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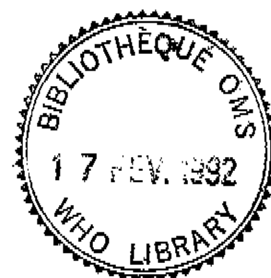
GLOBAL PROGRAMME ON AIDS

CURRENT AND FUTURE DIMENSIONS OF THE HIV/AIDS PANDEMIC

A CAPSULE SUMMARY

JANUARY 1992



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38 386

Contents

2 Introduction

3 General

5 Australasia, North America, and Western Europe

6 Latin America and the Caribbean

7 Sub-Saharan Africa

9 South and South-East Asia

10 East Asia and the Pacific

10 Eastern Europe and the former USSR

11 North Africa and the Middle East

12 Estimates and projections of HIV infections and AIDS

13 Summary and conclusions

14 Annex

Introduction

This summary of the current status and future trends of human immunodeficiency virus (HIV) infections and acquired immunodeficiency syndrome (AIDS) cases worldwide was prepared with the most recent information available to the World Health Organization Global Programme on AIDS (WHO/GPA) at the beginning of 1992. Minimal use has been made of the data on AIDS cases reported to WHO because, at best, they reflect HIV infections acquired up to a decade or more earlier.

The document will be revised periodically as additional data add to our understanding of this unprecedented pandemic.

Illustrations highlighting various aspects of the current status and future trends of HIV infections and AIDS are provided in the Annex.

General

- HIV infection and AIDS (HIV/AIDS) are epidemic worldwide (i.e., pandemic). However, they have not affected the world's population uniformly.

- Extensive spread appears, in retrospect, to have commenced in the late 1970s or early 1980s in populations of (a) homosexual or bisexual men and injecting drug users in certain urban areas of the Americas, Australasia, and Western Europe and (b) men and women with multiple sex partners in parts of the Caribbean and East and Central Africa.

- Two serotypes of HIV are recognized, HIV-1 and HIV-2. Worldwide, the predominant virus is HIV-1. Extensive spread of HIV-2 occurred through the 1980s, principally in West Africa, but HIV-2 has also been identified in East Africa, as well as in Asia, Latin America, and North America. Although the transmissibility and pathogenicity of HIV-1 and HIV-2 appear to differ, their modes of transmission are similar, and AIDS cases resulting from HIV-1 or HIV-2 infections appear to be clinically indistinguishable. In this document, the abbreviation HIV will be used when referring to HIV-1.

- The HIV/AIDS pandemic consists of many separate epidemics (in some cases even within a single country). Each epidemic has its own starting point and involves different types and frequencies of risk behaviours and practices (e.g., having multiple sex partners or sharing drug injection equipment).

- Studies to date indicate that about 60% of adults infected with HIV-1 will develop AIDS within 12-13 years of infection. Few data are available beyond 12 years, but it is expected that the vast majority of HIV-1 infected persons will develop AIDS eventually.

- Less is known of the natural history of HIV-2 infections; the evidence to date suggests a rate of progression of HIV-2 infection to AIDS that is considerably slower than that of HIV-1 infection.

- No major differences have so far been found in the rate of progression with HIV-1 to AIDS among middle-aged adults by geographical area, sex, or race. In infants born infected with HIV-1, the progression to AIDS is more rapid than in adults.

- Virtually all persons diagnosed as having AIDS die within a few years. Survival after diagnosis has been increasing in industrialized countries from an average of less than 1 year to about 1-2 years at present. However, survival time with AIDS in developing countries remains short - an estimated 6 months or less. Longer survival appears to be directly related to routine use of antiviral drugs, the use of prophylactic drugs for some opportunistic infections (e.g., pneumocystis pneumonia), and to a better overall quality of health care.

- By 1992, close to 450 000 AIDS cases had been reported to WHO, but WHO estimates that, when underdiagnosis, under-reporting, and delays in reporting

are taken into account, close to 1.5 million AIDS cases may actually have occurred in adults worldwide. In addition, it is estimated that by 1992 more than 500 000 paediatric AIDS cases resulting from perinatal transmission may have occurred, with more than 90% of this total in sub-Saharan Africa. Thus, WHO estimates that the cumulative global total of AIDS cases by 1992 stands at about 2 million.

- As of the beginning of 1992, at least 9-11 million HIV infections are estimated to have occurred in adults since the beginning of the pandemic, and about 1 million children are estimated to have been born infected with HIV.

