



AIDS epidemic update:

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Global summary of the HIV/AIDS epidemic, December 1999

People newly infected with HIV in 1999	Total	5.6 million
	Adults	5 million
	Women	2.3 million
	Children <15 years	570 000
Number of people living with HIV/AIDS	Total	33.6 million
	Adults	32.4 million
	Women	14.8 million
	Children <15 years	1.2 million
AIDS deaths in 1999	Total	2.6 million
	Adults	2.1 million
	Women	1.1 million
	Children <15 years	470 000
Total number of AIDS deaths since the beginning of the epidemic	Total	16.3 million
	Adults	12.7 million
	Women	6.2 million
	Children <15 years	3.6 million

The AIDS epidemic in the 21st century – a widening gap

As the 20th century draws to a close, some 33.6 million men, women and children face a future dominated by a fatal disease unknown just a few decades ago. According to new estimates from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO), 32.4 million adults and 1.2 million children will be living with HIV by the end of 1999.*

- Over the course of the year, some 5.6 million people became infected with the human immunodeficiency virus (HIV), which causes AIDS.
- The year also saw 2.6 million deaths from HIV/AIDS – a higher global total than in any year since the beginning of the epidemic, despite antiretroviral therapy which staved off AIDS and AIDS deaths in the richer countries. Deaths among those already infected would continue mounting for some years even if prevention programmes managed to cut the number of new infections to zero. However, with the HIV-positive population still expanding – there were 5.6 million new infections this year alone – the annual number of AIDS deaths can be expected to increase for many years before peaking.
- Around half of all people who acquire HIV become infected before they turn 25 and typically die of the life-threatening illnesses called “AIDS” before their 35th birthday. This age factor makes AIDS uniquely threatening to children. By the end of 1999, the epidemic had left behind a cumulative total of 11.2 million AIDS orphans, defined as those having lost their mother before reaching the age of 15.

Many of these maternal orphans have also lost their father.

- The overwhelming majority of people with HIV – some 95% of the global total – live in the developing world. That proportion is set to grow even further as infection rates continue to rise in countries where poverty, poor health systems and limited resources for prevention and care fuel the spread of the virus.
- HIV is still a challenge in industrialized countries. There is evidence that safe sexual behaviour is being eroded among gay men in some Western countries, perhaps because of complacency now that life-prolonging therapy is available. If this is the case, the complacency is misplaced. The disease remains fatal, and information from North America and Europe suggests that the decline in number of deaths due to antiretroviral therapy is tapering off.
- HIV infections in the former Soviet Union have doubled in just two years. Injecting drug use gave the Eastern European and Central Asian region the world’s steepest HIV curve in 1999. Drug-injecting is also a major concern in the industrialized countries, as it is in the Middle East, where total AIDS cases are still relatively low but drug-injecting accounted for two-thirds of cases in Bahrain, half in the Islamic Republic of Iran and over a third in Tunisia.
- Some Latin American countries are managing to expand efforts to provide treatment to those infected. However, there is evidence that infections are on the rise in Central America and in the Caribbean

* This appears to be a relatively small rise over the global HIV totals at the end of 1998. The real rise is larger, however. Improved surveillance now suggests that national infections in a few populous countries of Latin America and Asia were overestimated in 1998.

basin – which has some of the worst HIV epidemics outside Africa.

- Strong prevention programmes seem to have reduced HIV risk and lowered or stabilized HIV rates in some countries of Asia, such as Thailand and the Philippines. Other Asian countries have raised warning flags after collecting new information showing that injecting drug use is spreading and that condom use is uncommon, including among clients of prostitutes and men who have sex with men. In many places prevention efforts are hampered by the shame and stigma attached to AIDS.
- Sub-Saharan Africa continues to bear the brunt of HIV and AIDS, with close to 70% of the global total of HIV-positive people. Most will die in the next 10 years, joining the 13.7 million Africans already claimed by the epidemic and leaving behind shattered families and crippled prospects for development.
- Because of AIDS, companies doing business in Africa are hurting and are bracing themselves for far worse as their workers sicken and die. According to a survey of commercial farms in Kenya, illness and death have already replaced old-age retirement as the leading reason why employees leave service. Retirement accounted for just 2% of employee drop-out by 1997.
- Life expectancy at birth in southern Africa, which rose from 44 years in the early 1950s to 59 in the early 1990s, is set to drop to just 45 between 2005 and 2010 because of AIDS. In contrast, South Asians, who could barely reach their 40th birthday in 1950, can expect by 2005 to be living 22 years longer than their counterparts in AIDS-ravaged southern Africa.
- New information suggests that between 12 and 13 African women are currently

infected for every 10 African men. There are a number of reasons why female prevalence is higher than male in this region, including the greater efficiency of male-to-female HIV transmission through sex and the younger age at initial infection for women.

- In 1999, an estimated 570 000 children aged 14 or younger became infected with HIV. Over 90% were babies born to HIV-positive women, who acquired the virus at birth or through their mother's breastmilk. Of these, almost nine-tenths were in sub-Saharan Africa. Africa's lead in mother-to-child transmission of HIV was firmer than ever despite new evidence that HIV ultimately impairs women's fertility: once infected, a woman can be expected to bear 20% fewer children than she otherwise would.

In short, the huge gap in HIV infection rates and AIDS deaths between rich and poor countries, and more particularly between Africa and the rest of the world, is likely to grow even larger in the next century. Likely, but not certain. Massive national and international efforts may yet help to end the stifling silence that continues to surround HIV in many countries, to explode myths and misconceptions that translate into dangerous sexual practices, to expand prevention initiatives such as condom promotion that can reduce sexual transmission, to create conditions in which young children have the knowledge and the emotional and financial support to grow up free of HIV, and to devote real money to providing care for those infected with HIV and support to their families. A trail of successful responses has already been blazed by a small number of dedicated communities and governments. The challenge for the leaders of Africa and their partners in development is to adapt and massively expand successful approaches that make it harder for the virus to spread, and that make it easier for those affected to live full and rewarding lives.

