

ACCELERATING THE IMPACT OF HIV PROGRAMMING ON HEALTH SYSTEMS STRENGTHENING

Pre-Conference Meeting of Health Systems Experts, HIV Researchers and Implementers
The Town House Hotel and Conference Center

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9.00 – 11.00 am Session 1: Health Economics and Financing

Jacqueline Bataringaya: IAS Senior Policy Advisor

I wish to invite the first session speakers and moderators to move right on and get the day started. Our session moderator is Professor Alan Whiteside, whom you all know, a distinguished and leading health economist. The Director of Health Economics and AIDS Research Division [HEARD] and also a member of the International AIDS Society Governing Council and of course he is in charge of the money. He is the Treasurer. Alan, you are welcome.

Prof. Alan Whiteside: Moderator of Session 1.

[His voice is very faint and one cannot pick up what he is saying. He was standing far from the microphone].

Jacques Van der Gaag: [Co-Founder, Co-Director Amsterdam Institute for International Development]

**Title: Will there be Enough Money for HIV/AIDS in 2031?
Evidence from Health Expenditure Literature**

Thank you, Alan. You scared me a little bit but I will try to stay within the fifteen minutes which means I can only show you half of my slides. All right, what I'm going to do is a drastic question how many resources are there likely 20 some years from now for health? It's a very old question. It has an old answer, still valid and I'm going to show you the answer. I'm going to twist the old results a little bit so you get something new and then I'm going to basically conclude.

And if there is still time left I'm going to present the second part of my presentation, make stuff a little bit more dynamic, a little bit more complex and ask questions and I'm looking forward very much. That's why I want to listen to Alan through the discussions later this morning.

This is very old result, give me per capita per country and I can tell how much they have spent on health. The results were first published in 1978 by Newhouse, using OECD Data and essentially if you look at the whole world every dot [*on the slide*] is a country, on the horizontal axis you have per capita income of every country in log form and on the vertical axis you have health expenditure per capita and its basically all on the same line. Low income countries are there and are no different from middle and high income countries. This is a result as I said its 30 years old and essentially we can go home now because if you know the GDP per capita of a country 20 years from now, unless something tremendously fundamentally changes, then you can predict how much money will be there for health.

How can it not be? First of all this has been studied to death. This is a summary chapter in the handbook of Health Economics published almost 10 years ago and you can read it for yourself. People have thrown all kinds of variables in this equation whether it's public, private or mixed system, per capita system or a system with capitation which I think for hospitals, these results will stay there.

I ask the question what if we dish the starting; and now you have an active government that understands the important of health, step forwards and relatively speaking spends more on health care, what do you get? Well what you get is that the private sector will spend less and as you see here, with one percent increase and income gives one percent increase for health, private health care and the public share will remain relatively large. Therefore public health spending crowds out private health spending and the total health spending stays quite where it is.

Now what does international development aid for health [do] with this equation? You can look at it but as you can see it increases share, but as you can see the public share does not increase. I cannot change it. So if you have GDP projections, then I will tell you how much they are putting for health care and if you do that and I have done that then you will find the following: - if relatively fast growing middle income countries continue to perform as they do now based on IMF and World Bank projections, then they probably will grow into a situation where they can afford to have a decent health care system. [But] - if relatively low growing low income countries continue for decades to come they will not able under the current circumstances to finance a decent health care system.

The problem with this picture is that it is a very static picture and was based on a cross section of 176 countries but you have to make some assumptions to process and use those results and make projections over time. What I do here, I take for the country that has data available 148

countries then take about 11 years[The sound from the speaker is faint. It sounds like he is moving away from the microphone.] You can add more questions. Is health care expenditure recession proof? They are fragile; and they are fragile in sub-Saharan Africa but they are recession proof in OECD countries.

