



United States Department of State

The Global AIDS Disaster: Implications for the 1990s

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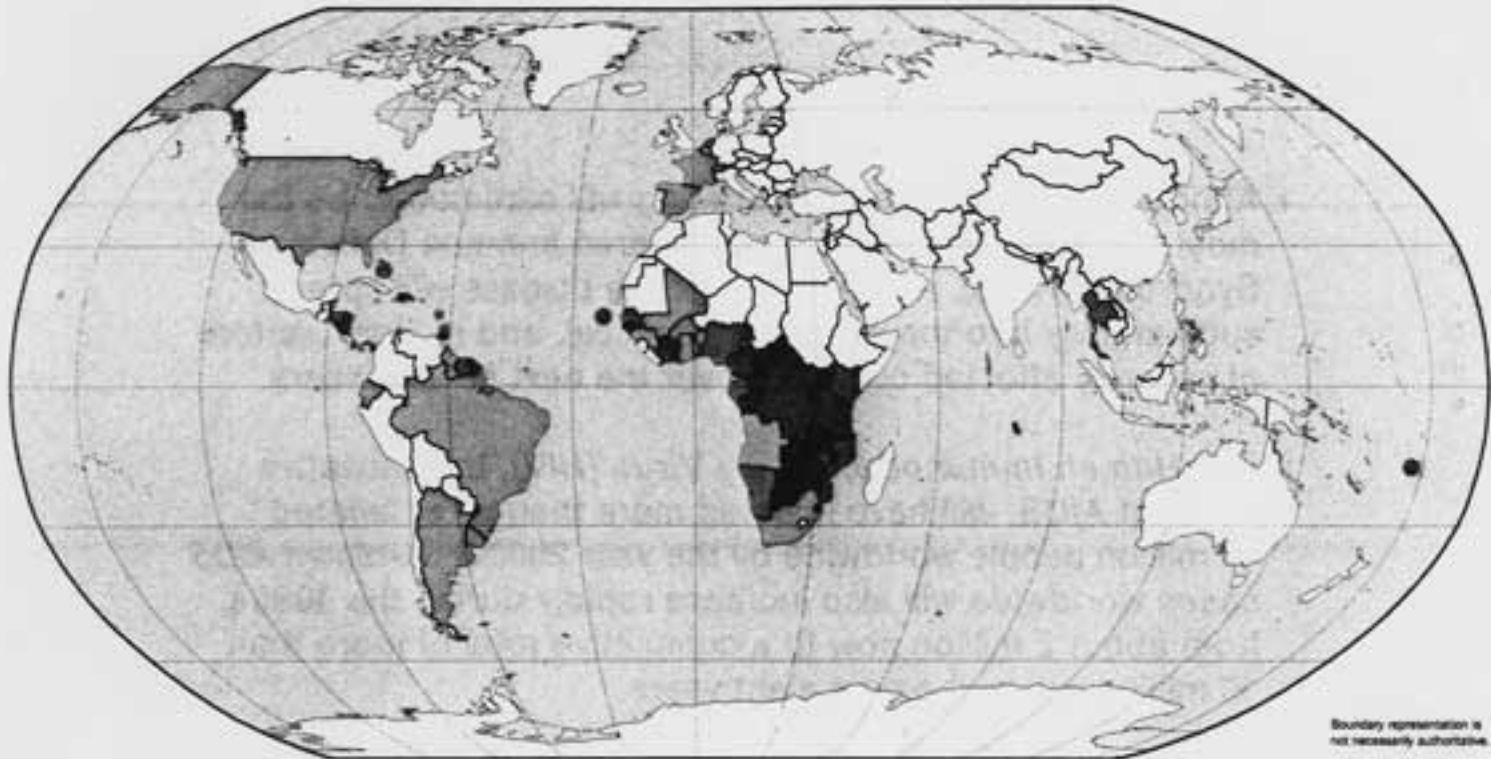
Executive Summary

The Global AIDS Disaster: Implications for the 1990s

- Although individual human suffering will continue to be the most significant implication of Acquired Immune Deficiency Syndrome (AIDS), ramifications of the disease will spread substantially into the economic, political, and military sectors of severely affected countries over the next several years.
- *The Human Immunodeficiency Virus (HIV)*, the causative agent of AIDS, will have infected more than an estimated 45 million people worldwide by the year 2000. Full-blown AIDS cases worldwide will also increase rapidly during the 1990s, from about 2 million now to a cumulative total of more than 10 million within the next eight years.
- Whatever the success of research on vaccines and treatment, the upward trend in AIDS cases through the mid-1990s will not be affected.
- Currently the problem is worst in Africa, but rapidly spreading infections in India, Brazil, and Thailand will contribute significantly.
- By any measure—deaths, number of people infected, economic cost—the impact of AIDS will be far greater in the 1990s than in the 1980s.
- Donor nations will face three basic foreign policy problems: how to allocate assistance for AIDS prevention, how to manage the testing and distribution of vaccines, and how to assist countries that are heavily afflicted with AIDS and that consequently undergo substantial socioeconomic and political change.

Figure 1

Human Immunodeficiency Virus (HIV): Rates of Infection per 100,000 Persons, 1 April 1992



Boundary representation is not necessarily authoritative.



500 to 1,000
Cape Verde
Dominican Republic
Yugoslavia
Gambia, The
Sudan
Morocco
Kenya
Mozambique
Namibia
Nigeria
Senegal
Switzerland
Thailand

200 to 500
Angola
Argentina
Bahamas, The
Belize
Benin

200 to 500 (continued)
Brazil
Burkina Faso
Ecuador
France
Ghana
Grenada
Guinea
Guyana
Mali
Martinique
Netherlands
Panama
South Africa
Spain
Switzerland
United States
Uruguay

Less than 200
All other countries

Summary

The number of AIDS cases worldwide will increase rapidly during the 1990s, from about 2 million as of early 1991 to a cumulative total of more than 10 million by the end of the century. The great majority of the new AIDS cases during the 1990s will occur in Sub-Saharan Africa, with North America a distant second. This increase is inevitable because about 12 million people have been infected with the virus that leads to AIDS, a figure expected to quadruple by the 2000.

