

Population
BULLETIN

September 2002

Vol. 57, No. 3

A publication of the Population Reference Bureau

Facing the HIV/AIDS Pandemic

*by Peter Lamptey, Merywen Wigley,
Dara Carr, and Yvette Collymore*

*HIV/AIDS has reversed
hard-won gains in
health and development.*

*A lack of resources
hinders HIV/AIDS
prevention and
treatment.*

*The worst of the
HIV/AIDS epidemic
is yet to come.*

PRB

Population BULLETIN

September 2002

Vol. 57, No. 3

A publication of the Population Reference Bureau

Facing the HIV/AIDS Pandemic

Introduction	3
HIV/AIDS Facts	4
Risk and Vulnerability	5
<i>Box 1. Estimating HIV</i>	6
Stigma and Discrimination	8
Global HIV/AIDS Epidemic	9
<i>Figure 1. People Living With HIV/AIDS by World Region, 1981–2001</i>	9
<i>Table 1. Indicators of the HIV/AIDS Epidemic by World Region, 2001</i>	10
<i>Figure 2. Prevalence of HIV by Country, 2001</i>	11
<i>Figure 3. HIV Prevalence in Sub-Saharan Africa, 1986–2001</i>	12
Demographic and Health Effects	15
<i>Table 2. Effect of HIV/AIDS on Child Mortality in Selected Countries, 2002</i>	16
<i>Figure 4. Effect of HIV/AIDS on Life Expectancy in 2010, Selected Countries</i>	17
<i>Figure 5. Projected Population of Uganda With and Without AIDS, 1985–2050</i>	18
<i>Figure 6. Projected Population of South Africa With and Without AIDS, 1990–2050</i>	18
<i>Figure 7. Projected Population Structure of Botswana in 2020 With and Without AIDS</i>	19
Social and Economic Impact	19
<i>Figure 8. Impact of HIV/AIDS on a Business</i>	20
<i>Figure 9. Projected Loss of Agricultural Labor Force Because of HIV/AIDS, Selected African Countries, 1985–2020</i>	21
Prevention and Care	22
<i>Figure 10. HIV/AIDS Prevention and Care Continuum</i>	23
<i>Table 3. Risk of HIV Infection by Mode of Exposure and Contribution to Global Infections</i>	24
Meeting Needs	27
<i>Figure 11. Voluntary Counseling and Testing as an Entry Point for HIV Prevention and Care</i>	28

Continued on page 2

Challenges	29
<i>Box 2. The Barcelona AIDS Conference: Focusing on Treatment</i>	31
Conclusion	34
References	35
Suggested Resources	39

About the Authors

***Peter Lamptey** is president of the Family Health International (FHI) Institute for HIV/AIDS. At the institute, he directs the USAID-funded Implementing AIDS Prevention and Care Project (IMPACT), which has programs in sub-Saharan Africa, Asia, eastern Europe, Latin America, and the Caribbean. Dr. Lamptey is a public health physician with expertise in HIV/AIDS and other sexually transmitted diseases and the spread of viral and infectious diseases in less developed countries. He has published numerous articles on HIV prevention in resource-poor settings and has edited technical handbooks and manuals.*

***Merywen Wigley** is an associate technical officer at the FHI Institute for HIV/AIDS, where she provides research, technical, and writing support. Previously, she worked as a research associate for the Schistosomiasis Control Initiative at the Harvard School of Public Health, where she received a Master of Science in population and international health.*

***Dara Carr** is a technical director for health communication at the Population Reference Bureau (PRB). She is the author of a wide range of publications on reproductive and child health and has more than 10 years of experience in managing research communication projects in Africa and Asia.*

***Yvette Collymore** is a senior editor at PRB. She has more than 15 years of experience as an editor and journalist in print, broadcast, and other electronic media. She has worked in more developed and less developed countries and has published extensively on issues involving HIV/AIDS and reproductive and child health.*

The authors would like to thank James Curran and Roy Widdus for their invaluable comments and suggestions. The authors also appreciate the comments of Robert Ritzenthaler, who reviewed an earlier draft of the manuscript, and the editorial suggestions and guidance of PRB's Mary Kent. The authors also acknowledge financial support from the Bill & Melinda Gates Foundation.

Readers should not assume that all people appearing in photographs in this publication are infected with HIV.

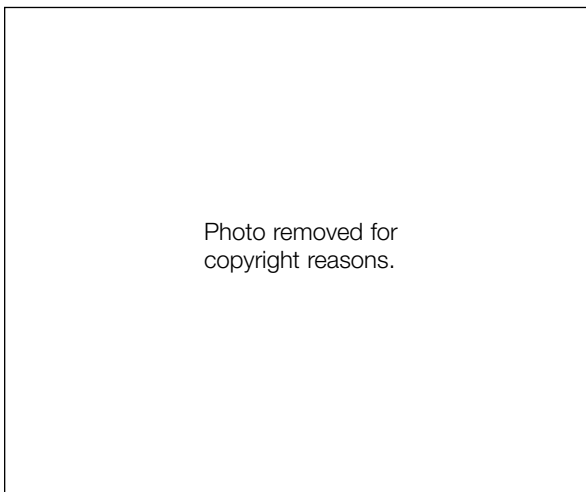
Facing the HIV/AIDS Pandemic

by Peter Lamptey, Merywen Wigley, Dara Carr, and Yvette Collymore

We are entering the third decade of what may be the most devastating epidemic in human history: HIV/AIDS. The disease continues to ravage families, communities, and countries throughout the world. In addition to the 20 million people who have already died of AIDS, most of the 40 million people now living with HIV are likely to die a decade or more prematurely. Each day, 14,000 people—12,000 adults and 2,000 children—become infected with HIV. At least 95 percent of these new infections occur in less developed countries; more than 50 percent afflict women and young adults. Unless the international community launches a coordinated and massive response to the epidemic, there will be 45 million new HIV infections by 2010.¹

In less developed countries, hard-earned improvements in health made over the last 50 years are being halted and, in some countries, reversed, as AIDS claims the lives of millions of young adults in their most productive years. Indicators of human development, such as child mortality, literacy, and food production, are also slipping as a result of the pandemic. The disease is crippling progress at the personal, familial, community, and national levels. In severely affected nations, economic growth and political stability are also threatened.²

Sub-Saharan Africa is the hardest hit region in the world: More people die there of AIDS-related illness than



An AIDS orphan is cared for by her grandfather. An estimated 13 million children have been orphaned by AIDS.

of any other cause. South Africa has the highest absolute number of infections of any country in the world: 5 million. Botswana has the highest adult HIV prevalence rate: 39 percent of the country's adults are infected with HIV. If Botswana's current infection rate persists, the chance that a boy who was 15 years old in 2001 will eventually die of AIDS exceeds 80 percent.³

While the scale and force of the epidemic have been worst in Africa, other regions face serious HIV/AIDS epidemics as well. The Caribbean, for example, has the second-highest adult HIV prevalence rate in the world. In Haiti, 6 percent of adults carry the virus. HIV prevalence is increasing

The global HIV/AIDS pandemic shows no signs of slowing.

fastest in eastern Europe and the former Soviet republics, where the breakdown of the health systems, economic crises, and wrenching social change have facilitated HIV infections, particularly through injecting drug use among young people.

HIV prevalence is also rising rapidly in many parts of eastern and southern Asia. China and India have relatively low overall prevalence rates, but the absolute numbers of infected people are staggering: at least 850,000 in China and nearly 4 million in India. These two countries will see millions of additional infections unless they launch large-scale, effective prevention programs. Epidemics have also surfaced in other Asian countries, including Myanmar (Burma), Nepal, and Cambodia.

Countries throughout the industrialized world face serious challenges from HIV/AIDS. Infection rates have not declined significantly in Western Europe or North America, where the epidemic is spreading from the gay male population to ethnic minorities, the poor, and other marginalized groups.

The global HIV/AIDS pandemic shows no sign of slowing, despite concerted efforts to control it. In 2001, more people contracted HIV and more died of AIDS than in any previous year: 5 million people became infected with the virus, and 3 million died of AIDS. Dr. Peter Piot, executive director of the Joint United Nations Programme on HIV/AIDS (UNAIDS), warns that the epidemic is still in its early stages.⁴

HIV/AIDS Facts

AIDS is an autoimmune deficiency syndrome caused by the human immunodeficiency virus (HIV), which is spread through blood, semen, vaginal secretions, and breast milk. The most common method of transmission is unprotected sexual intercourse with an HIV-positive partner. Other routes include transfusions of HIV-infected blood or blood products; tis-

sue or organ transplants; use of contaminated needles and syringes (or other skin-piercing equipment); and mother-to-child transmission during pregnancy, birth, or breastfeeding.

HIV is extremely fragile and cannot survive long outside the body's fluids or tissue, and it cannot penetrate unbroken skin. Therefore, HIV is not transmitted by casual physical contact such as kissing, holding hands, sneezing or coughing, sharing toilets, using the same eating utensils, or consuming food and beverages handled by someone with HIV. It is not spread by mosquitoes or other insects and can be killed with bleach, strong detergents, and hot water.⁵

There are two types of HIV virus: HIV-1 and HIV-2. HIV-1 accounts for the majority of infections in the world, and has at least 10 genetic subtypes. HIV-2, which is found primarily in West Africa, appears to be less easily transmitted and progresses more slowly to disease than type 1.

HIV kills by weakening the body's immune system until it can no longer fight infection. As the immune system becomes compromised by HIV, opportunistic infections such as pneumonia, meningitis, cancers, and tuberculosis (TB) easily attack the body. TB is the most common opportunistic infection in AIDS patients and accounts for about one-third of AIDS deaths in sub-Saharan Africa.

HIV/AIDS generally progresses over a decade to its final stages, but there is a long period after infection in which the infected person is largely free of signs and symptoms. The infected person may feel healthy, but he or she can infect others with the disease during this stage. Early AIDS symptoms include chronic fatigue, diarrhea, fever, weight loss, persistent cough, skin rashes, herpes and other oral infections, swelling of the lymph nodes, and memory loss or other mental changes.

AIDS is almost always fatal, although a few individuals have survived AIDS for up to 20 years. The disease is believed to progress more slowly in industrialized countries than in less

developed countries, largely because residents of industrialized countries have greater access to antiretroviral (ARV) drugs and high-quality health care. Current drug treatments, such as highly active antiretroviral therapy (HAART), slow the virus's replication in the body. Slower replication rates lessen the burden on the immune system, thereby reducing HIV-related illnesses and allowing patients to live longer, higher-quality lives. But there is no cure for AIDS; despite the effectiveness of HAART, termination of treatment leads to resurgence of the disease.

Risk and Vulnerability

When HIV/AIDS was first identified in the 1980s, public health officials assumed its spread could be halted by informing people about how the virus was transmitted and how people could protect themselves from it, and by safeguarding blood supplies. This approach to prevention was successful in politically organized communities with access to information and resources; the case of white gay men in North America, Australia, and Western Europe, for example, provides one success story. But populations in less developed and socially fragmented countries had little access to accurate information or effective prevention programs, and the virus continued to spread.⁶

In the late 1980s, as the epidemic surged and shifted from groups with high-risk behavior to the general population, especially to the marginalized and the poor, public health professionals realized they needed to better understand the causes of individual infection and the broader determinants of the pandemic. They knew HIV transmission was linked to specific risky behaviors, but they also realized that these behaviors were influenced by societal factors that determined people's vulnerability to infection. Many political, economic,

social, and cultural facets of life—such as poverty and powerlessness—determine vulnerability to HIV/AIDS, especially for women, children, and young adults. Understanding the pandemic in relation to these determinants helped recast HIV/AIDS as a universal human rights issue.

Women

Whereas men were most affected at the beginning of the epidemic, women's rates of new infection now surpass men's, especially in countries where women live in poverty and have relatively low status. In sub-Saharan Africa, there were 12 to 13 infected women for every 10 infected men in 2001.⁷ The gender gap is especially pronounced among Africans younger than 25 (see Box 1, page 6). In some African countries, infection rates are five times higher among young girls than among young men. Most infections in young women are a result of unprotected sex and reflect a power imbalance that limits women's ability to negotiate or control sexual interactions, especially with older men.

Biological, cultural, and socioeconomic conditions contribute to women's greater vulnerability to HIV/AIDS. During unprotected vaginal intercourse, a woman's risk of becoming infected is up to four times higher than that of a man. The vagina's greater area of susceptible tissue (compared with the male urethra) and microtrauma during intercourse make women more physiologically vulnerable to HIV.⁸ In addition, HIV-infected semen typically contains a higher viral concentration than do vaginal secretions.

A final biological factor that makes women more vulnerable to HIV involves the synergy between HIV and other sexually transmitted infections (STIs). Research shows that an untreated STI in either partner can increase the risk of HIV transmission as much as 10-fold. This is especially significant for women because most STI cases in women are untreated. Women's symptoms are

Women's rates of new infection now surpass men's.

often latent or difficult to see, and many women who have been diagnosed with STIs have no access to medical treatment.⁹

Socioeconomic factors, including women's lack of access to education or personal income, perpetuate women's lower status and create even greater vulnerability to HIV infection. Many women fear that they will be abandoned by their husbands or supporting partners if they try to exert control over how and when they have sex and whether their partner uses a condom. Moreover, widespread poverty drives some women into the sex industry, where sexual trafficking and worker rotations promote continued exposure of new sex workers

(and their clients) to HIV. Furthermore, men control the main tool for reducing the risk of sexual transmission of HIV: the male condom.

Cultural traditions such as forced marriage, older men's preference for young women, and female genital cutting contribute to women's lack of power.¹⁰ Throughout the world, prevailing views about masculinity encourage men to undertake risky sexual behaviors—multiple sex partners, alcohol consumption prior to intercourse, and sexual violence—that make women more vulnerable to HIV and other STIs. Young girls are at even greater risk of sexual coercion because of their social vulnerability and because some men assume that

Box 1

Estimating HIV

To estimate the number of people living with HIV and the number of new cases each year, AIDS experts must rely on limited data on HIV prevalence among the relatively few people who are tested for the virus and on a growing body of knowledge about the transmission of the virus.¹

HIV prevalence rates are usually reported as the percentage of people ages 15 to 49 who have been infected with HIV, so they do not reflect the percentage of the entire population that is infected. These rates are applied to the total population to calculate the number of people living with HIV/AIDS. The Joint United Nations Programme for HIV/AIDS (UNAIDS) reports a wide range for the estimates of people infected with HIV. For example, the estimated number of adults and children living with HIV/AIDS in India ranged from 2.6 million to 5.4 million for the end of 2001.²

Incidence rates—which measure the number of new infections over a year or some other time period—are important for tracking how quickly the AIDS epidemic is spreading in an area. But these rates are difficult and expensive to obtain, and often are not available. The projected number of AIDS cases and deaths from AIDS-related causes rests on these estimates of prevalence

and incidence, along with assumptions about how quickly HIV-infected people will develop AIDS and their risk of death from some other cause.

In many countries, most data on HIV prevalence come from health centers and hospitals that have been designated as HIV sentinel surveillance sites. Specific groups of patients or clients visiting these sites are tested for HIV, often anonymously. Pregnant women visiting an antenatal clinic are among the most important of these sentinel groups, especially in sub-Saharan Africa, because heterosexual transmission is the primary way Africans contract HIV. Antenatal clinic data are considered a valid bellwether for the course of the epidemic in the region. Health centers that treat sexually transmitted infections (STIs) and drug addiction are also important sentinel surveillance sites, especially in regions where HIV transmission has been concentrated among injecting drug users, commercial sex workers, or men who have sex with men. In these areas, which include the United States, HIV prevalence among pregnant women would not be a good indicator of the prevalence in the population, although it could signal the extent to which the epidemic had moved from high-risk groups into the general population. In

young girls are virgins and free of infection. A cultural myth in South Africa holds that sexual intercourse with a virgin can free a man from HIV infection. This belief has led to child rapes and to men seeking sex with very young girls.¹¹

Children

The rising HIV infection rates among women, particularly in sub-Saharan Africa, expose children to increased HIV risk even before they are born. In 15 sub-Saharan African countries, at least 5 percent of pregnant women attending prenatal clinics between 1999 and 2000 were HIV-positive; infection rates from mother to child

some countries, military recruits and blood donors are routinely tested for HIV, often anonymously, to help track the epidemic.