What this points at is that not only in lower and middle income countries are the level of expenditures too low to sustain a health care system but it is also a very fragile financial system and that if something goes wrong like in recession, those systems get a hit. The OECD countries are more robust. It's quite clear why that happens. If people lose their jobs, they don't lose any health insurance. Not necessarily. In a developing country, when they get a hit on the financial system, the government will have less money for health care and the private sector which is the largest contributor to health care, will also shrink. Therefore health care expenditures in low income countries are not recession proof. Now what will it look like in 2030, you will find that still 27 of 47 countries will spend less than 50 dollars per capita.

As I said I will rush because I'm looking forward to the discussion later on. I will ask Jacqueline or whoever can do that to print copies of the presentation for anybody who wants them. This is the overall conclusion. No matter how I kicked the data, I cannot go around it. GDP per capita is the main determiner of total health expenditure. If there's no growth, the health expenditure will not grow. If government steps up to the plate, pushes more money to the health sector you get the private health sector backs off a little bit and you stay in the same level.

GDP per capita continues to be the determiner of health care expenditures. If you believe that, then it's easy to make projections for the next 20 years or so.

All you need is population projections and GDP growth projections and this leaves a picture that in sub-Saharan Africa 27 countries will have resources of less than 50 dollars per person in the year 2030

Well, what can you do about it? You can push the international community to pump in more money but unless that money will be much larger than it is now; now it is about per capita of about a couple of dollars and that is not good especially if it comes out of the private sector. Therefore just more money and business as usual is not going to change this picture. What is not on this picture is off budget support which is growing very significantly but there you run into problems. So if you run a parallel system of support that does not coordinate at least with government, you get all these problems we can talk about seriously today. And you guys know more about it than I do but one way of trying to get around this very tight structure is to see what more can be done with off budget support in a way that this is integrated in the health care system. And if any of you have any ideas of what can be done, I hope to hear them today. I have one idea which is essentially also or maybe an introduction to the next speaker.

In low income countries 50 – 60% of financial resources for health care are private resources. The first - majority of those [private financial resources] are uninsured out of pocket payments. If the government steps up to the plate, part of those payments don't have to be made anymore, so they drain out of the system.

One way to keep them into the system instead of crowding them out is to organize a local health insurance structure and pull those resources in, in terms of relatively low insurance premiums that then subsequently can be topped up by either government or other resources. I can go into that story much more deeply and I will when time comes. Subsidized premiums can be in private and public sector really I don't think that conceptually it was a really big difference there. The other thing you can do once you have a system in place that funds in a particular way through low income insurance allowing people with a basic package - if a donor comes in who is interested in a particular disease all you have to do is top up the premium of the basic package to cover the costs of that disease whether its malaria or HIV/ AIDS, Tuberculosis. You name it. In fact there are now such experiments being development and there are such experiments in the filed. And Mr Chairman I will be happy to talk about that longer if you permit me more time after the discussion.

Thank you.

Di McIntyre: [South African Research Chair in Health and Wealth]

Title: Health Insurance for Health System Strengthening

Thanks very much. Gosh. In fact I'm going to be a little bit controversial and disagree completely with Jacques on his final slide. And it's very difficult to explain why in fifteen minutes but I will give it a shot. I'm just really going to agree with Jacques in terms of that if you increase public funding, you crowd out private funding but to say that public funding is better than private funding; you can do more with public funding.

I'm going just to pick up on two country examples in Ghana, and the proposed national health insurance in South Africa.

I want to first refer to the World Health Assembly Resolution in 2005¹ and for me that resolution is some kind of demonstration of international consensus. And the Resolution called for universal financial risk protection and enabling access to needed health services [ppt slide]. And my reading of the discussions and background documents, etc that led to this resolution is that we desperately need to move towards systems that are not as fragment in terms of their financing as

¹ http://www.who.int/mediacentre/news/releases/2005/pr_wha06/en/index.html

we currently have. The reason for the need to reduce fragmentation - so that we can promote cross subsidies in the overall health system, where everyone can benefit according to their need of health care and everyone can contribute according to their ability to pay.