Regional HIV/AIDS statistics and features, December 1999

Region	Epidemic started	Adults & children living with HIV/AIDS	Adults & children newly infected with HIV	Adult prevalence rate (*)	Percent of HIV-positive adults who are women	Main mode(s) of transmission (#) for adults living with HIV/AIDS
Sub-Saharan Africa	late '70s-early '80s	23.3 million	3.8 million	8.0%	55%	Hetero
North Africa & Middle East	late '80s	220 000	19 000	0.13%	20%	IDU, Hetero
South & South-East Asia	late '80s	6 million	1.3 million	0.69%	30%	Hetero
East Asia & Pacific	late '80s	530 000	120 000	0.068%	15%	IDU, Hetero MSM
Latin America	late '70s - early '80s	1.3 million	150 000	0.57%	20%	MSM, IDU, Hetero
Caribbean	late '70s - early '80s	360 000	57 000	1.96%	35%	Hetero, MSM
Eastern Europe & Central Asia	early '90s	360 000	95 000	0.14%	20%	IDU, MSM
Western Europe	late '70s - early '80s	520 000	30 000	0.25%	20%	MSM, IDU
North America	late '70s - early '80s	920 000	44 000	0.56%	20%	MSM, IDU, Hetero
Australia & New Zealand	late '70s - early '80s	12 000	500	0.1%	10%	MSM, IDU
TOTAL		33.6 million	5.6 million	1.1%	46%	

* The proportion of adults (15 to 49 years of age) living with HIV/AIDS in 1999, using 1998 population numbers.

MSM (sexual transmission among men who have sex with men), IDU (transmission through injecting drug use), Hetero (heterosexual transmission).

The world's splintered epidemics

Contrary to expectations when AIDS was first identified, the epidemic has taken different forms in different parts of the world. In some areas HIV rapidly became common among men and women throughout the population. In others it became entrenched in certain sub-populations whose sexual or drug-injecting behaviour carries an especially high risk of contracting or passing on the virus – particularly sex workers and their customers, men who have sex with men, and drug injectors.

The extent to which HIV spreads between groups with high-risk behaviour and any larger

population depends on whether members of those groups have sex with people who do not share their high-risk behaviour, and whether condoms are used in those sexual encounters. For an HIV epidemic to take off in a country's general population, there also has to be a substantial amount of sexual mixing among adults. To sustain a heterosexual epidemic, on average each infected person must have unprotected sex with a minimum of two partners, becoming infected by one and passing on the infection to at least one other. Indeed, since not every encounter between an HIV-positive and an HIV-negative partner will result in a new infection, a sustained heterosexual epidemic suggests that a substantial proportion of the population, both male and female, have a number of sex partners over their lifetimes.

The high HIV risk run by drug injectors

Sharing drug-injecting equipment without sterilizing it between users is an extraordinarily efficient way of spreading HIV. Where equipment sharing is common, HIV infection can race through drug-injecting populations with unparalleled speed. Because of the way drug solutions are prepared in Eastern Europe and Central Asia, there is also a danger that the solutions themselves are contaminated with HIV. This means that even if clean needles are used, there is still a danger of transmitting the virus.

Drug-injecting doubles HIV rates in the former Soviet Union

The world's steepest HIV curve in 1999 was recorded in the newly independent states of the former Soviet Union, where the proportion of the population living with HIV doubled between end-1997 and end-1999. In the larger region comprising the former USSR as well as the remainder of Central and Eastern Europe, UNAIDS/WHO estimate that the number of infected people rose by a third over the course of 1999, reaching a total of 360 000.

The bulk of new HIV infections were caused by unsafe injection of drugs and occurred in two countries, the Russian Federation and Ukraine.

In the Russian Federation, nearly half of all cases of HIV infection reported since the start of the epidemic were reported in the first nine months of 1999 alone. While reported infections admittedly represent only a fraction of real HIV infections, little has changed in the reporting system and public health officials therefore believe this massive rise in reported cases accurately reflects trends in the overall epidemic.

The virus has been recently introduced into networks of drug injectors in Russian cities where HIV was previously virtually unknown. This is true of smaller provincial cities as well as of large metropolitan areas.

- This year, for example, HIV prevalence rose rapidly among drug injectors in Moscow. Over 2700 cases of HIV were reported in the Russian capital in the first nine months of 1999 alone – three times as many as in all previous years combined.
- An even more stratospheric rise was recorded in the towns and cities around Moscow, with over five times as many infections reported in the first nine months of 1999 as in all other years combined.
- The virus has spread far and wide. In the Siberian city of Irkutsk, nearly 1300 infections have been reported, most of them in 1999.

The HIV epidemic among drug injectors in Ukraine started earlier than in the Russian Federation, and the consequences are now being seen in the numbers of people progressing to AIDS. Some 90% of all AIDS cases reported in 1998 and 1999 in the entire Eastern European region were in Ukraine, according to the European Centre for the Epidemiological Monitoring of AIDS.

Bridges into the wider Eastern European population

Since drug injecting is illegal, it is very difficult to estimate the size of the drug-injecting population, let alone the extent to which they are linked in sexual networks with non-injectors.

One good indicator of unprotected sex with multiple partners is infection with sexually transmitted infections (STIs) such as syphilis and gonorrhoea. Using this indicator, evidence indicates that many drug injectors also have unprotected sex. An outreach service providing support and safe injecting services for drug users in the Russian city of St Petersburg reported that 10% of over 1800 clients tested positive for syphilis. Among 100 female drug injectors who make a living as sex workers and who attended the outreach service, 32% had syphilis. Clearly, these people are at extraordinarily high risk of HIV infection because of their drug-injecting behaviour. The fact that they have unprotected sex would indicate that their sex partners are also at risk, whether or not they use drugs.

