

WORKING PAPER

**PROGRAMME
DIVISION
HIV/AIDS UNIT**

THE EPIDEMIOLOGY OF HIV AT THE START OF THE 21ST CENTURY

REVIEWING THE EVIDENCE

ELIZABETH PISANI

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**For every child
Health, Education, Equality, Protection
ADVANCE HUMANITY**



The Epidemiology of HIV at the start of the 21st Century: Reviewing the Evidence

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ABSTRACT

This paper examines current epidemiological assumptions about the HIV/AIDS epidemic and analyses the literature to validate or refute those assumptions. It suggests courses of action in policy and programme decision making that reconciles discrepancies between the research and the assumptions about the “face of HIV.” The paper notes that a significant amounts of data on HIV/AIDS morbidity and mortality exists, but a much lesser body of knowledge on the effects of the epidemic on families, communities and economies is available to policy and programme makers while developing HIV/AIDS programmes. The paper elucidates assumptions about the definition of generalized and concentrated epidemics, collection of age and sex disaggregated data, heterosexual transmission of HIV, injection drug use, transmission of HIV among men who have sex with men [MSM], infant feeding, measuring youth HIV/AIDS knowledge levels, the impact of education on HIV transmission, and the impact of being orphaned.

KEYWORDS: Strategic Information, Epidemiology, Young People, Orphans, Mother-to-child Transmission of HIV, Vulnerable Groups, Infant Feeding and Care and Support, Knowledge, School-based Life Skills Education.

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HIV: LEARNING FROM THE FIRST TWO DECADES?

Introduction

The HIV epidemic may be the best-documented epidemic in history. The epidemic is continuously evolving, and our understanding of the factors that drive it are under constant revision. Many statements made in good faith on the basis of limited information in past years have not been borne out by the evolution of the epidemic. And yet many of these assumptions continue to inform our thinking about HIV/AIDS and our responses to it. This paper, commissioned by UNICEF, is intended as a “reality check” on the current state of our knowledge about HIV/AIDS. Since fighting HIV is one of UNICEF's five midterm strategic goals, it is intended to provide UNICEF staff with a fuller explanation of the multiple dimensions and complexity of the epidemic so that we plan effective responses. This paper is based, wherever possible, on measured data, rather than the estimates or assumptions that have driven much of the advocacy surrounding AIDS to date. Written from a public health perspective, the paper does not pretend to address critical issues such as child rights, which will play an integral role in any response. It is an independent reading of the data by a medical demographer with several years of experience in the field of HIV. Where opinions are expressed, they are those of the author, based on a reading of the best available data.

Because AIDS follows a relatively predictable path from initial HIV infection to death in the absence of antiretroviral treatment, it is possible to estimate new infections and past deaths from a curve of measured current prevalence data. National epidemiologists work together with UNAIDS and WHO to produce country-specific estimates of HIV prevalence, incidence and mortality and children orphaned by HIV/AIDS. UNAIDS publishes these figures every two years, and in addition publishes regional summaries annually. Unless otherwise stated, the estimates at global, regional and national level given in this paper come from this source.

Box: A note on data sources

A remarkable amount of information is now available about the spread of HIV and about the morbidity and mortality it causes, and much of that information is extremely reliable. Far less is known about the effect of the epidemic on families, communities and economies. The backbone of information about the spread of HIV in the worst affected countries is surveillance among pregnant women. Sentinel surveillance systems are particularly well developed in Africa, and are rapidly improving in Asia and parts of Latin America. These systems provide estimates of current levels of infection among sexually active, non-contracepting women in the general population. They are subject to a number of biases (for example, women with advanced HIV infection are less likely to become pregnant and therefore less likely to enter the catchment population for sentinel surveillance), but adjustment techniques are becoming available for several of these biases. Studies comparing infection in the general population to that recorded in sentinel surveillance show that these systems are very robust in epidemics in which HIV is spread throughout the sexually active population (generalised epidemics). Surveillance systems in countries where HIV is concentrated among individuals with particular high-risk behaviours (concentrated epidemics) are less reliable because while it is often possible to measure levels of HIV in communities with high risk, it is usually impossible to know how many people engage in high risk behaviours.

While HIV prevalence estimates among sexually active adults are relatively robust, in Sub-Saharan Africa in particular, there are huge knowledge gaps in other areas. And there are questions about the reliability of some types of information, such as self-reported sexual behaviour. Validation studies have in the past shown self-reported sexual behaviour to equate well with biological markers of risk such as pregnancy and sexually transmitted infections (STIs). However as AIDS prevention campaigns spread the word about “desirable” and “undesirable” behaviours, there may be an increasing tendency to under-report risky sex. What’s more there are whole populations, for example children aged between five and 15, for which virtually no data are available.