- Potential interactions between HIV and other infectious agents have been of great public health concern. The only significant interaction identified so far is with *Mycobacterium tuberculosis* infection. Tuberculin-positive persons who are also infected with HIV develop clinical tuberculosis more rapidly than persons without HIV infection. WHO estimates that, by 1992, 4 million or more adults worldwide had become infected with both HIV and *Mycobacterium tuberculosis*, the vast majority being in sub-Saharan Africa, Latin America, and Asia.

- AIDS is essentially a sexually transmitted disease (STD), with HIV being transmitted through unprotected sexual intercourse - vaginal, anal, or oral - between men and women (heterosexual intercourse) or between men (homosexual intercourse). Like some other STDs, HIV infection can also be transmitted through blood, blood products, or donated organs or semen (parenteral transmission) and from a woman to her fetus or infant (perinatal transmission). Parenteral transmission principally involves the reuse of unsterile needles, syringes, or other skin-piercing instruments, and the transfusion of infected blood.

- HIV transmission through transfusion of HIV-infected blood or blood products has now been virtually eliminated in industrialized countries through the routine screening of donated blood and heat-treatment of blood factors VIII and IX. This problem is being increasingly addressed in most developing countries.

- Although there has been concern about the possibility that mosquitos and other biting insects may transmit HIV, all laboratory and epidemiological studies show that they do not play a role in transmitting HIV infection.

- Globally, as of 1992, over 75% of cumulative HIV infections in adults are estimated to have been transmitted through heterosexual intercourse; the relative proportion of HIV infections resulting from heterosexual as compared with homosexual intercourse varies markedly in different areas of the world.

- The predominant modes of HIV transmission in Australasia, North America, and Western Europe during the 1980s were (a) unprotected sexual intercourse between homosexual men and (b) exposure of injecting drug users to HIV-infected blood through shared unsterile injection equipment. However, HIV in these countries has increasingly been transmitted through heterosexual intercourse, and in most of them this is the only mode of transmission for which infection rates are clearly still rising.

- In sub-Saharan Africa, the predominant mode of transmission has been sexual intercourse between men and women. With many women becoming infected, perinatal transmission is an increasing problem.

- In Latin America, sexual transmission between heterosexuals is increasing, with a concomitant increase in perinatal transmission.

- In several countries in South and South-East Asia, there was a rapid increase in HIV transmission during the late 1980s through shared unsterile injection equipment and through heterosexual intercourse.

- In other areas of the world, such as East Asia and the Pacific, Eastern Europe, and North Africa and the Middle East, predominant modes of HIV transmission have yet to emerge fully because of the relatively recent (mid to late 1980s) spread of HIV in these regions.

Australasia, North America, and Western Europe

- In the industrialized countries of Australasia, North America, and Western Europe, HIV infections began to spread extensively in the late 1970s or early 1980s. The population groups predominantly affected have remained homosexual or bisexual men and injecting drug users, although heterosexual transmission is on the rise.

- Marked differences continue to exist in the relative proportions of AIDS cases among homosexual men and injecting drug users. For example, on the west coast of the USA about 90% of AIDS cases have been diagnosed in homosexual men, while on the east coast only about 60% of AIDS cases have been in homosexual men. The situation is similarly varied in Western Europe – in Scandinavia the vast majority of AIDS cases have occurred in homosexual men, while in Spain and Italy fewer than half of the reported AIDS cases are in this group.

- The incidence of HIV infection among homosexual men appears to have decreased markedly since the mid 1980s. However, large numbers of uninfected injecting drug users remain in many areas, and an explosive spread might occur in these populations in the future if they continue to share injection equipment. Heterosexual transmission increased slowly but steadily during the latter half of the 1980s, especially in urban populations with high rates of injecting drug use or STDs. Of all reported AIDS cases in the USA, about 3% were due to heterosexual transmission in 1985. In each succeeding year heterosexual cases increased gradually, so that by 1988 they constituted about 5% of total cases and by November 1991 they accounted for 6%.

- By 1992, an estimated 1.6 million HIV infections may have occurred in Australasia, North America, and Western Europe, about two-thirds of these in the USA. Over 250 000 AIDS cases have been reported from Australasia, North America, and Western Europe, but close to 350 000 or more cases may have occurred by 1992.

- Perinatal transmission was not considered a major problem during the 1980s, but is increasing as the number of HIV-infected women has grown. It is estimated that up to 20 000 infants may have been born in the USA to HIV-infected women from the start of the epidemic up to 1990; as many as a third of these children could have been infected perinatally.

- In many large cities in Australasia, North America, and Western Europe, AIDS has become a major cause of death for young adults aged 20-40 years. During the 1990s, HIV-related disease will be among the leading causes, if not the leading cause, of death in this age group. As early as 1988, AIDS became the leading cause of death for both men and women aged 25-34 in New York City.

