

Manuscript for Gapminder HIV presentation for print

Please note that this is not an article but a generic manuscript to be used together with the presentation.

Each of the 10 sections correspond to one of the 10 buttons at the top of the presentation.

1. 1983

The presentation shows a static image of the situation in 1983.

The disease AIDS was discovered 1981, the HIV virus in 1983. These Gapminder country bubbles show how the HIV virus was spread in different countries in 1983, or rather how it later was estimated that HIV was spread. On the vertical axis you can see the percentage of adults infected by HIV. On the horizontal axis you can see yearly income per person in comparable US dollars (GDP per capita in purchasing power dollars). The size of each the bubble shows the number of persons infected in each country, and the color shows the continent where the country is situated (legend in upper right corner).

United States, in 1983 had a relatively low percentage of infected adults - yet due to the big population, US still had a sizable bubble meaning that there was a high number of HIV infected persons in the US. Look up there at Uganda. They had almost 5 % infected adults in 1983 and quite a big bubble in spite of being a small country. Because a high percentage was infected, there were almost as many people infected as in the US even though the population in Uganda was much smaller. In 1983, Uganda was probably the country most infected by HIV.

Now you have understood the graph, and know what the bubbles represent. In the next 40 seconds you will see how the HIV epidemic spreads in the different countries of the world from 1983 up to 2007.

2. Epidemic

By clicking on button 2, the years start to roll.

First, we see a fast rise in Uganda and Zimbabwe, where more than 10% of adults got infected. The first Asian country to be severely affected was Thailand, but condom campaigns stopped the epidemic at 2% infected. And look, in 1990 Uganda stops and starts to go back, whereas Zimbabwe reaches more than 20% infected. And then South Africa had a fast rise of the percent HIV infected and the big Indian population got many infected in spite of a low percentage. And while Uganda and Zimbabwe are coming down, Russia reached 1% in 2007 when the global HIV epidemic reached a steady state.

3. 1 %

By clicking on button 3, the 1% level becomes marked by a hatched line.

Look, in the last years, the spread of HIV in the world has reached a steady state at 1% of the adult world population infected. But, steady state doesn't mean that things are getting better! It's just that HIV/AIDS have stopped getting worse, or it really means that each year as many people now die of AIDS as gets infected from HIV. This also means that 30 to 40 million people, a number corresponding to all persons in California, live with HIV in today's world.

4. Botswana

By clicking on button 4, a replay animation of Botswana 1983-2007 is shown.

Now, let me make a fast replay of Botswana. This is what happened in this peaceful middle-income country in southern Africa, with democratic government and good educational system. The number of infected in Botswana skyrocketed and peaked in 2003, and in spite of an income per person of more than 10 000 USD, the percentage infected is falling very slowly! Why? Because in Botswana, with a good economy, good governance and generous aid, the health service can provide AIDS treatment to almost all in need. If people with HIV are treated with modern medicines, they don't die of AIDS. Therefore these high numbers won't come down since people can survive 20 years and more with HIV. In fact, the percent infected may start to rise again in Botswana because treatment is very effective and many thousands still continue to be infected each year. It is therefore a big problem with the metric on the vertical axis – “percent adult infected by HIV”. In the poorest countries in Africa - these low-income countries to the left – the reason why the percent infected has fallen faster is probably because many HIV infected people still die as the health service cannot reach all with treatment - this in spite of the existence of AIDS drugs. Notwithstanding of the generous PEPFAR (*President's Emergency Plan for AIDS Relief*), all infected do not get access to treatment, and of those who get treatment several percent die every year from complicating diseases or resistance to drugs. It's unfortunately not feasible to provide all infected with lifelong treatment in the poorest countries. Still, it is of course important to get as many people as possible treated with the resources at hand.

Let us turn our focus back to prevention. It is only by a considerable reduction of transmission that the poorest countries will be able to treat those in need. Had there been an effective vaccine, even the poorest countries could have stopped HIV from spreading. If a very large percentage of the population is infected, the drug treatment is, however, too costly for the poorest countries. It is not only the drugs themselves that are costly, but also the lifelong follow-up and acute care for complications. The focus must be on prevention. and in order to stop the worst transmission, it must be understood what causes the very high HIV spread in some parts of Africa.

5. War?

By clicking on button 5, Congo and Zambia will be marked.

You find the highest HIV % in the world in a few African countries, and yet many other countries in sub-Saharan Africa, like Senegal and Madagascar are down here, with the same % infected as United States. There is just simply not **one** HIV epidemic in Africa.