Most of these data gaps will be noted in the text. Many areas in which gaps are noted may be areas for which readers recall having seen “data”, often in reputable publications. Much of this information is in fact not measured data, but is estimated using a series of inputs, each with its own margin of error. It is no secret that data easily take on a life of their own. While an initial estimate may be published with footnotes explaining its limitations, these can easily get lost as figures are cut and pasted from one advocacy document to the next. Quite quickly, something that was initially put forward as a best guess in limited circumstances becomes a universal truth.

This paper attempts to focus on what has been measured. With the exception of the country, regional and global level estimates given in the next section, the data in this paper come from published papers or from new information supplied by researchers already widely published in the field of HIV.

Basic statistics

Table 1

**Basic Statistics,
End 2001**

	Prevalence				Deaths		Orphans
	Total	Women	15-24	< 15	Total	< 15	
Global	40,000,000	18,500,000	11,800,000	3,000,000	3,000,000	580,000	14,000,000
Sub-Saharan Africa	28,500,000	15,000,000	8,500,000	2,600,000	2,200,000	515,000	11,000,000
North Africa & Middle East	500,000	250,000	156,000	35,000	30,000	1,700	65,000
South & South East Asia	5,600,000	2,000,000	1,060,000	220,000	400,000	<100	1,800,000
East Asia & Pacific	1,000,000	230,000	740,000	3,000	35,000	42,500	85,000
Latin America	1,500,000	430,000	560,000	40,000	60,000	<100	330,000
Caribbean	420,000	210,000	- ¹	20,000	40,000	<100	250,000
Eastern Europe & Central Asia	1,000,000	260,000	425,000	15,000	23,000	6,000	<5000
Western Europe	550,000	140,000	243,000	5,000	8,000	<100	150,000
North America	950,000	190,000	- ²	10,000	15,000	6,800	320,000
Australia & New Zealand	15,000	1,000	- ²	<200	<100	5,050	<1000

Source: UNAIDS. 2002. Report on the Global HIV/AIDS Epidemic

1. Included in Latin America count.

2. Included in Western Europe count.

The numbers presented in Table 1 make it clear that the overwhelming majority of women and children affected by HIV in the world live in sub-Saharan Africa. The proportion is shown graphically in Figure 1. In every category, sub-Saharan Africa accounts for the bulk of

infections, deaths and impact, even though as the bottom bar shows, only one in ten of the world's people live in the region.

