

Prevention: daunting challenges ahead

The spread of HIV relies primarily on private human behaviour. Even if individuals everywhere had the full benefit of measures to reduce vulnerability and full access to the tools and skills to prevent transmission, it is illusory to think that all the spread would stop. However, two decades of experience show that behavioural prevention can make a serious dent in the rate of new infections and change the course of the epidemic. This section looks at progress and problems encountered in reducing the spread of HIV through sex between men and women, through male–male sex, through injecting drug use and through mother-to-child transmission.



Avoiding heterosexual transmission: how well are existing prevention strategies working?

The regional update (see pages 8-20) can leave no doubt: unprotected sex between men and women continues to fuel the HIV epidemic in many countries, even in the face of prevention campaigns. The situation is so serious that there is no room for rhetoric or wishful thinking. It is time to take a long, hard look at what is working and what is not.

A number of options are traditionally promoted in prevention campaigns directed at the general public. One is to abstain altogether from sex – or, for young people who have not yet become sexually active, to postpone the start of their sex life. Another is to engage in sex that involves no penetration. As a further option, people are encouraged to have sex with only one other person – someone who will never have sex with anyone else. Mutual fidelity is protective, of course, only if both partners stick to the rules and were uninfected to begin with. Finally, the consistent and correct use of condoms (both the traditional kind and the female condom – see page 63) for every act of sexual intercourse protects both partners from HIV and other sexually transmitted infections.

These are not either/or choices. People may adopt different prevention strategies at different points in their lives, and good prevention campaigns emphasize that many options are available which reinforce each another.

There is now plenty of evidence about how well these various options work in prac-

tice. Because young people are an increasing focus for prevention campaigns, they are also a focus of this review of how well different strategies are working.

How many young people manage to delay first sex?

Many societies confer on their young people ideals that are not always matched by reality. Virginity at marriage, especially for women, is an ideal across many continents which AIDS prevention programmes have often espoused. But when young people are asked about what really goes on in their lives, the gap between the ideal and the reality can be very wide indeed.

In the high-income countries, the percentage of young people who were no longer virgins by the age of 17 started rising gradually in the late 1970s. In Switzerland, for example, 65% of boys in 1985 had already begun to have sex by age 17, and the same was true for 58% of girls in 1989. The epidemic and AIDS prevention campaigns, however, began to reverse this trend, and by 1997 the percentage of sexually active 17-year-old boys had fallen to 54%. In the United States, the proportion of sexually active 15-year-old boys fell from around one-third in 1988 to around one-quarter by 1995.

In most Asian countries, including China, sexual activity is reported to start later than elsewhere. Both men and women generally have their first intercourse after the age of 20. Studies of 15–19-year-olds who had never been married in Singapore and Sri Lanka, for example, found less than 2% of boys reporting that they had already had sex. In the Philippines, 15% of boys of this age said they were no longer virgins. In all three countries, none of the unmarried teenage girls surveyed reported having had sex.

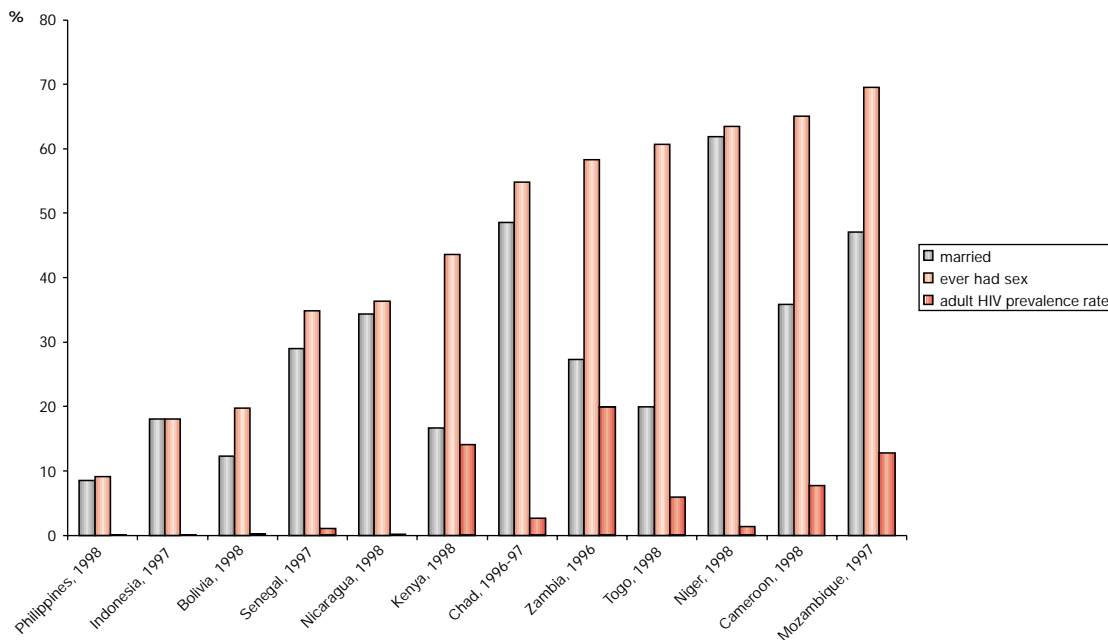
In Latin America, sexual activity can start earlier. A large study in Venezuela found that a quarter of young people had lost their virginity between the ages of 10 and 14, and in Mexico the proportion of sexually active boys in the same age group was 17%. In the Caribbean and in much of sub-Saharan Africa, many young people begin their sex lives at very early ages. Unlike the trend seen elsewhere, girls tend to become sexually active earlier than boys.

How many stay abstinent before marriage?

Even where the sexual debut is late, marriage tends to come later still. In study after study, in country after country, higher proportions of men and women in their teens and early 20s are sexually active than are married. In a large survey in the Indian state of Orissa, a quarter of men in rural areas and around half in the highly mobile district of Puri reported having had premarital sex. In Viet Nam, a society that maintains strict social controls and a firm ideal of virginity at marriage, over one-tenth of young people surveyed reported that they were having premarital sex, and just over half of those said they regularly used condoms.

Where more young people are sexually active than are married, there is a greater likelihood of HIV infection. Figure 21 shows the difference between the proportion of 15–19-year-olds who are married and the proportion who have started having sex in selected countries in Africa, Asia and Latin America. It can be seen that the countries with large discrepancies between these two categories are also the ones with high rates of HIV in the adult population.

Figure 21. Proportion of 15–19-year-old girls married, proportion reporting ever having had sex, and adult HIV prevalence rate, surveys in selected countries, 1996-1998



Source: *Demographic and Health Surveys, Macro International, USA*

Sex before marriage: the HIV risks

Clearly, very high proportions of women and men around the world are having sex before marriage, often from a very early age. Prevention campaigns that promote no sex until marriage seem to be failing young people in most continents. But so long as people are choosing only one uninfected partner who never has sex with anyone else, that is not necessarily a problem. Many people do go on to marry the person they first have sex with. But the available data suggest that this is by no means the norm.