The prevalence of sexually transmitted infections has skyrocketed in the former Soviet bloc region in recent years, indicating that many people are having unprotected sex with non-monogamous partners. If HIV were to spread from drug-injecting populations into this larger population, it would find fertile ground for a much wider expansion.

For the time being, however, the extent of the HIV epidemic in Eastern Europe and Central Asia is determined primarily by the number of people injecting drugs. Preliminary studies suggest that drug injecting is becoming extremely common among unemployed young people in many of the industrial cities of the Russian Federation and Ukraine, and is well-established even among schoolchildren. An outreach programme for drug injectors in St Petersburg reported clients as young as 12, with the percentage of clients aged 14 or less rising from 0.1% in 1997 to 2% in the first quarter of 1999.

Several areas in the Eastern European and Central Asian region, in partnership with United Nations Children's Fund (UNICEF), WHO and the UNAIDS Secretariat, are currently preparing studies that should give a better idea of the

scale of drug injecting and associated risk behaviours. Their findings should point to interventions that might help to reduce risk.

Warning signs in the Middle East

Injecting drug use may also touch off a wave of HIV in the Eastern Mediterranean region. Although overall AIDS cases remain relatively few in number, drug injecting is already the most common cause of AIDS in some countries, accounting for two-thirds of reported cases in Bahrain in 1998 and half in Islamic Republic of Iran. In Tunisia, injecting drug use is responsible for more than one-third of AIDS cases. In Egypt, one AIDS case in 10 is among drug injectors. In Pakistan, 5.4% of 703 drug injectors tested HIV positive in 1995. Recent studies by the United Nations International Drug Control Programme (UNDCP) in a few countries of the Middle East – Egypt, Iran and Lebanon – indicate that the magnitude of the drug abuse problem should not be underestimated. By most conservative estimates, the numbers of addicts are counted in the millions in this part of the world. A relatively high proportion of these addicts inject drugs, and needle-sharing is very common.

Sexually transmitted infections are not uncommon in the Eastern Mediterranean region. It is estimated that around 10 million cases occur in the region every year, although reporting rates are low – fewer than 6% of that number were reported in 1998. STI rates are particularly high among young adults and in urban areas. Sexually transmitted infections are an important indicator that high-risk sexual practices do exist in the region, as national behavioural surveys confirm.

Risky behaviour in high-income countries may be rising

HIV/AIDS surveillance in the richer countries has been complicated by the advent of antiretroviral drugs that stave off the development of AIDS and prolong survival (see box). Where antiretroviral therapy is widely available, it has increased the

Estimates of HIV-related deaths

For both technical and historical reasons, estimates of the current number of people living with HIV (HIV prevalence) are more reliable than estimates of the number of deaths among people with HIV/AIDS. Prevalence estimates are based directly on data collected through HIV sentinel surveillance, while estimates of HIV-related deaths are derived indirectly from mathematical models, based in turn on HIV prevalence data. Some countries began to establish HIV surveillance systems with WHO assistance as far back as the mid-to-late 1980s. By that time, however, epidemics had often been running for as long as a decade, and without direct HIV data it was difficult to know how many people had already become infected and estimate how many of them had died. Even recent deaths are difficult to model in countries which delayed the establishment of reliable sentinel surveillance. Moreover, knowledge about length of survival with HIV infection is imperfect, adding to the uncertainty about the timing of HIV-related death.

WHO and UNAIDS continue to work with national AIDS programmes and research institutions to refine knowledge and improve sentinel surveillance systems, especially in the developing world, where 95% of the epidemic is concentrated. These efforts should narrow current uncertainties and increase the future reliability of estimates of both HIV infection and death.

incentive for people at high risk of HIV to get tested, since the earlier they start taking the drugs the better. This means that a substantial proportion of HIV infections are detected relatively early on in most industrialized countries.

However, it is hard to tell whether the rise in reported infections simply reflects a change in the proportion of existing infections that are detected and reported, or whether it reflects a real increase in the number of people acquiring HIV.

The surveillance challenge in the antiretroviral era

It is becoming increasingly difficult to understand the epidemic in industrialized countries. Until the mid-1990s, HIV infections were estimated by calculating backwards from reported AIDS cases according to well-established patterns of disease progression. This method gave a delayed picture of new infections but was useful in ascertaining changes in the overall scale of the epidemic. While AIDS remains fatal, life-prolonging therapy can postpone death for an unknown period of time for some HIV-positive people. This means that the timing of the progression from HIV infection to AIDS and from AIDS to death has become very difficult to predict, so calculating past trends in HIV infection from current AIDS cases or deaths has become more or less impossible.

Many industrialized countries are thus beginning to strengthen their systems for tracking HIV infection, mostly by improving the system for reporting identified HIV cases. HIV case reporting suffers from many biases, and may tend in particular to neglect marginalized groups at risk of heterosexual infection.

There is no doubt that the numbers of new cases of AIDS – the disease syndrome that develops many years after infection with HIV and eventually leads to death – and of AIDS deaths are both falling significantly in countries that provide antiretroviral therapy for a majority of those diagnosed with HIV. However, there is no sign that new infections are following the same downward course.

On the contrary, there is extremely worrying evidence that the advent of life-prolonging therapies may have led to complacency about the dangers of HIV, and that that complacency may be leading to rises in risky behaviour. A study in the US city of San Francisco, for example, showed that in 1993-1994 just over one-third of gay men reported having had unprotected anal intercourse, while the proportion of men reporting anal sex without a condom rose to one-half three years later, when effective death-postponing therapy had become available. Many of these men did not know their partners' HIV status.