Surveys also provide epidemiological and behavioral data for estimates of HIV prevalence and the potential for wider spread in the population. The U.S. Agency for International Development, UNAIDS, the World Bank, and other organizations fund a number of survey programs that provide information about prevalence as well as knowledge about HIV and AIDS, sexual behavior, and access to health services.³

Sentinel and other survey data often produce a wide range of values. In India, for example, HIV prevalence among men treated for STIs in sentinel urban clinics ranged from 0.8 percent to 64.4 percent in 1999. Prevalence of HIV among Indian women tested at antenatal clinics outside major urban areas ranged from 1.0 percent to 3.9 percent in 2000.

To translate test results from sentinel sites into prevalence rates for a population, AIDS experts must make a series of assumptions about how the profile of the people tested relates to the characteristics of the general population. They apply statistical models to calculate adult prevalence rates and estimate the number of children infected.

were as high as 40 percent. UNAIDS estimates that 2.7 million children were living with AIDS at the end of 2001. Many children feel a double impact: Not only are they living with the disease themselves, but they have also lost one or both parents to AIDS.

The number of AIDS orphans is increasing at an unprecedented rate. At the end of 2001, 13 million children had lost at least one parent to AIDS. By 2010, the number is expected to climb to 25 million.¹² Prior to the HIV/AIDS epidemic, 2 percent of all children in less developed countries were orphans. In some of the worst-affected countries in sub-Saharan Africa, 15 percent or more were orphans by 2001. A 1999

2.7 million children were living with HIV/AIDS in 2001.

Epidemiologist James Chin calls the production of HIV/AIDS estimates more of an art than a science. Estimates are often adjusted up or down when new data are processed or new statistical models developed. With only two decades of experience with the disease, scientists and public health experts are still learning basic lessons about HIV and AIDS. Because HIV/AIDS is a global epidemic that has devastated the populations of some countries and threatens many others, many international health experts feel that they cannot afford to wait for more complete or accurate data—or better statistical models—before estimating HIV prevalence.

References

1. Thomas Goliber, "Background to the HIV/AIDS Epidemic in Sub-Saharan Africa," accessed online at www.prb.org/Background_HIV_in_SSA, on July 26, 2002; and James Chin, "Understanding HIV/AIDS Numbers," accessed online at www.cdpc.com, on July 31, 2002.
2. Joint United Nations Programme on HIV/AIDS, "Report on the Global HIV/AIDS Epidemic: June 2000, Annex I," accessed online at www.unaids.org/epidemic_update/report/, on July 8, 2002.
3. HIV/AIDS Survey Indicators Database, accessed online at www.measuredhs.com/hivdata/start.cfm, on July 22, 2002.

Photo removed for
copyright reasons.

Drug use and other high-risk behavior make young adults especially vulnerable to HIV infection.

study in northern Tanzania showed that 21 percent of families in the district of Bukoba were fostering at least one AIDS orphan.¹³ UNAIDS estimates that by 2010, 6 percent of children in sub-Saharan Africa will have lost one or both parents to AIDS.

Children in households affected by AIDS often lack food, medical care, money for school fees, protection from neglect and abuse, economic support, and emotional care even when their parents are still alive. Responsibility for caring for ill parents and younger siblings is often thrust upon children, especially girls. These duties often cause children to withdraw from school. Moreover, stigma and discrimination further marginalize these children and push them into living conditions that increase their own risk of contracting HIV.

Young Adults

Young adults are at the center of the HIV/AIDS epidemic: They are particularly susceptible to HIV infection, and they carry the burden of caring for family members living with HIV/AIDS. An estimated 11.8 million people ages 15 to 24 were living with HIV/AIDS at the end of 2001.¹⁴ More than half of all new HIV infections occur among people under age 25. Young people are vulnerable to HIV because they are more likely to engage in high-risk

behavior—such as unprotected sex with multiple partners and alcohol and drug use—and because they lack information about the risks of infection and how to protect themselves from it. Marginalized young people, including street children, refugees, and migrants, may be at particular risk because of social stigma, their exposure to unprotected sex, and the use of drugs.

Preventing HIV infection among adolescents is also critical to slowing the epidemic because young people ages 10 to 19 make up a large segment of the population: more than one-fifth of the total population in less developed countries and one-seventh of the population in more developed countries. First sexual intercourse commonly occurs during the adolescent years. In most sub-Saharan African countries, for example, 40 percent or more of women ages 20 to 24 have sexual intercourse before age 20.¹⁵ A recent publication from UNICEF, UNAIDS, and the World Health Organization (WHO) reports that the vast majority of young people remain uninformed about sex and sexually transmitted infections. But the young are also able to change their behavior to reduce their risk. In the same report, Peter Piot states, “In every country where HIV transmission has been reduced, it has been among young people that the most spectacular reductions have occurred.”¹⁶

Stigma and Discrimination

From the beginning, when HIV/AIDS appeared to be confined to groups perceived as socially deviant, the AIDS epidemic has been shrouded by ignorance, fear, and denial. This has led to stigmatization of and discrimination against people with HIV/AIDS. Many people with HIV/AIDS have lost their jobs and have been denied medical care, housing, insurance, and opportunities to travel because of their HIV status. HIV-posi-

tive children have been denied access to child care and school facilities. In many settings, individuals with HIV have been exiled from their families and communities. Ironically, stigma and discrimination have favored the further spread of the disease.¹⁷

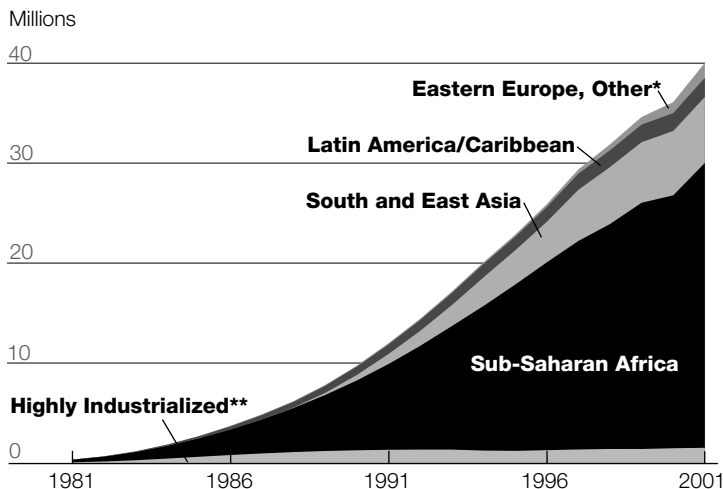
Stigma is a major obstacle to combating HIV/AIDS because it leads people to avoid being tested for HIV and disclosing their HIV status if they are tested. Furthermore, stigma and discrimination force those at highest risk of contracting and spreading HIV—including commercial sex workers, injecting drug users (IDUs), and men who have sex with men—to conceal their lifestyles, making it difficult to reach them through HIV-prevention programs. Thus, stigma creates more opportunities for HIV to spread to the general population. Such a situation is emerging in Ukraine, where the previously IDU-centered epidemic is spreading to the general population partly because people avoid disclosing their HIV-positive status for fear of stigmatization.¹⁸ Stigma and discrimination also make people with HIV/AIDS more vulnerable to sickness and death because they are less likely to seek appropriate medical care and psychosocial support, and are more likely to be denied services if they do seek them.¹⁹

Global HIV/AIDS Epidemic

The virus that causes AIDS was first identified in the United States in the early 1980s, but researchers soon found evidence of the disease in Europe and Africa, and eventually all over the world. UNAIDS now estimates there were fewer than 200,000 people living with HIV/AIDS in 1980; that number soared to 3 million by the mid-1980s, and to nearly 8 million by the end of the decade (see Figure 1). But it was the 1990s that brought the epidemic's nearly inconceivable growth worldwide, a growth that continues unabated today. At the end of

Figure 1

People Living With HIV/AIDS by World Region, 1981–2001



*Eastern Europe, Central Asia, Middle East, and North Africa.

**North America, Europe (except eastern Europe), Japan, Australia, and New Zealand.

Source: UNAIDS, "Twenty Years of HIV/AIDS: Fact Sheet" (2002), and unpublished data.

2001, an estimated 40 million people were living with HIV/AIDS. Sub-Saharan Africa, with less than 11 percent of the world's population, contains more than 70 percent of all HIV-infected people. But no region is unaffected: Adults and children with HIV/AIDS number more than 28 million in sub-Saharan Africa, 7 million in Asia, 2 million in Latin America and the Caribbean, and another 3 million in other regions (see Table 1, page 10). UNAIDS estimates that 5 million people became infected with HIV in 2001, more than replacing the estimated 3 million people who died from the disease during the year.

The prevalence of HIV in the adult population varies from at least 15 percent in nine sub-Saharan countries to less than 1 percent in much of Europe (see Figure 2, page 11). But prevalence rates can be a misleading indicator of the breadth of the problem because of vast differences in countries' population sizes. Just 0.8 percent of the Indian population was infected with HIV in 2001, for example, but because India has a population of about 1 billion, this

Table 1

Indicators of the HIV/AIDS Epidemic by World Region, 2001

Years epidemic started/Region	People living with HIV/AIDS	New HIV infections, 2001	Adult prevalence rate (%)	HIV-positive adults who are women (%)	Main mode of transmission
Total	40,000,000	5,000,000	1.2	50	Heterosexual
Late 1970s/early 1980s					
Sub-Saharan Africa	28,500,000	3,500,000	9.0	58	Heterosexual
Latin America	1,500,000	140,000	0.5	31	MSM, IDU, heterosexual
North America	950,000	45,000	0.6	20	MSM, IDU, heterosexual
Western Europe	550,000	30,000	0.3	26	MSM, IDU
Caribbean	420,000	60,000	2.2	53	Heterosexual, MSM
Australia and New Zealand	15,000	500	0.1	7	MSM
Late 1980s					
South/Southeast Asia	5,600,000	700,000	0.6	37	Heterosexual, IDU
East Asia and Pacific	1,000,000	270,000	0.1	24	IDU, heterosexual, MSM
North Africa/Middle East	500,000	80,000	0.2	54	Heterosexual, IDU
Early 1990s					
Eastern Europe/Central Asia	1,000,000	250,000	0.5	26	IDU

Notes:

Adult prevalence rate is the estimated percentage of people ages 15 to 49 years who are infected with HIV.

Main mode of transmission listed in order of importance in that region.

MSM: Men who have sex with men; IDU: Injecting drug use.

Source: UNAIDS, "Report on the Global HIV/AIDS Epidemic—July 2002" (www.unaids.org/barcelona/, accessed July 8, 2002).

prevalence rate translates into nearly 4 million people. Although the percentage is small, this large core of HIV-infected people could produce a rapid increase in HIV/AIDS cases in India. Some AIDS experts posit that any country with an HIV prevalence rate above 1 percent is ripe for a rapidly expanding epidemic.²⁰

In classical epidemiology, epidemics are assumed to follow a natural course that is ultimately self-limiting. The epidemic peaks when infections reach most people at risk of the disease, then subsides because there are declining numbers of people to infect. The most recent estimates published by UNAIDS and the U.S. Census Bureau show no evidence that a natural limit to the HIV/AIDS epidemic is approaching, even in the countries that are most severely affected.²¹

Sub-Saharan Africa

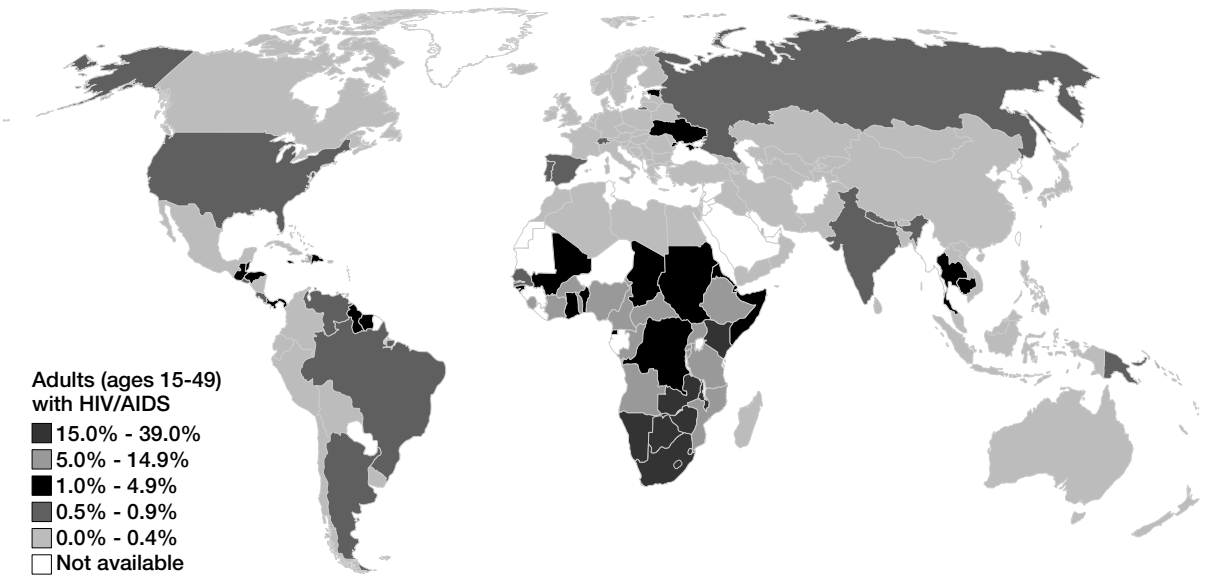
In the early stages of the HIV epidemic, the highest prevalence rates were concentrated along the major transportation routes that cut across sub-Saharan Africa: through Tanzania

and Uganda, around Lake Victoria into what is now the Democratic Republic of Congo, and into Côte d'Ivoire on the coast of western Africa. Infected soldiers, truck drivers, migrant workers, affluent businessmen, and commercial sex workers spread the disease to their families and communities. By 1986, between 5 percent and 10 percent of adults in Uganda and Burundi were infected with HIV, as were 1 percent to 5 percent of adults in 10 other countries (see Figure 3, page 12). As the epidemic progressed, HIV prevalence rates increased in these countries, and the virus spread throughout the region.

By 2001, at least 5 percent of adults in nearly every sub-Saharan country were infected with HIV. Prevalence rates have reached alarming levels in southern Africa: More than 20 percent of adults in Botswana, South Africa, Zambia, Zimbabwe, and three neighboring countries were HIV-positive in 2001. UNAIDS sees no evidence that rates have leveled off even in these high-prevalence countries, with the possible exception of Zambia. HIV

Figure 2

Prevalence of HIV by Country, 2001



Source: UNAIDS, "A Global View of HIV Infection" (www.unaids.org, accessed July 8, 2002).

prevalence among pregnant women in urban Botswana, for example, rose from 39 percent to 45 percent between 1997 and 2001, according to UNAIDS. Prevalence is even higher among younger women, suggesting that overall adult prevalence may rise further.

HIV prevalence rates have risen in most eastern African countries also, but Uganda stands out as a success story in the fight to stem the epidemic. In the 1980s, public health officials identified an epidemic of HIV in Uganda; public awareness of the disease spread as Ugandans saw increasing numbers of friends and relatives dying from AIDS. The government, along with religious and nongovernmental organizations (NGOs), launched programs to destigmatize people with AIDS and educate the public about how to avoid infection. Most programs promoted abstinence for adolescents, monogamy for adults, and safe sex for all sexually active people. Uganda's direct approach to HIV prevention earned wide respect throughout the international health

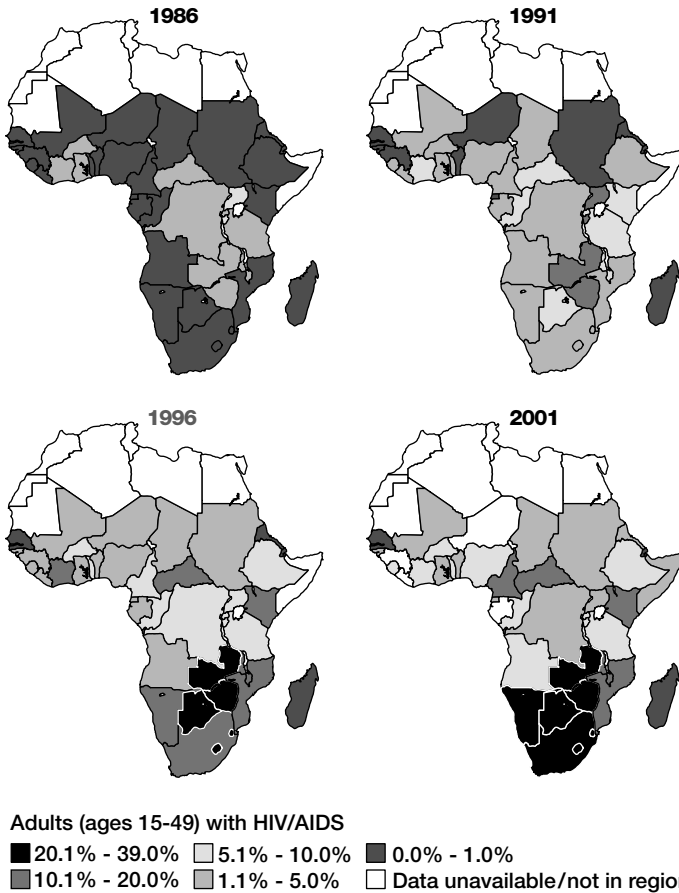
community, especially as the country's prevalence rates appeared to decline.²² Among pregnant women tested for HIV in Kampala, Uganda's capital, prevalence declined from a peak of nearly 30 percent in 1992 to 11 percent in 2000. An estimated 5 percent of Ugandan adults were HIV-positive in 2001, down from an estimated 10 percent or more in the early 1990s.