In a recent study in western Kenya, a third of young married men said they had had more than 10 partners before marriage, and the average number of premarital partners reported was close to 9. Women marry younger and may thus have less opportunity for premarital partnerships, but married women in rural areas in the Kenyan study nevertheless reported having sex with an average of three men before marriage. And it seems that, in many places, these partnerships overlap. In studies of young people's sexual behaviour in South Africa and Zambia, over half of the sexually active respondents in some areas said they had more than one sex partner currently or in the past three months.

The number of premarital partners is not the only factor contributing to the risk of HIV infection. As discussed on pages 46-49, the crucial factors for girls are early sexual debut – at an age when their biological vulnerability is very high – and sex with older and more heavily infected men. Studies in African cities where the prevalence of HIV is high tend to confirm that young women are more likely than young men to become infected with HIV during premarital sex. In the Kenyan city of Kisumu, nearly two-fifths of women who had had premarital partners were HIV-positive, while no infections were found in the women who said they were virgins when they married. Overall, in the high-prevalence heterosexual epidemics of eastern and southern Africa, HIV infection rates among young women are far higher than the rates among the men they are apt to marry – men their own age and those up to five years older. The inescapable conclusion is that in some badly affected countries women are now more likely than men to enter marriage already infected and may be exposing their new husbands to HIV. In Kisumu, over a quarter of married men aged 20–24 tested HIV-positive, compared with fewer than 10% of single men.

What about fidelity between regular partners?

While some women may be entering marriage infected and putting their husbands at risk, the reverse still holds true in most countries of the world. Moreover, in most cases women are far more likely than men to be put at risk of HIV by their partner's extramarital encounters.

Mutual monogamy is a social ideal in many societies and most religions, but a double standard tends to relax the rules for men. Men are far more likely than women to report and indeed to have multiple and casual sex partners, even if women underreport this activity where it is socially disapproved. In a study of the general populations of several cities in southern Viet Nam, more than one man in four reported having had a casual sex partner in the previous year, compared with 1 woman in 200, and two-fifths of the men did not always use a condom for casual sex. In a qualitative study in the Indian state of Gujarat, 33 out of 78 married men interviewed said they had had extramarital sex, mostly with unmarried women in their immediate community. The consequences for a spouse who remains faithful to an unfaithful partner can be devastating. A review of the case histories of 134 women infected

with HIV in Chennai (Madras) – almost all of them married – showed that 88% had had sex with only one person in their lives. Few women reported any risk factors other than sex.

Ideals and behaviour can conflict even within the same individual. In a South African study, four men out of five said that people should stick to one faithful, regular partner to avoid AIDS, but over half of the same men reported having had at least one casual partner in the past year. Similar but smaller discrepancies were found among women.

Condom use: rising, but still not enough

By far the commonest method of prevention mentioned spontaneously by people in many studies is condom use. For example, in a study among miners in South Africa in 1997, three-quarters mentioned condom use whereas only two-fifths mentioned monogamy.

Despite opposition from many quarters, condoms have been actively and successfully promoted as part of HIV prevention strategies in many countries.

Box 11. How well do condoms work?

Obviously, people will not use condoms to protect themselves against HIV, other sexually transmitted infections or pregnancy unless they believe that condoms provide effective protection. Huge misconceptions about the safety of condoms in many populations certainly contribute to the low levels of use among sexually active youngsters. In a large survey in central Kenya, nearly half of the young men who had had sex and over two-thirds of the young women had never used a condom. Among these young people, over 40% of the boys and 55% of the girls thought that HIV might be able to pass through a condom, and roughly the same proportions believed condoms could get stuck inside a woman's body.

Worryingly, misconceptions about condoms are not confined to the young. Over half of the parents and guardians of the young people in the study thought that HIV could pass through a condom, and only 48% said condoms were effective prevention against HIV. Misunderstandings about the effectiveness of condoms are reinforced by statements from social leaders. For example, a religious authority in the area of central Kenya where the study was conducted was quoted in the country's largest newspaper as saying that "the rampant use of condoms was to blame for the spread of AIDS... despite condom use, the number of people infected with AIDS continued to increase, an indication that they were not effective in the prevention of the disease".

The effectiveness of condoms in protecting against HIV and other sexually transmitted infections is a scientific rather than a moral issue. And all the scientific evidence points in the same direction: correct and consistent use of condoms of good quality

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vastly reduces the likelihood of HIV transmission. Among discordant couples (couples where just one partner is infected), those who always use condoms for sex have little or no risk of the virus passing to the uninfected partner compared with couples who use condoms sporadically or not at all.

There is wide variation in condom use around the world, and even within communities. On the whole, though, more men report using condoms than women, and both sexes are far more likely to use condoms for sex with casual partners than with a spouse or regular partner (see page 80).

Studies show that young people are more likely than their elders to use condoms to protect themselves and their partners against HIV infection. Young people in all cultures and corners of the globe have proved themselves ready and willing to adopt behaviours and attitudes that promise to stem the rampage of AIDS. This bodes well for the future, since it is probably easier to maintain established behaviours over time than to change habits once they have been formed. Indeed, many young people are beginning to insist on safe sex even at the start of their sexual lives.

In Latin America, Brazil has chalked up impressive results in encouraging condom use for first intercourse (see page 16). So has Mexico, where a study among high-school and university students found that 42% of young men and 36% of young women reported having used a condom the first time they had sex. Increases in condom use have also been recorded on the Caribbean coast of Nicaragua, following an active HIV prevention and condom promotion campaign conducted between 1991 and 1997. Among people who had had sex with more than one partner over the past year, condom use rose from 35% in 1991 (before the campaign) to 55% in 1994 and to 71% in 1997.

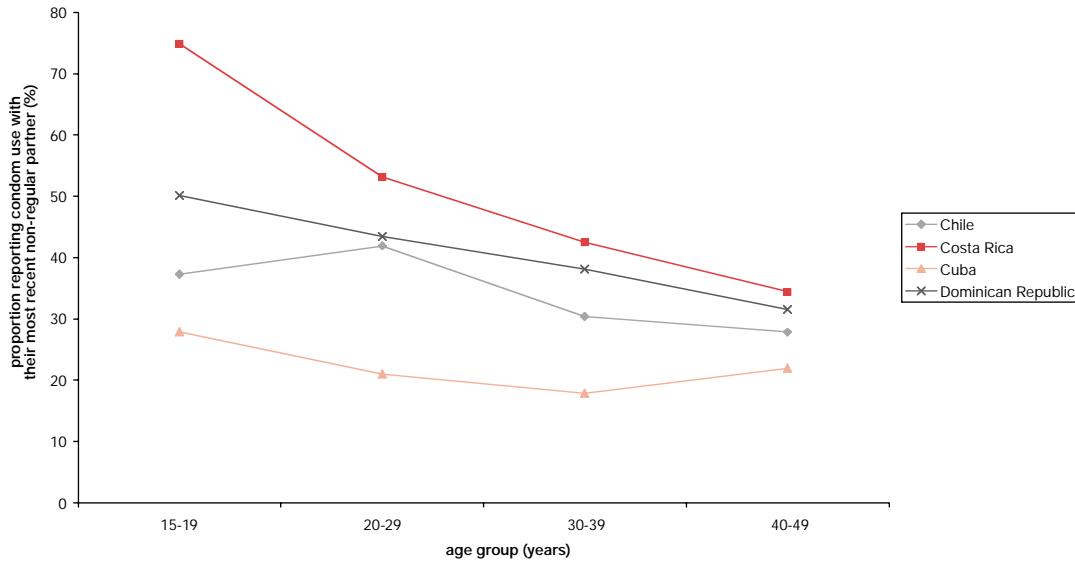
Figure 22 shows that, in several countries in Latin America and the Caribbean, young people were more likely than older people to use condoms with casual partners.

