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AIDS

THE HIV/AIDS PANDEMIC:
1994 OVERVIEW



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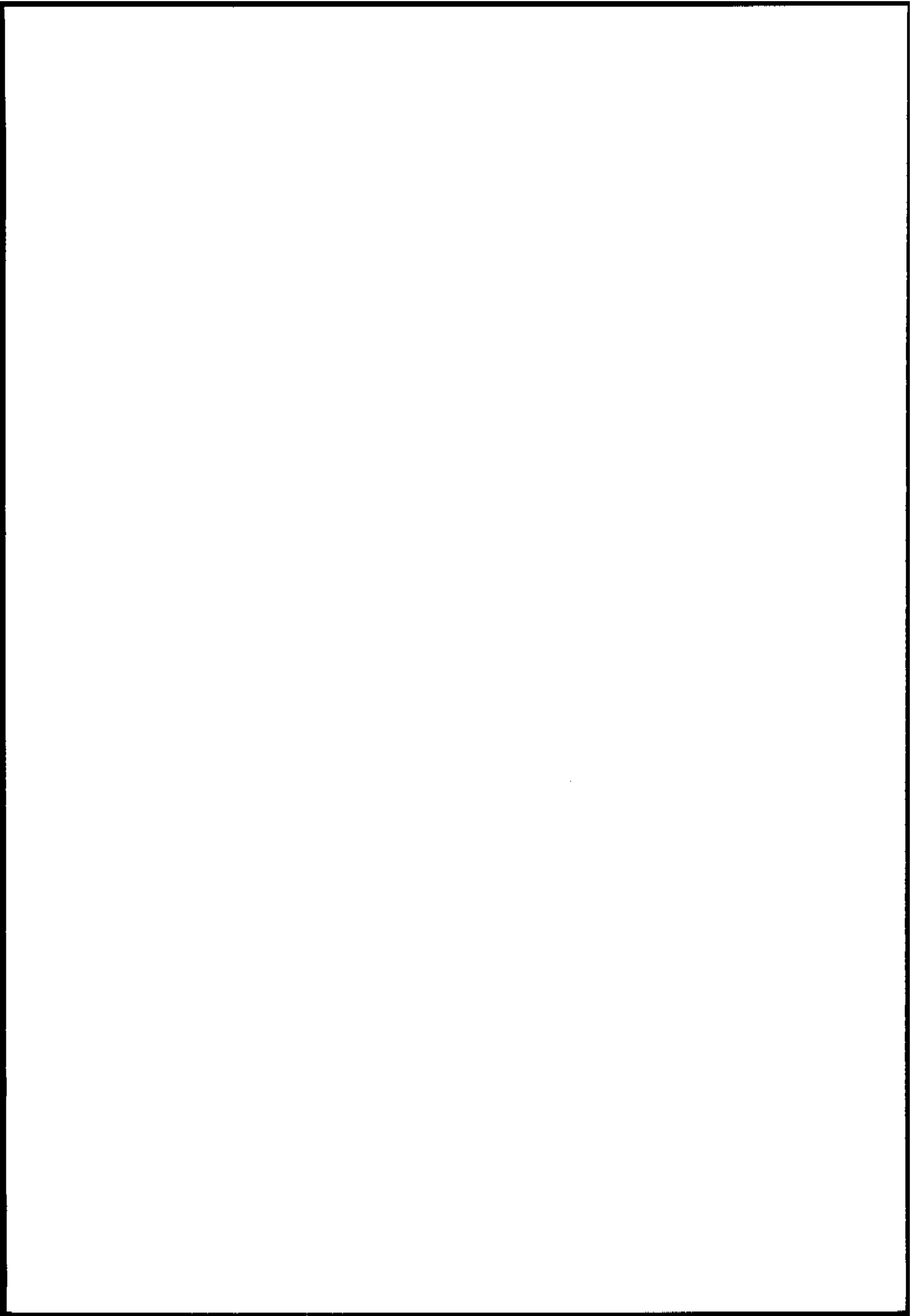
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THE HIV/AIDS PANDEMIC: 1994 OVERVIEW

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I. Introduction

a. The HIV/AIDS pandemic

In 1981 a new syndrome, the acquired immunodeficiency syndrome (AIDS), was first recognized among homosexual men in the USA. By 1983 the etiological agent — the human immunodeficiency virus (HIV) — had been identified. By the mid-1980s it became clear that the virus had spread, largely unnoticed, throughout the world and that its effects had reached global — or "pandemic" — proportions.

The HIV/AIDS pandemic consists of many separate epidemics (in many cases even within a single country). Each epidemic has its own distinct origin, in terms of geography and specific populations affected, and involves different types and frequencies of risk behaviours and practices — for example, having unprotected sex with multiple partners or sharing drug injection equipment.

The extensive spread of HIV appears, in retrospect, to have commenced in the late 1970s or early 1980s — in the Americas, Australasia and Western Europe primarily in homosexual or bisexual men and injecting drug users (IDUs) in certain urban areas; and in parts of the Caribbean and East and Central Africa among men and women with multiple sex partners. Today, the virus is being transmitted in all countries. As of mid-1994, more than 17 million HIV infections are estimated to have occurred since the beginning of the pandemic, over 16 million of them in adults (Figure 1; Table 1).

Figure 1. Estimated global distribution of total adult HIV infections from late 1970s/early 1980s until mid-1994