The epidemic spread more slowly in most western African countries, except in Côte d'Ivoire. More than one-third of female sex workers tested in urban areas in Côte d'Ivoire in 1999 had HIV, according to UNAIDS.

Some researchers see West Africa poised for a surge in HIV/AIDS cases. After at least five years of relatively low and stable prevalence rates, recent surveillance data have detected sharp increases in Cameroon and parts of Nigeria, for example. In 2000, about 10 percent of pregnant women tested for HIV in Cameroon were infected; in 2001, sentinel surveillance centers reported an HIV prevalence rate of about 5 percent in Nigeria. But

Figure 3

HIV Prevalence in Sub-Saharan Africa, 1986–2001



Source: UNAIDS, “A Global View of HIV Infection” (www.unaids.org, accessed July 8, 2002).

prevalence rates have remained low in Senegal, which appears to have staunched the epidemic through public health programs. UNAIDS has lauded Senegal’s response to HIV/AIDS as a model for other countries.

The epidemic in Africa is fueled by ignorance of the disease, lack of access to prevention, inadequate treatment and care services, and stigma and discrimination. Young African girls are dangerously undereducated about AIDS and how to protect themselves from it. UNICEF reports that more than 70 percent of adolescent girls in Somalia and more than 40 percent in Guinea-Bissau and Sierra Leone have never heard of AIDS; in Kenya and Tanzania, more than 40 percent of

young girls harbor serious misconceptions about the disease and how it is transmitted.²³ A survey conducted by Kenya’s Population Council in 2001 revealed that more than half of the women who are aware of their positive HIV status said they had not disclosed their status to their partners for fear of violence or abandonment.²⁴ Because heterosexual sex is the primary mode of transmission in Africa and because young women have the highest rates of new infection, these gaps in knowledge and understanding, along with discrimination and fear, fuel the epidemic.

A number of other factors may help explain why HIV has hit Africa especially hard. Among these are the high incidence of STIs, large refugee populations, seasonal labor migration by men, the active commercial sex industry, and cultural practices that allow for multiple sexual partners. Thousands of men live away from their families for months at a time to work in gold and diamond mines in southern Africa, for example. Many seek out commercial sex workers, which favors the spread of HIV. An estimated one-third of the miners in some South African mines are HIV-positive.²⁵ When these miners return to their families, they introduce HIV into their home communities.

While Uganda, Senegal, and Zambia have shown signs of containing the epidemic, the signs from most other sub-Saharan countries suggest that HIV prevalence is likely to increase.

South and Southeast Asia

HIV/AIDS took hold later in Asia than in most other regions, but the large sex industry and injecting drug trade favored its rapid spread. UNAIDS estimates there were fewer than 600,000 people living with HIV/AIDS in South and Southeast Asia in 1990; by 2001, the estimate topped 6 million. More than half of these people live in India. During 2001, there were an estimated 800,000 new HIV infections in the region.

Thailand and Cambodia initially were at the center of Southeast Asia’s

HIV epidemic, but both countries have been successful in slowing infection rates. The thriving sex industry in Thailand facilitated HIV infections, but new infections have slowed dramatically, largely because of the Thai government's mandatory condom-use program for brothels. In central and northern Thailand, up to 30 percent of commercial sex workers were HIV-positive in the early 1990s; by 1999, the rate had fallen to 13 percent. Infection rates among the Thai military have declined as well, reversing an upward trend. Thailand's success in controlling the spread of HIV is attributed to the government's willingness to commit substantial resources to public health, the mobilization of multiple sectors, an aggressive prevention program, and an excellent health infrastructure. Cambodia's government also acted early to slow the HIV epidemic by promoting condom use, reducing the fear and stigma associated with AIDS, and introducing programs to lessen vulnerability to infection.

Since the late 1990s, however, HIV/AIDS experts have detected alarming increases in HIV prevalence in other South and Southeast Asian countries. India is home to more people with HIV/AIDS than any other country except South Africa. Prevalence is high among urban residents, IDUs, truck drivers, and commercial sex workers. In some Indian cities, there has been a worrying increase in HIV/AIDS among pregnant women, suggesting that HIV is moving into the general population. A recent UNAIDS report says that HIV is infecting "strikingly diverse" populations in India, which may mean the disease is poised for rapid spread.²⁶

HIV prevalence has also increased among sex workers in Indonesia, Vietnam, and several other countries. While HIV prevalence in Indonesia is relatively low, recent increases in HIV prevalence among sex workers and IDUs, along with increasing sexual activity among adolescents and young adults, point to a potential surge in HIV infections. In one drug treatment center in Jakarta, 40 percent of

patients in 2001 had HIV, up from just 15 percent the previous year.²⁷

East Asia and the Pacific

HIV became widespread in East Asia and the Pacific only in the 1990s, although isolated AIDS cases had been identified in the region since the 1980s. HIV prevalence was less than 0.1 percent in Japan and South Korea in 2001. In Japan, HIV prevalence was highest among foreigners and Japanese men who acquired the virus overseas. However, more recent data indicate most new infections have occurred within Japan, which may signal an accelerating infection rate. In 1990, just 4,000 people in East Asia and the Pacific were living with HIV/AIDS, but by 2001, this number had reached at least 1 million, with the vast majority of new cases in China.

China

A recent UNAIDS report on HIV/AIDS in China warns of "the unfolding of an HIV/AIDS epidemic of proportions beyond belief," and calls for urgent action to slow the spread of the virus.²⁸ The number of people living with HIV/AIDS in China in 2000 was estimated at 600,000, but by the end of 2001, the number had soared to between 850,000 and 1 million. An estimated 70 percent of recent infections are related to injecting drug use. The worst-affected provinces border the Golden Triangle of Asian drug production, at the confluence of Myanmar, Laos, and Thailand. This region is a major drug trafficking route that runs north to mainland China, as well as west to Central Asia and Europe. UNAIDS has reported epidemics of HIV among IDUs in seven provinces, including Guangdong, a center of international trade. The report warns that nine additional provinces are on the brink of an epidemic, based on evidence that 20 percent or more of injecting drug users share needles.

Another HIV epidemic arose among rural villagers in several central Chinese provinces when villagers

became infected after selling plasma to unregulated and often illegal collection centers. The collection centers pooled the blood from numerous donors, extracted the plasma, then reinjected the blood into the donors. Any HIV-infected blood in the pool then infected all the donors. AIDS researchers fear that hundreds of thousands of rural farmers contracted HIV from contaminated blood and unsafe collection practices.

HIV infection among the general population is gaining momentum through sexual transmission. Ignorance, discrimination, poverty, and gender inequality contribute to the potential for a large-scale epidemic in China, according to UNAIDS.

In central Europe, strong prevention efforts have stymied the epidemic.

Europe and Central Asia

HIV prevalence is rising faster in Eastern Europe and Central Asia than anywhere else in the world. The epidemic took hold only in the early 1990s and was concentrated among injecting drug users. There were just 5,000 people living with HIV/AIDS in Eastern Europe and Central Asia in 1990, but by 2001, there were an estimated 1 million.

Russia has the region's largest number of people living with HIV/AIDS, while Ukraine has the highest percentage with the disease. An estimated 700,000 Russians were living with HIV/AIDS at the end of 2001, and experts fear that increased sexual activity and injecting drug use among adolescents and young adults, mass unemployment, and economic insecurity all favor another surge in HIV infections in the region. At the same time, deteriorating public health services are ill-equipped to deal with the epidemic. In Ukraine, an estimated 1 percent of young women and 2 percent of young men were infected with HIV in 2001.

In central Europe, strong prevention efforts may have stymied the rise of HIV infections, and prevalence has remained relatively low. The Polish government successfully contained the epidemic among drug users and prevented it from spreading into the

general population. But there is still a threat of spillover from eastern Europe, where HIV infections continue to proliferate.

In western and southern European countries, adult prevalence is below 0.5 percent, except in Portugal, Spain, and Switzerland. HIV transmission has been concentrated among gay men and injecting drug users, but HIV is slowly spreading into the general population as well. Recently, STIs among gay men have increased in some European cities, indicating a return to the unsafe sex practiced before the AIDS epidemic. New HIV infections among gay or bisexual men in Madrid rose from just over 1 percent to more than 2 percent between 1996 and 2000.²⁹

Latin America and the Caribbean

At the end of 2001, approximately 1.9 million adults and children in Latin America and the Caribbean were living with HIV/AIDS. Approximately 200,000 new HIV infections occurred in the region during 2001.

In most of Latin America, HIV/AIDS has hit the marginal populations hardest: men who have sex with men, commercial sex workers, and drug users, but heterosexual transmission is increasingly important, according to UNAIDS. In Argentina and Uruguay, HIV infections are concentrated among IDUs. In Peru and Mexico, transmission rates are highest among men who have sex with men. In Brazil, the region's most populous country, HIV infections are highest among men who have sex with men and among IDUs. Infection rates have dropped since the late 1990s, presumably in response to prevention programs that targeted people at high risk of exposure.

In the Caribbean, heterosexual contact has been the primary path for HIV transmission, aided by cultural norms that tolerate unprotected sex and frequent partner exchange among young people. HIV prevalence rates in the Caribbean are the

second-highest in the world, surpassed only by rates in sub-Saharan Africa. The severity of the epidemic in the Caribbean is often overlooked because the region's population is relatively small, but HIV/AIDS is the leading cause of death in some parts of the region. About 2.3 percent of adults in the region are infected. Haiti has the highest prevalence, with about 6 percent of adults infected, and is followed by Bermuda, where nearly 4 percent are infected. Migration and frequent travel among Caribbean islands and the United States also spread HIV.

North Africa and the Middle East

HIV infection rates are relatively low in North Africa and the Middle East: An estimated 500,000 people in the region, or less than 0.5 percent of the adult population, were living with HIV/AIDS in 2001. The public health systems in the region have not tracked HIV/AIDS transmission patterns closely, but surveillance systems are being strengthened. The current evidence suggests that HIV in the region is spread primarily through sexual intercourse and secondarily by injecting drug use. UNAIDS reports widespread epidemics in Sudan and Djibouti and a worrying increase in HIV prevalence among pregnant women in southern Algeria. Governments and NGOs in some countries are mobilizing to create prevention programs, offering hope that the epidemic can be contained within the region.

North America

In 2001, an estimated 940,000 adults and children in the United States and Canada were living with HIV/AIDS; an estimated 45,000 became infected during 2001. Sex between men is the primary transmission route in the United States and Canada, but injecting drug use and heterosexual relations are also important. Although prevalence has increased among women, men account for the vast

majority of North American adults living with HIV/AIDS and for an estimated 70 percent of new infections. Racial minorities and disadvantaged populations are disproportionately at risk of infection. African Americans accounted for 54 percent of new HIV infections in 2000, for example, although they made up just 13 percent of the U.S. population. About 80 percent of U.S. women infected with HIV are African American or Hispanic, according to the U.S. Centers for Disease Control and Prevention (CDC). These groups make up less than 30 percent of all U.S. women.

Researchers have reported high and increasing HIV prevalence among gay men in several areas in the United States and Canada. A recent CDC study conducted in six American cities found that about 30 percent of gay black men ages 23 to 29 had HIV/AIDS, as did 14 percent of Hispanic gay men and 7 percent of white gay men.³⁰ After six years of steady decline, the rate of HIV infection among British Columbia's gay male population increased by 9 percent between 2000 and 2001, according to statistics released by the British Columbia Centre for Disease Control and Prevention.³¹ The increased incidence of sexually transmitted infections among gay men in San Francisco, Los Angeles, and other large cities suggests that younger men are ignoring the safe sex rules that effectively stemmed the HIV/AIDS epidemic among North American gay men in the early 1990s. Without a reduction in high-risk behavior, HIV is likely to spread further. A similar increase in STIs has been detected in France, Australia, and other more developed countries.

Demographic and Health Effects

HIV/AIDS has exacted a devastating toll on population and health over the last 20 years. The epidemic has reversed hard-won gains in infant survival and life expectancy in sub-

Table 2

Effect of HIV/AIDS on Child Mortality in Selected Countries, 2002

Country	Deaths per 1,000 children under age 5		Percent of child mortality from HIV/AIDS
	With AIDS	Without AIDS	
Sub-Saharan Africa			
Angola	287	282	2
Botswana	107	31	71
Côte d'Ivoire	153	132	14
Kenya	95	66	31
Nigeria	136	125	8
South Africa	97	61	37
Uganda	145	128	12
Zambia	171	133	22
Zimbabwe	101	47	53
Latin America/Caribbean			
Haiti	117	107	9
Honduras	41	35	16
Asia			
Cambodia	103	96	7
Myanmar	101	96	5
Thailand	30	29	4

Source: K. Stanecki, *The AIDS Pandemic in the 21st Century* (www.usaid.gov/pop_health/aids/Publications/docs/aidsdemoimpact.pdf, accessed July 8, 2002).

Saharan Africa and in a growing number of countries and communities worldwide. HIV has triggered an upsurge in previously rare infections and malignancies and is contributing to an explosive TB epidemic around the world. In heavily affected countries, HIV has overwhelmed public health systems, stretching health care providers, infrastructure, and budgets beyond capacity.

Because HIV/AIDS tends to strike the young and sexually active, AIDS deaths have also distorted the age and sex profiles of the populations in heavily affected communities and countries. The unbalanced ratios affect population growth as well as the social and economic health of these areas.

The resurgence of TB in many parts of the world is forcing some countries to face HIV and TB epidemics simultaneously. In sub-Saharan Africa, TB cases are increasing by an estimated 10 percent per year because of HIV, with almost 2 million new cases of TB reported in 1999

alone. Researchers project that this figure will reach 3.3 million by 2005.

TB is a leading cause of death among people with HIV/AIDS and is responsible for an estimated 15 percent of AIDS deaths. In less developed countries, about half of HIV-positive individuals will develop TB.³²

HIV/AIDS and TB interact destructively, each worsening the effect of the other. TB speeds the progression of HIV infection, and HIV causes a more rapid progression of TB. In the absence of HIV infection, most people infected with TB remain healthy even though they are “carriers.” HIV/AIDS, however, triggers the active—and thus infectious—form of TB. Whereas only 5 percent to 10 percent of HIV-negative TB carriers will develop an active case of TB, studies have shown that HIV-positive TB carriers are at least 30 times more likely to develop active TB than those without HIV.³³ A person with an active case of pulmonary TB can infect an average of 10 to 15 people every year if he or she is not treated, according to UNAIDS.

HIV infection also makes TB more difficult to diagnose. UNAIDS estimates that one-half to two-thirds of those with HIV will develop forms of TB that are detectable only through special laboratory tests that may not be available in low-income countries. TB is curable in HIV-infected individuals, but treatment typically requires following a strict regimen of antibiotics for approximately six months, which often is difficult for residents in less developed countries.³⁴

Lower Life Expectancy

HIV/AIDS is the fourth leading cause of death worldwide. The estimated death toll of the disease since the epidemic began exceeds 20 million, and UNAIDS estimates that an additional 68 million will die of HIV-related causes by 2020 unless immediate and full-scale prevention and treatment efforts are implemented. In 2001, an estimated 3 million adults and children died of HIV/AIDS, of whom 2.3 million were in sub-Saharan Africa.

Conversely, AIDS-associated deaths in some countries have decreased dramatically, thanks to new drugs. In Brazil, government policies to provide universal treatment of HIV/AIDS reduced AIDS deaths by half between 1996 and 1999.³⁵ But in most countries, the drugs are not widely available, and the annual death toll will continue to rise.

