The Status and Trends of the HIV/AIDS Epidemics in Sub-Saharan Africa

FINAL REPORT

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The Status and Trends of the HIV/AIDS Epidemics in Sub-Saharan Africa

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MAP is jointly sponsored by:

The AIDS Control and Prevention (AIDSCAP) Project
of Family Health International

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Monitoring the AIDS Pandemic, (MAP), is an independent collegial network of professionals concerned with monitoring the status and trends of the HIV/AIDS pandemic.

MAP was founded and is supported by: the AIDS Control and Prevention (AIDSCAP) Project of Family Health International, funded by the United States Agency for International Development; the François-Xavier Bagnoud Center for Health and Human Rights of the Harvard School of Public Health; UNAIDS, the Joint United Nations Programme on HIV/AIDS, cosponsored by the United Nations Children’s Fund (UNICEF), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO) and the World Bank. MAP gratefully acknowledges the contribution of these agencies and institutions to its creation and development.

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Monitoring the AIDS Pandemic (MAP) Network

MAP is a collegial network of internationally recognized technical experts seeking to assess the status and trends of the global HIV/AIDS pandemic. MAP was created in 1996, through the collaboration of the AIDS Control and Prevention (AIDSCAP) Project of Family Health International, the François-Xavier Bagnoud Center for Health and Human Rights of the Harvard School of Public Health, and the Joint United Nations Programme on HIV/AIDS (UNAIDS).

MAP's more than 100 members in 40 countries are epidemiologists, modelers, economists, and social, behavioral, public health and international development specialists, recruited through a nomination process and currently guided by an Interim Global Steering Committee. MAP's activities, operating procedures and final structure will be formally agreed upon by its membership at the MAP Symposium to be held prior to the XIIth International Conference on AIDS to be held in Geneva in June-July 1998.

MAP hopes to make its greatest impact by providing objective, timely and high-quality analyses of the most current information on the pandemic, for the improvement of prevention, care and social interventions worldwide.

MAP workshops and membership meetings are held in conjunction with regional and international HIV/AIDS conferences. This enables MAP to function on a small budget and to distribute results from its analyses promptly to conference participants. Specific workshops are convened as needed, with expertise drawn from MAP members and other invited experts. Regional experts are encouraged and supported by MAP in the collection, analysis, synthesis and dissemination of regional information, which is then incorporated into MAP's global reports.

AIDS service organizations and regional networks of people living with HIV/AIDS are invited to participate in MAP workshops.

MAP works towards building consensus in an atmosphere of collegiality, cultural sensitivity, and mutual respect for conflicting points of view. It functions on the basis of volunteerism and personal and institutional contributions, with limited financial support from international organizations, including Family Health International and UNAIDS, and thus provides an independent perspective on issues raised by the HIV/AIDS pandemic.

MAP reports are available through the following websites:

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Preface

The Monitoring the AIDS Pandemic (MAP) Network symposium in Africa, The Status and Trends of the HIV/AIDS Epidemics in sub-Saharan Africa, was held in Abidjan, Côte d’Ivoire on 3–4 December 1997, as an official pre-conference satellite symposium of the Xth International Congress on STD and AIDS in Africa (ICASA).

The two-day MAP Network symposium held in Abidjan was the third symposium formally organized by this new global network. MAP was formed in December 1996 by the AIDS Control and Prevention (AIDSCAP) Project of Family Health International, the François-Xavier Bagnoud Center for Health and Human Rights of the Harvard School of Public Health and the Joint United Nations Programme on HIV/AIDS (UNAIDS). MAP has held a continuing series of regional and global symposia aimed toward improving the understanding of the trajectory of epidemics around the world.

Starting with the Status and Trends of the HIV/AIDS Epidemics in Africa symposium that was held in Kampala, Uganda, in December 1995, a team of internationally recognized technical specialists in epidemiology, modeling, economics, demography, public health and international development was formed to monitor the dynamics of the HIV/AIDS pandemic and various regional epidemics. By collecting, analyzing and disseminating information on HIV/AIDS, this team of experts, which has grown rapidly over the course of two years into a global network, seeks to assist governments, organizations and the world at large to respond more actively and effectively to the challenges posed by the HIV/AIDS pandemic.

The MAP symposium in Abidjan brought together some 25 global and regional experts, including MAP members and some specially invited participants, to achieve the following objectives:

- To present and share information on the status and trends of HIV/AIDS epidemics in sub-Saharan Africa and analyze this information in a global context;
- To review the epidemiological and behavioral patterns among HIV/AIDS epidemics affecting the different populations in the region;
- To identify specific data needs for monitoring and forecasting HIV/AIDS epidemics in the region; and
- To produce and disseminate a consensus report on the current status of HIV/AIDS epidemics in sub-Saharan Africa and on their current and projected trends.

Because a large percentage of the people in the world living with HIV reside in sub-Saharan Africa, the symposium held in Abidjan was important in enabling MAP to focus strategically on the evolving HIV/AIDS epidemics on the continent, fuse current knowledge, identify gaps therein and determine areas for action.

The symposium opened with a review of the sub-Saharan HIV/AIDS situation to position the various regional and/or country-specific epidemics within the context of current knowledge of epidemic patterns and potential trends. From then on, the team concentrated on specific issues, including determinants of rapid spread of HIV in the region, estimating the number of orphans, and monitoring care of people living with HIV and AIDS, among other topics of special relevance to sub-Saharan Africa.

The results of the MAP symposium are summarized in this report, coauthored by the MAP Abidjan participants and produced immediately following the
MAP wishes to expressly acknowledge the assistance provided by Rapid Science Publishers in London for allowing the workshop participants to use the second edition of *AIDS in Africa* (AIDS 1997, Vol. 11, Suppl. B) as a working document for the MAP symposium discussions in Abidjan. In addition, the International Programs Center at the U.S. Bureau of the Census has provided the invaluable maps as well as other data used herein.
HIV Epidemics in Africa: Unabated, Diverse, and Complex

Two in every three persons in the world living with HIV/AIDS is in sub-Saharan Africa. The likelihood of adults in this region to be infected with HIV is 10 times greater than for an adult in North America and 20 times greater than in Western Europe. Of every 10 women currently living with HIV, 8 are in sub-Saharan Africa. And of the estimated 530,000 children born with HIV infection, nine in every ten are in this region. Such factors as growing economic disparity, social and cultural uprooting linked to intense migration, insufficiencies in prevention and care programs and power gaps linked to gender, age and economic differences continue to fuel HIV epidemics across the continent.

Determinants of HIV Spread

Africa is not uniformly affected by HIV/AIDS: a mosaic of epidemics are progressing with varied intensity and velocity. For example, in antenatal clinics of several cities in Southern Africa, up to 45 percent of women tested during pregnancy carry HIV, a rate ten or more times greater than in pregnant women seen at urban antenatal clinics in most countries in Central or West Africa. However, subregional boundaries which, until recently, helped in the mapping of the epidemics in Africa can be misleading. In West Africa, HIV rates in pregnant women may be ten times higher in Abidjan, Côte d'Ivoire, than in Dakar, Senegal. In urban areas, a much higher proportion of adults are HIV-infected than in trading sites along highways where, in turn, the prevalence of HIV is higher than in rural villages. While local migratory and behavioral patterns have been suggested to explain these differences, how these patterns interconnect through complex social and sexual networks remains insufficiently explored. An increased understanding of these networks is necessary to guide prevention and care programs and help focus efforts on the most vulnerable populations.