Those kinds of ideals are not that controversial and I think they are generally expected as what we could expect in an equitable health system but I think we need to understand more clearly that it is impossible to achieve those goals unless there are cross subsidies in the overall health system and you cannot achieve that if you have fragmented financing pools.

I just quickly want to point out that one of the major motivations why that resolution was adopted at the World Health Assembly, was the recognition of the catastrophic out of pocket payments and it is one of the reasons why there's been this focus in health insurance particularly in the last few years.

I'll try to see if this will work, this is the situation in Vietnam [[ppt slide](#)], this green line along here is the poverty line and this shows the income of households and hard rises as ones moves along the distribution of household income. These yellow lines indicate the amount of out of pocket payments for health care and what I think this graph shows quite nicely is a couple of things. The first thing is that these households that are below the poverty line are spending very little on health care and in most countries there are graphs like this for many low and middle income countries. And in most countries this is not a reflection of protection through exemption mechanisms, it's a reflection that indicates simply that those below the poverty line do not get access to health care because they simply cannot afford to make out pocket payments but the other thing this shows is that even when we get to households we considered to be middle income households, they are making substantial payments out pocket and this actually pushes households below the poverty line.

That's really the thinking behind the increased focus behind health insurance that we want to move away from out of pocket spending and towards pre-payment mechanisms. And very briefly in pre-payment in terms of compulsory or mandatory, you can have general tax revenue as well as mandatory health insurance, in terms of voluntary health insurance as a pre-payment mechanism, the more kind of classical commercial private insurance and community based insurance that Jacques referred to.

One of the statements that have come from WHO researchers who have done extensive work on health systems from around the world, this is from Guy Carrin, who says that the system to which the degree of risk is greater achieve more [[ppt slide](#)]. And I think that it is based at looking at different health systems and I think that where funding pools are fragmented as in particularly fragmented health insurance, where you have literally hundreds or thousands tiny little community based community insurance schemes all around the country, you can achieve less because there isn't the ability to have cross subsidies in the health system even with top up health funding etc.

So, I want now to turn the two country examples and I'm referring to Ghana because it's a country that has embarked in the last few years on a national health insurance [ppt slide]. They said from the outset that we want a universal coverage. We don't want some kind of social health insurance and we will try and move to national health insurance. We are going for national health insurance from the outset. We recognize that we are not going to be able to cover everyone immediately but that is our goal and we are going to move towards that goal. I think that it was very controversial and led to many problems with the development of the health insurance in Ghana but I think it is interesting from the perspective that Ghana did have extensive experience of community based pre-payment insurance schemes and has used that notion of community based pre-payment community schemes as part and parcel of the national health insurance.

So, how they have structured it is that each district in Ghana has a district wide mutual health insurance scheme, something that doesn't look different from the community pre-payment scheme. But whether you are a formal sector worker or informal sector worker, you belong in that scheme and that scheme is part of the national health insurance.

For formal sector workers there's a parallel deduction for them. Others contribute directly to the scheme. So the organization of it is very much along the lines of community based pre-payment but the point is that all the money is put together in the district pools. And I want just to try to illustrate how it was intended to work [ppt slide]. Is that there's a single NHI fund and quite a lot of the money comes from additional VAT component, so 2,5% was added to the VAT rate. So a lot of it is tax funding. This is the 2,5% that is taken from formal sector workers' salaries and that's also paid into the NHI fund and the additional funds both from the general tax revenue and donors that flow via the Ministry of Health.

Those funds are seen as contributing to paying the health insurance for those who are unable to pay. As I say that each district has a mutual health insurance scheme. And this is just to attempt to illustrate that in metropolitan areas informal sector workers have greater ability to contribute to the district scheme less so in large towns and poor rural districts. There's very little contributions from informal sector because of the high levels of poverty and the intention is that, essentially, the funds that come from the national insurance fund, both pass on the contributions of formal sector workers who live in that district but also pass on tax money, the contributions for those who are unable to pay for themselves and who are poor.