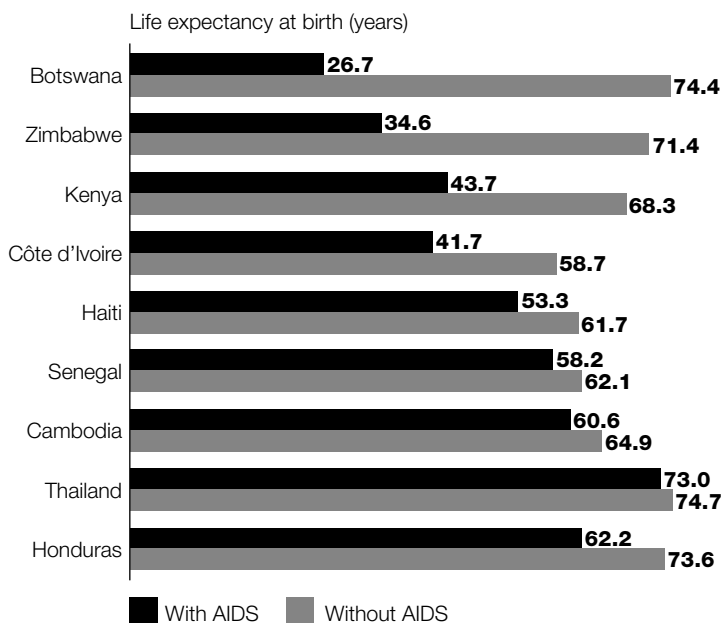
In heavily affected countries, death rates are substantially higher than they would be without HIV/AIDS. In eastern and southern Africa, for example, estimated crude death rates—deaths per 1,000 people—are 50 percent to 500 percent higher than they would be in the absence of HIV/AIDS. The disease has caused an increase in crude death rates in some Asian and Latin American countries.

The epidemic has also stalled or reversed progress in child survival and life expectancy, which are key indicators of social and economic development. In less developed countries, mortality rates among children under age 5 are substantially higher than they would be without HIV/AIDS. According to a report from the U.S. Census Bureau, about three-fourths of deaths of children under age 5 in Botswana are linked to AIDS, as are about one-half the child deaths in Zimbabwe (see Table 2). In 2002, South Africa's child mortality rate was 97 deaths per 1,000 children; it would have been 61 deaths per 1,000 without AIDS mortality. The AIDS death toll for children is substantially lower outside of southern and eastern Africa, even in countries with relatively high prevalence rates. Haiti, for example, had about 10 additional child deaths per 1,000 children in 2002 because of AIDS; without AIDS, there would have been 107 child deaths per 1,000 children.

Even in the worst-affected countries, improvements in public health and living standards throughout the world allowed life expectancy to rise until the mid- to late 1980s, but the surge of AIDS deaths set off a precipitous decline in life expectancy. Average life expectancy has

Figure 4

Effect of HIV/AIDS on Life Expectancy in 2010, Selected Countries

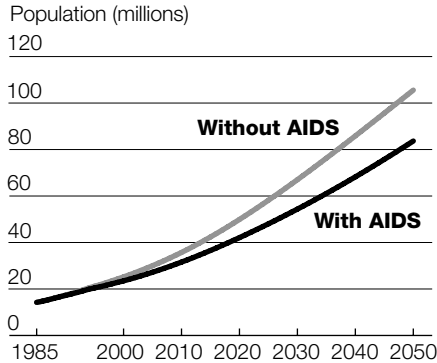


Source: K. Stanecki, *The AIDS Pandemic in the 21st Century* (www.usaid.gov/pop_health/aids/Publications/docs/aidsdemoimpact.pdf, accessed July 12, 2002).

dropped to age 40 or less in eight countries: Angola, Botswana, Lesotho, Malawi, Mozambique, Rwanda, Zambia, and Zimbabwe. Life expectancy at birth was close to 60 years before the AIDS epidemic took hold in Botswana, which was one of the continent's wealthiest countries. In 2002, average life expectancy in Botswana was down to 33.9 years and falling; by 2010, average life expectancy is projected to be 26.7 years (see Figure 4). The U.S. Census Bureau also projects that by 2010, life expectancy in a number of other southern African countries will fall to about 30 years—a level more common 100 years ago, before antibiotics and vaccines were available to fight disease.

Some countries outside of sub-Saharan Africa are also experiencing AIDS-related reductions in life expectancy. In Cambodia, Myanmar, and Thailand, life expectancy in 2010 will be nearly two years to four years lower than it would be without AIDS.

Figure 5
Projected Population of Uganda With and Without AIDS, 1985–2050



Source: U.S. Census Bureau demographic estimates and projections (2002).

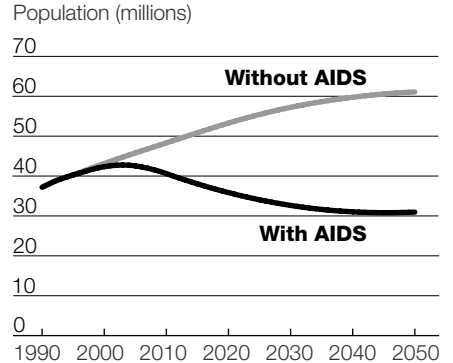
In Haiti, life expectancy in 2010 is projected to be 53.3 years, eight years lower than it would be without AIDS. The U.S. Census Bureau estimates that by 2010, average life expectancy in Honduras will be 11 years lower as a result of AIDS.

Slower Population Growth

Despite the millions of AIDS deaths worldwide, populations continue to grow in many heavily affected countries, although the growth is less than it would be in the absence of AIDS. In Uganda, for example, the U.S. Census Bureau projects the population at nearly 84 million by 2050; if the country had not experienced an HIV/AIDS epidemic, it would be closer to 106 million (see Figure 5). In South Africa, where the epidemic has shown little sign of abating, the population is projected to be 31 million in 2050, about one-half of what it would have been without AIDS-related mortality (Figure 6).

The U.S. Census Bureau also projected that Cambodia, Myanmar, Thailand, and several other non-African countries will experience lower population growth rates because of AIDS. In the Bahamas and Guyana, for example, annual growth rates are projected to fall from 1.0

Figure 6
Projected Population of South Africa With and Without AIDS, 1990–2050



Source: U.S. Census Bureau demographic estimates and projections (2002).

percent to 0.5 percent between 2002 and 2010.

AIDS will trigger population decline in a few African countries in addition to South Africa. The U.S. Census Bureau estimates that Botswana already had a negative growth rate in 2002, because of high rates of HIV prevalence combined with relatively low fertility rates. By 2010, Lesotho, Mozambique, South Africa, and Swaziland are projected to lose population; population growth is expected to halt in Malawi, Namibia, and Zimbabwe.

AIDS deaths are altering the age structure in severely affected countries. Some analyses suggest that in countries where HIV prevalence rates for adults are around 15 percent, AIDS will eventually kill one-third of current 15-year-olds.³⁶ In sub-Saharan Africa, HIV prevalence rates peak at around age 25 for women and at around ages 35 to 40 for men. Because individuals survive an average of about 10 years after infection, AIDS deaths tend to be high among women in their 30s and among men in their 40s and 50s.

Botswana embodies many of the changes projected for populations severely affected by HIV/AIDS. The graph of the population's age and sex structure in 2020 looks more like a chimney than the pyramid shape that is more typical for rapidly grow-

ing populations (see Figure 7). By 2010, fewer children will be born because of deaths and lower fertility among HIV-positive women. Many children will die during childhood because of HIV infection. The adult population will shrink, with especially high losses among young women in their 20s and 30s.

Social and Economic Impact

AIDS is much more than a health crisis. Its effects extend to nearly every dimension of social and economic life, especially in the worst-affected countries. Although the magnitude of the epidemic varies, in every country AIDS primarily strikes adults between the ages of 25 and 45—people who were infected in their adolescent and young adult years. AIDS deaths rob employees from the labor force, providers and caregivers from families, and teachers from communities.³⁷

Public Health Burden

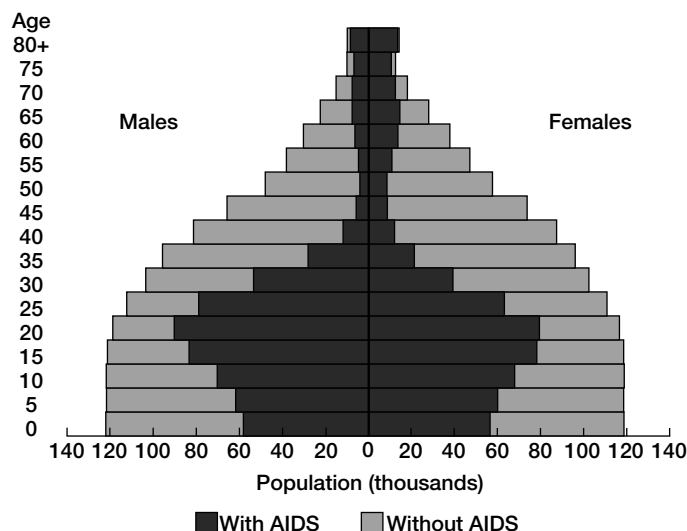
Health sectors feel the impact of AIDS through such direct costs as the expense of medical treatment, supplies, and personnel, and through such indirect costs as falling numbers of trained medical providers and increasing stress on health systems overwhelmed by the epidemic.

HIV/AIDS continues to overwhelm the health systems in many countries. People living with HIV/AIDS generally have a range of health care needs, spanning primary care and basic treatment for infections to hospitalization and psychosocial counseling. Where antiretroviral drugs are available, health systems need to monitor patients and manage the complex treatment regimens.

The increased need for care is especially problematic in countries that already face difficulty in meeting the most basic health care needs of their populations. In many countries, the care required for HIV/AIDS costs

Figure 7

Projected Population Structure of Botswana in 2020 With and Without AIDS



Source: U.S. Census Bureau demographic estimates and projections (2002).

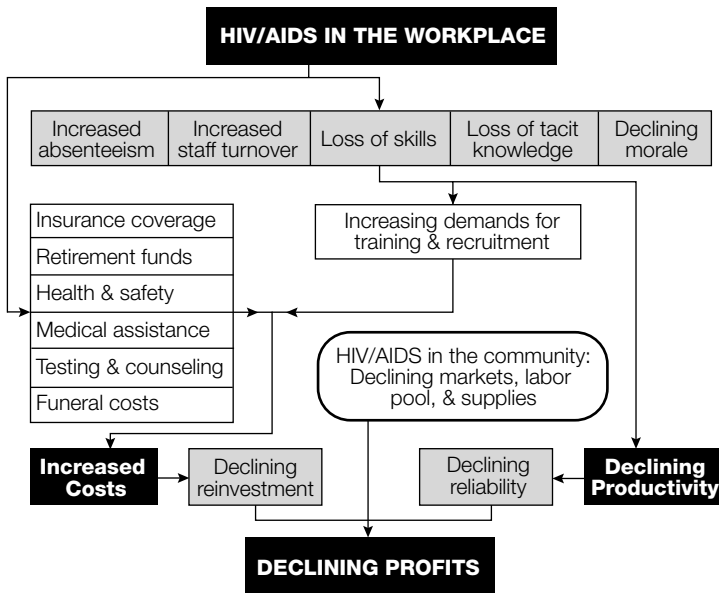
many times more than the average family's yearly income. National health budgets are also unable to meet the growing burden. The World Bank estimates that the cost of treating one AIDS patient for a single year is 2.7 times the per capita gross national product in a typical country. By 2005, HIV/AIDS is expected to account for more than 60 percent of public health spending in Zimbabwe.³⁸

Health sector resources needed to treat other health problems are being usurped by HIV/AIDS. In many hospitals in sub-Saharan Africa, for example, AIDS patients are crowding out other patients: AIDS patients occupy at least half of urban hospital beds in Côte d'Ivoire, Zambia, and Zimbabwe. In Kenya, the crowding-out effect has resulted in increased mortality among non-HIV patients.³⁹

The loss of health care staff to HIV/AIDS is another blow to the health care sector in heavily affected countries; their loss is particularly painful given the escalating need for their professional skills as more people fall ill with HIV/AIDS. Studies conducted in Lusaka, Zambia, during

Figure 8

Impact of HIV/AIDS on a Business



Source: Adapted from UNAIDS, Global Business Council on HIV/AIDS, and Prince of Wales Business Leaders Forum, *The Business Response to HIV/AIDS: Impact and Lessons Learned* (2002).

1991 and 1992 found that 39 percent of midwives and 44 percent of nurses tested positive for HIV. In one Zambian hospital, AIDS is blamed for a 13-fold increase in deaths among workers between 1980 and 1990. Health workers also face an above-average risk of exposure to opportunistic infections, particularly TB. In addition, HIV/AIDS undermines health workers' morale as their workload and stress increase and they witness high mortality among children, young adults, and colleagues.

Business, Labor, and Income

Because HIV/AIDS affects people in their prime working ages, businesses are suffering severe effects from the epidemic. This is especially true in some sub-Saharan African countries, where as much as one-third of the working-age population is infected with HIV. In high-prevalence countries, HIV/AIDS is consuming business profits because of three primary

factors: increased operating costs, decreased productivity, and declining markets (see Figure 8).

HIV/AIDS was initially believed to be a primarily urban phenomenon, but it now clearly threatens the lives and livelihoods of rural communities throughout the less developed world. In many countries, agriculture provides a living for a large segment of society and contributes significantly to the national economy. In many African countries, labor-intensive farming accounts for more than one-third of the gross national product. By disrupting agricultural production, HIV/AIDS can undermine countries' export capacity and thus their ability to earn foreign exchange.⁴⁰

AIDS-related deaths among farm workers threaten agricultural production and food security, most notably in southern and eastern Africa. In 25 African countries with high rates of HIV prevalence, the Food and Agriculture Organization (FAO) estimates that 7 million agricultural workers have died of AIDS since 1985. FAO projects that 16 million more agricultural workers in these countries will die because of AIDS between 2000 and 2020.⁴¹ Population losses in the agricultural labor force between 1985 and 2020 in the worst-affected countries will range from 13 percent in Tanzania to 26 percent in Namibia (see Figure 9).

In eastern Africa, AIDS-related labor shortages have led to lower crop yields, smaller amounts of land being cultivated, and a move from cash crops to subsistence crops.⁴² In Zimbabwe, the Farmers Union found that the loss of a breadwinner to AIDS decreased crop output by as much as 61 percent in small-scale farming areas.⁴³

Agricultural households coping with HIV/AIDS may forgo seed purchases and sell assets such as livestock, equipment, or land to support ill family members and pay for funeral expenses. Time devoted to care, funerals, and mourning of family members with HIV/AIDS reduces productivity and jeopardizes households' ability to produce and purchase food.

Moreover, important knowledge and skills are lost as deaths mount among the agricultural population.

Education Stresses

Education is a critical component of human capital because it influences skills, knowledge, and health. These factors, in turn, are important determinants of a country's standard of living and economic prospects. Education is also a potential tool for controlling HIV/AIDS.⁴⁴

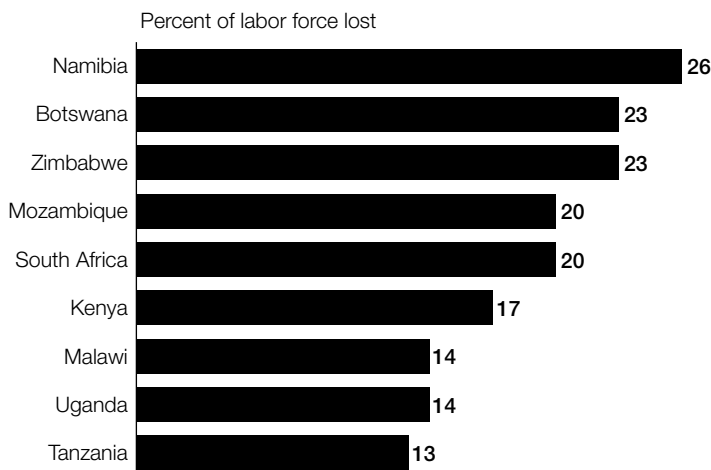
But the AIDS epidemic is exacting a heavy toll on the education systems in many low-income countries. Government funds are being shifted away from public sectors, including education, to cover the immediate needs of sick and dying HIV/AIDS patients. At the same time, overall government revenues can also be expected to decline as the disease disproportionately affects the working-age population. Illness and death among experienced educators and administrators have also jeopardized the quality and supply of education. Schools face increased expenditures associated with staff turnover and absenteeism. Widespread illness and death in affected communities diminish funds and support for schooling, as well as the ability of community members to participate in school affairs.