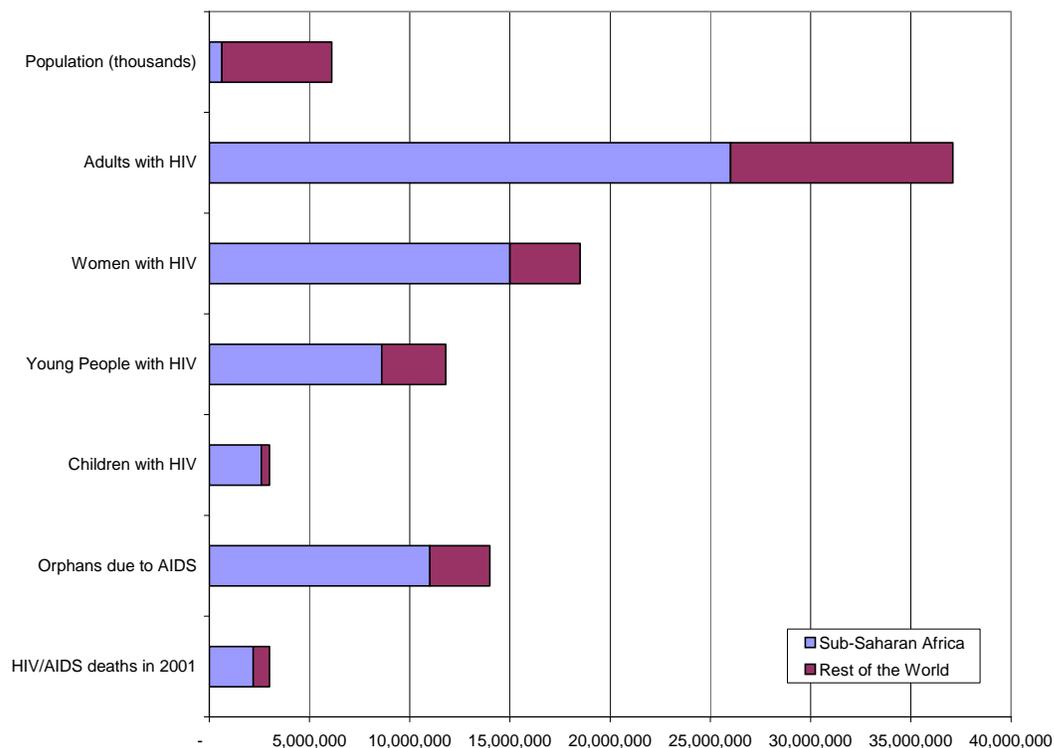


Figure 1: People affected by HIV in sub-Saharan Africa and the rest of the world, start of 2002

Source: UNAIDS data

Overall, seven out of 10 HIV-infected adults, eight out of 10 infected women, eight out of 10 infected children and eight out of 10 children orphaned by HIV/AIDS in the world live in sub-Saharan Africa. And seven out of ten people who died of HIV in 2001 were also Africans. Expressed as a proportion of the population, the gap is even wider: HIV infection in Africa is proportionately over 90 times higher than in east Asia, for example, and 18 times higher than in Latin America. The next most affected region, the Caribbean, has HIV rates just a quarter of those found in sub-Saharan Africa.

These estimates are for the end of 2001. They are far higher than was dreamed possible just a decade ago, when it was estimated that between 15 and 20 million people would be living with HIV by the end of the 20th century (Chin et al, 1990). Partly because the course of the epidemic has been so hard to foresee, very few organisations now prepare long-range projections for HIV infection. Projections to 2005 show that by 2005, 8.6 million children and 32.2 million adults in the developing world will have died of HIV since the start of the epidemic¹. The proportion of people infected in each region is not expected to change radically. In sub-Saharan Africa, for example, HIV prevalence is expected to fall from its current 9.1 percent to 8.1 percent over the next few years. This stable prevalence rate masks very high rates of new infection, which are “cancelled out” in the prevalence figures by high

¹ No projections are available for industrialised countries

deaths. Changes in the population structure, in part the result of the AIDS epidemic, also distort the picture.

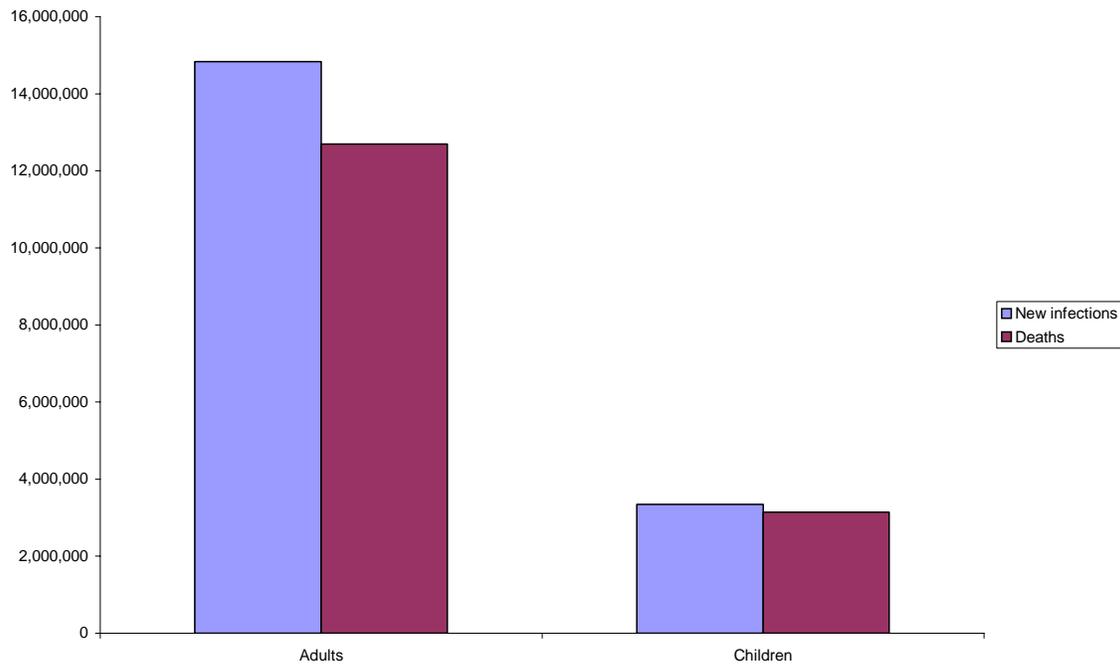


Figure 2: New HIV infections and deaths, Sub-Saharan Africa, 2001-2005

Source: *Working papers for Schwartländer et al., 2001*

It is worth taking note of the scale on this graph. If there is no change in HIV prevalence over the first half of this decade, there will still be around 18 million new infections in Africa alone, and close to 16 million lost lives. That is equivalent to the whole of the population of Australia becoming infected over the next five years, and every man, woman and child in the Netherlands dying.