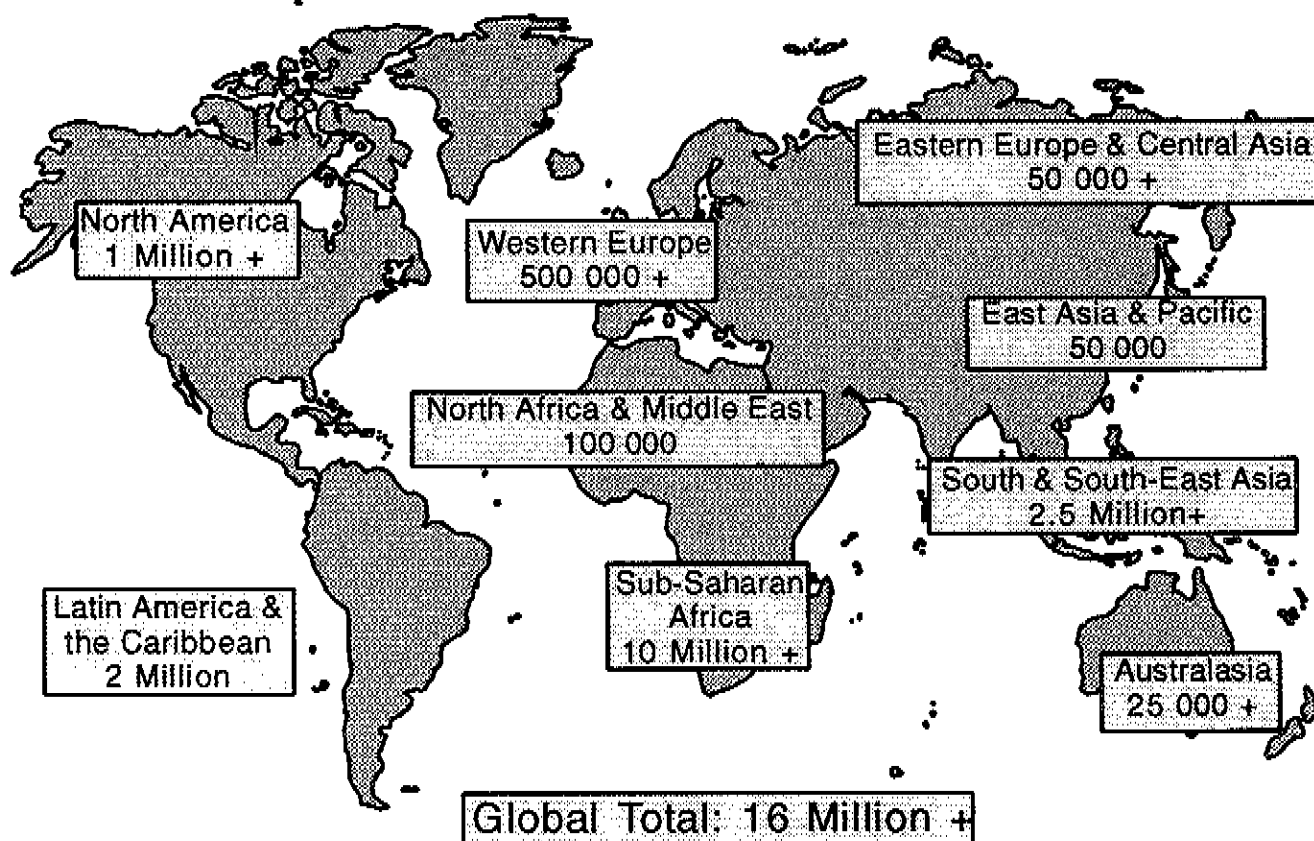


Table 1. The HIV/AIDS situation — mid-1994

| Region | Estimated total adult HIV infections ¹ | Estimated total adult AIDS cases ² | Cumulative reported AIDS cases (adults and paediatric) | Ratio of HIV infections to men to those in women |
|--------------------------------|---|---|--|--|
| Australasia | > 25 000 | > 5 000 | 5 158 | 5-6 |
| North America | > 1 million | > 450 000 | 421 418 | 5-6 |
| Western Europe | > 500 000 | > 150 000 | 111 877 | 5-6 |
| Latin America & the Caribbean | 2 million | > 400 000 | 102 359 | 4 |
| Sub-Saharan Africa | > 10 million | 2 million | 330 805 | 0.83-0.91 |
| South and South-East Asia | > 2.5 million | 250 000 | 7 195 | 2-3 |
| East Asia and Pacific | 50 000 | > 2 000 | 1 073 | 5-6 |
| Eastern Europe & Central Asia | > 50 000 | > 7 000 | 3 932 | 5-6 |
| North Africa & the Middle East | 100 000 | > 15 000 | 1 302 | 4 |
| Global Total | > 16 million | > 3 million | 985 119 | 1.5 |

¹ From late 1970s/early 1980s to mid-1994

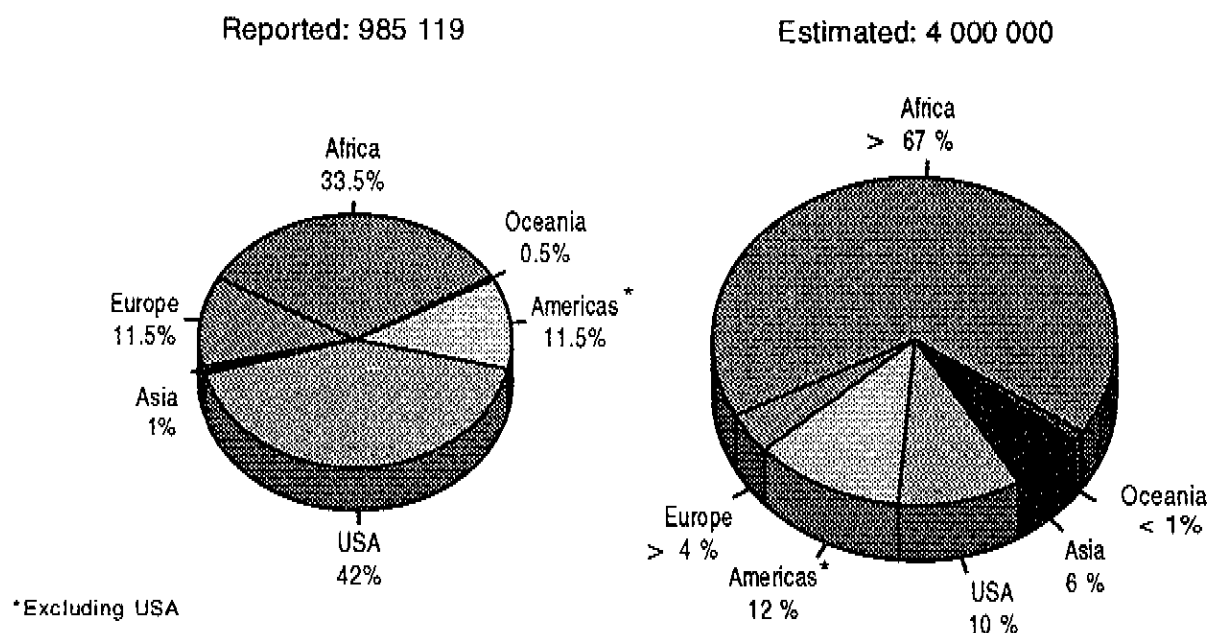
² No. of men infected for one woman

Initially, in developed countries, men were more exposed to HIV than women, primarily as a result of homosexual or bisexual intercourse or drug injecting, but the difference in the numbers of men and women infected with HIV has gradually narrowed as heterosexual transmission has become more common. In other parts of the world, where heterosexual transmission predominated from the outset, the difference in the numbers of men and women infected is even narrower. Worldwide, there are 3 men infected for every 2 women (see Table 1) and by the year 2000 the number of new infections among women will be equal to that among men. The rising infection rates in women are accompanied by a corresponding rise in the number of children born with HIV infection. To date, it is estimated that over 1 million children have been infected with HIV through mother-to-child transmission. These children rapidly develop AIDS and die — usually before the age of 5.