Teachers and education administrators in high-prevalence countries are dying of AIDS in alarming numbers. In sub-Saharan Africa, 860,000 children had teachers who died of AIDS in 1999. The Central African Republic sustained such high losses among teachers that more than 100 educational institutions were closed by the late 1990s. In Zambia, more than four teachers died of AIDS each day in 1998—1,300 teachers for the year.⁴⁵

The AIDS epidemic is also changing the demand for education, as more children die of the disease, leave school to care for family members, or become AIDS orphans without the means or opportunity to attend school. In South Africa's

Figure 9

Projected Loss of Agricultural Labor Force Because of HIV/AIDS, Selected African Countries, 1985–2020



Source: Food and Agriculture Organization (FAO), "AIDS—A Threat to Rural Africa: Fact Sheet" (www.fao.org/Focus/E/aids/aids6-e.htm, accessed July 12, 2002).

KwaZulu-Natal province, where adult HIV prevalence exceeds 30 percent, researchers found that first-grade enrollment dropped 24 percent in 2000.⁴⁶

Families and Communities

The stigma associated with HIV/AIDS, the gradual physical decline of those infected, patients' need for care, and the deaths of individuals have major consequences for families and communities. In the most affected countries, the epidemic is eroding households' socioeconomic well-being and threatening the social cohesion of communities. Just as HIV/AIDS robs the human body of its natural defenses, the disease depletes the assets that families and communities need for successful prevention efforts and for the care and treatment of those living with HIV.⁴⁷

For families, the consequences of HIV/AIDS are different from those of other illnesses. The people most likely to be infected are at the peak of their productive and income-earning years; they often support spouses and children. Families feel the effects of the epidemic as soon as one of their

*There is no
cure for
HIV/AIDS.*

members falls ill with an AIDS-related condition. Income falls as family members' ability to work decreases, while household living costs increase, especially for medical expenses. A study in Côte d'Ivoire found that households with an HIV/AIDS patient spent twice as much on medical expenses as did other households.⁴⁸ Time and transportation expenses also add to the economic burden because health facilities are often located far from home.

The poorest and least educated households are the ones least able to cope with HIV/AIDS. In Rwanda, a survey of HIV-positive individuals found that less than 30 percent of households were able to meet the costs of health services exclusively from their own resources; some families paid for health care by borrowing money and selling assets. Poverty pushes some families to send their children into the labor force or turn them over to recruiters who offer jobs in distant places, where the children may be forced into unlawful labor or sexual exploitation.⁴⁹ The poor also have limited access to health care information about prevention and treatment of HIV/AIDS and related health problems.

Governance and Public Service

In countries heavily affected by HIV, the epidemic affects governance and public service in three main ways: The country loses hard-to-replace civil servants; revenues decline and costs rise; and demand for social services increases. Taken together, these factors exert significant pressure on the governments of less developed countries.

In countries with low levels of literacy and education, deaths among skilled civil servants are especially difficult to absorb. Many of these countries rely on a small pool of staff members to develop and administer services.

Declining revenues and rising costs compound the loss of civil servants. In heavily affected countries, AIDS is reducing productivity and earnings. In half the countries of sub-Saharan

Africa, annual per capita growth is declining by 0.5 percent to 1.2 percent because of the AIDS epidemic.⁵⁰ Annual AIDS care expenditures in Zambia are projected to increase from US\$3.4 million in 1989 to US\$18.3 million in 2004.⁵¹

At the same time that costs rise and revenues decline, the demands on public services increase. AIDS generally affects the poorest households disproportionately, contributing to rising poverty and greater social welfare needs. Furthermore, millions of orphaned children will require new or expanded public services. Funding or investments in some public services are reduced because of increased expenditures on health care and social welfare, including the care of orphans. The World Bank estimates that treating an AIDS patient for one year costs as much, on average, as educating 10 primary school students for a year.⁵²

Prevention and Care

There is no cure for HIV/AIDS, and life-prolonging drugs are expensive and largely unavailable in less developed countries. Thus, prevention will remain the backbone of programs to curb the HIV/AIDS epidemic for the foreseeable future. But HIV/AIDS experts are realizing the need for comprehensive programs that encompass prevention, care, treatment, and support interventions that are accessible and affordable to the majority of people in need of these services. Comprehensive programs aim to meet the medical, psychological, and social needs of people living with HIV/AIDS and their families.

Successful prevention efforts include providing education about high-risk behaviors, distributing and promoting condoms, diagnosing and treating STIs, providing voluntary counseling and testing, preventing mother-to-child transmission, ensuring the safety of blood and blood products, and reducing the stigma

attached to HIV/AIDS. Comprehensive care includes postexposure prophylaxis (primarily for exposure to HIV as a result of rape or an occupational mishap such as needle stick), psychosocial support, support for orphans and children of AIDS patients, prevention and treatment of opportunistic infections, home-based care, antiretroviral therapy, and palliative care (see Figure 10).

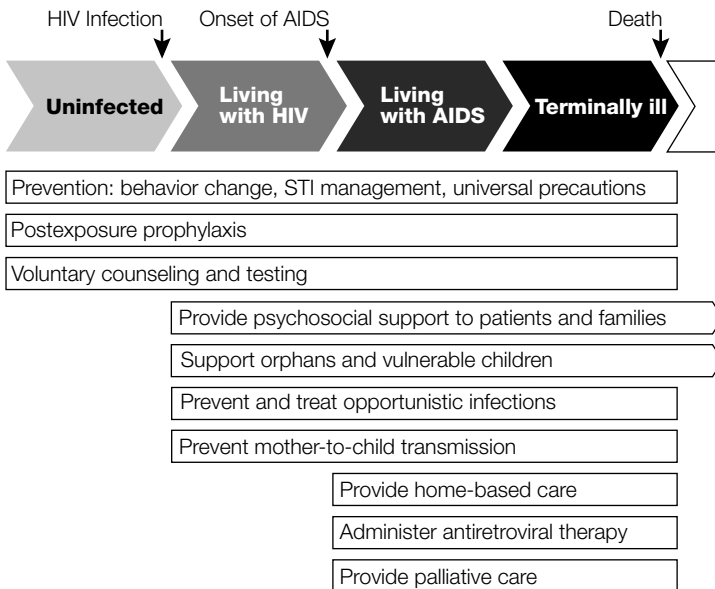
The various components of the prevention and care continuum are mutually reinforcing. The availability of HIV care and treatment services can be a powerful incentive for people to seek counseling and testing. Without such services, people have little incentive to learn their HIV status. Counseling provides an opportunity to educate infected people about the importance of and methods for preventing the infection of others. Experts often cite voluntary counseling and testing for HIV as a crucial entry point for effective prevention, treatment, and care.

Access to care and treatment also helps reduce the stigma associated with HIV infection, encourages more people to get tested for HIV, and may promote behavior change. But convincing people to change their behavior is difficult, especially if they believe that they are not personally at risk or that they can be successfully treated for HIV/AIDS. Studies in more developed countries have shown that some people practice high-risk sexual behavior when they know that effective AIDS therapies are available.⁵³

Prevention programs are much more likely to be successful if they involve policymakers and people who influence the social and economic environment of the community. Public policies that support HIV-prevention programs enable people to protect themselves. Successful prevention programs also address the factors that put individuals, families, and communities at risk of HIV infection and that increase their vulnerability to infection and to the effects of the epidemic.

Figure 10

HIV/AIDS Prevention and Care Continuum



Source: Family Health International.

Prevention programs are effective only if they can reach the people most at risk, especially young adults and marginalized groups such as sex workers, men who have sex with men, injecting drug users, and prisoners.⁵⁴ Successful programs are tailored to focus on the main modes of transmission in any given community. Sexual transmission is the most important mode of transmission in most countries, especially in less developed regions (see Table 3, page 24), but transfusions of contaminated blood, injecting drug use, and mother-to-child transmission are responsible for up to 30 percent of all global HIV infections. In sub-Saharan Africa, successful prevention programs would focus on preventing heterosexual transmission, mother-to-child transmission, and transmission through contaminated blood. In Southeast Asia, the primary focus would be on preventing transmission through sex and injecting drug use. In eastern Europe, the emphasis would be on transmission via injecting drug use. In Latin America, prevention efforts

Table 3

Risk of HIV Infection by Mode of Exposure and Contribution to Global Infections

Exposure mode	Transmission rate per exposure	Percent of global infections
Blood transfusion	More than 90%	5% to 10%
Mother-to-child transmission	25% to 40% in less developed countries 15% to 25% in more developed countries	2% to 3%
Unprotected sexual intercourse	0.1-1.0% ^{a,b}	70% to 80%
Injecting drug use	Less than 1.0% ^a	5% to 10%
Needle stick and other health-care setting exposures	Less than 0.5%	0.01%
Household contact from exposure to blood	Rare	negligible

^a Risk is cumulative and increases exponentially with each exposure.

^b Several factors, such as sexually transmitted infections and lack of circumcision, may increase risk.

Source: Communicable Disease Prevention and Control, “The Risk of HIV-1 Transmission by Type of Exposure” (www.cdpc.com/s6.htm, accessed July 8, 2002); and P.R. Lamprey and H.D. Gayle, *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs* (2001).

would need to encompass homosexual and heterosexual transmission, as well as transmission through injecting drug use.

Preventing Sexual Transmission

The rapid sexual spread of HIV has been attributed to behavioral factors such as frequent change of sexual partners and unprotected sex; biological factors such as the presence of STIs; and structural factors such as inadequate health infrastructure and poor access to effective treatment. Lack of circumcision is also a contributing factor in some populations.⁵⁵ In addition to these individual risk factors, some societal, cultural, and economic factors beyond the control of individuals are also important considerations.

Changing Behavior

Risk-reduction interventions are designed to encourage people to avoid risky sexual behavior—for adolescents to delay their sexual debut and for sexually active people to practice safe sex, especially condom use, and to limit the number of sexual partners—and to promote the treatment of STIs. For individuals to

change their behavior, they need basic knowledge of HIV and their risk of infection. They need to learn how to protect themselves and must have access to appropriate services and products, such as condoms. They must also perceive their environment as being supportive of safe behaviors.

Behavior-change interventions, including counseling and testing, have succeeded in a variety of situations, including urban gay communities in North America and Western Europe, IDUs in Australia, and heterosexual populations in Brazil, Cambodia, Senegal, Thailand, and Uganda.⁵⁶ In the Ugandan capital of Kampala, for example, behavior-change interventions and prevention efforts helped reduce prevalence rates among teenage women tested for HIV from 28 percent in 1991 to 6 percent in 1998.

Some of the most successful interventions target sex workers and their clients. In Nairobi, behavior-change programs among sex workers and their clients increased condom use from less than 5 percent to more than 85 percent, reducing the rate of new infections from nearly 5 percent to about 1 percent.⁵⁷ In Thailand and Cambodia, programs promoting condom use in brothels have reduced

HIV transmission in both sex workers and their clients, as well as in the general population.⁵⁸

Reducing Vulnerability

Preventing infections involves more than avoiding risky behavior; it also requires changing the socioeconomic and political conditions that make some people more vulnerable to infection.

Although HIV/AIDS affects both rich and poor throughout the world, the poor, underprivileged, and uneducated are often more vulnerable to infection. HIV/AIDS and poverty are mutually reinforcing: The epidemic pushes people deeper into poverty, making it more difficult for them to sustain or recover their earlier livelihoods; such an income drop, in turn, can make people and their families more vulnerable to HIV infection and AIDS-related illnesses. Illiterate women with limited skills, few job opportunities, and limited access to health information and services are, for example, more likely to engage in unprotected sex for money, thereby increasing their vulnerability to HIV.⁵⁹ Child prostitution in Southeast Asia and the financial enticement of young girls by adult men in many countries increases the vulnerability of children and adolescents to HIV.

Economic insecurity, displacement caused by conflicts and disasters, illiteracy, violence, abuse, and social exclusion deprive millions of people of the ability to protect themselves and others from HIV. Thus, social and economic policies that perpetuate inequalities, discrimination, and social exclusion also hinder HIV/AIDS prevention and care. Over the long term, policies to enhance socioeconomic development and social equality will also contribute to HIV/AIDS prevention in low-income countries.

Treating STIs

STIs make sexually active people more susceptible to HIV infection. Encouraging safe sex to lessen the risk of a sexually transmitted infection and treating curable STIs also

Photo removed for copyright reasons.

Young sex workers in many countries, such as these Cambodian women, face an exceptionally high risk of infection with HIV.

help reduce the transmission of HIV. In Thailand, condom promotion and improved treatment of STIs reduced the incidence of curable STIs by more than 80 percent in five years and contributed to the decline of HIV prevalence among sex workers, their clients, and the military.⁶⁰ In a study in Malawi, successful treatment of men with curable STIs and HIV led to a substantial reduction in the concentration of HIV in semen. A 1995 study conducted in the Mwanza region of Tanzania showed that HIV incidence in communities with aggressive STI control efforts was 38 percent lower than in areas with typical STI services.⁶¹

HIV and Injecting Drug Use

There are an estimated 6 million to 10 million injecting drug users worldwide, and as many as 3.3 million of them are infected with HIV.⁶² Between 5 percent and 11 percent of all HIV/AIDS cases are related to injecting drug use, which is a major mode of HIV transmission in southern and eastern Europe, most of Asia and North America, and parts of South America. It is also an important source of infection in North Africa and the Middle East. IDUs can play a critical role in

Most HIV-positive children acquired the virus from their mothers.

spreading HIV to the general population, through sexual transmission and mother-to-child transmission from infected IDU mothers.

The spread of HIV in IDU populations is often rapid and especially difficult to control. One reason is that sharing infected needles is a highly “efficient” way to transmit HIV; a single exposure to contaminated blood in a needle or syringe carries a 90 percent risk of infection. The behavior of drug users presents another obstacle: The underground culture of injecting drug use and the social stigma attached to drug use and HIV make the drug-using population highly vulnerable to infection. Studies show, however, that given the appropriate information and opportunity, many IDUs will change their drug-using and sexual behaviors to protect themselves and their partners from HIV. Education programs that have succeeded in reducing HIV transmission among IDUs in several more developed countries, including Australia, Canada, and the United States, promote such strategies as

- Education and counseling about risky behavior (such as sharing needles and unprotected sex);
- Counseling and testing for HIV;
- Needle-syringe exchange programs;
- Drug substitution therapy (such as methadone) to combat addiction; and
- HIV/AIDS treatment and care.

HIV-Infected Blood

Some of the first people identified with HIV/AIDS acquired the infection from infected blood and blood products. Thousands of people were infected through blood products in the 1980s, but the number of such infections plummeted when tests to screen blood and blood donors became widely used. In more developed countries, the dramatic reduction of HIV transmission from blood is one of the greatest success stories in the battle against the epidemic.⁶³ However, contaminated blood continues to cause between 5 percent and

10 percent of new HIV infections worldwide and is especially problematic in low-income countries that have inadequate health infrastructures. Unsanitary blood collection practices may have infected several hundred thousand Chinese villagers in the past few years.

Preventing the transmission of HIV through blood and blood products involves establishing a well-organized blood transfusion service; recruiting safe blood donors; using effective blood tests for HIV and other infectious diseases; ensuring appropriate use of blood and blood products, including avoiding unnecessary transfusions; and preventing health problems, such as anemia, that require blood transfusions.

Mother-to-Child Transmission

The great majority (90 percent) of HIV-positive children acquired the virus from their mother; 90 percent of infected children live in sub-Saharan Africa. Rates of HIV-1 transmission from mother to child range from 25 percent to 40 percent in less developed countries, and from 15 percent to 25 percent in more developed countries.⁶⁴

Risk of transmission is affected by factors related to the virus, the mother, the delivery process, the baby, and how the infant is fed. These factors explain the differing rates of HIV transmission between more developed and less developed countries. During pregnancy and delivery, the mother’s health, disruption of the placental barrier, preterm delivery, and hemorrhage are significant predictors of the child’s infection. After delivery, breastfeeding is the most important risk factor. Without treatment, an estimated one out of every seven infants breastfed by an HIV-positive mother becomes infected through breast milk.

Current strategies for preventing mother-to-child transmission include primary prevention and family planning services; antenatal care programs;

confidential counseling and testing; preventive antiretroviral drug therapy; follow-up care for mother and infant, including drug therapy when indicated; and nutritional counseling and breast-milk substitutes if appropriate. The most effective interventions are breast-milk substitutes and prophylactic drug therapy for the mother and infant, but counseling and testing services are also important.

