IS HEPATITIS ELIMINATION POSSIBLE AMONG PEOPLE LIVING WITH HIV, AND WHAT WILL IT TAKE TO ACHIEVE IT?

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DISCLOSURES

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WHO HEPATITIS ELIMINATION TARGETS

**Incidence:** 90% reduction in new cases of chronic HBV and HCV by 2030

**Mortality:** 65% reduction in HBV and HCV deaths by 2030

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**HBV**

**HCV**

**Scenario (Epidemic type)**


Woodall H, et al. EASL 2015
## WHO HEPATITIS ELIMINATION TARGETS

### Impact Targets
- **Incidence:** New cases of chronic HBV and HCV
- **Mortality:** HBV and HCV deaths

### WHO TARGET BY 2030
- 90% relative reduction for Incidence
- 65% relative reduction for Mortality

### Service Coverage Targets
- **HBV childhood vaccination coverage:** 90%
- **HBV birth dose vaccination coverage or other PMTCT initiative:** 90%
- **Screening of blood donations:** 100%
- **Safe injections:** % of injections administered with safety engineered devices in and out of health facilities
- **Harm reduction:** number of sterile needles and syringes provided per person who inject drugs per year
- **HBV and HCV diagnosis:** 90%
- **HBV and HCV treatment:** 80% of persons with chronic infection treated

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HEPATITIS C VIRUS ELIMINATION AMONG PEOPLE LIVING WITH HIV (PLWH)

• No particular targets for HIV-infected populations
• Settings need guidance as to how to achieve targets (overall and among PLWH)
• Different risk groups will likely require different strategies
• Dynamic transmission models can help determine what is required to achieve incidence targets
TALK OUTLINE

• Elimination among HIV-infected people who inject drugs (PWID)

• Elimination among HIV-infected men who have sex with men (MSM)

• Achieving HCV treatment scale-up for others at risk of reinfection: cost-effectiveness in India
HCV elimination among HIV-infected people who inject drugs (PWID)
ELIMINATION OF HCV AMONG HIV-INFECTED PWID

• Discussion about elimination among HIV+ subgroups through scale-up of HCV treatment to PLWH

• **Research Question:** Can treatment for HIV+ PWID eliminate HCV among this group?
  • **Methods:** Dynamic joint model of HIV and HCV transmission among PWID (current and former) calibrated to Andalucia, Spain.
    • ~30% PWID HIV positive
    • ~70% PWID HCV seropositive
    • 90% of HIV+ ever PWID HCV seropositive
IMPACT OF TREATING ALL HIV+ PWID IN ANDALUCIA: ELIMINATION AMONG HIV+ PWID NOT POSSIBLE TREATING ONLY PLWH

Skaathun B, Borquez A, and Martin NK, preliminary work
EUROPE: COMBINATION PREVENTION REQUIRED TO REDUCE INCIDENCE AMONG ALL PWID TO <2% 10 YEARS

- <80 per 1000 PWID annually treated without harm reduction scale up
- <50 per 1000 PWID + harm reduction to 80%
GENERAL SCENARIOS: COMBINATION INTERVENTION REQUIRED TO REDUCE INCIDENCE AMONG ALL PWID BY 90%, 2017-2030

- Stable epidemics, 12 year injecting duration
- <60 per 1000 PWID treated annually without harm reduction
- With harm reduction, could reduce to <40 per 1000 PWID annually

Annual DAA treatments per 1000 PWID

- No coverage of OST or NSP
- Coverage of OST and NSP = 20%
- Coverage of OST and NSP = 40%
- Coverage of OST and NSP = 60%

Baseline HCV chronic prevalence among PWID

Preliminary work based on Martin NK et al. CID 2013
SCOTT COUNTY, INDIANA: EPIDEMIC SCENARIOS WITH INCREASING INCIDENCE REQUIRE MORE SCALE-UP

Treatments per 1000 PWID annually required to reduce incidence by 90% by 2030

- 3-fold higher treatments required than if epidemic was stable

AUSTRALIA: REGULAR TESTING IS REQUIRED

Annual HCV incidence

- Treatment scale-up only
- Treatment + rapid RNA + annual testing of PWID in OST
- Treatment + rapid RNA
- WHO target (80% reduction)

Year

2020

2025

2030

Annual incidence
TREATMENT PRIORITIZATION LIMITING SCALE-UP TO PWID EVEN IN RESOURCE RICH COUNTRIES

H owever in low-mid prevalence settings, more cost-effective to prioritize early treatment to PWID
HCV elimination among HIV-infected MSM
HCV PRIMARY INCIDENCE AMONG HIV+ MSM

Fig. 2. Forest plot of hepatitis C virus seroconversion in HIV-positive MSM in 15 studies.