Two serotypes of HIV are currently recognized, namely HIV-1 and HIV-2. Worldwide, the predominant virus is HIV-1. However, HIV-2 appears to have spread during the 1980s, principally in West Africa, although sporadic infections with this serotype have now been reported from East Africa too, as well as from Europe, Asia and Latin America. HIV-2 is transmitted in the same way as HIV-1, and the two viruses appear to cause clinically indistinguishable AIDS. However, HIV-2 is less easily transmitted, and the period between initial infection and illness is longer in the case of HIV-2.

By 1 July 1994, a total of 985 119 AIDS cases had been reported to WHO (Table 1), but WHO estimates that as of mid-1994, allowing for under-diagnosis, under-reporting, and delays in reporting, there have been around 4 million cumulative AIDS cases worldwide (Figure 2). Of these, it is estimated that over three-quarters of a million are paediatric AIDS cases resulting from mother-to-child transmission, almost all of these having occurred in sub-Saharan Africa.

Figure 2. Total number of AIDS cases in adults and children from late 1970s/early 1980s until mid-1994



There is now evidence to suggest that a stabilization in the prevalence of HIV infection may be taking place in certain areas, such as the developed regions of Australasia, North America and Western Europe, as well as in the high prevalence areas of East and Central Africa; such changes are not necessarily positive developments from a prevention perspective. Stabilization in prevalence indicates that the number of deaths from AIDS over the last year has approximately equalled the number of new HIV infections. However, stabilization may mask disproportionate increases in particular modes of HIV transmission, as has been the case with heterosexually transmitted HIV in many developed countries, or disproportionate increases in new HIV infections among young people. Such phenomena are evidence of the transition from epidemic HIV/AIDS to endemic HIV/AIDS. Stabilization in HIV prevalence is simply one more facet of the ever-changing global challenge of HIV/AIDS.

b. Modes of HIV transmission

An understanding of the ways in which HIV can be transmitted is central to an understanding of the epidemiology of the pandemic. It has now been established, as a result of laboratory and epidemiological investigations, that HIV is transmitted in three ways: through **sexual intercourse**, through **blood** and from **mother to child**.

HIV transmission through **sexual intercourse** accounts for about three-quarters of all HIV infections worldwide. In other words, HIV infection is a sexually transmitted disease (STD).

The majority of the world's HIV infections have been acquired through sexual intercourse between men and women (heterosexual transmission). The proportion of HIV infections attributable to this mode of transmission continues to grow. Transmission through sexual intercourse between men occurs in most parts of the world, although in the developed countries it has become less common as a result of the adoption of safer sex practices by homosexual men.

As with certain other STDs, HIV infection can also be transmitted through **blood**, for example as a result of the medical transfusion of infected blood or blood products. In many parts of the world progress towards a safer supply of blood and blood products is being achieved through the appropriate selection and retention of voluntary, non-remunerated, low-risk donors, the screening of donated blood, and through more rational use of blood aimed at decreasing the number of people receiving transfusions. Less commonly, HIV is also transmitted through the use of non-sterilized skin-piercing instruments, both in health facilities (nosocomial transmission, mostly occurring from patient to patient) and outside the health care setting. A major problem in both the developed and developing world is HIV transmission resulting from the use of contaminated injection equipment by drug users.

The transmission of HIV from **mother to child** includes transmission during pregnancy, during delivery and through breast-feeding. Overall, approximately one-third of children born to HIV-infected mothers will acquire HIV infection from their mothers. The majority of mother-to-child transmission occurs during pregnancy and delivery, although some transmission is believed to occur through breast-feeding. Recent data suggest that up to 15% of babies breast-fed by HIV-infected mothers may become infected through breast-feeding.

Laboratory and epidemiological studies have shown that HIV is **not** transmitted by everyday contact, by hugging or kissing, through food or water, or by mosquitos and other biting insects.

c. Progression from HIV infection to illness

The interval between infection with HIV and the onset of clinical symptoms is unusually long compared with other communicable diseases, and varies considerably between individuals. Approximately 50% of those infected become ill within ten years of initial infection. Current evidence suggests that, in the absence of other causes of death, almost all HIV-infected people will ultimately die of AIDS. Once an individual develops AIDS, the average survival time appears to be between one and three years, and is influenced by factors such as exposure to opportunistic infections and access to health care.

Less is known of the natural history of HIV-2 infection, although the evidence to date suggests that people infected with HIV-2 progress to AIDS considerably more slowly than those infected with HIV-1.

Several factors may influence the rate of progression from HIV infection to onset of clinical illness. Some strains of HIV are more pathogenic than others. Human genetic factors and other host-specific factors may affect the rate at which different individuals develop disease. Yet other factors, including concurrent infections, may also play a role. There is clear evidence that young children and adults over 40 years of age progress to disease faster than young adults.

d. Interactions between HIV infection and other major diseases

The transmission of other **sexually transmitted diseases**, including gonorrhoea, syphilis and chancroid, is associated with the same behaviours that expose individuals to potential HIV infection and ultimately AIDS. Furthermore, data suggest that STDs — especially those such as chancroid and syphilis, which cause ulcerative lesions — facilitate both the acquisition and transmission of HIV. For both these reasons, early and effective STD diagnosis and treatment, and education on ways of avoiding reinfection are important for the prevention of HIV infection.

