



## COSTA RICA 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 through 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 methods used to limit the spread of HIV?

Different control methods are:

- 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 Costa Rica*

- 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	6400	7400
Estimated number of cases for adults (ages 15+ only)	6300	7300
Estimated number of cases for children (ages 0-14)	N/A	N/A
Estimated prevalence of HIV among adults and children <b>regionally</b>		0.5%

**Table 2: Country Specific (unless otherwise indicated)**

	2003	Most Recent Year with Data (2005)
Estimated number of deaths from AIDS among adults and children	<100	<100
Estimated number of deaths from AIDS among adults and children <b>regionally</b>		59,000

**Table 3: Country Specific (unless otherwise indicated)**

	2003	Most Recent Year with Data (2005)
Total population	4,176,372	4,327,000
Per capita national income		\$9,530
Per capita total expenditure on health	\$616	N/A
General government expenditure on health as a % of total expenditure on health	21%	N/A
Total number of adults needing ART	800	1400
Total number of adults receiving ART	<1000	2500
ART coverage for adults in your assigned country	80%	100%
ART coverage in your assigned region		68%



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 both children and adults with HIV, for 2003 and the most recent year for which data are available.

2003 Adult & children prevalence:  $(6400/4,155,651)*100 = 0.15\%$

2005 Adult & children prevalence:  $(7400/4327000)*100 = 0.17\%$

2005 Adult & children prevalence Latin America: 0.5%

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 rates in adults and children cannot be calculated for Costa Rica since the numbers are not absolute for 2003 and 2005. The numbers provided are inconclusive.

AIDS mortality in adults & children 2005 in Latin America:  $(59000/548,948,000)*100 = 0.01\%$ .

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

$(59,000/2,800,000)*100 = 2\%$

4. Produce a graph of the following results for your country and region for 2003 and for the most recent year for which data are available:
  - Total HIV prevalence rate (%) (including children and adults) for the 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 assigned country and the region in which it is located? Explain your response by providing data from your calculations and data tables.

In Costa Rica, the total number of HIV cases in adults and children has increased by 1,000 between 2003 and 2005. Costa Rica has 0.17% prevalence, while Latin America has 0.5% prevalence. As shown by the numbers, Costa Rica has a lower HIV prevalence than that of Latin America as a whole. However, HIV prevalence in Costa Rica increased from 0.15% to 0.17% between 2003 and 2005, indicating that HIV is a growing problem.



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 Costa Rica, the total number of AIDS-related deaths is less than 100 and has remained about the same between 2003 and 2005. Costa Rica also has a much lower cause-specific mortality rate than the rest of Latin America.

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

Costa Rica is the only country in Latin America with universal access to ART for anyone living with HIV/AIDS. This is one of the main contributing factors for the low number of AIDS-related deaths. The main cause of the rising number of HIV infections is due to male-to-male HIV transmission.

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?

In 2003 the ART coverage was 80%, and it has since increased to 100% in 2005. The increase reflects the country's efforts to make ART available to all infected individuals free of charge.

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 Costa Rica as calculated above is 0.17%. Costa Rica 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. Costa Rica is distributing ART medications free of charge; however, the country needs to raise more awareness among the population about proper prevention methods.

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.

Costa Rica is an upper-middle income country with an average annual per capita income of about \$9,530. Of that, \$616 per year -- about 6% -- is typically spent on health related costs. The government covers about 21% of total national health expenditure, a portion of which has gone into HIV awareness and health care, and has helped cut down the numbers of HIV infections a great deal. Male-to-male transmission and transmission among those involved with sex workers remain the biggest risk factors. The government has implemented large-scale, effective measures to provide ART and HIV-testing to all individuals in need of it. However, as the prevalence of HIV continues to increase in Costa Rica, the government should increase general awareness about various prevention methods, especially among groups that are at the highest risk.

\*\*\*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 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.

In Costa Rica, HIV prevalence is increasing -- just as it is in most other countries reviewed in the class. However, Costa Rica's prevalence rates are among the lowest. The mortality rate is very low, equal to China's mortality rate in 2005. Costa Rica is the only country with 100% ART coverage. Countries such as Costa Rica with limited HIV epidemics should intensively try to prevent further spread of disease by using some of the prevention measures mentioned above and focusing on the epidemiology in-country, such as spread through male-to-male transmission.

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?

Costa Rica has surpassed the United States in providing its residents with free ART medications. It has lower prevalence and mortality rates than the United States, but HIV prevalence in Costa Rica is on the rise.

\* Students responses will vary based on their own interpretations.