Current preventive measures are not being used on a sufficient scale to halt the spread of the epidemic. There is no prospect for a "cure" for HIV infection. Even if an effective vaccine is devised within the next few years, technical and financial obstacles probably will limit its use and, thus, its impact on the spread of the disease. Whatever the success of any of these measures, the upward trend in AIDS cases through the mid-1990s will not be affected.

The AIDS epidemic is at its worst in Sub-Saharan Africa. At least 7 million Africans have been infected with the HIV. By the mid-1990s, the cumulative total probably will exceed 20 million HIV infections, and, beyond the year 2000, infection rates will be up to 40 percent for young-adult populations in many urban areas, with life expectancy at birth reduced by 15 years or more. The resulting explosion of AIDS cases will substantially weaken the political elites and damage the economies of the hardest hit countries. A greater portion of their limited budgets will have to be devoted to prevention and treatment. At the same time, the AIDS-induced economic decline may discourage foreign investment.

During the 1990s, AIDS in the Caribbean countries, as well as in Brazil, may proceed on a scale comparable to that in Africa, with similar dire results for the affected societies by the end of the decade. Thailand's early prevention programs, however, may slow

Data Deficiencies

No country has an accurate count of the number of people infected by the Human Immunodeficiency Virus. Much of the testing to date comprises small samples of high-risk groups, such as prostitutes and drug addicts, and is therefore unrepresentative of entire populations. Within countries, infection rates vary widely from region to region, further complicating the problem of generalizing from a small sample. Counting the number of Acquired Immune Deficiency Syndrome cases and AIDS-related deaths is also difficult, particularly since health care systems in many countries lack the required diagnostic ability. Moreover, some governments suppress what information they have. Further improvements in data collection will probably reveal a crisis of even greater magnitude than is portrayed in this study.

that country's epidemic. In India, AIDS is a major threat on the horizon, with the potential for a repetition of the African experience in 10 or 15 years.

Using any standard of measure—deaths, number of people infected, economic cost—the impact of AIDS will be much greater in the 1990s than it was in the 1980s. The resulting social and economic changes will force donor nations to make politically sensitive decisions regarding the prevention programs that they encourage and the aid they dispense.

The three basic foreign policy problems facing all donor nations are:

- *How to allocate assistance for AIDS prevention.* Anti-AIDS programs are most effective when started early in an epidemic, but most of the money now goes to countries where the disease is already well entrenched.
- *Managing the testing and distribution of a vaccine.* Political friction will arise as countries haggle over the terms for allowing tests to take place among their people and over access to vaccines.
- *Assisting with countries that are heavily afflicted with AIDS.* Achieving development objectives in less developed countries will be made much more difficult in AIDS-stricken countries.

As compared with the situation in the developing countries, the West is better equipped to combat AIDS. Nevertheless, HIV infection and AIDS will continue to spread there, but without reaching the epidemic proportions of Africa or the Caribbean.

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Basic Facts About Aids

Acquired Immune Deficiency Syndrome (AIDS), first identified in 1981, is the final stage of a viral infection caused by the Human Immunodeficiency Virus (HIV). Medical experts recognize two strains: HIV-1, discovered in 1983, which is generally accepted as the cause of most AIDS cases throughout the world; and HIV-2, discovered in West Africa in 1986 and later found in some former Portuguese colonies elsewhere and in Europe. HIV is a retrovirus: a virus that inserts—probably for life—its genetic material into the cells of the host at the time of the infection. Inasmuch as the ability to remove genetic material from cells is far beyond the capability of current medical science, the infection may be said to be incurable.

The Course of HIV Infection

Following infection with HIV, only the most sophisticated tests can detect its presence for the first weeks or months. After this period, the infected person's system begins producing antibodies to HIV, which blood testing can reveal. Such tests were first available in 1985 and vary as to their ability to detect HIV. About half the infected people will develop AIDS symptoms in less than 10 years, and some within five years. The incubation period can be lengthened with drug therapy. Death from AIDS usually occurs in one to two years; infants generally die more rapidly. Everyone infected with HIV will acquire AIDS, and AIDS is always fatal.

Transmission

Three main routes of transmission exist:

- *Contact with infected blood or blood products via transfusions, transplants, or shared needles.*
- *Sexual contact with an infected person.*
- *Infection of infants born to an infected mother.*

Preventive Measures

A contaminated blood supply is often the first sign of an incipient AIDS epidemic, and it is relatively easy to control. Donated blood must be tested for HIV, which is costly but feasible.

The next stage of an epidemic is often an increased prevalence of HIV infection among prostitutes, prisoners, or intravenous (IV) drug users. This is far more difficult to control, and few countries have taken meaningful steps to do so.

When the virus infects IV drug users, it spreads rapidly if needles are shared. Distributing needles free, as in the Netherlands, is one way of combating this, although there are differing claims as to the success and social desirability of such an approach.

The spread of HIV in the general population is typically very slow, yet potentially it is the source of far greater numbers of AIDS cases than in the smaller groups of IV drug users and male homosexuals. Once the infection is established in the general population, it spreads mainly by sexual contact and thus may be impossible to eradicate. Reducing the prevalence of other sexually transmitted diseases can slow the transmission but would require public health expenditures in developing countries far greater than any to date.

In addition to all of these steps, behavioral changes—less promiscuity and more frequent condom use—by large numbers of people are essential for effective control. The main programs to achieve this are dissemination of information and distribution of condoms. Many public health experts are pessimistic about the prospect that the necessary behavioral changes will occur. Some decry the lack of research into prevention measures that women could use, although tests of "barrier methods" for women are under way.

The Global AIDS Disaster: Implications for the 1990s

Introduction

About 12 million people have been infected with the Human Immunodeficiency Virus (HIV), which causes Acquired Immune Deficiency Syndrome (AIDS). Absent a cure or effective prevention measures, the number of people infected with the HIV will at least quadruple by the year 2000. This will lead to a rapid worldwide increase from about 2 million cases of AIDS now to a cumulative total of more than 10 million by the end of the century. The great majority of the new AIDS cases will occur in Sub-Saharan Africa, with North America a distant second.