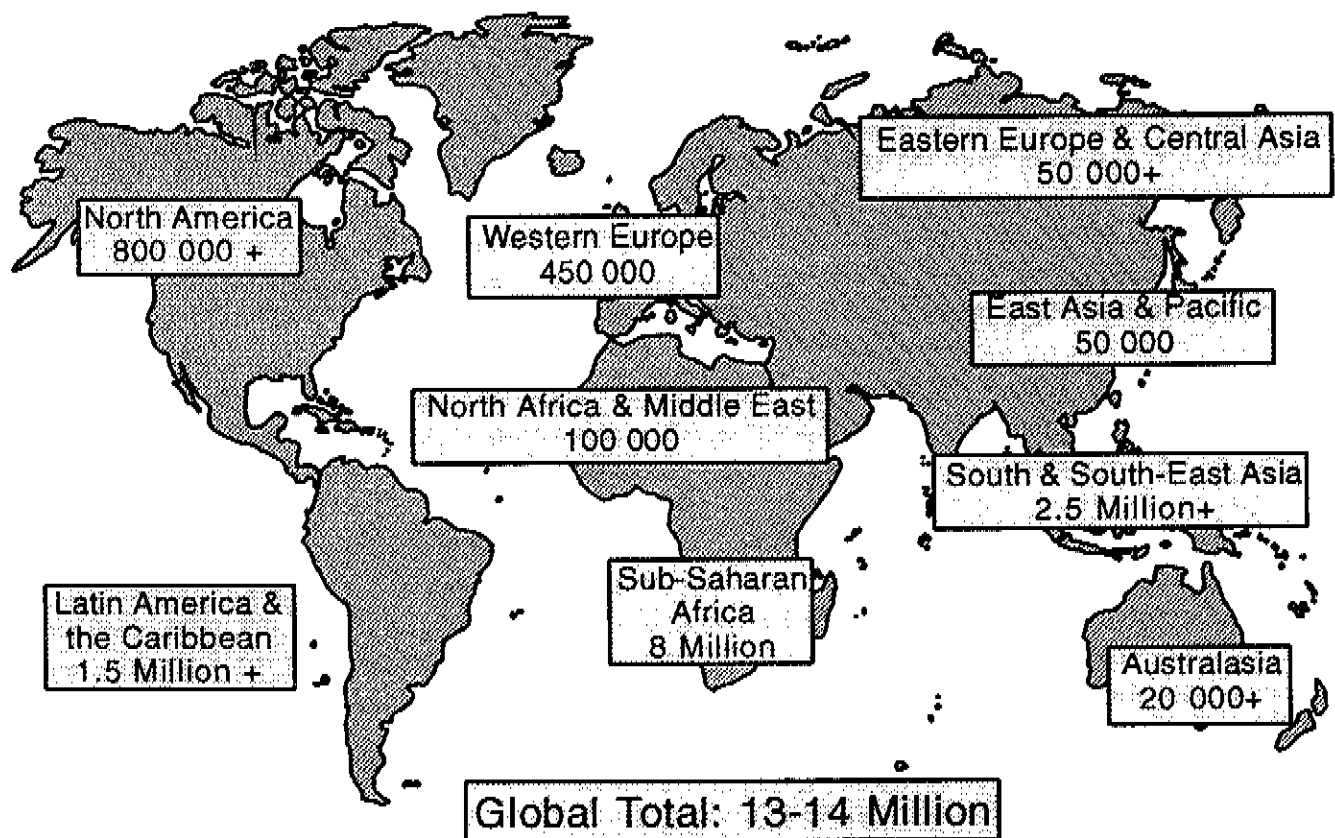
About 30% to 50% of adults in most developing countries have latent **tuberculosis** infection — i.e., they have been infected with *Mycobacterium tuberculosis* at some point in their lives, but have not developed active tuberculosis.

Tuberculosis is already one of the leading causes of adult death in many developing countries, killing around 3 million people a year. An alarming increase in cases has been reported in parallel with the AIDS epidemic in many countries. HIV infection is now the strongest known risk factor for the development of active tuberculosis. People with latent tuberculosis infection more readily develop the disease once their immune system has been damaged by HIV. Five to ten per cent of these dually infected people may develop active tuberculosis each year. Moreover, recent data from the United States indicate that some of the increase in active tuberculosis cases is attributable to new infections among those with HIV infection, who have increased susceptibility to tuberculosis.

II. Extent and geographical distribution of HIV infection and AIDS

This section describes some of the recent characteristics and trends in the spread of HIV/AIDS, with emphasis on the regions in which the virus has been spreading for the longest time and where the pandemic is thus best understood. Figure 1 presents the distribution of cumulative HIV incidence estimates, that is, the total number of adult HIV infections that have occurred since the late 1970s/early 1980s until mid-1994, whereas Figure 3 presents the distribution of HIV prevalence estimates. HIV prevalence estimates represent the total number of persons with HIV infection alive at any given moment in time. For a chronic infection such as HIV, cumulative incidence estimates were close to prevalence estimates early in the pandemic. As people infected with HIV early in the pandemic die of AIDS, the gap between the two measurements is widening. As the pandemic progresses, the gap will widen further, particularly in those regions that are furthest into the epidemic: Australasia, Latin America and the Caribbean, North America, sub-Saharan Africa and Western Europe.

Figure 3. Estimated global distribution of HIV-infected adults (including AIDS cases) alive as of mid-1994



Australasia, North America and Western Europe

In Australasia, North America and Western Europe, HIV began to spread extensively in the late 1970s to early 1980s. The people predominantly affected thus far have been homosexual or bisexual men and IDUs, together with their sex partners.

As of mid-1994, over 1.5 million cumulative HIV infections in adults are estimated to have occurred in these regions, with about two-thirds, or over 1 million infections, occurring in the USA. In total, 538 453 cumulative AIDS cases in adults and children have been reported but over 600 000 cases are estimated by WHO to have occurred in adults alone (Table 1).

In many large cities of Australasia, North America and Western Europe, AIDS has become a major cause of death in young adults. By 1988, AIDS was the leading cause of death among young adults aged 25-34 years in New York City. By 1989, HIV-related illness had become the second leading cause of death in men and the sixth leading cause of death in the United States among adults aged 25-44.

Marked differences continue to exist between and even within these countries in the distribution of AIDS cases among homosexual men and IDUs, reflecting the variability in HIV transmission patterns. For example, on the west coast of the USA, about 90% of the total number of people with AIDS have been homosexual men, while on the east coast up to 40% have been IDUs. Similarly in Europe, the majority of AIDS cases in Scandinavia have occurred in homosexual men, whereas IDUs constitute two-thirds or more of the AIDS cases reported from Italy and Spain.

Although HIV incidence appears to have decreased somewhat among homosexual men in many areas since the early to mid-1980s, substantial numbers of new infections continue to be documented in younger homosexual men. The proportion of AIDS cases attributable solely to sexual transmission between men has decreased over the last few years. For example, in the USA, this proportion decreased from 73% in 1985 to 52% in 1992. During the same period, in Western Europe, the proportion of AIDS cases attributable to homosexual transmission fell from 62% to 36%. In contrast, the proportion of transmission solely attributable to injecting drug use continues to grow in many places; in Europe this transmission route accounts for 40% of recent AIDS cases, up from about 16% of AIDS cases in 1985. In the USA, this proportion rose from 17% in 1985 to 25% in 1992.

