifying the drivers and influencers of COVID-19 vaccine hesitancy in Nigeria

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Background: COVID-19 vaccine hesitancy is a major challenge to public health globally, and it remains the main driver of the current global economic downturn. The current wave of COVID-19 vaccine hesitancy in Nigeria remained a major threat to the post-COVID-19 economic recovery efforts in the country. Though evidence has shown that none of the COVID-19 vaccines have 100% efficacy at building lifelong immunity in the host, the COVID-19 vaccines however prevent severe COVID disease and mortality.

This study aimed to identify the drivers and influencers of COVID-19 vaccine hesitancy among adults COVID-19 vaccine hesitant populations in Nigeria.

Methods: In a nationally representative sampling of 3,000 randomly presenting COVID-19 vaccine hesitant adults across the six (6) geopolitical zones of Nigeria, a semi-structured questionnaire was administered to consenting participants in this clustered and randomized cross-sectional survey between the months of February and August 2022.

Six (6) sets of trained volunteers administered 500 questionnaires each at six (6) selected representative cities in Nigeria. Participation in this survey was consensual and voluntary.

Results: Of the 3,000 participants in this study, 72% (2,160) were Christians, while 22.9% (840) practiced the Islamic religion. 52% (1,560) were vaccine naïve or inexperienced, while 78% (2,340) regularly observed the COVID-19 IPCMs.

A combined online sourcing of COVID-19 related information among the study participants was 92.3% (2,769/3,000) (Social Media platforms [1,530] and Internet Usage [1,239]). While 46.3% (1,389/3,000) of the participants were skeptical about the safety of the COVID-19 vaccines, 38.3% (1,149) also required better information about the COVID-19 vaccines.

Aside from these major drivers of COVID-19 vaccine hesitancy identified, those who could influence the COVID-19 vaccine uptake among the hesitant populations in Nigeria included: healthcare workers (48.6%), parents (27.6%), religious leaders (25.3%), and partners/spouses (8.3%) respectively.

Conclusions: The results obtained in this study are vital to the designing of new policy measures for the COVID-19 vaccination rollout in Nigeria.

In addition, appropriately tailored COVID-19 health educational programs, proper and adequate orientation of healthcare workers, and meaningful engagements of parents, and religious leaders in health promotion activities can help overcome the current challenge of COVID-19 vaccine hesitancy in Nigeria.

EPE1007

Delivering HIV pre-exposure prophylaxis to people who use drugs experiencing homelessness during the COVID-19 pandemic

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Background: The SARS-CoV-2 pandemic affected HIV care and prevention for many individuals, including people who use drugs and experience homelessness.

Description: We extracted data from medical records of Boston Health Care for the Homeless Program, a low-threshold community health center specializing in health-care for people who use drugs and experience homelessness.

We examined PrEP continuum outcomes (referrals, appointments, prescriptions) during 5 time periods: pre-pandemic (12/1/19-2/28/20), early pandemic (3/1/20-5/31/20); Delta surge (6/1/21-8/31/21); Omicron surge (12/1/21-2/28/22), and the intervening "lulls." In the year prior to the pandemic (3/1/19-2/28/20), 171 unique patients were referred to PrEP and 161 (94%) completed an intake appointment.



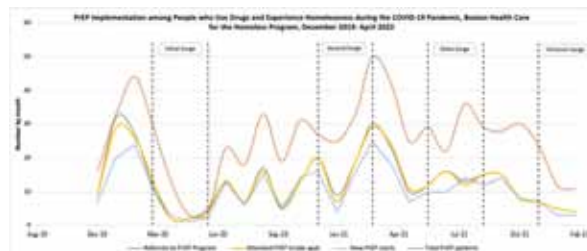
Of these, 110 (68%) were dispensed PrEP prescriptions. Mean age was 39 years, 65% identified as male, and 54% identified as non-Hispanic white. Nearly all (94%) were homeless or unstably housed, and 77% had injection drug use as their primary PrEP indication.

Lessons learned: Referrals for PrEP decreased from a monthly mean of 23 (SD=12.1) in the pre-COVID pandemic period to 5 (SD=5.8) in the early pandemic, with a steady rebound until the Delta and Omicron surges when mean referrals decreased back to 14 (SD=2.1) and 5 (SD=1.5), respectively (see Table).

Similar patterns emerged for mean numbers of PrEP intake appointments, new PrEP prescriptions and total PrEP users (see Figure).

	Pre-Pandemic 12/19/20- 2/29/20	Early Pandemic 3/1/20- 5/31/20	First Lull 6/1/20- 8/31/20	Second Lull 9/1/20- 11/30/20	Second Surge 12/1/20- 2/28/21	Third Lull 3/1/21- 5/31/21	Delta Surge 6/1/21- 8/31/21	Post- Delta Lull 9/1/21- 11/30/21	Omicron Surge 12/1/21- 2/28/22
PrEP Referrals, mean (SD)	23 (12.1)	5 (5.8)	8 (4.2)	12 (6.1)	16 (6.1)	21 (10.1)	14 (2.1)	13 (4.0)	5 (1.5)
PrEP Intake Appoint- ments, mean (SD)	21 (10.8)	6 (6.9)	8 (4.6)	12 (5.1)	15 (7.2)	21 (9.3)	13 (2.3)	13 (4.0)	5 (1.5)
New PrEP Starts, mean (SD)	17 (8.9)	5 (5.3)	7 (5.6)	11 (5.5)	12 (6.9)	17 (9.1)	11 (2.3)	11 (3.1)	4 (2.3)
PrEP users, mean (SD)	31 (14.1)	15 (13.7)	15 (9.8)	28 (7.6)	28 (4.2)	39 (12.8)	29 (7.0)	29 (1.0)	16 (

Table. Monthly averages for PrEP implementation outcomes among people who use drugs and experience homelessness during the COVID-19 pandemic, Boston Healthcare for the Homeless Program



Our findings suggest that, despite COVID-19-related disruptions to healthcare access, low-threshold PrEP programming tailored for the needs of people who use drugs and experience homelessness can successfully engage this socially and structurally marginalized population in PrEP services.

Conclusions/Next steps: Specific strategies (e.g., intensive street outreach, tailored navigation and support) that supported the success of programs like the one studied here warrant additional research and dissemination.

EPE1008

PrEP use behaviors and sexual health in China during COVID-19 lockdowns

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Background: Longitudinal monitoring of PrEP use, STIs, and sex behaviors in Chinese PrEP users are limited.

Here we reported self-reported PrEP use behaviors, newly diagnosed STIs, and sex behaviors among MSM PrEP users in COVID-era China, and identified potential influence from study sites, PrEP provision modes, and dosing strategies.

Methods: MSM in Guangzhou and Wuhan were recruited by online ads, clinic flyers, and community referrals. Survey data were collected at baseline and quarterly follow-ups over 6 months. MSM were prescribed oral PrEP by pick-up or mail delivery. Univariate and multivariate logistic regression with Firth's correction was conducted in Stata 15.0. Notably, the 3-month follow-up in Wuhan took place in October-November 2022 during the city's widest COVID-19 lockdown since early 2020.

Results: From September 2021 to December 2022, 775 MSM were enrolled and initiated PrEP. Overall, 57 (8.6%) dropped out, including 4 adverse events and 1 HIV sero-conversion.

We detected significant between-city differences in PrEP and condom use habits at Month3 (n=520, 316 in Guangzhou, 204 in Wuhan): Compared to Guangzhou, participants in Wuhan reported lower rate of newly diagnosed STI since baseline assessment (2.4% vs. 8.9%, p=0.003) and higher prevalence of "never using condoms in sex" at Month 3 (8.3% vs. 3.5%, p=0.02).

Multivariate analyses indicated participants in Wuhan were more likely to choose mail-delivered PrEP (81.9% vs. 19.2%, aOR=18.5, 95%CI: 11.2-30.7) and on-demand dosing (72.5% vs. 24.6%, aOR=7.7, 95%CI: 4.7-12.8).

Month6 follow-up data (n=232, Guangzhou only) showed the prevalence of having sex under substance influence slightly decreased from baseline (57.8%) but remained common (48.7%) at Month6. Neither PrEP dosing strategies nor provision modes were not found significantly associated with the occurrence of new STIs, never using condoms in sex, or sex under the influence of substance over time.



Conclusions: Remote PrEP is highly promising in facilitating PrEP scale-up in China especially among individuals with limited healthcare during the "Zero-COVID" era, as overall study retention remained high with infrequent dropouts. Neither mail-delivered PrEP nor on-demand dosing was found significantly increasing risks of STIs or sex behavioral changes. Nevertheless, ongoing HIV/STIs testing among PrEP users remains critical in controlling the epidemic.

EPE1009

The effect of Covid-19 on HIV services at HIV-care clinics in Myanmar

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Background: The Covid-19 crisis has disrupted the continuity-of-care for people living with HIV (PLHIV) even in well-resourced countries, resulting in limited access to HIV services. PSI/Myanmar has been operating during that crisis period by providing HIV services through its partner clinics, Sun-Quality-Health Clinics (SQHC) and Lan-Pya-Kyel clinics (LPK) and implementing a contingency plan including online booking and awareness-raising, alternate staffing, and scheduling.

The purpose of this study was to compare ART-retention and viral load(VL)testing rates among PLHIV before and during the Covid-19 pandemic and to identify the factors that impact ART-retention and VL-testing.

Methods: Study compared ART-retention and VL-testing rates before and during Covid-19 using program data from 53 healthcare facilities (40 SQHC, 13 LPK) collected Dec 2018-June 2021. ART-retention was defined as being on ART at 6 and 12-month intervals. VL-testing defined as having at least one VL test within 12 months of ART. Bivariate and multivariate regression analysis were used to examine the relationships between ART-retention and VL-testing with client characteristics.

Results: The study found 8,665 HIV clients, with 5,380 (62.1%) enrolled before the Covid-19 crisis and 3,285 (37.9%) enrolled during the crisis. The ART-retention rate for those enrolled before the crisis was 94.1% at 6 months and 86.1% at 12 months, while for those enrolled during the crisis was 93.4% at 6 months and 66.3% at 12 months.

The VL-testing rate before the crisis was 49.4% but decreased to 19.5% during the crisis. ($p<0.001$). Multivariate analysis showed that factors positively impacting ART-retention were being from Yangon, being MSM, over 20 years old, on first-line ART, and having follow-up and on-line counseling services. Positive factors for VL-testing were being on Anti-TB, being MSM, and on second-line ART.

Conclusions: The study found that ART-retention and VL-testing among PLHIV were impacted during the Covid-19 crisis, with lower rates compared to before the crisis. Factors affecting these rates include demographics, ART substitution, Anti-TB treatment, clinic type, location, and client support system.

These findings stress the need for continued efforts to sustain HIV services and build a system that is resilient to the effects of the pandemic to improve PLHIV outcomes and address service delivery gaps.

EPE1010

Changes in HIV service utilization and care outcomes during the first year of the COVID-19 pandemic in Central Africa IeDEA sites

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Background: This study aimed to describe changes in HIV care engagement, antiretroviral therapy (ART) initiation, viral load monitoring (VLM) and viral suppression (VS) in Central Africa during the first year of the COVID-19 pandemic.

Methods: We used national COVID-19 policy data from Our World in Data and routine patient data from 21 clinics in Burundi, Cameroon, Democratic Republic of Congo, Congo and Rwanda for the Central Africa cohort of the International epidemiology Databases to Evaluate AIDS to examine HIV care outcomes during 12-month periods before and after each country's first COVID-19 containment policy.

We used descriptive statistics to compare characteristics of ART-naïve patients entering care in the pre-and post-COVID periods, and to assess changes in HIV outcomes of



interest, including mean time to ART initiation, same-day ART initiation on day of enrollment; VLM and VS at 6 and 12 months after ART initiation; and loss-to-follow-up (LTFU), defined as >6 months with no clinic visit/encounter for patients on ART for <6 months and >9 months for patients on ART for ≥6 months.

Results: 4,567 ART-naïve patients entered care in the 12 months before (46.9%) and after (53.1%) initial country-level COVID-19 containment policies were issued, with the majority from Rwanda (40%) and Cameroon (35%).

There was a small decrease in the proportion of male patients (62.1% vs 58.5%, $p=0.012$), but no change in the age distribution of patients or the proportion entering care with advanced HIV disease (CD4 <200 or WHO stage 3 or 4).

Mean time from enrollment to ART initiation decreased from 20.8 to 12.7 days ($p<.0001$), and same-day ART initiation increased (67.4% to 72.0%). 6-month VLM decreased (from 28.0% to 22.2%, $p<.0001$), with a smaller decrease in 12-month VLM (13.9% to 11.2%, $p=.005$). 6-month VS increased (91.0% to 96.0%, $p=.001$), with no change in 12-month VS, and no change in patient LTFU.

Conclusions: During the first year of the pandemic, timely ART initiation improved and there was no increase in patient LTFU. While 6- and 12-month VS remained high, VLM was suboptimal and worsened.

Further research on the pandemic's longer-term impacts on HIV service delivery and care outcomes is needed.

EPE1011

Implementation of person-centered strategies to improve reengagement in care in Mumbai, India

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Background: Mumbai has an estimated HIV prevalence of 0.34% and is a destination for migrants from all over India. With the COVID-19 pandemic and sequential lockdowns, many People Living with HIV (PLHIV) who migrated to Mumbai receded to their place of residence outside Mumbai, creating a challenge for Antiretroviral therapy (ART) continuity.

Methods: During March 2020, we pre-emptively generated list of PLHIV due for their pill-pick-up and reached out by phone to all PLHIV (N=38,577) from 20 ART centres in Mumbai. We developed e-transfer protocols facilitating ART pick-up for 'out' migrant clients accessing ART services at alternate location.

From July to December 2020, we rapidly established decentralized dispensation sites, ART home delivery, and drafted standard operation procedures for tracking and

tracing PLHIV from inter and intra-state locations. We defined Lost-to-follow-up (LFU) as no pill pick-up for >28 days from the last expected pick-up. We calculated the number of PLHIV returned to treatment [RTT: LFU during April-June 2020 and successfully restarted ART and remained on ART between Sept 2020 to 2022).

Results: From April to June 2020, we observed LFU rate of 11.7% (4,497/38,577) in Mumbai. The median age of LFU cohort (4,497) was 38 years, 60% (2,702) were males and 47% (2,114) migrants. Of the 78% (3,509/4,497) who RTT, 77% (n=2,701/3,509) were on ART for > 2 years prior to LFU.

With the implementation of multiple strategies 83% (2,908/3,509) of RTT returned within 6 months after LFU during peak COVID. The majority [57%, (564/988)] who could not return to treatment were on ART for <6 months prior to LFU.

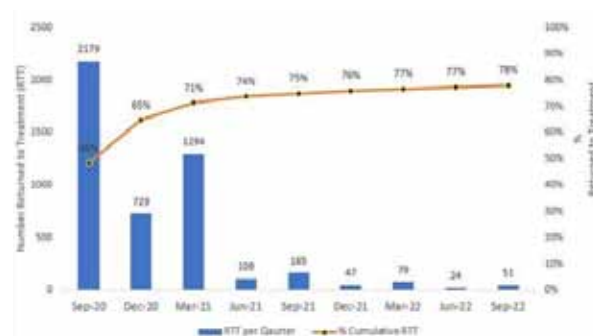


Figure 1. Outcome of implementing multiple person-centered strategies in ART centers on return to treatment among lost to follow-up patients by quarter, Mumbai (N= 4,497).

Conclusions: Through specialized tracking and tracing efforts in Mumbai serving higher migrants we observed high return to treatment during the first nine months and continued returns even after nine months of LFU.

OALBA0502

CD8 T cell counts negatively correlate with IL-15-mediated HIV reactivation *ex vivo*

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Background: The latent HIV reservoir remains the largest barrier to cure despite effective antiretroviral therapy (ART). Most assays measuring viral reactivation rely on stimulation of cells *ex vivo* with latency reversing agents (LRA) and quantification of viral RNA.

In this work we aimed to evaluate the ability of IL-15 to reactivate the translation-competent viral reservoir in CD4 T cells isolated from ART-suppressed people with HIV (PWH).

Methods: We optimized a novel assay to evaluate TRANslationally CompEtent viral Reservoirs (TRACER Assay) using a planar array ultrasensitive p24 Gag ELISA. We have previously shown that this assay can detect viral p24 at fg/ml in both supernatants and cell lysates (Levinger et al., *Scientific Reports*, 2021).

Using this assay, we evaluated the ability of IL-15 and α CD3/ α CD28 to reactivate the translation-competent viral reservoir in CD4T cells from 12 ART-suppressed participants and correlated viral reactivation with different markers of HIV persistence and other clinical characteristics.

Results: IL-15 and α CD3/ α CD28 both reactivated translationally competent virus in 9 out of 12 participants. In responders, viral reactivation by IL-15 when compared to unstimulated was an average of 14-fold (3.4-37.3) in supernatants ($p = 0.0039$) and 11-fold (0.83-84.4) in lysates ($p = 0.0078$). Viral reactivation by α CD3/ α CD28 was an average of 387-fold (1.05-724) in supernatants ($p = 0.0039$) and 302-fold (0.51-1758.3) in lysates ($p = 0.0078$). Levels of p24 induced by IL-15 and α CD3/ α CD28 were positively correlated between supernatants and lysates ($r = 0.79$, $p = 0.048$; $r = 0.69$, $p = 0.017$, respectively). No correlation was observed between reactivation of translationally competent virus by both stimuli and markers of persistence including total HIV DNA, integrated HIV DNA, TILDA, or HIV flow.

Interestingly, we observed a strong negative correlation between absolute CD8 counts and the ability of IL-15 to reactivate latent HIV ($r = -0.78$, $p = 0.0043$). This correlation was also observed with α CD3/ α CD28 albeit to a lesser degree ($r = -0.52$, $p = 0.089$).

Conclusions: We have developed a new assay to measure reactivation of translationally competent virus *ex vivo* from ART-suppressed PWH and have identified CD8 absolute levels as a potential response marker to the LRA activity of IL-15.

OALBA0503

Venetoclax, alone and in combination with the BH3-mimetic S63845, depletes HIV-1 latently infected cells and delays rebound in humanized mice

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Background: HIV-1 persists indefinitely in people living with HIV (PLWH) on antiretroviral therapy (ART) as a long-lived viral reservoir. Recent evidence suggests that the viral reservoir is resistant to cell death as a result of up-regulation of anti-apoptotic molecules including B-cell lymphoma (BCL)-2. BH3-mimetics, such as venetoclax and other compounds, are small-molecule therapeutics which lower the threshold for induction of intrinsic apoptosis by antagonising the function of Bcl-2 family pro-survival proteins.

Methods: We employed a humanized mouse model of latent HIV-1 infection, as well as CD4⁺ T cells from PLWH on ART collected by leukapheresis, to investigate whether antagonising host pro-survival proteins with clinically-relevant BH3-mimetics can preferentially prime latent cells to die and facilitate clearance of the viral reservoir.

We quantified the time to viral rebound in humanized mice following cessation of ART and changes in the viral reservoir using either integrated DNA or the intact proviral DNA assay (IPDA). We performed RNA sequencing on venetoclax-treated CD4⁺ T cells from PLWH on ART.

Results: Venetoclax, a clinically-approved inhibitor of Bcl-2, depleted total and intact HIV-1 DNA in CD4⁺ T cells from PLWH treated *ex vivo* in a dose-dependent manner (mean percentage decrease in intact DNA was 41.8% with 100 nM Venetoclax). Venetoclax induced higher rates of death in naïve and central memory T-cells, compared to other T-cell subsets. RNA-Seq analysis revealed that following



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venetoclax treatment *ex vivo*, cells with higher expression of transcripts of pro-apoptotic BH3-only proteins were over-represented. Venetoclax (dosed every weekday for 6 weeks) significantly delayed viral rebound following cessation of ART in a humanized mouse model of HIV-1 infection.

The combination of venetoclax (dosed every weekday for 3 weeks) with the Mcl-1 inhibitor S63845 achieved a longer delay in viral rebound compared to either intervention alone (median time to viral rebound was 3 weeks).

Conclusions: Selective inhibition of pro-survival proteins, including BCL-2 and MCL-1, can induce elimination of the viral reservoir and prolong time to viral rebound after cessation of ART in a mouse model. Given the well-established dosage and safety profile of venetoclax in humans as a licensed drug, rapid translation to a human clinical trial of venetoclax is warranted.

OALBA0504

Absence of viral rebound for 18 months without antiretrovirals after allogeneic hematopoietic stem cell transplantation with wild-type CCR5 donor cells to treat a biphenotypic sarcoma

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Background: Durable HIV-1 remission after antiretroviral treatment (ART) discontinuation has been reported for 5 individuals receiving allogeneic hematopoietic stem cell transplant (aHSCT) from CCR5Δ32 homozygous donors. We report here a Caucasian male (Icistem-34), diagnosed with HIV-1 in 1990 and on continuous suppressive-ART since 2005. In 2018, he received chemotherapy followed by aHSCT from an unrelated HLA-matched (9/10) wild-type CCR5 donor to treat a biphenotypic sarcoma. ART was discontinued in November 2021. His viral load has remained undetectable for 18 months so far.

Methods: Samples, pre-aHSCT, pre and/or post treatment interruption (TI), were analyzed for HIV RNA, HIV DNA, antiretrovirals, HIV-1 antibodies, NK and T cells phe-

notype, and HIV/CMV T-cell responses. Intact proviral DNA analyses (IPDA), tests of viral production by purified CD4+ T cells and their susceptibility to HIV were performed post-aHSCT.

Results: Ultrasensitive HIV RNA (4 copies/ml) and HIV DNA (457 and 1096 copies/million CD4 cells in blood and bone marrow) were detected before aHSCT. The virus was predicted R5. Full chimerism was achieved within a month post-aHSCT. Acute hepatic graft vs host diseases (GVHD) occurred soon after aHSCT, and was treated with corticosteroid/calcineurin inhibitor.

Chronic hepatic GVHD occurred 8m after aHSCT and was treated with ruxolitinib, which was transiently discontinued but had to be resumed due to GVHD relapse. Standard plasma viremia remained undetectable after aHSCT, ultrasensitive RNA dropped to undetectable values. Proviral DNA also decreased significantly, despite low levels (4 to 40 copies/million cells) being detected sporadically post-aHSCT, including defective but not intact HIV DNA by IPDA. No virus was amplified from in vitro stimulated CD4+ T cells post-TI. Cells remained susceptible to HIV-1 in vitro.

ART levels were undetectable post-TI except coinciding with two episodes of event-driven "PreP" (4 pills) at M2 and M12 post-TI. HIV-1 antibodies slightly declined since aHSCT. No HIV-specific T cell responses were detected post-TI.

Conclusions: We report an individual with HIV-1 who at 18m post-TI, 57m post-aHSCT with cells from a wild-type CCR5 donor, has no evidence of HIV-1 RNA rebound or replicating virus. These results suggest that HIV remission could be achieved in some cases in the context of aHSCT with wild-type CCR5.

OALBA0505

Anti-SIV Env RhmAbs +/- CD8a depletion and N-803 in ART-suppressed rhesus macaques leads to post-treatment control of viremia in a subset of animals

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Background: Building upon robust latency reversal seen after CD8a-depletion and IL-15 superagonist in SIV-infected, ART-suppressed rhesus macaques (RMs), here we combined these agents with four anti-SIV Env-specific

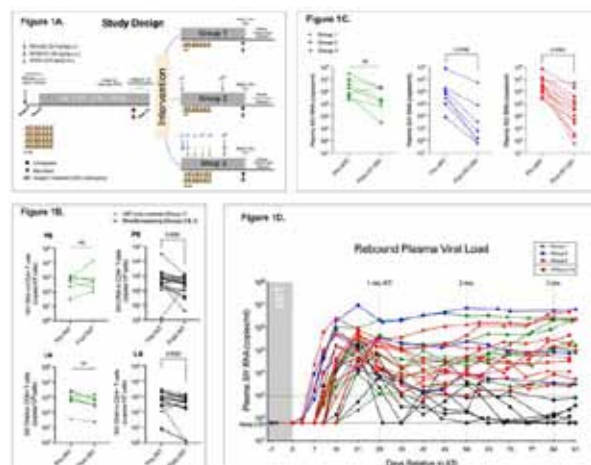
rhesus IgG₁ monoclonal antibodies (RhmAbs) with the goal to reduce reservoirs and/or modulate viral rebound dynamics after ART interruption.

Methods: 28 RMs were infected with SIV_{mac239i}; ART was initiated 8 weeks post-infection. Groups were assigned after 96-weeks on-ART: Group 1 (n=7): ART-only; Group 2 (n=7): ART+RhmAbs; Group 3 (n=14): ART+RhmAbs+CD8α-depletion+N-803 (Fig1A).

Analytical treatment interruption (ATI) of ART was initiated ~6 months post-2nd RhmAbs dose, when levels had declined below 1 mcg/ml in most RMs.

Results: Latency reversal (defined as on-ART viremia >60 copies/ml) was achieved in 11/14 Group 3 RMs versus 0/14 Group 1+2 RMs. Prior to ATI, all groups had similar levels of SIV-DNA in CD4+ T-cells from blood, lymph nodes and rectum; however, significant reduction from pre-intervention was seen only in RhmAb-receiving RMs (Fig1B). By ATI day 21, all RMs rebounded to >60 copies/ml with no intergroup difference in time-to-rebound.

Intragroup rebound setpoints 3 months post-ATI were significantly lower than pre-ART setpoints in Group 2 (p=0.03) and Group 3 (p<0.001), but not Group 1 (Fig1C). Post-treatment viral control (PTC, defined as ≥3 consecutive viral loads <10³ copies/ml) off-ART was observed in 4/7 Group 2 and 3/14 Group 3 RMs (Fig1D). No Group 1 RMs exhibited PTC. PTCers had lower peak viremia (p=0.02) and pre-ART viremia (p=0.01) versus non-PTCers, but similar levels of infected cells post-intervention. PTC was not associated with RhmAb concentrations.



Conclusions: Time-to-viral-rebound was not impacted by MT807R1+N-803+RhmAbs despite robust latency reversal and evidence of treatment response on infected cell level. PTC was observed only in RhmAb-receiving animals. Lower pre-ART viral loads in PTCers suggest SIV-RhmAbs may boost endogenous immune responses, giving rise to observed control of viremia off-ART.

Track B late-breaker

OALBB0502

A prospective, randomized trial to assess a protease inhibitor-based regimen switch strategy to manage integrase inhibitor-related weight gain

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Background: Integrase inhibitor (INI)-based antiretroviral (ARV) therapies are associated with greater weight gain than non-nucleoside reverse transcriptase inhibitor- or boosted protease inhibitor-based regimens, disproportionately affecting Black and Hispanic individuals and women.

There are no prospective, randomized data exploring the impact of switching ARV classes to mitigate or reverse ARV-related weight gain.

Methods: DEFINE (ClinicalTrials.gov: NCT04442737) is a randomized (1:1), prospective, 48-week, active-controlled, open-label, multicenter phase 4 study evaluating switching to darunavir/cobicistat/emtricitabine/tenofovir alafenamide (D/C/F/TAF) versus continuing INI+TAF/emtricitabine (FTC) in virologically-suppressed HIV-1-infected adults who had ≥10% weight gain while on the INI-based regimen.

The primary objective was to assess percent change in body weight from baseline to Week 24 in both arms. Data through Week 24 are reported.

Results: Overall, 103 adults were randomized to D/C/F/TAF (n=53) or continued INI+TAF/FTC (n=50); 30% were female and 61% were Black/African American (Table).

	D/C/F/TAF n=53	INI+TAF/FTC n=50	Total N=103
Age, years, median (range)	42.0 (22, 73)	49.0 (22, 69)	45.0 (22, 73)
Sex, n (%)			
Female	16 (30)	15 (30)	31 (30)
Male	37 (70)	35 (70)	72 (70)
Race, n (%)			
Black/African American	33 (62)	30 (60)	63 (61)
Non-Black/African American	20 (38)	20 (40)	40 (39)
Race/sex, n (%)			
Black/African American female	14 (26)	12 (24)	26 (25)
Black/African American male	19 (36)	18 (36)	37 (36)
Non-Black/African American female	2 (4)	3 (6)	5 (5)
Non-Black/African American male	18 (34)	17 (34)	35 (34)
Hispanic or Latino ethnicity, n (%)	6 (11)	10 (20)	16 (16)
BMI, kg/m ² , median (range)	31.4 (22, 61)	34.7 (22, 58)	32.7 (22, 61)
Weight, kg, median (range)	94.5 (69, 188)	102.9 (70, 188)	100.2 (69, 188)
Percent weight gain on current regimen at baseline, median (range)*	13 (-4, 56)	16 (-15, 86)	14 (-15, 86)
History of hypertension, n (%)	22 (42)	28 (56)	50 (49)
History of diabetes, n (%)	0	2 (4)	2 (2)
History of dyslipidemia, n (%)	11 (21)	16 (32)	27 (26)
Duration of virologic suppression on current INI+TAF/FTC regimen, months, median (range)	26.0 (5, 67)	27.0 (5, 69)	27.0 (5, 69)
Baseline CD4 ⁺ , cells/mm ³ , median (range)	696.0 (205, 1543)	622.5 (153, 2059)	680.0 (153, 2059)

BMI, body mass index; D/C/F/TAF, darunavir/cobicistat/emtricitabine/tenofovir alafenamide; FTC, emtricitabine; INI, integrase inhibitor; ITT, intent-to-treat; TAF, tenofovir alafenamide.

*One participant in the D/C/F/TAF arm did not have available data.

Table. Demographics and baseline characteristics (ITT set)



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At Week 24, there was no significant difference in percent change in body weight from baseline between the D/C/F/TAF and INI+TAF/FTC arms (*Figure 1A*). Most participants in each arm had body weight changes of $\pm 3\%$ and remained within baseline body mass index and waist circumference categories. Percent body weight changes for key subgroups are shown in *Figure 1B*. Switching to D/C/F/TAF was safe and well tolerated, and efficacy was maintained.

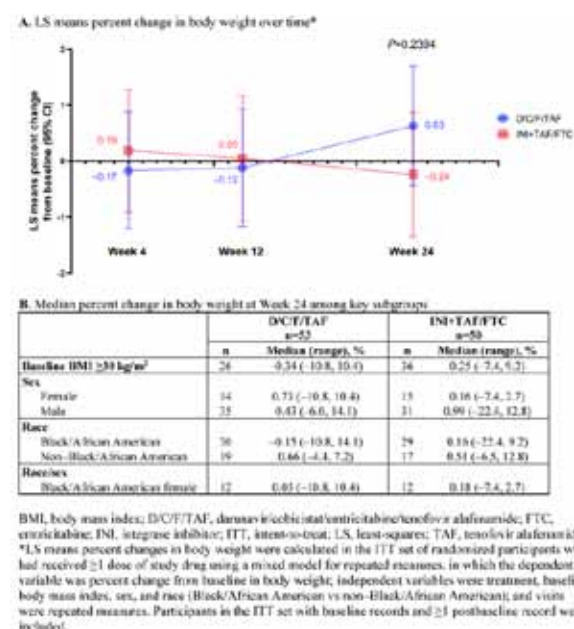


Figure 1. Percent change from baseline in body weight for participants who switched to D/C/F/TAF and those who continued their current INI+TAF/FTC regimen (ITT set).

Conclusions: There was no significant difference in weight change through 24 weeks after switching from an INI-based regimen to D/C/F/TAF in adults with INI-related weight gain. Additional analyses are ongoing, including follow up through Week 48 and evaluation of changes in biomarkers and body composition (DEXA).

OALBB0503

Increasing second-line antiretroviral therapy options for children with HIV in Africa: week-96 efficacy and safety results of the CHAPAS-4 randomised trial

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Background: There are limited options for second-line antiretroviral therapy (ART) for children with HIV. CHAPAS-4 (ISRCTN22964075) evaluated long-term outcomes for children starting second-line ART.

Methods: In this 2X4 factorial trial, children from Uganda, Zambia and Zimbabwe were randomised to second-line tenofovir alafenamide/emtricitabine (TAF/FTC) or standard-of-care (SOC) backbone (abacavir(ABC) or zidovudine (AZT) with lamivudine (3TC)) (randomisation 1) and to one of four anchor drugs: dolutegravir(DTG) or ritonavir-boosted darunavir(DRV/r), atazanavir(ATV/r) or lopinavir(LPV/r) (randomisation 2).

Primary endpoint was viral load (VL) <400 copies/mL at week-96. We hypothesised that TAF/FTC would be non-inferior to SOC (10% margin); ATV/r non-inferior to LPV/r (12% margin); DRV/r and DTG superior to LPV/r and ATV/r arms combined (superiority threshold $p \leq 0.03$; as multiple comparisons). Analysis was intention-to-treat, based on logistic regression.

