IDS Annual Lecture 2018

‘Can we end the AIDS epidemic? The need for a development approach’

Professor Peter Piot, director of the London School of Hygiene and Tropical Medicine and founding director of UNAIDS

MELISSA LEACH: . . . So, a warm welcome to all of you in the auditorium here, and also to our online audience, to this year’s IDS Annual Lecture. What we always try to do with the annual lectures is to bring cutting edge perspectives to really key global challenges and to think about development in a contemporary context. And the reason why we chose the topic this year, ‘Can we end the AIDS epidemic? The need for a development approach’ is because HIV and AIDS has been a major global challenge since the 1980s. It’s changed and transformed over that period, but it has absolutely not gone away. It’s indeed the kind of challenge that is not only still with us, but is, more than ever, requiring an approach that is truly developmental in terms of bringing perspectives that are not just sitting there in the area of global health, but are also bringing in ideas and perspectives and actions that address poverty, vulnerability, questions of gender, questions of migration, questions of globalisation. So, an ideal topic, really, to focus our energies and attentions on what development is all about, and what kinds of understanding and action we need to address it. So, I’m absolutely delighted that, given this topic choice, we’ve got Professor Peter Piot to deliver this year’s lecture. There is nobody more qualified to speak on this subject. Peter is currently the Director of the London School of Hygiene and Tropical Medicine, and a Professor of Global Health. He is one of *the* foremost scholars of global health in the world. He’s published more than 580 scientific articles, 16 books, including his memoir, *No Time to Lose*. And he’s held numerous academic positions and received a great many awards, including having been made a Baron in 1995 by King Albert II of Belgium, and in 2016 having been awarded a UK honorary knighthood – that, in the context of the work he did around the Ebola outbreak. However, it’s in relation to HIV and AIDS that I think Peter’s qualifications and presence really comes to the fore, because he was there at the very beginning, as a clinician, as a microbiologist, leading pioneering research on HIV and AIDS, its relationship with women’s health and infectious diseases in Africa, and, of course, he was the founding Executive Director of UNAIDS, the organisation established within the UN system to tackle the crisis, and was indeed Under-Secretary-General of the United Nations, between 1995 and 2008. So, I think what Peter can bring us is not just a development approach and perspective, but also an insider’s perspective, I hope, on some of the and politics around attempts to tackle this challenge. And then the final

thing I'd like to say: one of Peter's most recent roles in his numerous roles over the decades is as Chair of the SCOR board, which is a new cross-governmental UK board that's been established to steer the strategic coherence of overseas development research. And in that capacity, as we were hearing from him at lunchtime today, he's helping to shape research approaches that are genuinely interdisciplinary, developmental, engaging with action as well as academic research, and indeed, international, in their engagement with partnerships. And I hope some of that commitment will come through in what he brings to our discussion of HIV and AIDS this evening. So, without further ado, I'll turn over to Peter, thank you very much. [*applause*]

PROFESSOR PETER PIOT: Thank you, Melissa and good evening everybody, it is good to see some older friends and also some representatives of the vibrant civil society community in the Brighton area, and . . . with whom I've worked quite . . . and I mention that, like the HIV/AIDS Alliance, very relevant for the talk today. So what I thought [about] doing was to start a little bit with AIDS, how it was really a disruptive force, not only for people's lives, but also for institutions, who had no clue how to handle that, something new that nobody had planned for. As some senior international development official told me, when I said, 'Why don't you do more?' He said, 'We haven't planned for it.' So that's the . . . but then, also going to what I would say the current rhetoric and some of the myths that, you know, about the end of AIDS and the . . . whether this an exit strategy of the US, or is this real? Or is it another example of medical hubris? I mean, so that's the kind of things that I'd like to talk about and also to support it with some evidence.

So, my own study in terms of AIDS starts, actually, in Kinshasa, now the Democratic Republic of Congo, then Zaire, and where I went to see whether . . . to help people with a disease that didn't have a name yet, AIDS was only came up [with] in 1984, something like that, and the cause of AIDS was only discovered around that time. But it was this new syndrome, and the dogma was that 'this is a gay disease', because it was first described in the US and here and it was mostly in gay men. And it was probably caused by a virus, sexually transmitted, and I could never understand why a virus would care about sexual orientation of a human host. [*laughter from audience*] I thought, 'That doesn't make sense,' because I always try to put myself in the skin, in the head of the . . . others, you know, be it a microbe, or someone I . . . kind of dialogue with, and, because what's the *raison d'être*, what's the purpose in life of a virus, of a microbe? It's to have eternal life, I mean, it's to have a host that it needs to survive. And that means that the ability to jump from one host to another, be it plants, or be it animals, or be it human primates like us, and that's what sex between humans is, from the perspective of a virus – not very romantic, but that's what it is about. So, I said, 'You know, it doesn't make sense,' and also we were seeing – I was then in Belgium – seeing patients with this new syndrome, coming from Central Africa and about one third were women, so that didn't match the 'gay disease' thing, and actually, which led to an awful term: in the beginning it was called GRID – Gay

Related Immune Deficiency – a very stigmatising kind of a name for the disease. And so, when you have a problem, or when you have a question, it's always best to go and see there where you think you can find some answers.

So I went to Kinshasa, where I worked before in the late 70s, among other things, during the time of Ebola, the first known Ebola outbreak. And so yes, in the largest, one of the largest public health hospitals in Africa, called Mama Yemo these days, after the name of Mobutu's mother. That's one of the observations in life I've made, is that dictators like to call things after their mothers, so usually hospitals. And yes, it was full of AIDS patients. And half of them were women. And I really worked there, and what I saw with this extreme poverty associated with this new disease, a huge gender element, actually the majority were women. And with young people. So I immediately started spinning it in my head, and I said, 'This is going to be a real catastrophe for that part of the world.' And that's what it has become. And so, in no time – AIDS was described in 1980, in June 1980, so not that long ago from an historic perspective – in no time it became the first cause of death in Africa.

And here you see from the Global Burden of Disease exercise, from the University of Washington in Seattle, and you can see here, in terms of Burden of Disease, but also cause of death that in Sub-Saharan Africa, HIV is the single, number one cause. Although that's now getting better, and this is the Burden of Disease, so in terms of mortality its number one, but TB is now becoming number one because we have antiretroviral therapy. Now, from the beginning AIDS was political, and there was a debate, 'What is this?' And the medical community said, of course, 'This is a viral illness, this a health problem, [*words unclear*] so many infectious diseases', but there was someone, Jonathan Mann who was an epidemiologist from the Centers for Disease Control in Atlanta in the US, and who became the founding director of the first global AIDS programme, a special programme, it was called at the WHO, when the WHO got over its denial. And he said, 'This is fundamentally a human rights issue, because it affects those people whose rights are violated in some way or another – because they are very poor, because they have different sexuality, because they're using drugs, et cetera.' And so that makes them so vulnerable that they're more at risk for HIV.