The most effective drug therapy tested so far is long-course AZT therapy. It is currently used in more developed countries, but its complexity and cost have limited its use in resource-poor settings. As a result, shorter, simpler, and less costly regimens have been recommended for less developed countries. The most practical and least expensive (US\$4 per dose) of these options is Nevirapine, single doses of which are given at birth to both the mother and infant. Boehringer-Ingelheim, which manufactures Nevirapine, has made the drug available for free in less developed countries to prevent mother-to-child transmission.

Transmission of HIV through breast milk can be prevented by feeding infants formula or other foods rather than breastfeeding. The decision not to breastfeed is difficult for many mothers who cannot afford replacement food. Many health professionals are reluctant to instruct HIV-infected mothers to avoid breastfeeding, because it offers so many benefits. Breastfeeding offers infants adequate nutrition, protects them against some infectious diseases during the first six months of life, and greatly reduces the risk of gastrointestinal infections from contaminated foods. For mothers, breastfeeding facilitates uterine contraction, protects against excessive blood loss and anemia, and delays the return of menstruation, reducing the risk of another pregnancy. It also promotes emotional bonding between a mother and her infant. In some cultural settings, a woman who chooses not to breastfeed can face social stigmatization, economic hardship, and the risk

Photo removed for copyright reasons.

A Brazilian social worker counsels a mother and child who are both infected with HIV/AIDS.

of unwanted pregnancy. Other factors may also influence the risk of HIV transmission during breastfeeding, including premature birth, mixed feeding, age at weaning, and infant immune responses.⁶⁵

Meeting Needs

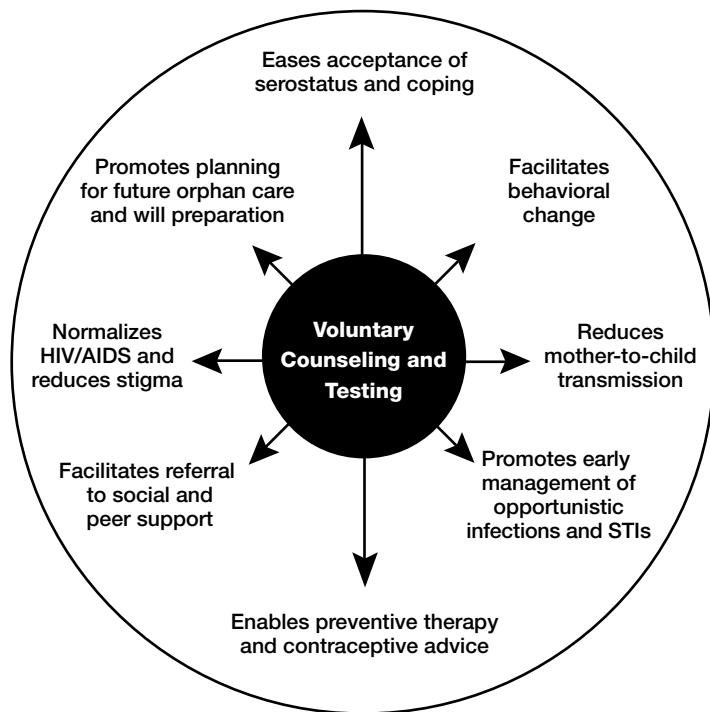
Life-prolonging drugs such as anti-retrovirals and drugs for the prevention and treatment of opportunistic infections have dramatically reduced mortality among people living with HIV/AIDS in more developed countries. But meeting the needs of people with HIV/AIDS involves much more than drug therapy and medical care. It includes counseling for individuals and their families, care and education for AIDS orphans, home care and financial support for individuals with AIDS, and many other components. Most low-income countries lack the resources for meeting these needs.

Expanding Counseling and Testing

Voluntary counseling and testing services for HIV have long been a component of HIV prevention and care programs in more developed countries. Although these services have

Figure 11

Voluntary Counseling and Testing as an Entry Point for HIV Prevention and Care



Source: UNAIDS, "Report on the Global HIV/AIDS Epidemic—July 2002" (www.unaids.org/barcelona/, accessed July 8, 2002).

only recently become an integral part of programs in less developed countries, they have proven to be a cost-effective way to reduce risky behaviors. Counseling and testing can lead patients to other HIV services (see Figure 11). A study that included Kenya, Tanzania, and Trinidad documented a 43 percent reduction in unprotected sex among those who received voluntary counseling and testing for HIV. The study also demonstrated that voluntary counseling and testing for HIV is a highly cost-effective prevention strategy.⁶⁶

Despite their recognized importance in national AIDS control programs, voluntary counseling and testing services tend to be of limited quality and coverage in less developed countries. Among the obstacles to expanding services are a lack of trained staff, concerns about confi-

dentiality, stigma and discrimination, clients' lack of knowledge about the existence and benefits of services, and lack of resources.

Voluntary counseling and testing programs involve raising community awareness, pre- and post-test counseling, psychological support, and referral to relevant services such as prevention services, treatment and care services, and community support groups. HIV counseling aims to enable people to cope with personal stress and make decisions related to HIV/AIDS.⁶⁷ The counseling process allows an individual or couple to evaluate their risk of contracting or transmitting HIV and facilitates preventive behavior. Because HIV testing has consequences that reach far beyond the diagnosis, counseling is an essential component of any testing program. The very act of being tested, for example, may have negative consequences in communities where HIV-positive people are stigmatized, and counseling can help individuals cope with this stigma and discrimination.

Management of HIV/AIDS

The disease burden attributable to HIV is expected to increase as a result of new infections and as people living with HIV progress to AIDS. Recent studies have shown that low-cost regimens can prevent some of the most important causes of HIV-related disease, including TB, *Pneumocystis carinii* pneumonia (PCP), and other major causes of illness, such as nontyphoid salmonella infections and cerebral toxoplasmosis.⁶⁸ Preventive therapy for TB would be especially effective in sub-Saharan Africa, where TB is a major cause of death in HIV-positive individuals. Using cotrimoxazole to treat PCP patients who have HIV can significantly reduce hospitalizations and mortality from other bacterial opportunistic infections.⁶⁹ However, PCP is not common in sub-Saharan Africa and other low-income areas, and the vast majority of AIDS patients do not develop it.

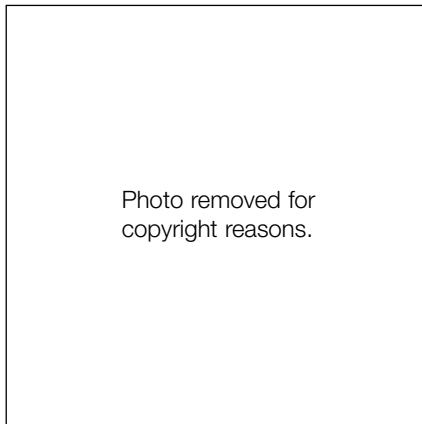
Fungal infections, a major cause of illness and death in HIV-positive individuals, respond to preventive therapy with fluconazole.⁷⁰

These simple preventive therapies could reach a much wider population than would be feasible for more expensive antiretroviral drug regimens. Despite the potential usefulness of these preventive therapies, however, further research is needed on who should receive them, how long therapy should be given, and how the therapies affect drug resistance.

Recent studies from Europe and North America provide convincing evidence of the benefits of highly active antiretroviral therapy (HAART). The therapy reverses immune deficiency and restores the immune system's reactivity to opportunistic infections. The antiretroviral drugs currently available work by blocking the action of enzymes that are important for the replication and functioning of HIV. These drugs belong to two major classes: reverse transcriptase inhibitors and protease inhibitors. Therapy is more effective when antiretroviral drugs from different classes are used in combination because the virus can develop resistance if only one drug is used. A similar approach is used to treat cancer and TB. These drugs slow or reverse the progression of HIV/AIDS, but they do not cure it.

Providing antiretrovirals to people living with HIV/AIDS carries social and economic costs that policymakers must weigh against the benefits. Benefits include lower mortality, improved quality of life, reduced hospitalization costs, increased labor-force productivity, potential reductions in new infections due to lower viral load, and increased stability and longevity of families, with fewer orphans. Costs include substantial increases in expenditures on overall treatment and patient monitoring and possible increases in new infections as more HIV-infected people live longer and return to risky behaviors.

The significant drop in AIDS drug prices in the last few years has made drug therapy more affordable, but it is



A sign depicts the need for care and understanding in the battle against AIDS in Kenya.

still beyond the reach of the vast majority of people living with HIV/AIDS in less developed countries. Special initiatives, such as UNAIDS' Accelerating Access Initiative and the Global Fund for AIDS, Tuberculosis, and Malaria, are expected to further improve access to drugs.

Challenges

Despite major medical and technological breakthroughs and advances, the HIV/AIDS epidemic continues its relentless spread in most resource-poor settings. Important challenges for the future include controlling further spread of the epidemic, especially in infants and young adults; treating, caring for, and supporting the millions of people living with HIV; and mitigating the epidemic's impact on individuals, families, and communities in less developed countries.

To meet these challenges, the international community and government partners need to take a number of steps, including

- Increasing resources available for prevention and care;
- Improving the health infrastructure for the delivery of these services;
- Improving technologies for the treatment and prevention of HIV/AIDS;

- Reducing poverty, illiteracy, and other social, economic, and political factors that increase vulnerability to infection; and
- Reducing the disease's stigma and the discrimination against those living with HIV.

Improving Resources for HIV/AIDS Programs

UNAIDS estimates that US\$10 billion per year is needed to ensure an expanded and comprehensive response to the HIV/AIDS epidemic. The response would include low-cost HAART, treatment of opportunistic infections, and support for orphans and vulnerable children.⁷¹ Providing such support will likely require major increases in national government allocations; greater support from the private sector; and substantial increases in international assistance, bilateral funding programs, and allocations by international organizations (see Box 2).

In June 2001, the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) brought together representatives of governments, NGOs, the private sector, activist groups, and foundations to address the global epidemic. The session addressed the many facets of HIV/AIDS, including human rights and the epidemic's effects on public health and on social, economic, and other facets of development. The session led to the creation of a global HIV/AIDS and health fund, with a target of US\$9 billion to support integrated approaches to prevention, care, support, and treatment. The establishment of the fund helped refocus attention not only on HIV/AIDS, but also on two other important threats to international health: TB and malaria.

The Global Fund to Fight AIDS, Tuberculosis, and Malaria received almost US\$2 billion in pledges by May 2002 and had at least US\$800 million for disbursement in 2002. But international assistance must increase by 50 percent in 2003 just to meet the

growing needs. In 2001, the UNGASS Declaration of Commitment stated that low- and middle-income countries need between US\$7 billion and US\$10 billion annually for HIV/AIDS prevention, care, treatment, and support and for mitigating the broader impact of the epidemic. About half of the estimated resource needs are for prevention and about half are for the care and support of people living with HIV/AIDS.⁷²

At least one-third of the resources required are anticipated to come from the governments of affected countries. The remaining two-thirds—about US\$6 billion—are expected to come from international donors, nongovernmental organizations, and the private sector. The international community is likely to increase HIV/AIDS spending to more than US\$2 billion in 2002, still far short of the amount anticipated by UNGASS. To achieve the programming goals for HIV/AIDS, funding must increase by 50 percent each year for the next four years. At the same time, the international health community requires resources to develop new and better treatments.

A new report suggests that about 29 million new infections could be averted by 2010 if, by 2005, the international community mobilizes a global response modeled after proven strategies to reduce HIV risk and vulnerability.⁷³

Search for a Vaccine

A safe, stable, efficacious, affordable, and accessible HIV vaccine would significantly enhance HIV prevention and help control the global epidemic. HIV vaccine development and testing has greatly accelerated over the last few years, but HIV researchers say that an ideal vaccine is at least seven to 10 years away because of many scientific, ethical, legal, and financial stumbling blocks. HIV infection and the human immune response are highly complex, and research and development are costly and time-consuming. In addition, there are no appropriate animal tests or alternate models for investigating possible vac-

The Barcelona HIV/AIDS Conference: Focusing on Treatment

In July 2002, more than 15,000 AIDS experts, scientists, activists, public health and development professionals, and people living with HIV/AIDS from 194 countries gathered in Barcelona, Spain, for the 14th International AIDS Conference. The conference opened with a sobering message: The worst of the global pandemic is yet to come. HIV prevalence is increasing even in many of the worst-affected countries in Africa and is spreading from high-risk groups into the wider population in many areas throughout the world.

As in previous international AIDS conferences, prevention was one of the attendees' primary goals, but the Barcelona conference also highlighted the need for the treatment, care, and support for those already infected or affected by HIV/AIDS. Part of this new focus reflected developments in therapy as well as a greater political commitment to HIV/AIDS treatment in less developed countries on the part of international donors, pharmaceutical companies, and national governments.

The predominant theme at the last international AIDS conference, which convened in Durban, South Africa, in July 2000, was the great disparity in AIDS prevention and treatment services available in more developed and less developed countries. In particular, the countries with the worst epidemics had little access to life-saving antiretroviral drugs (ARVs). Although a variety of barriers to ARVs' effective use and

distribution existed in many countries, the most insurmountable barrier appeared to be the cost of the drugs.

As the price of ARVs has fallen—from roughly US\$15,000 per year in 2000 to as little as US\$209 per patient per year—a number of programs have determined that these drugs can be effective in resource-poor settings.¹ As such therapies are developed, attendees agreed, it is essential that they be made available throughout the world, not just to patients in the more developed countries.

Among the actions discussed at the Barcelona conference were the expansion of AIDS prevention programs; expanded distribution of ARVs; use of a global arbiter for AIDS spending; and efforts to attract billions of dollars in AIDS assistance from more developed countries.² The next international AIDS conference, scheduled for 2004 in Bangkok, will provide an opportunity to assess the success of these efforts and to refine the strategies for the continuing battle against HIV/AIDS.

References

1. Campaign for Access to Essential Medicines, "Untangling the Web of Price Reductions: A Pricing Guide for the Purchase of ARVs for Developing Countries" (Geneva: Médecins Sans Frontières, 2002); and Paul Farmer et al., "Community-Based Approaches to HIV Treatment in Resource-Poor Settings," *Lancet* 358, no. 9279 (2002): 404.
2. David Brown, "AIDS Meeting Ends With Hope," *Washington Post* (July 14, 2002).

cines. Human clinical trials raise many ethical and legal issues, especially if the trials involve a fatal infectious agent like HIV.

More than 50 HIV-1 vaccine candidates were in development as of mid-2002. More than a dozen have been tested in human volunteers, but only one had progressed to large-scale, phase III efficacy trials by 2002.⁷⁴

If an effective HIV vaccine becomes available, the international community will need to address new challenges, including determining who will benefit the most from the vaccine and ensuring equitable access; understanding behavioral issues raised by a vaccine; developing new tests to differentiate between vaccine-induced and active HIV

Photo removed for
copyright reasons.

Children who have lost their parents through AIDS are often the victims of prejudice and neglect at the hands of their guardians and the community.

infection; and raising sufficient resources to deliver the vaccine.

Developing Microbicides

Millions of women around the world are not able to protect themselves from HIV infection. Most prevention strategies rely on monogamy, condom use, fewer sexual partners, and treatment of STIs. But many women are powerless to demand condom use. Even if a woman is monogamous, her husband may not be, and she risks HIV infection through her partner's other sexual relationships. And for some women, multiple sexual partners provide their only source of economic security. Treatment for STIs is often unavailable to women in less developed countries, and even when treatment is available, many women with STIs do not seek it because of the stigma attached to STIs or because they do not have symptoms suggesting they have an STI.

Microbicides would give these women much more control over their risk of infection. A microbicide is a substance—usually a gel, cream, or suppository—that can be applied to the vagina or rectum to prevent or substantially reduce the transmission of STIs or HIV. Microbicides can kill or immobilize the pathogen by creating a barrier between the pathogen

and the vagina or rectum or by preventing the pathogen from replicating once it has entered the cells.⁷⁵

A woman could use a microbicide if her partner does not use a condom; as an adjunct to condom use; and in the event of condom failure. Microbicides could be applied in advance of sexual intercourse and without the knowledge of the sexual partner.

The search for a microbicide effective against HIV suffered a major setback when a study in Cameroon showed that nonoxynol-9 (N-9), a widely used spermicide, did not provide protection against HIV and appeared to slightly increase the risk of transmission among frequent users. Some researchers believe that the frequent use of N-9 among trial participants may have led to vaginal microulcerations, which in turn increased the likelihood of transmission.⁷⁶

Presently, more than 50 microbicides are in various stages of development. Six of these are likely to be tested in large-scale clinical trials in the near future. The development of an effective and affordable microbicide would place HIV prevention in the hands of women and has the potential to avert between 2.5 million and 3.7 million infections over three years.⁷⁷

Improving Capacity

Prevention and treatment programs for the HIV/AIDS pandemic have been inadequate, small-scale, and fragmented in most countries, particularly in less developed regions. With few exceptions, the efforts have failed to slow the spread of the virus or to reduce the damaging effects of the pandemic. But public health and policy experts cite a number of strategies that could help meet the need for an expanded and comprehensive response.