In most western European countries, more than 60% of young people currently report that they used a condom the first time they had sex. In Switzerland (see Figure 23), almost 80% of people aged 17–30, many of whom are unmarried, say they consistently use condoms with casual partners (up from less than 20% a decade ago).

In sub-Saharan Africa, condom use has increased considerably over time. In Uganda, the percentage of teenage girls who had ever used a condom tripled between 1994 and 1997, and more teenage girls reported condom use than any other age group, indicating that the acceptability of condoms is growing more rapidly among young people than among older people. Lifetime condom use among the men who have sex with these women also rose, more than doubling in all age groups between 1994 and 1997.

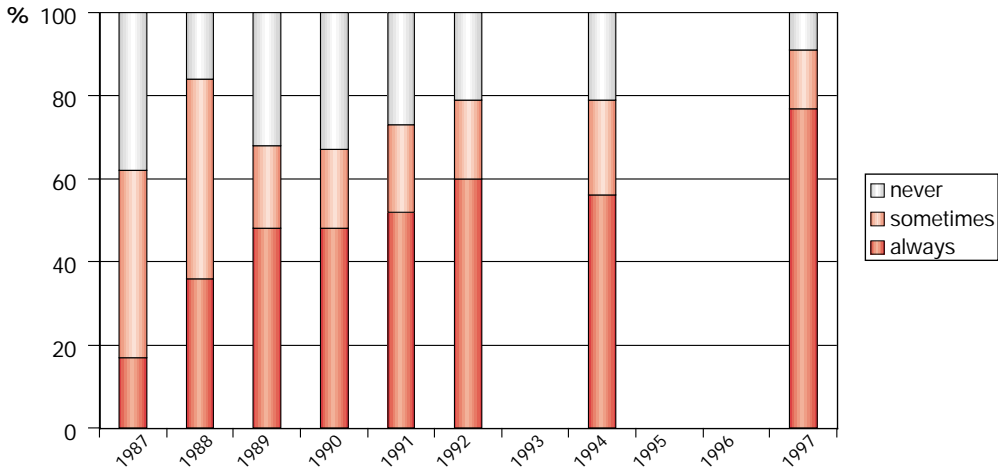
However, the rates remain very low in some areas. A study in western Kenya found that 63% of unmarried men and women who had had sex in the past year never

Figure 22. Condom use for casual sex, by age, selected Latin American and Caribbean countries, 1996-1997



Source: *National AIDS Programmes*

Figure 23. Condom use for casual sex in the past six months, 17-30-year-olds, Switzerland, 1987-1997



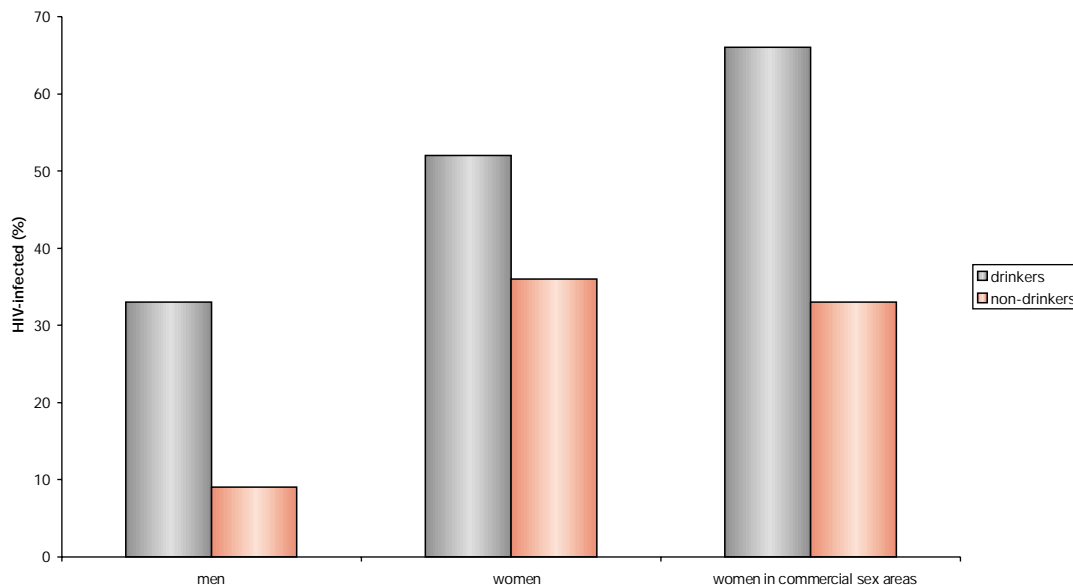
Source: *University Institute of Social and Preventive Medicine, Lausanne, Switzerland, 1999*

used a condom, while just 18% said they always did. Among those who were married, the men's use of condoms with outside partners was similarly low and that of the women was even lower – over four out of five married women never used a condom with men who were not their husbands. Most worrying of all were the relatively low rates of condom use for very high-risk encounters. A study of sex workers in

Kisumu, Kenya, showed that only half had used a condom with their most recent client, and a third had never used a condom. Perhaps not surprisingly, given this low rate of condom use, fully three-quarters of the sex workers responding to the survey in this high-prevalence area of East Africa tested positive for HIV.

One of the factors that influences condom use is alcohol consumption. In many continents, commercial sex and other risky encounters take place after drinking sessions. People who are drunk are less likely to use condoms than people who are sober. The consequences can be dire, as Figure 24 shows. In this South African study, the prevalence of HIV infection was far higher among men and women who consumed alcohol than among men and women who said they never drank. This was true even among women in red-light districts.

Figure 24. HIV prevalence rates among people consuming alcohol and among non-drinkers, Carletonville, South Africa, 1998



Source: *Campbell et al. (unpublished data)*

In Zambia, close to a quarter of women and a fifth of men with casual partners said they had been drinking the last time they had sex with their casual partners. In western Kenya, most sex workers questioned said that alcohol was involved the first time they ever sold sex, and the overwhelming majority of sex workers in the town of Kisumu said that alcohol was an integral part of sexual transactions, with men buying women a drink to signal their interest in buying sex. They also said condom use tended to evaporate when either the client or the sex worker was drunk. Studies among men in Europe, Mexico, Zimbabwe and Uganda have also shown a strong correlation between frequent use of alcohol and other drugs and unprotected sex.

Box 12. **The female condom**

Until recently, the male condom was the only physical barrier available against the sexual transmission of infection, including HIV. Now there is another prevention device to choose from: the female condom.

The female condom is a strong, soft sheath that is inserted into the vagina before sexual intercourse. It has two plastic rings: one at the closed end, which helps insert the condom and keep it in place, and the other at the open end, which remains outside the vagina. It is made of polyurethane plastic, which requires no special storage; it can be inserted quite a while before having sex, it does not require immediate withdrawal after ejaculation and it can be used with both oil-based and water-based lubricants. Because it is usually visible during sex, a woman cannot easily use a female condom without her partner knowing about it, but women do have more control over use of this method than they do over use of a male condom.