Are the wars the reasons for high HIV rates in Africa? No! Look at war-torn Congo down there with 2-4 % infected. In peaceful Zambia, the neighboring country, 15 % is infected. There are several good studies done on the HIV percentage among refugees coming out of Congo and other war torn countries in Africa. These studies clearly show that, even though wars are terrible and rapes are horrible, war is not the driving force behind the very high % of HIV in parts of Africa. The worst affected countries are peaceful.

6. Poverty?

By clicking on button 6, Tanzania will be marked.

So, is it poverty? Not if you look at the macro level. Many countries with higher income per person than Tanzania have higher % HIV. Countries with lower income tend to have lower % HIV infected. But that's a simplistic way to look at poverty - let me split Tanzania into five income groups, so called quintiles, from the 20% with highest income to the 20% with lowest income.

7. Tanzania split

By clicking on button 7, Tanzania will split into 5 income quintile bubbles.

Look at the different percentages of HIV among the adults in the five income groups in Tanzania. The 20% with highest income, the better off - I wouldn't say rich but better off - they have higher % of HIV. The difference goes from 11 % all the way down to 4 % in the lowest income quintile, and this difference is even bigger among women. There have been many assumptions about the high percentage of HIV infected in parts of Africa, but now good research, done by African institutions and researchers together with international researchers, show that many assumptions were myths. Poverty is not closely linked to high HIV percent.

8. Kenya

By clicking on button 8, Kenya will be marked.

And, I can't avoid showing HIV frequency in Kenya. The number of adults with HIV is around 8%, not among the highest and not among the lowest in Africa. So why does Kenya have this on average position? Let me split Kenya, with its more than 30 million inhabitants, into its seven provinces.

9. Kenyan provinces

By clicking on button 9, Kenya will split into province bubbles.

Look at the differences within one African country; it goes from 1% to 15%. The percent adults with HIV in Kenya are on an average level because some provinces have a low level of infected, some an average and others have a very high percent adults with HIV.

So, why these extremely high levels in some countries and in some parts or groups within a country? Well, HIV transmission tend to be higher where it is more common with multiple sex partners, where there is less early male circumcisions and less condom use, where herpes and other sexually transmitted diseases are common and where it is more common with age-disparate sex, that is, older men having sex with younger women. We see higher rates in younger women than among younger men in many of these highly affected areas and countries. Where are they situated?

10. World

By clicking on button 10, the bubble chart change to a map.

When swapping the bubble chart for a map, you see that the highly infected countries have 4 % of the world population and yet they have 50 percent of the HIV-infected. HIV exists all over the world. You find bubbles in all countries. Brazil has many HIV-infected. Arab countries not so many, but neighboring Iran has many HIV infected, mainly due to frequent heroin abuse. India has many HIV infected because of a big population. Countries in South East Asia have varying % of HIV infected persons. But, it is in parts of Southern and Eastern Africa where you will find areas and groups with very high percent of HIV infected. 4% of mankind, but 50% of the world's HIV infected, live in this part of Africa.

There is no consensus among researchers about the reasons for this pattern, but a major hypothesis is emerging. It seems as within populations where many have several concurrent sexual partners, the HIV virus spreads rapidly, even if the frequency of intercourses and the total number of partners during a ten-year period is relatively low. The risk of transmission gets very high where many have sex with two or more partners each month. A major reason for this is that the virus level in the blood is extremely high some weeks after being infected. If you during those weeks have more than one partner the virus spreads faster. Two months after being infected, the virus level falls drastically and therefore risk for HIV transmission is then very low if you change partner. It also seems that the pattern of two or more concurrent sexual partners, among both men and women, is common in cultural contexts that tolerate what is known as "transactional sex". This is not to be confused with prostitution, but is a continuous social relationship that includes sexual intercourse, friendship and exchange of favors and small-scale trade transactions in the every day life.

It is strange that the sexual patterns behind the highest HIV transmission rates are only now becoming a focus for research. A major finding in the last decade was, however, that male circumcision, beyond any doubt, will half the risk of HIV transmission from women to men, and thereby reduce the speed of transmission in the whole population.

WHO and UNAIDS already advice each country, and each part of a country, to get to know the driving forces of its local HIV epidemics and to consider where and when male circumcision can be promoted. Actions against HIV transmission have to be highly contextualized, both in regard to focus and action, to be successful. The results have to be monitored and compared over and between countries. It is therefore important that comparable data on HIV, its treatment and prevention becomes freely available.

The data that already exists is available in Gapminder World, welcome to use it at www.gapminder.org