So the amount of cross subsidies that come from the NHI fund will be greater for the poor rural schemes. So, I'm not sure if that is giving you the idea but I think what I'm trying to illustrate from Ghana is that the notion of community based insurance schemes can be used but my sense is that it in needs to be in an integrated form as part of mandatory insurance scheme.

The proposed National Health Insurance in South Africa [[ppt slide](#)] - essentially what is being proposed, [*and there is heated debate if anyone watches local TV, in the few days you are here I'm quite sure there will be plenty of debate*] but what is being proposed is that there should be increased tax funding for health services.

What we've seen in the past decade and a half is that spending on health care from tax funding hasn't kept pace with the inflation, it hasn't kept pace with population growth so we have declining real per capita spending from government resources and it certainly hasn't kept pace with the growth in the burden of disease. And so there is strong argument that government should be putting more tax money into the health system and I think that has been accepted.

The sort of more controversial parties that mandatory health insurance tax has been recommended and that there will be a single pool of funds and effectively, I think Jacques put it very nicely, what the expectation is, is that it will crowd out private spending so that it will be replaced with a single integrated pool of funds that can be used for the benefit for all South Africans.

And essentially, the tax fund component will be used to pay the contributions for all those outside the formal sector employment. I'm just going to show you this graph very quickly [[ppt slide](#)]. The point I want to make from this is that every South African is actually contributing to tax. In fact through indirect taxes like VAT, through fuel levies, through excised tax the poorest households in South Africa are contributing a very sizeable share of their limited household income and so in effect tax money is just basically the channel for those in the poor households and will be used to make the NHI contributions on their behalf.

Now what is being interesting for us in South Africa is looking at how that single pool of funding would be growing and it would be public funding. We have a situation in SA where essentially 60% of the funds are in the form of private funding and most of that is through private voluntary insurance that only covers about 15% of the population. And this is why one of our fundamental arguments is that indeed we should actually be trying to crowd out private funding and get it into an integrated public pool because if you look simply at the resources that we need to fulfill the ART Treatment Strategy in the South African context, in current terms, in terms of how much is currently being spent through just the general tax budget, we would have a situation where the ART Program would consume 48% of the health budget if it was fully scaled up [[ppt slide](#)]

When we look at how the national health insurance may progress over the next 10 – 15 years [[ppt slide](#)], essentially pulling into a single public funding pool, increased resources, not expecting overall expenditure on health in South Africa to increase dramatically, what we will find is that the ART and the broader AIDS National Strategy would actually only consume about 16% of that total pool.

I think the message I was trying to put across is that if we start focusing on trying to get less fragmentation in our financing of health services [[ppt slide](#)]. If we start pulling resources into a single pool and recognize that a lot of that has to come from general tax and donor funding. But lets also start seriously looking in low and middle income countries at mandatory insurance options where at least there is risk equalization between certain pools so that we have a single pool of effective money, we can achieve much more. Certainly community based pre-payment schemes do have a role but that's got to be part of an overall integrated pool of funding. I think my five minutes are up.

Thank you very much.

Charu Garg: [Senior Health Specialist, Health, Nutrition and Population Unit, The World Bank]

**Title: Review and Analysis of ODA and HIV Spending Accounts:
Is there Evidence of Additionality at Country Level?**

Good morning and thank you so much for giving me this opportunity to talk to you. [The speaker's voice becomes faint as she is not using the microphone.]

And of course my two co-contributors who have actually helped me in developing some of these slides for this presentation [Ajay Tandon and Geir Lie]. So the basic climb for this presentation [[ppt slide](#)] will be looking at the trend set by the official development assistance (ODA) for health with focus on HIV/AIDS; what are the implications of donor flows for HIV/AIDS funds at the country level, and finally looking at the additionality of funding to the health sector at the country level and we look at evidence from Kenya, Malawi, Rwanda, Tanzania, Zambia and from experience of Honduras, Rwanda and Thailand which is a study I just talked about, was done by WHO and later on I did the Malawi data and added to it. And finally if I have time we can talk about the context of global economic scenario and the financial crisis – [what is happening].