Results: 919 children aged 3-15 years (54% male, median [IQR] viral load 17,573 copies/mL [5549, 55,700]; CD4 count 669 [413, 971]) switching NNRTI-based ART, were randomised and spent 98% of time on allocated regimen. At week-96, 406/454 (89.4%) on TAF/FTC vs 378/454 (83.3%) on SOC had VL <400 copies/mL (no evidence of difference between ABC and ZDV arms). For randomisation 2, 208/226 (92.0%) on DTG, 203/230 (88.3%) on DRV/r, 193/229 (84.3%) on ATV/r, 180/223 (80.7%) on LPV/r had VL <400 copies/mL. TAF/FTC was superior to SOC; DTG was superior to LPV/r and ATV/r; DRV/r showed a trend to superiority to LPV/r and ATV/r; ATV/r was non-inferior to LPV/r (Table). Results were similar for VL <60 copies/mL and <1000 copies/mL and at weeks 48 and 144. CD4 count improved in all arms. More grade 3/4 adverse events (AE), predominately


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hyperbilirubinemia, occurred ATV/r vs LPV/r ($p < 0.0001$); DTG had fewer AE vs LPV/r ($p = 0.02$). There was no evidence of excess weight-gain with DTG±TAF. Improvement in growth parameters were greater with TAF vs SOC; and with DTG, DRV/r and ATV/r vs LPV/r. Renal and bone health was similar between arms. One child died (treatment-unrelated); 3% had serious adverse events.

	<400c/ml difference (%) [95% CI]	p-value	<60c/ml: difference (%) [95% CI]	p-value
TAF vs SOC	6.3 [2.0, 10.6]	0.004	6.3 [1.0, 11.5]	0.02
ATV/r vs LPV/r	3.4 [-3.4, 10.2]	0.33	5.4 [-2.5, 13.2]	0.18
DRV/r vs LPV/r+ATV/r	5.6 [0.3, 11.0]	0.04	3.1 [-3.5, 9.8]	0.35
DTG vs LPV/r+ATV/r	9.7 [4.8, 14.5]	<0.0001	10.5 [4.4, 16.6]	0.0007

Table. Week 96 VL comparisons

Conclusions: TAF/FTC and DTG were virologically superior to SOC backbone and comparators (ATV/r, LPV/r) respectively, with excellent safety profiles. Child-friendly fixed-dose combinations of TAF/FTC(±DTG or boosted DRV or ATV) would increase access to safe, effective second-line ART options for children.

OALBB0504

Risks of hypertension with first-line dolutegravir (DTG) and tenofovir alafenamide (TAF) in the NAMSAL and ADVANCE trials

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Background: Hypertension is a leading cause of death in sub-Saharan Africa, with a high background prevalence in the general population. First-line use of TAF and DTG lead to higher risks of clinical obesity than tenofovir disoproxil fumarate (TDF) or efavirenz (EFV). Clinical obesity increases the risks of hypertension and other non-communicable diseases (NCDs).

Methods: In the NAMSAL trial, 613 PLWH in Cameroon were randomised to TDF/3TC/DTG or TDF/3TC/EFV (EFV low-dose). In the ADVANCE trial, 1053 PLWH in South Africa were randomised to TAF/FTC/DTG, TDF/FTC/DTG or TDF/FTC/EFV. In both trials, blood pressure was measured at every study visit. Grade 1 hypertension was defined as SBP/DBP >140/90 mmHg. In ADVANCE, all participants developing Grade 1 hypertension were given antihypertensives. In NAMSAL, <1% of participants were given anti-hypertensives, as funding was not available.

Results: In NAMSAL <1% of participants were treated with anti-hypertensive drugs. By Week 192, 31% of participants developed Grade 1 hypertension on TDF/FTC/DTG, versus 19% on TDF/3TC/EFV ($p = 0.002$). In multivariate analysis, Grade 1 hypertension was significantly correlated with use of DTG, age, sex and BMI ($p < 0.01$ for each comparison). In ADVANCE, 6% of participants were already being treated for hypertension at baseline, rising to 20% by Week 192. Treatment-emergent Grade 1 hypertension was diagnosed for 42/315 (13%) participants on TAF/FTC/DTG, 33/316 (10%) on TDF/FTC/DTG, and 25/314 (8%) taking TDF/FTC/EFV. The risk of Grade 1 hypertension was significantly higher for TAF/FTC/DTG versus TDF/FTC/EFV ($p = 0.04$). However, 94% of participants developing hypertension were given anti-hypertensives. By Week 192, there was no significant difference in mean SBP or Grade 1 hypertension between the arms.

Conclusions: In the NAMSAL and ADVANCE trials, first-line use of DTG was associated with significantly higher risks of treatment-emergent hypertension, especially when combined with TAF. In NAMSAL, where hypertension was not consistently treated, risks of hypertension remained higher for TDF/3TC/DTG through Week 192. However in ADVANCE, most cases of hypertension were successfully treated, and there was no significant difference between treatment arms by Week 192. Hypertension can be diagnosed and treated with low-cost generic drugs. Mass HIV treatment programmes need to include support and funding for diagnosis and treatment for hypertension and other NCDs.

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OALBB0505

Impact of INSTI and TAF-related BMI changes and risk on hypertension and dyslipidemia in RESPOND

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on behalf of the RESPOND study group

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Background: We determined whether change in body mass index (BMI) differentially increases the risk of hypertension or dyslipidaemia in people with HIV (PLWH) receiving integrase inhibitors (INSTI) and/or tenofovir alafenamide (TAF) compared to other contemporary regimens.

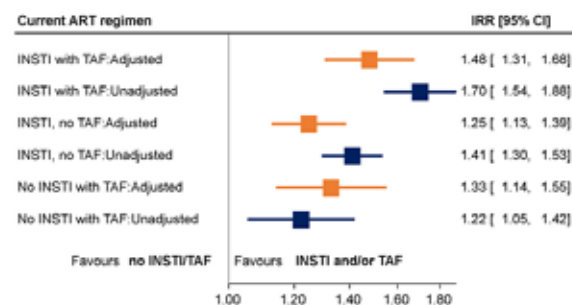
Methods: PLWH ≥ 18 years, receiving INSTIs (DTG, BIC, RAL, EVG/c), or contemporary non-INSTIs (DRV/b, ATV/b, EFV, RPV), with baseline and ≥ 2 follow-up BMI and lipid/blood pressure results were followed-up from the latest RESPOND or local cohort baseline date and censored at the earliest event date, last visit or 31/12/2021.

We used multivariate Poisson regression adjusted for time-updated BMI and confounder to determine the adjusted rate ratios (aIRR) of hypertension and dyslipidaemia by time-updated ART regimens and test for interaction between BMI and ART.

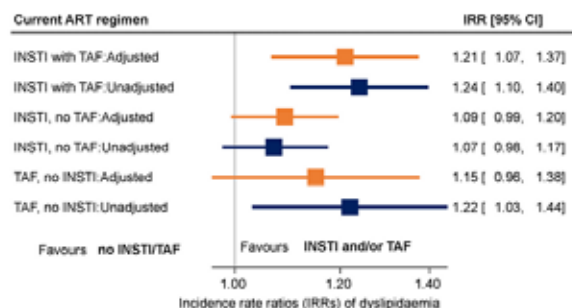
Results: Of the 9,704 participants without hypertension, 2977(30.7%) developed hypertension over 39993 person-years. In the unadjusted estimates, hypertension was more common with the use of INSTI with TAF or INSTI without TAF than ART without INSTI or TAF. Adjustment for time-updated BMI attenuated the risk with concurrent use of INSTI with TAF (aIRR 1.48 confidence intervals [CI], 1.31-1.68) or INSTI without TAF (1.25, 1.13-1.39) (Fig.1).

Of the 5231 participants included in the dyslipidaemia analysis, 2689(51.4%) developed events over 19547 person-years. In the unadjusted analysis, dyslipidaemia incidence was higher with concurrent use of TAF with INSTI or TAF alone.

Adjustment for BMI attenuated dyslipidaemia risk associated with receiving TAF with INSTI (aIRR 1.21, CI 1.07–1.37), while the risk associated with TAF alone became non-significant (1.15, 0.96–1.38). Hypertension and dyslipidaemia increased with increasing BMI, but the association was not different between regimens (interaction $P=0.459$ and 0.303 , respectively).



Panel 1A: Incidence rate ratios of hypertension by ART regimen (time-updated)



Panel 1B: Incidence rate ratios of dyslipidaemia by ART regimen (time-updated)

Figure 1: Adjusted and unadjusted incident rate ratios (IRRs) of hypertension (Panel A) and dyslipidemia (Panel B) in PLWH receiving combinations of INSTI with TAF versus those receiving contemporary regimens without INSTI or TAF.

Note: ART regimens fitted as current regimens. The multivariable model adjusted for time-updated BMI, baseline lipid and blood pressure values, age, ethnicity, sex, baseline calendar year, smoking status, baseline diabetes mellitus status, prior AIDS, cardiovascular disease, estimated glomerular filtration rate (eGFR), HIV RNA, CD4 counts, and baseline CD4 counts, duration since HIV diagnosis, and recent (six months before baseline) and cumulative exposure to potentially confounding ARVs that are not of primary interest [abacavir, nevirapine, didanosine, stavudine, zidovudine, zalcitabine, ritonavir]. INSTIs included dolutegravir, bictegravir, raltegravir and elvitegravir; while non-INSTIs included boosted atazanavir and darunavir, efavirenz and efavirenz.

Conclusions: In RESPOND, current use of INSTI or TAF and increases in BMI were associated with incident hypertension and dyslipidaemia. The relationship between BMI and hypertension or dyslipidaemia did not differ by ART regimen.

OALBC0602

Should social network testing be offered as an additional HIV testing approach? A GRADE systematic review and meta-analysis

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Background: Social network testing approaches (SNA) encourage individuals or 'seeds' to motivate sexual partners and/or those in their social networks who may benefit from HIV testing to test for HIV.

To inform the World Health Organisation Guidelines Development Group, we conducted a systematic review to guide recommendations regarding SNA as an additional testing approach for all populations.

Methods: We systematically searched five databases: Medline, Embase, Global Health, CINAHL and Web of Science, from Jan 2010 to July 2022. We included randomized controlled trials (RCT) and non-randomized studies (NRS) that compared SNA with non-SNA or that compared different types of SNA. We used random-effects meta-analysis to combine effect estimates of studies that shared similar interventions, control, and outcomes. Certainty was assessed using the GRADE approach.

Results: From 18,956 records, we included 43 unique studies: 11 studies for the effectiveness of SNA vs. non-SNA, 10 studies for the effectiveness of different types of SNA, four studies for resource use of SNA vs. non-SNA, three studies for resource use of different types of SNA, and 23 studies for the acceptability of SNA. Based on one RCT and four NRS with low certainty evidence, SNA may increase uptake of HIV testing services compared to non-SNA (Pooled RR 1.67, 95%CI:1.35–2.05, $I^2=99\%$).

Based on four NRS with moderate certainty evidence, the proportion of first-time testers was probably higher among partners or social contacts of seeds using SNA (compared to non-SNA) (Pooled RR 1.23, 95%CI:1.01–1.48, $I^2=97\%$).

Based on eight NRS with low certainty evidence, the proportion of people who tested positive for HIV may be higher among partners or social contacts of seeds using SNA (compared to non-SNA) (Pooled RR 2.28, 95% CI: 1.18–4.39, $I^2=95\%$).

High heterogeneity for these outcomes were mainly explained by population type and type of SNA.

Conclusions: SNA for HIV testing may be an effective, acceptable, and cost-effective approach to improve HIV testing in all populations. The type of SNA to implement should be based on the setting, epidemiology, client preferences and resources available.

SNA should be further scaled up to strengthen global efforts to end HIV as a public health threat by 2030.

OALBC0603

Acceptability of CAB-LA in cisgender female adolescents in South Africa, Uganda, and Zimbabwe (HPTN 084-01)

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Background: Initiation of and adherence to daily oral HIV pre-exposure prophylaxis (PrEP) has been low among African adolescent girls and young women (AGYW). Along with other sociocultural factors, PrEP uptake and adherence are a function of product acceptability. Understanding the acceptability barriers and facilitators faced by AGYW in regard to long-acting HIV prevention products is critical for successful implementation.

This qualitative analysis explored acceptability of long-acting injectable cabotegravir (CAB-LA) among cisgender adolescent females in South Africa, Uganda, and Zimbabwe.

Methods: The HPTN 084-01 study, which examined safety, tolerability and acceptability of CAB-LA among 55 adolescent cisgender females, included a qualitative component to better understand the participants' experiences with CAB-LA (2021-2022). In-depth qualitative interviews were conducted near the end of the product exposure period (Week 34 – after 5 injections) with 15 participants (5 per site) to explore issues of acceptability of CAB-LA injections, including negatives and positives associated with CAB-LA, as well as qualities of the injection itself. Participant interviews were deductively coded by five team members using NVivo 12 and representative memos were created via thematic analysis.

Results: Several major themes emerged regarding acceptability of CAB-LA injections. The needle size (1½ inch) and site of administration (gluteal muscle) were generally deemed acceptable by participants. Injection pain was the most reported barrier to acceptability, followed by injection site reactions and fear of the injection.

Despite this, positive overall experiences with injections were reported because of the lack of adherence challenges with bi-monthly injections as well as the discretion offered by CAB-LA in comparison to daily oral tablets.

In addition, familiarity with the mode of administration of CAB-LA emerged as a theme around CAB-LA and injectable contraceptives.



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Conclusions: In regard to HIV prevention products, the importance of choices is evident in the HPTN 084-01 data. While many participants reported a preference for CAB LA, and most (92%) chose to stay on CAB-LA during the open label extension (HPTN 084), some participants still preferred oral tablets for various reasons, including pain and fear of the injection. These barriers and facilitators should be discussed with future clients as part of the decision-making process around HIV prevention product choice.

OALBC0604

High in-hospital mortality in SARS-CoV-2 infected patients living with HIV during pre-Delta, Delta and Omicron variant waves: finding from the WHO Global Clinical Platform for COVID-19

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Background: There is limited data on the impact of SARS-CoV-2 variants on mortality among people living with HIV (PLHIV). We investigated changes in in-hospital mortality during the different SARS-CoV-2 variant waves.

Methods: **Method:** We analyzed individual-level data from the WHO Global Clinical Platform comprising 821,331 hospitalized children and adults from 42 countries. We used Cox regression to evaluate association of HIV co-infection with in-hospital mortality across SARS-CoV-2 pre-Delta, Delta and Omicron variant waves and to assess risk factors for mortality among PLHIV.

Results: PLHIV had a 54% (aHR 1.54, 95%CI 1.42-1.68) higher risk of death during the pre-Delta variant wave, 56% (aHR 1.56, 95%CI 1.40-1.74) during Delta variant wave and 142% (aHR 2.42, 95%CI 2.11-2.78) during Omicron variant wave compared to HIV negative populations, with the risk being higher among those with CD4 \leq 200 cells/mm³. While the mortality rate among HIV negative population declined from 21% (Delta wave) to 7.9% (Omicron wave), the reduction among PLHIV was only modest (from 25% to 18%). Reduction in mortality was even less apparent for PLHIV with CD4 $<$ 200 cells/mm³.

People with unknown HIV status also had a higher risk of death across the three waves. Common risk factors for mortality across the three SARS-COV-2 variant waves among PLHIV were severe/critical COVID-19 at admission and CD4 \leq 200 cells/mm³. PLHIV with at least one dose of COVID-19 vaccination had 39% (aHR 0.61, 95%CI 0.40-0.92)

lower risk of death during the Delta variant wave and 38% (aHR 0.62, 95%CI 0.45-0.85) during the Omicron variant wave compared to the unvaccinated.

Conclusions: While the mortality risk among HIV negative people decreased drastically in the omicron wave, only a modest reduction was observed in PLHIV, and especially in those with low CD4, resulting in a relatively greater hazard for PLHIV. The observed high risk of death among COVID-19 patients with unknown HIV status calls for the need to intensify HIV testing and treatment as PLHIV who are unaware of their serologic status may be at risk of worse outcomes during the pandemic.

These findings highlight the need to implement WHO guidelines recommending booster vaccine for populations most-at-risk of severe COVID-19 outcomes, including in PLHIV.

OALBC0605

An HIV Prevention model focused on key populations alone will not end HIV/AIDS in Thailand by 2030

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Background: Key populations (KP) are hidden drivers of the HIV epidemic. To facilitate achieving the 95:95:95 goals, Thailand implemented the Key Population-Led Health Services (KPLHS) model through community-based organisations (CBO) in 2015.

We examined trends in new HIV positive diagnoses in the Thai National Treatment program (NAP) after at least 1 year of KPLHS implementation.

Methods: The most recent voluntary counselling and testing (VCT) record of 14.5 million unique individuals with at least one VCT test result was matched with the National AIDS Program (NAP) database. Self-reported risk was used to categorise the individual as a KP member, a non-KP male or a non-KP female. Trends in the number of new cases per month were assessed with segmented time-series models. Three model segments corresponded to baseline (January 2008 to December 2014); a year lead-in for policy implementation (from January 2015), and post-implementation (January 2016 to July 2022).

Results: The policy increased case detection in all study groups during 2015 (Figure). In December 2014, KP accounted for 35/1756 (2%) new HIV cases, but increased to

482/2661 (18%) of new HIV cases in December 2015. From January 2016, new KP HIV case numbers increased by 2.8 (95%CI 1.7 to 3.9) per month, to 707/2013 (35%) of new HIV cases in July 2022. Non-KP females accounted for 614/1756 (45%) of new HIV cases in December 2014 and 798/2661 (30%) of new cases in December 2015. Non-KP female new HIV cases after January 2016 decreased by -3.8 (95%CI -4.8 to -2.9) cases per month, but accounted for 493/2013 (25%) of new HIV cases in July 2022.

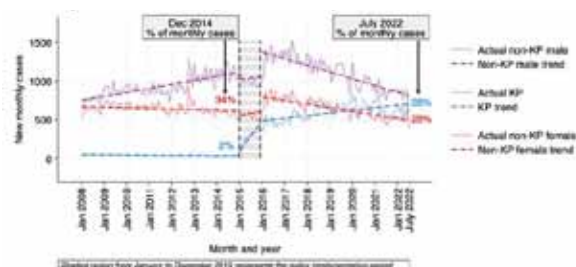


Figure. Segmented time series regression of monthly new HIV cases.

Conclusions: The KPLHS model though CBO has effectively improved testing and diagnosis in KP. However, non-KP women continue to account for a quarter of new cases. Policies to target these women are necessary to end AIDS.

Track D late-breaker

OALBD0602

"It was just the most horrible experience of my life" understanding social and care experiences during and after mpox illness: qualitative accounts of people diagnosed and close contacts in Australia

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Background: In May 2022, a global outbreak of mpox emerged, with a small number of mpox cases (n=144) identified in Australia. There is scarce qualitative research focused on understanding people's experiences of mpox illness and their interactions with healthcare services. This study sought to document in-depth qualitative accounts of the social, care, and health experiences of people directly affected by mpox.

Methods: Semi-structured interviews were conducted between October-December 2022 with 13 people diagnosed with mpox living in Australia, as well as 3 close contacts (household or sexual partners). 6-month follow-up interviews were conducted in April-May 2023 with 7 participants, providing 23 interviews. Interviews were deidentified and thematically analysed.

Results: All participants were gay or bisexual cisgender men. Most reported acquiring mpox overseas on holiday (n=11) in July or August 2022, and isolated or received care in Australia (n=8). Participants' experiences of mpox illness, diagnosis, care and recovery were highly distressing amidst the uncertainty of the outbreak, and severe symptoms and long isolation periods were difficult to manage. Physical symptoms were primarily confined to the acute illness period, including lesions, fever, and pain, but half of participants (n=7) reported longer-term social and physical sequelae from mpox, including continuing changes to sexual practices (avoiding sex), ongoing fatigue, psychological distress related to pain or clinical care, major scarring, and the need for corrective rectal surgery.



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Most participants diagnosed with mpox (n=10) reported dissatisfaction with clinical care, including challenging communication with contact tracers, perceived judgement about sexual behaviour, inadequate pain management, or stigmatising care in hospital. Participants expressed a desire for greater empathy from clinicians and contact tracers and more proactive pain management.

Conclusions: Participants' accounts portray negative healthcare experiences during an unfamiliar disease outbreak.

This study highlights potential vulnerabilities in health system capacity to provide culturally-appropriate care when responding to a disease that is linked to sexual practices, anogenital symptoms, and requires pain management. The potentially enduring aftereffects of mpox, including physical symptoms and healthcare-related distress, suggest a need for attention to follow-up care.

OALBD0603

Using client-centered models to sustain HIV service delivery to key populations in Uganda

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Background: On 21 March 2023, the Parliament of Uganda passed the Anti-Homosexuality Act (AHA) with overwhelming majority and re-approved a revised version on 2 May 2023. The AHA criminalizes homosexual behavior with sentences ranging from 10 years to the death penalty.

The hostile environment created with passing of AHA and the fear of law enforcement has led to reduced access to Key Population (KP)-friendly services.

Description: The President's Emergency Plan for AIDS Relief (PEPFAR) supports over 1.4 million Ugandans on HIV treatment. PEPFAR supports over 50 drop-in-centers (DIC) that provide HIV prevention and treatment services focusing on KP clients. Service delivery data from DICs is reported weekly and disaggregated by type of KP and services.

To protect client safety and confidentiality at the DICs, we de-identified the three DICs used in this analysis.

Lessons learned: The AHA discourse increased in the Ugandan media starting in January 2023. Weekly data show a steady decrease in KP client visits to the 3 DICs, with the lowest being when the first version of AHA was debated and approved in the Parliament. PEPFAR instituted measures in early March, some of which are below:

- Home delivery of anti-retroviral therapy (ART), and prevention products like condoms and Pre-Exposure Prophylaxis (PrEP)
- Reinforcing safety measures at DICs
- Scaling up multi-month dispensing (MMD) for eligible clients

- Employing paralegal peers to offer legal support for KP clients

These supportive measures led to a resumption of KP clients accessing HIV services at these 3 DICs by April (Figure 1).



Figure 1. Weekly cumulative KP service delivery visits at 3 DICs.

Conclusions/Next steps: The AHA is not a law yet but shows significant negative consequences on access to HIV services. While these 3 DICs show that PEPFAR programs can rapidly implement supportive measures, over 20 DICs have not seen a resurgence of KP clients despite interventions. Punitive laws against KP have the potential to derail HIV epidemic control.

OALBD0604

Bespoke strategies for coping with addiction and HIV during and after COVID-19 crisis by prisoners with comorbid HIV and a history of opioid use disorder in Kyrgyzstan

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Background: A third of 10,500-prisoner population in Kyrgyzstan, a low-income Central Asian country, have a history of opioid use disorder (OUD), and 70% have injected drugs within-prison. Since June 2020, strict 18-month Covid-19 lockdown disrupted heroin-smuggling channels into prisons. We examined how prisoners with OUD managed their addiction during the lockdown.

Methods: From Nov/22-Jan 2023 using a semi-structured guide we interviewed twenty prisoners with HIV and OUD from two male medium security prisons near Bishkek. Audio-recorded interviews asked participants about physical and mental health, methadone maintenance treatment (MMT) and HIV care uptake during and after Covid-19 lockdown, and how prisoners managed their addiction and withdrawal symptoms in the absence of heroin.

Transcripts were analyzed using NVivo qualitative management software by three researchers. Texts were coded using an inductively developed codebook for both explicit and latent meanings. Codes were aggregated into broader themes, with quotes exemplifying each theme.

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Per agreement with the Republican Penitentiary Service researchers were not obligated to report individual risky behavior but shared recommendations for future service improvement.

Results: Covid-19 lockdown blocked heroin procurement channels for prisoners with OUD, causing withdrawal experiences and anxiety about impending withdrawal symptoms.

Heroin shortages caused restructuring of within-prison gang hierarchies, increasing financial pressures on the peripheral members. Consequently, prisoners with OUD developed make-shift strategies for managing their addiction in the context of the crisis.

Common strategies to alleviate withdrawal symptoms involved using alternative substances, abusing pharmacy-purchased medications, and drinking alcohol that prisoners made on site. Prisoners with HIV purposefully discontinued ART to provoke physical health worsening and be transferred to a prison hospital where links to the external heroin market were preserved during lockdown. Interestingly, despite availability of MMT programs, prisoners were reluctant to join them despite suffering withdrawal symptoms due to stigmatization of MMT by prison sub-culture.

Conclusions: Covid-19 lockdown disrupted heroin market access, and prisoners' coping with opioid withdrawal compromised their HIV care and prevention. Despite heroin shortages, MMT uptake did not increase in prisons during the lockdowns due to stigma.

Covid-19 crisis learnings suggest co-production of interventions by researchers, prisoner participants, and clinicians to manage withdrawal (and overdose) among prisoners.

OALBD0605

Moral trauma among health professionals providing HIV services in Mozambique: preliminary results of a qualitative study

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Background: Provider burnout and HIV-related stigma is an urgent, and frequently interconnected problem globally. In sub-Saharan Africa, health professionals often deliver care in under-resourced facilities to clients who lack the financial resources, social support, and/or understanding to fully adhere to medications. This confluence

of challenges can lead to provider frustration, burnout, and moral trauma, resulting in poor care provision and client dissatisfaction.

This study assessed factors influencing burnout and stigma among health professionals in Zambézia Province, Mozambique.

Methods: We conducted a qualitative study employing in-depth interviews among health professionals providing HIV services in four health facilities, in Zambézia Province, between November 2022 and January 2023.

A semi-structured interview guide probed potential factors impacting professional burnout, stigmatizing attitudes and behaviors, and suggestions for improving the well-being of health professionals. Thematic analysis was performed.

Results: Forty-eight health professionals were interviewed, 23 (48%) men; median age was 30 years (IQR 27-37); 23 (48%) were clinicians, 9 (19%) lab/pharmacy technicians, 14 (29%) counselors/peer educators, 14 (4%) non-clinicians.

Health professionals choose a career in the health sector wanting to help people, but stated that lack of materials, medicines, staff, support from their superiors, low salary, and attending clients deemed as difficult were factors causing frustration and burnout. They usually deal with frustrations through conversation with friends/family or taking a break from the clinic between client attendance. Defaulting persons, those complaining about their care, men, adolescents and educated persons were reported as those causing most frustration. The respondents felt that seeing individuals' improvement, positive interactions with clients and colleagues and clients following recommendations, are factors contributing to their job satisfaction.

For the improvement of their well-being, respondents suggested psychological support for health professionals, off-site trainings/workshops, improvement of infrastructure of health facilities, more staff, and salary increase.

Conclusions: Working with persons attending HIV services deemed as difficult, lacking support and limited resources (staff, medicines, materials) influence burnout and frustration of health professionals providing HIV services in Zambézia Province.

Providing psychosocial support for health professionals, trainings on effective communication and coping with frustrations should be explored to improve their well-being, and to ensure provision of quality services for HIV care.

OALBE0602

e-PrEP: Enabling an all-virtual, community-led and demedicalized PrEP service for men who have sex with men (MSM) in the Philippines

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Background: Since its introduction in 2017, the uptake of PrEP in the Philippines has reached >10,000 individuals. With the rate of HIV transmission experienced by the country, other models to effectively roll-out PrEP are urgently needed. Barriers in PrEP uptake include challenges to service access, further highlighted by limited mobility caused by COVID-19.

Here we introduce an all-virtual, community-led PrEP program for MSM using a demedicalized approach.

Description: MSM clients who reported HIV-negative in an online unassisted HIV self-testing program were offered their interest in PrEP. A blood-based self-test kit is sent to their delivery address, and are guided with instructions-for-use and result reporting. Once marked HIV non-reactive, a self-assessment tool is sent to determine their sexual behavior and the presence of the following: acute retroviral syndrome, kidney-related morbidity, and supplementation. These information are then validated by trained community peers, and are provided PrEP information and counseling via telemedicine. Once assessed and marked eligible, the client is sent one PrEP bottle, another self-test kit, and a QR code for their refill instructions delivered via courier within 3 days.

For follow-ups, the client uses the received self-test kit and reports the results. Once marked HIV non-reactive, the client is sent one self-test kit with PrEP bottles relative to the number of their visit. The demedicalized process is detailed in Figure 1.



Figure 1. Updated PrEP process flow as of April 2022.

Lessons learned: Between August and April 2023, 230 clients were initiated with PrEP, which translates to 10.44% (of 2203 clients) who reported HIV-negative via the all-

virtual HIV self-testing process. 100 clients (43.48%) have completed their first monthly visit, with 92 clients reported taking PrEP daily.

Conclusions/Next steps: This program provides evidence that an all-virtual, community-led and demedicalized PrEP approach integrated with unassisted HIV self-testing is possible. Further demand-generation and other of-line-based key-population-friendly activities will be done to increase awareness and enable access to more clients.

OALBE0603

Costs and cost-effectiveness of immediate initiation of antiretroviral therapy upon diagnosis of HIV (Rapid Start) in the United States

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Background: Immediate initiation of antiretroviral therapy (ART) upon diagnosis of HIV (Rapid Start) results in better viral suppression and retention in HIV care. Cicatelli Associates Inc. (CAI) was funded by the Health Resources and Services Administration's HIV/AIDS Bureau, Special Projects of National Significance for the Rapid Antiretroviral Dissemination Assistance Provider (DAP) project from 2020-2023.

In partnership with the University of California, Los Angeles (UCLA), we estimated the cost-per-person of Rapid Start and modeled the potential cost-effectiveness of Rapid Start services.

Methods: We worked with seven established Rapid Start provider sites in the United States from 7/2022-2/2023 to estimate costs associated with initiation of ART and follow-up through eight weeks:

1. During the year prior to implementation of Rapid Start;
2. The first year of implementation; and
3. During a year of sustained implementation.

Effort and resources (i.e., personnel, recurring goods and services) were recorded in standardized Excel workbooks to estimate cost-per-person each year. Provider sites reported information on the number of people who initiated ART each year. Quality-adjusted life-years (QALYs) gained during Rapid Start implementation were modeled based on ongoing and published research.

We report information on the additional cost-per-person who received Rapid Start services and the incremental cost-per-QALY gained during the first year of implementation and during sustained implementation relative to the year prior to implementation of Rapid Start.

Results: Median additional cost-per-person of Rapid Start was \$98 (range=cost saving to \$13,250) during the first year of implementation and \$46 (range=cost saving


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to \$12,737) during sustained implementation. Costs were lower in sites with more concentrated clinical teams, more established support service programs, and larger increases in the number of people who initiated ART. Within the six organizations that experienced increases in the number of people who initiated ART, the median incremental cost-per-QALY gained was \$3971 (range=cost saving to \$52,915) during the first year of implementation and \$2492 (range=cost saving to \$46,578) during sustained implementation.

Conclusions: Rapid Start programs were reasonably inexpensive to implement and uniformly cost-effective or cost saving both during initial and sustained implementation. These programs have the potential to improve clinical outcomes and onward transmission of HIV.

OALBE0604

Feasibility and acceptability of delivering event driven PrEP (9ED-PrEP) to prevent HIV among MSM: a pilot project in Harare, Zimbabwe

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Background: Zimbabwe has made significant progress towards HIV epidemic control, with a 70% reduction in new HIV infections since 2010. However, key populations (KPs), including men who have sex with men (MSM) continue to contribute a significant proportion of new HIV infections relative to their population size. Oral Pre-exposure prophylaxis (PrEP), which is highly effective in reducing the risk of HIV infection, is recommended for all people at substantial risk in Zimbabwe.

Following the guidance from WHO, we implemented a pilot project. This intervention was to assess the feasibility and acceptability of delivering event driven PrEP (ED-PrEP) to prevent HIV among MSM in Harare, Zimbabwe

Methods: A cohort study was conducted from November 2022 to April 2023. Qualitative and quantitative data was collected to assess feasibility, acceptability, client and provider experiences and outcomes among clients testing HIV negative who were assessed for risk, counselled and offered a choice of daily oral PrEP (D-PrEP) or ED-PrEP.

Patterns of use and outcomes such as continuation on PrEP, incidence of sexually transmitted infections and adverse events were assessed by providers during the quarterly visits and by peers through mobile based platforms. Focus group discussions and in-depth interviews were conducted using a semi-structured questionnaire to explore experiences.