Hagan H et al. AIDS 2015; 29:2335-2345
HCV REINFECTION INCIDENCE AFTER SVR AMONG HIV+ MSM

4. Martin NK CROI 2017; Chaillon A et al. In preparation
UK: NEED MORE TREATMENT AND MORE TESTING OR BEHAVIOR CHANGE

Difficult to reduce low incidence by 90% (to <0.14%)

Requires:
• All treated after diagnosis (currently 88% tested/year) plus 25% behavior reduction, or
• Enhanced testing and treatment - all tested every 6 months and treated

Preliminary work based on Martin NK et al. CID 2016
BERLIN: INCREASING INCIDENCE AND HIGH TESTING/TREATMENT, NEED ACUTE TREATMENT OR BEHAVIOR CHANGE

Difficult to reverse increasing incidence with existing high testing/treatment rates.
Requires:
• All newly diagnosed treated within 3 months (licensing for acute treatment), or
• All newly diagnosed treated within 6 months plus 10% risk behavior reduction

90% reduction
SWITZERLAND: INCREASING HIGH RISK BEHAVIOR MEANS ELIMINATION REQUIRES BEHAVIOR CHANGE

• Sexual behavioral risk heterogeneity and HIV preferential mixing among sexual partners is likely to explain the concentration of HCV among HIV+ MSM.

• Changes in sexual mixing patterns could reshape the epidemic.
  • E.g. Preferential mixing due to PrEP could HCV among HIV- MSM

HCV TASP AMONG HIV+ MSM IN THE NETHERLANDS: ENCOURAGING REAL WORLD EVIDENCE

Model: elimination not possible by 2030, and at most ~20% reduction in 2 years...BUT:

- Real-world halving in acute HCV incidence 2014-2016!

Hullegie SJ et al. CROI 2015 abstract nr.536

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2014
A-HCV n=93
PYFU=8290
11.2/1000PYFU (95% CI 9-14)
1.1% per year

2016
A-HCV n=49
PYFU=8961
5.5/1000PYFU (95% CI 4-7)
0.55% per year

IRR 0.49 (95% CI 0.34-0.69)

Jan-Dec 2014 11.2/1000
Jan-Jun 2016 6.9/1000
Jul-Dec 2016 4.0/1000

Boerekamp A et al. CROI 2017 abstract 137LB
Achieving HCV treatment scale-up for others at risk of reinfection: cost-effectiveness in India case-study
OTHERS AT RISK OF REINFECTION: COST/REINFECTION CONCERNS IN INDIA

• In many LMICs, other PLWH at risk via unsafe medical/community injections
• India does not have a national screening and treatment strategy for elimination
• Substantial concerns about reinfection (& cost) among general population
  • 2.9 injections/person/year (over 3 billion), half considered unsafe
  • ~40% of HCV infections due to unsafe medical injections¹
• Recent evidence DAAs are cost-saving in India, but study does not include reinfection²

• Research question: Are DAAs cost-effective in India including reinfection?
  • Method: Closed cohort markov model with a fixed rate of reinfection/yr, health care provider perspective, India-specific public hospital health care costs, DAAs: 85-95% SVR and $900/treatment

DAAS IN INDIA COST-SAVING FOR F2-F4
INCLUDING RISK OF REINFECTION

DAAs for F2-F4 COST-SAVING (negative ICER due to negative costs) for reinfection rates <25% per year, compared to no treatment.

Would be even more cost-saving for PLWH due to accelerated liver disease.
TREAT ALL (F0-F4) COST-EFFECTIVE COMPARED TO F2-F4 WITH VERY HIGH REINFECTION RATES

Intervention highly cost-effective if ICER < per capita GDP in India ($1580).

DAAs for all (F0-F4) HIGHLY COST-EFFECTIVE for reinfection rates <25% per year, compared to no treatment.

Would be more cost-effective for PLWH

Chaillon A and Martin NK preliminary results
CONCLUSIONS
CONCLUSIONS:
HCV ELIMINATION AMONG HIV-INFECTED PWID

• To eliminate HCV among HIV+ PWID, need to target ALL PWID
• Elimination possible with
  • achievable levels of treatment
  • in combination with harm reduction
• More difficult in outbreaks and if scale-up delayed
• Current prioritization undermining elimination efforts and may not be most cost-effective
• Affordability still a key concern
CONCLUSIONS:
HCV ELIMINATION AMONG HIV-INFECTED MSM

• Difficult to reduce incidence by 90%, as would need to be <0.1-0.2% in most settings

• Elimination likely requires
  • Frequent HCV testing AND
  • Prompt treatment of all AND/OR
  • Behavior change

• Lacking empirical evidence for behavioral interventions to prevent HCV among MSM

• Other concerns: PrEP? Global transmission network?
DISCUSSION:
HCV ELIMINATION AMONG OTHER HIV+ RISK GROUPS

• In many LMICs, other PLWH at risk via unsafe medical/community injections, etc.

• Concerns surrounding reinfection hampering development of elimination strategies
  • HCV treatment can be cost-saving despite reinfection in India
  • Some reinfection is good - means you are treating people with ongoing risk!
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