- Through the 1990s, homosexual men and injecting drug users will continue to be the population groups most affected by AIDS in these countries, but it is expected that new infections will occur predominantly in heterosexuals with multiple sex partners.

- Health care for HIV-related illnesses in these countries during the early 1990s may cost several thousand million US dollars or more annually. These costs may rise further as newer and more effective but more expensive treatments become available and as the numbers of illnesses due to HIV infection increase.

- Almost all of the estimated direct medical care costs for AIDS treatment up to the mid-1990s will be incurred regardless of how successful programmes for HIV/AIDS prevention and control may be, because about 90% of the AIDS cases expected over the next 4-5 years will occur in persons already infected with HIV.

Latin America and the Caribbean

- The epidemiological pattern in Latin America has evolved rapidly, and in addition to the groups of HIV-infected homosexual or bisexual men, there is increasing heterosexual transmission. HIV transmission among injecting drug users also appears to be a growing problem in some countries; 20% or more of injecting drug users in some areas of Argentina, Brazil, and Uruguay have been found to be infected with HIV.

- Extensive spread of HIV began in the early 1980s. In the beginning, the population groups predominantly affected were homosexual or bisexual men and injecting drug users residing in large cities.

- Since the mid-1980s, in many countries of the region, sexual transmission between men and women has increased to become a major, if not the predominant, mode of HIV spread, principally occurring between bisexual males and their female partners, and female prostitutes and their male clients.

- In 1989, a study in Honduras involving several hundred prostitutes reported an HIV prevalence of close to 20%; in 1990, another study with a similar group showed an HIV prevalence of about 35%.

- In Central America, there has been a 40-fold increase in the rates of reported clinical AIDS cases in women in the last four years. Infection rates for pregnant women are increasing in Brazil and the Caribbean. The increasing prevalence of HIV infection in women of childbearing age will mean a corresponding rise in HIV perinatal transmission. According to recent analyses, 10 000 children in Latin America have already been born with HIV infection.

- Estimates of total HIV infections are difficult to make for Latin America and the Caribbean because of the relatively limited data available, but as of 1992 the cumulative total is estimated to be over 1 million. The total number of adult AIDS cases is estimated to be about 150 000.

- The potential health care needs of the projected hundreds of thousands of AIDS patients will constitute an immense challenge to those countries in the region that already have a less than adequate health care infrastructure and will prove a heavy economic burden.

Sub-Saharan Africa

- Most of the available epidemiological and clinical data indicate that extensive spread of HIV started in sub-Saharan Africa in the late 1970s, although some evidence suggests that HIV infection was present in some parts of Africa several decades earlier. Heterosexual transmission of HIV continues to be the predominant mode of spread.

- In these countries, parenteral transmission through HIV-infected blood continues to be a relatively small but nevertheless important public health problem, probably accounting for less than 10% of all infections. The problem is declining as routine HIV screening of blood donated for transfusions is implemented more widely.

- Such practices as male or female circumcision, ritual scarification, and the use of unsterile needles and syringes are believed to account for only a small proportion of total HIV infections in sub-Saharan Africa.

- High rates of other STDs, especially those which cause ulcerative lesions such as chancroid and syphilis, are believed to be important factors that have facilitated heterosexual transmission of HIV in this region.

- Because sexual transmission between men and women is predominant, the numbers of HIV infections in men and women are more or less equal. As with other sexually transmitted diseases, there is a slight excess of women infected with HIV, for a variety of sociological and biological reasons; the male to female ratio is approximately 1:1.2.

- Many women of childbearing age are infected, and HIV transmission from an infected woman to her fetus or infant before, during, or shortly after birth (perinatal transmission) is a widespread and increasing problem in sub-Saharan Africa.

- Most African countries did not begin routine reporting of AIDS to WHO until 1987; since 1989, AIDS case reporting has improved markedly. By 1992, more than 120 000 AIDS cases had been reported.

- Taking into account extensive underdiagnosis, under-reporting, and reporting delays, WHO estimates that by 1992 close to 1 million adult AIDS cases had probably occurred in sub-Saharan Africa, or around two-thirds of the estimated global total.

- WHO estimates that by 1987 about 2.5 million HIV infections had occurred in sub-Saharan Africa. As of early 1992, the cumulative total in adults may conservatively be estimated at more than 6.5 million.

- In 1987 about two-thirds of the HIV infections were found in nine countries of East and Central Africa, representing only about one-sixth of the total population of sub-Saharan Africa. Today, the main focus of infection remains East and Central Africa.