The transmission of HIV through heterosexual intercourse increased during the latter half of the 1980s and the early 1990s, with especially noticeable increases in urban populations with high rates of injecting drug use or STDs. Up to one-third of new HIV infections in some urban centres in Scotland are now due to heterosexual transmission. Among women attending antenatal clinics in London during 1992, HIV prevalence ranged between 1 and 5 per 1 000. Based on surveys of infants born in the United States, the average seroprevalence estimate for child-bearing women nationwide was 1.7 per 1 000 from 1991 to 1992.

Latin America and the Caribbean

As of mid-1994, WHO estimates that 2 million cumulative adult HIV infections have occurred in Latin America and the Caribbean (Table 1). WHO also estimates that over 400 000 AIDS cases have occurred in this region. As of July 1994, more than 100 000 adult and paediatric AIDS cases had actually been reported. By July 1994, Colombia and Venezuela combined had reported over 8 000 cumulative AIDS cases, while Argentina had reported nearly 4 000 cases. The number of AIDS cases is highest in Brazil, which had over 49 000 reported cases as of July 1994.

Extensive spread of HIV began in this region during the late 1970s or early 1980s. In Latin America, most infections were initially among homosexual or bisexual men. There has since been increasing heterosexual transmission, principally among bisexual men and their female sex partners, and among female sex workers and their clients. For example, in Brazil the percentage of reported AIDS cases attributable to heterosexual transmission increased from 7.5% in 1987 to 26% in 1993-1994. These AIDS cases are the result of transmission in the early 1980s. HIV infections among IDUs are a growing problem, for example in Argentina (where the prevalence of HIV infection among IDUs ranges from 30% to 50%) and Brazil (20% to 60%). In most of the Caribbean, heterosexual transmission has been the predominant mode of transmission for at least a decade.

Studies among pregnant women attending antenatal clinics in 1990-1991 found HIV prevalence rates close to 3% in the Bahamas, and over 1% in Santo Domingo, Dominican Republic, and São Paulo state, Brazil.

In Brazil, AIDS case data suggest a predominance of HIV infection in the south-eastern states, but data on HIV prevalence in selected STD clinic attenders indicates that the geographical distribution is more extensive (Table 2).

Table 2: HIV prevalence among males attending selected STD clinics for syphilis testing - Brazil, early 1993

| City | Region of Brazil | HIV Prevalence | |
|------------------|------------------|--------------------|-------------------------|
| | | Point estimate (%) | 90% Confidence Interval |
| Aracaju | North-East | 1.3 | 0.0-4.0 |
| Belém | North | 5.2 | 2.5-9.5 |
| Belo Horizonte | South-East | 2.3 | 1.0-3.5 |
| Brasília | Central | 2.9 | 1.5-6.0 |
| Porto Alegre | South | 4.5 | 3.0-6.0 |
| Salvador (Bahía) | North-East | 10.4 | 0.0-20.0 |
| São Paulo | South | 15.3 | 10.5-20.0 |

Source: Programa Nacional de DST/AIDS, Brazil

Sub-Saharan Africa

Most of the available epidemiological data indicate that in sub-Saharan Africa the extensive spread of HIV started in the late 1970s. As of mid-1994, around 330 000 cumulative adult and paediatric AIDS cases had been reported in sub-Saharan Africa; however, in view of extensive under-diagnosis, under-reporting and reporting delays, WHO estimates that more than 2 million adult AIDS cases have occurred in this region, constituting over two-thirds of the current global total (Table 1; Figure 2). As of mid-1994, WHO estimates that over 10 million adult HIV infections have occurred in sub-Saharan Africa.

Of the HIV infections that have occurred in this region, about 50% to 65% have been in East and Central Africa, an area which accounts for only about 15% of the total population of the sub-Saharan region. Epidemiological evidence indicates that heterosexual intercourse is the predominant mode of transmission in this region. Transfusion of HIV-infected blood probably accounts for less than 10% of transmission. The incidence of HIV transmission through this route is declining as routine HIV screening of blood donated for transfusions, and the more rational use of blood, are implemented more widely.

Practices such as ritual scarification and the use of inadequately sterilized skin-piercing instruments (e.g., needles and syringes) are believed to account for only a small proportion of HIV infections in sub-Saharan Africa.

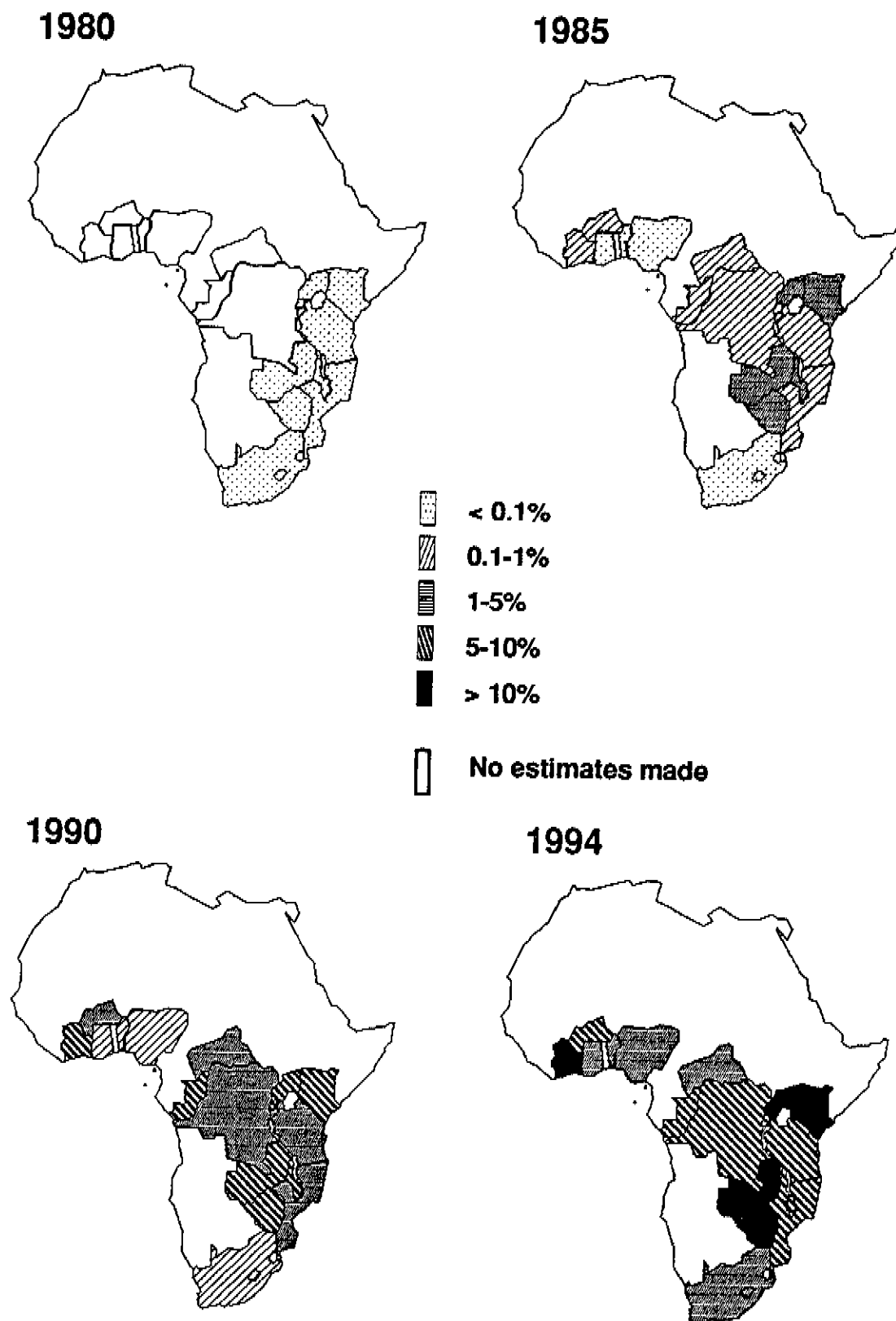
Recent serological data from sub-Saharan Africa indicate that the pandemic has continued to evolve, particularly in western and southern Africa (Figure 4). In West Africa, the 1992 results of sentinel surveillance from Nigeria, a country with almost one-fifth of sub-Saharan Africa's population, clearly indicate that HIV has spread throughout the country. HIV prevalence rates of 15% to 20% were found among some groups of female sex workers. In 9 of the 11 states in which sentinel surveillance has been instituted among people attending STD clinics, prevalence ranged from 0.5% to 22%. Among pregnant women, the HIV prevalence estimate was as high as 6% in one state. Among antenatal clinic attenders in Abidjan, Côte d'Ivoire, HIV prevalence is 10% to 15%. A similar situation to that in West Africa is also emerging in southern Africa. HIV prevalence rates of over 20-30% have been observed among adults in the major urban areas of Botswana. Disturbing data are also emerging from the Republic of South Africa, suggesting a three-fold increase in HIV prevalence between 1990 and 1992 in women attending antenatal clinics in most regions of the country. Aggregated data collected in antenatal clinics across the Republic of South Africa (excluding Bophuthatswana) indicated an overall HIV prevalence of 2.4% as of 1992.