Then a few years later when . . . starting in Japan and then later particularly promoted by UNDP, that the concept of human security became quite a new concept to look at poverty and other issues and bring together notions of economic development but also of personal development, discrimination and so on. Human security and development issues were then another framework to define AIDS. And then, unavoidably, in the US, at the end of the millennium, about everything was defined, and is defined again, as a security issue. And so the National Intelligence Council published a report with projections of the course of the epidemic that were well-inflated over what it would become, but it said 'This is a national security issue.'

Now, one thing I've learnt is that after coming out of academia and going into the UN, and I thought if you have the evidence you can . . . that's good enough. In the end I know that there are only two things that really can set an agenda in a big way, and that is the economy and that is security. So this security definition was interesting, because that model also [*word unclear, 'leads'?*] to the Security Council, so from human security to more classic type of state security.

So these have been four quite widely-used frameworks, conceptual frameworks of AIDS and I would say that we are back to where we started, today we are back into the biomedical model, and I think that's problematic. AIDS was highly disruptive in the development world, and the first reaction was denial, usually when there's bad news. And . . . one of my favourite books is *La Peste* by Albert Camus, the play, and he describes when the *Peste,* when the plague, hits Oran in Algeria, how there's all denial, it doesn't exist. Second phase is that, yeah, it's there, but it's . . . [*word unclear 'for' or 'all'?*] the others – it's only later that we . . . it's part of us.

And so in the beginning it was total rejection. Also here at IDS, in [*word unclear*], in DFID, in UNICEF, in WHO, and I can't understand because it was disruptive, but nobody knew is this a very short-lived type of thing, or is this a fundamental issue? And some of the times it went to extreme levels, like President Mbeki in South Africa who flatly denied that HIV existed, who thought that this was a conspiracy of the West, or pharmaceutical industry, and thereby blocked the access to antiretroviral therapy, first to prevent mother-to-child transmission, and then to save millions of his citizens.

So, in the beginning years, the early years, were really, as far as the experts are concerned, a lot of time was spent on saying 'why this is not important'. And I remember that DFID was organising workshops – why it is really not possible and not a good idea to introduce antiretroviral therapy in low-income countries, because it's not sustainable, it's not a public good, it doesn't fit, it's not [*words unclear*] and all these arguments that all of us could say, rather than to organise workshops to say 'How are we going to save these people's lives?' So that was . . . I found it always very interesting that the inability of institutions to deal with something that is not [*word unclear 'clear'?*] and I think we're going through the same thing in a much bigger and [*word unclear 'broader'?*] way with Trump, coming around just . . . it's also disruption.

All these experts and institutions have forgotten one thing – and that is people. They have forgotten people, and they have forgotten that this a disease that is affecting young people, young adults, not children, young adults, and in many countries also middle-class . . . it does affect the poor, but it affects the rich, because it's about sex. And in the early days, in many countries, it was actually the higher your income, the more likely it is that you have HIV. That was documented from Thailand to countries in Africa. Now it's the other way round. And it was often richer, older men and poor

younger women. But it was not counting with . . . you know, these people that they had a voice and they were fighting for their lives.

And that's what happened in the West, with Act-Up and so on, but in every country from Brazil, and . . . take South Africa which is the country that is . . . today has 6.5, 7 billion people living with HIV, can you imagine? And in the 80s had hardly any HIV, it's a pretty late invasion in the sense of the virus. And when you would come from the moon, where you would not know what the world is and [*word or words unclear*] to one of these, to a student in development, you ask, 'What does treatment action campaign, activists, the Anglican Church, the Communist Party, the Unions, [*word or words unclear*], you know, the Chamber of Mines, a UN organisation, MSF, Médecins Sans Frontières, academics, what do they have in common?' – absolutely nothing. Except around AIDS they formed a coalition. They put their differences aside. Also they were united because the government, and the leadership of Mbeki was not willing to recognise that fact, and to act while people were dying.

So it's this kind of brilliant coalition – the word 'brilliant coalition' I picked up from a book called *Bury the Chains* from Adam Hochschild, a brilliant book on how, in what is that now, it's more than 200 years ago, there was a real civil society movement that was organised and [*word or words unclear*] for the abolition of slavery, at a time when communication was by pigeons and horses were [*words unclear*]. And yet there was a movement that was spread, not only here in Britain, but also outside. And there was a coalition, and so on, led by the [*words unclear*] and I thought, 'This is like what we saw, and what we've seen in South Africa and other countries.'

So the . . . the [*words unclear*] moved from the technical debate to the political space. And that's what made the difference. And that political space became then from the community action and so on to the multilateral political space, the UN; the first session ever of the UN Security Council on a health issue, on actually a non-classic security issue, and it was the first meeting of the new millennium, on the 10 January and it was chaired by then Vice-President Gore, Al Gore, from the US, because the US had the chair of the Security Council. The Security Council has a different chair, it's a rotating chair, every month. And the one thing that a chair can do is to set some agenda items. So between Christmas and New Year, I'd been working with Ambassador Holbrooke and to put that on the agenda, which nobody really wanted because it was not so classic, but . . . that made a big difference. Erm, high level meeting etcetera, Nelson Mandela came out on it, it was interesting, his first speech on AIDS was not in South Africa, it was in Davos, at the World Economic Forum, and then he came out in South Africa, and one of his sons, actually, died from AIDS, [*words unclear*] and so on, and then it became like, quite a high-society type of thing.

But each country had to go through something. And for me, a turning point was in Abuja at the African Union, then chaired by President Obasanjo from Nigeria, in 2001, in April, hosted a special summit on this. And what was very interesting – even you can look at it from a psychoanalytic perspective – is that one president after the

other could say the ‘AIDS’ word, and say, ‘Yes, we have a problem.’ Because if you can’t say that you have a problem, then you will never go for a solution. Everybody, except one President, Mbeki, and so . . . and in China, you had to go through the Communist Party, et cetera, et cetera.