After 1995, the number of AIDS cases will continue to grow. Current prevention programs will begin to pay off at the margin, but, by then, AIDS will be deeply entrenched in many countries. After 2000, the trend in AIDS deaths will depend crucially upon changes in behavior or whether a scientific breakthrough is made during the next several years. For the 1990s, however, the trend is fairly clear and virtually independent of new scientific progress—barring development of a drug that disables the virus.

However the impact of the disease is measured—by deaths, AIDS cases, or monetary losses—it is just beginning. The worldwide impact during the 1990s will be five to 10 times that of the 1980s. As this process unfolds, the United States will find itself progressively more involved with prevention programs and with the political changes that AIDS will bring about in the hard-hit countries.

A Time Bomb for the 1990s

Much of the difficulty in halting the spread of AIDS stems from the long incubation period of the disease. Unlike any deadly epidemic of the past,

AIDS takes years to develop after the initial infection. During this time, infected people can infect others.

This lengthy incubation makes it hard to detect early signs of an AIDS epidemic. In the absence of an outbreak of AIDS cases, countries rarely undertake the rigorous test sampling needed to accurately measure HIV prevalence. More commonly, recognition of the disease is delayed until the epidemic is well established, making preventive action far more difficult.

Indeed, AIDS is unstoppable in the short term. Because it takes an HIV infection so long to develop into AIDS, virtually all of the AIDS cases that occur during the next five years will be the result of existing infections. Therefore, the epidemic cannot be materially reduced in this time frame by any reduction in new HIV cases. Worldwide, millions of HIV infections are set to explode into AIDS during the 1990s.

The long incubation period probably contributed to initial overestimates of how fast AIDS would spread globally. In the early 1980s, many cases of AIDS went undetected. As AIDS became better understood, the number of individuals diagnosed increased much more rapidly than the rise in the actual number of cases. Some projections of these rising numbers of cases diagnosed resulted in astronomical forecasts for the late 1990s. By now, the number of cases diagnosed probably has about caught up with the number of actual cases in the industrial countries, but not yet in the Third World.

AIDS Is Now Global

The great majority of the new AIDS cases during the 1990s will occur in Sub-Saharan Africa, with North America a distant second. This is simply a

AIDS: The New Plague?

Bubonic plague—the “black death”—is the best known of the earlier pandemics. It first appeared in the sixth century, then in the 14th, when it killed 20 million people in Europe, a quarter to a third of the population. Its last major appearance in England was the Great Plague of 1665, described in Defoe’s Journal of the Plague Year. France underwent its last epidemic in 1720. Later outbreaks occurred in Asia, Africa, and, as recently as 1983, in the United States.

The impact of Acquired Immune Deficiency Syndrome (AIDS) may not approach the historical significance of the black death. By

killing some of the rich and many of the poor, the plague helped end the feudal system. Serfs inherited or occupied estates whose owners had died. Peasant revolts and severe labor shortages made workers more mobile; many moved to towns, forming the nucleus of the urban middle class. Some historians argue that the black death ended wars everywhere in Europe and, by weakening Viking settlements in Greenland and Finland during one of its early surges, set back Europe’s reach toward the New World.

AIDS differs from the plague in several important ways:

AIDS

Incubation period lasts up to 10 years or more. Infection likely to persist in large parts of the world’s population.

Spread primarily by sexual contact or needle sharing. Prevention efforts aim at public awareness and behavior change. Other measures are of secondary importance so far.

Natural immunity uncertain, not yet observed.

Vaccines at early stage of development, no cure.

Bubonic Plague

Illness comes on quickly, spreads rapidly, disappears only to recur episodically.

Spread by rodent fleas. Personal measures for protection were not known, but public health measures are now effective.

Rodent and human populations build natural immunity upon exposure.

Vaccine now available, can be cured if treated quickly.

projection of the location of current HIV infections: about two-thirds in Africa and one-tenth in North America.

Elsewhere, the AIDS epidemic generally is in an earlier stage, though practically every country has reported the presence of AIDS, and some have several thousand cases. The Caribbean has some

of the highest infection rates in the world. In some countries—India, Brazil, and Thailand, for example—the infection rate is comparatively low overall but quite high among certain segments of the population and growing rapidly with little to impede it.

During the 1990s, 35 million people or more will become infected, in addition to an estimated 12 million infected to date. About 85 percent of the new infections will occur in developing countries, mainly in Africa. The epidemic will spread fastest in Asia and South America, setting the stage for a large increase in AIDS cases after the year 2000.

AIDS in the Industrial Countries

Industrial countries have important advantages over developing countries in combating AIDS:

- *Greater literacy.* This makes publicity campaigns more effective, facilitating the spread of knowledge necessary to avoid infection.
- *Financial resources.* AIDS prevention campaigns are expensive. They require widespread blood testing, education programs, well-developed epidemiologic systems, and other costly measures.
- *Lower prevalence of sexually transmitted diseases (STDs).* A person already infected with an STD, such as gonorrhea or syphilis, may be as much as 10 times more likely to contract the HIV from a sexual contact with an infected person than is a person without an STD.

The situation in the industrial countries, however, is favorable only in comparison with Africa and some other places in the developing world. Western Europe as a whole reports some 64,000 cumulative AIDS cases; Switzerland, for example, with a population of 6.9 million, has had more than 1,000 AIDS deaths. The epidemic in Western Europe afflicts mainly homosexuals as well as a growing number of intravenous drug users. Many IV drug users in Eastern Europe—notably in Poland and Yugoslavia—have also been infected, although overall rates are much lower than in the West. The main source of AIDS in Eastern Europe and the former Soviet Union has been the government health care infrastructure, which has unwittingly infected patients through the practice of reusing needles.

The mid-1990s will see great increases in AIDS cases in many industrial countries, given the extent of today's HIV infections. Beyond that, and into the next century, the outlook is mixed. While some affected groups have made substantial behavioral changes (US homosexuals, for example), other groups (IV drug users and, in some countries, heterosexuals) are at risk of accelerating infection rates. HIV infection among these groups is characterized by rapid spread, then saturation. Among heterosexuals in industrial countries, there is likely to be a very slow buildup, but ultimately many more AIDS cases than in the smaller cohorts of homosexuals and IV drug users. AIDS will affect people in every demographic group, but it will remain predominantly a disease of the poor, who are prone to riskier behavior regarding drugs and sex and have less access to preventive and therapeutic care.