The female condom is not meant to replace the male condom. Rather, it is meant to increase the options available to fight HIV and other sexually transmitted infections. According to a Thai study among sex workers in brothels, when a female condom was provided as an extra option to the male condom, the women experienced a 34% decrease in the number of new sexually transmitted infections. The same study also found that sex workers who had access to both the female and the male condom were less likely to have unprotected sex than women who had access only to male condoms.

Use of the product is not expected to reach the high levels recorded in many countries for the male condom, not least because it is currently far more expensive. Research in Zambia and Zimbabwe reveals that after a year of mass marketing, awareness of the female condom is high but use remains extremely low. Some studies show, however, that once women try the female condom, they like it. For example, among female drug users in Brazil, 75% who used the female condom reported being comfortable with it. Follow-up interviews three months later showed that 43% reported continued use, although women living in poor areas (favelas) were less likely to continue using the condom.

Four out of five sex workers who agreed to try a female condom in a study in Thailand said they were satisfied and would use it again. Indeed, the female condom may be especially attractive to sex workers, because it reduces the need for negotiation and can be used even when a man has an incomplete erection, which is sometimes the case with drunken clients.

Female condoms are several times more expensive than male condoms. Since 1996, a special agreement between UNAIDS and The Female Health Company, currently the sole manufacturer of the female condom, has made the female condom available to governments and other public agencies at a special price. Efforts to expand access, increase global volume and further reduce the price continue. A guide to assist countries in programme implementation has been prepared by WHO and the UNAIDS Secretariat, while the United Nations Population Fund (UNFPA) provides technical assistance to country programmes.

It is especially important for young people to use condoms in high-prevalence countries where they are likely to encounter an HIV-infected partner at the start of their sex lives. South Africa, one such country, offers good examples both of what can be done to encourage young people to behave safely and of the challenges that remain. In 1999, over three-quarters of all students in high schools in Johannesburg and in tertiary institutions in Northern Province had used a condom the last time they had sex, and nearly as many said they always used condoms. Unfortunately, in rural areas in KwaZulu Natal, where over a quarter of pregnant women in their late teens have HIV and where the probability of encountering an infected partner is probably as high as anywhere in the world, the rates of condom use among young people were three times lower than those elsewhere in the country. The study showed that the use of condoms is far higher in places where condoms are easily and confidentially available to young people than in places where no special effort is made to meet the needs of the young (see Box 13 below).

Box 13. **Making the safe choice easier**

Condoms must be widely and conveniently accessible if they are to be an easy choice. In one South African study, around 85% of both men and women said that use of condoms could prevent AIDS, and high proportions of the respondents had multiple partners or believed that their regular partner was unfaithful, but over 60% of both men and women had never used a condom. While half of all the men said they intended to use a condom every time they had sex with a casual partner, only 16% of them actually did so. When asked why, many respondents said they simply did not have a condom handy.

There has been impressive progress in improving the availability of condoms, for example through social marketing – an approach which relies on the profit motive as an incentive for vendors to purchase subsidized condoms and sell them at a small mark-up.

For example, in the space of less than a year, a condom social marketing project in Myanmar achieved an impressive increase in the accessibility of, and the demand for, condoms. The quarterly sales of condoms in this project rose from 1 million in October–December 1997 to 1.8 million in July–September 1999. Over the same period, the cumulative number of retail outlets (both traditional and non-traditional) for social marketing of condoms increased from 364 to 1500.

While programmes such as this operate in many countries, much still remains to be done, especially for young people who may need particularly discreet access and may not be able to afford even subsidized condoms.



Men who have sex with men

In many countries around the world, openly “gay” communities are rare or non-existent. Male homosexual behaviour, on the other hand, exists in every country. It often involves penetrative anal sex between men, an act that carries a high risk of HIV infection.

Sex between men is one of the major forces behind the HIV epidemic in many high-income countries and in some parts of Latin America. In Asia, the contribution of sex between men to the HIV epidemic has been recorded regularly but has rarely been quantified. Most of the countries with openly gay communities are in the industrialized world, which are also the countries with the best access to prevention information and to therapy and other care. In developing countries, men who have sex with men are far more likely to do so in hidden ways (see below), and they are less likely to have access to prevention information and services and care.

Prevention is faltering in high-income countries

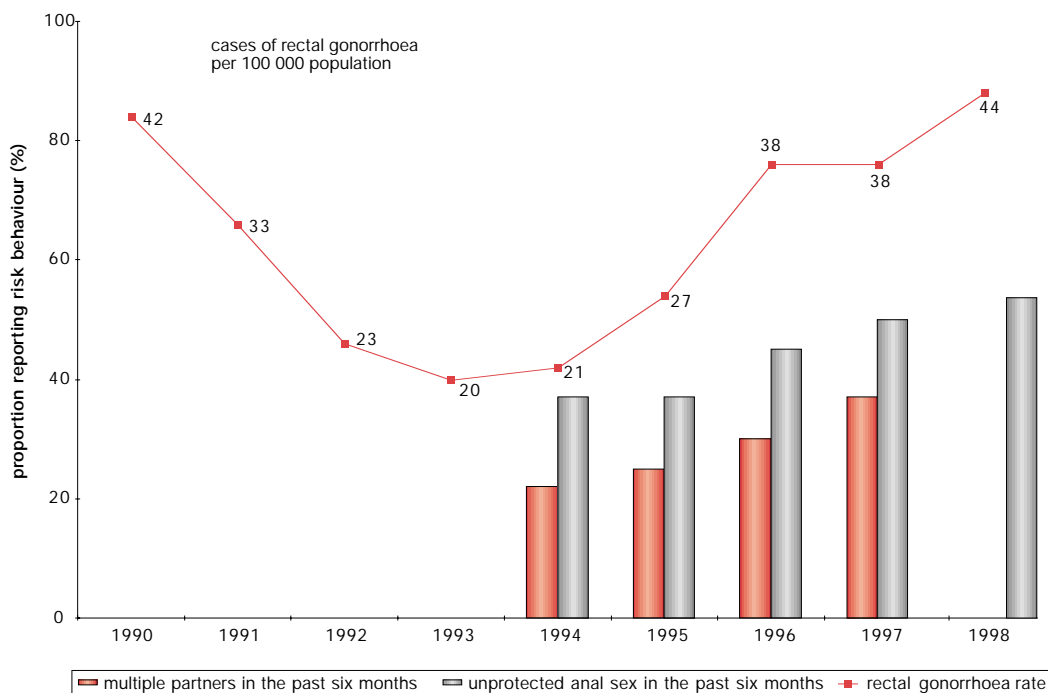
AIDS was first identified among gay men in the USA. By the time the virus that causes the syndrome was isolated, around 1983-1984, HIV had already spread widely throughout the gay community, and was beginning to be found in other groups, too. The reaction of the gay community in the United States and elsewhere was rapid and forceful. Prevention campaigns were organized on a huge scale, and they were largely effective. In particular, consistent condom use during anal sex rose from virtually nothing before the advent of AIDS to around 70% by 1995.