Results: A total of 196 MSM were initiated on PrEP in the six months of implementation (19 D-PrEP; 177 on ED-PrEP). At initiation, 60% (106) of the clients switched from D-PrEP to ED-PrEP citing infrequent events and reduction in pill burden whilst 10% switched back to D-PrEP citing unplanned events. Continuation was significantly higher among ED-PrEP users, 87.5% vs 12.5% at month 1 and 74% vs 26% at month 3. No adverse events were recorded; Forty-four percent (44%, 69) preferred ED-PrEP. Incidence of STIs was at 7% (13). No seroconversions were recorded.

Conclusions:

It is feasible to deliver ED-PrEP as an additional HIV prevention method for MSM. Clients can also switch from one method to another based on their prevention needs and preferences.

OALBE0605

Key population-led same-day antiretroviral therapy initiation hubs in Bangkok, Thailand: an evaluation of HIV cascade outcomes from a hybrid type 3 implementation-effectiveness trial

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Background: Approximately 20% of key populations (KPs), particularly men who have sex with men (MSM) and transgender women, diagnosed with HIV at community-based organizations (CBOs) in Bangkok, Thailand, experienced pre-antiretroviral therapy (ART) attrition. To bridge this gap, we pioneered the KP-led same-day ART initiation (SDART) hubs. This analysis evaluated the HIV cascade outcomes from ART initiation to viral suppression.

Methods: An implementation-effectiveness trial, guided by Proctor's Implementation Outcome Framework and Consolidated Framework for Implementation Research, was conducted at 2 CBOs in Bangkok.

The following pre-specified strategies facilitated the implementation process: developing multi-stakeholder partnerships, adapting SDART to CBO context, training KP lay providers, and using evaluative and iterative strategies. CBO clients were eligible for KP-led SDART if they were 13+ years, HIV-positive, ART-naïve, willing, and clinically ready.

Trained KP lay providers led counseling, laboratory testing, opportunistic infection screening, and ART dispensing under physician supervision primarily via telehealth. Participants were followed-up at 2-4 weeks after initiation,



referred to their long-term ART facility, and supported for 12 months by lay providers. Additional strategies, including care coordination between different providers and assisting participants with health system navigation, were enacted to enhance HIV outcomes.

Results: Between 8-Oct-2021 and 31-Mar-2023, 587 individuals enrolled in the study. The median (IQR) age was 25 (22-31), 72.1% were MSM, 7.3% were transgender women, and median (IQR) CD4 cell count was 384 (272-512). 585 (99.7%) accepted KP-led SDART; 97.9% (573/585) started ART in which 52.0% (298/573) started on the same day of HIV diagnosis at CBO and the median (IQR) ART initiation duration was 0 (0-1) day. 12 participants who did not start ART were referred to hospitals for clinical investigations, including for suspected tuberculosis (n=5), cryptococcal meningitis (n=2), and pneumocystis pneumonia (n=3). Among KP-led SDART participants who reached months 6 and 12, 87.0% (349/401) and 84.6% (115/136) remained in care, respectively. Of 210 participants who tested viral load, 94.2% had viral load <50 copies/mL.

Conclusions: Task-shifting ART initiation to trained KP lay providers can promptly link healthy KPs to care with high retention and viral suppression. KP-led SDART should be scaled up nationally to accelerate the end of AIDS epidemic in Thailand.

Co-Chairs' Choice

OALBX0102

Doravirine/Islatravir (100mg/0.75mg) once daily compared to bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) as Initial HIV-1 treatment: 48 week results from a double-blind phase 3 trial

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Background: Doravirine (DOR), an approved NNRTI, and Islatravir (ISL), an investigational nucleoside reverse transcriptase translocation inhibitor (NRTTI), have complementary mechanisms of action and resistance profiles. In virologically suppressed adults, switching to DOR/ISL (100mg/0.75mg) was non-inferior to continuing prior antiretroviral regimens. We report week 48 results from a double-blind non-inferiority trial (NCT04233879) evaluating initial HIV-1 treatment with DOR/ISL (100mg/0.75mg) compared to B/F/TAF.

Methods: Antiretroviral treatment-naïve adults with HIV-1 were randomized (1:1) to once-daily oral DOR/ISL (100mg/0.75mg) or B/F/TAF, stratified by screening CD4 count (</≥200 cells/mm³) and HIV-1 RNA (≤/ >100,000 copies/mL).

The primary efficacy endpoint was HIV-1 RNA <50 copies/mL at week 48 (FDA Snapshot approach, non-inferiority margin 10%, planned N=680). Due to exposure-related reductions in CD4+ T-cells and total lymphocytes, enrollment was closed before full accrual.

Results: Of 599 randomized participants, 597 were treated with DOR/ISL (n=298) or B/F/TAF (n=299); mean age 35.2 years, 25% female, 29% Black, 20% had pre-treatment CD4 count <200 cells/mm³ and 19% had pre-treatment HIV-1 RNA >100,000 copies/mL. At week 48, 88.9% receiving DOR/ISL and 88.3% receiving B/F/TAF had HIV-1 RNA <50 copies/mL. Virologic failure (2 consecutive HIV-1 RNA ≥200 copies/mL) occurred in one DOR/ISL participant (with acquired resistance-associated mutations to DOR, due to non-adherence) and 4 B/F/TAF participants.



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Mean increase from baseline in CD4+ T-cell count was 182 cells/mm³ for DOR/ISL and 234 cells/mm³ for B/F/TAF. The treatment groups had similar mean weight gain (table) and similar rates of drug-related adverse events (AEs) and infection-related AEs (Table).

Discontinuation due to AE was higher for DOR/ISL (7.4% vs 3.3%) due to protocol-required discontinuations for decreased CD4 or total lymphocyte counts.

Virologic Outcomes, n (%) ^a	DOR/ISL N=296	B/F/TAF N=296	Treatment Difference (95% CI)
HIV-1 RNA < 50 copies/mL	265 (89.5)	264 (89.3)	0.6 (-4.5, 5.8)
HIV-1 RNA ≥ 50 copies/mL	7 (2.3)	13 (4.3)	
No virologic data in window	26 (8.7)	22 (7.4)	
CD4+ T-cell Count (cells/mm ³) ^b	N=293	N=293	
Baseline mean	391	392	
Week 48 mean	573	625	
Mean change from baseline (95% CI)	182 (162, 203)	234 (212, 255)	-50 (-79, -21)
Total lymphocyte count (10 ⁹ /L) ^b	N=293	N=294	
Baseline mean	1.71	1.79	
Week 48 mean	1.72	2.00	
Mean change from baseline (95% CI)	0.01 (-0.05, 0.07)	0.21 (0.13, 0.29)	n.p.s.
Adverse Events, n (%) ^c	N=296	N=296	
One or more adverse events	270 (90.9)	256 (86.3)	4.3 (-0.8, 9.6)
Drug-related adverse events	78 (26.2)	75 (25.3)	1.1 (-5.9, 8.1)
Serious adverse events	18 (6.0)	16 (5.4)	0.7 (-3.2, 4.6)
Serious & drug-related adverse events	0 (0.0)	2 (0.7)	-0.7 (-2.4, 0.0)
Deaths ^d	2 (0.7)	0 (0.0)	0.7 (-0.6, 2.4)
Discontinued due to adverse events	22 (7.4)	10 (3.3)	4.0 (0.4, 7.9)
Discontinued due to decreased CD4 or lymphocyte count	17 (5.7)	6 (2.0)	n.p.s.
Infection-related adverse events	162 (54.4)	153 (51.2)	n.p.s.
Weight (kg) ^e	N=270	N=268	
Mean change from baseline (95% CI)	3.45 (2.83, 4.06)	3.32 (2.68, 3.96)	0.15 (-0.71, 1.02)

Table. Selected efficacy and safety outcomes at week 48.

Conclusions: DOR/ISL (100mg/0.75mg) was non-inferior to B/F/TAF for initial treatment of HIV-1 and was generally well-tolerated. There were small treatment differences in CD4+ T-cell and lymphocyte count changes, with similar rates of infection-related AEs observed.

OALBX0103

A social network-based intervention increases HIV self-testing and linkage to health facilities among fishermen in Kenya

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Background: Engaging men in HIV prevention and treatment is crucial to ending the AIDS epidemic in sub-Saharan Africa, but many men are unaware of their serostatus

and highly-mobile men like Lake Victoria fishermen have particularly low uptake of prevention and treatment. We conducted a cluster randomized trial to determine if an HIV status-neutral, social network-based approach could improve testing and linkage outcomes among fishermen.

Methods: The Owete study (NCT04772469) mapped the male social networks of fishermen in three beach communities in Siaya, Kenya, and identified distinct social networks ("clusters") with a highly-connected, network-central man ("promoter") in each network. Clusters were randomized to an intervention group in which promoters were trained and offered (a) multiple HIV self-tests (HIVST) to distribute to cluster members, and (b) transport vouchers (US\$4) to encourage cluster members to link to HIV treatment or pre-exposure prophylaxis (PrEP).

In control clusters, promoters received HIV information and referral vouchers for free self-tests in nearby clinics, and encouraged to offer them to cluster members. We compared self-reported HIV testing in past three months among participants in intervention and control clusters at three-month follow-up visit, using a cluster-adjusted two-sample test of proportions. Participants with missing data were coded as failure unless known to be living with HIV (per health facility records). Secondary analyses examined testing via any modality (counselor or HIVST) and linkage to facility.

Results: A total of 934 men in 156 social network clusters were mapped. Of these, 733 completed baseline and 666 follow-up surveys, with 14 deaths due to study-unrelated causes. Participants' average age was 37 years; 78% were married, 22% in polygynous relationships.

Self-reported HIV testing via HIVST at three months was significantly higher in intervention clusters (60% vs. 10%, $p < 0.001$, intent-to-treat). HIV testing via any modality was also significantly higher in intervention clusters (47% vs. 27%, $p < 0.001$).

Following testing, linkage to facility for HIV treatment or PrEP was significantly higher in intervention clusters (70% vs. 17%, $p < 0.001$).

Conclusions: A social network-based, status-neutral intervention in Kenya improved men's HIV testing and linkage outcomes and is a promising way to engage hard-to-reach populations of men in prevention or treatment.

**OALBX0104****Sustained aviraemia in the absence of anti-retroviral therapy in male children following in utero vertical HIV transmission**

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Background: Case reports of post-treatment control of HIV in children initiating early combination antiretroviral therapy (cART) prompt the hypothesis that a subset of very-early treated children can achieve post-treatment control without additional interventions.

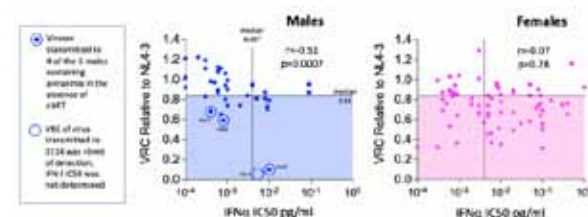
To test this, and identify underlying control mechanisms, we conducted a longitudinal study in KwaZulu-Natal, South Africa of 281 mother-child pairs monitored from delivery following *in utero* HIV transmission.

Methods: The study period was 2015-2023. All infants received ART at birth, and >92% of infants received cART prior to birth via placental transfer of maternal cART. ART adherence was monitored via plasma cART concentrations determined using liquid chromatography-tandem mass spectrometry (LC-MS/MS), maternal history, pill-counting and pharmacy records.

After generating chimeric *gag-protease*-NL4-3 viruses following viral RNA isolation and nested RT-PCR amplification of mother and child *gag-protease* from baseline plasma, type I interferon (IFN-I) sensitivity and replicative capacity of transmitted viruses were determined using the reporter cell lines U87-snLuc/EGFP and CEM-GXR, respectively.

Results: Maintenance of aviraemia was highly dependent on cART adherence, irrespective of infant baseline plasma viral load. Exceptionally, five males were identified in whom aviraemia was maintained (for >3m to >19m)

despite persistent cART non-adherence. By contrast, the majority (60%) of the cohort was female ($p=0.01$). Higher rates of *in utero* transmission to female fetuses was associated with female susceptibility to IFN-I resistant virus ($p<0.0001$) that tended to have low viral replication capacity ($p=0.0001$). While viruses transmitted to male fetuses overall were typically IFN-I sensitive and of higher replicative capacity, those transmitted to males maintaining aviraemia despite persistent cART non-adherence had low replicative capacity ($p<0.0001$; *Figure*: circled are the 4 baseline viruses from the 5 males that were analysed; all 4 were replication competent, in one case replication capacity was <LoD).



Conclusions: These data suggest that early-life innate immune sex differences contribute significantly to post-treatment control in children living with HIV.

OALBX0105**Socioeconomic support to improve completion of tuberculosis preventive therapy among adults starting HIV treatment in Tanzania: a quasi-cluster randomized trial**

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Background: Robust evidence shows that financial incentives for clinic attendance provided during the first months of antiretroviral therapy (ART) reduce loss to follow-up (LTFU). Given low rates of completion of isoniazid preventive therapy (IPT) for tuberculosis (TB) during the first months of ART, financial incentives may also improve IPT completion, especially when combined with additional support for individuals at highest risk of LTFU. This study evaluated whether an intervention comprised of financial incentives plus targeted peer counseling improved completion of IPT.

Methods: We conducted a quasi-cluster randomized trial (CRT) at 19 HIV primary care facilities in northwestern Tanzania: 16 control sites from a parallel CRT and three additional randomly selected intervention sites meeting the same eligibility criteria.



At each facility, clinic staff enrolled adults (≥ 18 years) who had recently initiated ART (≤ 30 days). Participants at control facilities received usual HIV care, while those at intervention facilities additionally received:

1. Digital financial incentives for monthly clinic attendance [22,500 TZS (US \$10)] for up to 6 months, plus;
2. Early pairing with a peer counselor for a subset of participants with high predicted LTFU risk, determined using a brief screening questionnaire at enrollment.

We compared receipt of the full 6-month course of IPT between intervention and control groups, measured via medication dispensing records, using generalized estimating equations clustered by facility.

Results: From May to November, 2021, we enrolled 1,018 participants (intervention $n=90$, control $n=928$). Participants were 58% female with a mean age of 37 years. Intervention facilities were smaller and more urban than the average control site, while individual-level characteristics were balanced between groups.

In the intervention group, 85 (94%) participants received at least one cash transfer (mean: 5.2) and 40 (44%) participants who met the screening threshold for higher LTFU risk were also paired with a community health worker for additional adherence counseling. At 6 months after starting ART, 67% of intervention participants versus 51% of control participants had received a full course of IPT (risk difference: 16.0, 95% CI: 2.3, 29.7).

Conclusions: These findings strengthen the case for providing short-term socioeconomic support to ART initiates, with potential benefit for TB prevention efforts.

Prevention science

OALBX0202

Positive Predictive Value of HIV Serological Tests in HPTN 084 Trial

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Background: HPTN 084 showed that injectable cabotegravir (CAB) is effective for PrEP in women. HIV diagnosis in the context of PrEP use may be complicated by both false negative and false positive tests results.

We evaluated the positive predictive value (PPV) of the HPTN 084 testing algorithm to guide HIV treatment initiation decisions in women on PrEP.

Methods: Site HIV testing included rapid tests (RT) and a lab-based antigen/antibody (Ag/Ab) test. Any reactive test prompted study product hold and further HIV status



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evaluation. Final HIV status was adjudicated based on study site test results and a centralized laboratory. PPV (95% confidence intervals [CI]) for initial site-based reactive visits were assessed for different testing algorithms compared to adjudicated results.

Results: Of 20 sites, 14 used two parallel RT and 6 used one RT. 3180 participants contributed 67314 HIV testing visits. Overall, 5% (162/3180) had 1 reactive test and 74/162 were adjudicated HIV positive by November 2022 (8 CAB, 66 TDF/FTC) while 86 participants did not acquire HIV. The PPV for any reactive RT or Ag/Ab test was 46% (CI: 38%, 54%). Two parallel reactive RT had a PPV of 100% (CI: 91%, 100%). Ora-quick Advance as a single test had high PPV (90%, CI: 78%, 97%). Ag/Ab testing detected 73/74 HIV diagnoses but had low PPV (54%, CI: 45%, 62%). PPV of all tests assessed was higher in those randomized to TDF/FTC compared to CAB (Table 1).

Rapid test (All types)	HIV-positive/ total reactive (CAB)	HIV-positive/ total reactive (TDF/FTC)	PPV (95% CI) (CAB)	PPV (95% CI) (TDF/FTC)	Difference in PPV (95% CI) (CAB vs. TDF/FTC)	Overall PPV (95% CI) (CAB and TDF/FTC)
Rapid Test (All types)	8/20	81/94	40% (19%, 64%)	86% (78%, 92%)	-46% (-72%, -21%)	78% (69%, 85%)
Alere Determine (3 rd gen)	4/12	36/44	33% (10%, 65%)	82% (67%, 92%)	-48% (-83%, -14%)	71% (58%, 83%)
OraQuick ADVANCE Rapid HIV-1/2 (3 rd gen)	4/5	40/44	Insufficient sample size	91% (78%, 97%)	Insufficient sample size	90% (78%, 97%)
Ag/Ab test	7/42	66/94	17% (7%, 31%)	70% (60%, 79%)	-54% (-70%, -37%)	54% (45%, 62%)
Two reactive rapid tests	4/4	36/36	Insufficient sample size	100% (90%, 100%)	Insufficient sample size	100% (91%, 100%)
Any reactive rapid or Ag/Ab test	8/55	66/107	15% (6%, 27%)	62% (52%, 71%)	-47% (-62%, -33%)	46% (38%, 54%)

Table 1. PPV for initial reactive visits with adjudicated HIV status (162 total, 74 confirmed positive) by treatment arm from HPTN 084

Conclusions: In this study, two reactive RT were sufficient to confirm HIV diagnosis and recommend treatment initiation. With a single reactive HIV test and high frequency of false positive testing, PrEP programs should anticipate the need for further testing, counseling about false positivity, and plans to resume PrEP after excluding HIV. More data is needed to determine if additional testing may be required in the setting of CAB.

OALBX0203

Initial PrEP product choice: results from the HPTN 084 open-label extension

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Background: HPTN 084 demonstrated that long-acting injectable cabotegravir (CAB) was superior to daily oral TDF/FTC for HIV prevention in individuals born female. In 2022, following a protocol amendment, eligible participants were offered the choice of open-label CAB or TDF/FTC as PrEP in an open-label extension (OLE).

Methods: In HPTN 084 participants who were eligible for (n=3028) and accepted OLE participation (n=2472), we assessed initial PrEP choice and reasons. We used the Decisional Conflict Scale to measure perceptions of effective decision-making (0=no conflict and 100=high decisional conflict). We compared participant demographic, behavioral and decision characteristics by initial product choice using chi-squared tests.



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Results: Of 2472 participants, 1931 (78%) chose CAB and 536 (22%) chose TDF/FTC. Among those initially randomized to TDF/FTC (n=1219), 817 (67%) chose CAB with 177 (15%) choosing the oral lead-in and 640 (53%) preferring direct-to-inject. Among those initially randomized to CAB (n=1253), 131 (11%) chose TDF/FTC. Participants who chose CAB (n=1931) preferred injections (77%), desired a convenient or discrete PrEP method (11%), valued CAB effectiveness (8%) or gave other/no reasons (4%). Those that chose TDF/FTC (n=536) preferred pills (81%), feared injection pain or side effects (5%), desired pregnancy (1%) or efficient clinic visits (1%), or gave no reason (12%).

Product choice varied by country ($p<0.001$). Participants who chose CAB were more likely to be sexually active but not live with partner ($p<0.025$), to have experienced recent physical intimate partner violence ($p<0.013$) and to have been paid for sex (0.002).

Although overall decision conflict scores were low and similar between groups (CAB 14; TDF/FTC16; $p=0.9$), effective decision sub-score differences suggest CAB users perceived more strongly that they had made a good decision (CAB 6; TDF/FTC 13; $p=0.011$). While most participants (66%) reported their choice was their own, discussions with study staff (20%) or family and friends (11%) were also influential.

Conclusions: The majority of HPTN 084 participants chose CAB for PrEP. Product choice was influenced by personal preference for product attributes, participant risk behaviours and social context. Future PrEP programs will need to adopt strategies that align user values and preferences with product choices.

OALBX0204

Racial disparities in HIV incidence and PrEP non-adherence among gay and other men who have sex with men (MSM) and transgender women (TGW) using oral PrEP in Brazil: ImPrEP Study

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Background: Access to healthcare can impact PrEP uptake, adherence, and persistence, especially among racial and ethnic minorities. Black Brazilians historically have worse health outcomes compared to white Brazilians. We evaluated HIV incidence and factors related to PrEP non-adherence among MSM and TGW from Brazil according to self-reported race.

Methods: ImPrEP was a prospective, single-arm, open-label, implementation study of same-day oral PrEP that enrolled 9509 MSM/TGW in Brazil, Mexico, and Peru (Feb/2018-June/2021). For this analysis, we used data from Brazil (n=3928 participants from 14 HIV/STI clinics in 11 cities). We

calculated HIV incidence per 100 person-years using the Poisson model for black, pardo (mixed-race), and white races. We created two logistic regression models (black/pardo and white) to identify factors associated with PrEP non-adherence (medication possession ratio (MPR)<0.6).

Results: From the 3928 enrolled, 47% were white, 36% pardo/mixed, and 15% black (Table 1).

	Total N = 3928 n (%)	White N = 1868 n (%)	Pardo N = 1410 n (%)	Black N = 650 n (%)	Indigenous N = 12 n (%)	Asian N = 42 n (%)
Gender						
Cisgender man	3733 (95.0)	1796 (96.1)	1312 (93.6)	574 (88.3)	11 (91.7)	40 (95.2)
Transgender woman	195 (5.0)	72 (3.9)	98 (7.0)	76 (11.7)	1 (8.3)	2 (4.8)
Age (Years)						
Median (IQR)	29 (24-35)	30 (25-36)	28 (23-34)	28 (24-34)	26 (23-30)	27.5 (23-35)
18-24	1013 (26.0)	389 (20.8)	443 (31.4)	182 (28.0)	5 (41.7)	14 (33.3)
25-30	1218 (31.0)	585 (31.2)	443 (31.4)	193 (29.4)	5 (41.7)	10 (23.8)
>30	1697 (42.7)	994 (53.0)	524 (37.2)	275 (42.6)	2 (16.7)	18 (42.9)
Education						
Primary (complete or incomplete)	52 (1.3)	18 (1.0)	21 (1.5)	12 (2.0)	1 (8.3)	0 (0.0)
Secondary (complete or incomplete)	778 (19.7)	274 (14.7)	344 (24.4)	144 (22.2)	3 (25.0)	10 (23.8)
More than secondary	3101 (78.9)	1576 (84.4)	1045 (74.1)	430 (65.8)	6 (50.0)	32 (76.2)
Number of sex partners¹						
Median (IQR)	5 (2-15)	5 (2-12)	5 (2-20)	5 (2-15)	8 (66.7)	4 (9.5)
<5	1813 (46.2)	842 (45.1)	650 (46.1)	293 (45.1)	4 (33.3)	24 (57.1)
5-10	968 (24.6)	529 (28.3)	295 (20.9)	135 (20.8)	4 (33.3)	5 (11.9)
>10	1147 (29.2)	497 (26.6)	465 (33.0)	167 (25.7)	4 (33.3)	13 (31.0)
Receptive CAS²						
Yes	2597 (66.1)	1265 (67.8)	962 (68.2)	357 (54.9)	9 (75.0)	24 (57.1)
No	1331 (33.9)	603 (32.2)	448 (31.8)	293 (45.1)	3 (25.0)	18 (42.9)
Transactional sex³						
Yes	207 (5.3)	133 (7.1)	185 (13.1)	79 (12.2)	4 (33.3)	5 (11.9)
No	3521 (89.7)	1735 (92.9)	1225 (86.9)	571 (87.8)	8 (66.7)	37 (88.1)
Binge drinking⁴						
Yes	2566 (65.3)	1174 (62.8)	919 (65.2)	390 (59.9)	11 (91.7)	32 (76.2)
No	1362 (34.7)	694 (37.2)	491 (34.8)	260 (40.1)	1 (8.3)	10 (23.8)
Stimulant use^{5,6}						
Yes	715 (18.2)	376 (20.1)	240 (17.0)	91 (14.0)	3 (25.0)	5 (11.9)
No	3213 (81.8)	1492 (80.0)	1170 (83.0)	559 (86.0)	9 (75.0)	37 (88.1)

¹Last 6 months; ²Intensified use was defined as use of any: club-drugs (e.g. ecstasy, LSD and GHB), cocaine (powder, crack, or paste), poppers or other inhalants.

Table 1. Characteristics of participants enrolled in the ImPrEP study, Brazil, according to race.

HIV incidence rate was higher among black individuals [2.16(CI95%0.54-8.63)] compared to pardo [1.49(CI95%0.48-4.62)] and white [1.00(CI95%0.25-4.01)]. Non-adherence was higher among black (26.2%) compared to pardo (24.2%) and white (18.7%) participants. TGW and young participants presented higher odds of PrEP non-adherence across all races. Among black/pardo participants, those with less education and transactional sex had higher odds of PrEP non-adherence (Figure 1).

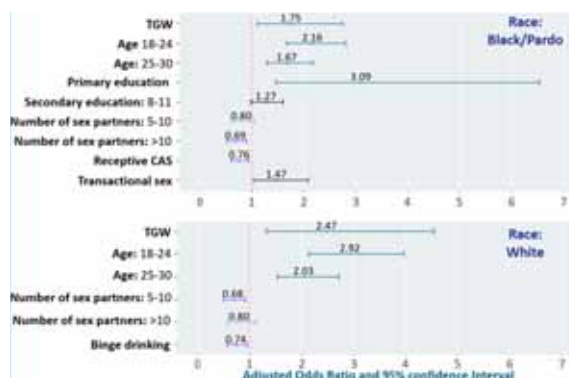


Figure 1. Factors associated with PrEP non-adherence measured by medication possession ratio (MPR) among black/pardo and white participants.

Conclusions: Higher HIV incidence and lower PrEP adherence among pardo and black individuals highlight race disparities and the impact of structural racism on health outcomes. The implementation of public policies to mitigate racial and social inequalities is urgent in Brazil, increasing equity in health access and promoting social justice.

**OALBX0205****Association of HIV pre-exposure prophylaxis (PrEP) use and bacterial sexually transmitted infections (bSTI) among men who have sex with men (MSM) and transgender women (TGW) in HVTN 704/HPTN 085**

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Background: HIV prevention trials enroll participants with high vulnerability to HIV and provide access to an enhanced HIV prevention package, including PrEP. HVTN 704/HPTN 085 was a randomized clinical trial evaluating VRC01 for HIV prevention in MSM and TGW in the Americas and Switzerland. We conducted a post-hoc analysis to characterize bSTI burden and evaluate the association of PrEP use with bSTI incidence among trial participants.

Methods: We included trial participants who received at least one VRC01/placebo infusion and had bSTI results from at least one bSTI visit (baseline and every 6 months). Participants received education about oral PrEP and could opt to use it. Prevalence of bSTI was summarized at each visit and categorized by socio-demographics, geographic region, and PrEP use (a time-varying covariate indicating self-reported PrEP use). We estimated incidence rates (for 100 person-years at risk [PYR]) of first bSTI occurrence among those who were negative at baseline, categorized by PrEP use. Cox proportional hazards models were used to evaluate the effect of PrEP use on bSTI incidence, additionally adjusted for age, region, race, ethnicity, and VRC01/placebo.

Results: The analysis included 2687 participants, of whom 31.8% initiated PrEP during follow-up. The table summarizes bSTI baseline prevalence by region and incidence rates by PrEP use. The baseline prevalence of any bSTI was highest among <20yo (35.7%), Hispanic/Latinx (32.4%), non-Black/non-Whites (32.1%), TGW (35.3%), and MSM (28.9%). Oropharyngeal (gonorrhea 6.5%) and rectal bSTI were more prevalent (chlamydia 9.0% and gonorrhea 5.8%) than genitourinary bSTI (chlamydia 3.0% and gonorrhea 0.9%) at baseline. PrEP use was significantly associated with increased hazard of any bSTI (HR 1.7, 95%CI 1.4-2.1), chlamydia (HR 1.7, 95%CI 1.3-2.2), gonorrhea (HR 1.8, 95%CI 1.4-2.5), and syphilis (HR 1.9, 95%CI 1.3-2.8).

bSTI	Baseline prevalence summarized by n/N (%)				Incidence rates for 100 PYR (95%CI)		
	Overall	Brazil	Peru	US/ Switzerland	Overall	While on PrEP	While not on PrEP
Any bSTI	749/2687 (27.9%)	55/150 (36.7%)	392/1124 (34.9%)	302/1413 (21.4%)	28.6 (26.4-31.0)	37.2 (33.0-41.8)	24.0 (21.5-26.7)
Chlamydia	297/2687 (11.1%)	11/150 (7.3%)	158/1124 (14.1%)	128/1413 (9.1%)	16.1 (14.5-17.8)	20.4 (17.5-23.7)	13.5 (11.7-15.5)
Gonorrhea	273/2687 (10.2%)	22/150 (14.7%)	151/1124 (13.4%)	100/1413 (7.1%)	12.2 (10.9-13.7)	16.2 (13.7-19.1)	9.9 (8.4-11.6)
Syphilis	353/2687 (13.1%)	34/150 (22.7%)	194/1124 (17.3%)	125/1413 (8.8%)	6.7 (5.7-7.8)	8.8 (7.0-11.0)	5.5 (4.4-6.8)

Conclusions: HVTN 704/HPTN 085 engaged communities with significant HIV/STI vulnerability. While on PrEP, users had higher rates of bSTI, suggesting risk compensation and underscoring the need for advancing bSTI testing and prevention measures in HIV prevention trials.

LBPEA01

Broad HIV-1 inhibition elicited by human data-driven HIVconsVX conserved T-cell vaccines vectored by ChAdOx1 and MVA in HIV-CORE 005.2: an open-label, non-randomized, dose-escalation, first-in-man phase 1 trial

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Background: HIV-1 vaccine is long overdue. While vaccine research focuses on induction of broadly neutralizing antibodies, challenging infections such as HIV-1 may require a parallel induction of protective cytotoxic T lymphocytes (CTL). Not all CTL are protective and effective vaccines will need to induce qualitatively superior CTL compared to those generated in natural HIV-1 infection.

Our aim is to contribute to an effective HIV-1 vaccine by developing a strategy for induction of protective CTL.

Methods: We use iterative improvements to T-cell vaccine immunogen design and delivery informed in part by pre-clinical studies but mainly driven by human data.

Our third-generation immunogen is designated HIVconsVX, focuses T cells on the most functionally conserved sub-protein regions shared by global HIV-1 variants, is computed as a bi-valent mosaic and is delivered by simian adenovirus vector ChAdOx1 and poxvirus MVA, a regimen proven potent in humans.

Here, we describe first-in-man (FIM), dose-escalation, open label trial HIV-CORE 005.2 in healthy, low risk HIV-1-negative individuals in the UK.

Results: Volunteer Group 1 (n=3) received a FIM low dose of vaccine ChAdOx1.tHIVconsV1 (C1) and the vaccine was judged safe and well tolerated. Group 2 (n=10) then received full dose of C1 on day 0 followed by vaccines MVA.tHIVconsV3 (M3) and MVA.tHIVconsV4 (M4) on day 28 in regimen C1-M3M4. Overall, all three vaccines were well tolerated with no SUSAR or SAE.

Local and systemic reactogenicities were consistent with intramuscular needle administration of immunogenic substances. The C1-M3M4 regimen was highly effective.

Vaccine-elicited T cells peaked at frequencies median (range) 4,432 (2,190-28,020) of IFN- γ SFU/10⁶ PBMC on day 35, which decreased 7.4-fold by day 140, recognizing 9 (7-10) peptide pools out of 10. T cells were capable of proliferation upon antigen re-exposure, displayed multiple effector functions and inhibited HIV-1 IMCs representative of four major global clades ABCD.

Conclusions: These data support a program of clinical evaluations in prevention and cure of the vaccine strategy alone and in combination with active induction or passive infusion of broadly neutralizing antibodies and/or drugs affecting HIV-1 latent reservoir, which will be presented.

LBPEA02

A rhesus macaque model of HIV/HBV co-infection

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Background: HIV/HBV co-infection is common due to similar routes of transmission, with an estimated 10% of HIV-infected individuals also infected with HBV. HIV/HBV co-infected individuals progress to chronic HBV infection more frequently and exhibit reduced HBV-specific T cell responses, with a higher probability of extensive liver fibrosis and hepatocellular carcinomas.

Thus, a greater understanding of the interplay between HIV and HBV infections is urgently needed to design strategies to prevent accelerated liver disease. Rhesus macaques (RM) are a well-established non-human primate model for HIV research, and we discovered recently that antibody-mediated CD4⁺ T cell depletion in RM leads to long-term, high-titer HBV replication.