But all this came together with some technical game-changers, so when you see how a social movement and a new issue can really develop in a big way, so that there is change, we have a combination of technical breakthroughs which are the result of science and research, the development of treatment, so that AIDS was no longer a death sentence and you can still, if you get three different drugs you can stay alive, the quality of life, et cetera, [*words unclear*] problems, but still. The prevention of mother-to-child transmission was very important also, that that was possible, because here we could go for quite a classic type of public health intervention. But what made the real difference were the political events. UNGASS is the acronym for UN General Assembly Special Session on AIDS, where 45 heads of state came and said, ‘Yes, this is what we commit to,’ and there was agreement on some targets, and all that stuff. And that was also part of the sustainable development goals. And the creation of dedicated funding streams, the global fund to fight AIDS, but also TB and malaria, so that was collateral benefits.

And in 2003, President George Bush took everybody by surprise by asking US governors for $50 billion. We were very happy in these days, if it was 100 million, more than that, and then suddenly we moved from the ‘m’ word to the ’b’ word – billions. And that’s what’s needed.

So this spans a bit of the history, since I see so many young people here, which is great. And, at the same time, there were big fights going on, that also I think are very important for the broader development agenda.

One was that we had this innovation in drugs, new therapy, coming out in ’96. And here in the UK this was announced in July, and in September, people living with HIV could get this therapy through the NHS, because we have this system here, and in other European countries as well. The rest of the world, it was a bit problematic, the sense that this was costing $14,000 per person, per year. Far too high for most people in the world, either because they’re too poor, the countries are too poor, there’s no health coverage in some. So this became quite an obsession: to decrease the price, the cost of these drugs so that they would become available to people who need it, because by that time there were about 20 million people in need. And to make a long story short, this happened after quite a while. You see the story for Uganda, from 12,000 in 1998, and now basically the same drugs are available for about $300 per person, per year. In other words, less than a dollar per day. That was a result of activism, diplomacy, changing the rules of the game. Like, I had no clue about TRIPS and, you know, I’d never heard of it when I was in the job but, [*words unclear*] all that, but it’s Trade-Related Intellectual Property rules, so, which made it that, if you make a copy of the drug, a so-called generic drug, you’re . . . and that’s made in India,

as most of them are, you can’t really import that in a third country, without certain rules. So we could make an exception, we obtained an exception in 2002 or 3 in Doha, with the World Trade Organisation trade negotiations so that there is a public health exception. I always said, ‘I don’t want to change everything, just do it for AIDS’, but that was the trick to . . . you have your foot in the door, and then you can open other things. That’s the way to do it.

And so, it was also the arrival on the global market of Indian generic manufacturers, also because the trade laws, the international property laws, sorry, in India changed. So it was, I would say . . . the stars were becoming aligned, and I’m not sure that would happen again very easily. But this was the first time that a technological innovation that’s still under patent even today, became fairly rapidly available also to the poor, thanks to these new mechanisms. And when today a big company, pharma, puts a new anti-HIV drug on the market, there is nearly always differential pricing for low-income countries, high-income countries, middle-income countries, the licensing et cetera, et cetera.

So that is, in that sense, AIDS has been a pathfinder. But even if something costs only a dollar a day, someone still has to pay for it. And so that . . . I mentioned, you know, the global fund was created, The President’s Emergency Plan for AIDS Relief, as it’s called in the US, et cetera. And you see a spectacular increase in funding for HIV, international funding and domestic. Also, because the economy was on the rise and international development envelopes and budgets were also on the rise, so we didn’t have to take it away from other budgets. All this led to some results, fortunately – which is not something we can always say in development.

And here, first of all, the indicator is that in 2000 about 200,000 people were on antiretroviral therapy in low and medium income countries. Half of them were in Brazil, at least half were in Brazil, and then some of the individuals. And this went up, particularly after 2005 and [*word unclear*] at the moment at about 21, 22 million, in 2017, and the new estimates will come out, actually, tomorrow, from UNAIDS. So that’s quite a spectacular programme, and this is something that, you know, books are written about it – why it’s impossible to provide this kind of therapy in low-income countries, and it was very funny, the administrator of USAID, the head of USAID at some point said, ‘Oh, Africans don’t have watch[es] they don’t have notion of time, so they can’t take these kinds of drugs.’ So . . . going close to, if not totally into, racism. But it was really an incredible conspiracy to keep these life-saving therapies from people. And that resulted in a decline in mortality, in new infections and this is for Sub-Saharan Africa so, real . . . real results.

Now, this has then given rise to some kind of euphoria. It took, first of all, far too long to [*words unclear*], and a lot of blood, sweat and tears, and human lives, but now the rhetoric of the UN and of the US, the two dominant forces here, are that the end of AIDS is in sight. We have the Millennium Development Goals, the encyclopaedia of development, and [*words unclear*] and one of the goals is that by 2030, there will be

an end to the AIDS epidemic, it will be [*word unclear 'gone'?*] Also, a few other things, but let's just concentrate on this.

And that has a been a mantra from [*word or words unclear*] President Obama, but also the, UNAIDS and . . . it has been hammered as the rhetoric, 'the end is in sight', which I think now has become rather counterproductive and it's actually not supported by the facts, even if we have made enormous progress. Now, four years ago, when there was the tenth anniversary, tenth? Twentieth sorry, anniversary of the HIV/AIDS Alliance in Brighton, and I was asked to give a speech, and to be honest, I didn't know very well what to say. I was, you know . . . and then I thought about it, I was getting very worried about this kind of euphoric type of [*word unclear 'discourse'?*] and I still travel around and talk to people and see . . . I said that what I'm seeing doesn't correspond to what the official rhetoric is.

And so I said, here are ten myths about AIDS. And I'll say a bit more about that. So, the first myth is that the end is in sight, we'll [*words unclear*] come back to that. The second myth is that all you need is some pills, we're going to fix this epidemic with some pills. 'ART' means antiretroviral therapy. Three is that a whole attack, basically, from the medical community that behavioural interventions, that anything that's not a pill doesn't work. And there is no evidence for that. Four is that, another myth is that we [*word unclear*] since it's over, therapy is integrated into health services, and in universal health coverage and all that. Fifth is that the epidemic, all we need to do is to just do more of the same, and it will be gone – because that's what mathematical modelling are showing us, kind of assuming that we are robots and not just people with this, you know, sex drive and so on. Six: that why bother about all these kind of difficult characters in civil society, we don't know them, we will fix this we physicians. The seventh myth is coming particularly from the US and the UN, and it's part of an exit strategy for not having to spend international development money. And that is that domestic funding will cover all the costs. Now, we have quite some good evidence that in some of the poorest countries in Africa, they would have to spend up to 4 or 5% of their GDP per year just for . . . to keep some of their people with HIV alive. They can't do that, so we . . . . Then, we can't do better with current funding, that's also sometimes coming from civil society, we can have efficiency. There is a lot of wastage. Finally, also, stigma and discrimination – and it's a hope that I also have, which has been so false, fearful with the HIV that when this condition becomes treatable, the stigma is gone and the discrimination will be gone, and that was a total . . . I mean, that was an error, that was a mistake, that's not happened. Because it's about something else. It's about sexuality, it's about being different [*words unclear*]. And then lastly, this is about funding vaccines.