Studies among gay men in a few cities where antiretroviral therapy for individuals with HIV is widely available have shown that men may be growing complacent about the risk of AIDS. A study in the Australian cities of Sydney and Melbourne in 1998 found that a third of gay men were less worried about HIV infection than they were before antiretroviral drugs became available. And they appeared to act on this new sense of security: these men were 40% more likely to have had recent unprotected anal sex than men whose fear of infection was not changed by the advent of therapy. Remarkably similar results were found among gay men in New York, San Francisco and London.

Risk behaviour is undeniably on the rise in some communities. Regular surveys of several thousand gay men in San Francisco have found an increase in the proportion reporting that they had unprotected anal sex and multiple partners in the past six months. As Figure 25 shows, these increases in risk behaviour are paralleled by rising rates of rectal gonorrhoea – a reversal of the falling trend seen up to 1993. More worrying still, surveillance systems using sophisticated testing methods show that in San Francisco the rate of new HIV infections in men with rectal gonorrhoea nearly doubled between 1996 and 1998. The rate of HIV incidence also rose among

men presenting for voluntary counselling and testing, nearly tripling from 1.3% in 1997 to 3.7% in 1999.

Figure 25. Rectal gonorrhoea and sexual risk behaviour among men who have sex with men, San Francisco, USA, 1994-1998



Source: San Francisco Department of Public Health (California), USA, 1999

The San Francisco surveys show that risk behaviour is increasing most rapidly among men under 25. In this age group, the percentage who had had unprotected anal sex and multiple partners in the past six months rose from 22% in 1994 to 32% in 1997. In 1997, 68% of the young men reporting unprotected anal sex with more than one partner in the previous six months did not know the HIV status of at least one of their partners. Alarming rates of continuing HIV infection have been detected elsewhere in the country too, with the help of methods that allow public health officials to calculate what proportion of HIV tests are recent infections. Among nearly 3500 young gay men aged 15–22 in seven US cities, nearly 3% became newly infected with HIV each year between 1994 and 1998, with the highest rate of new infections seen in African-American men.

Complacency may not be the only factor involved in these worrying trends among men under 25. It is possible that some young men are not using condoms because they do not identify with the group of HIV-positive gay men, or because information programmes have failed to reach or convince them. The time may have come for

young gay men to take on the task of informing their own peers, as was done almost two decades ago by the pioneers of AIDS education.

The high cost of neglect and denial

In much of the developing world, where expensive antiretroviral therapy is unavailable, the problem for many men who have sex with men is not complacency but neglect and denial. Too few have been reached with appropriate prevention messages and helped to adopt safe behaviour.

Although sex between men is a major driving force for HIV infection in much of Latin America and the Caribbean, a predominantly macho culture has stunted the development of gay identities and has led to widespread denial of male–male sex, at a societal and sometimes at a personal level. Getting appropriate HIV prevention services to men who have sex with men but who do not consider themselves gay has proved a major challenge in many countries.

In studies of the prevalence of HIV infection in Mexico between 1991 and 1997, 14% of over 7000 homosexual men tested positive for HIV, and male–male sex was shown to be the primary route of infection even among men who were also injecting drug users. While Argentina has little sentinel surveillance among men who have sex with men, over a quarter of all AIDS cases in Argentina were associated with sex between men in mid-1999.

Even in countries where HIV transmission is believed to be overwhelmingly heterosexual and where the overall proportions of infected men and women are similar, sex between men is a major risk factor for HIV. In a study of truck drivers in four cities in Honduras, men who said they had had anal sex with men were six times more likely than exclusively heterosexual men to be infected with HIV, syphilis or hepatitis B. In Honduras, 8% of men who had sex with men were HIV-positive, as compared with just under 2% of the whole adult population. In Jamaica, the prevalence of HIV infection among men who have sex with men rose from close to 10% in 1985 to 15% in 1986, then doubled to 30% in the decade that followed; the rate in the general adult population was less than 1%. In Peru, the prevalence rate among men who engaged in sex with men was 14% in Lima and almost 5% in provincial areas; one study found that 60–77% of men reporting anal sex had never used a condom.

In many countries in Latin America, there is a deliberate willingness to ignore the existence of this “socially undesirable” behaviour, as shown by the sparse information on homosexual activity, and perhaps even some unwillingness to promote measures that would stop an undesirable behaviour from becoming a fatal behaviour. However, in countries where governments have supported nongovernmental organizations in implementing prevention programmes, successes have been recorded. In the Colombian capital, Bogotá, for example, while sexual activity with multiple partners remains common, the use of condoms for anal sex has increased. Some 55% of men in one survey said they always used a condom during anal sex

with casual partners. Among men with no steady partner, three-quarters reported using a condom the last time they had had anal sex. These rates of protected sex, on a par with those recorded in countries where the gay community is far less marginalized, constitute a major achievement for HIV prevention.

Brazil, too, has seen an increase in condom use by men who have sex with men. While a series of studies in Rio de Janeiro showed that between 1989 and 1995 the proportion of men reporting anal sex in the past six months rose from 67% to 76%, the proportion of anal sex protected by condoms rose much more dramatically, more than doubling from 34% to 69%. In the impoverished north-eastern region of Brazil, however, where there is little in the way of prevention activities, a study in the city of Fortaleza found very high levels of unprotected anal sex among men having sex with men, who had an average of 14 sex partners over the previous year. Brazilian men continue to become infected with HIV through male–male sex at an alarming rate. In São Paulo, one study showed that the rate of new HIV infections in this population group was 2% a year between 1994 and 1997.

Men who have sex with men and women

The Fortaleza study in Brazil raised an issue of some concern: while only 15% of the men spontaneously identified themselves as bisexual, 23% reported in answer to questioning that they had had sex with a woman in the previous year, most of it unprotected. Of those reporting unprotected sex with a woman, two-thirds had also had unprotected anal sex with a man. This overlap of risk behaviour provides a classic “bridge” for HIV, allowing it to pass from a population with high prevalence rates to a heterosexual population with typically lower infection rates.

Box 14. Needed: an AIDS vaccine

An AIDS vaccine is urgently needed in a world where over 5 million people are newly infected with HIV every year, but it will take time and a concerted international effort before we have one.

In the long term, a safe, effective and affordable preventive vaccine against HIV is our best hope of bringing the global epidemic under control. However, it would be a mistake to think that the development of such a vaccine will be quick or easy or to expect that once a vaccine is available it will replace other preventive measures. Given the complex chain of endeavour involved in vaccine development, it would also be illusory to believe that a vaccine will be developed without the active participation of affected countries and communities, who are an essential link in the chain.

Scientists around the world are working to understand the kind of immunity a vaccine would have to induce in order to protect someone against HIV infection. They are also

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looking into the genetic variability of the virus, which might affect the protection a vaccine could confer.

The information that scientists generate is in turn being used by the pharmaceutical and biotechnology industry to develop "candidate vaccines" to be tested in HIV-negative human volunteers. The first human trial of an HIV-preventive vaccine was conducted in 1987 in the United States. Since then, more than 30 small-scale trials have been conducted, including 12 in developing countries (Brazil, China, Cuba, Thailand and Uganda). These trials, carried out with the participation of more than 5000 healthy volunteers, have shown that the candidate vaccines are safe and that they induce immune responses that could potentially protect people against HIV infection.