AIDS will be a growing concern in industrial countries. The major issues will focus on health care cost—which will grow rapidly in the 1990s—and equity in benefits and burdens. Should an effective vaccine or treatment be discovered, questions will arise over how rapidly and cheaply it will be made available, and over the patent rights and liability of drug manufacturers.

AIDS in the Developing Countries

Without the industrial countries' advantages, the developing countries will be far more vulnerable to AIDS. The disease will bring fundamental changes in the economic structure of those countries where it is widespread.

Impact on the Work Force. The years of highest economic productivity coincide with the age groups of highest infection rates. Workers will begin succumbing to the disease in the greatest numbers just as they finish their education or apprenticeships and enter their most productive years.

Regional Trade. Governments may come under pressure to "protect" their citizens by restricting the free flow of labor from countries that have higher rates of infection than in their own. Foreign investment will also be hurt. In Africa, Western investors may see AIDS as a reason to put their money elsewhere. Expatriate workers from industrial countries may prove increasingly reluctant to come to AIDS-stricken countries.

Health Care Expenditures. It is not clear just how much governments or international organizations will choose to spend on care for AIDS sufferers. The harsh reality is that most victims will receive little treatment beyond home care. Ameliorating drugs like AZT are beyond the reach of all but the most wealthy. Many in Africa die of AIDS without even being tested for HIV infection. The ELISA test costs about \$5 to administer. The Western Blot test, which is used to confirm a positive ELISA test, costs about \$35. To put this in perspective, the entire annual health budget for Ivory Coast is about \$10 per person, high for Africa.

Education and Training. AIDS could ruin a nation's strategy of higher education. As AIDS reduces school graduates' working lives, the pay-off to investment in education is greatly reduced. Policymakers will face the grim question: why spend money training people who are likely to die before the cost of specialized instruction can be recouped? This consideration applies not only just to those who are infected, but also to the entire cohort of young people *likely* to become so.

Impact on Elite Groups. Elites in Africa, with greater access to travel and multiple sex partners, are afflicted by AIDS in increasing numbers, with negative consequences for filling skilled jobs and for national economic productivity. Whether this trend will continue or whether elites will change their high-risk behavior is unclear. Also unclear is the susceptibility of elites in other parts of the Third World. The urban base and risky behavior of most elites, however, lead to speculation that the African pattern will be repeated elsewhere.

Impact on Military Personnel. Screening in many countries of soldiers and recruits for the HIV has turned up high rates of infection. This has implications for national security and for the ability of some rulers to maintain their hold on power, mainly in Africa at present, but possibly elsewhere in time.

Revenues From Tourism. Revenues from tourism comprise 4 to 5 percent of GNP in Kenya and Thailand, and more than 20 percent in some Caribbean countries. In Haiti, tourism was virtually wiped out when the country became associated with the disease, though tourists' fear of violence played a role too. Tourist visits fell from 70,000 to 10,000 a year. Some of the sizable decline in Kenya's tourism is ascribable to foreign fears of AIDS. Thailand's tourism is also threatened because its sex industry is a major attraction.

For these reasons, AIDS will be a huge drain on the economies of highly infected countries. Moreover, the epidemic will not alleviate problems stemming from rapid population growth. Development policies of the past several decades may be undercut or reversed; donors will feel obliged to reexamine their assistance policies to determine whether to redirect their aid to—or away from—AIDS-ridden countries.

Political Instability. AIDS may in time undermine political stability in some countries as key officials succumb to the disease. AIDS will generate a search for scapegoats that will focus on leaders who fail to stop the epidemic. Leaders who themselves contract the disease may undergo behavioral change secondary to "AIDS dementia." Corruption may worsen as elites attempt to accumulate more wealth for their heirs at public expense in countries where this is possible. Leaders' illnesses may lead to power struggles among would-be successors.

The Epidemic Has Limits

Epidemics typically reach a point of "saturation" whereby incidence levels off at well under 100 percent of the population. This happens because some people either are naturally immune or avoid exposure to the disease. Thus, Acquired Immune Deficiency Syndrome will not wipe out entire populations, but the point of saturation for the Human Immunodeficiency Virus probably varies substantially from population to population and cannot be predicted with any precision.

Africa: Getting Worse

The AIDS epidemic is at its worst in Sub-Saharan Africa. HIV infection was well established there by the early 1980s, and until recently little was done to slow its spread. At least 7 million of the 575 million Sub-Saharan Africans are already infected with the HIV, and, by the mid-1990s, the cumulative total probably will exceed 20 million. The number of AIDS cases will grow apace, well into the millions this decade.

The African Response: Too Little, Too Late

In 1990, about \$150 million was spent on AIDS prevention in Africa, nearly all of it coming from the World Health Organization's (WHO) Global Program on AIDS and other foreign donors. However, even this modest level of effort is very recent and will have only a marginal effect on the spread of HIV infection. Africans are not changing their sexual behavior fast enough to affect the course of the epidemic, even though the basics of HIV transmission have now been widely publicized.

Few African political leaders now put the full force of government into the fight, and fewer still share the medical professionals' sense of urgency. For example, in one African country with high and rising infection rates, the Minister of Health downplayed the threat; only after his replacement last year—and subsequent death from AIDS—did the government embark on an aggressive prevention program. In another country with one of the world's worst epidemics, the President has been under considerable political pressure not to encourage condom use despite awareness of their efficacy.

However, during the June 1992 meeting of the Organization of African Unity, an action plan to address HIV/AIDS passed unanimously, suggesting that African leaders are accepting the need to promote prevention programs.

Grim Future: A Changed Continent

Infection rates are rising almost everywhere and are particularly high in cities and certain countries. Botswana, Central African Republic, Malawi, Uganda, Zambia, and Zimbabwe all have HIV infection rates exceeding 5 percent of the population. In a variety of subgroups in these and other African countries, infection rates of 40 or 50 percent have been recorded. Nigeria, the continent's most populous country (90 million), has recently acknowledged that 750,000 are infected—probably a substantial underestimate.