ODA, I know a lot of it has been mentioned; actually Debrewerk Zewdie mentioned a lot yesterday in her presentation and Jacques said that we know that ODA is increasing and its currently at 125 billion and the health share of ODA has gone up from 6% to 12% [[ppt slide](#)] so it has doubled, but is that enough? That's of course is always the question. In terms of the rising share of external resources as a of total health spending especially in low income countries and in sub-Saharan Africa, we see that it goes up from 4,2% in 1995 to 11,3% [[ppt slide](#)], where its almost triple, you

can say. And in sub-Saharan Africa it's more than three times so therefore external risk of share has gone up in total health spending in both low income countries and sub-Saharan Africa.

In terms of the composition for the major five health components [[ppt slide](#)]: (1) Health Systems Strengthening; (2) Population and Reproductive Health; (3) Basic Nutrition; (4) HIV/AIDS and (5) Infectious Disease Control, [the orange one is the one on HIV/AIDS] we see that actually the spending commitments for HIV/AIDS have been increasing over time and exactly from the major donors that were mentioned yesterday.

If you look at five major donors, we do find that [*as the green part shows – [on the slide](#)*] really that the component for HIV/AIDS funding has been going up. I think the more interesting part of this, [because some this has been said], is to look at what's happening at the country level to the HIV/AIDS funds [[ppt slide](#)] so if you are looking from ODA and also from the HIV/AIDS sub accounts, the data we get from there - we are going to see what's really happening. Is the funding additional at country level or is it really displacing the government funding or what's happening? That's been said earlier by Jacques Van der Gaag and Di McIntyre before.

The first thing that we find at the country level is the disconnection between AIDS financial commitments, disease burden and national priorities [[ppt slide](#)]. I just say like in Ethiopia, the HIV prevalence is 2,1%, the national health budget is \$360m out of which the donor HIV commitments are \$297m. So the donor commitment as percentage of national budget is 82,6% and it is even higher in Uganda and also quite high in Rwanda and Mozambique.

Now this is especially evident, if suppose a country's major health problem is acute respiratory infections which actually account for 25% of disease burden but get only 3% of the cash flow. Is this OK? Do we need to think about it? These would be some of the important questions we need to consider but then obviously if so much of money is coming to HIV/AIDS, some of it has to be used for health systems strengthening and I think that is some of the crucial question we are talking about.

So we do have to consider what really this money is used for. We find that before the influx and after the influx of funding and fiscal data of 02; 03; 05 but mostly it's before the influx and after the influx of foreign funding [[ppt slide](#)]. So the greenish brownish bar shows how much is the increase in health spending and the yellow portion shows how much they are increasing HIV/AIDS funding. So we find an increase in both health spending and HIV funding. What is this increased health spending used for?

So if you look at the compositions in terms of what HIV/AIDS funds finance, we find [[ppt slide](#)] that before the influx, actually the red part is the in-patient hospital care. The yellow one is out-

patients, purple is for public health programs, green is for pharmaceuticals, health administration is another purple color towards the end and then it is the other funding.

We find that two major things that come out of this slide - that after the influx of foreign resources, the inpatient care funding went down and in most of the countries except Rwanda where it increased. But expenditure in administrative care [*participants later asked for a breakdown in costs covered under administrative care*] which is the purple one has actually increased in almost all the other countries. So is the donor money really being use for administrating these health funds. That could be the question one would have to ask from here. And where does this increased funding for health and HIV/AIDS come from? Is it coming from donors, is it coming from domestic resources? So this [[ppt slide](#)] shows really the composition and obviously by looking at this composition, we can say, if we look at the increase in the first and the second part of it, there is an increase in funding coming from donors. So for both health and HIV/AIDS we do find that the donors' funding composition of the total donor funding is increasing between the two time periods.