In this study, we investigated the potential of inducing natural CD4⁺ T cell depletion via SHIV_{DH12 Clone 7} infection and using it to establish HIV/HBV co-infection in RM.

Methods: Animals were intravenously infected with SHIV_{DH12 Clone 7} (5x10³ TCID₅₀) followed by challenge with HBV (genotype D, 1x10⁹ virions, i.v) three weeks later. Weekly blood draws were taken to monitor HBV and SHIV infection, and track CD4⁺ T cells and HBV surface antigens (HBsAg). Liver biopsies were obtained monthly to quantify HBV replication in the liver by quantitative PCR.

Results: Preliminary studies showed successful CD4⁺ T cell depletion in two RM following SHIV infection. However, one RM controlled SHIV infection (Mamu-B*08*) and CD4⁺ T cells returned concurrent with clearance of HBV. The second RM exhibited SHIV (>10⁵ copies/ml) and HBV (>10⁴ copies/ml) chronic co-infection (>24 weeks). HBV infection was validated by the presence of HBsAg and HBV DNA in the serum and HBV RNA in the liver.

Based on the preliminary results, we repeated the study with nine additional animals and found that four exhibited a similar trend of co-infection.

Conclusions: These results indicate that SHIV-mediated CD4⁺ T cell depletion helps sustain HBV infection. Thus, we show for the first time an HIV/HBV co-infection model in RM that can be beneficial for studies investigating pathogenesis associated with co-infection; which will be critical for the further development of this model.





LBPEB01

Associations between antiretroviral regimen and changes in blood pressure: results from the D²EFT study

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Background: Within the large international randomised trial D²EFT, we assessed whether dolutegravir (DTG) containing regimens had significantly greater change in systolic and diastolic blood pressure (BP) over 48 weeks compared to non-DTG containing regimens.

Methods: D²EFT is a second-line antiretroviral (ARV) trial comparing a standard of care (SOC) arm of ritonavir boosted darunavir (DRV/r) plus 2 NRTIs to:

- DTG + DRV/r and;
- DTG with fixed tenofovir and lamivudine or emtricitabine (TDF/XTC).

Participants with systolic BP (SBP), diastolic BP (DBP) and body mass index (BMI) measurements available at baseline and Week 48, and without hypertension at baseline were included.

Multivariate linear regression analyses adjusted *a priori* for key baseline confounder variables, and additionally for BMI change, were used to assess the association of BP change with randomised arm.

Results: 621 of the 826 participants met the inclusion criteria (212/271, 212/294, 197/261 in DTG+DRV/r, DTG/TDF/XTC and SOC respectively). Mean age was 38 years, 56% female, and mean BMI 23.5. Mean baseline SBP/DBP was 114/74 in DTG+DRV/r, 115/75 in DTG/TDF/XTC, and 116/75 in SOC. At week 48 SBP increased by 6.73(SD: 13.32), 5.41(SD: 13.36) and 2.68(SD: 12.78), and DBP increased by 3.83(SD: 8.67), 3.03(SD: 9.90), and 1.36(SD: 8.77) in DTG+DRV/r, DTG/TDF/XTC and SOC respectively.

In multivariate analyses, DTG+DRV/r participants had statistically significant greater mean change in SBP which persisted even after additionally adjusting for BMI change (Fig1a). Comparing DTG/TDF/XTC to SOC mean change in SBP and DBP was higher but not statistically significant (Fig1b).

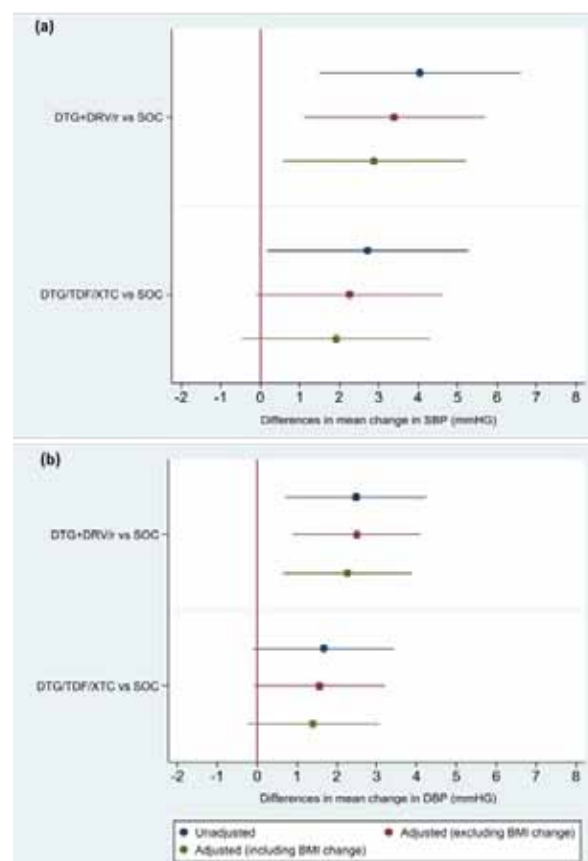


Figure 1. Mean change in (a) systolic and (b) diastolic BP. SOC: standard of care (DRV/r+2NRTI). BP: blood pressures. SBP: (systolic BP) and DBP (diastolic BP) adjusted for baseline covariates: age, sex, race, smoking status and SBP (for SBP change) and DBP (for DBP change); and +/- BMI change to week 48.

Conclusions: In this randomised trial of second line ARV, mean BP rose in both DTG-containing arms compared to SOC and was greatest in the dual arm of DTG+DRV/r. These differences persisted after adjusting for weight gain (DTG+DRV/r only).

The pathophysiology of BP change associated with ARV class requires further exploration given their widespread global use and associated CVD risk.



LBPEB02

Low HIV transmission among high-risk infants receiving post-natal prophylaxis in Botswana

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Background: The World Health Organization recommends nucleic acid amplification testing for HIV at birth. We present preliminary findings from birth and 6-week testing among high-risk newborns screened in Botswana.

Methods: At 35 delivery facilities, the Moso Study identifies newborns at highest risk of HIV acquisition. HIV screening is offered using the Cepheid Xpert® HIV-1 qualitative point-of-care platform with confirmation by Roche Taq-Man HIV-1 DNA PCR for those testing positive. Infants with negative birth tests are followed by telephone and subsequent HIV test results are abstracted from national electronic laboratory/medical records to assess uptake and results of government-provided 6-week testing.

Results: From July 2022–April 2023, 1057 high-risk newborns were screened at median 20 hours of life (range 0, 155 hours); 9 (0.9%) had confirmed HIV and started on ART at median 58 hours post-delivery (range: 33, 105 hours). Among those with negative birth testing, extended prophylaxis consisted of nevirapine/lamivudine/zidovudine in 534 (51.0%), zidovudine alone in 455 (43.4%), or no documented prophylaxis in 59 (5.6%) (Table 1); 341 (32.5%) were breastfeeding at discharge.

Vertical transmission risk factor	Infant post-natal prophylaxis regimen		
	Zidovudine Only	Zidovudine/Lamivudine/Nevirapine	None/Unknown
No<12 weeks on ART	27 (22.0)	83 (67.5)	13 (10.5)
Detectable maternal viral load	76 (46.9)	81 (50.0)	5 (3.1)
Maternal CD4 < 350 cells/mm ³	25 (71.4)	7 (20.0)	3 (8.6)
Self-described poor adherence	51 (49.5)	44 (42.7)	8 (7.8)
Tested positive during index pregnancy	149 (61.6)	75 (31.0)	18 (7.4)
Others	71 (27.7)	179 (70.0)	6 (2.3)
More than 1 risk factor	56 (44.1)	65 (51.2)	6 (4.7)

Table 1: Vertical transmission risk factors and infant post-natal prophylaxis regimen provided at 35 government delivery sites in Botswana from July 2022–April 2023

Of infants negative at birth who were beyond 10 weeks of age, 678 (80.4%) received government-recommended HIV DNA PCR testing at median 6 weeks (IQR 6, 7 weeks); 604

had available results at time of analysis and 1 (0.2%) was positive (on nevirapine/lamivudine/zidovudine). Of 165 yet to present for re-testing, 149 (90.3%) mothers/caregivers could not be reached, 1 (0.6%) mother died, 8 (4.8%) infants died, 7 (4.2%) had other reasons for not testing.

Conclusions: Point-of-care testing at birth identifies the majority of transmission events among high-risk infants, allowing for immediate ART initiation. Most infants with initial negative screens were re-tested at 6 weeks.

Preliminary Moso Study results suggest very low in-utero and intrapartum/early breastfeeding transmission rates in Botswana, without a discernable difference between post-natal prophylaxis regimens to date in this observational cohort.

LBPEB03

Combined "Test and Treat" campaigns for HIV, hepatitis B and hepatitis C: a systematic review to provide evidence to support WHO treatment guidelines

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Background: Over 38 million individuals are living with HIV, 296 million with chronic Hepatitis B (HBV) and 58 million with chronic Hepatitis C (HCV). Despite successful and cost-effective treatments for these blood-borne viruses (BBVs), over 1.7 million people die per annum. HIV testing is common practise in many countries; yet HBV and HCV screening is often neglected.

This systematic review aims to identify the prevalence of these BBVs, and discuss the cost-effectiveness of implementing combined testing and treatment programmes, to justify the need for triple testing on a global scale.

Methods: MEDLINE, Embase and Global Health were searched to identify papers published between 1/01/2013 and 24/02/2023. Included studies reported the prevalence of HIV (anti-HIV 1/2 antibodies), HBV (Hepatitis B surface antigen) and HCV (anti-HCV antibody).

Results were stratified into risk groups: blood donors, general population, healthcare attendees, homeless individuals, MSM, PWUD, pregnant women, prisoners, and refugees.

Results: 175 studies from 56 countries sampling over 14 million individuals were included. The mean prevalence of HIV, HBV and HCV was 3.12%(± 7.71%), 4.01%(±5.80%) and 6.70%(±14.64%) respectively. The mean number of individuals testing positive for at least one BBV was 11.83%(±16.86%).

Therefore, if combined testing was implemented globally, for every 3 individuals diagnosed with HIV, another 4 would be diagnosed with HBV and 7 with HCV.



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Sub-Population	Number of studies	HIV positivity (%) [95% CI]	HBV positivity (%) [95% CI]	HCV positivity (%) [95% CI]	Total single BBV prevalence (%) [95% CI]
Blood Donors	43	1.03 [±1.71]	2.61 [±3.51]	1.07 [±1.42]	4.42 [±5.50]
Pregnant Women	16	1.92 [±3.17]	3.30 [±4.02]	1.23 [±1.71]	6.17 [±6.14]
Healthcare Attendees	34	2.02 [±5.04]	3.25 [±6.38]	1.53 [±8.12]	7.07 [±10.31]
Immigrants, Refugees and Asylum Seekers	35	1.30 [±1.76]	5.11 [±4.04]	2.05 [±2.27]	8.24 [±5.61]
General Population	11	2.45 [±4.28]	3.96 [±3.48]	3.05 [±3.88]	9.46 [±8.64]
Prisoners	19	2.09 [±2.63]	3.18 [±3.17]	7.90 [±6.82]	12.83 [±6.76]
Homeless Individuals	4	3.58 [±2.11]	1.72 [±3.78]	21.72 [±8.68]	27.02 [±13.86]
MSM	4	25.75 [±30.45]	2.54 [±2.54]	3.32 [±2.15]	30.54 [±32.03]
PWUD	13	14.03 [±13.27]	10.78 [±13.21]	50.26 [±20.62]	55.36 [±23.03]
Total		3.12 [±7.71]	4.03 [±5.80]	6.70 [±4.44]	13.83 [±6.86]

Prevalence of HIV, HBV and HCV and the total testing positive for one BBV in included risk groups.

Conclusions: The cost of manufacturing this triple BBV test is \$1. Additionally, HIV can be treated for \$60/year using TDF/FTC+DTG, HBV for \$32/year using generic TDF and HCV can be cured for \$79 via generic Sof/Vel, thus providing a cost-effective package solution that could be implemented in the majority of countries. The results of this paper highlight the importance of expanding isolated HIV testing to combination test and treat programmes.

Track C: Epidemiology and prevention science

LBPEC01

Factors associated to incident sexually transmitted infections (STI) among men who have sex with men (MSM) and transgender women (TGW) on oral PrEP in Latin America: the ImPrEP study

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Background: Latin America holds a high burden of STI, disproportionately affecting MSM and TGW. Despite structural challenges to build a local response, regional expansion of PrEP programs would strengthen a combination prevention approach, including STI screening.

We aim to identify factors associated to STI diagnosis after PrEP initiation during the ImPrEP study.

Methods: ImPrEP was a prospective, single-arm, open-label study, enrolling 9,509 MSM/TGW from February 2018 to December 2020. Syphilis serology was collected quarterly, while rectal chlamydia and gonorrhea molecular detection was performed annually. Participants with no STI testing during follow-up were excluded.

The Cox proportional hazard model was used to identify factors associated with first diagnosis of any STI (p-value<=0.05).

Results: Of 7,624 participants [Brazil (n=3,478); Mexico (n=2,541); Peru (n=1605)], 2350 (30.8%) had at least one STI during follow-up.

Participants younger than 30 years, reporting prior post-exposure prophylaxis use, multiple sex partners (>=2), condomless receptive anal sex (both within 3 months prior to baseline), presenting adequate PrEP adherence (medication possession rate [MPR]>=0.6 within 3 months prior to STI diagnosis), and having any STI at baseline had higher odds of having an incident STI during follow-up. (Figure 1).

No substantial behavior change was observed after PrEP initiation (Table 1). During follow-up, 28.5% (n=670/2,350) had recurrent STI.



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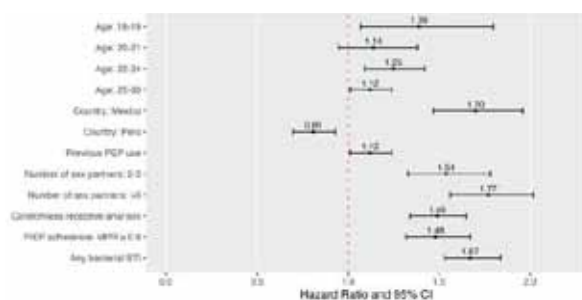


Figure 1. Factors associated to any STI diagnosis during ImPrEP study.

	At study entry	At the time of first STI diagnosis
Multiple sex partners in the last 3 months (≥ 2)	2,095 (89.15%)	1,991 (84.7%)
Condomless receptive anal sex	1,731 (73.7%)	1,037 (44.1%)
Use of stimulant drugs	502 (21.4%)	409 (17.4%)

Table 1. Behavioral characteristics of ImPrEP participants diagnosed with any STI ($n=2,350$)

Conclusions: High rates of STI among PrEP users underscore a need for tailored interventions, especially among young MSM/TGW. Our results suggest that PrEP users with incident STI were already highly vulnerable at the study's baseline, not configuring a risk compensation behavior after PrEP initiation. PrEP programs represent an unprecedented opportunity to expand STI screening, preventing further HIV and bacterial STI transmission. Our findings also contribute to identifying individuals who would benefit most from bacterial STI prophylaxis.

LBPEC02

Effectiveness of HIV self-testing when offered within assisted partner services in Western Kenya (APS-HIVST Study): a cluster randomized controlled trial

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Background: Assisted partner services (APS) is an effective strategy for increasing HIV testing, diagnosis, and linkage to care among sexual partners of people living with HIV. There is limited evidence for the effectiveness of offering HIV self-testing (HIVST) as an option for partner testing within APS.

Methods: We conducted a cluster randomized controlled trial comparing provider-delivered HIV testing (standard APS) versus offering partners the option to receive pro-

vider-delivered testing or HIVST (APS+HIVST) at 24 health facilities in western Kenya. Facilities were randomized on a 1:1 basis, stratified by county, APS performance, HIV testing volume, and urbanicity.

We conducted intent-to-treat analyses using Poisson generalized linear mixed models to estimate intervention impact on HIV testing uptake, new HIV diagnoses, and linkage to care (defined as enrollment at a HIV clinic).

All models accounted for clustering at the clinic level and new diagnoses and linkage models were adjusted for individual-level age, sex, and income a priori.

Results: From March-December 2021, 755 index clients received APS and named 5054 unique partners. Among these, 1408 partners reported a prior HIV diagnosis, were not eligible for HIV testing, and were excluded from analyses. Of the remaining 3646 partners, 96.9% were successfully contacted for APS and tested for HIV: 2111 (97.9%) of 2157 in the APS+HIVST arm versus 1422 (95.5%) of 1489 in the standard APS arm.

Overall, 16.7% of the 3533 who tested were newly diagnosed with HIV [standard APS=232/1422 (16.3%) versus APS+HIVST=357/2111 (16.9%)]. Of the 589 partners who were newly diagnosed, 90.7% were linked to care [standard APS=225/232 (97.0%); APS+HIVST=309/357 (86.6%)].

There were no significant differences between the two arms in HIV testing [relative risk (RR)=1.02, 95%CI=0.96-1.10], new HIV diagnoses [adjusted RR (aRR)=1.03, 95%CI=0.76-1.39], or linkage to care [aRR=0.88, 95%CI=0.74-1.06].

Conclusions: This APS program successfully reached and HIV tested >95% of elicited partners, and 1 in 6 of those tested was newly diagnosed with HIV, >90% of whom were linked to care.

There were no significant differences between the APS+HIVST arm and standard APS, demonstrating that integrating HIVST into APS is an effective strategy.

LBPEC03

Ethical issues regarding the implementation of doxycycline post-exposure prophylaxis

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Background: Doxycycline post-exposure prophylaxis (doxy-PEP) decreases the incidence of sexually transmitted diseases (STIs) among men who have sex with men (MSM) with recent STIs. If implemented effectively, doxy-PEP may decrease gonorrhea, chlamydia, and syphilis morbidity



and onward transmission. Current understanding of potential harms and benefits of doxy-PEP is based on short-term studies, yet there are unanswered questions about long-term effects on the microbiome and antimicrobial resistance, public health impact, and implementation. It is critical to identify and address the associated ethical issues as policies and guidelines for doxy-PEP are developed and implemented.

Description: Experts in ethics, STIs, public health and stakeholder engagement were convened by the US Centers for Disease Control and Prevention. Background presentations on doxy-PEP and ethics were followed by a moderated discussion to identify the associated ethical issues.

Lessons learned: Attention should be directed to the following categories of ethical issues:

1. *Uncertainty.* While doxy-PEP efficacy is high, there are unclear long-term risks for individuals and populations, including changes to the microbiome and antimicrobial resistance. The ethical principles of *beneficence*, *non-maleficence* and *utility* underscore the need to gather data regarding such long-term benefits and risks.
2. *Equity.* Justice requires doxy-PEP be equitably available to those disproportionately burdened by STIs despite challenges in fragmented health systems. Appropriate methods to ameliorate STI morbidity in cis-gender women and other populations must be developed.
3. *Different ideologies.* Promoting doxy-PEP may appear to counter antibiotic stewardship efforts, perhaps leading to confusion among providers and potential doxy-PEP users, thwarting its appropriate use. *Transparency* necessitates using clear messaging while additional data are collected.
4. *Shared decision making.* To respect *autonomous choice*, potential doxy-PEP users must have access to adequate and understandable information about efficacy, safety, long-term uncertainties, and alternatives to enable reflective decision-making.
5. *Engagement.* Meaningful stakeholder engagement is needed to *build and maintain trust*, and to identify relevant considerations for guideline development, equitable implementation and constructing appropriate messaging about doxy-PEP.

Conclusions/Next steps: The successful development of policies and guidelines for doxy-PEP implementation necessitates attending to the associated ethical issues. Implementation should also be monitored for other issues that might emerge.

Track D: Social and behavioural sciences

LBPED01

The VOICE practical guide to consensus-driven strategies for improving youth consent processes in HIV research in LMICs

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Background: Improving informed consent processes is essential to increase the participation of adolescents and young adults (AYA, age 10-24) in HIV research in low- and middle-income countries (LMICs). Using a multi-step consultative process, we developed a practical guide focused on actionable strategies to enhance informed consent among AYA in LMIC HIV research.

Methods: The VOICE (HIV Youth Informed Consent & Ethics in Research) project organized a scoping review, launched a global crowdsourcing open call for ideas, established a Working Group, and conducted an adapted Delphi process comprised of three online surveys and a hybrid consensus summit.

AYA joined the project governance as steering committee members and judging panelists, generated ideas as open-call participants, finalized the strategies for inclusion as consensus survey participants, and developed and refined the draft practical guide as VOICE Working Group members.

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Results: The multi-step consultative process resulted in a practical guide outlining 25 consensus-driven strategies for improving AYA consent in LMICs, organized into seven thematic groupings. In the short term, centering AYA perspectives in designing and implementing studies and meaningfully engaging them in the research process can improve AYA's participation in research. Parents and other adults should be invited as potential allies to adapt AYA informed consent processes, with consideration of the local cultural context.

In the long term, laws and institutional norms that constrain local informed consent by youth should be changed to reflect the wisdom, insights and needs of AYA. Policymakers and researchers should establish long-term community engagement plans with multiple stakeholders, including AYA.

In addition to these recommendations, the practical guide contains background information on AYA consent processes, open access resources from LMIC contexts, examples to provide guidance for implementing the strategies, and is accompanied by a youth-focused plain language summary.

Conclusions: AYA and other key stakeholders developed actionable strategies for adapting informed consent processes to be more relevant and culturally appropriate in LMIC settings. The VOICE Practical Guide can be used by HIV researchers seeking greater inclusion of AYA in HIV studies and provides direction for research ethics committees, AYA advocates, policymakers, funders, institutional officials, and others working to advance AYA HIV research in LMICs.

LBPED02

Sexualized and non-sexualized substance use among transgender women: prevalence, harms, and associated factors from the Tangerine Clinic Cohort in Bangkok, Thailand

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Background: Data on substance use among transgender women in Asia and globally are limited. We explored the substance use prevalence, including chemsex, assessed harms, and identified factors associated with substance use among transgender women in Thailand. Despite studies suggesting that the transgender populations have higher rates of chemsex, they are understudied.

Methods: Demographic, socioeconomic, behavioral risks, and clinical/laboratory data were retrieved from a cohort of the Tangerine Clinic, a transgender-led gender-affirming sexual health clinic in Bangkok, Thailand.

Transgender clients were categorized by substance use status in the past 3 months into sexualized substance (chemsex) users, non-sexualized substance users, and no use. Multinomial logistic regression was used to identify factors associated with chemsex and non-sexualized substance use.

Results: Of 1,683 transgender women attending the Tangerine Clinic from April 2021 to March 2023, 88 (5.2%) reported using substances, including amphetamine, cocaine, cannabis, sedatives, inhalants, hallucinogens, in the past 3 months and 34/88 (38.6%) reported having chemsex.

Sex work (aOR 6.50, 95%CI 3.10-13.66), PEP use (aOR 5.68, 95%CI 2.16-14.90), being HIV-positive (aOR 5.60, 95%CI 1.59-19.73), were associated with chemsex. Sex work (aOR 2.77, 95%CI 1.41-5.43) and age ≥ 25 (aOR 2.70, 95%CI 1.11-6.56) were associated with non-sexualized substance use.

Substance use leading to health, social, legal and/or financial problems was reported by 23.5% of chemsex vs. 5.6% ($p=0.020$) of non-sexualized substance users, failing to maintain routine activities was reported by 26.5% vs. 7.4% ($p=0.028$), and ever taking steps to decrease substance use was reported by 55.9% vs. 35.2% ($p=0.077$).

Conclusions: Around a quarter of Thai transgender women with recent chemsex experienced health, social, legal and/or financial problems due to substance use. Sex work is linked to both sexualized and non-sexualized substance use among transgender women.

Gender-affirming sexual health clinic for transgender women must integrate clinical, sexual, mental, social, legal harm reduction services, tailoring to substance use in sex work and use among those living with HIV.

Data on access to, and effectiveness of, these services should be collected and disseminated in the future in order to expand and scale up the evidenced-based, people-centered harm reduction services for transgender women.

**LBPED03****"Should I have my nose close to his?": perspectives on the effects of COVID-19 on clinical trial participation and HIV risk among women in HPTN 084**

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Background: HPTN 084 demonstrated that long-acting injectable cabotegravir (CAB) was superior to daily oral TDF/FTC for HIV prevention in women. Few studies have explored women's experiences in HIV prevention clinical trials during the COVID-19 pandemic.

This analysis seeks to assess how COVID-19 affected the participant experience within HPTN 084.

Methods: Between August 2020-December 2022, 73 HPTN 084 participants were enrolled into a qualitative sub-study conducted in Malawi, South Africa, Uganda, and Zimbabwe and interviewed at multiple timepoints using semi-structured guides regarding experiences using Oral and injectable PrEP, and the impact of COVID-19 on participant experiences within and outside of the trial. Interviews were transcribed and translated into English. Data were coded using NVivo Version 12 with intermittent interrater reliability checks. Memos were developed using a thematic approach.

Results: Participants in all countries complained of COVID-19's profound effects on work, including that of their partners, due to movement restrictions that directly affected their income.

During the first interview, most participants viewed COVID-19 as highly contagious and a potential "death warrant" but during follow-up interviews the majority accepted that "the virus is here to stay" and that they needed to live their normal life.

Despite the fear for Covid-19, most women reported to have not received the Covid-19 vaccine due to uncertainty of its effectiveness and misconceptions. Women eventually balanced fear of COVID-19 with a fear of HIV, which requires lifelong treatment.

Fear of HIV and instrumental support provided by study staff motivated a desire to adhere to study visits despite COVID-19 restrictions across sites. In some instances, participants were transported to clinical sites using study transport and issued food parcels, which was a motivation to attend study visits.

Most women reduced sexual partners due to COVID-19 restrictions on mobility, closure of entertainment hubs, and fear of COVID-19 spread, leading to a potential reduction in risk of HIV.

Conclusions: Lessons from the COVID-19 pandemic and other emerging diseases should inform future preparedness for HIV prevention trials to promote access and continuation of study products among high-risk participants in an African context. Material aid may motivate study participation during periods of community-wide financial struggle.

LBPEE01

Feasibility of long-acting injectable cabotegravir PrEP initiation and administration by community health workers and early aspects of the PrEP injection care continuum in a primary care center in Washington D.C.

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Background: We describe the integration of long-acting injectable cabotegravir (LAI CAB) PrEP, administered by community health workers, or non-medically licensed staff, in a primary health clinic.

Description: Whitman-Walker Health (WWH) is a primary care center in Washington, D.C. In 2018, WWH launched the "PrEP Clinic," a clinic where center-qualified peer health staff (or PrEP Specialists), who are trained in PrEP care follow up discussions, navigation, rapid HIV testing, and phlebotomy, conduct follow-up visits after individuals have been initiated on oral daily PrEP by their licensed physician. The clinic has 900 oral PrEP clients and the clinic sought to administer LAI CAB by Specialists.

Lessons learned: For LAI CAB implementation, we formed a workgroup to devise a clinical protocol, Specialist procedure checklist, missed appointment follow up plan, unique LAI CAB pharmacy communication system, specialized EMR changes and dashboard, client billing communication, marketing plan, and structural examination room changes.

An education program was formulated to train Specialists in conversations regarding LAI CAB care, administering the ventrogluteal intramuscular injection, medical documentation, and appointment scheduling. The injection room resembles a spa resort room overlooking the beach to generate a more relaxing environment for clients who may fear injections; appointments are 30 minutes in length.

From February - May 2023, 87 LAI CAB PrEP clients have received care, 153 injections have been administered, 5 people discontinued injections, 106 appointments were scheduled, 5 people missed appointments with oral PrEP bridging, one person required re-loading injections, none seroconverted, and 1 had a false positive HIV Ag/Ab test. PrEP clients were 31% AA/Black, 18% Hispanic/Latino, 7% transwomen, 77% MSM, 5% cisgender women, and aged 24-51 years.

Those who discontinued injections included one cisgender woman, 4 MSM, and 4 non-whites; 2 occurred after the first injection due to site pain, 2 due to inconvenience,

and 4 transitioned to oral PrEP. One hundred percent of clients reported no dissatisfaction with LAI administered by Specialists during their post-injection survey.

Conclusions/Next steps: LAI CAB PrEP delivered by community health workers or non-medically licensed, trained health staff is feasible and well received by PrEP users. Program methods and lessons learnt can aid other organizations to adopt similar programs.

LBPEE02

Unlocking the potential of HIV voluntary counseling and testing service (VCT) in a metropolis: an Internet-based urban network in Guangzhou, China

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Background: As a metropolis located in southern China, Guangzhou has established an urban network for VCT service. This urban VCT network includes 12 center for disease control and prevention (CDC) and 214 primary health care institution (PHCI). Unfortunately, many people were unaware of the VCT offered by PHCIs and preferred to receive testing at CDCs. This led to the underutilization of the entire network and hindered its ability to effectively prevent the spread of HIV/AIDS.

To address this issue, we implemented an Internet-based urban network to promote and increase access to VCT services.

Description: Based on WeChat (a Chinese social application like WhatsApp) Mini-Program Framework, we developed an online VCT service applet named "ChaBei". This applet can be accessed directly through WeChat without any additional installation. "ChaBei" offers consultation services that allow individuals to communicate with experts online, as well as an appointment function for accessing VCT service offline. After conducting internal testing with 12 CDCs in 2018, we began to promote "ChaBei" to PHCIs since 2019.

Lessons learned: The number of VCT sites on "ChaBei" has increased from 108 (2019) to 179 (2022), covering all 11 districts of Guangzhou. In 2019, of the total 10,528 online appointments made through "ChaBei", 87.9% of individuals sought VCT services at CDCs.

Due to the impact of COVID-19, the VCT service hours of CDCs were shortened each year (2020 to 2022). As a result, the total number of online appointments made through "ChaBei" decreased slightly to 7,261 (2022). Nevertheless, the proportion of appointments made at PHCIs increased significantly from 12.1% (2019) to 63.24% (2022). This highlights the success of our efforts to promote and utilize PHCIs as a key component of the urban VCT network.



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Conclusions/Next steps: The Internet-based urban VCT network that we established in this case provides a significant opportunity to unlock the potential of VCT services at PHCIs and improve the overall utilization of the urban VCT network through joint efforts from all PHCIs.

This model can be applied effectively in many cities, promoting the development of a nationwide network that enables people to access VCT services more conveniently.

LBPEE03

Integrating COVID-19 testing and treatment programs into HIV care in low- and middle-income countries: initial success in Zambia

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Background: COVID-19 test-and-treat programs have the potential to save lives and protect fragile health systems, particularly when integrated horizontally. The COVID Treatment QuickStart Consortium partnered with 10 countries to accelerate access and introduce oral antivirals such as nirmatrelvir/ritonavir.

We present here the model of integrating COVID-19 test-and-treat within the University Teaching Hospital (UTH), including the Adult Infectious Disease Center (AIDC) in Lusaka, Zambia, after 1,000 courses of donated nirmatrelvir/ritonavir arrived on December 22, 2022.

Description: Client flow for COVID-19 at UTH involves conducting rapid antigen testing for symptomatic clients presenting for care in any department. Eligibility criteria for oral antivirals in Zambia requires positive SARS-CoV-2 clients to meet the following criteria: high-risk (e.g. age 50+, people living with HIV (PLHIV), and other conditions), mild/moderate disease, and presenting within five days of symptom onset. COVID-19 oral antivirals are then prescribed by trained clinicians and dispensed from the TB/COVID clinic or emergency pharmacy. For PLHIV, bidirectional screening occurs for COVID-19 and TB; testing, prescribing, and drug dispensing all happens within AIDC.

Lessons learned: Between December 24, 2022 and April 30, 2023, out of 7,125 tests, 290 (4.1%) clients had positive SARS-CoV-2 tests at UTH, 9% of which were HIV-positive or from AIDC. Nirmatrelvir/ritonavir was prescribed to 84% of these clients. Median age was 37 years, 61% were female, and 69% were previously vaccinated. Bidirectional screening at AIDC helped identify clients with diabetes and hypertension, and AIDC is now adopting this as standard-of-care. Integration of screening and updated training models to include a team approach increased acceptability amongst health workers.

Conclusions/Next steps: Zambia was one of the first countries in Africa to prescribe nirmatrelvir/ritonavir to SARS-CoV-2 positive PLHIV. The quick roll-out succeeded because of strong leadership from the Zambian Ministry of Health and public-private partnerships. UTH has demonstrated the feasibility of integrating COVID-19 services into all hospital entry points, with a focus on high-risk clients such as PLHIV attending AIDC. Nirmatrelvir/ritonavir has subsequently been integrated into routine services at ten other facilities throughout the country.