Economic and labor migration patterns in sub-Saharan Africa, especially in the Great Lakes Region, Southern Africa, and parts of West Africa have been well documented. The role of mass population movements, especially of single male migrant workers in the Southern Africa region has brought with it cultural and social dislocations that have led to adoption of new forms of sexual practice, exposing migrants to higher risk of HIV infection. The migrants in turn take the infection back to their partners and spouses back home. It is believed that the high levels of HIV infection within Southern Africa largely result from patterns of migration.

Social disruption and warfare have also contributed to high population mobility, particularly in the Great Lakes Region, in the Horn of Africa and parts of East Africa. Regrettably, the impact of this mobility on the spread of HIV has not yet been documented.

Predominant Patterns of HIV Transmission

Heterosexual contacts and mother-to-infant transmission of HIV account for the vast majority of HIV infections in the region, and ongoing prevention programs must expand their reach in order to curb the spread of HIV through these routes. The information required to monitor these trends and the impact of prevention programs remains incomplete. For example, while data exists on the proportion of 15- to 49-year-old pregnant women who are infected with HIV, little is known about the levels of infection in girls younger than 15. In a community-based study near Lusaka, Zambia, 6 percent of girls aged 15-16 were found to be HIV-

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infected, a rate far higher than in boys of the same age. Whether consensual or forced sex within or outside the context of marriage in this population determines these high rates remains unclear. Exploring such issues raises complex social, cultural and behavioral questions. Research and interventions must address the issues in the context of the protection of the rights and the health of children.

Apart from occasional and rarely published studies in the military, knowledge is also incomplete about trends of HIV in sexually active men. Among women, the dynamics of HIV infection are interpreted on the basis of prevalence rates of HIV infection—the proportion of women infected, regardless of when they acquired HIV infection—but there is a paucity of incidence data—the proportion of women in a specific age group who acquire infection within a time period. Such information is needed to monitor epidemic trends and their response to prevention programs. New methods must be developed to fill this knowledge gap, while at the same time, ensuring the protection of individual rights.

Other Modes of HIV Transmission
The transmission of HIV infection through unscreened blood transfusion continues to be a concern in several countries in sub-Saharan Africa. In this region in 1995, over 2.5 million blood transfusions were administered—most of them to women and children—and of those, nearly a quarter had not been screened for HIV antibodies. Action must be undertaken in every country to drastically reduce the risk of HIV transmission attributable to the transmission of contaminated blood. Ensuring the safety of blood supply in Africa is a matter of extreme urgency.

Occupational exposure to HIV by health care workers has received too little attention. Studies of the frequency of needle stick injuries have estimated that in certain settings the per annum risk of occupational acquisition of HIV may be as high as the yearly incidence of HIV infection acquired through heterosexual intercourse. Universal precautions against occupational exposure to HIV infection must be promoted and systematically enforced.

Anecdotal evidence supports the assertion that sex between men does occur in the region. In the absence of documented evidence that such a pattern of sexual behavior prevails, in particular in single-sex male communities around industrial sites and in prisons, prevention programs are neglecting the needs of these vulnerable populations. Likewise, the rising availability of injectable substances such as heroin, especially at new transit points for drug trafficking, creates an additional risk for HIV spread in sub-Saharan Africa. Active inquiries into illicit drug availability, demand and use should be undertaken. The early introduction of substance abuse prevention programs, including harm reduction interventions respectful of human rights, has a potential for thwarting the development of a new epidemic.

Another route of possible infection, which has long been considered but little documented, is transmission through unsterile injection of pharmaceuticals and other solutions for therapeutic purposes and then reusing injection equipment without adequate sterilization. This may create risks both in the established clinical setting and in the informal or “traditional” healing setting. Evaluation of these risks is needed.

Care
Sub-Saharan Africa faces the daunting task of care provision for rising numbers of people whose health status has been directly affected by HIV/AIDS. The provision of home-based care is an essential element of the continuum of care to People Living with HIV/AIDS (PLHA) and is not an isolated community phenomenon. Even though home care services at the community level are expanding rapidly, coverage and quality of care are still problematic in many countries. This “home-care” gap is closely linked to an under-resourced health care system. The incompleteness and lack of application of care standards and treatment protocols for AIDS patients need to be addressed.

A continuum of care needs to be established that links various care partners and sources from the home-based setting to community facilities of care and support to formal health care institutions. Despite centers, hospice care, expanded use of existing clinics and other options need to be looked at as useful, acceptable, and appropriate in different communities and countries. The provision of quality care needs to be the focus of systematic analyses in order to identify useful examples and lessons learned.

Learning from Successes?
The documented success of several prevention programs associated with declining trends in the incidence of HIV in young people generates hope. In addition, targeted community-based programs have shown that, given appropriate access to information and services in a favorable environment, people do adopt protective behaviors that slow the spread of HIV.
Countries in sub-Saharan Africa are confronting the epidemics with courage and creativity, in spite of insufficient infrastructures and resources. The age at first sexual intercourse is increasing, as is the reported use of condoms in many countries. In Uganda and Zimbabwe, the introduction of female condoms is adding to women’s capacity to protect themselves, and in communities in Kenya and Tanzania, demand for voluntary HIV-testing is growing rapidly, although the services needed to promote and sustain this essential prevention and early care strategy are insufficient across the region.

The successes achieved by limited trials, such as the syndromic treatment of curable sexually transmitted diseases in a study in Mwanza, Tanzania, have not yet lead to large-scale implementation. Too often, demonstrations of effective prevention and care interventions fail to be used as models for policy development and for wider and sustained implementation through public health programs. There is an urgent need to reorient program approaches in the light of these and other successes. While there are legitimate reasons for hope, these should not overshadow the reality of a continent where epidemics continue to spread with unabated force and, in particular in some countries in Southern Africa, with staggering rapidity.

The Children of the HIV Epidemics
In sub-Saharan Africa, over half a million children are born with HIV infection. Little is known about their prospects for survival. Also, little is known about the acquisition of new infection in early childhood. Of the estimated 8.2 million children under the age of 15 who have lost their mother to AIDS, 7.8 million are in Africa. Information remains unavailable on children who have lost their father, or both parents to AIDS.

HIV disease and premature death of young adults and children, as well as growing number of orphans, is overwhelming the coping capacity of the extended family, which is already under stress as a result of economic and social pressures. Actors on the AIDS scene have tended to shy away from initiatives to enable communities to cope better with this growing challenge out of fear of creating conditions to promote and protect the health and the development of orphans that would require long-term support. There is a growing awareness that the lack of attention to the essential needs of orphaned girls and boys may lead them to survival strategies that would increase their vulnerability, and in turn, place them at higher risk of acquiring HIV infection. Efforts from national entities (including governments and civil society) and international agencies should be strengthened to provide effective support to children who are infected with HIV, to those who are affected by the impact of the epidemics, and to those whose vulnerability to HIV/AIDS is created or accentuated by the deterioration of their daily environment.

As soon as results have confirmed the safety, efficacy, and feasibility of prevention approaches toward reducing mother-to-child transmission—including safe alternatives to breastfeeding—large-scale implementation programs should be rapidly put in place throughout the region. National and international agencies should be geared to making this a reality.
Epidemic Trends in Sub-Saharan Africa

UNAIDS has estimated that at the end of 1997, 30.6 million people in the world were living with HIV/AIDS. Of that total, 20.8 million, or 68 percent of all infections, were in sub-Saharan Africa. (See Figure 1, below.) Heterosexual transmission accounts for most of the estimated 3.4 million new HIV infections in 1997 among adults in sub-Saharan Africa. Eighty percent of all female HIV infections in the world are in this region. (See Box 1 on page 6.)