Experts suggest that an effective response should include strategic planning, a multisectoral approach, and the active involvement of NGOs. Ideally, HIV/AIDS response programs should also include state-of-

the-art technical strategies; administrative and resource management plans that ensure adequate distribution of resources at the community level; development of human capacity, as well as technical and operational competence; and improvement in the management and supply of drugs and commodities. Program planners also need to anticipate the costs of expanded coverage, program evaluation, and future technological developments.

An expanded and comprehensive response also requires improving public- and private-sector capacity to expand care and treatment services, including new technologies such as HAART and vaccines. But the most critical challenge is the effective application of current technologies on a large enough scale to curb the epidemic, improve access to care and treatment, reduce stigma and discrimination for persons living with HIV/AIDS, and support and protect orphans and vulnerable children.

Serving AIDS Orphans

There is an urgent need to support and protect the children who have been orphaned by HIV/AIDS, especially in sub-Saharan Africa, where 90 percent of AIDS orphans live. Many are malnourished and are likely to be withdrawn from school when their guardians can no longer afford to pay for their education.⁷⁸ Orphans are more likely to be sexually abused and forced into exploitative situations because they often are emotionally vulnerable and financially dependent. Children who lack the support of relatives may live on their own in child-headed households. Some work to earn money even as they grieve for dead or ailing parents and struggle to cope with the social stigma and isolation associated with AIDS. Children orphaned by AIDS are also prone to discrimination, which can limit their access to health care, social services, and education.⁷⁹

Addressing the needs of orphans often includes providing material support, education and job training, and

medical care; and protecting their legal and human rights. These needs can be met by adequate national planning; development of comprehensive, cost-effective, and sustainable programs; mobilization of community resources; and the development of partnerships between public and private institutions.

While the individual efforts of countries are paramount, solving the crisis that children face as a result of HIV/AIDS will require the collective power of the global community. UNICEF states that a global response to the epidemic's impact on children should include declaring the orphan crisis a global emergency; providing needed resources to the most affected regions; exchanging information about successful experiences and projects to aid children and orphans; keeping Africa high on the development agenda; making AIDS a priority in poverty reduction through debt relief; supporting and promoting the Convention on the Rights of the Child; and highlighting the AIDS crisis, including orphans' issues, in sector-wide programs.⁸⁰

Protecting Human Rights

In the context of HIV/AIDS, human rights protections are critical for reducing vulnerability to HIV, protecting the dignity of persons affected by the virus, and sharing medical advances with less developed countries.

Much of the work to combat HIV/AIDS has focused on short-term interventions aimed at reducing risk behaviors. Equally important, but largely neglected, are efforts to alter civil, political, economic, social, or cultural factors that increase individuals' vulnerability to HIV.⁸¹ Sofia Gruskin and Daniel Tarantola argue that more attention needs to be given to the concept of societal "vulnerability reduction" via protection of human rights.

Women's rights are especially relevant to the fight against HIV/AIDS. Combating gender inequality tackles one of the root causes of the epidemic: women's inability to protect

Human rights protections are critical for reducing vulnerability to HIV.

themselves from HIV.⁸² AIDS experts have outlined several ways to enhance women's rights to reduce their vulnerability and exposure to HIV/AIDS, including promoting sexual responsibility among boys and men, developing female-controlled prevention methods such as microbicides, and increasing women's economic opportunities.

Violations of the rights of those living with HIV/AIDS have been documented worldwide and have included denial of medical care, breaches of the right to privacy, restriction of HIV/AIDS information for certain populations, and discrimination in employment and housing. Under international law, governments have obligations to respect, protect, and fulfill the human rights of people vulnerable to HIV, those living with HIV/AIDS, and those affected by the disease.

Especially relevant to the discussion of human rights in the context of AIDS is the right of people in less developed countries to have access to life-saving drugs. AIDS activists argue that lack of resources at the individual and national levels, inadequate health infrastructure, cost of drugs, patent rights, and protecting pharmaceutical companies' investments are no longer acceptable reasons for denying treatment access to AIDS patients in less developed countries.⁸³ Human rights groups, AIDS activists, people living with HIV, and civil and political leaders have joined in the call to make HIV-related treatments available and affordable to less developed countries. As a result, prices of antiretroviral drugs have dropped dramatically, therapies have been offered at cost or free to less developed countries, patent rights are being challenged and parallel importing is increasingly used, and resources are becoming available to provide treatment and care. Despite these changes, however, the vast majority of people living with HIV/AIDS in less developed countries will not have access to treatment.

Conclusion

HIV/AIDS has created a devastating human tragedy throughout the world and especially in resource-poor countries. Despite concerted efforts to curb the epidemic—and some success stories—HIV continues its relentless spread. The global community has failed to provide adequate care for millions of people currently living with HIV/AIDS. The availability of effective treatment technologies has been severely limited throughout the less developed world.

New technologies will certainly enhance HIV/AIDS prevention, care, and treatment. But the knowledge to effectively fight the epidemic already exists. What most countries lack are the will, the commitment, and the resources to implement effective programs.

It seems inconceivable that an infectious disease could so quickly reverse gains in health and development of the past five decades in less developed countries, but it is happening. It is even more astounding that the world has been so slow to react to the threat. Nelson Mandela, former president of South Africa, has pleaded for urgent action against AIDS, saying, "We must recognize that for most of the time the pandemic was spreading like wildfire, we were in a state of denial about HIV/AIDS."⁸⁴ And Dan Rather, anchor of CBS Evening News, noted, "Just as past generations asked why England slept in the years leading to World War II, we might one day ask why the affluent world slept during the greatest health calamity to befall Earth in the past seven centuries."⁸⁵

At the June 2001 UN General Assembly Special Session on HIV/AIDS, UN Secretary-General Kofi Annan made HIV/AIDS his personal priority and challenged the world to "define AIDS ... as a threat to our common future and as a test of our common humanity." Future generations will judge us on how well we meet this challenge.

References

1. Joint United Nations Programme on HIV/AIDS (UNAIDS), "Report on the Global HIV/AIDS Epidemic—July 2002," accessed online at www.unaids.org/barcelona/presskit/report.html, on July 8, 2002; and John Stover et al., "Can We Reverse the HIV/AIDS Pandemic With an Expanded Response?" *Lancet* 360, no. 9326 (2002): 73-77.
2. U.S. Agency for International Development (USAID), "Leading the Way: USAID Responds to HIV/AIDS" (Washington, DC: USAID, 2001).
3. Paul R. De Lay, Gunilla Ernberg, and Karen Stanecki, "Introduction," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamprey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): vii-xxv; and Peter Piot, "Halting the Spread of Global HIV/AIDS: The Future of U.S. Bilateral and Multilateral Responses," testimony to the Committee on Foreign Relations, U.S. Senate, Washington, DC, Feb. 13, 2002.
4. Piot, "Halting the Spread of Global HIV/AIDS."
5. International Labor Organization (ILO), *An ILO Code of Practice on HIV/AIDS and the World of Work* (Geneva: ILO, 2001).
6. Daniel Tarantola, "Reducing HIV/AIDS Risk, Impact, and Vulnerability," *Bulletin of the World Health Organization* 78, no. 2 (2000): 236-37.
7. Geeta Rao Gupta, "How Men's Power Over Women Fuels the HIV Epidemic," *British Medical Journal* 324, no. 7331 (2002): 183-84.
8. Peter K. Lamprey, Kristen Ruckstuhl, and Willard Cates, "HIV/AIDS Evolving Impact on Global Health," in *Dawning Answers: How the HIV/AIDS Epidemic Has Strengthened Public Health*, ed. Ron Valdiserri (New York: Oxford University Press, 2002).
9. UNAIDS, "Women and AIDS: UNAIDS Point of View" (Geneva: UNAIDS, 1997).
10. Cynthia A. Gómez and Barbara V. Marín, "Gender, Culture, and Power: Barriers to HIV-Prevention Strategies for Women," *Journal of Sex Research* 33, no. 4 (1996): 355-62.
11. Charlayne Hunter-Gault, "Infant Rape Crisis Jolts South Africa," CNN Johannesburg Bureau, Dec. 12, 2001, accessed online at www.cnn.com/2001/WORLD/africa/12/10/infant.rape/, on Feb. 20, 2002.
12. USAID, UNICEF, and UNAIDS, "Children on the Brink: A Report on Orphan Estimates and Program Strategies," accessed online at www.unaids.org/barcelona/presskit/childrenonthebrink.html, on July 10, 2002.
13. Gabriel Rugalema, "It Is Not Only the Loss of Labor: HIV/AIDS, Loss of Household Assets, and Household Livelihood in Bukoba District, Tanzania," in *AIDS and African Smallholder Agriculture*, ed. Gladys Mutangadura, Helen Jackson, and Duduzile Mukurazita (Harare, Zimbabwe: SAFAIDS, 1999).
14. UNICEF, UNAIDS, and World Health Organization (WHO), "Young People and HIV/AIDS: Opportunity in Crisis," accessed online at www.unicef.org/pubsgen/youngpeople-hiv/aids/youngpeople-hiv/aids.pdf, on July 16, 2002.
15. Arletty Pinel, Gary Svenson, and Hilary Hughes, "Youth Intervention Programs," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamprey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001).
16. UNICEF, UNAIDS, and WHO, "Young People and HIV/AIDS: Opportunity in Crisis."
17. Theodore de Bruyn, "HIV/AIDS and Discrimination: A Discussion Paper" (Montreal: Canadian HIV/AIDS Legal Network and Canadian AIDS Society, 1999); and International Center for Research on Women, "Addressing HIV-Related Stigma and Discrimination: A Collaborative Project of the International Center for Research on Women, the CHANGE Project, and Local Partners," accessed online at www.icrw.org/projects/hivrelatedstigma/hivrelatedstigma_bulletin.htm, on Feb. 6, 2002.
18. Ian Fisher, "Stigma of AIDS Strong in Ukraine," *New York Times*, Jan. 23, 2002.
19. De Bruyn, "HIV/AIDS and Discrimination: A Discussion Paper."
20. UNICEF, UNAIDS, and WHO, "Young People and HIV/AIDS": 10.
21. Laurie Garrett, "Grim Report on AIDS Epidemic," *Newsday*, July 3, 2002, accessed through LexisNexis on July 3, 2002; and Karen Stanecki, *The AIDS Pandemic in the 21st Century*, draft report presented at the XIV International Conference on AIDS, Barcelona, July 2002, accessed online at www.usaid.gov/pop_health/aids/Publications/docs/aidsdemoimpact.pdf, on July 12, 2002.
22. Sam Okware et al., "Fighting HIV/AIDS: Is Success Possible?" *Bulletin of the World Health Organization* 79, no. 12 (2001): 1113-19; and Justin O. Parkhurst, "The Ugandan Success Story? Evidence and Claims of HIV-1 Prevention," *Lancet* 360, no. 9326 (2002): 78-80.
23. UNAIDS, "AIDS Epidemic Update: December 2001," accessed online at www.unaids.org/worldaidsday/2001/Epiupdate2001/Epiupdate2001_en.pdf, on July 8, 2002.
24. UNAIDS, "AIDS Epidemic Update: December 2001."

25. "AIDS in South Africa," *NewsHour With Jim Lehrer* (Dec. 2, 1998), accessed online at www.pbs.org/newshour/bb/health/july-dec98/aids_12-2.html, on July 17, 2002.
26. UNAIDS, "Report on the Global HIV/AIDS Epidemic."
27. UNAIDS, "Report on the Global HIV/AIDS Epidemic"; and Monitoring the AIDS Pandemic (MAP) Network, "The Status and Trends of HIV/AIDS/STI Epidemics in Asia and the Pacific" (2001), accessed online at www.unaids.org/hivaidsinfo/statistics/MAP/MAP2001FINAL.doc, on July 22, 2002.
28. UN Theme Group on HIV/AIDS in China, "HIV/AIDS: China's Titanic Peril" (June 27, 2002), accessed online at www.unaids.org/whatsnew/newadds/AIDSchina2001update.pdf, on July 17, 2002.
29. UNAIDS, "Report on the Global HIV/AIDS Epidemic": 40-41.
30. U.S. Centers for Disease Control and Prevention (CDC), "HIV Incidence Among Young Men Who Have Sex With Men—Seven U.S. Cities, 1994–2000," *MMWR Weekly* 50, no. 21 (2001): 440-44.
31. Associated Press, "HIV Infection Rates Increase Among B.C. Men," Feb. 17, 2002.
32. UNAIDS and WHO, "HIV Causing Tuberculosis Cases to Double in Africa," accessed online at www.unaids.org/whatsnew/press/eng/pressarc01/TB_240401.html, on Feb. 18, 2002; WHO, "Tuberculosis: Fact Sheet N104," accessed online at www.who.int/inf-fs/en/fact104.html, on Jan. 4, 2002; and UNAIDS, "World TB Day 2001: Access to TB Cure a Human Rights Imperative," accessed online at www.unaids.org/whatsnew/press/eng/pressarc01/TB_220301.html, on Jan. 4, 2002.
33. UNAIDS, *Tuberculosis and AIDS: UNAIDS Point of View* (Geneva: UNAIDS, 1997): 3-4.
34. UNAIDS, *Tuberculosis and AIDS*: 3-4.
35. WHO, "Scaling Up the Response to Infectious Diseases: Health Services," accessed online at www.who.int/infectious_disease_report/2002/healthservices.html, on July 23, 2002.
36. UNAIDS, "AIDS and Population," accessed online at www.unaids.org/fact_sheets/files/Demographic_Eng.html, on July 12, 2002.
37. Anthony Kinghorn, Malcolm Steinberg, and Alan Whiteside, "Responding to the Socioeconomic Impact of HIV/AIDS," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 55-84.
38. World Bank, *Confronting AIDS: Public Priorities in a Global Epidemic* (Washington, DC: Oxford University Press, 1997); and John Stover and Lori Bollinger, *The Economic Impact of AIDS* (Washington, DC: The Futures Group, March 1999): 8.
39. World Bank, *Intensifying Action Against HIV/AIDS in Africa: Responding to a Development Crisis* (Washington, DC: The World Bank, 1999): 15; and Bertil Egerø, Mikael Hammarskjöld, and Lise Munck, *AIDS: The Challenge of This Century* (Geneva: Swedish International Development Cooperation Agency, 2000).
40. UNAIDS, "HIV/AIDS, Food Security, and Rural Development: Fact Sheet" (Geneva: UNAIDS, 2001); and Food and Agriculture Organization (FAO), "The Impact of HIV/AIDS on Food Security," accessed online at www.fao.org/docrep/meeting/003/y0310e.htm, on Feb. 2, 2002.
41. FAO, "AIDS—A Threat to Rural Africa: Fact Sheet," accessed online at www.fao.org/focus/e/aids/aids6-e.htm, on Jan. 22, 2002.
42. FAO, "Food Insecurity and AIDS: A Vicious Circle," accessed online at www.fao.org/focus/e/aids/aids2-e.htm, on Jan. 22, 2002.
43. Jon Jeter, "AIDS Sickening African Economies," *Washington Post*, Dec. 12, 1999.
44. World Bank, *Intensifying Action Against HIV/AIDS in Africa*: 14-15; and Pia Malaney, "The Impact of HIV/AIDS on the Education Sector in Southern Africa" (Cambridge, MA: Harvard Institute for International Development, 2000).
45. UNAIDS, "AIDS Epidemic Update: December 2001"; and Michael J. Kelly, "The Encounter Between HIV/AIDS and Education" (Lusaka, Zambia: University of Zambia, unpublished paper, 2000): 11.
46. Peter Badcock-Walters, "Managing the Impact of HIV/AIDS in Education in KwaZulu Natal: A Presentation to the National Teacher's Union Advocacy Conference on HIV/AIDS," accessed online at www.und.ac.za/und/heard/publications/EducationImpact_June2000.pdf, on Jan. 25, 2002.
47. Miriam Lyons, "The Impact of HIV and AIDS on Children, Families, and Communities: Risks and Realities of Childhood During the HIV Epidemic," accessed online at www.undp.org/hiv/publications/issues/english/issue30e.html, on July 17, 2002; and Mattias Lundberg, Mead Over, and Phare Mujinja, "Sources of Financial Assistance for Households Suffering an Adult Death in Kagera, Tanzania" (Washington, DC: World Bank, 2000).
48. Nathalie Béchu, "The Impact of AIDS on the Economy of Families in Côte d'Ivoire: Changes in Consumption Among AIDS-Affected Households," in *Confronting AIDS: Evidence From the Developing World: Selected Background Papers for the World Bank Policy Research Report*, ed. Martha Ainsworth, Lieve Fransens, and Mead Over (Brussels, Belgium: European Commission, 1998): 341-48.

