



INDIA KEY



Controlling the Pandemic: Public Health Focus

Just 25 years since it was first reported, HIV/AIDS has become one of the world's greatest public health crises. More than 39 million people worldwide are estimated to be living with HIV/AIDS, mostly in developing countries. Although a variety of public health measures such as safe sex practices and needle exchange programs for intravenous drug users have proven effective in controlling the spread of the disease, they are often surrounded by controversy. Effective antiretroviral therapy (ART) exists to treat individuals with HIV/AIDS and control the disease in their bodies, but the treatments are costly and not readily available in some parts of the world.

In this lesson you will first watch a video that examines the facts about HIV/AIDS and methods for controlling the spread of the disease. You will then evaluate epidemiological information to identify factors contributing to the spread of HIV/AIDS around the world. You will compare the data from several countries to answer the following question:

If you were a member of a team of experts convened to control the spread of HIV/AIDS in a certain country, how would you use statistical data to help determine the most effective regional public health plan?

After gathering information about the state of the HIV/AIDS epidemic in your assigned country, you will share the results with your classmates. You will have an opportunity to compare the situation in several countries and regions of the world, as well as in the United States. Be sure to study your results carefully and check your answers closely to ensure that you make appropriate correlations between the numbers. Keep in mind that statistics are not always as clean cut and easy to compare as you may think!

Pre-Viewing Questions

1. What is public health?

Public health is the study of how diseases spread in a population and the measures used to control them.

2. How is HIV spread between individuals?

HIV can be spread through sharing needles, through semen and vaginal fluids during intercourse, from a mother to a child in the uterus, and through breastfeeding and birth.

3. What regions of the world are most affected by the HIV pandemic?

Developing countries are most impacted, especially sub-Saharan Africa.

4. What are some different medical and public-health related control methods used to limit the spread of HIV?

Different control methods include:

- a) Providing education and training about HIV, including how HIV develops into AIDS, how HIV is spread, how to prevent transmission, and how to treat HIV and AIDS;
- b) Offering specific and culturally relevant instructions on how to use and obtain condoms and clean needles, which should be targeted to high-risk groups such as commercial sex workers and intravenous drug users (in places where HIV is concentrated in these populations);
- c) Ensuring safe, HIV-free blood supplies for transfusion;
- d) Providing access to HIV testing, with protection from discrimination;
- e) Diagnosing HIV infection in pregnant women, and providing them with timely access to anti-HIV ART drugs to decrease mother-to-child transmission of HIV;
- f) Ensuring that males are circumcised;
- g) Possibly, treating other STDs; and
- h) Possibly, widespread anti-HIV ART treatment which may decrease the infectiousness of persons living with HIV (as well as potentially decreasing the stigma associated with HIV).

After Viewing the Video

Revisit the questions above and add any details that you may have missed before, then answer the questions below.

5. How does the limited availability of ART medicine in low-income countries affect individuals with HIV/AIDS? What can happen to the virus?

The HIV virus mutates very quickly and therefore can develop resistance to medication if it is not administered continuously. ART medication is crucial in slowing down the progression from HIV to AIDS and limiting the spread of the virus in the body. ART decreases the level of HIV in the blood, and it may decrease person-to-person transmission (although this is currently under study).

6. Pick one of the countries highlighted in the video and describe a specific program established there that has helped reduce the spread of HIV/AIDS.

Botswana established routine HIV testing in medical clinics as part of blood screening for all ailments. Intensive national campaigns to eliminate mother-to-child transmission have also been instituted.

Thailand incorporated a nation-wide campaign among sex-workers that mandated condom use, lowering the transmission of HIV among the Thai Army.

In Uganda, government distribution of 160 million condoms per year has virtually halted the sexual spread of HIV in many areas.

Evaluating the Data

In small groups, you will be evaluating data provided by the World Health Organization (WHO), the authority for global health issues within the United Nations system. From this data, you will determine the extent of the HIV/AIDS threat in different countries and regions, as well as possible ways to control the spread of the disease. You will present your results to the class and compare data from several countries to understand regional and international risk factors and variations. First, complete the following questions and data tables by doing some research as a team.