The first large-scale HIV vaccine trials, designed to show whether the candidate vaccines actually protect against HIV infection or disease, were launched in 1998 in the United States and in 1999 in Thailand. The trials involve 8000 healthy volunteers who are given one of two different versions of gp120, a protein located on the outside of the virus, depending on the virus strains prevalent in the two countries. The initial results from these trials may be available within the next two years. In parallel, other candidate HIV vaccines are being developed through different experimental approaches. Some are based on the HIV strains prevalent in developing countries. Most of these newer candidate vaccines will be tested in small-scale trials in human volunteers, and the best will proceed to large-scale evaluation for efficacy.

Vaccine development is complicated not only by the range of virus subtypes circulating but by the wide variety of human populations who need protection and who differ, for example, in their genetic make-up and their routes of exposure to HIV. Inevitably, different types of candidate vaccines will have to be tested against various viral subtypes in multiple vaccine trials, conducted in both high-income and developing countries. It is vital for developing countries to build up their technical and human capability to conduct such trials with the highest ethical and scientific standards and with the full participation of the community.

Most likely, the initial HIV vaccines will not be 100% effective, and they will have to be delivered as part of a comprehensive prevention package. What is important now is to ensure that countries where there is an urgent need for HIV vaccines participate in the global effort to ensure that a vaccine appropriate for their use is developed. Likewise, it is not too early to start planning how to ensure that a future vaccine is made available in the areas of the world where it is most needed.

In Asia, a clearly defined "gay" identity is even rarer than it is in Latin America. There is very strong social pressure on men to marry and father children, and men who have sex with men are commonly married as well. This results in even higher levels of potential "bridging" than those recorded in Latin America.

In one study of truck drivers in India – men who spend long hours together on the road – almost a quarter reported oral or anal sex with a man, and all of those said

they also had sex with women. A study of men attending a clinic for sexually transmitted infections in the southern Indian city of Pune showed that men reporting receptive anal sex with men were 2.6 times more likely to be HIV infected than men who reported no anal sex, even after taking into account other risk factors.

In Thailand, the impressive success in reducing heterosexual transmission of HIV has exposed a failure to focus on other important groups, including men who have sex with men. In a study of military conscripts in an area of northern Thailand with a high prevalence of HIV infection, 134 of over 2000 young men said they had sex with men and all but three of these men also had sex with women. The men reporting male–male sex were nearly three times as likely to be infected with HIV as the men who had sex only with women, even after taking into account other factors such as sexually transmitted infections. Although male–male sex was reported by less than 7% of the men, it was responsible for 13% of the HIV infections in this population in 1995.

Box 15. Male circumcision and HIV infection

For several years, researchers have been debating the relationship between male circumcision and HIV. Several studies have indicated that circumcised men are less likely to become infected with HIV than uncircumcised men. However, because circumcision is usually linked to culture or religion, it has been argued that the apparent protective effect of the procedure is likely to be related not to removal of the foreskin but to the behaviours prevalent in the ethnic or religious groups in which male circumcision is practised. In addition, some researchers have assumed that any association between circumcision and HIV must be complicated by the presence of other sexually transmitted infections, which have been found to be more common among uncircumcised men.

Clearly, the correlations are not straightforward. In the higher-income countries, the rates of HIV infection among men who have sex with men do not vary greatly even though the circumcision rates do: few men in Europe and Japan but four-fifths of men in the United States are circumcised. In Africa, however, circumcision seems to confer some protection. A study in Nyanza Province, Kenya, among men from the same ethnic group, the Luo, found that one-quarter of uncircumcised men were infected with HIV, compared with just under one-tenth of circumcised men. The protective effect remained even after other factors, such as sexual behaviour and sexually transmitted infections, had been taken into account. A study of over 6800 men in rural Uganda has suggested that the timing of circumcision is important: HIV infection was found in 16% of men who were circumcised after the age of 21 and in only 7% of those circumcised before puberty. A recent review of 27 published studies on the association between HIV and male circumcision in Africa found that, on average, circumcised men were half as likely to be infected with HIV as uncircumcised men. When African men with similar socio-demographic, behavioural and other factors were compared, circumcised men were nearly 60% less likely than uncircumcised men to be infected with HIV.

Even though the weight of evidence increasingly suggests that circumcising men before they become sexually active does provide some protection against HIV, the practical implications for AIDS prevention are not obvious. Circumcision, where it is practised, usually has links to religious or ethnic identities and life-cycle ceremonies, and may customarily be done after puberty. If the same scalpel were used without sterilization on a number of boys, this could actually contribute to the transmission of HIV. Finally, if circumcision were promoted as a way of preventing HIV infection, people might abandon other safe sexual practices, such as condom use. This risk is far from negligible – already, rumours abound in some communities that circumcision acts as a “natural condom”. A sex worker interviewed in the city of Kisumu in Kenya summed up this misconception, saying: “I can sleep with circumcised men without a condom because they don’t carry a lot of dirt on their penis”. While circumcision may reduce the likelihood of HIV infection, it does not eliminate it. In one study in South Africa, for example, two out of five circumcised men were infected with HIV, compared with three out of five uncircumcised men. Relying on circumcision for protection is, in these circumstances, a bit like playing Russian roulette with two bullets in the gun rather than three.



HIV and other sexually transmitted infections: an opportunity to strengthen prevention

The important links between HIV and other sexually transmitted infections have been known for many years. One link is behavioural. Engaging in unprotected intercourse exposes a person both to HIV and to a classic sexually transmitted infection. By the same token, using condoms consistently can prevent both kinds of infection. The second link is biological. A person with an untreated sexually transmitted infection is more likely both to contract and to pass on HIV during unprotected sex. Some evidence exists that prompt diagnosis and treatment of the curable sexually transmitted infections, such as syphilis and chancroid, can sever this link and reduce the number of new HIV infections.

New information highlights the challenges raised by these interlinked infections as well as the opportunities for their joint prevention. On the one hand, there now is evidence that genital herpes, an incurable viral infection in which patients have recurrent genital ulcers, may play a more important part in fuelling the spread of HIV than previously thought. On the other hand, recent data point to the enormous potential of using improved health care for sexually transmitted infections as an entry-point for prevention services that could help reduce the rates of both HIV and other sexually transmitted infections.

In high-income countries, genital herpes – infection with herpes simplex virus-2 (HSV-2) – is the leading cause of genital ulcers, although rates are low. HSV-2 is now assuming that position in sub-Saharan Africa, too, overtaking chancroid and other

sexually transmitted infections in many countries. An ulcer in the genital area provides an “open door” through which HIV can easily pass. HSV-2 and HIV appear to operate in a vicious circle, each increasing the risk of contracting and passing on the other. Unfortunately, HSV-2 infection is lifelong and incurable. Drugs that suppress the genital ulcers and viral shedding associated with HSV-2 do exist, but they are very expensive, and their widespread use in poor countries is problematic. Thus, the only practical option for HSV-2 is prevention. This brings us full circle: the best way to deal with the exponentially rising risks of HIV and HSV-2 infection is to increase efforts to prevent them both, particularly by increasing condom use.