HIV epidemics continue to spread in sub-Saharan Africa. HIV prevalence is still increasing in some major urban centers such as Nairobi, Kenya, and Harare, Zimbabwe. (See Figure 2 on page 7.) While in other urban centers, such as Lusaka and Blantyre, HIV prevalence appears to have stabilized, implying continuing HIV incidence to maintain this stable prevalence. In fact, only Uganda has reported any declines in HIV prevalence in some sentinel surveillance sites.

The levels of HIV infection and the epidemic patterns vary widely across the region, with as much variation within countries as between countries. Within most countries where data are available, strong regional differentials exist, resulting from variation in risk behavior, population mobility, population density, and social disruption. In most countries there is an urban-rural gradient, with urban areas exhibiting higher levels of infection. However, this pattern is not universal and may be diminishing over time, as noted below.

FIGURE 1: Annual number of new HIV infections in selected regions, 1980–2000

- sub-Saharan Africa
- South & South-East Asia
- East Asia & Pacific
- Latin America & Caribbean
- Established Market Economies*

* Western Europe, North America, Australia, New Zealand, Japan
Where Do the Numbers Come From?

Information on the magnitude of HIV/AIDS epidemics, trends in these epidemics, and the populations affected are derived primarily from prevalence studies of HIV infection in selected populations. Data on cases of AIDS, as reported to the World Health Organization and to UNAIDS, are of little use in understanding the current situation for two reasons. First of all, the data on AIDS cases represent the impact of infections that typically occurred five to ten years previously. Secondly, the data for AIDS cases for most of the world’s regions, including Africa, are severely underreported.

Most African countries have established sentinel surveillance systems to collect HIV prevalence data in selected populations. Of the populations included in such surveillance systems, women attending antenatal care facilities typically are the most representative of the general population. This is so because in the African setting, most women bear children and most pregnant women receive some form of antenatal care. But variation in antenatal care patterns exists among countries as well as within countries themselves. Furthermore, some selectivity in the population attending ANC facilities included in surveillance systems often exists as well as in the geographic coverage of such systems. Therefore, in making use of the ANC sentinel data for estimating the total population burden of HIV/AIDS, efforts have been made to reduce the impact of such biases and to produce estimates that are as accurate as our current state of knowledge allows.

Much is still unknown about levels and trends of HIV infection in the region. This picture will be more complete with additional seroprevalence data, more detailed analysis, and a better understanding of the natural history of HIV infection and its impact on fertility and mortality in the region. Epidemic patterns will also change over time due to natural epidemic processes and the effect of HIV prevention efforts. Future descriptions of the HIV/AIDS situation in Africa will continue to be revised to reflect our improved understanding.

There are two major international compilations of seroprevalence information. The first of these is the HIV/AIDS Surveillance Data Base, developed in 1987 at the International Programs Center, U.S. Bureau of the Census, and maintained since that time with funding support from USAID. This data base is a compilation of aggregate data drawn from HIV seroprevalence studies in developing countries. Currently it contains more than 30 thousand data items drawn from over 3,800 publications and presentations. This data base and associated data-retrieval software is available to download from the Internet at www.census.gov.

The second major international source of information on HIV/AIDS epidemics is the compilation of country-specific fact sheets being prepared by UNAIDS. These fact sheets will contain summary epidemiological data, a commentary on epidemiological patterns and trends, and maps showing subnational patterns of infection. These fact sheets will be available on the UNAIDS website at www.unaids.org.

The HIV epidemics in sub-Saharan Africa can usefully be considered within each of five geographic regions.

In West Africa, Côte d’Ivoire is an epicenter of HIV infection, and is also an important center of economic migration in the region. HIV prevalence among antenatal women in Abidjan has reached levels between 10 and 15 percent. (See Figure 3 on page 7.) Similar rates have also been reported among antenatal women in Ouagadougou and Bobo-Dioulasso. In other countries in this region, HIV-1 has stabilized at much lower levels than in eastern and southern Africa—between less than one percent and 5 percent of antenatal clinic women tested. Data from Nigeria are limited, but the National AIDS Control Programme now estimates that 2.2 million people are currently living with HIV.

HIV prevalence among pregnant women in Central Africa has remained relatively stable at around 5 percent in urban centers. (See Figure 4 on page 8.) However, some studies have reported prevalence as high as 10 percent in Point-Noire, Congo, and 16 percent in Bangui, Central African Republic. Although HIV prevalence had remained relatively low in Cameroon for several years, recent data indicate that HIV prevalence among pregnant women has now increased in both Yaoundé and Douala.

The HIV epidemics in East Africa are among the oldest in sub-Saharan Africa, where HIV began to spread widely in the late 1970s and early 1980s. (See Figure 5 on page 8.) HIV prevalence among antenatal clinic women in urban areas ranges from 15 to 25 percent. While HIV prevalence continues to increase in some countries, such as Kenya, HIV prevalence now appears to be declining in some urban sites in Uganda. But Uganda remains the only country in sub-Saharan Africa that has reported such declines. The movement of people along the trans-African highway drives the epidemics in East Africa, and HIV prevalence rates in the rural areas still tend to be lower than in the urban areas.
FIGURE 2: HIV seroprevalence for pregnant women in selected urban areas of Africa, 1985–1997

HIV Seroprevalence (%)


FIGURE 3: Seroprevalence of HIV-1 for pregnant women in West Africa, circa 1995

Percent Seropositive
- 0.0
- 0.1 - 0.9
- 1.0 - 4.9
- 5.0 - 9.9
- 10.0 - 19.9
- 20.0 +
FIGURE 4: Seroprevalence of HIV-1 for pregnant women in Central Africa, circa 1995

FIGURE 5: Seroprevalence of HIV-1 for pregnant women in East Africa, circa 1995
HIV epidemics in the Horn of Africa are among the least well documented in sub-Saharan Africa. (See Figure 6, below.) Limited sentinel surveillance in Ethiopia, one of the largest countries in sub-Saharan Africa, however, indicates that over 2 million people could have been living with HIV at the end of 1997. In southern Africa, the HIV epidemics range from those that are well established such as in Zambia, Zimbabwe and Malawi, to those that are some of the newest and most explosive in sub-Saharan Africa such as in Botswana, Lesotho and South Africa. (See Figure 7 on page 10.) Among antenatal clinic women, HIV prevalence ranges from 25 to over 40 percent in some urban as well as some semi-urban areas.

In Francistown, Botswana, HIV prevalence among antenatal clinic women reached 43 percent in 1997. In some sites in Zimbabwe, HIV prevalence among women attending antenatal clinics is over 50 percent. In Lusaka, Zambia, and Blantyre, Malawi, HIV prevalence among women attending antenatal clinics ranges between 25 and 30 percent. HIV prevalence among antenatal women increased from less than 1 percent in Orange Free State, South Africa, in 1990 to 18 percent in 1996. In KwaZulu/Natal, South Africa, HIV prevalence increased among pregnant women from 1.6 percent in 1990 to 20 percent in 1996.

Nigeria, Ethiopia, and South Africa have the largest populations in sub-Saharan Africa. However, only South Africa has a well-documented sentinel surveillance system established to monitor the HIV epidemic. Based on the limited information available from Nigeria and Ethiopia, over 2 million people are estimated to be living with HIV in each country. These three countries alone account for about one-third of the total number of people living with HIV in sub-Saharan Africa.