What makes this all the more worrying, in a population with historically high risk behaviour, is that the absolute number of HIV-positive people is probably growing because they are surviving longer thanks to antiretroviral drugs. Antiretroviral therapy could conceivably reduce a person's infectiousness – the likelihood that he or she will pass on the virus to a sex partner – but this effect has not been clearly demonstrated. For now, it must be assumed on the contrary that a higher level of HIV in the pool of potential sex partners means a higher risk of transmission whenever there is unprotected sex with a partner of unknown HIV status.

Another challenge to complacency is that the dramatic fall in AIDS deaths seen over the last three years is beginning to taper off in some countries, suggesting that there is a limit to the effectiveness of existing therapies. In the United States, for example, AIDS deaths decreased by

42% between 1996 and 1997, but by only half that proportion between 1997 and 1998. Western Europe, too, witnessed a slowing in the decline in AIDS deaths. They fell by 20% in 1999, significantly less than the previous year.

UNAIDS/WHO estimate that some 1.5 million people were living with HIV in Australia and New Zealand and in the industrialized countries of Western Europe and North America at the end of 1999.

Costs and benefits of antiretrovirals in Latin America

Some countries in Latin America have joined the ranks of those providing antiretroviral treatment for people infected with HIV. Brazil, for example, spent some US\$300 million in 1999, providing drugs for around 75 000 people. While the treatment is clearly expensive, health officials say that savings in episodes of hospitalization and medical care for patients go a long way towards justifying the cost of drugs which stave off the progression of HIV/AIDS. There are also considerable savings of the indirect costs of illness. Without antiretroviral therapy, many more people with HIV would develop opportunistic infections associated with a damaged immune system. It is estimated that over a one-year period between 1997 and 1998, Brazil averted around US\$ 136 million in hospital admission and treatment costs alone for people with HIV.

In Argentina, too, antiretrovirals are provided for those found to be HIV-positive. The result has been a fall of over 40% in the rate of new AIDS cases reported each year, from a peak of 71.6 per million people in 1996 to 41.3 just two years later. Interestingly, the educational level of people with newly-diagnosed AIDS has shifted since therapy became available. In 1995 the proportion of people newly diagnosed with AIDS who had completed primary school was roughly the same as the propor-

tion having completed secondary school. By 1998, only a third of those with a new AIDS diagnosis had a secondary education. One reason could be that the progression to AIDS is being postponed among more-educated people with HIV – who are more likely to know about the benefits of therapy, to assess correctly their risk of being infected, and to come forward for testing and early treatment.

As in industrialized countries, the provision of therapy is complicating the task of HIV and AIDS surveillance in Latin America. Prevalence may be rising slightly as a result of life-prolonging treatment in some countries but it is hard to be sure of trends over time because in many countries HIV surveillance systems are weak and rates of infection are generally low outside the groups with highest risk behaviour. In 1999 in Argentina, for example, just 2.4 pregnant women in 1000 tested positive for HIV, while even among people with sexually transmitted infections – usually considered a high-risk group for HIV infection – rates were below 7 per 1000. In Uruguay, similarly low rates were recorded among over 8000 workers tested in 1997, with just 2.6 per 1000 positive for HIV.

Central America and the Caribbean: a mixed picture

In Central America and the Caribbean island states, access to antiretroviral therapy is far more limited than it is in South America. Guatemala, for example, which spends US\$ 64 per person per year on health, estimates that just 185 people have access to antiretroviral drugs out of an estimated number of over 50 000 living with HIV and AIDS.

The prevention challenge remains acute in the region, against a backdrop of evidence that infections are on the rise. In Guatemala in 1999, some 2-4% of pregnant women tested at antenatal clinics in major urban areas were found to have HIV. Indeed, the Caribbean basin

has some of the worst HIV epidemics outside of sub-Saharan Africa. In Guyana, HIV prevalence was recorded at 3.2% in blood donors – who are generally thought to represent a population at low risk of infection – while surveillance among urban sex workers in 1997 showed 46% were infected. The last time Haiti performed HIV surveillance among pregnant women, in 1996, close to 6% tested positive for the virus. Infection rates approaching 8% had already been registered in some antenatal clinics as early as 1993.

Altogether, UNAIDS/WHO estimate that some 1.7 million people in Latin America and the Caribbean will enter the 21st century with HIV infection – almost 30 000 of them children. This number is somewhat less than the total given in 1998 because estimates for two populous countries, Brazil and Mexico, were revised downwards on the basis of new data.

The two giants of the Asia/Pacific region

HIV came relatively late to Asia, affording the region the opportunity to learn from the experience of other countries. It seems that some lessons are indeed translating into successful prevention efforts, although prevention failures can also be found. Across the continent as a whole, UNAIDS/WHO estimate that 6.5 million people were living with HIV at the end of 1999, over five times as many as have already died of AIDS in the region.

The huge populations of India and China inevitably dominate any assessment of HIV in Asia. Because these countries have so many inhabitants, small percentage changes in estimates of national infection rates result in large changes in the estimates of the total number of people infected. A rise of just 0.1% prevalence among adults in India, for example, would add over half a million people to the national total of adults living with HIV.

India has recently made a major effort to improve its understanding of the HIV epidemic. Having expanded and improved its surveillance system, the country now has a clearer idea of the likely number of people living with the virus. The picture that emerges is extremely varied:

- In some states, principally in the south and west of the country, HIV has a significant grip on the urban population, with over one pregnant woman in 50 testing positive for HIV.
- In the northeast, HIV infection has shot through networks of men who inject drugs and has spread to their wives.
- Yet other states of India detected their very first HIV infections just in the last year or two.

Overall, it has been estimated that around 4 million Indians have HIV infection – a lower number than would have been expected by simply projecting forward previous information. This accounts for the drop from the estimated infection total in Asia at the end of 1998 – from 7.3 million to the current 6.5 million for the continent as a whole.