Figure 4 shows trends in national estimates of adult HIV prevalence in 15 selected countries of sub-Saharan Africa since 1980.

South and South-East Asia

Although the extensive spread of HIV in South and South-East Asia began only in the mid-1980s or even later, the progression of the pandemic in this region is rapid. As of mid-1994, WHO estimates that over 2.5 million HIV infections have occurred in adults (Table 1). Of these, over 1.5 million are in South Asia and approximately 1 million in South-East Asia. An estimated 250 000 cumulative AIDS

Figure 4. Estimated nationwide adult HIV prevalence in selected sub-Saharan African countries: 1980-1994

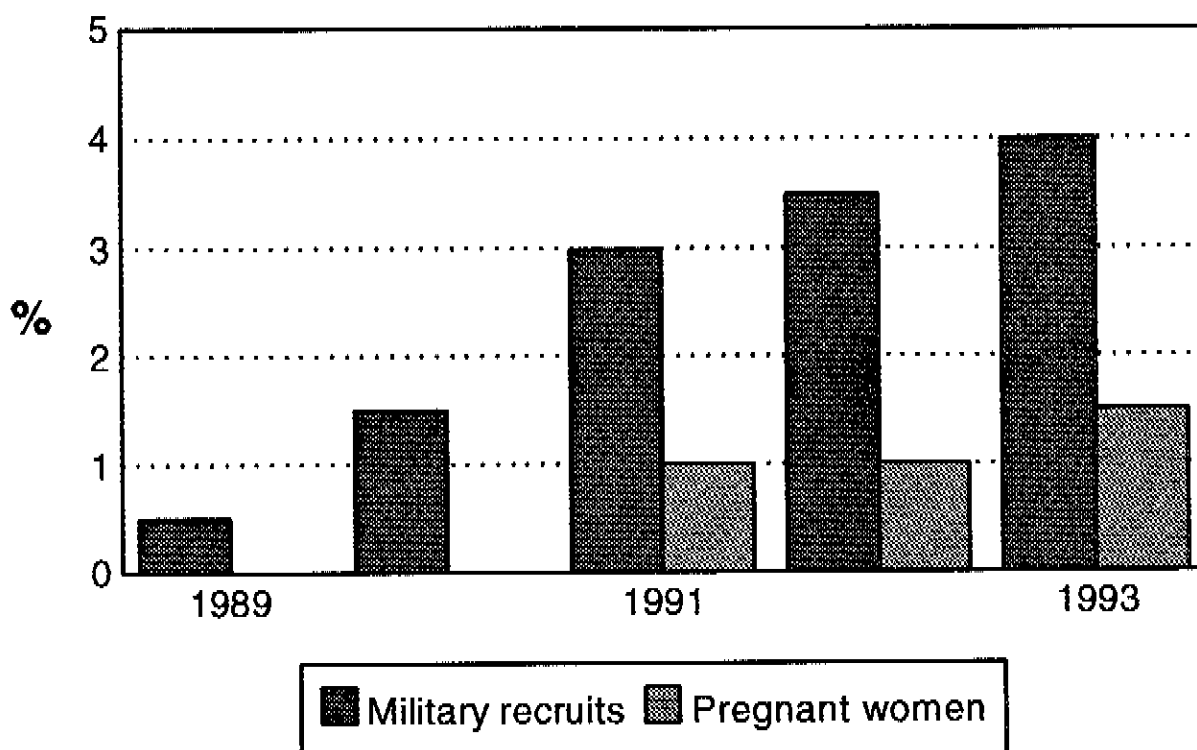


cases in adults are believed to have occurred to date, but only 7 195 adult and paediatric cases have been reported (Table 1).

While India and Thailand account for the majority of infections, rapid spread of HIV into specific populations has been seen elsewhere in the region. Significant levels of HIV infection have recently been detected among IDUs in Ho Chi Minh City, Vietnam, peninsular Malaysia and Yunnan province, China. In Ho Chi Minh City, prevalence rates among groups of IDUs rose from 2% in late 1992 to more than 30% in the third quarter of 1993. In Bangkok, Thailand, in Manipur, northeast India and Yangon, Myanmar, HIV prevalence rates among this group rose to 50% between the late 1980s and 1992. Concomitantly, heterosexual transmission of HIV has been increasing in the region, with significant levels of infection in female sex workers in several states of India, in various cities of Myanmar and across Thailand. HIV infection has also been detected among female sex workers in Cambodia, as well as among fishermen working off both the eastern and western reaches of the Indonesian archipelago.