Without an effective vaccine or widespread behavioral change, the virus beyond the year 2000 is likely to infect 10 to 30 percent of the Sub-Saharan African population. Infection rates could reach 40 percent for young-adult age groups in many urban areas. Life expectancy at birth could be reduced by 15 years or more.

Some African economies will be stunted by AIDS, for reasons discussed above. In particular, foreign investment in Africa, now only a tiny fraction of world investment, may dry up almost entirely later this decade in countries where AIDS is widespread. Foreign companies may substantially reduce their operations out of fear for the health of their personnel and in recognition of worsening performance of African economies.

Will Africa's Experience Be Repeated Elsewhere?

Conditions in Africa that contributed to the AIDS disaster included sexual behavior patterns conducive to the spread of HIV infection, high incidence of STDs, nonuse of condoms, governmental inattention to the problem in its early years, and contaminated blood supplies in some places. Wherever such conditions prevail, the African experience is likely to be repeated.

In certain Latin American and Asian countries, conditions resemble those of Africa. There, the future course of AIDS threatens to follow Africa's

path. Elsewhere, the outlook for the 1990s is better, for two reasons: the slow-moving epidemic is in an earlier stage, and conditions that govern the spread of AIDS range from somewhat better to much better than in Africa. However, the potential number of AIDS cases in newly infected countries is enormous. For example, Brazil and India together have almost twice the population of Sub-Saharan Africa.

Other AIDS Hotspots Around the Globe

Thailand

Thailand is the most AIDS-prone country in Southeast Asia, according to the WHO, mainly because of widespread prostitution and IV drug use. Estimates range as high as 400,000 in a population of 57 million. Recent projections indicate that more than 1 million and up to 3 million could be infected by 2000. A study by the Thai Development Research Institute puts the potential losses in the billions of dollars by the mid-1990s.

The government recognizes the problem and has launched large-scale programs to counter it, including systematic surveys for those infected, education efforts, and promotion of condom use. Critics say the program is too small and disorganized, but it appears that some behavioral changes have been made. Debate still rages over what, if anything, to do about the sex industry, which is a major source of foreign exchange. A former Prime Minister described prostitution and AIDS as two of Thailand's greatest problems.

Brazil

Estimates of the number of Brazilians infected with the HIV range from 500,000 to 1.5 million in a population of more than 160 million. The spread of the disease will at least double the number of infections by the mid-1990s.

Brazilian authorities need an adequate picture of the overall problem. Screening for HIV infection is minimal, and the number of unknown AIDS cases is likely to be many times greater than published figures. A large proportion of prostitutes in Recife and Rio de Janeiro is believed to be infected, and IV drug use is a growing urban problem. The city of Santos may have a 5-percent overall infection rate. Rates are reportedly over 50 percent in Brazil's prisons. Prevalence rates among new military

Modeling the Future of Aids in Brazil and Thailand

According to the results of an epidemiological-demographic model using data from Brazil and Thailand, AIDS will grow steadily in those countries.*

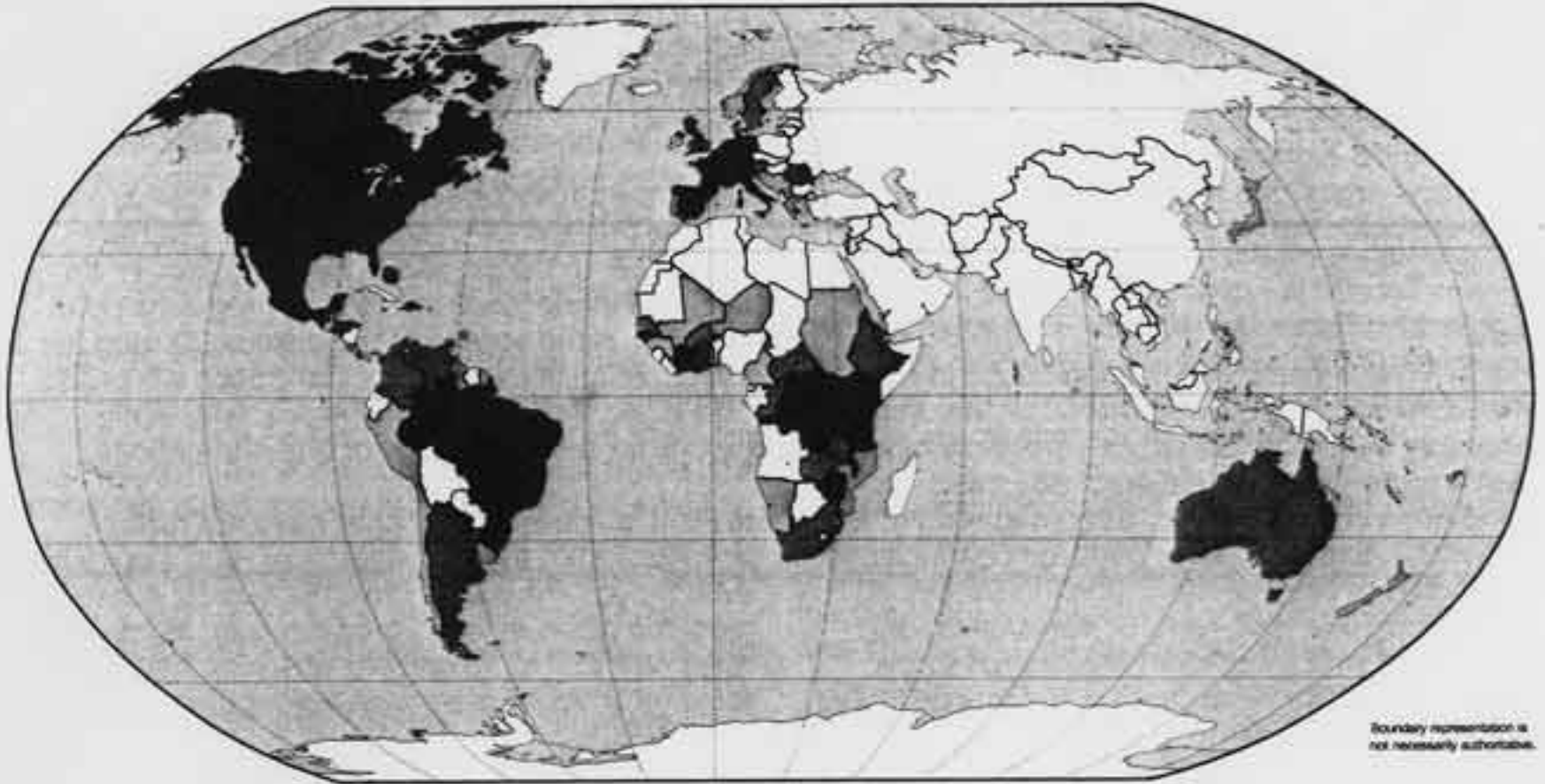
These particular simulations assume no changes in personal behavior and no vaccines. Should prevention programs be effective, the growth of the disease would be less.