Overall, unless prevention and care programmes manage to produce dramatic successes on a huge scale, it was expected that some 23 million people around the world would become infected with this preventable, fatal disease between 2001 and 2005, and 19.5 million would die. It appears we are on our way to matching this tragic projection. Since these projections were made, nearly 15 million people have become newly infected with HIV, and close to half that number have died with the virus..

EPIDEMIOLOGY: A global pandemic?

The story so far

AIDS was first identified among gay men in the United States in the late 1970s. It was initially associated with anal sex between men and with direct injection, either through sharing contaminated needles or through the use of contaminated blood products. When it was established that the cause of AIDS (now identified as HIV) could be passed on in heterosexual sex, the threat of a major epidemic in the general population loomed. As the number of women infected grew, transmission of HIV from mother to infant was observed.

By the early 1980s, an increasing number of AIDS cases were being reported in East Africa and in some Caribbean countries. The African epidemics did not seem to be associated with sex between men or with injection: they appeared to be driven almost entirely by sex between men and women.

Other continents were little touched by AIDS until nearly a decade later. Epidemiologists predicted that it was only a matter of time before the virus established itself throughout the globe. They spoke of an inevitable progression from “high risk groups” (including gay men, drug injectors and sex workers) into the general population. Especially dire warnings were sounded for parts of Asia, notably India, where even low prevalence rates began to translate into headline-grabbing numbers of people living with HIV.

Much of the information about the global pandemic has come from international institutions keen to raise awareness about the threat posed by HIV. Great strides have been made towards this goal.

The tendency of international agencies to be inclusive and universal has, however, obscured some very real differences in the pattern of HIV infection and its effects around the world.

New thinking

It is now apparent that we are not facing a single global pandemic, but rather a number of distinct epidemics, which run largely parallel, sometimes within the same country. There is no doubt that there is some “cross-over” between these epidemics, because risk behaviours are not mutually exclusive. People who inject drugs also have sex, for example, while men who have sex with men also have sex with women. One epidemic can indeed “seed” another. For example, high rates of injecting drug use among sex workers can rapidly increase HIV prevalence in that population, creating a critical mass of infection which may then get passed on to clients and from them to other, non-drug using sex workers as well as to wives and other sex partners. However, it is now clear that the extent to which epidemics in different populations overlap depends entirely on the mix of risk behaviours in that population. There is no “inevitable progression” from one type of epidemic to another.

Broadly, there are four major driving forces for HIV epidemics in the world: male-male sex, injecting drug use, sex between men and women with high partner turnover (usually commercial), and sex between men and women who are linked in broad, non-monogamous networks which are frequently not commercial in nature. The two heterosexual epidemic types differ: The first is largely concentrated among specific sub-populations whose behaviour in terms of partner turnover differs from that of the population at large. The second (known as a “generalised” epidemic) is spread widely throughout men and women with behaviours which are more or less the norm in their area.

These different behavioural drivers are geographically fragmented. In general terms, the industrialised world and Latin America are home to homosexually transmitted epidemics, and to epidemics among injecting drug users. Drug injection is the primary source for almost all infections in Eastern Europe, and is a major driver for the spread of HIV in many countries in Asia, where it exists in parallel with homosexual and concentrated heterosexual epidemics. North Africa and the Middle East have recorded exceptionally low levels of infection to date, and virtually no reliable information is available about which behaviours predominate. In Sub-Saharan Africa and some parts of the Caribbean basin, unprotected sex between men and women in the general population is overwhelmingly the most common driver for HIV

transmission, with transmission from mothers to children a secondary consequence of heterosexual activity.