HIV is highly stigmatized in India. As in many countries, the association between HIV and “promiscuous” sexual behaviour has created a belief that people who are infected with HIV somehow “deserve” their fate. Paradoxically, a recent study of attitudes shows that women – who are often monogamous wives infected by their husband – are especially stigmatized. They are frequently blamed by their in-laws for the fate of their infected spouse, even in cases when they themselves are not infected. If a man dies of AIDS, his wife risks being thrown out of her home by her in-laws, often losing her children in the process. The stigma affects the provision of health care too. A majority of hospitals are reported either to turn away HIV-infected patients or to serve their needs badly. In a study of discrimination

in the health system many health workers said that treating patients with HIV was a waste of time and money because the patients would go on to die anyway. Interestingly, they did not express similar views about other chronic or fatal diseases that strike young adults.

In a climate of irrational fear and discrimination, prevention work is extremely difficult. For prevention to be effective, culturally sensitive issues such as extramarital sex and condom use must be tackled head on. This applies to all countries, of course, not just to India.

At least one progressive state government, in the southern Indian state of Tamil Nadu, has taken the initiative in this area through its State AIDS Society (similar societies now exist in all Indian states). Together with a multinational advertising agency, the State AIDS Society launched campaigns that address the issue of AIDS-related stigma directly, alongside a campaign to encourage safer sexual behaviour. The high-profile safe behaviour campaign sought to reach men in their 20s and 30s and chose to build its messages around cricket, a national passion in its target group. Advertisements using cricketing language which doubles as sexual innuendo (such as “If you bowl a maiden over tonight, use a condom”) were screened during major sporting events which draw massive audiences. The humour took the sting out of a sensitive subject while still getting the message across. Besides making people laugh and opening up the possibility of discussion around formerly taboo topics, these messages seem to have sunk in. Surveys of behaviour repeated over time show that the proportion of factory workers in Tamil Nadu reporting recent casual sex fell by half over two years, while condom use with casual partners rose to 50% in 1998 from just 17% in 1996, before the first wave of the campaign was launched.

In China, HIV infection rates remained relatively low, with almost half a million people in a population of over a billion estimated to be HIV-positive. The bulk of new infections were concentrated in drug injectors. Worryingly, injecting drug use seems to be on the rise. The practice is becoming common in areas where it was previously little recorded, such as the populous coastal province of Guangdong. HIV prevalence in drug injectors in Guangdong rose from virtually nothing at the start of 1998 to 11% by the start of 1999. Since over half of injectors reported sharing needles in behaviour surveys, HIV infection levels are likely to rise rapidly in the future.

As in other places, the potential for HIV to spread beyond China's drug-injecting population certainly exists. Massive population movements and increasing disparity in income have fuelled the sex industry in China, which estimates that there may be as many as 4 million prostitutes throughout the country. Behavioural surveys show that more than 5 out of 10 sex workers have never used a condom to protect themselves and their clients from STIs and HIV; in some areas the figure is 9 out of 10.

Asian prevention successes and failures

Elsewhere in Asia and the Pacific, the epidemic is taking a variety of forms.

Thailand's well-established HIV prevention efforts are apparently continuing to bear fruit. A study tracking over 40 000 pregnancies in the badly affected northern Thai province of Chiang Rai showed that the proportion who were HIV-infected fell from a peak of 6.4% in 1994 to 4.6% in 1997. Encouragingly, the fall in HIV prevalence was especially steep in younger women. In women under 25 experiencing their first pregnancy, HIV prevalence fell by 40% over the three-year period. The fall is remarkably

consistent with a slightly earlier decline in HIV prevalence among young male military conscripts in northern Thailand. It is plausible to assume that fewer new infections in young, newly sexually active women reflect the decline in infections among men in the age group likely to be their partners.

Infection rates remain relatively low in Viet Nam, but they are on the rise. The HIV surveillance system indicates that HIV prevalence in pregnant women increased more than ten-fold between 1994 and 1998, although it did not climb beyond 1.5 per 1000. In the group at highest risk of all, injecting drug users, HIV prevalence remained stable over that period at 18%. However, warning signs that HIV transmission could increase dramatically through sexual risk behaviour are not lacking:

- In female sex workers, HIV prevalence increased five-fold in the four years to 1998, reaching 2.6%.
- National surveillance suggests that the HIV infection rate in male STI patients doubled to 1% in the same period.
- A study in two STD clinics in southern Viet Nam found somewhat lower HIV rates but exceptionally worrying patterns of sexual behaviour. Every one of the over 800 men in the study had had sex with a prostitute at some point in his life, and three-quarters of them had done so in the past three years. Fully 70% of these men had never used a condom.
- In the same study, 45% of the men picked up sex workers on the street while just 38% visited brothels. The distribution of sex workers frequented sounds another alarm bell. Generally, HIV prevention activities are easier to conduct in brothels than among street-based prostitutes, even in countries such as Thailand and Viet Nam where brothels (and indeed prostitution) are illegal.

Bangladesh is seeing a similar pattern of low HIV prevalence accompanied by warning signals that rates could rise quickly. In female sex workers, for example, HIV infection rates ranged between 0 and 15 per 1000 in different sites. However, there is no question that risk exists. For a start, around half of all prostitutes are infected with syphilis. Quite apart from being a clear indication that a woman's clients do not all use condoms, syphilis infection greatly increases the chance of HIV transmission if she or her customer is infected with the virus. Fewer than 20% of sex workers reported regular condom use. On top of that, some 13% of sex workers questioned in behavioural surveillance said they had injected drugs. Bangladesh estimates that it has 25 000 drug injectors who share needles and syringes daily. While HIV prevalence in this group is relatively low for the moment, about 2.5 per 1000, the virus is bound to spread rapidly unless needle exchange programmes and other prevention measures are urgently undertaken.