While some knowledge exists on HIV and AIDS trends, data on the impact of HIV/AIDS are limited to estimating mortality and the number of orphans. (See Box 2 on page 11.) Trends in life expectancy at birth can also be projected on the basis of estimated HIV, AIDS and AIDS-related death rates. Such an analysis shows that even if the spread of HIV were to be stopped now, life expectancy at birth, which increased consistently through the mid-1980s in some of the sub-Saharan countries that have been hardest hit by the HIV epidemics, will decline by the year 2000 to levels

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**FIGURE 6: Seroprevalence of HIV-1 for pregnant women in the Horn of Africa, circa 1995**
observed in the 1970s. (See Figure 8 on page 12.) Morbidity data are virtually non-existent. Information on the macro- and micro-economic impact is generally obtained from simulation and not from empirical data. The natural history of HIV infection is poorly documented. Even before the advent of HIV, sub-Saharan Africa had experienced major tuberculosis (TB) epidemics; these have been exacerbated by HIV. In some instances, 40 percent of clinical/new TB infections have been attributed to HIV.

While age-specific HIV rates are limited, data from several countries demonstrate a rise of infection in very young women. In Zambia, 6 percent of 15- to 16-year-olds in a population-based sample around Lusaka were infected. Infection also certainly exists among those under 15, but ethical and data collection considerations have prevented any direct measurement of its level. In Abidjan, Côte d'Ivoire, HIV infection has been found among girls under 15 attending antenatal clinics.

HIV seroprevalence data are collected for the 15 to 49 age group and for perinatal transmission, but the lack of data in girls under age 15 or for people over 50 limit our understanding of the natural history of the epidemic. Due to the high rates of infection, data should be collected in the 15 to 24 age group by single year categories as this would enable more meaningful interpretation and analysis of the dynamics of HIV transmission.

While a number of HIV-1 subtypes have been reported in sub-Saharan Africa, there has not been sufficient mapping of their distribution. At this point in time, the implications of these subtypes in terms of infectivity, pathogenicity, or for vaccine development are still unclear.

While extensive data exists on heterosexual transmission and mother-to-child transmission, data on other modes of transmission in Africa such as intravenous drug use, men who have sex with men, blood transfusion and iatrogenic mechanisms remain non-existent or limited. In spite of progress achieved in many sub-Saharan countries in making blood transfusion safer, the use of blood unscreened for HIV antibodies continues to contribute to the spread of the epidemics in the region. (See Box 3 on page 13.)

Sub-Saharan Africa has pioneered the development and the use of HIV sentinel surveillance systems based
More than 95 percent of the world's 8.2 million children orphaned by AIDS live in the sub-Saharan African region, according to UNAIDS' 1997 numbers. Several factors help to explain why these orphans, defined as those under age 15 who have lost their mother to AIDS, are concentrated in this region. The overall magnitude of Africa's AIDS epidemics and their predominantly heterosexual nature as well as the maturity of the epidemics compared with, for example, those in Asia, have resulted in a greater number of deaths relative to the current total burden of HIV infection.

The UNAIDS numbers are based on an estimation of deaths to women of childbearing age due to HIV/AIDS over the course of the epidemic, combined with an estimate of the average number of children born to each woman over the previous 15-year period. These numbers are cumulative through 1997, with appropriate adjustments for the premature deaths of those offspring themselves infected by HIV; the mortality of children due to non-HIV-related causes, and the natural "aging" of the surviving children through the age of 15, which removes them from the ages of greatest concern.

These estimates are the latest in a series of attempts to measure the overall magnitude of this problem, both in the region and worldwide. Another effort, recently released by USAID, includes estimates of the number of orphans for selected countries both inside and outside the region, not only from HIV/AIDS but from all causes. These include maternal orphans, as in the UNAIDS figures, as well as the number of children who have lost either their father or both parents. Due to methodological difficulties, estimates of the latter two groups were derived from the ratios of maternal to paternal and dual orphans found in the limited empirical data.

The magnitude of the orphan population is of great concern both to individual countries as well as to the international community. In many African countries, even those with more moderate epidemics, HIV/AIDS will more than double the social burden caused by orphans. This is particularly true in communities, which are already economically stressed and equipped with limited coping resources. Traditionally, communities and extended families have provided orphans with social and economic support, but with such dramatic increases in the number of orphans, there is little chance that traditional approaches will be adequate to cope with the current and future situation.

The needs of orphans are an expression of both the social impact of becoming an orphan and the economic position in the communities in which the orphans live. These needs can be grouped into the following broad categories:

- Shelter, food, and clothing
- Attention, guidance, and support to cope with stress and trauma
- Health and child care, recreation, and being a child
- Education and skills development

New adaptive approaches need to be developed to help communities provide for orphans without abandoning traditional systems, and in fact, build on them. These approaches should be developed and evaluated based on the four "Cs," namely, community involvement, continuity, cost, and culture. The following examples are presented in rank order of decreasing appropriateness, based on those criteria:

- Extended/immediate family
- Elderly- or child-headed households supported with active community involvement
- Traditional methods of community support
- Fostering arrangements by non-relatives
- Village institutions
- District or community development approaches
- Orphanages

The experience of innovative orphan care programs in Zimbabwe, South Africa, Tanzania, and Uganda shows that community visiting, involvement, and responsibility work well if organized by community peers or opinion leaders. Furthermore, there is clear evidence that "traditional" methods of providing support, such as the extended family in many parts of Africa and the Zunde Ramombo concept in Zimbabwe, are indeed still viable and can be used to provide support and care for children and households in distress. The present and future challenge will be to determine whether these and other approaches can adequately provide for the multitude of needs of Africa's growing orphan population.

on antenatal clinic attendees. While the data generated from antenatal clinic attendees has been useful in understanding epidemic trends, there is a need for data on STDs, behavioral indicators, age-specific data on men, mortality data, and data for women in the population at large to better understand the transmission dynamics. The paucity of reliable and recent data from some countries is also a matter of concern. The devolution of the World Health Organization/Global Programme on AIDS (WHO/GPA) and its technical support has resulted in some transitory gaps. The health reforms underway in some countries, which have moved toward more decentralized health care provision, present a threat to the maintenance and collection of country-level HIV data. Further, the macro-analysis of HIV prevalence data masks the complexities, at the regional
as well as at a country level, and indicates a need for second level analysis perhaps within countries.

Pressing Research Issues
Given that antenatal clinic attendees are a very select group within a population, data generated from this group needs to be evaluated if they are to be used to make estimates for the general population. The result of this validation exercise would make it possible to generate data on infection rates among men and women in the general population to estimate the biases in current surveillance, and the influence of socio-cultural factors on health-seeking behaviors. Approaches could include population-based studies or cohort studies.

In order to make meaningful interpretations of the data and to design target interventions, epidemiological findings will need to be linked to behavioral data. The most recent UNAIDS fact sheet on global HIV infections highlights the fact that 50 percent of new infections are in the 15 to 24 age group. There is an urgent need to understand the epidemiological and behavioral determinants of risk in the 10 to 19 age group, which seems the most appropriate for measuring incidence trends (recent HIV infections) and their early changes in response to behavior change.

Populations in sub-Saharan Africa bear a heavy burden of sexually transmitted diseases (STDs). (See Box 4 on page 14.) While the treatment of STDs has been the focus of much attention, the utility of STD case data for monitoring HIV epidemic trends is uncertain. More studies are needed on the natural history of STDs and their interaction with HIV. The use of STD data for monitoring behavior trends relevant to HIV prevention needs to be explored further.

The Determinants of the Rate of Spread of HIV
In order to answer the question why in some and not in other African populations the HIV epidemic has run an explosive course, there is a need to study population characteristics.

There are broadly three approaches to take to study population characteristics: the epidemiological, cultural and socioeconomic. From an epidemiological perspective, a complex interplay of sexual behavior patterns and factors that enhance or hamper the transmission of the virus during sexual intercourse determine the rate of the spread of HIV through a population. Biological factors that enhance the transmission of the virus include the disease stage of the infecting partner (early infection and advanced disease), presence of another sexually transmitted disease, certain sexual practices such as anal intercourse and intercourse during menses, and infection of HIV-1 compared to HIV-2.
In 1995, an estimated 2.5 million blood units were transfused in sub-Saharan Africa, a majority of them to women in their reproductive years and to children. Of these, nearly a quarter had not been screened for HIV.