In Thailand, HIV infection is now spreading in the general population. Over 3.5% of military recruits aged 21 were reported to be HIV-infected in many parts of the country following a 1992 round of surveys, with a prevalence rate close to 20% in Chiang Rai, Northern Thailand. Among antenatal clinic attenders, HIV prevalence is now around 8% in Chiang Mai and Chiang Rai, Northern Thailand. Figure 5 provides nationwide estimates of HIV prevalence in these two groups, thought to be representative of the general population.

Figure 5. HIV prevalence among military recruits and antenatal clinic attenders, Thailand, 1989-1993



In South Asia, studies of HIV prevalence in female sex workers point to a sharply rising trend in several large cities of India. In urban areas of many states of India, such as Tamil Nadu, Gujarat, Karnataka, and Punjab, prevalence levels in STD patients are now estimated to be above 1%.

The magnitude of the HIV/AIDS pandemic and the relative importance of the different routes of transmission are not, as yet, fully established in the following regions: East Asia and the Pacific; Eastern Europe and Central Asia; North Africa and the Middle East. However, significant foci of HIV infection have been reported from several areas within these regions since the mid-1980s. More than 20 000 adult AIDS cases are estimated to have occurred in these parts of the world to date; over 6 000 have been reported.

East Asia and the Pacific

WHO estimates that about 50 000 cumulative adult HIV infections had occurred in this region by mid-1994 (Table 1). A large proportion of the 1 073 reported AIDS cases to date have been among people with haemophilia who were transfused with HIV-infected blood products in the early to mid-1980s.

Yunnan Province, China, is geographically contiguous with South-East Asia, and the outbreak of HIV infections among IDUs in that province may be considered part of the epidemic in South-East Asia. The likelihood of further spread into the adjoining Guangxi and Guangdong Provinces of China remains of great concern.

Eastern Europe and Central Asia

As of mid-1994, WHO estimates that there have been over 50 000 cumulative HIV infections in adults in Eastern Europe and Central Asia (Table 1). More than 7 000 cumulative adult AIDS cases are estimated by WHO to have occurred in this region, 3 932 having been reported.

In two countries, localized outbreaks of HIV transmission have occurred in infants and young children as a result of unsafe medical practices. In the Kalmykia (Russian Federation) outbreak in 1988, several hundred children were infected through injections of medicines using shared syringes that had been contaminated with HIV-infected blood. In the 1989 Romanian outbreak, in which it is believed that between 1 000 and 2 000 children were involved, transmission occurred through transfusions of unscreened blood, and possibly as a result of the use of needles and/or syringes that had not been properly disinfected or sterilized.

However, there is no reason to believe that these are the main routes of HIV transmission in this region. As in other regions, sexual transmission is probably the predominant route.

HIV prevalence levels of at least 10% have been reported among IDUs in Poland since 1989. However, few other epidemiological studies of IDUs have been reported, and the magnitude of the HIV/AIDS problem in this group in Eastern Europe and Central Asia remains poorly defined.

North Africa and the Middle East

The few studies that are available regarding this region suggest that the extensive spread of HIV began in some parts of North Africa and the Middle East in the late 1980s. As of mid-1994, WHO estimates that close to 100 000 cumulative adult HIV infections have occurred in North Africa and the Middle East (Table 1).

Only limited and indirect information is available regarding the extent of high-risk behaviours in North Africa and the Middle East. For example, reports have suggested substantial numbers of STDs among the employees of some oil companies.

Of the approximately 1 500 HIV infections among resident and immigrant expatriates reported over the past seven years in one Gulf state, one-third were believed to have occurred during 1992 alone.

III. Global estimates and projections of HIV/AIDS

The longer-term dimensions of the HIV/AIDS pandemic cannot yet be forecast with confidence. However, on the basis of available data on the current global status of the pandemic and recent trends in its spread, WHO has generated a plausible range of projected new HIV infections during the 1990s (see box). In making projections of the future magnitude of the pandemic, WHO uses the lower limit of its estimated range of HIV prevalence for each region. The results of HIV/AIDS forecasting by WHO should thus be considered conservative.

During this decade, WHO forecasts that around 10-15 million new HIV infections may be expected in adults, mostly in developing countries. During the same period, WHO projects that as many as 5-10 million children will be HIV-infected through their mothers, the majority of them in sub-Saharan Africa. For the year 2000, WHO currently projects 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 for the year 2000 is close to 10 million. By the year 2000, the cumulative number of HIV-related deaths in adults is predicted to rise to more than 8 million from its current total of 2 million. Table 3 shows WHO estimates, by region, of the number of adults infected with HIV and alive as of mid-1994, and its projections of the number who will be living with HIV infection in the year 2000. Figure 6 illustrates estimated and projected annual adult AIDS incidences in the same regions.

Projections of the number of AIDS cases in infants and children are based on perinatal transmission rates of about 30%. However, because their infected mothers are likely to die of AIDS within 5 to 10 years of their birth, the uninfected infants will constitute a growing population of orphans. WHO estimates that over 5 million children under 10 years of age will be orphaned by the end of the 1990s as a result of the HIV-related deaths of their mothers. The number of orphans will increase further in the early years of the next century as a result of the death of those mothers who were infected with HIV in the 1990s.

Estimating and projecting HIV infection

WHO uses several methods and a variety of data sources to make estimates of the current and future extent of the HIV/AIDS pandemic. First, the current level of HIV infection is estimated. Official country estimates of HIV prevalence made by national experts or AIDS Programmes are used when available. When not available, WHO makes estimates based upon a review of HIV seroprevalence studies, reported AIDS cases, estimates of under-reporting, population size and structure (including the age/sex distribution and urban/rural differentials), and the predominant modes of transmission. HIV seroprevalence rates for populations engaging in behaviour putting them at increased risk of HIV infection are used to set an upper bound for the national estimate. Seroprevalence data from studies of groups thought to be representative of the general population are used as the bases of the national estimate. When appropriate, HIV prevalence is estimated for sub-populations of a country and then aggregated for a national estimate. These national estimates are used to arrive at a regional estimate.