- In 1987 most infections were concentrated in urban populations. Epidemic spread of HIV is increasingly being documented in the rural areas, where most of the people live.

- In East and Central Africa, between one-quarter and one-third of all adults aged 15-49 living in some large urban centres had become infected with HIV by 1992.

- In West Africa, in addition to moderate HIV-2 transmission, many countries have experienced marked increases in HIV-1 infections. For example, in Abidjan, Côte d'Ivoire, HIV-1 prevalence in adults has risen from around 1% to over 7%. During the late 1980s, reports of AIDS cases from West Africa increased steadily; by January 1992, approximately 8 300 AIDS cases had been reported from Côte d'Ivoire alone.

- It is estimated that about 750 000 HIV-infected infants had been born in Africa by 1992, and the projected total by the end of the 1990s is 4-8 million.

- The projections for HIV-infected infants are based on a perinatal transmission rate of about 30%. This rate may increase with time, but it nevertheless suggests that up to 70% of infants of HIV-infected mothers will be born uninfected. These uninfected infants will constitute a growing group of potential orphans, since most of their HIV-infected mothers will die of AIDS within 5-10 years of their birth. During the 1990s, as many as 10 million children under 10 years of age may be orphaned as a result of maternal AIDS in the region.

- Projected infant and child deaths from AIDS may increase child mortality rates by as much as 50% in much of sub-Saharan Africa during the 1990s. In many countries this would wipe out the gains in child survival achieved over the past two decades.

- During the 1990s, the impact of AIDS will be greatest in large urban areas of sub-Saharan Africa, especially in East and Central Africa. In such cities, AIDS deaths in young children and in those aged 15-49 may well reduce expected

population growth by more than 30%. The adult mortality rate may more than triple. However, the population in these countries is expected to continue growing during the 1990s.

- The economic and social impact of a disease that kills people in what should be their most productive years will be immense. The selective impact on young and middle-aged adults, who include members of social, economic, and political elites, could lead to economic disruption and political turmoil.

- The health and social support infrastructure in the region will be inadequate to cope with the clinical burden of HIV-related disease. Up to 80% of all hospitalized patients in some large urban hospitals in Central and East Africa are HIV-infected.

- An adequate response to this unprecedented epidemic will require substantial resources so that countries in sub-Saharan Africa can continue to strengthen HIV/AIDS prevention and control programmes and take care of the ever-increasing numbers of AIDS patients and orphans.

South and South-East Asia

- Although extensive spread of HIV began only in the mid-1980s or later, the spread of infection has been rapid in some population groups practising high-risk behaviour for acquiring or transmitting HIV infection.

- In South-East Asia, HIV transmission was initially predominant among injecting drug users, with HIV prevalence rates in certain groups of about 50% in Bangkok, Thailand, and 30% in Yangon, Myanmar. Prevalence rates of at least 10% have also been noted in a few studies in neighbouring regions. However, heterosexual transmission has been increasing rapidly among persons with multiple sex partners, and since 1989 this appears to be the predominant mode of transmission of HIV.

- In South Asia, the predominant mode of transmission is heterosexual. Since 1988, available evidence suggests that up to 250 000 individuals have become infected with HIV in several of the larger cities. About 20% or more of the estimated 100 000 to 300 000 prostitutes in the Bombay area are thought to be HIV-infected. High-risk populations in Madras and Pune also appear to have significant, though still lower, levels of HIV infection. In addition, there is some transmission through drug injecting; HIV prevalence rates of over 50% have been found in injecting drug users in Manipur, northeastern India.

- In late 1991, the Government of Thailand, in collaboration with WHO, estimated that 200 000 to 400 000 HIV-infected persons were present in Thailand. In addition, projections derived from HIV modelling indicate that if no major changes occur, there may be a cumulative total of 2 to 4 million HIV infections in Thailand by the year 2000.

- The pandemic in this region is thus still at an early stage, but indications are that it is growing quickly. As of early 1992, a conservative estimate of HIV infections in South and South-East Asia is over 1 million, the vast majority of them in India and Thailand.

- There is concern that the pandemic in South and South-East Asia may be growing at a pace reminiscent of sub-Saharan Africa in the early 1980s, but may have an even greater potential for spread, given the adult population of nearly 500 million as compared with 225 million in sub-Saharan Africa.

The predominant modes of transmission in the following areas of the world are not fully delineated because of the relatively recent spread of HIV into these areas. However, significant foci of HIV infection have been reported since the mid-1980s.