The lack of a specific budget allocation for blood transfusion services in most sub-Saharan countries constitutes an obstacle to the prevention of HIV transmission due to contaminated blood and blood products. Additional limiting factors to the further enhancement of blood transfusion safety include: the shortage of voluntary, non-paid blood donors, the insufficiencies of systematic blood screening for syphilis, hepatitis and HIV, and the lack of quality assurance programs in more than half of the countries in the region.

The region remains far from ideal. (See Figure A, below.) Although the technical know-how exists to make blood safer throughout the region, a number of constraints to the large-scale implementation of the needed measures remain to be addressed. These include: the development and implementation of national policies on blood safety, the allocation of the needed resources, the promotion of voluntary blood donation, the systematic screening of these donations for blood-borne viral and other infectious agents and the creation of quality assurance schemes.

Major efforts are urgently needed to enhance blood safety by enlisting the commitment and participation of governmental and non-governmental institutions involved in blood transfusion programs in a region-wide blood safety framework.

Genital trauma as the result of the insertion of vaginal products is suspected of facilitating transmission. Certain HIV-1 subtypes may be more transmissible than others, but so far strong evidence is lacking. High rates of partner change and contact with commercial sex workers were identified as individual risk factors for HIV infection early in the AIDS epidemic in Africa. In populations where a high proportion of men have sex with sex workers, such as in Kigali, Rwanda, HIV has spread much faster than in populations where commercial sex is less common, such as in Kinshasa, Democratic Republic of Congo. This is in keeping with simulation models that suggest that the HIV epidemic runs an explosive course in populations where a large proportion of men have sex with a small group of highly sexually active women—such as sex workers and their regular partners.
knowledge of the incidence of STDs is critical to our understanding of HIV patterns in the region, due to the well-documented additional risk of acquiring HIV when other partner is infected with one of a number of STDs. Prevention and treatment of STDs has been demonstrated as an effective means of reducing the incidence of HIV infection.

The World Health Organization has estimated that a total of 333 million cases of curable sexually transmitted diseases (STDs) occurred in the world during 1995. Nearly one-fifth of those, or 65 million cases, are estimated to have occurred in Sub-Saharan Africa. The annual incidence rate per 1,000 population for this region is more than 50 percent higher than any other region of the world. In 1995, it is estimated that one case of curable STD occurred for every 4 persons in Sub-Saharan Africa between the ages of 15 and 49.

The following table highlights the estimated number of new cases of STD by type for Africa in 1995:

<table>
<thead>
<tr>
<th>STD</th>
<th>New Cases (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>3.5</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>16</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>15</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>64.5</td>
</tr>
</tbody>
</table>

The high incidence of STDs in Africa is a reflection of behavioral risk, as well as a generally poor health system infrastructure, lack of adequate diagnostic facilities, chronic shortages of effective drugs for treatment of curable STDs, the presence of non-symptomatic infections, particularly among women, and poor health-seeking behavior on the part of the population.

Adequate treatment of curable STDs would result in fewer new HIV infections in the region, as well as increased health and well-being within the population. Large-scale programs to prevent and treat STDs targeting both women and men are urgently needed.

Knowledge of the incidence of STDs is critical to our understanding of HIV patterns in the region, due to the well-documented additional risk of acquiring HIV when another partner is infected with one of a number of STDs. Prevention and treatment of STDs has been demonstrated as an effective means of reducing the incidence of HIV infection.

It is clear that patterns of sexual behavior and some of the co-factors, such as sexual practices and other STDs, exist in a cultural and socioeconomic context that shapes sexual behavior and determines the prevalence of co-factors. Cultural and socioeconomic factors that have been found or are suspected to be determinants of the rate of spread of HIV include: migration/mobility, cultural context of human sexuality, sexual networking, education, poverty, male circumcision, the use of contraception and condoms, human rights, religion, and civil stability. However, singling out just one of these determinants for programming and monitoring is generally not useful.

The interrelationships and value of the determinants vary according to place, time and society. A socioeconomic risk factor such as poverty, for instance, has to be understood in a wider cultural and socioeconomic context. Poverty alone does not automatically cause AIDS, but may push women into commercial sex and thus puts them at risk of HIV infection. Cultural norms and values and the availability of other economic options will also determine whether a woman will engage in commercial sex under economic pressure. Conversely, contradictory findings of studies of male circumcision as a protective factor can probably be explained by differences in cultural context.

Unravelling the interplay between epidemiological risk factors and cultural and socioeconomic determinants is important for the design of interventions with lasting impact. Ultimately, communities shape culture; likewise, they can change cultural practices. In Uganda and Zambia, community leaders devised an alternative to the practice of men having sex with their brother's widows in order to cleanse them of spirits; while sexual intercourse has been eliminated from the ritual, the cultural significance of the practice is retained in a safer form.

On the other hand, increased knowledge and understanding of the complexity of determinants and possible underlying factors that appear to be relevant to the spread of HIV can be confusing, or worse can lead to inaction. Such an attitude is not useful and would show a lack of lessons learned, as well as the experience and insight gained on the capacity to undertake effective interventions. Based on past experience, epidemiological data and knowledge of interventions, sustainable and systematic programs to reduce the risk of transmission of blood-borne HIV and/or those programs that improve symptom recognition and access to effective care of patients with STDs should continue and be expanded where possible and appropriate. Secondly, targeting recognized high-risk behavior groups, such as sex workers, young military recruits, and large single sex labor forces through continued peer education, condom...
implementing socioeconomic action programs that address poverty, social and economic inequality based on gender and marginalization. Including data on HIV/AIDS in ongoing monitoring efforts would allow for an exploration of the links between some of the known key determinants of the HIV/AIDS epidemic and the central focus of the programs. It also would avoid costly duplication of data gathering and could foster fruitful collaboration on the understanding of HIV/AIDS as well as efforts to prevent further spread of these epidemics.

Monitoring the Impact of Prevention

A range of interventions is in place to slow the rate of spread of HIV in heterosexual populations in sub-Saharan Africa. Some of these interventions have been or are still being tested on their effectiveness in carefully controlled research settings. These interventions include condom promotion through peer education, treatment of STDs in groups of sex workers, voluntary testing and counseling, and management of STDs at the primary health care level. Studies on the effectiveness of different approaches to sex education among adolescents are underway. Other interventions, such as information, education and communication (IEC) campaigns and promotion of condom use in the general population, have not been formally tested in research settings but have been gradually implemented, while being monitored using process indicators rather than impact measures.

With regard to mother-to-child transmission, clinical trials have proved in 1994 that AZT was efficacious in reducing transmission of HIV to babies. A number of trials of shorter and simpler regimens as well as interventions, such as vitamin A supplementation, are underway in Africa. Large-scale programs are now envisioned for the very near future, which will require monitoring and assessment of their impact.

Preventions aimed at reducing heterosexual transmission

Sentinel surveillance of HIV infection in pregnant women remains the most reliable, least costly and most easily implemented method for assessing trends in HIV infection in the general heterosexual population, notwithstanding its limitations and possible biases. While interpreting an increase in prevalence early in the epidemic is relatively straightforward, it is much more difficult to gain insights in the underlying mechanisms of stable or declining trends. Concentrating the analysis on younger age groups, that is, in the group aged 15 to 19 who have been infected more recently, gives a clearer picture of recent new infections.