So, a few words on the 'where are we', as you can see, you know, I come from the London School of Hygiene and Tropical Medicine, one of the temples of immunology, so bear with me. The blue is the decline of new infections. And that started, actually, already in the 90s, as a result of very basic interventions, condom use

and community mobilisation, there were no drugs. Mortality, that declined from 2005. But we have, cumulatively, about 35 million deaths from HIV, and about 1 million deaths a year. That means that by 20— let's say, 2030 plus, we'll have as many people killed by HIV as by the Spanish Flu. I mention the Spanish Flu because this year is the 100th Anniversary of the Spanish Flu, which killed more people than in World War I. And unfortunately people who, men who had survived the trenches and gone through all these horrors, and then a few months later they were killed by a stupid virus. So, we are not there yet.

And there are few regions that are particularly problematic. And one is close to here, and that is Eastern Europe. And HIV in Eastern Europe is completely [*word unclear*] it's getting out of control, because of a fear of policy and politics. And because, particularly in Russia and some of the ex-Soviet states are refusing to face a few things: one that injecting drug use is rampant, there is a huge problem on drug use, and that you can actually do something about it, there are ways that are scientifically proven, from needle exchange to reduce the risk, to substitution therapy, et cetera, et cetera, but that's absolutely been proven. And erm, personally, when I was head of UNAIDS, I went there so many times, and I felt it was a personal failure, I could not convince them. And you see what's happening, it's really getting out of control. In a country that's also very interesting, like Russia, the population of Russia is declining by about 200- to 300,000 people a year, there's a democratic deficit [*words unclear*]. And AIDS comes [*words unclear*] plus there's enormous discrimination, access to treatment for drug users, for gay men and so on is [*word or words unclear*].

And then we've got southern Africa, where you can say it's hyper-endemic, where that's the part of the world where I would say that HIV is and has become a true development issue, because it's affecting many ways of society, but societies are also adapting. These are fairly old figures, but nothing has changed unfortunately. This is from rural KwaZulu-Natal, where you can see that the incidence, in other words the risk of new infections per year, for young women, it's between 4 and 9% per year. It was like that in 2017, it's not gone down. So by the time you are 30 years old, as a woman, it's like 40% are HIV positive. So the end of AIDS is not for them.

And Science Magazine, from the American Association for the Advancement of Science had a special cover on AIDS two weeks ago, and it shows where, it's comparing Nigeria, Russia and then US, Florida, particularly, and then South Africa, and it shows how, in many of these countries, particularly in Nigeria, Russia and some parts of the US, there's still a huge problem, and also a failure of policy and access.

So it's really in the first place, I would say that, on the one hand, our tools are imperfect, because they are technical tools, and it's about people and their circumstances of their environment, cultural and development, but also its ideology, because when you see that 44% of all new infections in what the UN, with some words I find horrible, calls 'key populations' – it's people who are high risk, for many

reasons, of HIV. And when you take . . . what, what does that mean? It's . . . men who have sex with men, in many societies completely illegal, so you can't reach, and all that, discriminated. Migrants . . . it's sex workers, drug users, but also women in general, but particularly adolescent girls, and where you see, when you look into intimate partner violence, it's playing a big role.

One thing that we should bear in mind for, not only for HIV, but [*word or words unclear*] in development is that Africa's on the wave of the largest cohort in its history of young people. Now, that in Asia that was . . . there was an enormous dividend to it, because states and households, families, invested massively in education of their children, and there was also the economic boom and so on. In Africa we don't see that, and I think we're going for a timebomb, a political timebomb, when we have this massive number of young boys, men and women, without a job and so on, but with education, what are they going to do? Immigration pressure on Europe will increase, and then from the health perspective, this is going to create quite some challenges. How to turn that into a dividend, like in Africa [*sic, means Asia?*] I think it's one of the biggest challenges that African leaders have to take. But I don't see that there is a very proactive policy there.

And these are some projections, it's difficult to predict the future, but this is very simple to do, because it's people who are already there today, they are born. And then when you see, sorry, it's a bit complicated, but the new infections in these . . . HIV infections in adolescent boys and girls are really high, particularly in girls and they have less access to therapy and so on. So that's [*word or words unclear*]. But we have also an interesting and paradoxical effect, general effect, and that is that in general, certainly in Africa, that women have more access to antiretroviral therapy than men. That's probably one of the few examples. And this partly the fact that they, during pregnancy that women are screened for HIV, so . . . and there are more programmes that are directed there, and men don't come for medical care. In other parts of the world, it's not exactly the same thing, but that's a . . . I find an interesting paradox.

Now, we've known for years about so-called risk-factors, again, in epidemiology, there's talk about risk factors, which has a very limited usefulness in real life, but it makes analysis very easy. But when you go into a broader development context, there are what we call in the trade, structural drivers of HIV, but there also structural drivers of many other issues: gender inequality and violence, poverty and livelihood, stigma and criminalisation, we had added here also alcohol – this is from a programme coordinated out of the London School of Hygiene and Tropical Medicine, by Charlotte Watts, she started to do that.

And so, we are not going to fix this epidemic with pills as long as we also haven't addressed some of the basic drivers that make the societies have these problems. And then it's a bit like other things, with the antiretroviral therapy, 20 years ago, and said, 'Yeah, okay, it's fine you know, I know beating your wife is bad, and there's violence and all that, sorry but there's nothing we can do about it.' That is kind of what you

hear also. And we know that you can do something about it. You can interfere with these . . . you know, from medication, which is not in there but . . . and we now have some firm evidence that you can actually prevent intimate partner violence and so on, and one of the mistakes we've made, perhaps, [*word unclear*] many of the gender issues is that we only work with women and forget that, certainly when it comes to violence it's not the women initiating violence, so we need to work with men. So this is kind of accumulating evidence that it does work, but it's all fairly small scale.

Stigma and discrimination, just look at the . . . this is the homophobic climate index, it's an indexing that exists. It is everywhere really, but it can be particularly bad in some countries. And it was interesting that in the New York Times a couple of days ago, Larry Kramer who's one of the pioneers and . . . *The Band Played On* book on the gay AIDS movement in New York, he's still alive, which is kind of a miracle, and he says with the Trump administration, with what's going on in the world, he says, this is his words, 'For gays the worst is yet to come. Again. We have to come back to the streets.' And I think that's true in many, many countries, but even here. And when you see how criminalisation of same-sex activity really kills people. And I don't have the time to go into detail, but in red you see countries where same-sex activities are criminalised, and this is just an ecological coalition, but the HIV prevalence is always higher.