East Asia and the Pacific

- The limited data available indicate that the fewer than 700 AIDS cases reported to date represent reasonably accurately the current status of AIDS in East Asia and the Pacific. A large proportion of these are in persons with haemophilia who became infected through HIV-infected blood products in the early to mid 1980s. However, the numbers of HIV-infected persons are estimated to be at least in the tens of thousands, and the numbers of AIDS cases are thus expected to increase markedly during the 1990s.

- Yunnan Province, China, is geographically contiguous with South-East Asia, and the epidemic of HIV infections among injecting drug users in that province may be considered part of the epidemic in South-East Asia. However, the outbreak in Yunnan is also an important reminder that if high-risk behaviours exist, regions relatively spared by the pandemic to date may experience a precipitous change in their status.

Eastern Europe and the former USSR

- In the late 1980s in Romania and Elista, USSR, localized outbreaks of HIV infection occurred in infants and young children as a result of the use of unsterile parenteral injection equipment, or the inappropriate use of blood and blood products, which had not been screened for HIV antibody. In the Elista outbreak, several hundred children became infected; in the Romanian outbreak, it is believed that the number of children who became infected with HIV may be as high as 1000 to 2000.

- A countrywide HIV prevalence among injecting drug users of about 10-15% was reported in Poland in 1989. Few other epidemiological studies of injecting drug users have been reported, and the potential magnitude of the HIV/AIDS problem in these groups in Eastern Europe and the republics that composed the former USSR remains poorly defined.

- It remains to be seen whether or not the recent far-reaching social and political changes in this region will lead to changes in the epidemiology of HIV/AIDS. Careful monitoring of the situation will be needed.

- HIV/AIDS prevention and control programmes in these countries will continue to require strengthening over the next few years. In addition to developing educational programmes on HIV/AIDS for health care providers and the general public, high priority must be given to improving medical care procedures to avoid further outbreaks from bloodborne infectious agents such as HIV.

North Africa and the Middle East

- Although data from only a few studies are available to WHO, they suggest that extensive spread of HIV has begun in some parts of North Africa and the Middle East. Approximately 1000 cases of AIDS, and in addition, more than 3000 HIV infections have now been officially reported. It is estimated that by 1992 there may have been about 50 000 HIV infections in this region.

- An HIV prevalence of close to 40% was found among female prostitutes in one North African country in 1991. A prevalence of about 14% was reported among injecting drug users known to authorities in one Gulf state in 1989.

- Little information is available regarding the extent of high-risk behaviours in North Africa and the Middle East except indirectly. For example, penicillin-resistant *Neisseria gonorrhoeae* has been isolated on the Arabian Peninsula, and reports have suggested substantial numbers of cases of STDs in this region. Trade in addictive drugs such as heroin also appears to be substantial in some parts of the region.

Estimates and projections of HIV infections and AIDS

- Uncertainties about the potential for the spread of HIV and the ultimate dimensions of the HIV/AIDS pandemic have existed since the initial recognition of AIDS in the early 1980s.

- The major uncertainties include (a) when, and at what level, HIV prevalence will peak in different populations at risk in the various geographical areas, and (b) the precise proportion and rate at which HIV-infected children and adults will ultimately develop AIDS and die. Despite these uncertainties, a variety of methods and models have been developed to make estimates and projections of the HIV/AIDS pandemic.

- In countries where AIDS reporting is relatively reliable and timely, short-term (less than 3 years) AIDS projections can be made with reasonable accuracy by extrapolating from trends in reported AIDS cases, after correcting for reporting errors.

- WHO has developed a simple model to make AIDS projections for up to 5 years using (a) an estimate of HIV prevalence for a given year, (b) an estimate as to the year when extensive epidemic spread of HIV began, and (c) estimated annual rates of progression from HIV infection to AIDS. This model is especially useful for countries where AIDS reporting is relatively incomplete.

- WHO uses HIV estimates made by national authorities or, if unavailable, those made by WHO. The lower range of HIV estimates is used for projection purposes, and thus the results of AIDS modelling by WHO should be considered conservative.

- It is difficult to develop reliable methods or models to project HIV incidence into the short-term or longer-term future. Nevertheless, forecasts of HIV trends have been attempted.

- The "Delphi" survey method was used by WHO in late 1988 to forecast global HIV infections by the year 2000. The Delphi survey participants, a selected group of experts in HIV/AIDS epidemiology, predicted a cumulative total of 15-20 million adult HIV infections worldwide by the year 2000.

- Since 1988, data indicative of substantial increases in HIV infections in sub-Saharan Africa and in South and South-East Asia have accumulated and suggest that the Delphi results may be very conservative. Recent information indicates that there have been over 3 million new HIV infections over the past 3-4 years, most of them in these two regions. The Delphi projection of 15-20 million cumulative HIV infections in adults may well be reached by the mid to late 1990s, if the currently estimated rate of new HIV infections in developing countries is sustained.