Overall lessons learnt will enable further scale-up—both within Zambia and in other African countries—and allow for further learnings of integrated test-and-treat programs.

LBEP001

Large decrease in the proportion of newly diagnosed HIV-1 infections grouping in large clusters in Spain

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Background: In recent years, increasing HIV-1 phylogenetic clustering has been observed in many countries, including Spain. Factors that have been associated with HIV clustering include men having sex with men (MSM) and greater number of sexual partners. The use of phylogenetic methods has been advocated for the detection of large or rapidly growing HIV-1 clusters, to assist in prioritizing preventive interventions were they would be expected to be more effective, and to monitor their efficacy.

Here we longitudinally analyze HIV-1 clustering in a large Spanish cohort of newly diagnosed infections in the years before and after the roll-out of pre-exposure prophylaxis (PrEP) in December 2019.

Methods: HIV-1 protease-reverse transcriptase (PR-RT) was amplified by RT-PCR using RNA extracted from plasma from HIV-1 infections newly diagnosed Spain in 2017-2021 in clinical centers from 10 regions. Phylogenetic analyses were performed with the approximate maximum likelihood method implemented in FastTree2, including more than 15,000 HIV-1 PR-RT sequences from Spain from samples collected in 1999-2023.

Clusters were defined as those supported by SH-like values ≥ 0.95 comprising ≥ 4 individuals, at least 50% of them native Spaniards, with large clusters being defined as those comprising ≥ 30 individuals. Statistical analyses were performed with Fisher's exact test.

Results: A total of 3,265 HIV-1 PR-RT sequences were obtained from newly diagnosed individuals in 2017-2022, 62.1% of whom were self-declared MSM. Each year 54.3-64.4% infections grouped in clusters of ≥ 4 individuals, without statistically significant differences between years. However, when only large clusters (29, each comprising ≥ 30 individuals) were considered, a decrease was observed in the proportion of newly diagnosed infections belonging to them from 17.2%, 14.3%, 15.9%, 16.7%, and 17.6% in successive years 2017-2021 to 10.8% in 2022, which was statistically significant ($p < 0.05$) for the comparison of 2022 with previous years, except with 2017 ($p = 0.099$).

Conclusions: A statistically significant reduction in the proportion of HIV-1 infections newly diagnosed in 2022 grouping in large (≥ 30 individuals) clusters (all but one as-

sociated with MSM) was observed compared to infections diagnosed in previous years. Since such reduction was observed 2 to 3 years after roll-out of PrEP in Spain, a causal correlation should be considered.

LBEP002

Immune responses to respiratory syncytial virus among HIV-exposed uninfected infants from the United States correlate with maternal inflammation during pregnancy

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Background: Respiratory syncytial virus (RSV) is a major contributor to morbidity and mortality among HIV-exposed, uninfected infants (HEU). We hypothesized that *in utero* exposure to maternal HIV-associated inflammation impacts HEU immune responses to RSV infection.

Methods: We enrolled pregnant women with and without HIV and collected maternal blood during pregnancy and cord blood at delivery. We measured concentrations of 16 inflammatory markers in maternal and cord plasma and identified differences between women with vs. without HIV, and between HEU vs. HIV-unexposed infants (HUU). We used a novel *in vitro* model of human respiratory infection to measure cord blood mononuclear cell responses to RSV. We compared 7 indicators of RSV response among innate immune cells from HEU vs. HUU infants, and identified correlations between RSV responses and plasma inflammatory markers.

Results: Samples were collected from 23 women with HIV, 61 women without HIV, and their infants. Among women with HIV, the median (IQR) viral load at delivery was 0 copies/mL (0-15) and CD4 was 655 cells/mm³ (322-814).

There were no differences between HEU and HUU in regard to maternal age, mechanism of delivery, infant gestational age, sex, or birthweight. Twelve inflammatory markers were higher in plasma from women with vs. without HIV. Interleukin (IL)-1 β was higher in cord plasma from HEU vs. HUU.

In the respiratory infection model, HEU dendritic cells (DC) expressed less IL-12 and more CD83 in response to RSV, compared to HUU DC. Killing of RSV-infected respiratory epithelium was associated with higher cord plasma concentrations of IL-1 β in both HEU and HUU. Maternal plasma concentrations of IL-6 and tumor necrosis factor- α , as well as two markers of monocyte and macrophage activation (soluble CD14 and CD163) were inversely correlated with several innate immune cell responses to RSV in HEU and/or HUU.

Conclusions: Innate immune responses to an *in vitro* model of RSV infection are altered in HEU vs. HUU and inversely correlate with the degree of maternal plasma inflammation. HIV-associated maternal inflammation may





be a driver of immune dysregulation in HEU infants and predispose to increased susceptibility to morbidity and mortality upon exposure to RSV.

LBEPA03

Polymorphonuclear myeloid-derived suppressor cells regulates immune reconstitution during HIV infection through PD-L1 and TGF- β signaling

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Background: Although myeloid-derived suppressor cells (MDSCs) are widely recognized for their immunoinhibitory effect in a variety of pathological conditions, their function during human immunodeficiency virus (HIV) infection and the onset of inadequate immune reconstitution remains elusive.

Methods: We conducted a cross-sectional study in which 30 healthy controls (HC) and 62 HIV-1-infected subjects [31 immunological non-responders (INRs) and 31 immunological responders (IRs)] were selected.

After two years of antiretroviral therapy, INRs and IRs were designated as patients with CD4⁺ T-cell counts <350 cells/ μ L and >500 cells/ μ L, respectively. The proportion of MDSCs was measured and their relationship with HIV disease progression was studied. Specifically, using flow cytometry and real-time PCR, immune regulatory molecules (including programmed death-ligand 1 [PD-L1], arginase 1, inducible nitric oxide synthase, interleukin 10, transforming growth factor beta [TGF- β], and indoleamine 2,3-dioxygenase) that are relevant for MDSCs activity were quantified.

Furthermore, we investigated the impact of the blockade of PD-L1 and/or TGF- β signaling on MDSCs and their effects on CD4⁺ T cells using *in vitro* functional experiments.

Results: We found that polymorphonuclear MDSCs (PMN-MDSCs) are more abundant and negatively correlated with CD4⁺ T-cell counts in HIV-infected individuals. PMN-MDSCs suppress CD4⁺ T-cell proliferation and interferon- γ (IFN- γ) production in INRs.

Furthermore, correlations were found between PD-L1 expression on PMN-MDSCs and PD-1⁺ CD4⁺ T-cells. TGF- β expression on PMN-MDSCs was likewise enhanced in INRs. Importantly, inhibiting both PD-L1 and TGF- β signaling had a synergistic impact on restoring CD4⁺ T-cell activity *in vitro*.

Conclusions: Our findings reveal that the expansion of PMN-MDSCs decreased CD4⁺ T-cell proliferation and IFN- γ secretion in HIV infection through PD-L1 and TGF- β mediated pathways. Interventions that target both PD-L1 and TGF- β pathways may be novel strategies for enhancing immune reconstitution in INRs.

LBEPA04

HIV-1-induced isoformic PD-1 undermines Env-specific B cell response

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Background: Immunoregulatory mechanisms underlying HIV-1-induced B cell dysfunction remain incompletely understood. Potent neutralizing antibodies (NAbs) appear only months after HIV-1 transmission, which is in great contrast to high amounts of Nabs readily found within 14 days after SARS-CoV-2 infection.

We hypothesized that B cells for producing Env-specific antibodies were somehow inhibited by HIV-1-induced suppressive mechanisms.

Methods: To address the hypothesis, we investigated the expression and function of immune regulatory protein PD-1 and its isoform Δ 42PD-1 using primary B cells derived from healthy blood donors (BDs, n=60), acute HIV-1 people (AHPs, n=41), chronic HIV-1 people (CHPs, n=103) and human B cell line RPMI 8866.

Results: We found that both acute and chronic HIV-1 acquisition induced Δ 42PD-1 up-regulation significantly on up to 28% total B cells that do not co-express inhibitory receptors PD-1 or FcRL4. The majority of Δ 42PD-1⁺ B cells did not co-express PD-1, whereas the frequency of Δ 42PD-1⁺ B cells was significantly higher than that of PD-1⁺ B cells. Δ 42PD-1 is induced primarily by BCR stimulation, resulting in B cell cycle arrest, functional exhaustion, and death.

Mechanistically, Δ 42PD-1 recruits the tyrosine phosphatase SHP1 but not SHP2 in human B cells via its intracellular immunoreceptor tyrosine-based switch motif. SHP1 then binds and inhibits AKT1 activation directly and thereby suppresses the AKT1/FOXO1 pathway, leading to B cell exhaustion.

Consistently, Δ 42PD-1-specific antibody reduces the SHP1 recruitment, increasing the AKT1/FOXO1 activation and reverting the function of HIV-1 ENV-specific antibody-secreting B cells derived from patients with high Δ 42PD-1 expression.

Conclusions: Our findings demonstrated that the Δ 42PD-1-SHP1 axis, which is distinct from the previously reported PD-1-SHP2 axis, has likely played an essential role in the suppression of Env-specific B cell responses since the acute phase of HIV-1 acquisition.

We also identified the anti- Δ 42PD-1 antibody as a potential HIV-1 immunotherapy to recover ENV-specific B cell functionality.



LBEP05

Preserved frequency and cytotoxicity of HIV-specific follicular CD8 T cells associates with reduced viral reservoir in individuals treated during primary HIV infection

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Background: CD8 T-cells expressing the follicular homing receptor CXCR5 have access to B-cell follicles within lymphatic tissue and therefore to the anatomic region where the majority of the HIV reservoir is located in individuals receiving antiretroviral therapy. Individuals treated during acute HIV infection are the group where functional cure of HIV seems more likely to be achieved due to their lower burden of viral reservoir when compared to individuals treated during chronic infection.

Methods: In this project we investigated frequency, phenotype and HIV-specific functionality of circulating follicular CD8 T-cells in a cohort of individuals treated during acute HIV infection (n=27), long-term non-progressors (n=10) and individuals treated during chronic infection (n=10). We applied flow cytometry, RNA-seq analyses of sorted HIV-specific CD8 T-cells, HIV DNA quantification by ddPCR, functional in-vitro viral inhibition assays and PD1 blockade assays.

Results: 1. Follicular CD8 T-cells exhibit strong HIV-specific effector functions (CD107a-production, p=0.0006 follicular vs non-follicular) and efficiently control viral replication in-vitro.

2. Follicular CD8 T-cells are effector cells with high (co-)expression of PD1 and CD127 (p<0.0001 follicular vs non-follicular) that proliferate in response to PD1 blockade (Ki67-expression) and upregulate HIV-specific effector functions (CD107a, granzyme&perforin) in-vitro.

3. HIV-specific follicular CD8 T-cells associate with HIV DNA decline in individuals treated during acute HIV infection (p=0.04; r=-0.4 Spearman rank correlation).

4. Treatment initiation during acute HIV infection preserves HIV-specific effector functions (granzyme & perforin and CD107a expression of follicular CD8 T-cells over 48 weeks of antiretroviral therapy), comparably to the phenotype observed in the group of long-term non-progressors.

Conclusions: Our findings support the hypothesis that natural occurring follicular CD8 T-cells play a central role in the control of HIV replication. Our observation that treatment initiation during acute HIV infection preserves frequency and HIV-specific functionality of follicular CD8 T-cells is just another reason to select this group of individuals for future interventional trials exploring functional cure of HIV.

HIV-specific follicular CD8 T-cells could be used as a tool to purge the viral reservoir, which resides mainly within lymphoid tissue and presents the major obstacle to cure since it can fuel viral rebound as soon as antiretroviral therapy is stopped.

LBEP06

Epigenetic associations with APOL1 nephropathy and kidney function in individuals of African ancestry with HIV

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Background: Apolipoprotein L1 (APOL1) kidney risk variants are major determinants of HIV-associated nephropathy (HIVAN) and chronic kidney disease (CKD) in people of African ancestry. Previous studies have identified epigenetic changes related to kidney function and kidney disease, but these effects have not been explored for those with HIVAN or APOL1 kidney risk genotypes.

Methods: We conducted an epigenome-wide association study in UK-based individuals of African ancestry with HIV having APOL1 kidney risk genotypes. We identified differentially methylated cytosine guanine dinucleotide (CpG) sites associated with APOL1 nephropathy (HIVAN/FSGS/arterionephrosclerosis or non-diabetic proteinuric CKD; primary outcome) and report results at a genome-wide false discovery rate of 5% after considering technical and biological covariates.

Sensitivity analyses at the discovery signals explored DNA methylation association with estimated glomerular filtration rate (eGFR). Replication was pursued in two independent multi-ancestry cohorts, including African Americans with HIV for CKD, and for eGFR in individuals with and without HIV.



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Results: A total of 116 participants (mean age 48 years, 46% female, median CD4 count 515 cells/mm³, 93% viral load <200 copies/mL, 23% with *APOL1* nephropathy) were included. DNA methylation levels at 14 CpG sites from peripheral blood mononuclear cells were associated with *APOL1* nephropathy.

The strongest signals for *APOL1* nephropathy were located in the *SCARB1*, *DNAJC5B* and *NEK6* genes, which are involved in cellular cholesterol homeostasis, post-translational protein configuration, and cellular senescence, and may be involved in glomerulosclerosis and/or CKD progression.

Four of the 14 signals in *SCARB1*, *FRMD4A*, *CSRNP1* and in an intergenic region replicated in the multi-ancestry cohort and showed consistent direction of effect in analyses restricted to African Americans. Seven CpG sites from the primary outcome, located in *SCARB1*, *DNAJC5B*, *FRMD4A*, *PLEKHA7* and *NCOR2* genes, were also associated with eGFR.

After correction for multiple testing there were no significant changes in DNA methylation levels at CpG sites in or near the *APOL1* promoter region.

Conclusions: We report several novel as well as previously reported epigenetic associations with *APOL1* nephropathy and eGFR in individuals with *APOL1* kidney risk genotypes. Further investigation of pathways linking DNA methylation to *APOL1* nephropathy and CKD in those with *APOL1* kidney risk genotypes is warranted.

LBEP07

In-depth characterization of functional anti-Env antibody responses during early or late viral suppression with fostemsavir in treatment-experienced patients

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Background: The HIV-1 attachment inhibitor fostemsavir (FTR) is a first-in class small molecule approved for treating multi-drug resistant (MDR) HIV-1 infection. In treatment experienced people with HIV (PWH), rates of viral suppression with FTR continued to increase from week 48 through week 96 (BRIGHTE study).

Factors that contribute to this favorable late response rate are not understood. Given that FTR can modulate HIV-1 envelope trimer conformational state in vitro, we performed an in-depth examination of humoral immune responses in the BRIGHTE study to examine how changes in functional anti-Env antibody responses correlate with delayed viral suppression.

Methods: 16 patients from the BRIGHTE study were selected based on their time to first viremic suppression, including 8 early (EVS) and 8 late viral suppressors (LVS). Immunological correlates of suppression were also examined in 8 participants (ppt) of the SAILING study that evaluated dolutegravir in PWH with resistance to at least one drug and integrase inhibitor naive.

Anti-HIV Env responses measured were infected-cell binding IgG titer, FTR-sensitive IgG binding to infected cells, neutralization activity (cell-free and cell-cell), FcγRIIa- and FcγRIIIa-signaling activity and plasma cytokines.

Responses were tested at treatment initiation, 4 and 108 weeks and correlated with clinical variables associated with treatment response.

Results: At baseline, LVS group had higher VL and lower CD4 counts. LVS ppt experienced greater increases in CD4 counts than EVS. Despite higher VL, LVS ppt possessed significantly lower anti-HIV IgG infected-cell-binding titers as compared to EVS ppt. Antibodies from SAILING ppt showed significant increases in FcγRIIIa signaling during drug treatment, though this was in ppt with lower baseline signaling at Day 1 compared to the FTR groups.

Additionally, IL-8 levels were increased in LVS vs. EVS ppt at treatment start.

Conclusions: Our findings suggest that high initial viremia and IL-8 levels, coupled with lower anti-HIV-1 Env IgG titers are associated with delayed viral suppression in FTR-treated ppt.

Further studies are needed to determine if pre-treatment characteristics that associate with early suppression, such as high antibody titers and low Fc signaling activity, may serve as indicators for the time to VS in individuals with MDR-HIV treated with FTR.



LBEP08

HIV-infected macrophages can be made susceptible to antibody dependent cellular cytotoxicity by small molecule CD4 mimetics

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Background: HIV evolved mechanisms to evade host immune responses allowing the persistence of the latent reservoir. Effective targeting of the HIV reservoir is the focus of intense cure research. Small molecule CD4mimetic (CD4mc) are effective at exposing ADCC epitopes on the surface of infected CD4+T cells.

Limited data exists, however, as to the effectiveness of CD4mc for exposing vulnerable Env epitopes on HIV infected macrophages and its potential for targeting the myeloid reservoir.

Methods: Using flow cytometry, we compared CD4 and BST2 expression and Env epitope exposure in the presence or absence of the small molecule BNM-III-170, on autologous macrophages and CD4+T cells infected with macrophage-tropic viruses AD8, JRFL, YU2 and T/F CH77. In addition to WT viruses, cells were infected with mutants defective for Nef (N-), Vpu (U-) or both (N-U-); and viruses containing a mutation in the CD4-BS (D368R; N-U-D368R).

Results: At 48hr (CD4+T cells) or 5-days (macrophages) post-infection, measurement of surface expression of CD4 and BST2 demonstrated that BST2 downmodulation was similar for autologous CD4+T cells and macrophages. Thus, Vpu plays parallel roles in downmodulating BST2 on CD4+T cells and macrophages. In contrast, CD4 was downregulated to ~1% on CD4+T cells infected with AD8 compared to ~20% in macrophages. Surprisingly, though absence of either Vpu or Nef restored CD4 levels to ~2% and 44% respectively in CD4+T cells, this was insufficient to rescue CD4 expression on macrophages. Consistent with all viruses tested. Importantly, we show that, while the absence of Nef and/or Vpu exposed

ADCC Env epitopes on CD4+T cells, this minimally influenced exposure on macrophages. However treatment with CD4mc exposed these Env epitopes on the surface of HIV-1 infected macrophages predisposing them to killing in particular by monocytes but surprisingly not NK cells.

Conclusions: These results suggest that while HIV-1 has three proteins, Nef, Vpu and Env, which modulate CD4 expression on CD4+T cells, this strategy is redundant in macrophages where just one is required.

This results in minimal exposure of ADCC epitopes on macrophages. Importantly, small CD4mc can be used to expose vulnerable Env epitopes on infected macrophages. Importantly monocytes may be an under-appreciated effector for reservoir clearance.

LBEP09

Recombination of "defective" proviruses to produce replication-competent HIV-1

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Background: Treatment with cART leads to "undetectable" plasma virus levels in the majority of persons with HIV (PWH). While plasma virus cannot be detected, cell-associated "defective" proviral DNA and complementary RNA transcripts persist in PWH receiving cART. In a small number of individuals treated early in the course of transmission, discontinuation of cART has led to a prolonged period of time in which virus remains undetectable, only to re-appear months later from what has been presumed to be a latent reservoir.

An alternative explanation is that this delayed recurrence of plasma virus might represent the recombination of defective proviruses.

Methods: H9MN cell line, chronically infected with MN strain of HIV-1, contains a panel of defective proviruses. Two distinct defective proviruses: SD (lacking *nef* and *gp41*) and FD (containing a frame-shifting indel in the RNase H domain of *pol*) were molecularly cloned into pNL4.3. The pNLSD and pNLFD constructs were singly transfected or co-transfected into 293T cells or primary CD4+ T cells from healthy donors. Supernatants from transfected 293T cells were used to infect MT-2 cells, while the transfected primary CD4+ T cells were co-cultured with PHA-stimulated healthy donor CD4+ T cells for infection. The status of HIV-1 infection was monitored by syncytia formation in MT-2 cells and HIV-1 p24 ELISA in T cell culture.

Results: While no syncytia formations were noted in MT-2 cell culture when incubated with a mixture of supernatants from singly transfected 293T cells, supernatants from co-transfected 293T cells led to abundant syncytia



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formation. Similarly, while p24 antigen levels in the mixture of pNLSD and pNLFD individually transfected CD4⁺ T cells reached only <400 pg/mL, those in the co-cultures of CD4⁺ T cells co-transfected with pNLSD and pNLFD in combination reached >80,000 pg/mL.

Conclusions: We have provided *in vitro* evidence of the generation of replication-competent HIV-1 viruses through the recombination of defective proviruses.

Studies are underway to extend these findings by involving defective proviruses derived from PWH with “undetectable” levels of virus in plasma. The ability of “defective” proviruses to recombine to form competent viruses may provide an additional challenge to HIV cure strategies.

Track B: Clinical science

LBEPB11

Effectiveness of point of care testing in improving HIV early infant diagnosis access in 16 US Agency for International Development Nigeria-supported states

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Background: Nigeria has an HIV prevalence of 1.4% (0.2% for 0–14 years) with 12% of burden among children 0–14 years. According to the Federal Ministry of Health (FMOH), HIV Early Infant Diagnosis (EID) Coverage of children ≤2 months remains low at 28% in Nigeria. Nigeria HIV-Laboratory services are structured with 15 of the 17 PCR laboratories (PL) processing EID referred through National Integrated Sample Referral Network in Hub-spoke model. Centralized system limits access and prolong Turn Around Time (TAT). POCT molecular assays have been reported to improve EID access and TAT in some African countries. This paper presents POC EID testing outcomes across 60 Health Facilities (HFs) in 16 US Agency for International Development (USAID)-supported States.

Description: Following POCT EID pilot successes in 19 HF in 2021, USAID commenced implementation in 60 secondary HFs across 16 supported states. USAID supported state MOHs to conduct desk analysis, determine equipment spare capacities for POC EID followed by capacity assessments using a checklist for POC deployment and training to determine sites readiness for EID testing in June 2022. Next was supply of commodities, HFs staff training and activation of sites in phases from July–September 2022. Biweekly reporting and monitoring template was developed to collect data from October 2022–February 2023. The prospective data from HFs collected and entered in Excel for analysis and performance compared with PL quality indicators.

Lessons learned: A total of 4,627 (≤2months=2,672 and 2–12months=2,005) EID were tested and results dispatched, which is 100% of accepted samples higher than 60% recorded by PLs. Two-hundred-and-fourteen infants tested positive (4.6% positivity rate) lower than 5.6% for PLs. Sample Rejection Rate (SRR) of 1.6% (73/4,700) due to insufficient volume and improper labelling is higher than the national SRR of 0.3% for PL. Average sample-result TAT of 48 (24–72) hours was less than 54 days for PL. All results were released to end users compared to cases of missing results in PLs.



Conclusions/Next steps: Decentralized testing using POCT improved access and reduced TAT for EID results availability in HFIs for timely clinical decisions for HIV-exposed infants. The scaleup of EID POCT across Nigeria is recommended.

LBEPB12

Evaluation of incident hypertension and blood pressure changes among people living with HIV-1 (PLWH) receiving dolutegravir (DTG)-based regimens or comparator antiretroviral therapy (CAR) in randomized clinical trials through 96 weeks

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Background: An association between integrase strand transfer inhibitor-based antiretroviral therapy and incident hypertension (HTN) among PLWH has been reported. We evaluated incident HTN and blood pressure (BP) changes among participants without baseline (BL) HTN receiving a DTG-based regimen or CAR in pooled Phase 2/3 randomized studies through Week (W)96.

Methods: Data from ART-naïve participants randomized to DTG + ABC/3TC or TDF/FTC, or CAR including EFV/TDF/FTC, RAL + 2 NRTIs, or DRV/r + 2 NRTIs, were pooled from the SPRING-1, SPRING-2, SINGLE, and FLAMINGO clinical trials. BP and weight were assessed at BL, W24, W48, and W96. HTN at each timepoint was defined as a single systolic BP (SBP) ≥ 140 mmHg and/or diastolic BP (DBP) ≥ 90 mmHg measured after a 5-minute rest, history of HTN, and/or BL antihypertensive medication use.

Proportion meeting HTN criteria was evaluated using logistic regression and BP changes using mixed-models repeated-measures analyses, with adjustment for relevant BL variables and pooled treatment (DTG or CAR).

Results: Among 2345 participants, 23% (n=530) were excluded for BL HTN; of the remaining, 927 received a DTG-based regimen and 888 received CAR. At BL, median (range) age was 34 (18-85) years, 15% were female sex at birth, and 15% Black or African American race. At W96, no significant difference in odds of HTN between the DTG and CAR groups was observed (OR, 1.02; 95% CI, 0.79-1.33; between-study heterogeneity was observed based on differing data collection frequency).

Age, sex, race, BL HIV-1 RNA, and BMI were associated with HTN at W96. At W96, in pooled DTG vs CAR groups, respectively, adjusted mean (SE) change from BL SBP was 2.42 (0.398) vs 2.62 (0.437) mmHg (treatment difference, -0.20 mmHg; 95% CI, -1.36, 0.97; $P=0.741$) and change from BL in DBP was 1.62 (0.624) vs 1.80 (0.629) mmHg (treatment difference, -0.18 mmHg; 95% CI, -1.05, 0.69; $P=0.683$). There was no evidence of heterogeneity between studies ($P\geq 0.312$).

Conclusions: Odds of HTN were not statistically different between DTG and CAR at W96. Multiple factors were statistically associated with HTN except study treatment. Observed BP increases were small and comparable between groups at W96.

LBEPB13

Week-96 results of ALLIANCE, a phase 3, randomized, double-blind study comparing bicitgravir/emtricitabine/tenofovir alafenamide (B/F/TAF) versus dolutegravir + emtricitabine/tenofovir disoproxil fumarate (DTG+F/TDF) in treatment-naïve people with both HIV-1 and hepatitis B

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Background: ALLIANCE (NCT03547908) is the largest, and first randomized, study to date comparing the efficacy and safety of B/F/TAF versus DTG+F/TDF in people with both HIV-1 and HBV. In the primary analysis, B/F/TAF was noninferior to DTG+F/TDF at achieving HIV-1 RNA suppression and superior at achieving HBV DNA suppression at Week (W) 48.

We report W96 outcomes for HIV-1 and HBV.

Methods: Adults with HIV-1/HBV from 46 sites internationally (n=243) were randomized 1:1 to daily oral B/F/TAF or DTG+F/TDF (plus corresponding placebos).

Secondary endpoints at W96 were HIV-1 suppression (HIV-1 RNA <50 copies/mL), HBV suppression (HBV DNA <29 IU/mL), change in CD4+ cell count/percentage, alanine aminotransferase (ALT) normalization, HBsAg loss. Additional endpoints at W96 were HBeAg loss, HBeAg seroconversion, HBsAg seroconversion.

Results: Most participants were male (95.5%) and Asian (88.1%), with median age 32 years. At baseline, 29.6% had HIV-1 RNA $>100,000$ copies/mL, 40.3% CD4+ <200 cells/ μ L and 51.9% HBV DNA ≥ 8 log₁₀ IU/mL; 77.8% were HBeAg+. At W96, similar proportions of participants had HIV-1 RNA



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and HBV DNA suppression with B/F/TAF versus DTG+F/TDF ([87.4% vs. 87.7%] and [74.8% vs. 70.5%], respectively; *Table*). Mean CD4+ cell count/percentage increased similarly from baseline in both treatment groups. Proportions of participants with ALT normalization and HBsAg loss/seroconversion were numerically higher, and with HBeAg loss/seroconversion were significantly higher, for B/F/TAF versus DTG+F/TDF at W96 (*Table*).

Adverse events were similar between treatment groups. For B/F/TAF and DTG+F/TDF, respectively, median (IQR) changes from baseline for eGFR_{CG} (mL/min) were -9.9 (-21.6, -0.6) and -12.0 (-17.4, -5.3), and for weight (kg) were 4.3 (0.9, 8.0) and 2.3 (-0.5, 5.7), at W96.

	B/TAF	DTG+TDF	B/TAF vs. DTG+TDF	
			P-value	Difference (95% CI)
Secondary endpoints				
HIV-1 RNA virologic response, FDA Snapshot algorithm, % (n/N)				
< 50 copies/mL	87.4 (104/119)	87.7 (107/122)	0.943	-0.3 (-8.9, 8.3)
≥ 50 copies/mL	2.5 (3/119)	6.6 (8/122)		
No data	10.1 (12/119)	5.7 (7/122)		
HBV DNA virologic response, missing = failure, % (n/N)				
< 29 IU/mL	74.8 (89/119)	70.5 (86/122)	0.637	2.6 (-6.3, 13.4)
≥ 29 IU/mL	25.0 (30/119)	29.5 (36/122)		
CD4+ cells/μL, mean (SD) change from baseline	281 (161.6)	229 (174.0)	0.185	30 (-14, 74)
CD4+ cell %, mean (SD) change from baseline	10.7 (5.0)	10.4 (5.1)	0.846	0.1 (-1.2, 1.5)
ALT normalization, % (n/N) [†]	71.7 (43/60)	57.4 (27/47)	0.125	14.1 (-4.3, 32.6)
HBsAg loss, % (n/N) [†]	22.7 (27/119)	14.0 (17/121)	0.066	9.3 (-0.7, 19.2)
Additional HBV outcomes, missing = failure, % (n/N)				
HBsAg loss [‡]	37.8 (34/90)	19.6 (19/97)	0.006	18.1 (5.2, 31.0)
HBsAg seroconversion [§]	32.2 (29/90)	15.5 (15/97)	0.006	16.4 (4.2, 28.6)
HBsAg seroconversion	9.2 (11/119)	6.6 (8/121)	0.441	2.7 (-4.6, 10.0)
All efficacy endpoints except HBsAg and HBsAg loss/seroconversion were assessed in the full analysis set, which included all randomized participants who received ≥ 1 dose of study drug and had ≥ 1 post-baseline HIV-1 RNA or HBV DNA result while on study drug. The serologically evaluable full analysis set, defined as all participants in the full analysis set who were HBsAg positive and HBsAb negative or missing at baseline, was used for assessment of HBsAg and HBsAg loss/seroconversion. For categorical data, P-values were calculated using the Cochran-Mantel-Haenszel test, and differences in percentages and 95% CI were calculated based on Mantel-Haenszel proportions, adjusted according to baseline status of HIV-1 RNA level (for HIV-1 RNA), HBV DNA level (for HBsAg loss/seroconversion), or both HBsAg status and HBV DNA level (for HBV DNA, ALT normalization, HBsAg loss/seroconversion). For CD4+ cell count and percentage, P-values and differences in least-squares means and 95% CI were from an analysis of variance model adjusted by baseline HIV-1 RNA status.				
*Reduction in ALT to < ULN for participants with ALT ≥ ULN at baseline, based on American Association for the Study of Liver Diseases criteria, where ULN is 25 U/L for females and 35 U/L for males; †Missing = failure; ‡Changes from HBsAg positive at baseline to negative at a postbaseline visit with HBsAb negative or missing at baseline; §HBsAg loss and HBsAb changes from negative or missing at baseline to positive at a postbaseline visit				
ALT, alanine aminotransferase; B, bicitravigir; CD, cluster of differentiation; CI, confidence interval; DTG, dolutegravir; F, emtricitabine; HBsAg, hepatitis B s antigen; HBsAb, hepatitis B surface antibody; HBV, hepatitis B virus; SD, standard deviation; TAF, tenofovir alafenamide; TDF, tenofovir disoproxil fumarate; ULN, upper limit of normal				

Table. Virologic and immunologic outcomes at week 96 (full analysis set/serologically evaluable full analysis set).

Conclusions: Treatment with B/F/TAF or DTG+F/TDF resulted in high and sustained rates of HIV-1 and HBV viral suppression over 96 weeks in adults with HIV-1/HBV. Markers of anti-HBV activity (ALT normalization, HBe/sAg loss/seroconversion) trended towards benefit of B/F/TAF over DTG+F/TDF.

LBEPB14

Epidemiological and clinical features of mpox in adults aged greater than 50 years in the United States of America, May 2022–April 2023

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Background: Persons aged >50 years were hypothesized as less susceptible to mpox due to routine smallpox vaccination, which ended in 1971 in the USA. However, with more comorbidities, older adults may be at risk for severe disease from mpox. We examined the characteristics of mpox among those >50 years old in the USA.

Methods: Public health departments reported confirmed and probable mpox cases to CDC. We included cases from May 27, 2022-April 2, 2023 and stratified by age (>50, older, vs 18-50 years, younger). Sociodemographics, sexual behavior, HIV-status, smallpox vaccination (receiving at least one dose of historical, during eradication and emergency preparedness, or contemporary vaccines, during the current outbreak), and clinical outcomes were compared using Chi-square or Fisher's exact tests.