And then finally there is a decline in funding. First, this is from the latest figures from The Institute for Health Metrics and Evaluation, and they report on financing global health, they also . . . global development and so on, international development. And so after the boom years between 2000 to about 2012, when we see every year an increase, particularly in the US, that funding is now going down. When you look at just HIV, it is going down also [*word or words unclear 'in a way' or 'anyway'?*].

Now, you could argue that perhaps too much money went to HIV compared to other things. My answer has always been, 'everything should be funded, and not just HIV.' Now, this is going to hit Africa particularly badly – and sorry for the complicated [*word unclear*], my finger is not long enough to . . . for this button. It is really, the dependency of international assistance is certainly true in the low-income countries in Africa, where it's about 40% [*word or words unclear*]. So that is a big issue.

Activism is going down, and that's another issue, so we are still trying to find the magic bullet, and that is, at the moment, strategy is you treat and then you prevent. And it's true, if you treat someone, you know, the virus is supressed and you're less infectious, but it's not enough. So you need really the behavioural, the biomedical and structural interventions all coming together. And as to quote a famous philosopher, it belongs in the dustbin of history, the one single magic bullet.

So what we need now is to move it, it's like in development, we have the acute crisis, we need to take care of people's needs, but we also need a long-term view. And that's where AIDS has become, from an emerging disease, an epidemic like Ebola and so on

in the beginning, to acute, has become endemic, in other words, in it's in societies, and we should think about societies living with HIV, just as living with other things.

But the question is, what level if acceptable? And so, a book was published, several years ago, taking the long-term view, but it was not very popular. But now it's clear that we have to take this long-term view, which brings it much closer to development.

Take one example: here you see the dependency of several African countries for foreign aid, for the treatment of the people living with HIV – in other words, the survival, the daily survival of millions of people, today depends on a vote in the US Congress and whatever DFID will give and the Global Fund and so on. Can you call these countries still sovereign? The largest HIV treatment programme in the world is in South Africa with about 4 million people. But there, the government pays for it itself. So these are some questions that come up.

So next week is the big international AIDS conference in Amsterdam. And lots of, thousands of people come there, and a report will be published, released on Thursday that I'm co-author on, in The Lancet, with the International Aids Society, and these are some of the key messages. And the first one, really, is that we're not on track to end the AIDS epidemic, so let's get real. And the rhetoric of 'The End of AIDS' [*word unclear*] counterproductive. Although I understand why it is, but it's a bit like 'Health for All by the Year 2000', I mean, in the end the credibility goes down. So we have to be careful when we set targets. And all countries, member states of the [*word or words unclear*] signed up to the UN have signed up to the SDGs, but when you start looking at it and you go into some detail and you say, 'What have they been smoking, you know, when they signed this?' Because so many things are going to be eliminated by 2030. And I think any reasonable person knows that it's not possible. And that's not because we're incompetent and so on, because it's a very complex problem. So HIV's in that. So we need to reboot the global effort, but also it has to be far more integrated into the broader development efforts – that's where the SDGs are a good framework, also with Human Rights, if you're serious about prevention. And we have to get real that it's a long-term challenge.

And finally, I would say and argue that this AIDS epidemic and AIDS response really engender what we call today 'global health', it's a term that didn't exist last century, we were still [*words unclear*] like our [*word unclear 'school'?*] but that's a legacy of the colonial past. Global health is about far more, it's broader and it connects health and development, it's multidisciplinary, the divide between prevention and treatment, advocacy and activism, the people's voice, global funding, breaking through these obstacles of access to essential products that are still under patent. Human rights there, and it will provide a major boost. So this is a bit of the story, and so the question, 'Are we there, is the end there?', the answer is 'No, but we have made good progress' and I think the way now is to connect far more with the broader development agenda, with, you know . . . and continuing to, in a sense for me, to use AIDS as a pathfinder to innovate in society, so that we can accelerate all the strategies

to reach the SDGs, so this is the advertisement of [*words unclear, audience laughing*] book, that will go into more detail. Thank you very much. [*applause*]

MELISSA LEACH: Wonderful. Peter, that was fantastic, an absolute *tour de force*, and really I think proves the point, the quote at one point that AIDS always has been, and is still political I would answer to that 'and so is development', and I think you've shown is that very, very clearly. So, we've got just over half an hour now to open up to some questions and comments from the floor, and also from our online audience on Facebook live. So, what I'd like to do, if people could just indicate if they'd like to speak, try and keep your questions or comments short. Perhaps say who you are, and we'll take sort of maybe groups of three or four, and then come back to Peter for a response and then take another round. So, who'd like to speak? We've got some roving mics to go around. Okay, we might start here, this might be one from our online audience.

HAHHAN CORBETT: So this is from our online audience, someone called Hannah. She's from Toronto, and she says, 'How do we make HIV funding sustainable in African countries, and what can we do in other countries to help them refocus or reorganise their spending? You mentioned that you believe in funding for HIV but also for other diseases, but how do we do that in our own countries?'

MELISSA LEACH: Let's collect up a few. Good question. Okay, the lady in the row here?

GEMMA: Hello my name's Gemma, I'm a [*word unclear*] student at BSMS. I was wondering what role you think that universal health coverage [*inaudible*]

MELISSA LEACH: The role of universal health coverage, okay, great. I'll take another one. Just further up here?

SOPHIE EDWARDS: Thanks very much, my name's Sophie Edwards, I'm a reporter with Devex. There's been some talk in The Lancet Commission as well about the need to be less siloed and have less vertical funding, but at the same time we need more of that funding, but we also need to be more integrated. How do you sort of square those two slight contradictions in real terms, in terms of what kind of funding we're asking donors to give?

MELISSA LEACH: Okay, well perhaps we should take those three, which all in different ways are about funding, [*words unclear*] by country or by silo.

PROFESSOR PETER PIOT: Yes. Staying with funding in Africa for the Toronto question. First, I think we need always need to define what we mean by 'sustainable', because 'sustainable for whom and what'. Is there sustainable funding for the National Health Service in this country? It all depends. That sustainability depends on the power relations in a country.