The model divides populations into rural and urban components. If urban-rural contact is limited, the epidemic's growth will vary from region to region within each country. The disease also spreads at radically different rates among various groups: among IV drug users, infection rates can near 100 percent in only a few years, depending on assumptions about transmission. Rates among prostitutes and their frequent clients typically grow somewhat less rapidly. Among heterosexuals who have few extramarital sexual contacts, the disease spreads very slowly.

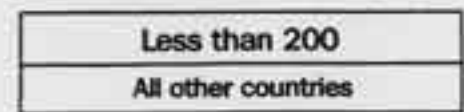
The model's simulations of public health intervention strategies strongly suggest that early intervention is vital to successful prevention strategy. Once HIV infection is well established, the cost-effectiveness of intervention falls substantially. These simulations also indicate how long it takes for intervention to have visible impact. Because of the time lags involved, as well as technical and financial constraints, it takes five or more years before even the most assiduous preventive measures achieve measurably lower infection rates.

* A computer model is being developed as part of a US Government research program conducted under the auspices of the Interagency Working Group on Acquired Immune Deficiency Syndrome (AIDS), chaired by the Department of State. These results are being updated as new and better data are obtained.

Figure 2
AIDS Cases as Reported to World Health Organization (WHO), 1 April 1992



Boundary representation is not necessarily authoritative.



conscripts are not well established, since testing is infrequent, but the rate is increasing and is apparently much greater than in the general population.

Brazil's program to increase condom availability distributes about 6 million per year, and the program suffers from erratic supply and distribution. Although WHO figures show Brazil to have the world's third-highest number of AIDS cases, some Brazilians argue that the figures overstate the problem since the number is small in relation to Brazil's population.

India

The WHO estimates 250,000 infections in India, although reporting from scattered locales suggests a number several times larger—possibly more than 1 million in a population of 885 million. Conditions in India point to a rapid spread of the epidemic: sexual behavior patterns conducive to the spread of HIV infection, high incidence of STDs and IV drug use, high rates of infection among prostitutes, and insufficient safeguards to the blood supply. Moreover, with a nationwide literacy rate of only 36 percent, no doubt much lower among prostitutes and drug users, anti-AIDS publicity campaigns will not be highly effective.

The Indian Government is beginning to recognize AIDS as a serious problem. However, a recent meeting of experts advised adhering to "Indian cultural values" as the best way of combating the disease. Foreigners are frequently blamed for transmitting AIDS.

These attitudes are reflected in India's health care budget. In 1991, the government announced a three-year AIDS-prevention program costing \$1.8 million—0.2 cent per capita. India's bureaucracy, lack of funding, and inadequate screening for HIV infection may well keep the government's efforts lagging far behind the problem.

This situation probably will continue until AIDS cases and deaths exceed hundreds of thousands. As with other epidemics, a death toll lower than this will not be clearly evident in a country of India's size and level of development. If the Indian Government does not take meaningful steps to counter AIDS during the next five years, the epidemic will likely grow to Africa-like proportions in 10 to 15 years.

The Caribbean

AIDS is a major concern in the Caribbean, and the rate of infection is increasing rapidly. Haiti, the Dominican Republic, and The Bahamas have been particularly hard hit. AIDS initially affected mainly homosexuals, but now it is well established among heterosexual men and women, as well as among children.

Caribbean governments are aware of the problem, but the prevalence of sexual behavior patterns conducive to the spread of HIV infection, IV drug use, and inadequate prevention programs point toward a rapid spread of the disease. During the 1990s, AIDS in much of the Caribbean will proceed on a scale similar to that in Africa, with similar dire results for the economies of affected nations.

In Haiti, government officials have not publicly acknowledged the seriousness of Haiti's epidemic, even though the country has the highest number of reported cases in the Caribbean, with infection rates now at 7 to 10 percent of adults. Until recently, officials refused to gather data on AIDS.

The Dominican Republic has a far more active anti-AIDS program than Haiti, but infected prostitutes and contaminated blood supplies still are spreading the disease. The Bahamas has one of the highest infection rates, difficult to control for similar reasons. AIDS is also spreading steadily elsewhere in the region.

Other Countries

Romania. AIDS is a major health problem in Romania. Hundreds of infants received infected blood transfusions in hospitals. This type of transmission is relatively easier to prevent than sexual transmission, as it only requires improving infection control in the health care system. Romania, with considerable international assistance, is attempting to correct this, but the infection has already spread to the adult population through contaminated blood supplies and sexual transmission. The scope of infection is poorly understood, and prevention programs are only just beginning.

Former Soviet Union. The AIDS problem in the republics of the former Soviet Union is relatively small—about 600 people with AIDS and about

20,000 infected with the HIV, according to scientists in the region. Difficult conditions in hospitals have led to transmission by infected needles—a problem now widely recognized—and limited efforts are under way to deal with it. Some hospital patients are now tested for HIV (although they are not always told the results). Economic duress and the breakdown of former institutions and restrictions are aggravating previously existing substance abuse and social dislocation problems. These factors may lead to the spread of what is now a relatively small HIV/AIDS problem.

Cuba. AIDS in Cuba will not approach the infection rate in Haiti or other Caribbean hotspots, largely because Cuba's AIDS-control program is the most aggressive in the world. It includes nationwide HIV screening, lifetime quarantine of those who test positive, and strict control of blood supplies and products. According to the Cuban Health Ministry, by early 1991, 9.6 million tests had been given since 1986. (Cuba's population is 11 million.) These tests identified over 600 HIV positives, and, of 73 with AIDS symptoms, 44 have died. It appears, however, that testing for the HIV-2 (a strain found in Angola) was not sufficiently rigorous.