Results: Among 29,901 adult mpox cases, 9.7% were older adults, whom 96.3% were cis-men and 47.1% were non-Hispanic White (Table 1).

Characteristics and clinical outcomes		No. and % ^a		p-value		
		18-50 years (n = 77,003)	Greater than 50 years (n = 7,888)			
Gender	Cisgender men	25,602	95.1	36.3	<0.001	
	Cisgender women	808	3.0	88		
	Transgender women	220	0.8	9		
	Transgender men	54	0.2	0		
	Other gender identity	220	0.8	11		
	Missing	95	0.3	10		
Race and ethnicity ^b	Non-Hispanic Black or African American	8,740	34.3	559	20.4	<0.001
	Hispanic or Latino	7,406	31.1	744	27.9	
	Non-Hispanic White	3,711	37.6	1,387	47.1	
	Other Race and Non-Hispanic	1,648	6.5	120	4.4	
	Multiracial and Non-Hispanic	142	0.6	4	0.1	
	Missing	1,558	6.1	164	6.1	
Any sexual contact in the past 3 weeks	Yes	34,526	81.5	1,536	78.7	0.002
	No	3,067	18.5	416	21.3	
	Missing	5,140	6.4	946	11.9	
Sexual contact in the past 8 weeks (among cisgender men)	Exclude cisgender men	479	3.7	49	3.5	0.17
	Exclusively cisgender men	12,160	93.0	1,339	94.3	
	Include cisgender men and other genders	490	3.3	51	2.3	
Immunocompromised conditions ^{c,d}	Yes	947	9.4	147	15.5	<0.001
	No	6,155	90.6	940	86.5	
	Missing	16,866	6.1	1,784	6.1	
HIV status	HIV positive	4,601	54.8	537	55.9	<0.001
	HIV negative	3,799	45.2	278	24.1	
	Unknown and/or missing	16,603	6.2	2,498	26.0	
Sexual/gynecological vaccines ^{e,f}	Human papillomavirus	97	0.6	2,718	93.8	NA
	Contraception	3,246	26.4	379	6.2	
	No vaccine history	8,097	79.0	0	0.0	
	Missing	16,886	0	0	0.0	
Deaths	Yes	94	0.2	5	0.5	0.58 ^g
	No	15,941	99.8	1,572	99.7	
	Missing	15,028	6.1	1,521	6.1	
Hospitalizations	Yes	3,554	7.7	151	6.9	0.18
	No	18,570	82.3	2,014	93.1	
	Missing	7,099	6.1	713	6.1	
Constitutional symptoms ^h	Yes	13,396	80.7	1,264	90.6	<0.001
	No	1,536	10.3	105	10.4	
	Missing	12,071	6.1	1,329	6.1	
Gastro-intestinal symptoms ^{h,i}	Yes	5814	49.4	447	37.6	<0.001
	No	5,966	50.6	743	62.4	
	Missing	15,221	6.1	1,708	6.1	
Risk	Yes	16,767	97.5	1,885	97.5	0.90
	No	404	2.5	53	2.7	
	Missing	10,511	6.1	961	6.1	

* Percentages were calculated using non-missing data. N and column % may not sum to grand total due to missing values; † Fisher's exact test; otherwise, Chi-square test was performed; ‡ All racial/ethnic groups are mutually exclusive; Hispanic/Latino persons could be of any race; ** Does not include HIV and AIDS; †† Adults born before 1972 were assumed to have received historical vaccination; ‡‡ Includes fever, headache, malaise, myalgia, chills, and lymphadenopathy; *** Includes rectal pain/bleeding, nausea in the stool, proctitis, tenesmus, and abdominal pain.

Table 1. Characteristics of adult mpox cases in the USA stratified by age - May 27, 2022 - April 2, 2023 (N=29,901)


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Most recent sexual contact among both younger (86.1%) and older adults (89.3%) were cis-men having sex with men. Compared to younger adults, more older adults had immunocompromising conditions and HIV (p-values<0.05).

Older adults who received contemporary vaccinations, versus those who did not, had lower prevalence of constitutional symptoms, rash, pruritus, and hospitalizations (p-values<0.05) (Table 2).

		No. and %*				p-value
		Historical vaccination ¹ (n = 2,719)		Contemporary vaccination ¹ (n = 179)		
HIV status	Positive	477	66.2	62	63.3	0.32
	Negative	244	33.8	36	36.7	
	Unknown or missing	2074		81		
Immunocompromising conditions	Yes	133	86.8	14	84.1	0.47
	No	875	13.2	74	15.9	
	Missing	1,711		91		
Constitutional symptoms **	Yes	1,189	81.8	75	65.2	<0.001
	No	265	18.2	40	34.8	
	Missing	1,265		64		
Rash	Yes	1,758	97.5	125	94.0	0.02 ¹
	No	45	2.5	8	6.0	
	Missing	916		46		
Pruritus	Yes	483	56.9	43	45.7	0.04
	No	366	43.1	51	54.3	
	Missing	1,870		85		
Gastro-intestinal symptoms **	Yes	403	37.0	44	43.6	0.19
	No	686	63.0	57	56.4	
	Missing	1,630		78		
Conjunctivitis	Yes	31	4.7	0	0.0	0.05
	No	622	95.3	77	100.0	
	Missing	2,066		102		
Death	Yes	5	0.3	0	0.0	0.72
	No	1,473	99.7	99	100.0	
	Missing	1,241		80		
Hospitalizations	Yes	149	7.4	2	1.2	0.001 ¹
	No	1,874	92.6	160	98.8	
	Missing	696		17		

* Percentages were calculated using non-missing data. N and column % may not sum grand total due to missing values; ¹ Fisher's exact test; otherwise, Chi-square test was performed; ¹ Adults born before 1972 were assumed to have received historical vaccination. Hence, all individuals in the contemporary vaccination were assumed to have also previously received historical vaccination; ** Includes fever, headache, malaise, myalgia, chills, and lymphadenopathy; ** Includes rectal pain/bleeding, pus in the stool, proctitis, tenesmus, and abdominal pain

Table 1. Characteristics, symptoms and clinical outcomes among older adult mpox cases in the US, stratified by vaccinations status - May 27, 2022 - April 2, 2023 (N=2,898)

Conclusions: As older adults have higher prevalence of factors compromising their health, contemporary vaccinations must be encouraged despite assumptions about historical vaccinations like potentially lower susceptibility to infection.

Older adults affected by mpox may experience intersecting stigma, including HIV stigma, ageism, and homophobia; a non-stigmatizing healthcare environment could improve diagnosis and treatment of mpox.

LBEPB15

Neural tube defects and major external structural abnormalities by antiretroviral treatment regimen in Botswana: 2014-2022

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Background: The Tsepamo Study reported a preliminary safety signal associating neural tube defects (NTDs) with dolutegravir (DTG) exposure from conception in 2018. We now report complete data through August 2022.

Methods: Tsepamo conducts birth outcomes surveillance at public hospitals in Botswana (>2/3 of births in the country). During routine care, all live infants and stillbirths have a surface examination. Study staff record descriptions of abnormal exams, and exposures to maternal HIV and antiretrovirals; photograph abnormalities (with maternal consent); and review findings with a medical geneticist. NTDs include meningocele, myelomeningocele, anencephaly, encephalocele and iniencephaly. Abnormalities are 'major' if there is medical, surgical or cosmetic significance.

Primary analyses evaluated age-adjusted prevalence differences (aPD) with 95% confidence intervals using a binomial model with identity link.

Results: From 15 August 2014 to 15 August 2022, there were 235,727 deliveries; 235,286 (99.8%) had an evaluable infant surface exam, 162 (0.07%, 95% CI 0.06%, 0.08%) had an NTD and 1455 (0.62%, 95% CI 0.59%, 0.65%) had major external structural abnormalities. Among 11,110 exposures to conception-DTG there were 12 NTDs overall (0.11%, 95% CI 0.06%, 0.19%), similar to all non-DTG ART conception exposures (N=24,368, aPD -0.02%, 95% CI -0.09%, 0.05%)(Figure). The prevalence of NTDs with conception-DTG exposure (0.40%) among conceptions in the year after the DTG rollout (2017) was higher than subsequent years (range 0.06%-0.10%), (p<0.01). Among DTG-conception exposures, the prevalence of factors known to be associated with NTDs (maternal age, diabetes, weight >90kg, antiepileptic medication, folic acid supplementation at conception) was similar in 2017 and other years. The prevalence of major external structural abnormalities was similar between DTG-conception and non-DTG conception exposures (0.77% vs. 0.76%, aPD -0.04%, 95% CI -0.24%, 0.15%).

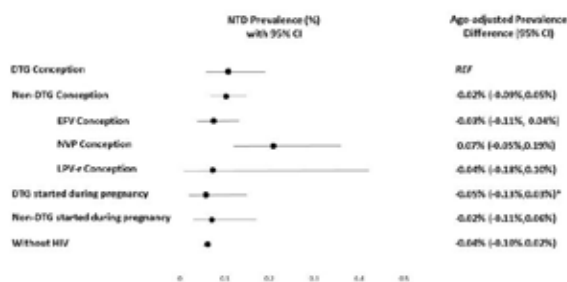


Figure. Neural tube defect prevalence and age-adjusted prevalence difference by exposure category in Tsepamo (2014 - 2022).

*For DTG started during pregnancy, this is an unadjusted prevalence difference, as age adjusted model did not converge.

Conclusions: There was no detectable increase in NTDs or major external structural abnormalities among more than 11,000 exposures to DTG at conception captured in the Tsepamo Study from 2014-2022.

LBEPB16

HIV drug resistance profile in clients experiencing treatment failure after the transition to a dolutegravir-based, first-line antiretroviral treatment regimen in Mozambique

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Background: There are limited real-world data about HIV drug resistance (HIVDR) following transition to tenofovir/lamivudine/dolutegravir (TLD). Understanding prevalence and risk factors for drug resistance, and its contribution to virological failure (VF), is crucial for public health HIV programs.

We investigated HIVDR rate and patterns in clients with virologic failure after TLD transition.

Methods: We conducted a cross-sectional study in seven high-volume health facilities in Gaza province, Mozambique between August 2021-February 2022.

Adults on first-line antiretroviral treatment (ART) ≥12 months before TLD transition were eligible if they had unsuppressed viral load (VL) (>1,000 copies/mL) at least six months after transition and returned for repeat VL after enhanced adherence counseling.

Participants with VF (repeat VL test ≥1,000 copies/mL) had samples sent for genotyping to the national reference laboratory. Drug resistance mutation (DRM) patterns were analyzed based on the Stanford Interpretation Algorithm.

Results: We enrolled 716 participants (mean age of 40.3 years, 70.7% female). VF was found in 216 clients (30.2%), and genotyping was performed for 172 (79.6%), of which 167 (97.0%) were successfully genotyped. Intermediate-high dolutegravir (DTG) resistance was found in 35/167 (21.0%; 95%CI:15.1-27.9) and was more common in those with unsuppressed VL prior to TLD transition (19.4%; 95%CI:10.8-30.9) or no VL prior to transition (40.5%; 95%CI:24.8-57.9) (Figure 1).

In addition, 28.6% (10/35) (95%CI:14.6-46.3) had resistance to all three drugs in the TLD regimen and 14.3% (5/35) (95%CI:4.8-30.2) to DTG only; none had combined resistance to DTG and tenofovir. INSTI resistance mutations included G118R (10.2%), G140S/A/C/R (10.2%), Q148H/R/K (4.8%), N155H (2.5%), Y143R/H/C (0.6%) and R263K (7.2%).

Conclusions: Accounting for pre-transition unsuppressed VL may improve management of TLD treatment failures. While adherence counseling and psychosocial support is appropriate for most clients with initial unsuppressed VL, those with unknown or previous confirmed virological failure may be at the highest risk to develop DTG drug resistance.

Analytical treatment interruption among African women and Peruvian men & transgender individuals with early ART initiation +/- VRC01 circulating at HIV acquisition: early observations of viral rebound & control

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Background: HIV rebounds rapidly in most people living with HIV upon ART cessation. ART-free virologic control associates with early ART initiation and broadly neutralizing anti-HIV-1 antibody receipt, which may modulate anti-HIV immune responses. The AMP trials evaluated VRC01 bnAb-mediated HIV-1 prevention among women in Africa and men & transgender individuals (MSM/TG) in the

Americas; those diagnosed with HIV were linked to early ART. The Post-AMP ATI studies evaluate the impact of early ART +/- VRC01 circulating at HIV acquisition on ART-free virologic control and underlying immunologic and virologic dynamics.

Methods: Eligibility includes early ART initiation and ≥1year of viral suppression after estimated HIV acquisition occurring within 8wks of AMP VRC01 or placebo infusion. Frequent viral load (VL), CD4+ T-cell and STI testing is conducted. ART re-initiation criteria include CD4<350, VL>1,000 for 4wks without 0.5log decline, HIV-related conditions, or participant/clinician ART restart request.

Results: 13/52 prescreened participants in South Africa, Malawi, Botswana and Zimbabwe and 17/72 in Peru enrolled, thusfar. Top reasons for not enrolling include post-AMP loss-of-contact or relocation (n=33), disinterest (n=17), visit schedule (n=10) or pregnancy/breastfeeding (n=7). Two African women demonstrated virologic control ≥33wks on ATI. 11/13 African and 14/17 Peruvian participants met ART re-initiation criteria (n=15 for VL, n=9 participant/clinician request, n=1 acute retroviral syndrome).

Evidence of antiretroviral use during ATI was seen in two African and one Peruvian participant. Median time to meet ART re-initiation criteria is 13.3wks (range 5.3-29.0) among African women and 7.5wks (2.7-18.9) among Peruvian MSM/TG and is not significantly higher among AMP VRC01 vs. placebo recipients. ART was restarted a median of 7.5days (Africa) or 3.5days (Peru) after meeting criteria; all re-suppressed. 14 STIs were diagnosed in 12 participants during ATI. No related SAEs were reported. See Figure 1.

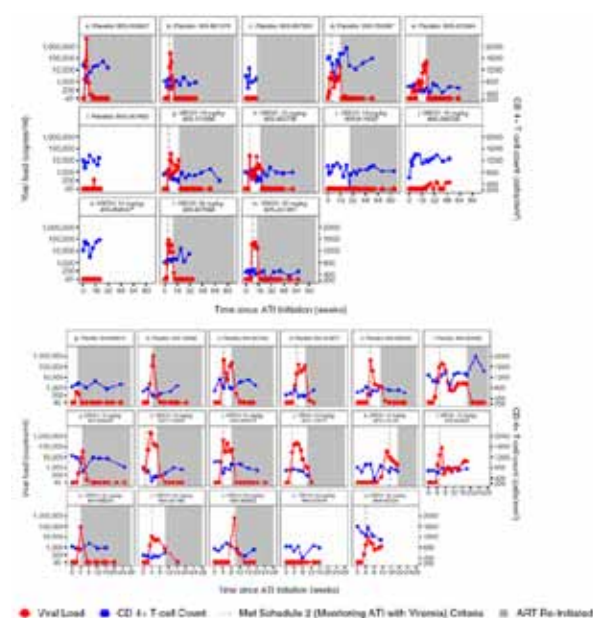


Figure 1. Individual participant viral load (red circles) and CD4+ T-cell counts (blue squares) over time during analytical treatment interruption among African women (top panel, n=13) and among men and transgender individuals in Peru (bottom panel, n=17). The treatment each participant received in the pre-ATI AMP study is indicated above each panel. Time of first viremia is indicated by the gray shaded area. Time of meeting ART re-initiation criteria is indicated by the beginning of the gray dashed line. Three participants (305-011812, 935-058247, and 804-210476) had Dried Blood Spot (DBS) or plasma HIV levels consistent with ongoing ARV use during ATI.

Conclusions: In a well-tolerated ongoing ATI, 15% of African women and no Peruvian MSM/TG exhibit durable virologic control.





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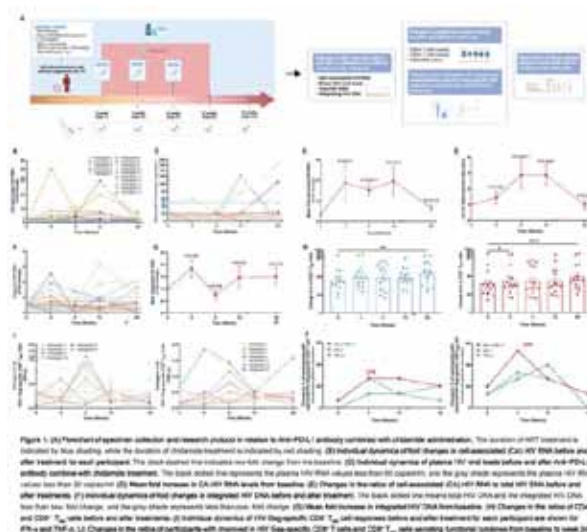
Anti-PD-L1 antibody ASC22 in combination with chidamide potentiates HIV latency reversal and immune function from ART-suppressed individuals: a single center, single-arm, phase 2 study

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Background: The combination of chidamide, an HIV latency reversal agent, and an anti-PD-L1 antibody that boosts HIV-specific immunity, has the potential to serve as a "shock and kill" functional cure treatment strategy for HIV.

Methods: 15 people living with HIV who had achieved virological suppression for at least 1 year were enrolled. Patients received a subcutaneous injection of anti-PD-L1 antibody ASC22 (1mg/kg) once every 4 weeks for a total of 3 times. Chidamide (10 mg) was administered orally twice weekly for 12 weeks while maintaining antiretroviral therapy. Patients were followed up for 24 weeks and changes in the HIV reservoir and HIV-specific CD8⁺ T cell function were measured (NCT05129189).



Results: Cell-associated (CA) HIV RNA rapidly increased at week 8 and week 12, with mean increases of 4.27 and 3.41-fold ($P < 0.001$; $P=0.017$). The combination treatments also resulted in increases in CA HIV RNA to HIV DNA ratios at week 8 and week 12, with mean increases of 1.87 and 2.14-fold from baseline ($P=0.001$; $P=0.008$).

However, these changes returned to normal at week 24 after discontinuing ASC22 and chidamide. Significant increase in the proportions of effector memory CD4⁺ and CD8⁺ T cells (T_{EM}) were observed at week 24 compared to baseline ($P=0.003$; $P<0.001$).

Some participants also showed improved function of HIV gag and pol-specific CD8⁺ T cells and CD8⁺ T_{EM} cells. 8 adverse events were deemed drug-related, all of which were graded 1 and resolved spontaneously.

Conclusions: Combination treatment with ASC22 and chidamide for 12 weeks was safe, well-tolerated, which effectively activated latent HIV reservoirs, promoted CD8⁺ T_{EM} cell proliferation, and had a positive impact on the recovery of HIV-specific CD8⁺ T cell function. This strategy holds promise for activating and clearing latent HIV reservoirs and deserves further investigation.

LBEPB19

Factors associated with COVID-19 vaccination uptake amongst PLHIV in southern Nigeria

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Background: Studies have shown that vaccine hesitancy is rising globally, with variability in the reasons behind refusals. This study sought to determine COVID-19 vaccine acceptance and the factors associated with uptake amongst People Living with HIV/AIDS (PLHIV) on a USAID-funded project Accelerating Control of HIV/AIDS Epidemic (ACE) in Nigeria, cluster 6 (ACE6).

Methods: Retrospective analysis of routine program data of PLHIV aged 16 years or older who were eligible for the COVID-19 vaccine from December 2020 to February 2023 in fifty-six supported facilities, on a USAID-funded project ACE6 was conducted. COVID-19 and HIV program data were extracted from an electronic medical record system. Multivariable logistic regression was implemented in STATA version 12 to examine variables associated with COVID-19 vaccine uptake.

Results: Of 76,026 patients currently on treatment, 53,694 (71%) were females. 27% (20,657) received a minimum of one dose of COVID-19 vaccine. Of 20,657 who received at least one dose, 14,653 (71%) were females, and the median


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age was 44 years [interquartile range (IQR) 36–52]. Multivariable logistic regression model revealed that being male (aOR: 1.11, 95% CI: 1.05–1.17), having primary school education compared to no education (aOR: 1.51, 95% CI 1.34–1.69), unemployed compared to employed (aOR: 1.36, 95% CI 1.28–1.43), no sign or symptoms of TB compared to clients currently on Isoniazid (INH) prophylaxis (aOR: 1.30, 95% CI 1.13–1.49) were more likely to be vaccinated.

The odds of COVID-19 vaccine uptake increase with an increase in age [(25–34 years: aOR: 1.13, 95% CI: 1.01–1.27), (35–49 years: aOR: 1.14, 95% CI: 1.01–1.28), (≥ 50 years: aOR: 1.34, 95% CI: 1.18–1.52; ref 16–24 years).

Conclusions: COVID-19 vaccine uptake varied by socio-demographics and clinical factors. These findings suggest that targeted interventions are needed to promote COVID-19 vaccination acceptance among PLHIV based on socio-demographics and clinical factors.

LBEPB20

T-cell responses induced by HTI vaccines and vesatolimod correlate with improved control of HIV rebound

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Background: Vaccination with HIV-specific T-cell immunogens is a key component of a potential HIV cure strategy. The HIVACAT T-cell immunogen (HTI) redirects cellular immune responses to HIV targets associated with viral control and is currently expressed in DNA (D), ChAdOx1 (C), and MVA (M) viral vectors. AELIX-002 (NCT03204617) and AELIX-003 (NCT04364035) were randomized (2:1), placebo-controlled studies in early-treated people with HIV (PWH) of HTI vaccines given alone (DDMM followed by CCM) or in combination with the toll-like receptor 7 agonist vesatolimod (CCMM+VES), respectively.

Here, we report AELIX-003 final immunogenicity results, and AELIX-002/AELIX-003 pooled analyses of immune correlates of virological outcomes after a 24-week analytical treatment interruption (ATI).

Methods: Longitudinal changes in HTI-specific T-cell responses were measured by IFN γ ELISPOT up to ATI start. During ATI, plasma viral load (pVL) was monitored weekly and antiretroviral treatment (ART) was resumed if pVL $>100,000$ copies/mL and/or $>10,000$ copies/mL for 8 consecutive weeks. Study populations and immunogenicity at ATI start were compared between studies. A pooled survival analysis of efficacy outcomes was undertaken using the Gehan-Breslow-Wilcoxon test.

Results: Median (range) of peak total HTI-specific T-cell responses in the CCMM+VES (n=31) and placebo (n=16) arms were 1710 (0–4790) and 413 (0–1460) spot-forming cells/ 10^6 peripheral blood mononuclear cells, respectively ($P<0.0001$, van Elteren test with stratification for beneficial HLA alleles). Similar to AELIX-002, total HTI-specific T-cell responses at ATI start were significantly correlated with longer time to ART resumption ($R=0.49$, $P=0.01$) in the CCMM+VES but not in the placebo arm.

Study populations were comparable between AELIX-002 and AELIX-003, and levels of vaccine-induced HTI-specific T-cell responses at ATI start were not statistically different.

In the survival analysis, participants with HTI-specific responses above the median magnitude of the pooled populations (n=84) at ATI start had a significantly delayed (time to pVL >50 copies/mL) and slower (time to pVL $>10,000$ copies/mL) viral rebound, and an increased time off ART versus individuals with below the median responses ($P<0.05$ for all).

Conclusions: HTI vaccines are highly immunogenic in early-treated PWH. AELIX-003 confirmed previous clinical findings demonstrating that vaccine-induced HTI-specific T-cell responses contribute to improved control of HIV viremia after ATI.



LBEP21

HIV transmission clusters in Zambia are smaller than in Europe: evidence from the HPTN-071 (PopART) study, BEEHIVE study, and individual-based models

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Background: HIV incidence has been declining in sub-Saharan Africa (SSA) but not at par with the UNAIDS treatment targets, suggesting an important role of individuals with unsuppressed HIV who might be at a higher risk of transmitting HIV than the general population. Focused treatment can address viral suppression disparities and speed up incidence reduction. However, it is heavily contingent on the existence of core groups. We applied phylogenetic and modelling methods to analyse HIV transmission clusters in generalised HIV epidemics in SSA.

Methods: Using HIV-Trace, ClusterPicker and a custom approach based on dated phylogenies, we reconstructed molecular transmission clusters in Zambia from a dataset of 3897 HIV sequences from the HPTN 071-2 PopART Phylogenetics study.

We comparatively analysed clusters in a dataset of 2122 European samples from the BEEHIVE study and simulated transmission networks from two independent individual-based models calibrated to SSA epidemics: the PopART

IBM and the IDM EMOD. Analyses were done on the complete phylogenetic datasets as well as where the datasets were matched for time since epidemic peak and temporal sampling pattern. The cluster analysis was extended to HIV sequence datasets from other countries in SSA (South Africa: n=2359, Uganda: n=4248 and Botswana: n=3658).

The simulated data were additionally used to analyse clustering in SSA at different sampling fractions as well as with or without high-risk populations.

Results: All the analytical methods found smaller clusters in the Zambian dataset than in the European dataset. The pattern of clustering observed in this generalised HIV epidemic in sub-Saharan Africa was consistent with being sustained by serial heterosexual transmission without super-spreader events.

The Zambian cluster size distribution pattern was consistent with observations across other SSA locations and the simulated African epidemics.

Conclusions: Our findings suggest that, within the generalised epidemic in which we did not seek to sample particular subpopulations, cluster-busting interventions are unlikely to improve HIV prevention.

More efforts are needed to link and retain all individuals living with HIV in the general population to care, and to provide pre-exposure prophylaxis to people at high risk of acquiring HIV.

LBEP22

Preliminary results of the bio behavioral survey among prisoners in Mozambique

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Background: Knowledge of HIV and syphilis is important for elimination of HIV and ITS. The study aimed at estimating the prevalence of HIV, Syphilis and HIV viral load suppression among prisoners. Additionally, we assessed the risk factors associated with HIV and syphilis as well as access and use of health and social support services for this population in Mozambique.

Methods: A cross-sectional study was carried out in prison facilities across the country. The study considered inmates aged 18 years old or above, who had been incarcerated for at least 3 months prior to the survey and with at least one month to be released from prison. In total, 10690 male prisoners and 99 female prisoners were interviewed.

Results: HIV prevalence was estimated at 25.4% and 31.5% in male and female inmates, respectively. Concerning Syphilis, the prevalence was estimated at 10.9% in male


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inmates and 3.6% in female inmates. In male prisoners living with HIV, it was observed that 93.6% are aware of their serostatus, 84.1% are on antiretroviral treatment and 76.3% have achieved viral suppression. Regarding female prisoners living with HIV, 98.4% are aware of their serostatus, 96.1% are on antiretroviral treatment and 76.1% on viral suppression.

These results also showed that there a great disparity between the availability and use of health services in prison facilities.

Conclusions: The prevalence of HIV infection among prisoners in Mozambique was high in comparison to the general population. In relation to the 95-95-95 goals, the women inmates living with HIV reached the goal of 95% regarding knowledge of sero-status and 95% regarding treatment retention. However, efforts should be made for continuity, increment and retention relatively.

LBEP23

Relative risk of death during pre-Delta, Delta and Omicron variants waves among children and adults hospitalized with COVID-19 in Africa

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Background: There is scarcity of data on relative changes in mortality across the SARS CoV-2 variant waves among most-at-risk populations in Africa. We investigated changes in in-hospital mortality in more-at-risk groups over the course of the pandemic.

Methods: We used individual-level data from the WHO Global Clinical Platform comprising 520,810 hospitalized children and adults from 13 African countries across pre-Delta, Delta and Omicron variant waves. Cox regression model was used to evaluate the impact of SARS-CoV-2 variant on in-hospital mortality and assess associated risk factors.

Results: The risk of death during the pre-Delta and Delta variant waves was similar in children (aHR 1.02, 95%CI 0.77-1.35) but increased by 6% in adults (aHR 1.06, 95%CI 1.04-1.09). Compared to the Delta variant wave, the risk of death during the Omicron variant wave declined by 42% (aHR 0.58, 95%CI 0.43-0.80) in children and by 59% (aHR 0.41, 95%CI 0.40-0.43) in adults.

Vaccinated patients had a 56% (aHR 0.44, 95%CI 0.32-0.59) lower risk of death compared to the unvaccinated. In children, common risk factors for in-hospital mortality across

the three waves were severe COVID-19 illness at admission and HIV co-infection while in adults were older age, severe COVID-19 illness, HIV co-infection, TB co-infection, diabetes, cancer, and chronic kidney disease.

Reduction in risk of death during the Omicron variant wave varied across the different risk groups with a higher absolute risk reduction (ARR) of >20% in adults older than 45 years and in those with chronic kidney disease.

Risk reduction was modest (ARR of <7%) in children with severe/critical COVID-19 illness, those co-infected with HIV as well as adults co-infected with HIV and TB.

Conclusions: Risk of death declined during the Omicron variant wave relative to Delta and Pre-delta waves across all populations but was modest among children with severe/critical COVID-19 and in those co-infected with HIV as well as in adults co-infected with HIV or TB.

This modest reduction in risk of death for some groups coupled with an overall high risk of death across the three waves in some groups support the current WHO guidelines recommending booster vaccines for most-at-risk groups.

LBEP24

Growth and neurodevelopmental outcomes of 18-month-old children with exposure to maternal HIV and placental insufficiency in a peri-urban area of South Africa

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Background: Children who are HIV-exposed-and-uninfected (CHEU) and those who are growth restricted *in utero* due to placental insufficiency are both regarded as high risk populations, which can impact growth and neurodevelopment as well as short- and long-term complications in terms of morbidity and mortality. However, the growth and neurodevelopmental outcomes of CHEU who have also experienced growth restriction *in utero* have not been researched.

We therefore compared the growth and neurodevelopment outcomes of children aged 18 months with *in utero* HIV exposure and abnormal umbilical artery resistance indices (UmA-RI), indicating placental insufficiency.

Methods: The cross-sectional study investigated 264 mother-child pairs, who were grouped into four sub-groups based on HIV exposure and history of normal/abnormal Uma-RI, using available pregnancy and birth information.

The World Health Organization standard procedures were used for anthropometric measurements and z-score calculations, and Bayley III to test child development.



Results: CHEU with abnormal UmA-RI (n=14) had lower length-for-age z-scores (-1.40 ± 1.40 vs -0.04 ± 1.31 ; $p=0.001$), weight-for-age z-scores (-0.60 ± 0.96 vs 0.04 ± 1.16 ; $p=0.02$) and head-circumference-for-age z-scores (0.42 ± 0.66 vs 0.90 ± 1.15 ; $p=0.04$) compared to children who are HIV-unexposed-and-uninfected (CHUU) with normal UmA-RI (n=181). Nearly a quarter (21.4%) of CHEU with abnormal UmA-RIs had a mild delay in cognitive development, 7.1% had a moderate delay in language and 7.1% had a moderate delay in motor development compared to CHUU with normal UmA-RI: 2.2%, 2.8% and 0.0%, respectively.

Conclusions: Exposure to both maternal HIV infection and placental insufficiency is associated with stunting, underweight and cognitive developmental delay.

LBEP25

Mathematical modeling of improving formal PrEP provision to MSM who are PrEP-eligible in the Netherlands: continuing and extending the national PrEP program is necessary

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Background: HIV pre-exposure prophylaxis (PrEP) was made formally available in the Netherlands in 2019. However, the current pilot PrEP programme in the Netherlands has reached its maximum availability of 8500 slots, resulting in 3000 MSM on the waiting list for formal access. Additionally, 28000 MSM were estimated to be PrEP-eligible and show PrEP-intention. This results in a gap of 19500 PrEP unmet-needs. More importantly, the current pilot program will be evaluated in July 2023 and a decision about the (dis-)continuation of the current PrEP program will be made.

To inform political decision-making, we modelled the epidemiological impact of further improving the current PrEP provision to further cover:

1. 3000 MSM on the waiting list, and;
2. 19500 PrEP-eligible MSM who show PrEP-intention by 2030 in the Netherlands.

Methods: We adopted a deterministic mathematical model of MSM HIV transmission, stratified into four sexual activity groups. We calibrated our model to the Dutch MSM HIV epidemic. Improved PrEP provision was seeded in January 2022 to achieve targeted coverage for the targeted populations by January 2024, with different coverage-levels (25%, 50%, 75% and 100%).

Epidemiological impacts of improving PrEP provision were evaluated by 2030 in comparison to the baseline scenario of no PrEP provision extension.