Now, when we take the . . . let's take Zambia for example, because I've got the figures in my head, where this is a country where it would require, for many, many decades up to 5% of its GDP to spend on HIV to do even basics. So there I think we will need a combination of continuing international support, but also there are efficiencies that can be made. And even poor governments have budgets. And it depends where is the budget going to? There is a commitment by African states that was made in Abuja in 2001 I think, to spend 15% of their public spending on health. Now, only two or three have reached that. And I'm not saying that that's an absolute type of figure, but I think that there is a case for more investment by the countries in health and education in general, but I don't have an answer, I mean, we need to . . . sustainability depends on societal sustainability, but this is where the last question, I'd like to jump from that – or the second one – on more integration can save money.

It doesn't make sense that you've got, say, a consultation, a clinic for pregnant women just for HIV and then all the other antenatal services are next door, or even far away. So that's where we can have efficiency gains, and that's I think also where the universal health coverage, where, I mean, this is an important aspiration, but we can't wait for . . . whether that's realised. There [*words unclear*] doesn't have universal health coverage. And there are . . . most middle-income countries don't have it. They have the means, but, again, it's politics. So I think I'm kind of more of the pragmatic type, so I think that we have to look at it in each country, and some countries are doing that, for example Kenya is doing it, at a county-by-county level, how to.

Where are the synergies, and where not? Because integration for integration's sake doesn't work either. And you can lose, and it can come from a win-win to a lose-lose. But the question about the paradox, indeed, in this Lancet report that [*words unclear*] is about that, it is, on the one hand, we've got 22 million people now on antiretroviral therapy. If funding stops, they will die. It's as simple as that. And the ones that are not yet on treatment will also not survive. So you need continuing funding for it, but it can be organised in a much better way. And there are some examples already.

On the one hand, when you look at the Global Fund to Fight AIDS, it's not just about AIDS, it's TB and malaria, for the first time, tuberculosis, which is killing lots of people, a million and a half a year, and malaria gets some serious funding, so that is for the benefit, but the problem is that then you have a separate TB and a separate HIV programme, and I saw that in Cape Town, for example, where so many people with TB are infected with HIV and vice versa. And [*word unclear*] those in Khayelitsha, one of the big townships there, and so they were trying to integrate these two, people with TB and HIV there. What was the biggest problem was that TB is a municipal responsibility, and HIV a provincial one. So you've got different nurses with different pay scales, with times that they go to work, et cetera, et cetera. So as long as we don't deal with that kind of "warring things" quote, unquote, we're not going to bring it together, and that's what I think we should work on.

MELISSA LEACH: Fantastic, I'm going to throw in a question here, because I was really interested in the case of the Treatment Action campaign in South Africa, and this idea of 'brilliant coalitions' involving civil society. I was wondering how important you feel now and into the future is civil society action? And if it's critical now and for the future, how does one reconcile the need for it, and for this kind of 'brilliant coalition' in new contexts, with what we're seeing worldwide around the closing space for the civil society in many countries and regions, if not the disintegration or the demolition of civil society action? How much is that a problem, or actually is the future HIV/AIDS fight going to be led by governments and aid agencies. But that's just one to add to the mix. But we've got others, so . . . Mia?

MIA: Thank you. Thank you for your talk. I was struck by something you said which was around how the criminalisation of same-sex activity shows higher prevalence of HIV/AIDS you had mentioned this? And it struck me that, just thinking about that, perhaps new audiences and new kinds of civil society activism, like legal activism, sort of might also be important to . . . because the landscape as you've said around AIDS is shifting and so my sense is – and I don't know if you've taken this . . . if there's some work on this, or if you yourself have some ideas about whether legal activism is the way forward as well, sort of new audiences but then civil society. Thinking about, you know, from the position of abortion and how that has been around again for such a long time, and different kinds of legal activism is really time-critical.

MELISSA LEACH: I think there was one . . . yes, there was a question here, this gentlemen in the pink T-shirt, or maybe . . . okay, let's got to Stefan, and then we'll come to you.

STEFAN ELBE: Thank you very much for your talk, my name's Stefan Elbe, I direct a Research Centre on Global Health Policy here, but I have a background in international politics. So I was really interested in terms of what you were saying about what a politically disruptive force HIV also was. But then, if I heard you correctly, you also actually dropped in a really interesting analogy, because you said there was an analogy between the political disruption of the virus, and the political disruption that is Trump – both for the kind of HIV policy, but also more generally. And so I just wanted to invite you, whether you could expand upon that a little bit.

MELISSA LEACH: If we just go across the aisle, I think there are a couple of questions.

NAME UNCLEAR: Thank you for a great presentation. My name is [*name unclear*] I'm with the International HIV and AIDS Alliance. And I noticed in one of your slides you presented the structural barriers to AIDS, and one of them was familiar but also not familiar, as a structural barrier, which was alcohol. Could you explain a bit more, or respond a bit more how you see that as a structural barrier rather than may be a behavioural aspect which has [*word or words unclear*]

MELISSA LEACH: Right, so Peter do you want to come back on some of those, we've got a range there!

PROFESSOR PETER PIOT: Yes, okay. First I think civil society, indeed . . . take South Africa, when there was denialism by Mbeki and so on, so that civil society was really the driving force between the national campaign and many others, and actually received quite some money from international donors. Then, when the government became more reasonable, they became service providers and the money went to the government and so on, and so there was a . . . and treatment action campaign is in quite some crisis, and we've seen in several countries, I mean, look at the UK, frankly there hasn't been that much, and there's certainly hardly any civil society activists neither on HIV, nor on, you know, gay issues and so on, as far as I can tell. When I came here, when I landed on the island, I'm an immigrant here, so I just feel, with whom can I connect, and all that, and it was not so clear. But I think that the answer came from you, you know, we need new force, first of all new generations, there are different forms of civil society engagement. The problem can be that, you know, when you click . . . so, click-activism and you sign . . . you do something on Facebook, you think that it's done, that's really not going to make the difference. And so, how, what is activism in today's world, and I've given some speeches on that, because I'm really fascinated going to *Bury the Chains* to, you know, street demonstrations and so on, and now, the virtual world of activism. But I think that civil society remains absolutely vital for two reasons. One is accountability. I mean, also because the media, the press, traditionally played that role, but I think civil society has an important role in accountability, and bringing on new issues. Now, there has been some legal activism also, like in India the [*words unclear*] and what was it, the . . .