Trends in prevalence point at changes in epidemic spread, but their interpretation requires additional data that are not usually collected in the context of serological sentinel surveillance. Some socio-demographic data such as age, educational attainment and place of residence are quite easily collected. In order to acquire insights into possible changes in sexual behavior, additional methods are required. Several standardized tools are available for assessing sexual behavior in the general population and selected groups. While it is recognized that cultural and socioeconomic determinants shape sexual behavior, for the purpose of surveillance it may be sufficient to concentrate on a number of key indicators, such as age at first sexual intercourse and age at first marriage; number of sex partners broken down by casual partners, commercial sex partners and stable partners; and condom use.

The usefulness of analyzing behavioral data in interpreting trends in HIV infection among pregnant women has been illustrated in urban settings in Uganda, where a decline in prevalence of HIV infection among pregnant women has been observed since 1992. Analysis of the data in the group aged 15 to 19 years has revealed that this decline is mainly due to a reduction in the numbers of new infections. The behavioral data that have been collected in 1989 and in 1995 has allowed researchers to attribute this reduction in incidence to certain changes in behavior, including delay in sexual debut and first marriage, reduction in number of sex partners and increase in the use of condoms.

The easiest and most readily available indicator of condom use is the national sales and distribution figures of condoms. This indicator, however, is not sufficient and needs to be supplemented with data on condom demand, availability and use, which may be extracted from behavioral surveys.

Control of sexually transmitted diseases

Numbers of cases of STDs managed and reported by health services is a well-established indicator used in STD control programs to assess the burden of STDs and plan for such management. Interpreting trends in reported cases is problematic, because of the substantial...
variations in incidence of STD and possible changes in health-seeking behavior of STD patients, which may affect effective coverage. For instance, in Zimbabwe, the reported numbers of STD cases managed in public health services have highlighted the seriousness of the problem. Over the past few years, a decline has been noted from 1 million cases per year to 850,000 cases per year. However, it is as yet unclear to what extent this is due to STD control efforts or due to the shifts in health-seeking behavior or other factors unrelated to interventions. Apart from these difficulties in interpreting trends in reported STD cases, this indicator is rather problematic in many African countries, because of the weak health infrastructures and the low coverage of STD patients by public health services.

Alternative methods to assess the impact of STD control efforts include the assessment of the prevalence of STD and reported symptoms in selected population groups, such as pregnant women attending antenatal clinics, commercial sex workers, miners, military personnel, and students.

Probably of more direct relevance to STD control programs is the monitoring and evaluation of availability and quality of STD care in health services. WHO-GPA/UNAIDS has developed a standard protocol to this end. While such protocols are relatively easily applied in public health services, it is much more difficult to monitor quality of care in the private health sector. Several surveys conducted in different parts of Africa have shown that a large proportion of patients suffering from an STD prefer to seek care in the private health sector, and innovative approaches have to be developed to ensure and monitor quality of care in these settings.

Prevention of mother-to-child transmission

Clinical trials conducted in the U.S. and in France proved in 1994 that AZT was efficacious in reducing perinatal transmission of HIV from 25 to 8 percent. As soon as the results of the trials were released, it was evident that these results had potential application in the developing world, where nearly all perinatal HIV transmission occurs. Shorter and simplified treatment regimens could greatly improve the feasibility of this approach, its potential coverage and compliance, and at the same time would decrease its side effects and dramatically reduce its cost. A number of trials are now underway to test the efficacy of such shorter and simplified regimens (against placebo) in Africa.

Other approaches that do not require HIV counseling and testing of pregnant women are vitamin A supplementation during pregnancy and vaginal lavage at the time of delivery. A trial of vaginal lavage with chlorhexidine was performed in Malawi showing no beneficial effect of the intervention, but demonstrating, however, a reduction in neonatal mortality due to sepsis. Trials are now underway in Zimbabwe, Tanzania and Malawi to test the efficacy of vitamin A supplementation in preventing perinatal transmission. Finally, a randomized trial in Kenya is evaluating the impact of breast-feeding on perinatal transmission. Early weaning has also been proposed. In view of the concerns regarding formula-feeding, innovative alternative approaches for infant feeding are urgently needed.

Cost-effectiveness studies have shown that due to the high cost of treatment for HIV-infected infants, prevention of perinatal transmission, especially in countries where prevalence rates in pregnant women are high and where minimal health care infrastructures are available, is highly cost-effective.

More clinical and operational research would be needed to answer the many outstanding scientific and public health questions raised by the potential application of these interventions in developing countries. However, in order to implement larger scale programs, national authorities, international health institutions, drug manufacturers, and the medical community at large will have to work in close collaboration to enable infants of developing countries to benefit from these newly discovered life-saving treatments.

Monitoring the Impact of Care

HIV and AIDS care currently presents a formidable public health challenge in sub-Saharan Africa. Reasons include poorly performing economies with less than US$ 10 per capita available for health each year, and high HIV prevalence rates, which result in a heavy burden of AIDS and AIDS-related disease. The strain on health services is expected to increase with time. Consideration of the burden of care should be considered at the national, institutional, and individual levels. Because of the high HIV prevalence in most sub-Saharan countries, there is a substantial burden of patients presenting at health care facilities. Health care workers are increasingly overwhelmed, and they must be supported as they cope with their increasing work load.

There is, however, a general lack of information on the needs, gaps and understanding at the national, institutional and individual levels, and there appear to be gender and age biases in health-care-seeking behavior and in the utilization of available health resources. The
available empirical data on alternative forms of care, such as community-based care projects and the lessons learned have not been sufficiently explored and incorporated into resulting data used in modeling.

Most countries have essential drugs listed for procurement and eventual distribution in the health care systems. The operational capacity of such a system is of prime importance economically and to ensure that the most appropriate drugs are prescribed. In order for the essential drugs to reach the end user, a fully functional, effective, wide-reaching and well-monitored referral health care system is important.

The importance of voluntary HIV counseling and testing (VCT) in the care and support for HIV-affected people has been long recognized, and its effectiveness in changing behaviors among those seeking such service in developing countries has been recently documented by a multi-center (Kenya, Tanzania, and Trinidad) randomized controlled trial. Voluntary HIV counseling and testing as defined by the World Health Organization is a confidential dialogue between a client and a care provider aimed at enabling the client to plan and cope with issues related to HIV/AIDS and facilitating preventive behavior.

It is now crucial to move from research and demonstration projects to the actual implementation of VCT services as an integrated component of a comprehensive national HIV prevention and care program. The implementation of VCT services will require ongoing or periodical operational research to provide information specific to each setting on the adequacy of the counseling protocol, the accessibility to the service, the level of service use, the staff performance, the quality assurance, and the sustainability of the service. This information must be used to provide feedback to service implementers at all levels and identify ways of improving counseling and testing provision.

A variety of antiretroviral drugs is now available on the market. Although most countries cannot afford them because of the prohibitive cost, individuals continue to access and use these drugs without quality follow-up. Chemoprophylaxis of TB and other diseases have been studied in some countries, and the general consensus is that it is beneficial and effective.

In most African countries, traditional medicine is widely practiced, and traditional healers often provide the first point of contact for HIV/AIDS patients who may present at formal health care after a substantial delay. Integrating formal and informal health services provides a more effective overall response to the care of those with HIV/AIDS.

It is vital that both traditional and pharmacological treatments for HIV infection are properly evaluated and approved for use only when they have been shown to be both safe and effective. Raising false hopes among people who may be desperate and seriously ill is inhumane. Alternative forms of care are arising in most countries, based on the needs and gaps in the health care systems. In general terms, however, there is a lack of consensus on optimal and practical HIV/AIDS care. Public health practitioners, community workers and people living with HIV/AIDS must collaboratively identify, collect and analyze the information required to plan, implement, monitor and evaluate HIV/AIDS care programs.