Assigned Country India

- Go to <http://www.who.int/globalatlas/predefinedReports/default.asp>. Follow the link to the *Epidemiological Fact Sheets* and print the copy of the report relevant to your country.
- Go to <http://www.who.int/hiv/epiupdates/en/index.html>. Follow the link to the most recent *Report on Global AIDS Epidemic* and print the report for global information to use in your evaluation.
- Go to <http://www.who.int/hiv/countries/en/index.html> and print the relevant *Profile on HIV/AIDS treatment scale-up* sheet for your country.

Complete the data tables below by using relevant information from the previous databases. If the information is not available, indicate that with an N/A in the appropriate box. Blackened cells indicate that there is no data available for the majority of the countries or regions for that year.



Data Table 1: Country Specific (unless otherwise indicated)

	2003	Most Recent Year with Data (2005)
Estimated number of cases for adults and children	5,300,00	5,700,000
Estimated number of cases for adults (ages 15+ only)	5,200,000	5,600,000
Estimated number of cases for children (ages 0-14)	N/A	N/A
Estimated prevalence of HIV among adults and children regionally		0.4%

Table 2: Country Specific (unless otherwise indicated)

	2003	Most Recent Year with Data (2005)
Estimated number of deaths from AIDS among adults and children	380,000	475,000
Estimated number of deaths from AIDS among adults and children regionally		600,000

Table 3: Country Specific (unless otherwise indicated)

	2003	Most Recent Year with Data (2005)
Total population	1,064,399,000	1,103,370,000
Per capita national income		\$3100
Per capita total expenditure on health	\$82	N/A
General government expenditure on health as a % of total expenditure on health	4.4%	N/A
Total number of adults needing ART	830,000	970,000
Total number of adults receiving ART	N/A	53,784
ART coverage for adults in your assigned country	2%	6%
ART coverage in your assigned region		16%



Respond to the following questions based on the data you have recorded above.

1. Calculate the prevalence (percentage of sick individuals in an entire population), including children and adults with HIV, for 2003 and the most recent year for which data are available.

2003 Adult & children prevalence: $(5300000/1,064,399,000)*100 = 0.49\%$

2005 Adult & children prevalence: $(5700000/1,103,370,000)*100 = 0.52\%$

2005 Adult & children prevalence Asia: 0.4%

2. The cause-specific mortality rate is the percentage of deaths in a country due to a specific cause or disease. Calculate the percentage of deaths due to AIDS in your assigned country to find the cause-specific mortality rates due to AIDS in 2003 and in the most recent year for which data are available. Calculate the same for your region for the most recent year with data.

AIDS mortality in adults & children 2003: $(380000/1,064,399,000)*100 = 0.04\%$

AIDS mortality in adults & children 2005: $(475000/1,103,370,000)*100 = 0.04\%$

AIDS mortality in adults & children 2005 in Asia: $(600,000/3,938,020,000)*100 = 0.15\%$

3. Use your *Global Facts and Figures* sheet to determine the total percentage of deaths due to AIDS for people in your region.

$(600,000/2,800,000)*100 = 21.4\%$

4. Produce a graph of the following results for your country and region for 2003 and the most recent year for which data are available:
 - Total HIV prevalence rate (%) (including children and adults) for your assigned country, and for adults only in your region
 - Cause-specific mortality rates (%) due to AIDS, (including adults and children), in your assigned country and region
 - ART coverage (%) for adults in your assigned country and region

Please see attached graphs.

5. In the country you are studying, has the total number of HIV cases increased or decreased since 2003? How does the prevalence of HIV differ in your country and the region in which it is located? Explain your response by providing data from your calculations and data tables.

In India, the total number of HIV cases in adults and children has increased by 400,000 in India between 2003 and 2005. India has 0.52% prevalence, while Asia has 0.4% prevalence. As shown by the numbers, India has a much higher HIV prevalence rate than that of Asia as a whole. This indicates that HIV is a growing problem in India, since the prevalence increased from 0.50% to 0.52% between 2003 and 2005.



6. Has the total number of AIDS-related deaths increased or decreased in your assigned country since 2003? How do the country's cause-specific mortality rates due to AIDS compare to those of the region in which your country is located? Explain your response by providing data from your calculations and data tables.

In India, the total number of AIDS-related deaths has increased by 39,000 between 2003 and 2005. During that same period, the number of HIV cases has increased by 400,000. However, India's mortality rate of 0.04% is much lower than Asia's, which is 0.15%. India's mortality rate has not necessarily increased, although the number of AIDS-related deaths has risen (see explanation in next question).