- Even though the ultimate longer-term dimensions of the HIV/AIDS pandemic cannot yet be forecast with any degree of confidence, a plausible range of estimates of new HIV infections during the 1990s can be inferred from available data on the current global status of the pandemic. Such

information suggests that during the 1990s, 10-20 million new HIV infections may be expected in adults, mostly in developing countries. During the same decade, WHO projects that 5-10 million children will have been born with HIV, the majority of them in sub-Saharan Africa.

- For the year 2000, WHO's current projection is that there will be a cumulative total of 30-40 million HIV infections in men, women, and children, of which more than 90% will be in the developing countries. The projected cumulative total of adult AIDS cases is close to 10 million, of which almost 90% will be in the developing countries. And there will be 10 million or more children less than 10 years of age orphaned as a result of AIDS, primarily in developing countries.

Summary and conclusions

- Education strategies that modify or eliminate risk behaviours continue to be the primary interventions available to prevent and control the continuing spread of HIV.

- The HIV pandemic is dynamic and evolved markedly during its first decade. In Australasia, North America, and Western Europe, the number of new HIV infections is decreasing overall, although infection rates are rising in heterosexuals. In many developing countries new infections continue to increase overall.

- During the next 10 years, AIDS will have a very selective and severe impact on mortality rates of young and middle-aged adults in industrialized countries and many developing countries. It is likely that increases in child mortality due to HIV/AIDS will more than offset the gains achieved over the past two decades by child survival programmes in many developing countries.

- The first cases of AIDS were reported in the United States of America in 1981 - just one decade ago. During that decade the world has seen what appeared at first to be an illness largely confined to homosexual men and drug injectors in industrialized countries become a pandemic affecting millions of men, women, and children on all continents.

ANNEX

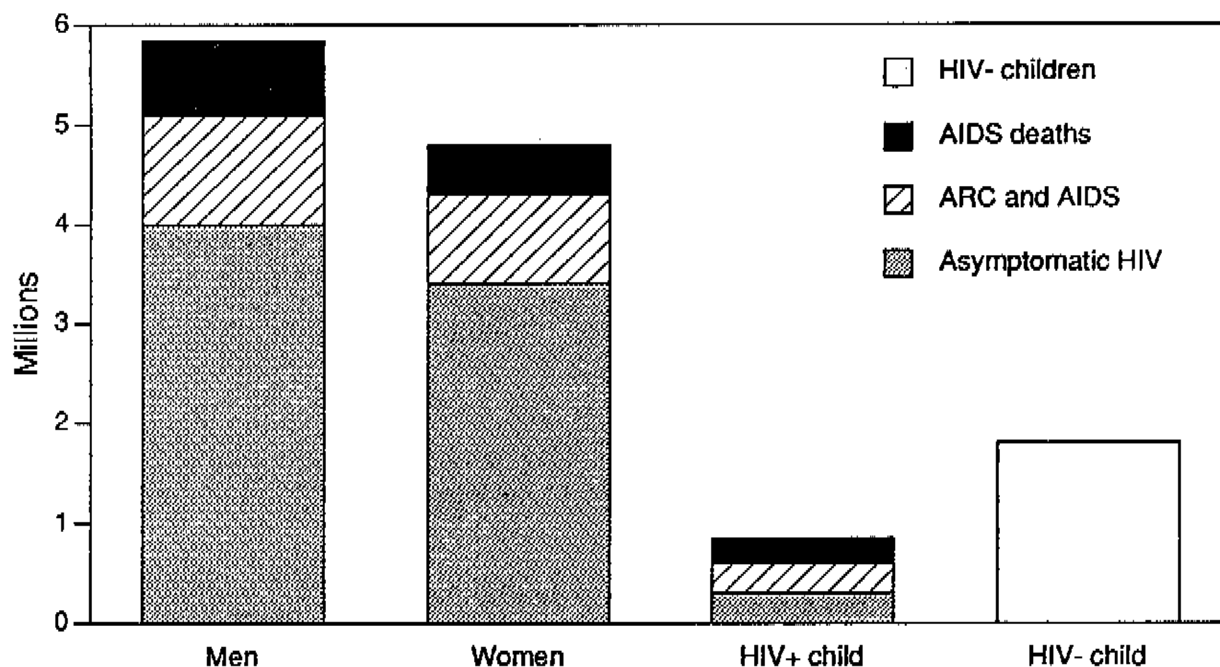

Fig 1. Cumulative global HIV/AIDS estimates, January 1992.
The stacked columns show the status in early 1992 of the men, women, and children estimated to have become infected with HIV and the estimated numbers of HIV-negative children born to infected women.