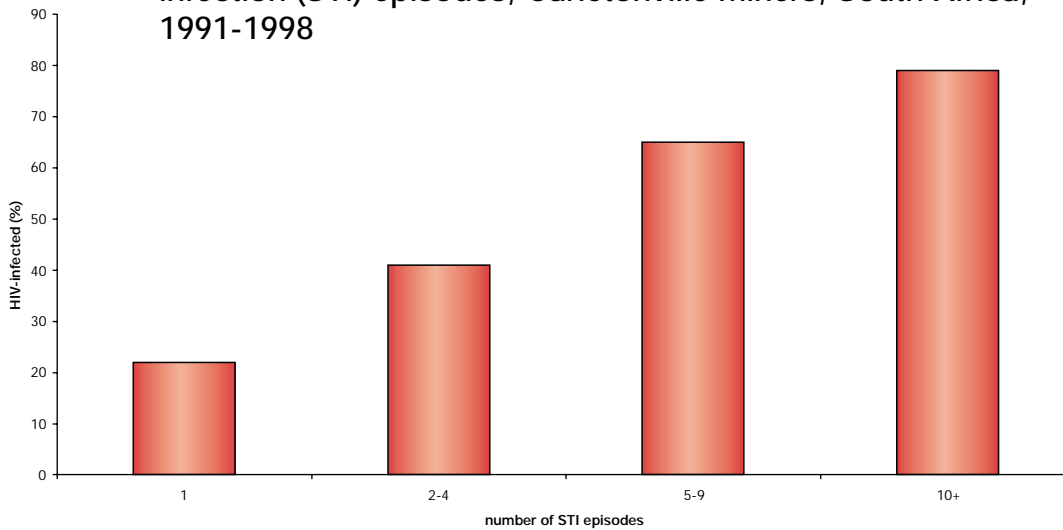
Turning past failure into future success

Patients seeking health care for a sexually transmitted infection should be a primary target for renewed prevention efforts. This is especially true of people who are experiencing their first such infection. It is often difficult to reach young, sexually active men with information about safe sexual behaviour, because they generally have little contact with health services apart from seeking care for a sexually transmitted infection. Men can also refer the women with whom they have had sex to the clinic; an infected woman often has no symptoms of illness and may therefore not seek care, even though her untreated sexually transmitted infection puts her at high risk for HIV as well as for infertility and other ill-health.

In many countries, the opportunity of using such clinics to deliver HIV prevention services to populations at high risk for HIV transmission is being lost, in part because health systems emphasize curative services over prevention, and in part because the clients are thought of as “prevention failures”. Clearly, people with a sexually transmitted infection have by definition engaged in unprotected sex with someone who also has other high-risk partners. But a past failure can be translated into a future success. These patients stand to gain more from prevention counselling than people with no risk behaviour.

Analysis of data from a large treatment programme in South Africa shows just how great the potential impact of prevention might be among patients with sexually transmitted infection. As Figure 26 shows, less than a quarter of miners presenting for the first time with one of these infections at a free clinic provided by employers are infected with HIV. This is very nearly the HIV prevalence rate recorded in the general male population in this area of South Africa. Of those who have further bouts of sexually transmitted infections and come back for treatment a second, third or fourth time, over two-fifths are infected with HIV. By the time men are being treated for their tenth episode or more – new infections that can only have been acquired through unprotected sex – four out of five are HIV-positive. And since most of those interviewed said they never used condoms in their primary relationship, many of these infections will have been acquired or passed on through sex with a spouse or regular partner.

Figure 26. HIV prevalence rate and frequency of sexually transmitted infection (STI) episodes, Carletonville miners, South Africa, 1991-1998



Source: Ballard R, 2000 (unpublished data)

If effective prevention measures were directed at men presenting with their first episode of sexually transmitted infection, many would be able to prevent subsequent episodes and avoid becoming infected with HIV. Standard guidelines for the management of such patients do call for counselling patients about prevention, including the use of condoms and the referral of sex partners for treatment. But service providers regularly score very poorly on this part of patient management. Referral for HIV testing has rarely if ever been assessed, but anecdotal evidence suggests that it is rare.

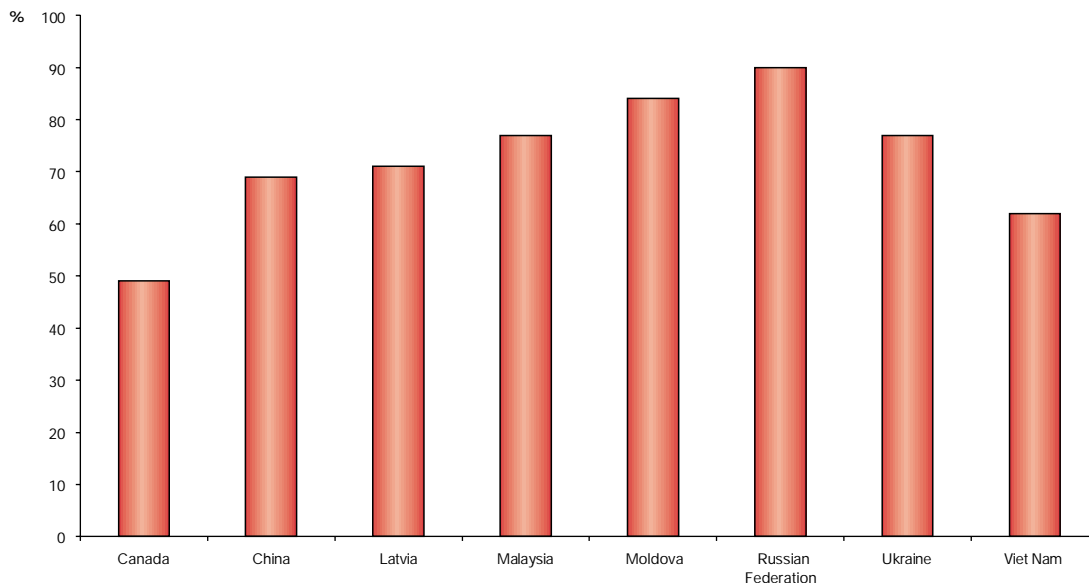
Fortunately, good training can make a big difference in performance in the area of prevention. A recent study in Zambia found that 61% of trained health-care providers – but only 35% of those who had not been trained – performed adequately in providing prevention advice to patients with a sexually transmitted infection. The Zambian study found that training did not make much difference to already good performance in other aspects of patient care, such as history-taking and physical examination. Depressingly, however, only one-fifth of the cases were correctly treated – probably because the correct drugs were rarely available. Almost all the service providers reported serious shortages of drugs in the past year, and almost all were out of stock of at least one essential drug at the time of the study. A study in India showed that only 10% of all men and women presenting with urethritis were satisfactorily managed in public and private health facilities. Thus, while a greater emphasis on prevention is desperately needed, much also remains to be done to ensure the proper diagnosis and treatment of curable infections such as syphilis and gonorrhoea.