So now I come to my final question and which I feel is the most important part that I would say for this presentation in terms of, is donor funding additional to domestic resources [[ppt slide](#)]? Is it additional to government the funding? Is it additional to private the funding? That's the question we are trying to ask in this part of the presentation.

And I again break this up into two parts [[ppt slide](#)]- first we look at the experience in Kenya, Malawi which is the first set which is based on the HIV sub-account. The second one is also based on the HIV sub-account but looks more in terms of the empirical evidence from the WHO study I talked about.

So, if you look at my previous slide where I said the donor composition has grown up in the total health funding and in the HIV/AIDS funding, what is really happening at the absolute level? In terms of absolute funding [[ppt slide](#)] the light blue ones show what is the domestic contribution that is both public and private funding, leaving out the private donor contribution. We find that in Kenya, Malawi, Rwanda and Tanzania the domestic contribution has actually gone up. The donor contribution has also gone up but the domestic contribution has not really been displaced.

So therefore except for Zambia and all these four countries, if you just speak very broadly, we can say there is additionality of external donor funding. That means donor funding is additional to the domestic contribution of resources that were there for HIV/AIDS. What are they doing at the government spending level? We find that government spending is actually again increasing in Kenya, Rwanda and in Tanzania; and of course the HIV/AIDS contribution has slightly gone down in Kenya, Malawi, Rwanda and Zambia but only increased in Tanzania [[ppt slide](#)].

It does tell a story but its not very clear and that is why I go on to my next two slides to show exactly how empirical measures can be useful rather than just looking at ratios and seeing what is

the contribution. So what we cannot really say is the HIV/AIDS funding really displacing the other health funding in the country because even the total health funding is increasing. Unless you look at empirical measures, you cannot really come to a conclusion here. So the story from these two is not very clear, and therefore what we thought even when we started this study was to really think of a definition of *additionality* that was not existing before we started with over this study.

The motivation really of this study was that The Global Fund has given a lot of money to the countries and they wanted to see if their funding really is additional to the funding that already existed in the countries. So these case studies were done for these countries. We define additionality with a very simple definition saying that external resources spent on a specific health priority which can be HIV/AIDS program or even an activity which could be preventive care activity or ARVs, whatever you can take; so *external resources spent on a specific health priority are said to be additional if it leads to increased expenditure for that priority without reducing public expenditures for that priority* [[ppt slide](#)].

We restrict this definition saying that there will be no additionality if they countries are reducing the public expenditures. We set out with a number of operational indicators for measuring additionality but the two main ones which I'm going to focus here [[ppt slide](#)]- actually isn't - is increasing HIV funding from external sources associated with decreasing funding from external sources for other parts of the health sector? So what I'm trying to say here is that - if HIV/AIDS funding increased by external donors, did it displace the external funding for the other parts of the health sectors by other donors.

And in the definition we use very simple indicators comparing the current year's external resources with the best year, i.e. if these are greater than one and the external resources - second one - is basically all health sectors spending without HIV funding. So if that is greater than one that means we find that external resources increase and therefore it would imply additionality. Similarly there was another one I want to mention here - the additionality of external resources where I say that HIV spending from external resources increase; did the public expenditure on HIV/AIDS go down? And again we have indicators there like all this is done with constant paces and real increases. So therefore if the first ratio is better than one we are looking at the responsiveness on public expenditures.

This public expenditure does not include donor funding. It's only domestic public expenditures. So the responsiveness of domestic public expenditures, if that is greater than one, then it will imply additionality. Interesting results from the three case studies and this is what I want to actually focus here. All the yellow ones show that additionality is not met [[ppt slide](#)]. The first column is showing that the rest of the world funding of external resources in current years has increased more than the best year. So if that ratio is greater than one, that means there is an increase for rest of the world HIV funding. But what happens to the other funding especially in Rwanda where

the public sector went down. Even in Honduras the same thing happened and for Thailand. For one year the same thing happened.