To estimate the future number of HIV infections and current and future AIDS cases WHO uses a model based upon the natural history of HIV and a theoretical epidemic curve. Due to the lack of data from developing countries, both the shape of the epidemic curve and the distribution of the incubation period from HIV to AIDS are based upon data primarily from the United States and Western Europe. When data from other regions are available the shape of the epidemic curve is modified and the incubation distribution from HIV to AIDS is changed. In addition to the current level of HIV infection, the shape of the epidemic curve, and the incubation distribution, the model requires two assumptions: the year the epidemic began and an estimate of the level at which, and the year in which HIV incidence peaks. These assumptions are used to determine the current position along the theoretical epidemic curve. The model then determines the total number of infections since the epidemic began necessary to produce the current level of HIV prevalence. The total number of infections is distributed along the epidemic curve to produce the number of new HIV infections each year. The incubation distribution is then applied to these annual infections resulting in the annual number of AIDS cases.

Projections of future HIV infections are produced by extrapolating along the epidemic curve past the current position to generate the number of new infections in future years. The incubation distribution is applied to these new infections to produce estimates of the future number of AIDS cases.

As the epidemic ages in some parts of the world and the pool of non-infected, sexually active adults at risk of HIV infection decreases, the large number of young people becoming sexually active will replenish the pool of susceptible people, especially in developing countries where the base of the age pyramid is broad. The proportion of new infections accounted for by youth is therefore likely to increase with time. Evidence of high incidence rates in young age groups as compared with older cohorts is emerging from various countries. In the USA, the number of 13 to 21-year-olds who have become infected with HIV rose by 77% between 1991 and 1993. These considerations highlight the need for prevention programmes to target young people at a very early age.

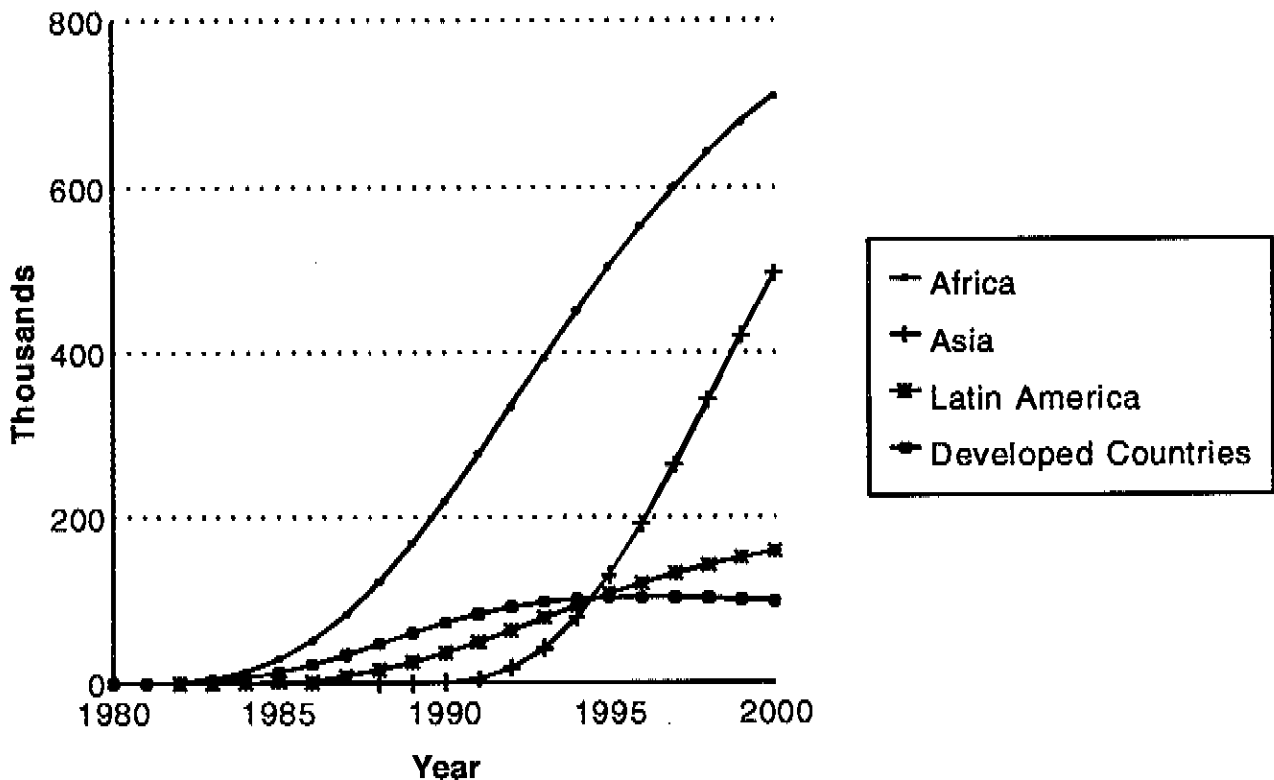
Table 3. Estimated and projected HIV prevalence in adults by "macro" region

| Region | Mid-1994 | 2000 |
|-------------------------------------|---------------------------------------|---------------------------------------|
| | Estimated HIV prevalence ¹ | Projected HIV prevalence ² |
| Australasia, Europe & North America | > 1.2 million | 1 million |
| Latin America & Caribbean | > 1.5 million | > 2 million |
| Africa | > 8 million | > 9 million |
| Asia | > 2.5 million | 8 million |
| Global Total | 13-14 million | > 20 million |

¹ Total number of HIV-infected adults currently alive.

² Total number of HIV-infected adults alive in the year 2000.

Figure 6. Estimated and projected annual adult AIDS incidences¹ by "macro" region – 1980-2000



¹Number of new AIDS cases each year

Despite our increased understanding of the virology, immunology and modes of transmission of HIV/AIDS, there is uncertainty about the exact extent, ultimate course and eventual impact of the HIV/AIDS pandemic. In some countries that are furthest into the epidemic in Africa, more than half of adult mortality is now attributable to HIV infection.

The factors that determine how HIV is likely to influence the demography of different regions include the future AIDS-specific mortality rates in adults and children, the effect of maternal HIV infection on the mortality of HIV-negative children, and the effect of adult HIV infection on fertility. Available data indicate that HIV is already causing enormous increases in adult mortality.

It is now clear that the pattern of explosive growth in new HIV infections which occurred in much of the world during the 1980s may be tragically repeated in many areas of Asia during the 1990s. Furthermore, the pandemic will persist throughout many parts of the world, and particularly in the developing world, as susceptible populations are replenished by younger generations. During the coming years, the public health response, particularly in those countries where the epidemic is in expansion phase but is not yet fully visible, is likely to have a decisive influence on the course of the pandemic. There is every reason to believe that the future course of the pandemic could still be dramatically altered by effecting simple HIV prevention strategies, which are within the technical reach of all countries of the world.