Results: Improving formal PrEP provision can further reduce the MSM HIV epidemic. We found that covering the 3000 MSM on the waiting list with formal access by January 2024, eight new HIV infections among MSM were pro-

jected by 2030, resulting in an averted 9% of cumulative new infections. Most relevant, we found that covering 75% and 100% of PrEP-eligible MSM who showed PrEP-intention with formal PrEP access would reduce the number of new infections to zero by 2030, resulting in an averted 39% and 45% of cumulative new infections, respectively.

Conclusions: Achieving high PrEP coverage by improving PrEP formal provision can help to reduce new HIV infections to zero by 2030 in the Netherlands.

Our findings are thus timely and can support the national PrEP program evaluation, suggesting a further extension of the current PrEP provision program in the Netherlands to accelerate ending the HIV epidemic.

LBEP26

Preferences for long-acting HIV pre-exposure prophylaxis (PrEP) formulations among East and Southern African women – evidence from a discrete choice experiment (DCE)

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Background: Oral HIV pre-exposure prophylaxis (PrEP) is highly effective, but adherence to daily oral PrEP is challenging for young women. Products centered around women's preferences could address some of these barriers. Using a longitudinal discrete choice experiment (DCE), we evaluated young African women's preferences around PrEP product attributes, including daily and monthly oral pills and long-acting injections, and whether preferences changed after taking daily oral PrEP for a month.

Methods: 3087 sexually active, HIV-uninfected cisgender women from six countries in east and southern Africa were enrolled in a prospective cohort from August 2022 – June 2023. At enrollment and Month 1 visits, participants completed a DCE with 16 randomly assorted choice sets (product choice A, B, or neither) assessing five PrEP at-



tributes (form and dosing, dose forgiveness, reversibility, weight change, protection type). Preference weights quantifying relative desirability were estimated with a hierarchical Bayesian model; higher positive numbers indicate greater preference for a given attribute level.

We calculated importance scores, which compared relative importance across the five attributes (higher scores indicate greater importance).

Results: The median age was 23 years (range: 16–30), 87.8% were not married, and 93.0% were newly initiating PrEP. At enrollment and month 1, the “product form and dosing” attribute exerted the greatest influence on product choice (importance scores: 41.5% and 44.4%), followed by “weight change” (importance scores: 27.7% and 24.3%) and “drug reversibility” (importance scores: 15.7% and 16.1%). At enrollment, women preferred small oral pills taken monthly (preference weight: 0.70, 95% Confidence Interval [CI]: 0.61, 0.79) and at Month 1, an injection every 6 months (preference weight: 0.58, 95% CI: 0.47, 0.68). No weight change was most preferred and a 5kg weight loss was least preferred. For both “drug reversibility” and “dose forgiveness” attributes, longer periods were preferred.

Conclusions: Product form and dosing was the most important attribute in this cohort of mostly PrEP naïve African women; a small monthly oral pill and a 6 monthly injection were most preferred.

Discrete, long-acting prevention methods and approaches are needed to support product choice and switching among young women in sub-Saharan Africa.

LBEP27

Prevention effective PrEP use in pregnancy and postpartum: evaluation of alignment of oral PrEP use and sex behaviors in South Africa

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Background: HIV acquisition risk is high during pregnancy and postpartum. Oral pre-exposure prophylaxis (PrEP) is one method to prevent HIV acquisition, however PrEP persistence and adherence remains challenging over time. In this analysis, we evaluated prevention-effective adherence, or PrEP use in alignment with sexual activity and condomless sex, across gestational periods and postpartum.

Methods: Using data from the PrEP in pregnancy and postpartum study (PrEP-PP), a prospective cohort of pregnant women without HIV enrolled from their first ante-

natal visit followed through 12-months postpartum in Cape Town, South Africa, we examined PrEP use (quantifiable tenofovir-diphosphate [TFV-DP] in dried bloodspots among those who reported recent adherence) over time during pregnancy and postpartum periods; we used any/no TFV-DP since the proportion of participants with TFV-DP consistent with daily use was low.

Primary exposure was any condomless sex in the last 3-months collected quarterly. We used generalized estimating equations of repeated measures to examine the association between reported condomless sex in the last 3-months and PrEP use (TFV-DP present) adjusting for maternal age, partner HIV status, and gestational age at baseline.

Results: Of 1199 participants, 3367 visits were completed with information on recent sexual behaviors and oral PrEP use. Median age was 26 years (IQR=22–31) with baseline gestation of 21 weeks (IQR=15–31) and 21% (n=228) married/cohabitating with partner. Prevention-effective adherence (initiation and quantifiable TFV-DP during follow-up among those reporting condomless sex) was 65% overall (81% at 1st trimester, 78% at 2nd trimester, 67% at 3rd trimester, 49% at 0–6-months postpartum, 50% at 6–12-months postpartum).

More women who reported recent condomless sex continued and adhered on PrEP (53% adhered among those with risk vs. 47% who did not; aRR=1.88; 95% CI: 1.28–2.76) across pregnancy and postpartum stages. More women reporting a new recent sexual partner adhered to PrEP (65% adhered vs 35% did not; aRR=1.12; 95% CI: 0.94–1.33).

Conclusions: PrEP persistence varied significantly across pregnancy and postpartum stage, however, pregnant and postpartum women who continued on PrEP aligned their PrEP use with sexual behaviors (i.e. having new sex partners).

However, prevention-effective adherence was lowest during postpartum period; targeted interventions to improve delivery of PrEP and counseling urgently needed.



LBEP28

District HIV epidemiological profiling using data integration in Andhra Pradesh, India: an evidence-based initiative of decentralised data use for epidemiological Insights and strategic prioritization

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Background: India's AIDS response is decentralised to the district level. In 2022, the state of Andhra Pradesh began systematic collection and synthesis of HIV program data in 11 districts, to understand epidemiological patterns, vulnerabilities, programme response and gaps, and strategic priorities at district and sub-district levels.

Description: Routine de-identified data was compiled from over 582 testing centres, 37 key population (KP) interventions, 76 blood banks, 21 anti-retroviral therapy treatment (ART) centres, 20 sexually transmitted infections (STI) clinics, 63 private facilities, and community-based interventions, from 2017-2022.

Over 20,000 excel files, 1000 variables and 12 million records were organized into uniform datasets using Extract-Transform-Load tool Power Query. After quality checks and adjustments, the data was consolidated using PowerBI. Dynamic analytic outputs and dashboards with drill-down, cross-filtering features were developed. Data pipelines have been established to update the analysis with new data. To ensure sustainability of the exercise, district and facility-level staff were also involved.

Lessons learned: Routinely collected data shed light on treatment response (CD4 and viral load count) and its association with other factors like gender, age, occupation, KP groups. Data generated evidence for the growing role of casual sexual network and spousal transmission. Provider-initiated (PI) testing modality was 80%, while client-initiated (CI) testing was 20% of the total tests, however, positivity was double in CI (4%) as compared to PI (2%).

High rates of positivity (>50%) were observed among spouses of HIV-diagnosed pregnant women. STI clinic attendance is higher among females; specifically young and adolescent girls, as compared to men.

The average time from HIV detection to treatment initiation in 2017 was 43.57 days, which significantly fell to 6.97 days in 2022 (significant with t value 29.65 and P value < 0.05). The median time between ART initiation and first viral load test fell from ~24 months to 7 months.

Conclusions/Next steps: Routine data triangulation highlights programmatic gaps and focus and has huge potential for programme improvement and creating culture of data analysis and use.

This project database and dashboard strengthen real

time, assisting and decision making. It greatly contributes to strengthening HIV epidemiological understanding at decentralized levels of programme.

LBEP29

Retention and clinical outcomes improve after implementation of test and treat policy among children living with HIV in Zambia: a retrospective cohort study

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Background: Initiating antiretroviral therapy (ART) immediately after diagnosis of HIV infection may reduce morbidity and mortality in children living with HIV (CLWH) especially when they are retained in HIV care. In Zambia, retention of CLWH was unknown.

The goal of this study was to determine the retention rate and clinical outcomes of implementing a test and treat program in children diagnosed with HIV infection.

Methods: We conducted a retrospective cohort study in 12 districts of the southern region of Zambia among CLWH. We reviewed 984 files. The cohorts were divided into two groups, 405 (41.2%) before test and treat (BTT) and 579 (58.8%) after test and treat (ATT) policy.

We collected demographic, laboratory and clinical data using a data collection form which was structured in Research Electronic Data Capture (REDCap). Descriptive statistics and logistic regression were the statistical methods employed.

Results: The median age (interquartile range (IQR)) of children enrolled was 60 months (22, 100) and 52.3% (n=515) were females. Overall retention (alive and on treatment) was 82.0% (n= 807; 95% CI 79.5, 84.4). A higher proportion of children ATT were retained in care compared to the ones BTT (91.0% vs. 69.1%, p <0.001). The majority of children BTT were transferred out (19.0% vs. 4.8%), lost to follow (11.1% vs. 3.8%) and died (0.7% vs. 0.2%) as compared to those in the ATT cohort.

At multivariable analysis, the factors significantly associated with retention were ATT cohort (odds ratio (OR) 4.98; 95% confidence interval (CI) 4.06, 6.11), female sex (OR 0.80; 95%CI 0.67, 0.95), use of DTG-based regimen (OR 2.66;



95%CI 1.05, 6.72), an increasing number of days to ART initiation after HIV-diagnosis (OR 0.99; 95%CI 0.99, 0.99), and WHO stages 3 (OR 0.68; 95%CI 0.52, 0.90) and 4 (OR 0.30; 95%CI 0.19, 0.48).

Conclusions: The retention rate among children was sub-optimal and it was influenced by cohort, sex, ART regimen, time to ART initiation after HIV diagnosis and WHO staging. However, retention improved as well as clinical outcomes ATT compared to BTT.

This study underscores the importance of initiating ART immediately after diagnosis of HIV to enhance retention in HIV care and treatment.

Track D: Social and behavioural sciences

LBEPD32

Australia averts an mpox outbreak during Sydney World Pride: primary outcomes from a government, community, and research partnership to prevent mpox between October 2022 and April 2023

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Background: In mid-2022, an mpox outbreak spread across non-endemic countries, primarily affecting sexually active men who have sex with men (MSM) attending large Pride events and sex parties. Amid vaccine scarcity and in the leadup to Sydney World Pride, we established a government, community, and research collaboration to inform Australia's mpox response.

Methods: TraX was a co-designed national, prospective observational study assessing the rollout, uptake, and effectiveness of mpox vaccines.

Open to all adults living in Australia (to monitor the spread of mpox among non-MSM populations), participants completed weekly surveys on vaccination status, mpox acquisition, and sexual behaviours.

We calculated vaccine uptake rates and used Cox proportional hazard models to identify factors associated with vaccination.



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Results: Between 3-Oct-2022 and 24-Apr-2023, 3,595 participants joined the study through community organisations and social media (29.6%), government health vaccine waitlists (30.7%), and pop-up vaccine clinics (39.7%). Median age was 38 years (range=19–80). Most identified as gay men (84.6%) and 8.3% were living with HIV.

Most (87.5%) received one mpox vaccination before World Pride commenced. By study end, 12.1% reported being unvaccinated. No participants reported acquiring mpox during study follow-up.

A sub-analysis of 799 participants unvaccinated at study entry assessed factors predicting vaccination uptake. Total follow-up time was 13.23 person-years, and 364 participants reported receiving a vaccination at a rate of 321.46 per 100 person-years (95%CI=290.08–356.24).

Compared to participants who remained unvaccinated, participants were more likely to have received at least one mpox vaccination if they scored higher on measures of LBGTQ community connectedness (aHR=1.93;95%CI=1.20–3.09), reported sex with casual partners in the last week (aHR=1.25;95%CI=1.54–1.96), and reported recent international travel (aHR=1.47;95%CI=1.19–1.82).

Conclusions: Rapid vaccination rates, low numbers of imported overseas cases, and immediate clinical management combined with efficient public health and community-led response were crucial in preventing a large outbreak of mpox, highlighting the importance of targeted actions to at-risk groups.

Strong health-seeking behaviours and collaborative action with key affected communities, coupled with effective targeted health promotion for populations at higher risk of mpox, reinforce the ongoing message that MSM are prepared to take the necessary steps to protect themselves and the community.

LBEPD33

[A community-based research to improve access to health services among young female domestic servants in Bamako, Mali: is this a “new” key-population for sexually transmitted infections? \(ANRS-0005s 2DM2K\)](#)

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Background: West African countries including Mali experience large numbers of rural-urban temporary migration by young female domestic servants (YFDS). Age (10–19 years), ignorance and stigma –including by healthcare professionals– hinder access to healthcare services.

There is a potential risk of urban-rural “bridging” for infectious diseases including HIV/STIs, among other public health challenges. We aimed providing preliminary results of a study focusing on the YFDS neglected population.

Methods: ANRS-0005s/2DM2K is an ongoing study launched in February-2023 in Bamako (approval 2022/79/CE/USTTB). The NGO-ARCAD-Santé-PLUS provides medical consultations, integrated in the community-based activities of the NGO-ADDAD (defending domestic servants' rights). YFDS are offered with comprehensive package including nutritional status evaluation; counseling/testing/confirmation for HIV/STIs/HBV/HCV.

Personalized support is provided for testing/confirmation of suspected tuberculosis. Sexually active YFDS are offered with pregnancy tests and vaginal swabs. Routine data is collected including medical information and cross-sectional survey is proposed to YFDS >11 years old.

Results: Up to May 7, 2023, community-based activities concerned 300 YFDS with median[IQR] age 17[15–19] years. 53% have no education, 68% without rest day, median monthly wage was 21[17–25]USD; for 54% it was the first contact with ADDAD. Medical consultation concerned 197 YFDS (66%): 8%, 25% and 57% were affected by stunting, overweight and anemia respectively.

One case of HIV (0.51% versus 0.9% national) was confirmed and HBV prevalence was 5.1% 95%CI[2.0–8.2] (8.7% national). No HCV was detected and 2 suspected cases of TB are waiting for confirmation. 53%(n=105) were sexually active (19 known pregnancies, 10 discovered during consultation).

Acceptability of vaginal swabs was 68% (n=71). Analyses revealed 9 candidiasis (*albicans*, *glabrata*, *dubliniensis*) (13%), 2 streptococcus *agalactiae* B (3%), and 7 HPV cases (10%). Among 164 YFDS (83% out of 197) accepting the cross-sectional survey, 11% declared sexual violence and 18% declared having had suicidal intentions.

Conclusions: Our results shed light to a neglected population with important public health challenges including the dissemination of infectious diseases. Long-term food insecurity leading to the triple burden of malnutrition, pregnancies, and poor mental health also highlight the urgent need of healthcare services adapted to YFDS. Preserving the confidence social environment of YFDS is a key lever to improve their access to healthcare services.

**LBEPD34**

Can a behavioral science-informed therapeutic alliance be the answer to attaining the third 95 Global UNAIDS target? Promising results from a viral load study involving children on ART in Zambia

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Background: Globally, 52% of the 1.7 million children living with HIV (CLHIV) aged 0-14 years received ART in 2021, but only 4 in 10 were virally suppressed (UNICEF 2022). CLHIV on ART are more likely to be virally non-suppressed due to clinical and behavioral aspects, e.g., poor adherence, non-optimized antiretrovirals (ARVs) and severe immunosuppression.

We aimed to determine the impact of a behavioral science-informed therapeutic alliance (TA) on viral non-suppression among CLHIV in USAID DISCOVER-Health-supported facilities in two provinces of Zambia.

Methods: Non-suppressed CLHIV on dolutegravir-containing ART for >6 months and assigned to a TA comprising a clinician, oriented community-based volunteer (CBV) and a household caregiver as standard care were enrolled in the study.

The intervention arm enrolled CLHIV from 8 of the 15 districts, also assigned to a TA, but layered behavioral science informed approaches targeted at decision making biases and social/organizational norms:

- CBVs directly supported caregivers administering ARVs every week, uncovering and addressing barriers to adherence;
- Clinicians supported CBVs and submitted progress reports to supervisors and discussed challenges and remedies monthly.

Cascade data for CLHIV enrolled in enhanced adherence counseling (EAC) to viral suppression outcomes were collected for analysis with WINPEPI.

Results: The study enrolled 188 non-suppressed CLHIV in November 2022. After 4 months, 177 CLHIV (94%) were enrolled in EAC with 89% completion rate. Additionally, 140 CLHIV underwent repeat VL testing with 25% viral non-suppression rate.

No significant differences were observed in EAC enrollment ($p=0.412$) or completion rates ($p=0.556$) between the two study arms. VL retesting after EAC completion was statistically significantly higher in the intervention arm (risk ratio (RR)=1.12; CI=1.01-1.26, $p=0.026$).

The risk of viral non-suppression was two-times less in the intervention arm (RR=0.472; CI=0.25-0.89, $p=0.012$) compared with standard care.

Conclusions: Applying behavioral science to TAs spearheading pediatric ART service provision can lead to optimized clinician and caregiver behavior, which increases positive treatment outcomes and reduces viral non-suppression.

Applying behavioral science in such settings is crucial to achieving the goal of ending AIDS in children by 2030.

LBEPD35

Predicting factors associated with whether both, one, or neither couple member uses substances when having condomless anal sex: findings from a longitudinal study with cisgender male couples in the U.S.

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Background: Among couples who engage in condomless anal sex (CAS), little is known about what factors predict whether both, only one, or neither couple member uses substances while having CAS – either with each other or with a casual sex partner.

Methods: Analyses were recently completed for an epidemiological, longitudinal study that collected quantitative, dyadic data (baseline, month 3, and month 6) from 226 cisgender male couples in South Florida. Assessments included validated measures (e.g., DAST-10, communication patterns) and a variety of behavioral items.

Descriptive and comparative statistics were computed, followed by odds ratios and 95% CIs from mixed effects, multinomial longitudinal models that identified what factors predicted whether both, only one, or neither couple member used substances while engaging in CAS in the future – either with each other or with a casual sex partner.

Results: Descriptive statistics of the sample will be reported. Compared to both members who used substances when having CAS with each other at month 6, increases in baseline, within-dyad DAST-10 scores predicted lower likelihood of neither member using (OR=0.47, 95% CI 0.28-0.81, $p<0.01$) and only one member using substances (OR=0.65, 95% CI 0.43-0.97, $p<0.05$).

Increases in baseline, within-dyad scores on perceived seriousness about their relationship partner contracting HIV predicted greater likelihood of only one member using (OR=2.47, 95% CI 1.28-4.77, $p<0.01$) compared to both members using substances when having CAS with each other at month 6.

Compared to both members using substances when having CAS with a casual sex partner at month 6, increases in baseline, within-dyad mutual constructive communication



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tion scores predicted greater likelihood of neither member using substances (OR=2.96, 95% CI 1.18-7.44, $p<0.05$). Compared to both members using substances when having CAS with a casual sex partner at month 6, increases in baseline, within-dyad scores on perceived seriousness about personally contracting HIV predicted greater likelihood of only one member using substances (OR=9.76, 95% CI 1.27-75.00, $p<0.05$).

Other predictive, time-based results will be shared (e.g., baseline for month 3).

Conclusions: Findings suggest that screening substance use behaviors among couples may be advantageous for prevention, as well as integrating harm reduction approaches into dyadic HIV prevention-care programs.

LBEPD36

#WhatGirlsWant: mentoring AGYW in a new dimension for a global transformation

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Background: Across the board, mentorship programmes are far and few between, often inaccessible, and seldom offer context-specific support, particularly in Sub-Saharan Africa. However, ATHENA believes they are essential and should be taken seriously and supported with resources and sufficient funding.

We believe that mentorship, capacity building, and leadership training are at the core of assisting AGYW and our #WhatGirlsWant focal points self-actualize and become self-determined leaders in driving interventions aimed at achieving gender equality, universal health care, and ending HIV/AIDS as public health threat on the continent and beyond.

Description: The AGYW's capacity-building efforts through mentorship programs and leadership training have enabled individuals to become the leaders they have the potential to become.

Africa is the youngest continent, with an estimated 60% of its inhabitants under 25, making it essential to recognize their strengths and potential to achieve the 2030 Sustainable Development Goals and end HIV/AIDS as a public health pandemic.

Lessons learned: AGYW, women, and other vulnerable populations are disproportionately affected by health interventions and need support for capacity-building and leadership skills training to participate in healthcare programming and interventions.

To ensure their experiences and needs are supported, they must be equipped and self-determined to affect meaningful and sustainable life changes.

This is demonstrated by the #WhatGirlsWant model, an advocacy campaign that focuses on HIV prevention and management and helps to create a movement of well-connected AGYW in their countries.

Conclusions/Next steps: The AGYW peer mentoring model was developed to empower five young women from Eastern and Southern African countries, including Kenya, Tanzania, Zimbabwe, Namibia, and Zambia.

The project focused on providing mentorship programs on financing HIV responses, female control HIV prevention options, biomedical intervention, human and legal rights, sexual reproductive health and rights, and gender equality. It also increased the expertise of the five #WhatGirlsWant country focal points with the ability to train and mentor their peers and ensure skill-based peer advocacy.

LBEPD37

Inhaled nitrite abuse and quitting intention among men who have sex with men in China: a theory of planned behavior-informed study

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Background: There was a high prevalence of chemsex, especially the use of inhaled nitrites (commonly known as "poppers" or "Rush"), among men who have sex with men (MSM) worldwide and in China.

This study aimed to explore the factors associated with Rush quitting intention based on the Theory of Planned Behavior (TPB), so as to design theory-based interventions to reduce Rush use and also identify subgroups of MSM who can benefit more from Rush cessation programs.

Methods: A total of 184 MSM who used Rush in the past six months were recruited with the assistance of a local MSM community-based organization (CBO). The cross-sectional survey was conducted to collect participants' information on social demographics, sexual behavior, TPB-informed measures from October 2022 to January 2023 in Chengdu, China. Univariate and multivariate regressions were used for data analyses.

Results: Among the 184 Rush using MSM, 31.5% intended to stop using Rush in the next six months; identified barriers of having quitting intention included positive attitudes towards Rush use (Adjusted Odds Ratio: AOR 0.77, 95% CI 0.61-0.97) and supportive subjective norms from the MSM community (0.72, 0.59-0.88). MSM who were polydrug users (30.4% vs. 69.6%, $P<0.01$) and having a greater amount of prior Rush use (17.4% vs. 39.1%, $P<0.01$) were reported to have lower quitting intentions.

Conclusions: The study found a low intention of Rush quitting among this Chinese sample of MSM, and TPB could be used to design interventions to reduce Rush use. Additional support is needed for polydrug using MSM.



LBEPD38

The support and care of vulnerable populations living with HIV/AIDS in remote rural communities: interrogating the role of traditional leaders

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Background: Despite the successes gained in reducing the spread of HIV/AIDS, substantial impediments remained among vulnerable populations living with HIV/AIDS in rural areas.

The purpose of this study was to interrogate the role of traditional leaders in the provision of care, support and treatment of vulnerable people living with HIV/AIDS.

Methods: The study, which is largely qualitative was carried out in 2022 in rural Zimbabwe. The study population comprised people living with disability and women living with HIV/AIDS and traditional leaders from ward 32 in Mberengwa district.

Some parts of Mberengwa are difficult to access due to poor road network, which consequently deprive people living with HIV/AIDS from receiving adequate care and support from health practitioners.

Data was collected using in-depth individual and focus group interviews from 30 participants who were selected using the snowballing sampling technique. Data was analyzed using thematic data analysis method.

Results: HIV/AIDS wreaks havoc upon vulnerable populations living with HIV/AIDS in rural areas by precipitating their rejection, isolation and stigmatization by other members of the community.

The goal of HIV care has shifted from merely initiating people living with HIV/AIDS on antiretroviral therapy to a more holistic approach which demands the involvement of traditional leaders. Traditional leaders render fundamental support to the provision of quality service to vulnerable populations living with HIV/AIDS.

The services rendered include the provision of psychosocial and economic support, which consequently reduce the spread of HIV/AIDS, increases the uptake of drugs and reduces the violation of human rights.

Conclusions: The provision of multifaceted psychosocial and economic support leads to the longevity and improvement of the quality of life of vulnerable populations living with HIV/AIDS in rural areas.

To strengthen community driven support systems, community leaders need to be equipped with health care and support strategies such as counselling skills, use of stigmatization-free language.

LBEPD39

Empowering and enhancing self-disclosure of U=U to sexual partners with the patient portal: a qualitative study among youth living with HIV

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Background: Self-disclosure of HIV to sexual partners is often a source of HIV-related stigma. Eliminating stigma is fundamental to achieving the Ending the HIV Epidemic in the U.S. (EHE) goals. Since individual-level awareness that HIV cannot be sexually acquired from people with an undetectable HIV viral load [i.e., "Undetectable = Untransmittable" (U=U)] reduces anticipated HIV stigma, using patient portals to self-disclose an undetectable HIV viral load may support reducing HIV stigma.

The current qualitative inquiry investigates perceptions among youth living with HIV (YHIV) about using the patient portal to self-disclose HIV-related information.

Methods: YHIV at an U.S. academic health center were recruited to participate in virtual in-depth interviews (IDIs) as part of a study investigating the use of patient portals for HIV care (data collection concluded in March 2023). Participants were asked to discuss perceptions about using the patient portal to self-disclose HIV-related information to sexual partners.

IDIs were transcribed verbatim and inductively coded during thematic analysis. Emergent themes and codes are described below.

Results: Sixteen YHIV aged 13 to 25 years participated in virtual IDIs; 15 participants identified as Black/African-American. Thematic analyses yielded two major themes on the use of patient portals to self-disclose HIV-related information to sexual partners:

1. Relative Advantage, and;
2. Caution.

Salient emergent codes include:

- a. Opportunities for HIV Education, meaning the participant may use portals to educate their partners about HIV;
- b. Demonstrating Personal Accountability, meaning the participant is responsible in adhering to their HIV medications;
- c. Validating Self-Disclosed Information, meaning adding assurance to the information disclosed to a partner;
- d. Allaying Concerns of Transmission, meaning assuring partners that the risk of HIV acquisition is inhibited when viral load is below threshold, and;
- e. Preserving Privacy, reflecting desires to protect who knows about the HIV.

Conclusions: Self-disclosure is core to HIV prevention, but it is inhibited by stigma. YHIV support using patient portals to reverse the stigma anticipated with HIV self-disclosure, by better equipping them to educate partners about HIV, HIV care, and to disclose undetectable viral



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loads. To achieve EHE goals, research on practical and effective strategies for safely engaging in patient portal facilitated disclosures is warranted.

LBEPD40

Internalized stigma still impedes the HIV response in Thailand: findings from the Thailand People Living with HIV Stigma Index 2.0

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Background: Internalized stigma can contribute to delays in HIV diagnosis and treatment initiation and remains an impediment to the HIV response in Thailand. The first Stigma Index study in Thailand (2009/2010) found that people living with HIV in Thailand reported high levels of self-stigma manifesting as embarrassment (64%), guilt (48%), self-blame (43%) and low self-esteem (44%).

Methods: The Thailand People Living with HIV Stigma Index 2.0 was conducted August 2022 to January 2023. Participants were recruited through community venues and social networks. Led by The Thai Positive Women Foundation, 2508 people (1328 female, 1108 male; including 120 transgender people) were interviewed in 24 provinces from all 13 health regions, conducted by trained community researchers living with HIV, representing communities and reached participants living with HIV from a range of groups such as young people (243), migrants (95), people who use drugs (304), gay and other men who have sex with men (236), transgender people (120) and sex workers (235).

All participants were informed about the study design and objectives and gave their written consent to participate.

Results: More than one-third of participants surveyed (40%) reported experiencing high levels of self-stigma. Experiences were highest among young people living with HIV (49%) and those who identified as being a man who has sex with men (50%), a person who uses drugs (46%), a transgender woman (45%) and/or a sex worker (44%) (Figure 1). The disaggregated results show the importance of considering age and identity in understanding experiences of stigma.

Conclusions: The high levels of self-stigma reported in 2022/3 mirror those noted in 2009/10, indicating that much more must be done to address internalized stigma. Tailored efforts within diverse communities of people living with HIV are needed to improve quality of life as well as outcomes for HIV prevention, treatment, care and support for all in Thailand.

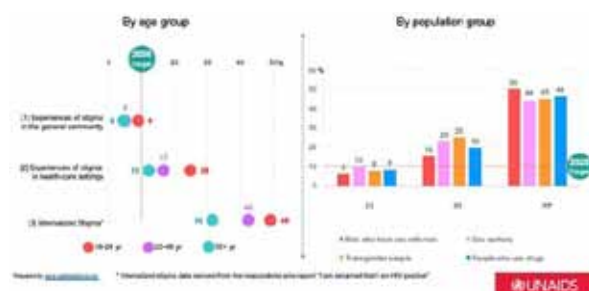


Figure 1. Disaggregated experiences of people living with HIV who experienced stigma and discrimination in the general community, in health-care settings, and internally.

LBEPE41

Enhancing tuberculosis screening and diagnosis through community health worker engagement in Uganda: a case study in the Ankole region

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Background: Uganda is among the 30 countries with a high burden of tuberculosis (TB) and HIV. Despite efforts by the health system, a significant proportion of TB cases remain undiagnosed, with approximately 40% of individuals missed annually. In the Ankole region, long waiting times for sputum processing, coupled with the misinterpretation of early TB symptoms, have hindered effective TB screening. Moreover, the fear of community stigma associated with TB and HIV has discouraged individuals from seeking healthcare services.

This study aims to address these challenges by involving community health workers (CHWs) in TB screening and diagnosis

Description: The USAID-Local Partner for Health Services (LPHS) project collaborated with the district health leadership in the Ankole region to identify and train 3,065 CHWs in TB awareness, counseling, screening, and sample collection. These CHWs were deployed to 2,320 villages, aiming to reach 68,457 households every six months. In the interim between the massive screening periods, CHWs followed up on contacts of individuals identified with TB.

GeneXpert machines and a hub-and-spoke system were utilized to transport samples for processing, with results relayed to clients through both phone and in-person communication via CHWs

Lessons learned: During the month of March, a total of 165,733 clients were screened for TB, resulting in a presumption rate of 11.2%.

Out of the 13,978 samples tested, 227 TB cases were identified, and 449 contacts of TB cases were initiated on TB preventive treatment. In September, a larger-scale screening was conducted, with 634,875 clients screened and a presumption rate of 4.2%.

From the 23,824 samples tested, 497 TB cases were identified, and 483 contacts were initiated on TB preventive therapy.

Conclusions/Next steps: This study demonstrates the positive impact of involving CHWs in TB screening and diagnosis at the community level. By training and deploying CHWs, the project successfully increased the number of individuals screened for TB and identified previously undetected cases.

Furthermore, initiating contacts of TB cases on preventive therapy contributes to reducing transmission rates. These findings highlight the importance of community engagement and the potential of CHWs in enhancing TB control strategies in high-burden settings like Uganda.

LBEPE42

Adolescent and young adult preferences for PrEP service delivery models and formulations in Colorado, USA

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Background: Adolescents and young adults (AYA), especially young men who have sex with men and transgender women, represent a large proportion of people newly diagnosed with HIV-1; however, uptake and utilization of pre-exposure prophylaxis (PrEP) by AYA remains low. As new strategies for providing PrEP, including telehealth and injectable PrEP, are implemented, understanding the preferences of AYA remains vital.

Methods: AYA assigned male at birth and ages 18-24 years at risk for HIV in Colorado responded to an electronic survey conducted between Feb-Mar 2023. Participants were recruited through youth organizations, social media, and word of mouth.

AYA rated their comfort level with aspects of PrEP care delivery and drug formulation; PrEP model comfort was analyzed between groups using Fisher's Exact Test.

Results: Participants included 137 AYA (34% 18-20 years, 66% 21-24 years); 85% identified as cis-gender male, 14% as transgender women, and 1% as non-binary or other gender; 49% were White, 28% Black, 10% Hispanic/Latinx, 13% other. 45% had never been on PrEP, while 28% were currently on and 27% previously on PrEP.

Those currently and previously on PrEP reported higher level of comfort with TelePrEP and mail delivery of PrEP (Table 1) compared to the group never been on PrEP.

Overall, 74% of respondents preferred long-acting injectable PrEP compared to daily oral PrEP which was most pronounced in those AYA never on PrEP.

Conclusions: AYA at risk for HIV in Colorado have differential preferences for PrEP service delivery depending on PrEP utilization.

There was a high level of comfort with PrEP offered at school-based clinics and with HIV self-testing. Injectable PrEP was preferred by all groups but highly preferred in AYA not yet using PrEP.