**Research Priorities**

Research needs include the following:

- The impact of HIV/AIDS at the micro- and macro-levels and the implications for care need to be better understood.
- The attitudes and capability of health care workers in the provision of care for people living with HIV/AIDS need to be determined.
- Although there is a policy on essential drugs in most countries, the actual availability of such drugs at all levels of the health care delivery system needs to be determined. In order to maximize resources and gain wide coverage in terms of variation of HIV infection, multi-center antiretroviral drug trials should be explored. Preventive and cost effective studies on TB and other opportunistic infection chemoprophylaxis should be undertaken.
- Health care workers are at considerable risk of occupational exposure. The natural history of HIV infection in health care workers under stress conditions and daily exposure to infectious agents should be determined. In addition, post exposure prophylaxis with AZT in iatrogenic situations coupled with universal procedures on such infections should be explored.
- Methods of establishing a synergistic working relationship between traditional healers and medicine need to be investigated.

**Mobilizing Governments**

The response to HIV/AIDS at the national level requires effective action from all sectors of society. Governments have a central responsibility for dealing with HIV prevention, treatment and care, and for alleviating the impact of AIDS. It is essential that they also provide
vision and leadership to create a social context within which other role players and organizations can operate. Governments need to create the legal framework, respectful of human rights, within which HIV/AIDS interventions are carried out and provide support, leadership and direction to the national HIV/AIDS response. (See Box 5, below.)

Establishing and sustaining a national response
While most governments have established national AIDS programs, the response of most governments has been less than adequate both in quality and magnitude, although there have been notable exceptions. It may be that this can be explained in part by the natural history of the disease. The long incubation period means that by the time the AIDS epidemic and the resulting impact are felt by the country in general and the health services in particular, the adult prevalence of HIV has often reached levels of 10 to 40 percent.

Governments, whose political time frame rarely extends beyond five years, are not well placed to deal alone with a disease whose impact may only be fully felt over a period of ten to twenty years. However, the responsibility is on governments to ensure that the response at a national level is adequate. It is necessary to ensure that governments understand the need to develop a long-term response that can be sustained and is able to deal with the continuing evolution of knowledge and the accumulation of experience.

The community of AIDS workers and researchers, as well as associations of People Living with HIV and AIDS, NGOs and members of civil society must work to make governments aware of their commitments and of the need for immediate actions that will lead to long-term benefits.

There are a number of specific areas in which governments need to act:

1. Responding to the care load and impact of HIV/AIDS is a public health issue. It is essential to strengthen the primary health care infrastructure in the countries of sub-Saharan Africa where the majority of HIV infections exist. However, it is also increasingly clear that HIV will impact all sectors of society: not only health, but also education, transport, tourism, finance, and so on. Governments need to ensure that their response is genuinely multi-sectoral and not regarded as the responsibility of health departments alone.

2. It is important to acknowledge that resources committed to mitigating HIV/AIDS must compete with the demands of other primary health care needs. It is essential, therefore, that HIV/AIDS programs are based on sound analysis and comparisons of benefits and effectiveness. This should also guide the setting of general priority health programs.

3. There are many societal and contextual issues of HIV/AIDS epidemics that must be addressed. This is an area in which governments have an important role to play. Because of the particular

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**BOX 5 Human Rights and the International Legal Framework**

Every government in the region has made international legal commitments to promote and protect human rights. Human rights law includes civil, cultural, economic, political and social rights, which individuals everywhere are entitled to enjoy. Whereas public health is recognized as a valid justification for restricting rights, governments have taken actions in the context of HIV/AIDS and STD control that have reinforced, in some cases, existing patterns of discrimination and clearly violated human rights norms. Restrictions have ranged from the denial of HIV prevention information to certain populations, to obligatory partner notification, to the rounding up and mandatory testing of sex workers. Under international human rights law, restrictions relevant to public health are considered exceptions that must be justified and interpreted according to the following criteria:

Restrictions must be:
- in the interest of a legitimate objective of general interest;
- strictly necessary in a democratic society to reach this objective;
- imposed without a less intrusive means being available to reach the same goal; and
- not imposed in an arbitrary or discriminatory manner.

Whereas these criteria do not provide a prescription that defines when restrictions of rights are acceptable or unacceptable, they do provide a set of questions relevant to the formulation of policies and the design, implementation and evaluation of programs. In light of the proven effectiveness of recent drug therapies, for example, the above criteria should be considered by health professionals as they design and test approaches reducing HIV transmission from mother to child. The burden is on public health professionals to ensure that their actions are in compliance with these international norms at all stages of their work.
vulnerability of women, special efforts must be made to ensure that women have access to care services, information and education as well as technical options to enable women to take more control over their reproductive and sexual health, such as the promotion of female-controlled barrier methods.

4. Migration, which is widespread in Africa and especially in Southern Africa, may be one of the most important determinants of the rapid spread of HIV infection. In Southern Africa, for example, all of the countries of the Southern Africa Development Community (SADC) are intimately connected by extensive systems of formal and informal migration, and it is unlikely that any major change in the epidemic can be brought about unless the response is carried out at a subregional level. (See Box 6, below.) Governments in the subregion have a responsibility to ensure that regional responses become a reality. The recent adoption by member countries of the SADC AIDS and employment labor codes is an important step in this direction.

African countries that appear to have had a significant impact on the course of the HIV epidemic are Uganda and Senegal. In Uganda, the epidemic struck earlier than in most other countries, and the impact has been both profound and visible. Nevertheless, the government has helped to create a social environment in which community-based campaigns have been able to flourish assisted with an influx of donor money. Efforts must be made to ensure continuation and expansion of these efforts. In Senegal it appears that the epidemic has not taken off to the extent that it has in many other sub-Saharan African countries. (See Box 7 on page 20.)

While this may be attributed to very widespread responses from many different sectors of civil society, including the press, religious leaders, political and community organizations, the government has provided the social context and stability within which such activities can take place. Other governments have made significant financial, policy and social commitments and it is important that these are built on, strengthened and extended.

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**BOX 6 Migration/Population Mobility and HIV/AIDS**

There is evidence that migration/population mobility may be a determinant in the explosive HIV epidemics in South Africa. A wide variety of data and evidence show that men and women who leave their natural home or community and travel to towns or workplaces elsewhere in the region and stay away for days, weeks, months and in some cases years develop sexual relations with other men and women in their temporary domiciles. The same individuals return, occasionally or frequently, to their natural home, and (re)establish sexual relations with their regular partner or spouse, thus potentially introducing HIV or STDs in a partnership or even community. It is only if these “outside” sexual relations take place in a situation of high HIV prevalence that this behavior contributes to significantly increased chances of HIV spread through migrant workers or traders. Evidence from West Africa shows that large numbers of Senegalese men and women travel in the region or further abroad. Senegal has a consistently low HIV prevalence among the general population, showing that mobility/migrancy in itself is not necessarily a man determinant of increased HIV transmission. The second important conclusion that can be drawn from this is even if migrancy/mobility can be identified as a significant co-determinant of HIV transmission, the program implementations are unclear. Worldwide macroeconomic trends place a high value on easy cross border traffic of goods, skills and people. Clearly addressing the links between the spread of HIV/AIDS and migrancy/mobility will require transnational collaboration.
Low and Stable HIV Epidemics—The Case of Dakar, Senegal

After ten years of HIV sentinel surveillance among antenatal clinic attendees, there is continuous evidence of stability of HIV prevalence rates, at low levels, in some countries in sub-Saharan Africa. Major cities in such a situation include Cotonou, Benin (less than 3 percent), Yaoundé, Cameroon (less than 4 percent), and Dakar, Senegal.