NAME UNCLEAR: [*words unclear, begins with 'Lawyers'?*]

PROFESSOR PETER PIOT: [*word unclear, also says 'Lawyers'?*] Yeah, like the [*word unclear, sounds like 'Den'*] in South Africa, also, which is now Section . . . twenty-[*fragment of word, or word unclear*] . . . you know, I'm dyslexic for figures so I don't . . . and they've been very, very important, both in terms of individual cases, like . . . I remember also living in Nepal, someone who distributed leaflets or condoms to men, was put in jail, tried to get people out as a precedent, but also trying to change the law. In India it was Section 377, is that the right . . . ? Okay. And so, but I think there are others. We have a great example in the environment, what's it called, the Lawyers, the Earth, er . . .

STEFAN ELBE: ClientEarth.

PROFESSOR PETER PIOT: Yeah, that's it. Right, I mean, I think that's a fantastic example of some activism that's really making a difference. And I think this is where we need also to join forces, be . . . it depends on the country and the culture – it could be reproductive health rights and so on. It could be gay rights, whatever it is that's relevant. And, by the way, there was a big report on the reproductive health and

family planning community that was just published, there were maybe two words on it, that's the whole thing, so you see these silos are still there.

On Trump, no, I was thinking about the paralysis of institutions. When Trump makes all these comments in NATO or the EU, we really don't know what to say and what to do. So it's maybe . . . it's a cheap comparison, but I was just thinking how, as individuals and as societies when something happens that is not in our normal daily or whatever framework, then we are complete— that's really disruption. Of course, when you go to Silicon Valley, the disruption is we have the latest on our phone, or this and that, but that's . . . and I tried to explain that in my field disruption is not necessarily a positive thing. For them, if it's not disruptive then it's boring, it doesn't exist.

Now, alcohol, okay that's part of the . . . it's a DFID-sponsored programme, it's called STRIDES and alcohol has been identified as a major risk, determined for that. But I agree, you could argue, 'is this structural nor not', I mean that's a . . . I'm not a teetotaller, so I can say that, but I think that it is a . . . it's at the nexus also, because this programme works a lot on violence and gender-based violence, and alcohol, just as football, when your football team loses, the probability that the wife and the girlfriends of these men are beaten up goes up tremendously, and we can also connect it with alcohol. But we haven't really [*words unclear*] the problem is also, what do you do about it? And how to deal with, and then you get into the politics [*word or words unclear*]. Look at this country, I mean . . . and the minimum price for alcohol is [*word unclear, 'only'?*] . . . but I think your point is well taken.

MELISSA LEACH: Great, okay. The questions keep coming, so we'll go to Michael here at the front.

MICHAEL: How good are the statistics on both the incidence of AIDS and the number of new cases? I was very struck by one of your graphs which showed Burundi as a very low incidence or very low number of new cases, and I wondered how good those data were. The reason I ask is that I'm interested in what it is about either the statics or dynamics of populations that leads them, some of them, to have surprisingly low exposure to HIV/AIDS – if one could understand that, one could perhaps get to grips with the developmental and behavioural sides of the issue, which you so rightly emphasise. But do we have that information, do we have those numbers in a reliable way?

MELISSA LEACH: If we go just behind?

FIONA [*SURNAME UNCLEAR*]: My name is Fiona [*surname unclear*]. Some time ago, workplace policies were invested in, HIV/AIDS workplace policies, and I alone had, I think quite a role in promoting HIV in the workplace. Once of your slides showed that men were not accessing services as much as women, and you mentioned women had greater access because of antenatal case. To what extent is ILO taking a

role in promoting HIV workplace programmes and access to treatment through the workplace, and making employers more responsible for provision of care? Because it is difficult for men to access services in the context of limited-hour clinic places. We don't hear much about ILO these days.

MELISSA LEACH: Okay. So there's one just a couple of rows further back, from the stripy shirt there. If you're at the back wave at me, I don't want to miss people out.

JOSHUA [*SURNAME UNCLEAR*]: Hi, my name is Joshua [*surname unclear*], I'm a Ph.D. student in the Science Policy and Research Unit, and my Ph.D focus is on how we learn from outbreaks. And what I'm actually interested in is the difference between the AIDS epidemic, which is incredibly long and incredibly protracted, versus something like SARS or Ebola, which is an incredibly emergent, incredibly crisis-driven outbreak. And to what extent does the timescale between something that lasts, say, six months to two years compare to something that's been around for almost 40 now?

MELISSA LEACH: One more in this round, so . . . that person in this row here?

RACHEL: Thank you. My name's Rachel, I'm also a [*word unclear*] student at BSMS. Erm, you mentioned in your talk, a comment made that you weren't so keen on the idea of key populations, and I was just wondering if you wouldn't mind sharing your thoughts with us around that?

PROFESSOR PETER PIOT: Around what, the . . .

RACHEL: Around key populations, and issues of terminology and stuff around that.

MELISSA LEACH: Good so . . . let's hear from Hayley just there, and then we'll come back to you.

HAYLEY MACGREGOR: Hi, it's Hayley MacGregor from IDS, I wanted to ask a question also that comes out of experience from a South African context. I'd be very interested to know what you think a development perspective or either a broader social perspective might add to some of the debates about retention in care, and how to keep people in care, and in particular I'd be interested to know your thoughts on linking to forms of informal in the context of South Africa?

MELISSA LEACH: Right, so, a wide range.

PROFESSOR PETER PIOT: Erm, yes. On the statistics, how good are they, I could say that they're probably the best health statistics out on HIV, but that doesn't mean that they're as good for each country as . . . as you would wish to. It's one of things when I started with UNAIDS in '94, I said, 'We need better data, and consistent data',

so there's a uniform methodology that's being used across the world, although now I think it's less and less funded. And that was based on antenatal clinic attendance, in other words pregnant women, as some kind of sample of society. However, that misses some of the key populations and people who are not there. And then there have been massive kind of demographic and health service testing. And usually it matched more or less. What I'm particularly interested in is the trends, it's going up, go down, and so on. Some countries I'm not so sure about. For example, Nigeria. And there is a $100 million effort now, US dollars, funded by the US, to map HIV in Nigeria. Unfortunately, it's just for HIV, which I think is a missed opportunity to just not do . . . to include other, whatever it is, you know, and do the effort. And the question about Burundi is very interesting. I got interested in that even in the 80s. I was working in Zaire and also Katanga, the [*word or words unclear*] as they're called, in Lubumbashi, and Lubumbashi had quite a low HIV prevalence, whereas in Zambia, Ndola and so on, you can drive to it, we would drive to it because that's where you could buy all kinds of things you couldn't find, a very high prevalence. Also when you see Uganda and [*words unclear*] Eastern [*word unclear*] you have, even within a country, when you look at South Africa, KwaZulu-Natal is very different from, you know, the Western Cape, and so on. I mean, in terms of [*word unclear*] and I agree with you, we need to study that more to understand, because it's from differences that we often can learn. And we, I remember in UNAIDS I found a study comparing high and low prevalence countries and we didn't find anything, actually what came out was something bizarre, it was that in places in Cameroon, where there was very low HIV prevalence, they had the highest number of sex parties and unprotected sex [*words unclear*] but that was discredited, so it's something else. So I think that . . . but I think that all simplistic explanations [do] not work. And when you look at KwaZulu-Natal where we're working with the University of KwaZulu-Natal and UCL and so we're, as I showed, extremely high HIV prevalence, particularly for young women. And it's any single explanation has failed to [*word or words unclear*] What we can see is hotspots and so on, and then okay, in general younger women, older men and so on, and you can find it now with genomic sequencing of HIV. And then you talk with the women and so, because then you start stigmatising . . . and then I understand there is a rationale, why, as a young woman, you would have sex with a few older men who can give you something? I mean, I always think of the economics of it as well. I can give a talk on that, but I won't do it.