The HIV epidemic among injecting drug users

Sharing a needle with an infected person is a remarkably efficient means of transmitting HIV and other blood-borne pathogens such as Hepatitis B and C. Viral infections tend to rise very rapidly to very high levels among injectors if HIV prevention programmes are not instituted very early on, before a network of injectors is widely exposed to the virus. Once they have reached these levels, they are exceptionally difficult to roll back. Figure 3 shows the percentage of new HIV infections, which are known to be in injecting drug users. It is likely that the actual proportion is higher in some of these countries, since information about route of transmission is not available for a sizeable proportion of infected individuals. Drug injection accounts for the majority of new HIV infections in a number of countries in Asia and the industrialised world, as well as in most of the transitional economies of Eastern Europe and Central Asia. While other modes of transmission do exist in every country, any organisation wishing to have any significant impact on the HIV epidemic in these countries has no alternative but to tackle the politically sensitive issue of injecting drug use head on.

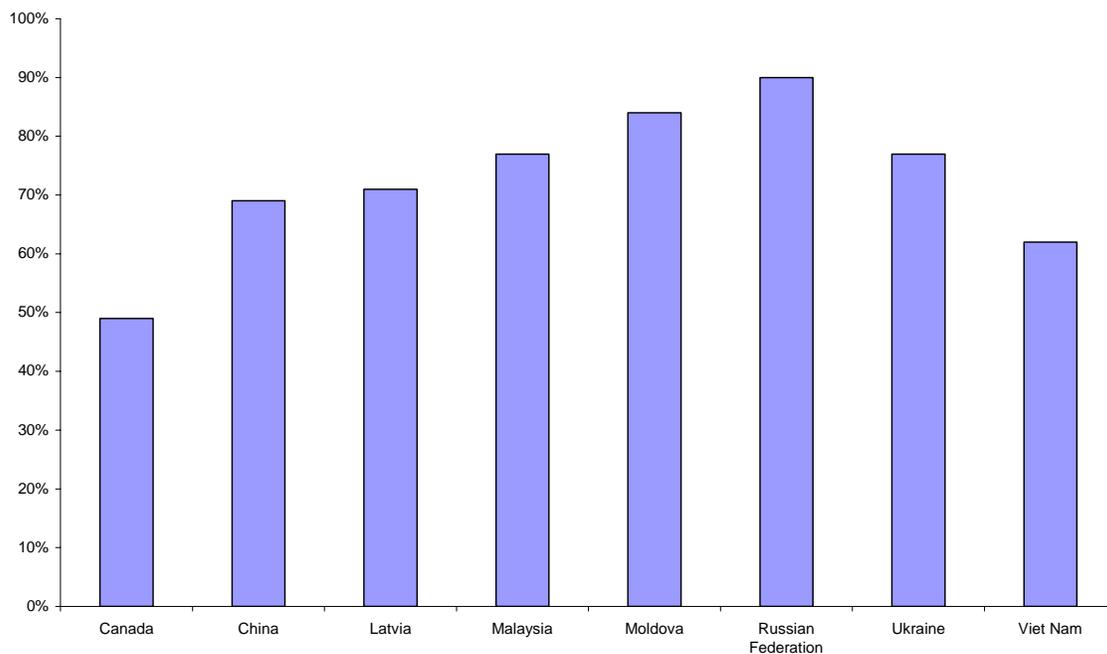


Figure 3: Percentage of all new HIV infections that are known to be in injecting drug users

Source: WHO 1999

Injecting drug use is more or less single-handedly responsible for the dramatic rise of HIV infection in the countries of the former Soviet Union. Population prevalence figures remain very low, but identified HIV cases are expanding exponentially; most of the increase is associated with drug injection. There are now a million people estimated to be living with HIV in Eastern Europe and Central Asia. Eight out of 10 are men, and some seven out of 10 cases are still directly attributable to drug injection.

Information on the absolute numbers of people injecting drugs is notoriously hard to come by, and estimates often fluctuate wildly. However, there is evidence from several countries that the overall number of drug injectors is on the rise. The proportion of 21 year-old military conscripts in northern Thailand who had ever injected drugs quadrupled between 1991 and 1997, and these young men were 12 times as likely to be HIV-infected as those who had never injected drugs (Nelson et al., 1998). In Indonesia, the number of injectors in the country's only public treatment programme rose dramatically in the late 1990s before levelling off at the end of the decade. Numbers in the public programme levelled only because booming demand has led to the mushrooming of a large number of private treatment centres (RSKO treatment hospital, personal communication).