In Dakar, the capital city of Senegal, HIV seroprevalence rates have stabilized among pregnant women between 0.2 and 1.3 percent. (Figure B) Among male STD patients, the seroprevalence rates stayed at around 4.5 to 6.1 percent. However, there is evidence of a sharp reduction of STD rates, except gonorrhea, among pregnant women, as well as among registered sex workers from 1991 to 1996. (See Figure C on page 21.)

There are several factors that may explain the control of the HIV epidemic in Dakar: Some of them are linked with the situation before the emergence of the HIV epidemic:

- Sex work was regulated in Senegal in the early 1970s, resulting in a STD control program for sex workers and clients and a high use of condoms in commercial sex.
- A long tradition of thousands of associations/movements and community organizations used to working in the health field (malaria, vaccinations).
- A solid system of blood transfusion banks.
- Strong social control of women’s sexuality.
- After ten years of HIV-sentinel surveillance among antenatal clinic attendees, there is continuous evidence of stability of HIV prevalence rates, at low levels, in some countries in sub-Saharan Africa. Major cities in such a situation include Cotonou, Benin (less than 3 percent), Yaoundé, Cameroon (less than 4 percent), and Dakar, Senegal.

Other factors are linked with the early response of the society to HIV/STD, including: (a) STD and HIV prevention and care activities have been integrated since 1989; (b) there has been a very high response of the civil society and an intense political dialogue with the government; and (c) media coverage of HIV/AIDS issues and production of IEC material were particularly high. These efforts would have been impossible without political stability, including a particularly strong national AIDS program.

As a result of these efforts, the knowledge of ways to prevent HIV is extremely high (more than 95 percent of 15- to 49-year-olds). This stabilization of the HIV epidemic is happening in a societal context marked by strong migration movements, a large proportion of adult single men with late age at first marriage and frequently reported casual sex. Condom use in the last sexual intercourse of risk was reported among men to be as high as 65 percent in Dakar in 1997. This reported figure should be seen in the context of the explosion of condom sales in Senegal from 800,000 in 1988 to more than 7 million in 1997.

FIGURE B: HIV prevalence among pregnant women in Dakar, Senegal, 1989–96
FIGURE C: Prevalence of STDs among sex workers in Dakar, Senegal, 1991 and 1996
Conclusion/Recommendations

Quality Surveillance

Substantial efforts have been made by many of the governments in the region to set up surveillance systems. This report highlights areas that require improvement, because the sustainability of these systems is critical for tracking of the epidemics within the region. Resources must not be taken away from current surveillance systems, but should be enhanced and improved. This will then facilitate the transition into second generation surveillance systems, which will allow for the interpretation and collation of trends in the national surveillance data.

HIV surveillance data remain important both for monitoring and forecasting trends, as well as for predicting future needs. Anonymous, unlinked testing has proven to be critical to this effort. Despite the availability of extensive data on the prevalence of HIV infection in sentinel populations, particularly women attending antenatal clinics, information on HIV incidence is generally unavailable. It is important to measure HIV incidence to better understand the current state of the epidemic, as well as to better target and evaluate prevention and care activities. Approaches to estimating incidence require further development and evaluation. Such approaches would require sequential sero-surveys in single-year age groups in young women attending antenatal clinics, and application of the new serological assay methods using cross-sectional surveys (an experimental technique that determines which infections were recently acquired).

Migration

The historical, economic and political importance of migration in sub-Saharan Africa, especially in the Great Lakes Region, the Horn of Africa, Southern Africa, Central and West Africa is well documented. Mass population movements, especially of single male migrant workers in Southern Africa, have caused cultural and social dislocation, often leading to behaviors that expose migrants to higher rates of HIV infection. These migrants, in turn, run the risk of taking the infection to their partners and spouses back home. It is believed that the high HIV prevalence levels among miners in South Africa, and probably in Zambia, Malawi, Botswana and Zimbabwe can be largely attributed to their migrant status.

A better understanding of the determinants and patterns of migration should be achieved through social, economic and behavioral studies conducted at sites of origin, tourist points and sites of employment and temporary settlement. From an HIV/AIDS perspective, the objectives of these studies should be to explore the determinants of migration and of sexual behaviors among the migrant populations in order to design and implement HIV prevention and care programs appropriately suited to their needs.

Adolescents

Increased attention must be given to understanding infection trends in young men and women between the ages of 15 and 19, an age group that has been too often characterized by anecdotal data. This method provides the best estimate of the rate of new infections because of the rapid changes taking place in the infection levels in this age group.

Vigorous prevention programs targeting adolescents must be undertaken. Prevention programs must take into account specific needs and concerns and recognize that traditional and cultural taboos often do not allow adolescents to openly discuss sexuality.
THE STATUS AND TRENDS OF THE HIV/AIDS EPIDEMICS IN SUB-SARAN AFRICA

Voluntary Testing with Pre- and Post-test Counseling
Voluntary counseling and testing services must be an integral component of HIV/AIDS prevention efforts. The demand for voluntary counseling and testing services in sub-Saharan Africa continues to grow. Pioneering studies have been done in Uganda (by TASO), Kenya, Tanzania and Rwanda, and the results are sufficiently encouraging to make this service a priority for national AIDS control programs. Efforts must be made to ensure all those who wish to know their sero-status are able to do so. The impact of such services must be carefully monitored and evaluated. In all countries in the region, counseling and HIV testing programs should be considerably expanded to respond to the growing demand for voluntary HIV testing.

Moving from Research to Program Implementation
Pioneering studies have shown that HIV transmission is prevented through the management of STDs, as well as the use of therapies to reduce vertical transmission of HIV. However, these successes have not resulted in large-scale sustainable intervention programs. Public health professionals must consider the results of these studies in the formulation of HIV prevention programs.

Access to Care for People Living with HIV/AIDS
The number of people living with HIV/AIDS continues to grow in sub-Saharan Africa, requiring increased attention to care and treatment. Care facilities must be set up that are accessible, affordable and free of stigma. Care strategies that have been shown to work need to be replicated both in their countries of origin and elsewhere in the region. Efforts must be made to provide effective and safe therapies to the region. The sheer numbers of sub-Saharan Africans living with HIV/AIDS makes the care needs in this region a matter of urgent global concern. The world community is called upon to make this issue a top priority. There is an urgent need to develop a global vision, policy and strategy on the provision of care, as well as for the regular monitoring and evaluation of the quality, quantity and coverage of care for HIV/AIDS.

Occupational Exposure to HIV
Exposure to occupational HIV infection in sub-Saharan Africa is rarely discussed, although of a great relevance to the region. Studies done in Zambia found a high prevalence of HIV infection among health care workers, especially midwives. South Africa has taken an important step in making AZT available as a prophylactic drug for nosocomial transmission to health care workers. There is need for further research to shed light on a number of gray areas, including the degree to which HIV infections in health care workers are due to nosocomial transmission or to other forms of transmission. It is imperative that governments of the region protect their front line health workers from HIV infection. For a region with the highest levels of infection, such a policy is long overdue.

Political Commitment
As HIV infections and the numbers of people living with AIDS continues to rise, policymakers in the region are called upon to review their commitment to treating HIV/AIDS as a critical and urgent health and development problem. Public health practitioners and other governmental and nongovernmental workers concerned with HIV/AIDS must make every effort to collect and analyze the information required by political leaders to develop needed policies. On the international scale, quality information on the trends and impact of HIV/AIDS epidemics and on HIV/AIDS prevention and care programs will contribute to the strengthening of a coordinated global response to the pandemic.
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