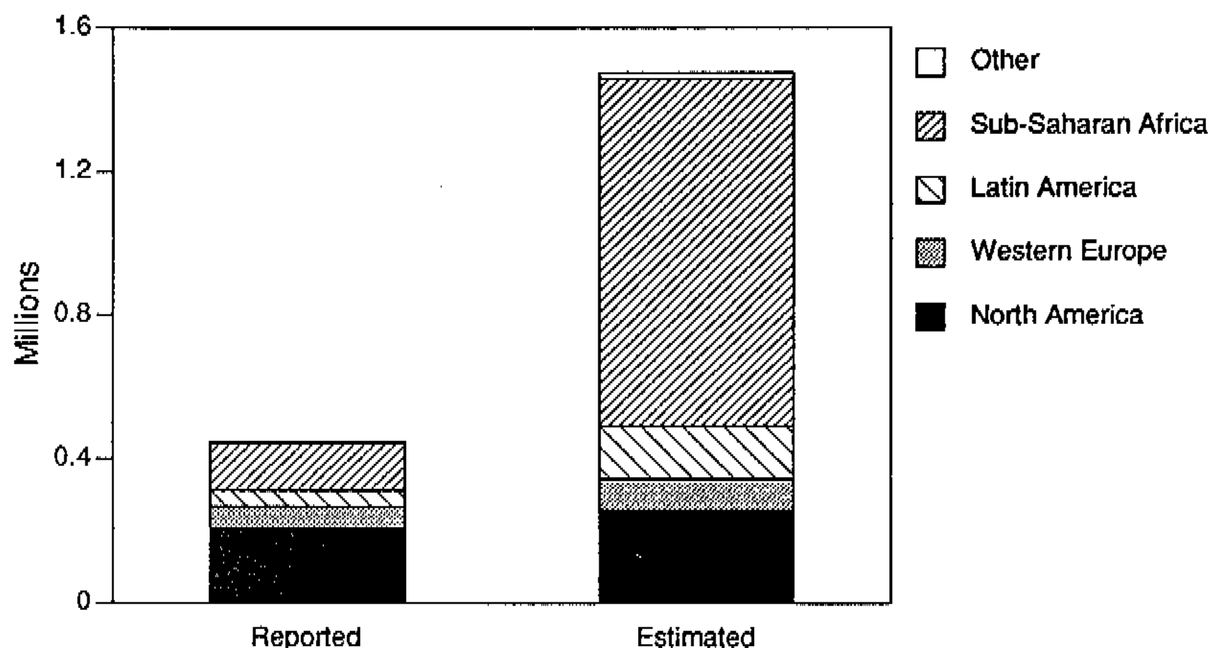

Fig. 2. Reported and estimated cumulative adult AIDS cases, January 1992.
The stacked column on the left shows the distribution of AIDS cases that had been reported to WHO as of 1992 in different regions of the world; the column on the right shows the distribution of the cumulative adult AIDS cases estimated to have occurred in those regions.