Workplace - very interesting. I don't know what they're doing, I left the UN ten years ago, so when I go, I go. But they are co-sponsor of UNAIDS . . . but I agree with you, the workplace is the way to reach men, I think. And I worked on [*word or words unclear*] but that was pretty controversial, when I was Kinshasa we had big problems, I mean, it was with alcohol – some of the biggest employers are the breweries. So we started with the workplace programmes, you know, and they did a great job, and today if you do that then you're stigmatised because you're with the bad alcohol industry. So we need to look at the workplace, and it really is an issue, because I think that . . . how to reach men is a big issue. Also in this country. When you look at life

expectancy among white men in this country, it's going down in a number of geographic areas, in men. It's the same in the US. And someone could give a talk on that also. But, so, the workplace for those who have a job.

The difference between acute epidemics and AIDS, I think the biggest difference is that AIDS is approaching more and more as a more classic development issue. It started, also as an epidemic, explosive, in gay communities, whereas with SARS and Ebola the response is very different. In a sense, at that stage you don't care too much about development aspects and all that, you just go for it, and you want to stop it, because you know that otherwise, the devastation will be enormous in a short period. With HIV you can't do that. You really need to have this long-term approach, and connect it with other things, as we've been discussing. But there are quite a few others, also the economies – what's interesting is that when you look at funding for once something is felt as a real threat to national security, and that . . . you know, money is no longer a problem. And when you look at the Ebola/AIDS epidemic in West Africa, I mean . . . the army, armed forces went to Sierra Leone, Liberia [*words unclear*] and so on. So, that was . . .

So key populations, well I think that HIV knows sexual activity are randomly distributed in society, and the networks. One of the things that one day I woke up, and I can't remember how many people were living HIV, say 30 million, and then 15 million dead, and suddenly I realised that all these people, everybody, every single individual with HIV is related to all other individuals with HIV, that came before. And, maybe some after. And it tells a story. So we have, cumulatively, about 70 million people who are connected, because they have sex with each other, their mother had it, or they had a blood transfusion, or they shared needles and so on. [*words unclear*] And that tells a story about human . . . human condition, behaviour and nearly all of that is kind of happening and is global, and some people are more vulnerable, or more at risk, because 'vulnerabilities' kind of is a very passive type of concept, 'at risk' is more active. And there is a lot of combinations. But it means that, I think, in these societies we need to know where is HIV spreading? And we often have programmes where there is the least problem. My 95-year-old mother doesn't need HIV prevention, you know? And that we can . . . today we have some tools for that, also. An analysis of social media, you can have heat maps and so on, and where are the infections, and, for example, that's what we've seen in KwaZulu-Natal, most of the infections are happening in a few places. Okay, you put your resources there. But we need to understand why, and what this . . .

And finally was, ah, detention [*sic, means 'retention'?*] and the informal care. Informal care is phenomenally widespread, including here. Maybe a bit less in the US, in the UK I don't know, because there's a National Health Service for your care, but in many countries in Europe, homeopathy is so . . . and all this. But in South Africa, certainly. So I think now, when you look at detention in care, again you need to go where people are. And we need to provide incentives. And that's where we need

to bring in that informal [*word unclear*]. I was recently in Ghana, not for HIV but hypertension, [*words unclear*] hypertension, diabetes are really skyrocketing, and so there's a program with informal chemist people, who sell drugs, I mean drugs, pharmaceuticals, and [*words unclear*] they are not pharmacists, but you find them everywhere. Okay, we gave them a way to measure blood pressure and so on, and they're not paid for it, but it's good for their business, because they have more clients. And it led to a major uptake of detection of people with hypertension, and they could be treated, et cetera. So, I think we need to be a bit more innovative. The biggest obstacles that are the official health services, because it's competition there, but also they [*word or words unclear*] threatened, so even if they're overwhelmed, look, in South Africa, I mean, if you work in a public clinic or hospital, people work, work, work like mad and cope with it. And yet, if you propose some innovations, some, I don't know, some alternative ways, they're 'No, no' – it's the same here so.

MELISSA LEACH: Peter thank you so much, I think we're very nearly out of time, so I think we'll join in a moment just to thank Peter for a tremendously enlightening talk. And some of things I take from it, you've shown us why we need a development lens on HIV and AIDS, but I think you've also shown why, actually, HIV and AIDS gives us a lens on development, actually, and the wide range of issues you covered, whether it's in the area of gender violence, questions around work and unemployment and the lack of work, population trends, or indeed politics. And politics not just in the sense of political economy and the way funds flow [*word or words unclear*] flow, but also something that's very dear to our hearts on this campus within IDS and elsewhere, which is actually around the politics of knowledge and the politics of science. And I think the title of your book here really says it all, I mean, AIDS is between science and politics, but it's also very much about the politics of science and the sense in which myths and the need to disrupt those myths is alive and well. I think you've also shown us that actually the AIDS epidemic is not over, it's become endemic, it's transformed, but nor is the puzzle, actually, and in a way that sense of an ongoing puzzle that requires multiple perspectives to solve it, a mix of the quant data, the epidemiology, the social understandings, the political understandings, and indeed, the perspectives that come from those who are living with HIV and AIDS, or are activists around it, as well as the experts perspectives from those in seats of power and schools of global health or schools of development studies are really important. So, we're going to go through in a moment to a drinks reception that you're all very welcome to, which has been sponsored by the HIV/AIDS Alliance, and we'll hear a little bit about their work, but please join me now, and our online audience too, in thanking Sir Peter Piot for a fantastic talk, and actually lending power to this ongoing struggle to end an epidemic that is certainly not over yet. Thank you very much indeed. [*applause*]