Where actually you see public expenditures did the government displace their funding, it did not happen? So the very simple thing I see here is that donors should not preach what they cannot practice. They keep telling countries that you should be additional to the funding we are giving to you but donors themselves are not additional and therefore it comes out as an interesting lesson from this study [\[ppt slide\]](#).

Finally, coming to some key discussion elements from this study [\[ppt slide\]](#) – One, the lack of good real time data and fluctuations render projections and counter calculations difficult to do. Second, the external funding actually could lead to reduced out of pocket expenditures and I totally agree with what Di McIntyre was saying; if it helps to reduce out of pocket expenditures it will help to reduce the catastrophic payments and also the people below the poverty line. External funding and out of pocket expenditures are inversely related [\[ppt slide\]](#). And therefore if external funding goes up, the out of pocket spending does go down. In terms of interpretation, I just want to mention two or three important things - causality is not always possible especially in the context of the economic crisis where one tends to find. One can tend to find that countries do reduce health spending – [what Jacques was saying earlier] simply if GDP per capita decreases, health budget per capita is likely to decrease and government funding will go down. So its not that government do not want to be additional. They cannot be if their GDP per capita is going down. Fungibility could also be simply due to lack of absorption capacity of the country and therefore it should not be like there is a decision to re-allocate domestic resources.

And finally the decrease in the economic crisis can also reduce the expenditure and should not be considered as fungibility by the governments [\[ppt slide\]](#). The final thing I say is about adverse-ability especially in the context of the global economic scenario looking at what happened in the past economic crises. We saw that government funding and total health expenditure went down for these four major countries [\[ppt slide\]](#). So therefore it's going to happen even after this crisis and what we would really say is that the current economic crisis will make donor financing vital for HIV and health systems. But using this money much more effectively is better for health out comes [\[ppt slide\]](#).

Thank you very much.

Vivian Dias. Lima: [Postdoctoral Fellow, Canadian Institute of Health Research-British Columbia Centre for Excellence in HIV/AIDS]

Title: What Can we Learn from the Impact of Dramatically Scaling up Treatment on Future Costs and Prevention Efforts?

Good morning and thank you for inviting me to present on this topic.

What's the rationale for using Highly Active Antiretroviral Therapy (HAART) as a complimentary prevention strategy [\[ppt slide\]](#)? We know clinically that HAART stops HIV replication because HIV viral levels fall from detectable blood as well as sexual fluids and therefore it induces a sharp reduction in HIV transmission. We have tons of evidence that this is the case. We look at the studies for mother to child transmission, post exposure prophylaxis, population based studies and there are lots of new literature on mathematical models to address this issue. So to start with, let's talk about some evidence we have from British Columbia (BC), Canada.

These graphs were based on the 2006 IAS USA guidelines. At that time we estimated in BC that 50% of those eligible for ART treatment were receiving treatment. And the question was what if we increase those on ART treatment from 50% to 75% coverage? So on that side [\[ppt slide\]](#) we look at the number of new HIV infections and this side here we look at the direct [ART] cost in Canadian dollars.

So we look at three scenarios [\[ppt slide\]](#), the white line shows what's going to be the number of new HIV infections if nothing is done. The red line shows what's going to be the effect if we increase from 50% to 75% *[coverage of people eligible to start ART]* immediately, and then the yellow in three years, and the green line in six years. You can see the area between the red and the green lines is basically the number of HIV cases that were not averted because we did not do the ART uptake immediately and if you look this side, it shows what the cost is for not scaling up ART treatment immediately.

You can see that, you know of cost of ARV drug treatment is going to increase because we have more people on treatment, but if we don't do that in an immediate fashion, you can see that the cost really goes up over time. And here is just a summary [\[ppt slide\]](#).