7. What are some of the possible factors that are contributing to changes in HIV prevalence and AIDS-related deaths?

The increase in numbers of death due to AIDS between 2003 and 2005 is perhaps attributable to India's rapidly growing population, since the proportion of deaths remained the same. However, the numbers also indicate that India has not progressed much in its ability to reduce deaths due to AIDS. Also, the number of HIV infections has drastically increased, due to the growing population and the expansion of people moving to areas where there is high HIV prevalence. The most common ways of transmission are through sexual encounters or needle sharing among intravenous drug users.

8. Compare the ART coverage in your assigned country and region. How do you think this is impacting the spread of HIV in your assigned country?

Not nearly enough people are receiving appropriate treatment for HIV/AIDS. Although the number of people receiving ART in India increased from 3% in 2003 to 6% in 2005, it is still a very small percentage compared to the number of individuals infected with the virus. In addition, India is a very large, and a big with a proportion of the population is poor. The nation's per capita expenditure on health is a total of \$82/year, which is not enough to cover an infected individual's medical needs.

9. Providing national access to HIV testing and screening centers, as well as ART distribution centers, may have an impact on management. In your opinion, how effectively is your country addressing this issue? (*Hint:* Look at the method of HIV screening and at the number of individuals being screened for HIV.) Do you think there are sufficient ART distribution centers and testing and screening centers available?

The prevalence of HIV in India as calculated above is 0.52%. India has taken steps to test for HIV in 100% of all blood samples that are collected for whatever reason. While this is an effective step in the right direction, there are others at risk who still need to be tested. With just 833 HIV testing and counseling sites and 74 ART distribution centers available in the entire country, there is not enough to serve the whole population. Most likely, there is a large group of people who are also not getting diagnosed since they do may not have access to these clinics and facilities.

10. Read through the profile on HIV Prevention/Treatment Scale-up for your assigned country. Given your understanding of how HIV spreads, discuss some of the obstacles faced in that country in establishing total prevention of the spread of HIV. Be detailed and specific, offering what you think are relevant, feasible suggestions.



India is a lower-middle income country with an average annual per capita income of about \$3,100. Of that, \$82 per year -- about 3% -- is typically spent on health-related costs. India has the second-highest number of HIV cases in the world. The government covers about 4.4% of total national health expenditure. Individuals involved in the sex trade and those in heterogeneous groups having unprotected sex are at the most risk. Another growing source of HIV transmission is due to needle sharing among drug users. India has done a great deal to slow the spread of HIV and treat those with AIDS by implementing a plan to provide ART to 100,000 individuals by 2007. Treatment prolongs the lives of people with HIV/AIDS. As a result, as more people are treated, the number of people living with HIV (and therefore the HIV prevalence) increases, even as the number of new cases (incidence) stays the same. Another big problem for India is a lack of different antiretroviral drugs beyond first-line exposure. Because HIV is adept at developing resistance to drugs, new ART medications must be periodically introduced to be effective. India needs to target its efforts towards interventions at all stages of infection, especially prevention. It also needs to focus efforts on building more facilities and making them accessible to more people. Government efforts are focused on establishing clinics that can provide ART treatment and raising awareness about prevention measures and mother-to-child transmission.

***Students can offer a number of suggestions here based on their understandings which include instituting programs encouraging people to join the medical profession, soliciting more volunteers, funding more facilities across the country, and many others. ***

Post-Class Discussion

11. How does your country compare to the other countries being evaluated in terms of HIV prevalence and prevention measures? What social, economic, and political factors in these countries have led to these different variations? Refer to the graphs containing class data and your classmates' presentations to help you answer this question.

India has comparatively low prevalence and mortality rates. However, its ART coverage is the lowest compared to the other countries studied here. And although India's HIV prevalence rates are low, the incidence rates are high. After South Africa, India has the highest number of HIV cases in the world. India has just recently begun implementing programs to address the problem of HIV/AIDS. It is a poor country with many socio-economic problems. These conditions make it difficult to increase distribution of drugs and raise awareness. .

12. Look at the data your teacher provided about HIV/AIDS in the United States. How does the country you studied compare in terms of prevalence and mortality rates? Does the data surprise you? Why or why not?

India has higher prevalence and mortality rates than the United States. This has much to do with India's economic state, the lack of ART medications, and the dearth of information about prevention measures.