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Demographics	Total N=137 N(%)	Currently on PrEP N=38 N(%)	Previously on PrEP N=37 N(%)	Never been on PrEP N=62 N(%)	p-value [†]
Age (years)					
18-20	47(34)	12(32)	15(41)	20(32)	0.64
21-24	90(66)	26(68)	22(59)	42(68)	
Gender					
Male	115(84)	30(79)	33(89)	52(84)	0.44
Transgender	19(14)	7(18)	3(8)	9(15)	
female	2(1)	0	1(3)	1(1)	
Other	1(1)	1(3)	0	0	
Missing					
PrEP Model Comfort (Respondents reporting very comfortable or comfortable)[†]					
How comfortable would you be getting PrEP through... or How comfortable would you be doing an HIV test by yourself using an at-home HIV test?					
TelePrEP	77(57)	35(95)	22(59)	20(33)	<0.001
HIV self-testing at home	116(86)	33(89)	31(84)	52(85)	0.86
Mail delivery of PrEP	52(39)	21(57)	16(43)	15(25)	0.005
School-based clinic	102(76)	30(81)	31(84)	41(67)	0.13
PrEP Formulation Preferences[†]					
Which of the following approaches for PrEP would you prefer?					
Daily oral pill	35(26)	12(32)	12(32)	11(18)	0.17
Long-acting injectable	100(74)	25(68)	25(68)	50(82)	

Table 1. Comfort with PrEP service delivery models and PrEP formulation preferences by PrEP usage among AYA at risk for HIV.

[†]135 respondents completed relevant survey questions

LBEPE43

Scaling up opioid agonist therapies (OAT) in Ukraine before the war: implementation factors related to disruptions from legislative reform

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Background: In March 2016, the Ukrainian Ministry of Health implemented a reform allowing clients to get OAT from pharmacies and providers to prescribe take-home dosing.

The study aims to analyze implementation factors for scaling up OAT in Ukraine guided by the Network for the Improvement of Addiction Treatment (NIATx).

Methods: Client-level data from the national OAT registry (SyReX) were used to analyze regional implementation responses (N=25) in Ukraine using NIATx elements.

These included:

1. Attendance at collaborative meetings with stimulus lectures;
2. Training in the U.S. (visit 1);
3. Collaboration climate assessed with COPAN-3 scale;
4. Leadership risk-taking assessment, and;
5. Pay-for-performance (P4P) measured in a U.S. visit (visit 2).

A two-step clustering algorithm classified the regions into three clusters:

1. Engaged Collaborators with high leadership participation;
2. Risk-takers with a high risk-taking measure, and;
3. Late Adopters. Scale-up was measured by new client enrollment and drop-out rates, and census from Jan 2017-March 2021 as a proportion of estimated PWID.

Multivariate GLM was used to analyze acquisition rate with group and month as independent variables for new enrollment and drop-out.

Results: Overall, the census increased from 9,214 to 20,591 over the observation period. Results revealed the main effects for the group ($F=67.1, \eta^2=.71$) and for a month ($F=4.49, \eta^2=.67$), $p<0.01$ for both enrollment and drop-out. Tukey's HSD pair-wise comparisons among the three groups were significant ($p<.01$ in all cases), with Engaged Collaborators having the highest rate of enrollment (Mean = 137.58, SD=5.99), followed by Risk-takers (Mean = 101.24, SD=5.19), and Late Adopters (Mean = 66.06, SD=4.65). For drop-out, with group and month as independent variables, there was one main effect for the group ($F=59.53, \eta^2=.62, p<0.01$), but not for Month ($p=0.528$).

The differences among groups were significant ($p<0.01$) for dropout, with Risk-takers having the highest drop-out rate (Mean=94.85, SD=3.37), followed by Late Adopters (Mean=64.3SD=2.92) and Engaged Collaborators (Mean=52.37, SD=2.47).

Conclusions: OAT scale-up using NIATx approach showed regional variations in long-term outcomes. Collaborators who actively engaged in collaborative learning and responded to P4P achieved high enrollment and low drop-out rates. In low-income countries like Ukraine with limited external learning opportunities, these elements offer valuable insights into the NIATx strategy.

LBEPE44

Improving Health outcome among children living with HIV through child friendly comprehensive service delivery in India

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Background: Globally, children living with HIV (CLHIV) present suboptimal HIV viral suppression. Comprehensive approaches are needed to address children-specific challenges and support overall well-being to improve viral suppression.

Description: Project ACCELERATE, USAID-funded program, supports the Orphan and Vulnerable Children (OVC) program in 33 districts across 6 states of India (Andhra

Pradesh, Maharashtra, Telangana, Manipur, Mizoram and Nagaland) to provide child friendly comprehensive care services to 7813 CLHIV (0-17 years).

Using chi-square tests routine program data for the period of October 2021 to September 2022 were analysed to look at associations between children's sociodemographic profiles, service accessibility variables, and viral load outcomes.

Lessons learned: 7,813 CLHIV (<18 years) received a comprehensive services package through the project. The mean age was 16 (sd: 3.89); 53% were male, 37% were single-orphan, and 19% orphans. 74% of CLHIV have HIV-positive caregivers, and 3% caregivers were key population (FSW/MSM/TG/PWID). 99% of children received treatment adherence and health counselling including 7% screening for early childhood diseases, 78% nutrition services, 10% life skills education and 3.7% social schemes. 91% (7,124) of CLHIV know their Viral load status of which 82% (5,879) were virally suppressed.

Among 7124 CLHIV tested for viral load 3,962 had baseline and follow-up viral load testing carried during this period and showed significant increase in viral load suppression 69% (828 out of 1227) at baseline to 84% (2490 out of 2375) at follow-up at 12 months ($p<0.001$).

There is a significant association between viral suppression and gender (Female having higher Viral suppression when compare with male children), orphanhood (Not orphan having higher viral suppression when compare with orphan and semi orphan), early childhood health screening services and linkage to social entitlements service ($p<0.05$).

Service Variables	Received	Not received	Significance (P)
Early childhood/adolescent health screening services	85.5% (n-517)	82.3% (6607)	<0.05
Social entitlement services	89.9% (n-265)	82.2% (6895)	<0.05

Conclusions/Next steps: Comprehensive service approaches can help to improve and sustain HIV viral suppression among CLHIV. Availability and accessibility to child friendly comprehensive care services includes non-HIV non-health services is critical for achieving viral load suppression among children living with HIV. Thus emphasising need for universal health coverage for people living with HIV especially children.

LBEPE45

Mixed-methods assessment of health outcomes of differentiated service delivery among adults living with HIV in a semi-urban Nigerian community: clients and clinicians' perspectives

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Background: Differentiated service delivery (DSD) aims to improve the quality of care provided to people living with HIV (PLHIV). A holistic evaluation of the outcomes of DSD requires a multi-dimensional approach.

This study assessed the health outcomes of DSD in a semi-urban Nigerian community.

Methods: A retrospective review of the clinical outcomes of DSD and a cross-sectional assessment of its humanistic outcomes were conducted in Aba, Nigeria.

The 2020 and 2021 entries (67,000 and 160,134 respectively) of PLHIV were retrieved from the database of the DSD provider and assessed for retention in care and viral load changes.

Then, validated questionnaires were used to obtain responses from randomly sampled 361 PLHIV (quality of life [QoL], satisfaction, adherence, and barriers) and 310 healthcare professionals (preferences, expectations, and concerns) about DSD.

Appropriate descriptive and inferential analyses were conducted, with $p<0.05$ considered statistically significant.

Results: There were 55,000 (2020) and 104,682 (2021) eligible entries in the database. From the total, 35,436 (2020) and 66,087 (2021) PLHIV were retained in care and not lost to follow-up for a year ($p=0.001$), with 79.9% (2020) and 84.3% (2021) achieving viral suppression.

For the self-reported section, PLHIV on DSD had a QoL score of 0.837 ± 0.006 , with 284 (76.3%), 66 (21.2%), and 11 (3.5%) reporting *no problems* (self-care), *slight problems* (usual activities) and *severe problems* (anxiety/depression), respectively.

While satisfaction with DSD was $75.72\pm2.01\%$, 112 (35.9%) PLHIV were *very unsatisfied* with the availability of antiretrovirals; level of education was a predictor ($p=0.004$). PLHIV that never stopped taking their antiretrovirals when they felt better or worse were 226 (72.4%) and 219 (70.2%), respectively. DSD was reported to have removed the barriers of distance (97[31.1%]) and cost of transportation (70[22.4%]).

Of the 279 responses from clinicians, 98 (35.1%) preferred that community health workers should monitor DSD, 20(7.3%) expected that community-based DSD would reduce stigma, while the absence of remote consultation was their main concern (238[85.5%]).

Conclusions: DSD was associated with an improvement in the health outcomes among PLHIV, considering databases and self-reported sources.



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While retention in care and viral load suppression were found to be impressive, overall humanistic outcomes were also remarkable, as reported by both the PLHIV and their clinicians.

LBEPE46

Reducing cervical cancer deaths in women living with HIV (WLHIV): advancing an integrated approach to increase access to HPV screening and treatment in low- and middle-income countries (LMICs)

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Background: Cervical cancer (CxCa) persists as a leading cause of cancer deaths in LMICs, with WLHIV at six times greater risk of developing this disease. Integrating CxCa secondary prevention with HIV services has the potential to increase access to screening and treatment and reduce this unique population's risk.

The SUCCESS project (Scale-Up Cervical Cancer Elimination with Secondary Prevention), funded by Unitaid and implemented by Expertise France, Jhpiego, and UICC, seeks to improve access of WLHIV to CxCa screening and treatment.

Description: SUCCESS is supporting Burkina Faso, Côte d'Ivoire, Guatemala, and the Philippines to introduce HPV testing, including self-sampling, and precancer treatment with thermal ablation and LLETZ. The project aims to reach 175,000 women including 40% WLHIV.

SUCCESS collaborates with Ministries of Health to implement integrated service delivery models adapted to local contexts, responding to identified needs in improving access to services.

Key interventions include: supporting advocacy and civil society mobilization including for WLHIV, developing integrated curricula; integrating samples into existing sample transport systems and laboratory platforms; proposing HPV and HIV co-testing and counselling within HIV, sexual/reproductive health, and primary care services; and introducing technologies for client data and tracking to reduce follow up loss.

Lessons learned: By January 2023, across all countries, integration with existing HIV services and laboratory platforms has enabled CxCa screening for 12,472 WLHIV (14.6% of 85,275 women screened), 87.4% by self-sampling. HPV positivity rate was 27.3% among WLHIV and 14.0% among women in general population.

For high risk HPV type 16 and 18/45, overall prevalence was 28.3%; 35.1% in WLHIV and 26.0% in general population. 95.7% of women assessed and eligible for, received ablative treatment.

HPV testing including self-sampling and thermal ablation treatment were highly accepted by women and providers.

Challenges to address include, turnaround of test results, timely treatment and effective coordination between relevant national programs.

Conclusions/Next steps: SUCCESS's experience suggests that integrating HIV and CxCa secondary prevention services can contribute to increasing access to screening and treatment and may lead to reducing the incidence of invasive cancer in WLHIV.

Creatively fostering integration between national programs and services at all levels is key to advancing this goal.

LBEPE47

Implementation considerations of digital health interventions for HIV prevention in the United States

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Background: The real-world application and scale up of digital health interventions (DHIs) for HIV prevention is contingent on the needs of community-based organizations (CBOs) who will refer and/or integrate them into their existing and future services.

Understanding CBOs' understandings and implementation needs of DHIs is critical to realize their potential promise, which this present qualitative study sought to explore from a variety of key informants (KIs) representing CBOs throughout the U.S.

Methods: 40 KIs – who represented CBOs in 13 U.S. states serving populations in Ending the HIV Epidemic jurisdictions – recently completed a semi-structured interview on Zoom (i.e., approximately 60 minutes).

The majority of KIs were in leadership/management positions (45%, n=18), 17.5% were providers, 12.2% were case managers, and 27.5% were HIV/STI test counselors, PrEP navigators, or outreach workers.

KIs ranged in age from 22 to 66 ($M=35$, $SD = 10$) and were racially diverse (e.g., 40% Black or White, 7.5% multiracial, 2.5% Asian) and 17% identified as Hispanic/Latinx. Half identified as cisgender women, 42.5% as cisgender men, 7.5% as transgender women, and two-thirds identified as a sexual minority.

Interviews were transcribed verbatim, checked for accuracy, de-identified, and analyzed using a mix of deductive and inductive approaches to identify broad themes within which the data could be grouped and summarized.



Results: Three overarching themes emerged about perceived implementation needs.

1. *Intervention Intentionality* referred to whether the purpose of the DHI aligned with service needs of the CBO.
2. *Cultural and Local Relevancy* related to whether the DHIs' content and design will be culturally and locally inclusive to population(s) served by the CBO.
3. *Plans for Sustainability* referred to what CBOs would need to scale up and sustain implementation of DHIs for HIV prevention (funding, staffing, tech support).

Conclusions: To ensure DHIs for HIV prevention are useful, scalable, and sustainable, developers must partner with CBOs from the outset during formative phases, as well as throughout the evaluation process (e.g., using hybrid trial designs).

Researchers must also consider and balance the needs of the population(s) of focus with those of CBOs regarding wide-scale implementation of DHIs for HIV prevention.

Sexual and reproductive health and HIV prevention

LBEPX51

Implementation of doxycycline post-exposure prophylaxis to prevent sexually transmitted infections at a frontline Boston community health center

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Background: Doxycycline used within 72 hours of condomless sex (DoxyPEP) has been demonstrated to decrease bacterial sexually transmitted infection (STI) incidence in MSM and transgender women (TGW), but the practice has not yet been widely implemented.

Description: Fenway Health is a Boston community health center, with expertise in sexual and gender minority (SGM) healthcare. Of >32,000 primary care patients, ≈2500 are living with HIV, and >5000 have been prescribed PrEP. Between 2015 and 2020, >10,000 STIs were diagnosed in MSM/TGW/nonbinary patients screened more than once, with an estimated incidence of 35.9/100py.

Starting in late 2022, staff discussions about DoxyPEP began, which subsequently included group learning sessions, the creation of electronic media templates to assist providers in identifying candidates for DoxyPEP, prompts for appropriate diagnostic coding and billing, and printable materials for patient education.

Lessons learned: Providers were asked to complete surveys prior to an educational session in early 2/2023, with 72% expressing concerns about rising STI rates, but only half indicated familiarity with DoxyPEP.

The most common concern about DoxyPEP was selection for antibiotic resistance (top ranked by 70% of respondents), followed by concerns about client adherence, side effects, drug costs, less than 100% efficacy, and questions about how busy providers can incorporate this practice into routine care.

When surveyed in late 3/2023, 57.1% indicated they felt they did not have enough time to conduct DoxyPEP visits, 42.9% expressed desire for additional health record (HR) supports; 28.6% expressed concerns about lack of CDC guidelines, 28.6% had concerns about antimicrobial resistance and 14.3% felt that there was insufficient clarity about eligibility criteria.

No one expressed concerns about the adequacy of the data supporting DoxyPEP or risk compensation. By 4/2023, 61% of providers had prescribed DoxyPEP at least once, with one clinician prescribing it for more than 90 patients. Thus far, 383 patients have received a DoxyPEP prescription.



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Conclusions/Next steps: DoxyPEP implementation was feasible in a busy primary care clinic experienced in SGM healthcare. Staff education has facilitated uptake, but residual concerns about workflow, need for additional HR supports, and selection for resistant organisms remain. Formal guidance from normative bodies and ongoing surveillance should help allay some concerns.

LBEPX52

Willingness to use long-acting injectable cabotegravir (CAB-LA) or oral TDF/FTC for pre-exposure prophylaxis (PrEP) during pregnancy in Africa: findings from the HPTN-84 Qualitative Sub-Study

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Background: HPTN 084 demonstrated that long-acting injectable cabotegravir (CAB) was superior to daily oral TDF/FTC for HIV prevention in women. During the trial, participants were required to use long-acting reversible contraception in response to a safety signal concerning peri-conception use of dolutegravir, and to switch to open-label TDF/FTC at first positive pregnancy test.

We explored pregnant participants PrEP preferences, motivations and concerns given this context.

Methods: As part of a four-country qualitative sub study nested within HPTN 084, we conducted in-depth interviews (IDIs) with 16 pregnant participants whose pregnancies occurred primarily in the post-unblinding period when CAB efficacy was known (October 2020-March 2022). The IDIs explored pregnancy circumstances, HIV risk perception, experiences using oral TDF/FTC, and perceptions and/or preferences for CAB-LA during the pregnancy period. All IDIs were audio-recorded and transcribed. Qualitative thematic analysis was used for data analysis.

Results: Participants were 21 to 30 years old. Half of participants intended to get pregnant, some due to a partner's wishes. Other pregnancies were unintended, due to contraceptive failure or discontinuation.

Most women perceived a risk of HIV and were relieved to use oral TDF/FTC during pregnancy due to its known efficacy and safety; a few acknowledged that CAB-LA safety was unknown.

Some said that taking oral TDF/FTC became a routine since they had been taking study pills daily. However, others reported challenges with daily pill adherence, in-

cluding difficulty swallowing pills and high pill burden as participants also took pregnancy supplements. About half said that they would have preferred using CAB-LA if proven safe during pregnancy because use was more discreet and had a long duration of action.

Other factors influencing PrEP preferences during pregnancy included fear of side effects for self and baby, fertility desires, product-related attributes, and partner approval.

Conclusions: Pregnant participants desired to protect themselves and their baby from HIV Acquisition, motivating their willingness to use PrEP during this period. Many women preferred CAB-LA to oral TDF/FTC but wanted assurance that safety was demonstrated; ongoing studies will address this.

Understanding pregnant participants values, preferences and informational needs regarding PrEP use in pregnancy is essential for future trials and product introduction.

LBEPX53

Implementing pre-exposure prophylaxis through virtual platforms to reach hidden populations, vulnerable to HIV

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Background: The penetration of internet and web-based dating platforms in India have resulted in a new "virtual" vulnerable population" with HIV burden almost 20 times higher than the general population. This population has poor access to services and HIV literacy but represent a population that will benefit from Pre-Risk Exposure Prophylaxis (PrEP).

We established a web-based platform, SafeZindagi.in (SZ), to provide services to this population

Description: Virtual counselors of SZ contacted online clients across 17 Indian states and 49 cities through dating apps, social media platforms and community networks, via paid targeted ads.

Registered clients were counseled and referred for PrEP baseline screening followed by teleconsultation or physical consultation with SZ networked doctors based on the clients' choice. PrEP was either couriered or available for pick at network pharmacies, as per participants' choice, upon the client uploading a valid e-prescription and an invoice for medication costs on SZ. All newly initiated clients received adherence and refill counseling on a fortnightly basis via the virtual counselors.

Lessons learned: Between 06/2020 and 03/2023 1,552 clients registered for PrEP services. The median age at initiation was 27 years, 61% were male, 10% female and 29%


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transgender. The average adherence and retention were 88%, and 50% respectively. Clients were linked to PrEP through tele-consultation and community-led transgender clinics, under the program.

Of those who discontinued PrEP, 72% expressed reduced perceived risk or fatigue, and 18% were lost to follow-up and, the median period on PrEP was 120 days. Descriptive statistics were used to characterize these outcomes.

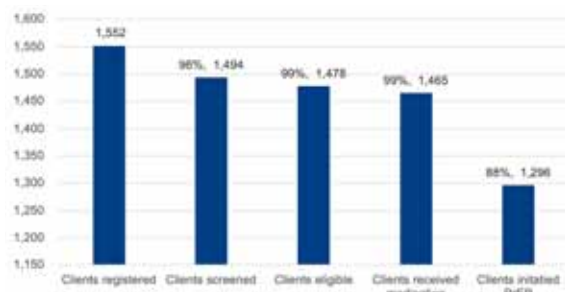


Figure. PrEP client cascade.

Conclusions/Next steps: These data highlight the utility of a web-based platform to deliver PrEP to vulnerable virtual populations via subsidized out-of-pocket payments. With the continued expansion of the internet and overcrowding of physical facilities, such virtual models could help decongest care centers and improve outcome

LBEPX54

CONNECT: using vending machines to increase rapid testing in priority populations

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Background: Research has shown that notification rates amongst Australian residents born in Southeast Asia, Latin America and Sub-Saharan Africa are higher than amongst Australian-born residents. Moreover, late diagnosis is increasingly prevalent amongst overseas-born men who have sex with men (MSM) and those for whom HIV notification is attributed to heterosexual sex. As Australia works toward its national goal of ending HIV transmission, increasing the uptake and frequency of HIV testing is critical, especially in the case of overseas-born residents.

The CONNECT pilot project uses vending machines to distribute free HIV self-test kits in an attempt to overcome barriers to testing known to affect priority populations, in particular MSM from culturally and linguistically diverse backgrounds, migrants, and international students.

Description: The CONNECT pilot was implemented by Thorne Harbour Health (THH) in partnership with SHINE SA under the joint-partnership SAMESH program in October 2021. CONNECT distributes free HIV Self-Test (HST) kits through four vending machines at university campuses and one at Adelaide's only sex-on-premises venue. Users answer four quick questions to access a vending machine and are given a one-time access code.

A social marketing campaign promoted the project on public transport and outdoor advertisements, gay hook-up apps, and social media. The service targets gay, bisexual and other men who have sex with men (GBMSM) from culturally and linguistically diverse (CALD) backgrounds, migrants, and international students.

Lessons learned: Over a twelve-month period 1380 people have registered to use CONNECT and 1,580 kits have been distributed. Key findings include:

- 52% of users are overseas-born, with the majority being born in an Asian country
- 70% of users were 29 years and younger
- 64% cent of all users have never tested before
- 48% of GBMSM users had never tested.
- 32% of users who accessed the sauna (SOPV) vending machine had never tested

Conclusions/Next steps: This project has found that HST kits distributed via vending machines are highly effective at reaching young GBMSM who have never had an HIV test, particularly those who are overseas-born.

It also suggests that vending machines can support regular testing amongst priority populations who have a history of infrequent, suboptimal, testing.

LBEPX55

HIV prevention research & development investments 2001-2021: shifting investment priorities fund innovation in a challenging global health landscape

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Background: Information on financial investments in research and development for HIV prevention options is critical in understanding political and social commitment to these technologies and the impact of public policies aimed at accelerating scientific progress.

Methods: Data was collected on basic research, clinical trials, product development, and policy advocacy efforts to estimate 2021 investments in preventive HIV vaccines, microbicides, pre-exposure prophylaxis (PrEP), treatment as prevention (TasP), voluntary medical male circumcision (VMMC), female condoms and prevention of vertical transmission (PVT).

Results: In 2021, total funding for HIV prevention R&D increased 9 percent (US\$104 million) from 2020, rising to US\$1.2 billion. R&D funding increased for PrEP, VMMC, TasP and female condoms. PrEP saw a tripling of both public and philanthropic funding as compared to 2020. Microbicide funding saw a 25 percent decline from 2020, and preventive HIV vaccine research declined 8 percent. Even with this decline, preventive HIV vaccines, with 62 percent of total prevention research investments, continued to make up the largest share of overall HIV preven-



tion funding. The increase in total prevention funding in 2021 was principally fueled by increases in PrEP and TasP funding. The relative proportion of PrEP funding, at 22.5 percent of overall HIV prevention funding in 2021, has risen steadily since 2015 when oral PrEP was first recommended for wide use by WHO.

As in past years, overall HIV prevention research continued to be concentrated in funding from the US National Institutes of Health (67%), USAID (12%), and the Bill and Melinda Gates Foundation (6%).

Conclusions: Investments in 2021 shifted further toward PrEP, TasP and VMMC, and there is growing interest in longer-acting PrEP. PrEP overtook microbicides as the second highest funded area in 2021 for the first time. Despite an increase in philanthropic funding levels from US\$127 million to US\$152 million in 2021, the decline in the number of philanthropic donors continued.

Finally, a survey of funders from 19 countries surveyed reported that COVID-19 did not cause them to make new long-term shifts in their HIV prevention investment. More than half of funders, however, reported that they experienced pragmatic operational challenges resulting from the COVID-19 pandemic.

LBEPX56

Uptake and adherence of pre-exposure prophylaxis (PrEP) among female sex workers in Nairobi, Kenya: a cross-sectional socioecological analysis

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Background: Pre-exposure prophylaxis (PrEP) is highly effective at preventing HIV. However, levels of uptake among female sex workers (FSWs) remain low, and adherence even lower.

Methods: The longitudinal Maisha Fiti study randomly selected FSWs from Sex Worker Outreach Program clinics in Nairobi, Kenya. Behavioural-biological survey data were collected from 1003 FSWs between June-October 2019 and included questions on current PrEP use.

Harmful alcohol/substance use was assessed using the WHO ASSIST tool. PrEP adherence was measured by testing urine samples with a novel urine tenofovir immunoassay.

Using a socioecological theoretical framework, hierarchical multivariable logistic regression models were used to estimate adjusted odds ratios (aORs) and 95% confidence intervals (CI) for associations of individual (level 1), interpersonal/community (level 2) and structural/institutional (level 3) factors with:

- PrEP uptake, and;
- PrEP adherence.

Results: 746 HIV-negative FSWs aged 18-40 participated in the baseline study, of whom 180 (24.1%) self-reported PrEP uptake. Of these, 56 (31.1%) were adherent to PrEP as measured by urine tenofovir immunoassay.

In the multivariable analyses, high alcohol and/or substance use score (aOR 2.15; 95% CI 1.23-3.77) and feeling empowered to use PrEP (aOR 4.79; 95%CI 2.59-8.34) were strongly associated with increased odds of PrEP uptake.

Having support from FSW community (aOR 1.68; 95%CI 0.94-3.01), and having skipped a meal in the last week (aOR 1.42; 95%CI 0.94-2.16) trended towards increased uptake. Perceived and/or experienced stigma in healthcare settings was associated with decreased odds of PrEP uptake (aOR 0.50; 95%CI 0.26-0.96).

Among those who reported PrEP uptake, PrEP adherence was strongly associated with higher wealth tertile (aOR 2.99; 95%CI 1.26-7.12), but a high alcohol and/or substance use score (aOR 0.23; 95%CI 0.07-0.78) and having support from FSW community (aOR 0.29; 95%CI 0.08-1.08) were strongly associated with decreased odds of PrEP adherence.

Conclusions: The striking disparity between self-reported and biologically assessed PrEP adherence suggests that PrEP adherence research should include objective measurements to better inform HIV prevention strategies.

Addressing community and structural level factors such as FSW community support and healthcare stigma may help improve PrEP uptake.

Alcohol and substance use interventions as part of HIV prevention programming may be needed to improve PrEP adherence among FSWs.

LBEPX57

From clients to providers: strengthening literacy to improve PrEP outcomes

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Background: Men who have sex with men (MSM) bear a disproportionate burden of HIV in the United States, especially in the South. As demonstrated in the pivotal HPTN 083 trial, MSM will benefit from long-acting pre-exposure prophylaxis (LA PrEP).



Yet, there is limited understanding of MSM communities' attitudes, preferences, and barriers surrounding LA PrEP, especially among MSM who have experience with oral PrEP.

Methods: From January-March 2023, we conducted four focus group discussions with MSM in Baltimore, Maryland. Participants were recruited via flyers posted online, at a community-based PrEP clinic, and at venues around Baltimore.

Focus groups included a pile sorting activity to identify factors influencing PrEP decision-making, followed by a discussion about these factors, opinions on PrEP modalities, service preferences, and sexual behaviors.

We inductively coded transcripts and pile sorting data and engaged in analytic discussions.

Results: Participant age ranged from 22-75 years; about a third of participants were Black. All had prior experience with oral PrEP. Most participants had never heard of LA PrEP prior to the study.

Participants shared a range of opinions surrounding LA PrEP, ranging from enthusiasm to opposition. Some were excited by the convenience of LA PrEP, while others were disinterested due to aversion to needles, worry about cost or side effects, or doubts about effectiveness. Key factors influencing PrEP decision-making included minimizing side effects and having sexual autonomy without fear of HIV.

Participants appreciated how oral PrEP offered a reason to have routine check-ups and interact with providers but emphasized a preference for affirming service environments. In all discussions, participants described experiences with providers who lacked knowledge about PrEP, stigmatized them, or even discouraged PrEP use.

Conclusions: The poor levels of literacy around LA PrEP in PrEP-experienced populations, even after the FDA approval of LA PrEP in the United States, highlights the urgent need for PrEP literacy campaigns. However, client education alone is not enough.

Addressing provider-level barriers, including knowledge about and hesitation to even prescribe PrEP, is also critical for uptake.

Strengthening literacy from clients to providers will help individuals choose and adhere to whichever PrEP modality is best for them.

LBEPX58

Precision targeting of adolescent girls and young women in South Africa for HIV prevention campaigns is feasible on Facebook

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Background: HIV incidence among adolescent girls and young women (AGYW) in South Africa remains concerning high. Recent ethnographic studies have suggested a need for customized marketing campaigns, describing six target segments of AGYW.

We conducted experiments using available data on user interests captured by Facebook to examine the feasibility of digitally targeting different segments with customized creative content on HIV prevention.

Methods: We matched Facebook interests to the behavioral, motivational, and psychographic profiles of the six segments. For each segment, we defined a target audience based on these interests and set up campaigns to distribute creative content previously developed for the segments. Respondents completed a survey where they self-identified with a specific segment.

The primary outcomes are:

1. The matching rate between the Facebook-defined audience and self-identified segments,
2. Differences in the audience response to two pieces of creative content ("HIV" and "Fearless").

Segment	Segment Size in Population	Size in Targeted Group	Improvement
Family Girl	18%	33%	1.85*
Conservative Survivalist	23%	32%	1.41*
Liberated Survivalist	6%	8%	1.26
Situational Struggler	5%	4%	0.75
Protection Savvy	21%	23%	1.08
Responsible Mother	27%	38%	1.41*

* $p < 0.01$

Results: We collected 2,624 valid responses from AGYW 18-24 years old, geo-located in South Africa during November 2022-April 2023. Compared to the baseline audience (i.e., no targeted interests), three of the Facebook-defined audiences can correctly target the corresponding segments: Family Girl segment achieves an improvement of 85%, Conservative Survivalist 41%, and Responsible Mother 41%.

We also find significant differences in the performance of the creative content across the segments in terms of click-through rate and conversions.



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For five of seven audiences the "HIV" ad outperforms the "Fearless" ad, but we find no difference between the ads for the general population group and the "Responsible Mother" segment.

Conclusions: Findings suggest that personalized targeting of HIV prevention messages on social media platforms is feasible. The challenge of identifying which segment a particular AGYW belongs to is potentially addressable by mapping Facebook interests to segment characteristics and attributes.

Messages that specifically appeal to the behavioral and psychographic profile of different AGYW segments may be more effective for marketing and promoting HIV prevention products.

LBEPX59

Swiping right on PrEP: a qualitative study of MSM preferences for PrEP public health messaging on dating apps

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Background: Men who have sex with men (MSM) are disproportionately affected by HIV, with 70% of new cases in the United States in 2019 occurring among MSM. Rates of willingness to take HIV pre-exposure prophylaxis (PrEP) are as low as 22% in some Black and Latinx communities. Given that over 70% of MSM meet sexual partners via dating apps, they may be an effective platform for promoting PrEP use. We aimed to describe preferences and desired content for PrEP ads displayed on dating apps among MSM.

Methods: We conducted individual in-depth interviews with 16 MSM recruited from a mobile unit that offers sexual health services outside of LGBTQIA+ venues in Boston, Massachusetts, USA. Two focus groups were also conducted with mobile unit users (N=3) and staff (N=3). Due to the COVID-19 pandemic, individual online interviews were favored over focus groups.

Conversations were recorded, transcribed, translated from Spanish when applicable, and imported into NVivo14 Software. Content analysis was used to identify themes related to ad content and integration with app use.

Results: Mean participant age was 28 (SD 6.8); 37% identified as white and 63% as Latinx. 21% of interviews were conducted in Spanish. Preferences for PrEP ads on dating apps were organized around five themes:

1. Tailored ads that speak to the individual,
2. Expansion of target audiences beyond MSM,

3. Support for bi-directional information sharing on apps,
4. Need for concise and captivating ads, and;
5. Optional engagement with ads.

Participants expressed a desire for PrEP ads tailored to individual users based on age, race, gender, geographic location, or other factors to increase relatability.

Participants also hoped that PrEP ads could be shown to a wider audience, including women, transgender individuals, younger age groups, and men who do not identify as LGBTQIA+.

Participants preferred to be able to opt in to engaging with PrEP ads, without a sense of being forced or obligated.

Conclusions: MSM are supportive of sharing and receiving information about PrEP on dating apps, but feel that existing ads require modification to engage viewers.

Dating apps may be an underutilized tool for increasing PrEP awareness and knowledge among MSM.

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