Injecting drug use: the other HIV epidemic

Globally, sex between men and women is by far the most common way of passing on HIV. But a second epidemic drives the virus in many, if not most, countries outside of Africa. That is the epidemic among men and women who inject drugs. Over half of all AIDS cases are attributed to injecting drug use in countries including Bahrain, Georgia, Italy, Kazakhstan, Portugal, Spain and Yugoslavia, and over two-fifths in Argentina and the Islamic Republic of Iran. Figure 27 shows the proportion of HIV infections attributable to drug use in a number of countries. In total, 114 countries and territories had reported HIV transmission between injecting drug users by mid-1999, up from just 52 seven years earlier.

Figure 27. Proportion of all new HIV infections that are in injecting drug users, selected countries, 1998-1999



Source: *National AIDS Programmes*

Injection of any sort is an even more efficient way of spreading HIV than sexual intercourse. Since injecting drug users are often linked in tight networks and commonly share injecting equipment with other people without cleaning it, HIV can spread very rapidly in these populations. Because injecting drug use is illegal in most countries, it is hard to know exactly how many people inject drugs and how many share their equipment; it is harder still to gauge how many are infected with HIV. Many of the estimates of HIV infection rates among injecting drug users come from tests of drug users who have been arrested or who are registered at treatment centres. However, information collected by outreach services – which take HIV prevention and other

health and social services to drug-using communities – suggest that the official figures underestimate the true rates of infection in this population. New data from clients contacted by outreach programmes for drug users in the Russian city of St Petersburg show that 12% of those tested are infected with HIV, whereas the rate is just 0.2% in registered drug users. In the Ukrainian city of Poltava, some 40% of clients of prevention projects are infected with HIV, compared with around 10% of registered drug users.

While precise figures may be hard to come by, it is clear that HIV can explode through drug-using populations with remarkable speed and can stabilize at very high rates. For example, HIV infection among injecting drug users in various cities in the Ukraine rose from virtually zero in 1994 to 31–57% in less than two years. In 1999, there was a massive outbreak of HIV infection among injecting drug users in the Russian capital, Moscow, with over three times as many new cases of HIV reported in that year as in all previous years combined. HIV prevalence rates ranging between 30% and 70% have been found among injecting drug users in Argentina, Brazil, India, Spain, Thailand and the USA (Puerto Rico). Risk behaviour in these populations remains common. Recent studies in various cities have found that close to a third of injecting drug users in Brazil and two-thirds in Thailand regularly share injecting equipment, while in Argentina three-quarters of those surveyed said they had shared syringes at some time.

Some countries – including several in central and eastern Europe – are recording a rise in the absolute number of injecting drug users, with a distressing fall in the age at which people start injecting drugs. In Slovakia, 2% of 15–16-year-olds said they had injected drugs. In St Petersburg, over 40% of drug users attending a treatment centre in 1999 were young people, up from just 13% two years earlier. In one study, some Thai girls said they started injecting before they turned 16, on average two years earlier than boys.

Drug injection poses a threat of HIV infection not only to the individuals who engage in it but also to their sex partners. In the USA, it is estimated that 9 out of 10 cases of heterosexual transmission of HIV in New York City are related to sex with a drug user. In some places, including much of China and parts of India and Myanmar, more women are infected through sex with drug users than in any other way. Fully 83% of injecting drug users in Brazil's Rio de Janeiro said they did not use condoms with their regular partners, and 63% never used them even with casual partners. Injecting drug use also contributes to mother-to-child transmission of HIV. In Uruguay, 40% of babies with HIV are born to mothers who inject drugs.

When injecting drug users sell sex to pay for drugs, the prospect of sexual transmission obviously looms large. But because both commercial sex and drug use are hidden, they are doubly hard to quantify. In studies of injecting drug users in Argentina (Buenos Aires), Brazil (Rio de Janeiro) and Canada, a third or more of respondents of both sexes said they had exchanged sex for drugs at least once. The overlap appears to increase the risk of infection. In a study among 212 male inject-

ing drug users in Quebec City, Canada, the prevalence of HIV infection was close to 30% among users who were also sex workers and just under 10% among men who did not report sex work.

Despite the great uncertainties about the number of injecting drug users and the proportion already infected with HIV, enough is known to move ahead quickly with comprehensive programming that can help reduce the high risk of new infections. This must include the primary prevention of drug use, especially among young people, and HIV prevention activities among drug users.

Reducing HIV transmission among drug users: interventions are effective but not politically popular

If large-scale, comprehensive HIV prevention programmes can be implemented among injecting drug users before the prevalence rate exceeds 5%, infections can be contained at a low level. Such programmes should include AIDS education, condom promotion, needle exchange and drug treatment. These comprehensive programmes are sometimes referred to as “harm reduction”. Yet the term “harm reduction” is politically sensitive, and some aspects of the approach are also politically sensitive in most countries. For example, at least six government-funded studies of HIV infection among drug users in the United States concluded that needle exchange programmes significantly reduce new HIV infections among drug users, without encouraging drug use. Despite these results, however, federal funding of needle-exchange programmes is still prohibited because of political opposition. In one study it was estimated that failure to implement widespread needle-exchange programmes in the United States between 1987 and 1995 will cost the country at least US\$ 244 million in medical care for HIV cases that could have been prevented.

Harm reduction programmes, especially those aimed at preventing HIV infection, have been shown to work in transitional economies as well as in high-income countries. In Belarus, an HIV prevention programme among drug users in Svetlogorsk, which included education about safe injecting and safe sex and which provided clean syringes, seems to have led to far safer behaviour among drug users. In 1997, before the prevention programme began, 92% of those surveyed said they shared syringes. By 1999, this percentage had dropped precipitously to 35%. While some people did continue to reuse syringes, the proportion who cleaned them before using them again rose to 55%, from just 16% before the prevention campaign. The prevention project also included distribution of condoms to help reduce HIV transmission from infected drug users to their sex partners. And the users appear to be taking advantage of them: by 1999 nearly two-thirds said they sometimes or always used condoms, twice as many as two years earlier. The programme, which cost around US\$ 0.36 per disposable syringe distributed, is estimated to have prevented over 2000 cases of HIV infection by its second year of operation, at a cost of around US\$ 29 per infection prevented – far below the cost of an AIDS case to a family or a health system.

The Belarus campaign was bolstered by a change in the law, which made it legal to carry syringes. A legislative change that facilitated the funding and implementation of AIDS education and needle exchange among drug users has also been brought about in Brazil.

Drug treatment is another approach to preventing HIV infection among injecting drug users. This includes helping users to switch to substances that do not need to be injected. Methadone treatment, which involves giving oral doses of methadone as a substitute for the injection of heroin, has been associated with reduced risk behaviour and lower HIV infection rates. In an 18-month study of 255 drug users in Philadelphia (USA) in the early 1990s, only 3.5% of the drug users on stable methadone treatment became infected with HIV, compared with 22% of those who were not being treated.

Clearly, greater efforts are needed to reduce both injecting drug use and the risk of HIV infection among drug users, especially in the many countries where drug injection is a major driving force for the spread of HIV. Like other marginalized groups, drug users can often be reached more easily by nongovernmental organizations. National AIDS programmes in some countries, including several in central and eastern Europe and a few in Latin America and Asia, are actively supporting such organizations in their efforts to prevent HIV infection among injecting drug users and transmission from them to their sex partners. Their prevention efforts should be applauded, but above all they must be expanded.