Despite draconian measures, HIV prevalence in Cuba is likely to grow, given sexual behavior patterns, high incidence of STDs, and the return of troops from Angola. Perhaps in recognition of this likelihood, the network of quarantine facilities is being expanded, with plans said to call for at least one facility in each of Cuba's 14 provinces.

Mexico. Mexico has a moderate but growing rate of HIV infection and is second to Brazil among Latin American countries in AIDS cases. The Mexican Government views AIDS as a serious public health problem and recognizes the threat it poses, but eight years of economic austerity measures have limited the resources available for combating the disease. The government has established a national council on AIDS, which conducts public awareness programs. Military leaders are wary of the potential for infection among soldiers.

Prevention Strategies

The effectiveness of AIDS prevention strategies worldwide is difficult to assess. Worldwide publicity on AIDS has induced a portion of the world's

population to protect itself against the disease, particularly in the industrial countries. In the developing countries, current programs may well be worthwhile in terms of lives saved per dollar spent, but they are extremely small in scale. These programs are very difficult to evaluate, because of inadequate data and because their benefits may not be observable for years.

The unanswered question is whether greatly expanded programs could reverse the long-term trend. Most likely, the question will remain unanswered, since anti-AIDS resources will probably grow only moderately during the 1990s. However, it is clear that foreign assistance without powerful national leadership will have little impact.

The developing countries that are taking steps to contain the infection are mainly those where the problem is already obvious, grave, and intractable. In other countries such as India, Brazil, Nigeria, and Thailand—where infection rates are sure to accelerate—preventive measures are inadequate. This is particularly troubling, since preventive strategies are far more effective when they are taken early in the epidemic.

The reasons for this nonaction involve medical technology, politics, and cost:

- In the early years of an epidemic, few infected people display symptoms. Without appropriate blood testing, sizable rates of HIV infection can go unnoticed.
- The design and implementation of anti-AIDS programs is an evolving field. Preventive measures are now familiar in basic outline, but none guarantee success. Indeed, behavioral patterns that cause the spread of infection are extremely resistant to change. Another serious deficiency is the lack of preventive methods designed for women.
- Even if dangerous rates of infection are detected, remedial actions are often politically difficult. Public awareness programs, for example, require a country to advertise its problems boldly—never an easy political course, especially in countries with sizable tourist industries.

- An effective political constituency for action is often lacking, particularly in the early stages of an epidemic when action is most effective. In the badly infected African countries, governments traditionally have not been very responsive to public wishes or needs, and there has been little public outcry to initiate strong anti-AIDS programs.
- Full-scale prevention programs are costly. Free distribution of condoms, for example, would require a government to establish a *permanent* program costing upwards of \$10 per year for each person in the targeted population. Even measuring the extent of the problem is costly: testing and analysis, costing roughly \$40 per person, represent a major investment for health systems that are already meagerly funded. In Africa, even modest prevention programs can easily double the public health budget.

A few countries, however, have taken action early in the epidemic. For example, China adopted an aggressive policy to identify infected individuals and to educate the population. Even though China has announced fewer than 500 HIV infections and hepatitis is a more pressing problem, Beijing included AIDS in a recent international symposium on hepatitis. Likewise, after the first AIDS case was reported in Japan in 1985, the Japanese Government instituted universal screening of blood products and ended their importation. Japan estimates less than 2,300 infections, including about 475 AIDS cases. The disease, however, still poses a risk, and Tokyo will continue to use education and screening to control its spread.

Even though the 1990s will bring an upsurge in AIDS cases, anti-AIDS expenditures will probably increase only modestly in developing and middle-income countries. In Africa and the Caribbean, resources are lacking and behavioral change on the needed scale has not occurred. In South America, political pressures for governmental action probably will increase during the 1990s, but dramatic spending increases are not likely to occur. The WHO now spends about \$70 million on 14 countries, but much greater expenditures are required. For example, it would cost \$460 million a year to provide condoms to Africa for an adequate program.

In Western countries, by contrast, far more will be spent. Political pressures are substantial for spending on research, public awareness, and health care. The economic situation is far more favorable too: not only is far more money available, but also the payoff per dollar spent may be greater. For example, Japanese researchers estimated that each AIDS case costs more than \$450,000 in treatment costs and lost productivity and that a prevention program in Japan would therefore be worthwhile, even if only a relatively small number of cases could be prevented.

Implications of Research on Treatments and Vaccines¹

Even the most optimistic researchers acknowledge that an immediate breakthrough would not appreciably reduce the number of AIDS cases during the next five years. An effective treatment for HIV infection—even if discovered right now—would take several years to test, manufacture, and implement. Likewise for a vaccine: by the time everyone at risk was inoculated, it would take another decade for the epidemic to wind down.

Treatment for HIV Infection

Medical experts believe that no outright cure for HIV infection is likely. Viruses in the human body cannot be killed or removed by drug treatment, but the disease can be slowed by impeding its ability to multiply or incapacitate cells. Much effort is directed toward drugs, like AZT, that postpone the onset of AIDS symptoms. Progress along these lines is generally expected to be incremental, with gradual improvements in effectiveness and reductions in cost. These drugs, however, probably will remain too expensive for widespread use in any but the richest countries. By comparison, penicillin, at 10 cents a dose, is too expensive to treat everyone in poorer countries who needs it.

¹ This study makes no attempt to predict the success of the research efforts under way; rather, it deals with the implications of ongoing research and what might occur if it were successful.

Vaccines

Expert opinion varies on the prospects for a vaccine against HIV infection. Some think that the technical barriers may never be fully overcome, in part because of the high mutability of the virus, while the most optimistic think that a massive research effort might produce a usable vaccine within five years or so. Approximately 15 "candidate" vaccines are in the early stages of testing on small numbers of people and in some cases may be ready for large-scale testing soon. Once into a field trial, these experimental vaccines probably will need at least four to five additional years of development and testing before they can be deemed safe and effective.