We run the model for 25 years and we look at increasing coverage from 50% – 70%, 50% - 90% and 50% - 100% and we then look at one year, which would be the ideal scenario. We look at 25 years and we saw that by scaling up [ART] immediately we averted 32,000 new HIV infections and that translated to C\$49m in cost savings and a lifetime cost saving of C\$1,2bn and if we go to 100% coverage, the averted new HIV infections would be 59,000 and savings of C\$90m and lifetime cost savings was C\$2,1bn.

So this is just the result of a new model because the guidelines have recently been updated, and therefore we going to see more patients coming to treatment at a much earlier phase of their disease. Now of course because the new guidelines are more broad - before we had 50% needed to be treated, however, now that percentage is much less; the number of people being treated are the same but the percentage is lower because the guidelines include are much bigger proportion of people living with HIV as eligible to start ART.

So we look at what is going to be the effect if we don't do anything. If we use the previous guidelines and the yellow and the green line present what is the difference that we are going to see if we increase the number of patients because of the new guidelines and also because we need to expand 50% of those who need therapy, anyway. So this plot shows the return on investment [ppt slide], looking at these two approaches. So you can see that in the beginning you are going to spend much more than you spend right now and if you increase to the 50% scenario, we see a return on investment in 20 years. And if we increase to 75% the return on investment is going to take like 15 years.

So what is the current global area of our need? This block shows the number of people in millions receiving antiretroviral drugs in low and middle income countries from 2002 – 2007 [ppt slide]. You can see that the number of people on ART has increased exponentially mainly driven by sub-Saharan Africa. However this new table shows [ppt slide], also by geographical region, the antiretroviral therapy coverage for the same regions we saw before and you can see, for example, in sub-Saharan Africa only 21% of those in need of ART were receiving ART and in December of 2007, after one year, that percentage had increased to 30%. However you see that more and more people are getting infected but the increase of people being on ART does not reflect the speed that the epidemic is growing.

And here it shows the funding gap between resource needs and resource availability from 2005 – 2007 [ppt slide]. So the red bar represents what is needed and the blue represents what is available. As you can see in 2005 the funding gap was \$2,8bn and only in two years we saw that the funding gap just tripled. So now the funding gap is about \$8,1bn. Recently there has been a paper published in the Annals of Internal Medicine² looking at the impact of PEPFAR on the HIV prevalence and HIV mortality, because we know that lots of funding from PEPFAR was channeled to sub-Saharan Africa and it's important to evaluate the effect of the money invested on key indicators of the HIV epidemic.

So, in this paper that we wrote, we just went a step further in that paper and came up with models of HIV incidence based on their data. So basically we look at control countries and they have 29 control countries and 12 PEPFAR focused countries. So we just looked at the two years before PEPFAR [2003] and the two years after PEPFAR. As you can see from that plot the control countries [ppt slide], the mode for distribution has changed from 13,47 to 12,68 between those eight years. The focus countries, the HIV incidence rate now has changed from 18,28 to 13,71. So we show that in a very short period of time we saw some shift in the HIV incidence by having that money from PEPFAR. But where do we go next?

² <http://www.annals.org/content/150/10/688.abstract/reply>

We know that scaling up ART [[ppt slide](#)] – there are lots of constraints associated with this strategy because we have direct and indirect costs associated with scale up. We do have limited resources, so how do we prioritize the available funds. Based on treatment guidelines, depending which region you are, when do you start with patients on ARVs, what should be the first and second line therapy choices for those people and do they have appropriate global laboratory monitoring to see if they are benefiting from the therapy and also we have to look at patients holistically – patients don't only have HIV, they have other health issues that also need treatment. The other question would be what is the long term sustainability of health systems and funding for those countries? We also look at where funding has to go, as well to concurrent prevention efforts in addition to having people on treatment.

And before we do anything we do have to address the social and gender inequalities that we see across the world especially in Africa. We have cultural and governmental barriers that that have to be addressed. There are several human rights issues that also merit to be addressed in order to up scale our priorities in those countries.

Thank you very much.

End of Session 1