While it is believed that infection rates in Myanmar are high and still rising, no recent data are available. Asia's highest levels of infection continue to be recorded in Cambodia, where an ever-improving surveillance system suggests that HIV is well established in the general population in all provinces. HIV prevalence among pregnant women in 1998 exceeded 2% in 12 out of the country's 19 provinces. Nationwide, on average, some 3.7% of married women of reproductive age were living with HIV in 1998. Prevalence in men may be somewhat higher – 4.5% of male blood donors were infected with HIV compared with 2.5% of female donors.

In other populous countries such as the Philippines, HIV infection appears to remain contained at low levels, with no significant growth even in groups at traditionally high

risk of infection. This is probably partly because registered sex workers are screened every two weeks for other sexually transmitted infections, which facilitate the spread of HIV, and are treated for any STIs found. In addition, sex workers report relatively high levels of condom use. According to national behavioural surveillance conducted in 1997, nearly three-quarters of registered prostitutes said they had used a condom with their most recent client.

Africa increases its lead in HIV infections, with women at the forefront

For some years, it has been clear that Africa – especially south of the Sahara – is the area of the world worst affected by HIV and AIDS. Infection levels are highest, access to care is lowest, and social and economic safety nets that might help families cope with the impact of the epidemic are badly frayed, in part because of the epidemic itself.

At the start of the 21st century, some 23.3 million Africans south of the Sahara are estimated by UNAIDS/WHO to have HIV infection or AIDS. That is almost 70% of the world's total in a region that is home to just 10% of the world's population. As prevention efforts elsewhere reduce the number of infants acquiring HIV, the continent's lead in terms of child infections is more compelling than ever: UNAIDS/WHO estimate that nearly 90% of the half million children born with the virus or infected through breastfeeding in 1999 were living in sub-Saharan Africa.

Recently, 15 studies of HIV prevalence in the general population conducted in various African countries have added enormously to our understanding of the spread and shape of the epidemic – an understanding which up to now has been based largely on anonymous screening of blood taken from pregnant women at antenatal clinics. The new studies suggest that, in many

African countries, antenatal estimates tend to underestimate the real levels of HIV infection in women. The reason is that infected women progressively become less fertile: the longer their HIV infection progresses, the less likely they are to get pregnant. And because many HIV-infected women are no longer becoming pregnant, they are not showing up at antenatal clinics where blood samples for anonymous HIV testing are taken. The antenatal estimates thus fail to reflect the true extent of HIV infection in the female population as a whole.

On the other hand, the population-based studies suggest that infection levels in men are lower than the levels of HIV recorded among pregnant women.

The conclusion seems to be that there are significantly more women than men living with HIV infection in sub-Saharan Africa. The ratio of women to men is not the same everywhere, and it changes over time. Current information suggests that more men than women become infected in the early stages of a heterosexual epidemic, especially in settings where a small number of sex workers rapidly become infected and in turn spread HIV to a much larger number of men. Over time the male-female gap is closed, and eventually the ratio is reversed. On average, however, the 15 studies conducted in both rural and urban areas in nine different African countries suggest that between 12 and 13 African women are infected for every 10 African men. UNAIDS/WHO estimate that, at the end of 1999, 12.2 million women and 10.1 million men aged 15-49 were living with HIV in sub-Saharan Africa.

Why more women than men are infected is not fully understood. A combination of factors are clearly involved, including the fact that HIV passes more easily from men to women through sex than from women to men. However, a prime factor is surely the differ-

ence in age patterns of HIV infection in men and women. Women tend to become infected far younger than men for both biological and cultural reasons. According to recent studies in several African populations, girls aged 15-19 are around five or six times more likely to be HIV-positive than boys their own age. The infection rate in men eventually catches up, but not until after they reach their late 20s or early 30s. Clearly, older men – who often coerce girls into sex or buy their favours with sugar-daddy gifts – are the main source of HIV for the teenage girls.

- This age pattern has two consequences for the sex ratio of infections. The first has to do with the pyramid-shaped age structure common to the growing populations of sub-Saharan Africa. HIV prevalence – the total proportion of people who are infected at a given point in time – rises very quickly in women, peaking at young ages. This is the age group that constitutes the broad base of the population pyramid in Africa. In contrast, prevalence does not peak in men until they are older, by which time they belong to an age group that makes up a smaller fraction of the overall population, higher up the narrowing pyramid. Prevalence figures that span the entire 15-49 year age range will therefore be weighted towards the sex that has higher infection rates in younger age groups – in the case of HIV, that is clearly women.
- The second factor involves survival time from infection with HIV to death. There is little evidence of differences in survival time between men and women infected with HIV at a given age. However, studies in industrialized countries before the advent of antiretroviral therapy have shown that the length of survival of HIV-positive people does differ according to their age at initial infection. The older one

is when one gets HIV, the shorter the time between infection and death. A community-based study in rural Uganda that has been running for many years appears to suggest that the same pattern holds in sub-Saharan Africa. Therefore, African women – who as a rule become infected younger than their male counterparts – can expect to live longer with HIV on average than men and be counted for a longer time among the female population alive with HIV. Because of this survival factor, even if women did not experience more new infections than men, female prevalence would still be higher than male prevalence.

It is only recently that evidence has been available to allow us to assert with confidence that more women are infected than men in Africa. (It should be noted that no such evidence as yet exists in other continents, where different patterns of transmission have tended to yield more male than female infections.) This is the first time that different sex ratios of infection and reduced fertility in HIV-positive women have been taken into account in the UNAIDS/WHO estimates for sub-Saharan Africa. In accordance with evidence emerging from studies in a number of African countries, HIV-positive women are assumed to bear 20% fewer children once they become infected than they otherwise would. That of course affects estimates of mother-to-child transmission and orphans. The 20% reduction in fertility translates into fewer children at risk of acquiring the virus and hence fewer children born with HIV (or infected through their mother's milk), as well as fewer children left orphaned by their mother's death from AIDS. Overall, however, the reduction in these estimates is not substantial because the reduced fertility of HIV-positive women is largely balanced out by the fact that HIV prevalence in women is higher than previously thought.