Several problems will hinder progress. For example, Africa's high rate of infection makes it a good choice as a test site, but the strains of HIV prevalent in Africa may differ from those isolated elsewhere. A different vaccine may be required for each region of the world.

Pharmaceutical companies may concentrate on the strains of the HIV prevalent in the United States and Europe rather than on African strains that promise lower profits. However, since many medical experts believe that in time all HIV strains will spread globally, such attention to particular strains may become moot.

At this early stage, the likely cost of mass producing a vaccine is uncertain, and, if previous patterns hold, vaccines will probably be priced higher in the United States than elsewhere. This could lead to disputes over patents between US firms and their low-price competitors, an issue that the WHO has already begun to address.

In the long term, an effective vaccine may be the best hope for a radical reduction in the spread of the disease. On the basis of experience, even after effectiveness is established, it takes many years before vaccines are used widely, particularly in developing countries. Polio and measles vaccines—effective and cheap, but still not in universal use—are examples.

Other Technical Progress

The area of testing shows some promise. Cheaper tests for the HIV infection would help pinpoint new infections, so that preventive measures could be better targeted. Tests that work in the earliest stages of infection (conventional tests do not)

AIDS and Immigration

Laws and policies designed to reduce a perceived foreign threat to populations from Acquired Immune Deficiency Syndrome (AIDS) will remain controversial in several countries. Although the World Health Organization considers such measures discriminatory and unjustified on medical grounds, various governments have considered restrictions on immigration aimed at reducing risks to residents and costs of caring for infected immigrants. A study concluded that there would be a net saving in direct health costs if all potential immigrants were screened and those testing positive for the Human Immunodeficiency Virus (HIV) were excluded. Critics charge, however, that this unfairly targets HIV-positive individuals and unnecessarily highlights AIDS among diseases. The study, which was done in a developed country, also determined that screening immigrants for cardiovascular disease would be even more cost effective than screening for the HIV. It is likely that the debate over the laws and policies designed to restrict immigration on the basis of HIV infection will become more heated as AIDS cases and associated costs rise.

would permit more effective blood product screening.

International Transmission

AIDS has crossed virtually every national border in its global spread, and international transmission remains a significant source of infection and subsequent growth of the pandemic. For example, emigration from Haiti is believed responsible for much of the spread of the HIV into the Dominican Republic, The Bahamas, and Jamaica. Many Cuban troops were infected in Angola. Thailand's sex industry has the potential to infect tourists from many countries.

To counter the spread of the disease and reduce costs of caring for infected immigrants, more than 40 countries, including the United States, now

restrict the entry of short-term visitors and/or immigrants with the HIV infection or AIDS, although the WHO has characterized such policies as unjustified on epidemiological grounds and ethically unacceptable. Several countries single out black Africans, and some deport infected foreigners. Restrictive measures may increase during the next five years, when the number of the HIV infections in many countries will be much larger than it is today.

Implications for the Donor Nations

Donor nations will face three basic foreign policy problems associated with the spread of AIDS in the 1990s:

- Allocating assistance for AIDS prevention abroad.
- Managing the testing and distribution of a vaccine in other countries.
- Assisting afflicted countries.

What To Spend Where

The United States now spends about \$65 million annually on AIDS prevention and control programs in foreign countries. Africa gets most of the resources, but there are also small programs in South America and Asia. Thus, the money goes where the disease is worst and where the demand for assistance is the highest.

In allocating funds, policymakers face the problem of how to choose between countries where the disease is already widespread and those where infection rates are low but threaten to grow rapidly. The payoff to AIDS-prevention assistance might be higher in countries where the epidemic is in a much earlier stage—Brazil, India, and Thailand, for example. These countries, however, have only recently acknowledged their AIDS problem and are at the initial stages of planning effective strategies.

For Africa, dealing with AIDS will be an expanding part of the aid package during the 1990s. One study concluded that, in five central African countries, AIDS medical care and screening alone could consume all foreign aid, if foreign assistance remains at current levels. Caribbean nations could follow this pattern, and, later, so could India. The rapidly rising incidence of AIDS—particularly in Africa—will attract concentrated media attention during the 1990s. Whether this will build popular

support for large-scale relief programs—as has often been the case with natural disasters and refugee problems—remains to be seen. In a broader context, the experience with AIDS demonstrates the importance of quick intervention, which may well be needed to deal with other deadly but undetected viruses that may now exist in quiescent forms and could spread in the future.

Vaccine Issues

Although some populations have achieved slowing of the HIV/AIDS pandemic through educational and behavioral modification, it is widely thought that an effective HIV vaccine offers the greatest hope for preventing the spread of the virus. Three major strategies are under consideration:

- Prevent infection.
- Prevent those already infected with HIV from progressing to AIDS.
- Prevent transmission from an HIV-infected woman to her fetus.

Field trials of candidate vaccines will require close attention to cultural and political sensitivities. Among the many issues which will require attention are:

- Determining appropriate research sites.
- Obtaining adequate financing.
- Ensuring human subjects protection.
- Ensuring access to benefits resulting from research for field trial participants.
- Establishing legal liabilities.

Many public health experts question the capability of existing mechanisms to dispense HIV/AIDS vaccines worldwide. Some have suggested establishing an international corporation, funded by a consortium of nations, to produce and distribute a vaccine at cost or below, with clear standards for assigning priorities for treatment. The issue of protecting patent rights of companies that might develop a successful vaccine would need to be addressed.

The possibility of racial, ethnic, or other charges such as inequitable risk sharing may well emerge during vaccine field trials. While representing a challenge to vaccine development, these considerations—if appropriately addressed during the initial design of vaccine trials—may afford an excellent opportunity to enhance international cooperation and understanding.

Assisting Afflicted Countries

AIDS threatens the objective of promoting economic development in developing countries. Although the economic impact of AIDS cannot yet be quantified, it is hard to conceive of a developing country with both a serious AIDS problem and a thriving economy. The badly infected countries will be radically transformed, with greatly reduced chances for economic growth. Economic assistance will become less effective in AIDS-ridden countries. Generating private enterprise activity and foreign investment will be more difficult. Whatever the scale of future international aid programs, a growing proportion of assistance is likely to be directed at the myriad problems associated with HIV/AIDS pandemic.