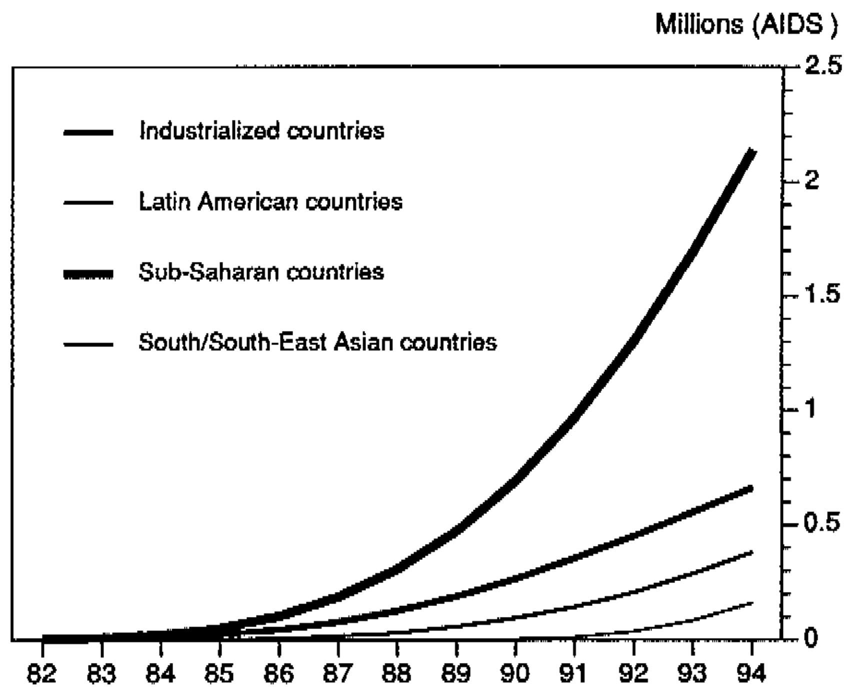

Fig 3. Cumulative estimates/projections of adult AIDS cases.
These estimates and projections were derived from estimated HIV prevalence rates for 1990, using a WHO model for short-term projection of AIDS. The cumulative global projections for the mid-1990s total about 4 million adult AIDS cases.

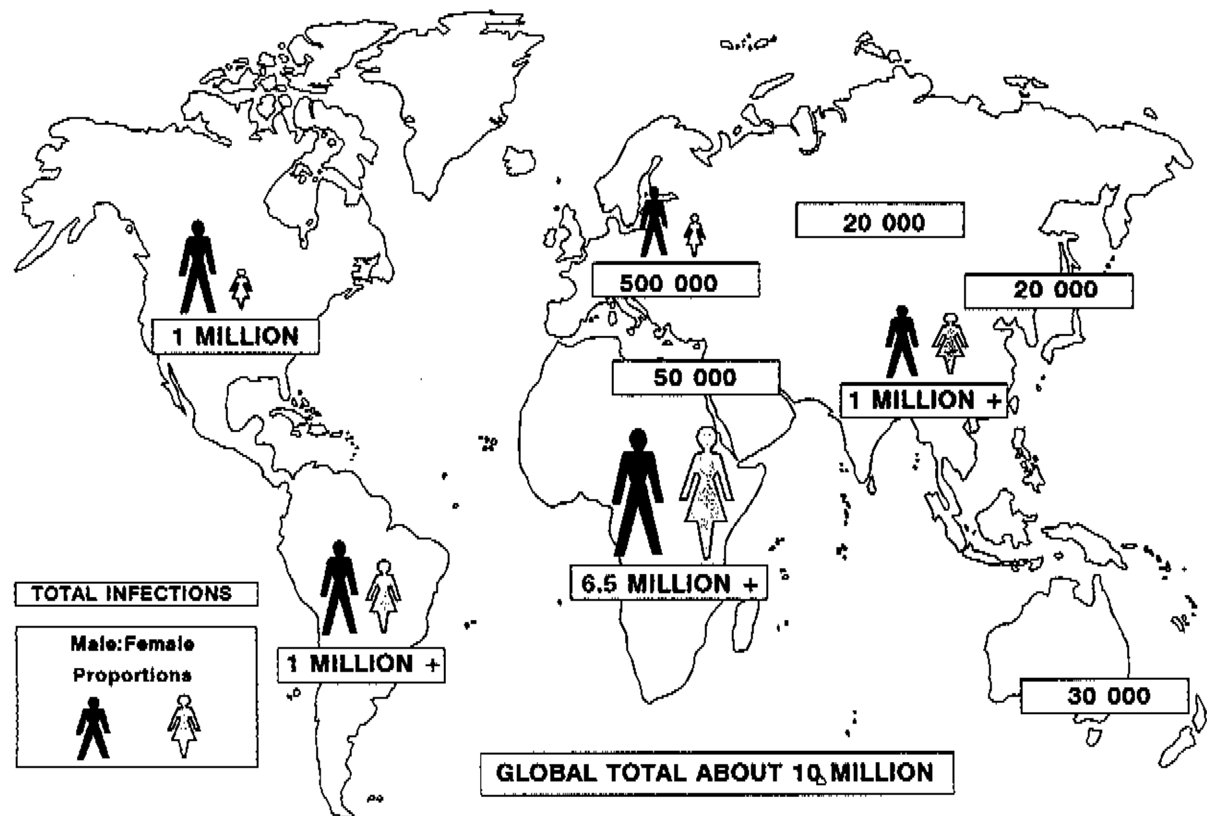

Fig. 4. Estimated cumulative global distribution of adult HIV infections, January 1992.
The estimated cumulative global total of HIV-infected adults in 1992 is about 10 million, which means that, for the world population, 1 in every 250 adults has been infected with HIV. Infection rates vary widely in different regions of the world. The highest rates are in sub-Saharan Africa, where 1 in 40 men and 1 in 40 women are estimated to be infected, with an estimated cumulative total of more than 6.5 million.