It is expected that estimation methods will continue to improve as the understanding of the dynamics of this evolving epidemic expands.

The impact of HIV and AIDS on African lives...

Many African nations took a battering in this year's Human Development Index, a ranking published by the United Nations Development Programme (UNDP) to reflect health, wealth and education. Almost all of the major downward changes in rank could be ascribed to declining life expectancy – the direct result of AIDS. Life expectancy at birth in southern Africa rose by a full 15 years from 44 years in the early 1950s to 59 in the early 1990s. Because of AIDS, life expectancy is set to recede to just 45 years between 2005 and 2010 – its lowest level in half a century, according to the Population Division of the United Nations. By comparison, life expectancy in South Asia, another of the world's poorest regions, is evolving very differently. While South Asians born in 1950 on average could survive barely to their 40th birthday, by 2005 they can expect to live 22 years longer than their counterparts in the AIDS-ravaged southern African region.

A new measure published by UNDP calculates the percentage of the population currently alive that can expect to live to celebrate their 60th birthday. Fewer than 50% of South Africans currently alive are expected to reach the age of 60, compared with an average of 70% for all developing countries and 90% for industrialized countries.

...and African livelihoods

While it is inevitable that massive rises in death among young, economically active adults will affect national economies, it is not easy to isolate or measure that effect. In many of the countries worst affected by HIV, poor economic management, high inflation, rampant corrup-

tion, and deteriorating infrastructure are commonplace, and conflicts and population displacement are far from rare. Military spending often far outpaces spending on health and education, and inequitable distribution of resources is the rule. The contribution of AIDS to this generally grim picture is hard to pinpoint, but clearly the epidemic can only exacerbate the already precarious situation faced by many countries.

A degraded macro-economic situation inevitably influences priorities at every level from the national down to the individual. In South Africa, for example, a 1996 study estimated that 52% of the 11 million people aged 16-30 are unemployed, and half of those unemployed people are classified as marginalized, with few prospects of formal sector employment. Hardly surprising, then, that young people think of short-term survival before long-term well-being. Short-term survival strategies often include exchanging sex for schooling, a job, money or a roof over one's head. In a country where so much of the population is already infected with HIV, such strategies are a recipe not for survival but for premature death.

AIDS is everybody's business

Companies have begun to realize that HIV poses a genuine threat to the workforce, the marketplace and the bottom line – some only after seeing the costs reflected in their own balance sheets. This is especially the case in Africa, where the private sector is feeling the cumulative impact of a severe, long-standing and still-emerging epidemic.

Many businesses have started prevention programmes in the workplace to try to protect their investment in human capital. They provide information and condoms to workers, often through peer education programmes. Sexually transmitted infections are treated, and counselling and referral for voluntary HIV testing are often pro-

vided. Prevention programmes are making progress. In companies ranging from construction firms and banks to mines and agro-estates across Africa, management and peer educators report a surge of demand for condoms, especially on payday. But much remains to be done: medical officers in the same companies report that the demand for treatment for sexually transmitted disease surges shortly after payday. One Kenyan medical officer typically records about 20 STI patients a week and then three times that many in the week after payday. Obviously, not everyone is using condoms even when they are freely available.

Forward-thinking companies in high HIV prevalence countries have to look beyond prevention to the inevitable dent that the disease will make in their workforces and their bottom lines. Some have felt the impact of the disease all too forcefully already.

A recent study of commercial farms in Kenya revealed very high levels of HIV. On one sugar estate a quarter of the entire workforce was infected with HIV. Direct cash costs related to HIV rose dramatically – company spending on funerals increased five-fold between 1989 and 1997, and direct health expenditure increased ten-fold. In addition, the estate's managers reported greatly increased absenteeism, lower productivity (a 50% drop in the ratio of processed sugar recovered from raw cane between 1993 and 1997), and higher overtime costs as workers were paid to work extra hours to fill in for sick colleagues. This is by no means an isolated case. A flower farm in a different part of the country saw a similar ten-fold rise in spending on employee health costs between 1985 and 1995. This expenditure – estimated at over a million US dollars for a company with 7000 employees – ate so heavily into profits that the owners sold the company.

Indeed, according to the survey's findings, illness and death – attributable largely to HIV –

have leap-frogged from last to first place in the reasons for people leaving a company. Old-age retirement, the leading cause in the 1980s, accounted for just 2% of employee drop-out by 1997.

Anticipating the skill drain

Companies need to anticipate the loss of workers, so that they can plan extra recruitment and training. While many companies would like to know exactly what proportion of their workforce they are likely to lose to AIDS, most recognize that this is not a straightforward issue. Increasingly, employers are rejecting the idea of pre-employment screening of job candidates – an applicant who is HIV-negative when hired may in any case go on to acquire the virus later on. Testing the existing workforce would be unethical unless individuals gave their consent; mandatory testing would lead to great hostility and perhaps even to strikes or industrial action. Last but certainly not least, mandatory testing is incompatible with effective AIDS prevention and care programmes at the workplace. By abandoning testing requirements, a company creates the right climate for workplace programmes and maximizes their chances of success.

With careful preparation, however, it may be possible in large companies to carry out surveys of blood samples given voluntarily and anonymously by workers. The South African utility company Eskom worked with unions and employees for 18 months before carrying out a survey of HIV levels in its workforce. In 1999, some 5 000 people out of a total of 37 000 employees volunteered to give samples for anonymous testing, and a significant proportion also requested counselling and testing so that they could learn their own results, many along with their spouses. The company will not publish the results of the study, but will now be able to plan better for its own training and recruitment needs.