49. A.K. Nandakumar, Pia Schneider, and Damascene Butera, "Use and Expenditures on Out-patient Health Care by a Sample of HIV-Positive Individuals in Rwanda," paper presented at the International AIDS Economic Network (IAEN) Symposium on the Economics of AIDS, Durban, South Africa, July 7, 2000; and Sumalee Pitayanon, Sukhontha Kongsin, and Wattana S. Janjareon, "The Economic Impact of HIV/AIDS Mortality on Households in Thailand," in *The Economics of HIV and AIDS*, ed. David Bloom and Peter Godwin (Delhi, India: Oxford University Press, 1997): 53-101.
50. UNAIDS, "HIV/AIDS and Development: Fact Sheet" (Geneva: UNAIDS, 2001).
51. Kelly, *The Encounter Between HIV/AIDS and Education*: 13; and Office of National AIDS Policy (ONAP), "Report on the Presidential Mission on Children Orphaned by AIDS in Sub-Saharan Africa: Findings and Plan of Action" (Washington, DC: The White House, 1999): 8, 10.
52. World Bank, *Intensifying Action Against HIV/AIDS in Africa*: 15; and World Bank, *Confronting AIDS*.
53. Robert Colebunders et al., "Management of HIV Disease and Its Complications in Resource-Constrained Settings," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 603-29.
54. UNAIDS, "Preventing HIV/AIDS."
55. Daniel T. Halperin and Robert C. Bailey, "Male Circumcision and HIV Infection: 10 Years and Counting," *Lancet* 35, no. 9192 (1999): 1813-15; and Helen D. Gayle and Peter Lamptey, "Future Challenges in HIV Prevention and Care," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helen D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 679-788.
56. UNAIDS, "Preventing HIV/AIDS."
57. Universities of Nairobi and Manitoba, "The STD Project, Sex Workers Intervention Programs" (Nairobi, Kenya: Universities of Nairobi and Manitoba, 2001).
58. Cambodia Ministry of Health, Cambodia Sentinel Surveillance, in collaboration with National Center for HIV/AIDS, Dermatology and STD (NCHADS), and Family Health International, 2000 HSS Survey (2001); and UNAIDS, "STI/HIV: 100% Condom Use Programme for Sex Workers," accessed online at www.unaids.org/bestpractice/digest/files/condoms.html, on July 31, 2002.
59. UNICEF, "Domestic Violence Against Women and Girls," *Innocenti Digest*, no. 6, June 2000 (Florence, Italy: UNICEF Innocenti Research Centre, 2000); and AIDS Consortium, *Vulnerability of the Girl Child to HIV/AIDS*. Report of a seminar organized by the Working Group on Children and HIV/AIDS of the United Kingdom NGO AIDS Consortium, London, England, November 1999.
60. UNAIDS, "STI/HIV: 100% Condom Use Programme For Sex Workers."
61. UNAIDS and WHO, *Consultation on STD Interventions for Preventing HIV: What Is the Evidence?* (Geneva: UNAIDS and WHO, 2000): 4.
62. Andrew Ball and Nick Crofts, "HIV Risk Reduction in Injection Drug Users," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 517-46.
63. Eve Lackritz and Brian McClelland, "Ensuring the Safety of Blood and Blood Products," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 477-500.
64. Isabelle de Vincenzi and Ehounou Ekpini, "Reducing the Risk of Mother-to-Child Transmission of HIV During Pregnancy and Delivery," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 427-50.
65. Ruth Nduati and Jay Ross, "Mother-to-Child Transmission of HIV Through Breastfeeding: Strategies for Prevention," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 451-75.
66. Voluntary HIV-1 Counseling and Testing Efficacy Study Group, "Efficacy of Voluntary HIV-1 Counseling and Testing in Individuals and Couples in Kenya, Tanzania, and Trinidad: A Randomized Trial," *Lancet* 356, no. 9924 (2000): 113-21.
67. Rachel Baggaley, Ignatius Kayawe, and David Miller, "Counseling, Testing, and Psychosocial Support," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 547-78.
68. Alison Grant, Jonathan Kaplan, and Kevin de Cock, "Preventing Opportunistic Infections Among Human Immunodeficiency Virus-Infected Adults in African Countries," *American Journal of Tropical Medicine and Hygiene* 65, no. 6 (2001): 810-21.

69. Colebunders, van Praag, and Perriens, "Management of HIV Disease and Its Complications in Resource-Constrained Settings."
70. Grant, Kaplan, and de Cock, "Preventing Opportunistic Infections Among Human Immunodeficiency Virus-Infected Adults in African Countries."
71. UNAIDS, "HIV/AIDS Financing Gap: Fact Sheet" (Geneva: UNAIDS, 2001).
72. B. Schwartländer et al., "Resource Needs for HIV/AIDS," *Science* 292 (2001): 2434-36.
73. John Stover et al., "Can We Reverse the HIV/AIDS Pandemic With an Expanded Response?" *Lancet* 360, no. 9326 (2002): 73-77.
74. Gayle and Lamptey, "Future Challenges in HIV Prevention and Care."
75. Global Campaign for Microbicides, "Facts About Microbicides," accessed online at www.global-campaign.org/about_microbicides.htm, on Feb. 11, 2002.
76. NIAID, "NIAID Evaluates N-9 Film as Microbicide," NIAID Press Release (April 3, 1997), accessed online at www.niaid.nih.gov/newsroom/releases/n9.htm, on July 23, 2002.
77. Zeda Rosenberg and George Brown, "Placing HIV Prevention in the Hands of Women: The Promise of Microbicides" (Arlington, VA: Family Health International, 2002).
78. UNICEF, "Children Orphaned by AIDS: Frontline Responses From Eastern and Southern Africa" (New York: UNICEF, 1999): 5.
79. UNAIDS, *Children and Young People in a World of AIDS* (Geneva: UNAIDS, 2001).
80. UNICEF, "Children Orphaned by AIDS": 5.
81. Sofia Gruskin and Daniel Tarantola, "HIV/AIDS, Health, and Human Rights," in *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*, ed. Peter R. Lamptey and Helene D. Gayle (Arlington, VA: Family Health International AIDS Institute, 2001): 661-78.
82. Gupta, "How Men's Power Over Women Fuels the HIV Epidemic."
83. Lamptey, Ruckstuhl, and Cates, "HIV/AIDS Evolving Impact on Global Health."
84. CNN, "Mandela Issues World AIDS Day Plea," Dec. 1, 2000, accessed online at www.cnn.com/2000/WORLD/europe/12/01/aids.events, on July 17, 2002.
85. Dan Rather, "Why do We Sleep as AIDS Epidemic Continues?" *Houston Chronicle*, March 4, 2002.

Suggested Resources

Dallabetta, Gina, Marie Laga, and Peter Lampthey, eds. *Control of Sexually Transmitted Diseases: A Handbook for the Design and Management of Programs*. Arlington, VA: Family Health International, 2001.

Global HIV Prevention Working Group. "Global Mobilization for HIV Prevention: A Blueprint for Action." Accessed online at www.gatesfoundation.org/global-health/hivaidstb/hivaids/hivprevreport_final.pdf, on July 30, 2002.

Goliber, Thomas. "The International Response to HIV/AIDS." Accessed online at www.prb.org/internationalresponseHIV, on July 23, 2002.

Joint United Nations Programme on HIV/AIDS (UNAIDS). *Report on the Global HIV/AIDS Epidemic—July 2002*. Geneva: UNAIDS, 2002.

Lampthey, Peter R. "Reducing Heterosexual Transmission of HIV in Poor Countries." *British Medical Journal* 324, no. 7331 (2002): 207-11.

Lampthey, Peter R., and Helene D. Gayle, eds. *HIV/AIDS Prevention and Care in Resource-Constrained Settings: A Handbook for the Design and Management of Programs*. Arlington, VA: Family Health International, 2001.

Lampthey, Peter R., Paul Zeitz, and Carol Larivee, eds. *Strategies for an Expanded and Comprehensive Response (ECR) to a National HIV/AIDS Epidemic: A Handbook for Designing and Implementing HIV/AIDS Programs*. Arlington, VA: Family Health International, 2001.

Stanecki, Karen. *The AIDS Pandemic in the 21st Century*. Accessed online at www.usaid.gov/pop_health/aids/Publications/docs/aidsdemoimpact.pdf, on July 12, 2002.

Stover, John, et al. "Can We Reverse the HIV/AIDS Pandemic With an Expanded Response?" *Lancet* 360, no. 9326 (2002): 73-77.

U.S. Agency for International Development (USAID), UNICEF, and UNAIDS. *Children on the Brink 2002*. Washington, DC: USAID, UNICEF, and UNAIDS, 2002.

World Health Organization. *Bulletin of the World Health Organization—Special Theme: HIV/AIDS* 79, no. 12 (2001).

Websites

Development Gateway, HIV/AIDS: www.developmentgateway.org/node/130640/

Family Health International, HIV/AIDS: www.fhi.org/en/aids/naids.html

HIV InSite Knowledge Base: <http://hivinsite.ucsf.edu/InSite.jsp?page=KB>

HIV/AIDS Survey Indicators Database: www.measuredhs.com/hivdata/start.cfm

Joint United Nations Programme on HIV/AIDS : www.unaids.org

Monitoring the AIDS Pandemic (MAP) Network: www.mapnetwork.org

U.S. Centers for Disease Control and Prevention, Divisions of HIV/AIDS Prevention: www.cdc.gov/hiv/pubs/facts.htm

U.S. Census Bureau International Programs, HIV/AIDS Surveillance: www.census.gov/ipc/www/hivaidsn.html

Population Reference Bureau (PRB)

Founded in 1929, the Population Reference Bureau is the leader in providing timely and objective information on U.S. and international population trends and their implications. PRB informs policymakers, educators, the media, and concerned citizens working in the public interest around the world through a broad range of activities, including publications, information services, seminars and workshops, and technical support. Our efforts are supported by government contracts, foundation grants, individual and corporate contributions, and the sale of publications. PRB is governed by a Board of Trustees representing diverse community and professional interests.

Officers

Michael P. Bentzen, *Chairman of the Board*

Partner, Hughes and Bentzen, PLLC, Washington, D.C.

Patricia Gober, *Vice Chairwoman of the Board*

Professor of Geography, Arizona State University, Tempe, Arizona

Peter J. Donaldson, *President*

Population Reference Bureau, Washington, D.C.

Montague Yudelman, *Secretary of the Board*

Senior Fellow, World Wildlife Fund, Washington, D.C.

Richard F. Hokenson, *Treasurer of the Board*

Director of Demographic Research, Credit Suisse First Boston, New York

Trustees

Jodie T. Allen, *Assistant Managing Editor, U.S. News & World Report, Washington, D.C.*

Patty Perkins Andringa, *Consultant and Facilitator, Bethesda, Maryland*

Pape Syr Diagne, *Director, Centre for African Family Studies, Nairobi, Kenya*

Bert T. Edwards, *Executive Director, Office of Historical Trust Accounting, Office of the Secretary, U.S.*

Department of the Interior, Washington, D.C.

James H. Johnson Jr., *William Rand Kenan Jr. Distinguished Professor and Director, Urban Investment*

Strategies Center, University of North Carolina, Chapel Hill, North Carolina

Terry D. Peigh, *Executive Vice President and Director of Corporate Operations, Foote, Cone and Belding,*

Chicago, Illinois

Francis L. Price, *Chairman and CEO, Q3 Industries and Interact Performance Systems, Columbus, Ohio*

Douglas Richardson, *Executive Director, Association of American Geographers, Washington, D.C.*

Gary B. Schermerhorn, *Managing Director of Technology, Goldman, Sachs & Company, New York*

Barbara Boyle Torrey, *Independent Writer and Consultant, Washington, D.C.*

Amy Ong Tsui, *Professor and Director, Bill & Melinda Gates Institute for Population and Reproductive*

Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland

Mildred Marcy, *Chairwoman Emerita*

Editor: Mary Mederios Kent

Production/Design: Tara Hall

The *Population Bulletin* is published four times a year and distributed to members of the Population Reference Bureau. *Population Bulletins* are also available for \$7 (discounts for bulk orders). To become a PRB member or to order PRB materials, contact PRB, 1875 Connecticut Ave., NW, Suite 520, Washington, DC 20009-5728; Tel.: 800-877-9881; Fax: 202-328-3937; E-mail: popref@prb.org; Website: www.prb.org.

The suggested citation, if you quote from this publication, is: Peter Lamptey, Merywen Wigley, Dara Carr, and Yvette Collymore, "Facing the HIV/AIDS Pandemic," *Population Bulletin* 57, no. 3 (Washington, DC: Population Reference Bureau, 2002). For permission to reproduce portions from the *Population Bulletin*, write to PRB, Attn: Permissions

Related PRB Publications

For more information on global population and health issues, here are several other PRB publications available in print or on our website:

New Population Policies: Advancing Women's Health and Rights,

by Lori S. Ashford, 2001

This *Population Bulletin* reviews the evolution of national population policies, particularly following the historic 1994 Cairo conference. It describes the new focus on improving reproductive health and women's rights and how governments have tried to incorporate this new approach in their policies and programs. (BUL56.1) \$7.00

Attaining Global Health: Challenges and Opportunities,

by Scott C. Ratzan, Gary L. Filerman, and John W. LeSar, 2000

This *Population Bulletin* looks at trends in health over the past century and identifies ways we can pursue better global health. The authors explore the many factors that determine health and stress the need for action from the individual to the international level. (BUL55.1) \$7.00

Conveying Concerns: Media Coverage of Women and HIV/AIDS,

compiled and edited by PRB staff, 2001

This report examines the effect of the global HIV/AIDS epidemic on women and girls from the perspective of women journalists. (IWOMED5ENG) \$5.00

2002 World Population Data Sheet,

by Carl Haub, 2002

PRB's popular *World Population Data Sheet* contains the latest population estimates, projections, and other key indicators for 200 countries. The *Data Sheet* includes measures of births, deaths, natural increase, infant mortality, life expectancy, HIV/AIDS prevalence, urban population, contraceptive use, and other indicators. (DS02WENG) \$4.50

To order PRB publications (discounts available):

Population Reference Bureau

1875 Connecticut Ave., NW, Suite 520

Washington, DC 20009

Phone: 800-877-9881

Fax: 202-328-3937

E-mail: popref@prb.org

Website: www.prb.org

Recent Population Bulletins

Volume 57 (2002)

No. 2 Poverty in America: Beyond Welfare Reform, by Daniel T. Lichter and Martha L. Crowley

No. 1 International Migration: Facing the Challenge, by Philip Martin and Jonas Widgren

Volume 56 (2001)

No. 4 Elderly Americans, by Christine L. Himes

No. 3 World Population Futures, by Brian O'Neill and Deborah Balk

No. 2 First Glimpses From the 2000 U.S. Census, by Mary M. Kent, Kelvin M. Pollard, John Haaga, and Mark Mather

No. 1 New Population Policies: Advancing Women's Health and Rights, by Lori S. Ashford

Volume 55 (2000)

No. 4 American Families, by Suzanne M. Bianchi and Lynne M. Casper

No. 3 An Urbanizing World, by Martin P. Brouckhoff

No. 2 America's Diversity and Growth: Signposts for the 21st Century, by Martha Farnsworth Riche

No. 1 Attaining Global Health: Challenges and Opportunities, by Scott C. Ratzan, Gary L. Filerman, and John W. LeSar

Volume 54 (1999)

No. 4 Population and Health: An Introduction to Epidemiology, 2d ed., by Ian R.H. Rockett

No. 3 America's Racial and Ethnic Minorities, by Kelvin M. Pollard and William P. O'Hare

No. 2 Immigration to the United States, by Philip Martin and Elizabeth Midgley

No. 1 World Population Beyond Six Billion, by Alene Gelbard, Carl Haub, and Mary M. Kent

Volume 53 (1998)

No. 4 Injury and Violence: A Public Health Perspective, by Ian R.H. Rockett

To read selected PRB publications, go to: www.prb.org