Deaths in the workforce have various implications. The loss of unskilled workers, while a human tragedy, is not a major blow to employers. The loss of skilled workers is vastly more damaging to productivity, and carries much higher costs. In many industries there are a small number of key functions on which the whole production process depends. For instance, without engineers skilled in pan boiling and centrifuging, the whole sugar industry comes to a standstill.

Companies have begun to respond to these challenges by hiring extra staff in key areas, and by training some staff to acquire a range of important skills so that they can be deployed to fill important gaps as the need arises. This requires considerable forward planning; for example, it takes seven years for a fresh engineering graduate to become a fully-productive sugar engineer. Another option is purchasing special insurance. In Botswana, where the market for skilled workers was tight even before AIDS started making inroads, many companies are taking out “key man” insurance to cover the costs of recruiting replacements for people in critical positions if they die.

Interestingly, while all companies recognize that the loss of skills at senior levels can be particularly crippling, very few report any HIV prevention initiatives for senior staff.

The dilemma of benefits and insurance payments

One of the consequences of the HIV epidemic is that employers are beginning to rethink the benefits they are able to pay if employees sicken or die in service. On the downside, many companies and organizations are increasingly hiring staff on casual or rolling short-term contracts, thus escaping the need to pay disability, death or other benefits. Far more positively, a significant number of companies are working together with the insurance industry to work out policies and benefits packages that meet

the needs of terminally ill people and their families without bankrupting the companies themselves.

Increasingly, employers are turning against pre-employment screening of job candidates as a way of keeping down health costs. Besides depriving themselves of access to skills in a shrinking market, companies realize that an employee who starts out HIV-negative may become infected once on the payroll. Indeed, some life insurance companies are finding that a third or more of deaths are HIV-related, even in insurance schemes that require a negative HIV test as a condition of entry.

Some health insurance firms in South Africa have responded to the challenge posed by AIDS by setting up facilities specifically for those with HIV or other terminal infections, guaranteeing and at the same time capping payments for HIV-related treatment. These schemes currently provide benefits of up to 25 000 rand (some US\$ 4 000) per person per year – enough to cover a good share of the cost of antiretroviral therapy. But managers are already worried that as the proportion of sick people in the workforce rises, they will not be able to maintain benefits at those levels.

Other responses include radical changes in the way the insurance and benefits industries have always worked. Death benefits, for example, traditionally were paid to the family only when the employee died in service. In the case of people with AIDS, this system puts a massive strain on both sick workers and the company, because if they want their families to get any payout, employees have to keep coming to work even though they are sick and not productive. Some benefits schemes are now agreeing to pay terminal benefits to employees who are certified as terminally ill, so that they can retire and spend their final days in peace at home without forfeiting the money due. This also gives individuals the opportunity to invest

the money paid and to plan for the financial security of their dependants.

These responses are encouraging. However, it is important to note two things. First, only a tiny fraction of people in countries hard-hit by AIDS are covered by formal health insurance and benefits schemes. Second, even those who are covered will inevitably see their health and death benefits fall significantly in the next few years because insurance companies and employers will pass on at least part of the rising costs to beneficiaries and employees, including those who are not HIV-infected.

Premiums on some group life insurance policies in Botswana have already doubled, for example, even though the country is still at a relatively early stage of the epidemic, with the vast majority of young adult deaths still to come. Employers will absorb some of these rising costs but by no means all. In South Africa, which is in a similar situation to Botswana, a survey conducted by the financial services group Old Mutual in 1999 showed that 30% of companies are lowering the benefits they pay to their employees as a result of the rising number of claims related to HIV. Old Mutual estimated that without these adjustments, the proportion of the wage bill paid out in death benefits by a typical company in some provinces would rise by two-thirds between 1997 and 2002.

End-1999 global estimates Adults and children

- ✕ People living with HIV/AIDS..... 33.6 million
- ✕ New HIV infections in 1999..... 5.6 million
- ✕ Deaths due to HIV/AIDS in 1999..... 2.6 million
- ✕ Cumulative number of deaths due to HIV/AIDS.... 16.3 million



UNAIDS
UNICEF • UNDP • UNFPA • UNDG
UNESCO • WHO • WORLD BANK



World Health
Organization

Estimated number of adults and children newly infected with HIV during 1999



Total: 5.6 million

Adults and children estimated to be living with HIV/AIDS as of end 1999



Total: 33.6 million



UNAIDS
UNICEF • UNDP • UNFPA • UNHCR
UNESCO • WHO • WORLD BANK



World Health Organization

Estimated adult and child deaths due to HIV/AIDS from the beginning of the epidemic to end 1999



Total: 16.3 million



UNAIDS
UNEP • UNICEF • UNCTAD • UNESCO • UNFPA • UNHCR • UNRWA • WHO • WORLD BANK



World Health Organization

Note about UNAIDS/WHO estimates

The estimates concerning HIV and AIDS in this document are based on the information available to UNAIDS and WHO at the current time. They are provisional. WHO and UNAIDS, together with experts from national AIDS programmes and research institutions, keep these estimates under constant review with a view to updating them as improved knowledge about the epidemic becomes available and as advances are made in the methods for deriving estimates.

For example, knowledge about the epidemic improves not only as better information becomes available about HIV spread (for example, through more representative sentinel surveillance), but also as more is learnt about the factors that help or hinder the spread of the virus (for example, the natural history of HIV infection in different parts of the world, the impact of HIV infection on fertility, and the effects of improved treatment). This improved knowledge together with methodological advances together provide the basis for updated estimates of HIV incidence, prevalence and mortality. Because of these factors, the current estimates cannot be directly compared with those for earlier years, nor with those that may be published subsequently.

The purpose of publishing these estimates is to help governments, nongovernmental organizations and others who have a stake in bringing AIDS under control to gauge the status of the epidemic in their country and to monitor the effectiveness of the considerable efforts at prevention and care being made by all partners.