Data from Indonesia and elsewhere also confirm that drug abuse starts young: many addictions begin during the teen years. Indeed there is some evidence that the age at first injection is falling. The proportion of people attending a drug outreach programme in St. Petersburg who were teenagers more than tripled in just two years, reaching 40 percent by early 1999. Two thirds of these young people were using drugs before they turned 15 (Vozvrastcheniye Foundation and Medecins du Monde, 1999). Over half of drug injectors interviewed on the streets of Odessa as early as 1996 were aged under 25 (de Jong, 1997), as were a fifth of those interviewed in the Indian city of Chennai (Kumar et al, 1998). Three separate studies of injecting drug use in Brazil all recorded an average age at first drug injection of between 19 and 20 (Telles et al., 1997). In the Argentinean capital, Buenos Aires, a fifth of drug injectors said they started injecting when they were 16 or younger, and two thirds had started by the time they were 18 (Rossi et al.). And as Figure 4 shows, the limited data available from developing and transitional countries indicate that youth is no protection against HIV infection among drug users.

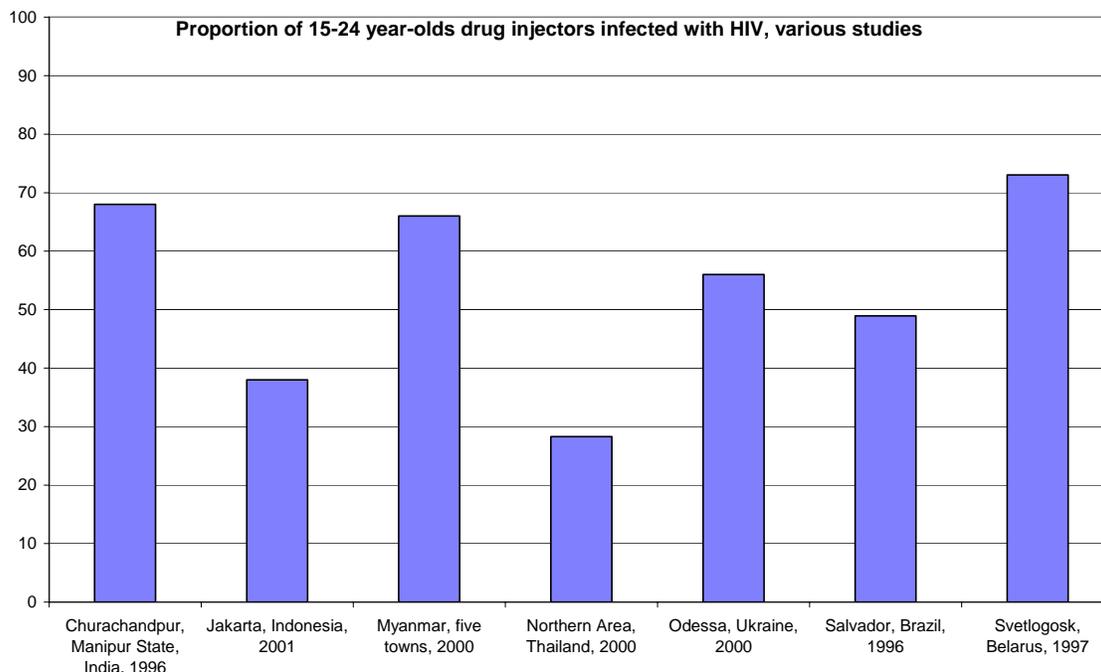


Figure 4: Proportion of 15-24 year-olds drug injectors infected with HIV, various studies

Source: Myanmar, Belarus and Jakarta, sentinel surveillance. Others: published studies, see US Census Bureau

* 15-20 only

Indeed in Jakarta, where numbers tested in surveillance in a rehabilitation centre were admittedly relatively small, teenager drug injectors had the highest prevalence of any age group: 46 percent of teens were infected with HIV compared with 37 percent of 20-24 year-olds (Indonesia Directorate General of Communicable Disease Control and Environmental Health, 2002).

HIV among drug injectors: where does it go next?

Drug injectors have lives outside their addiction, and that of course includes sex lives. The potential for HIV infection to spread from injectors to a wider population through sexual networks is hotly debated. Some have claimed that drug injectors have very low levels of sexual activity (WHO 2001). While it is known that prolonged addiction to some ingestible drugs (notably opiates) reduces sexual desire, this effect is not seen in data from countries in Asia where behavioural surveillance among drug injectors has been conducted. In the Bangladesh capital of Dhaka, for example, 40 percent of male drug injectors were married, 58 percent had bought sex from a sex worker in the past year, and 63 percent had had sex with a casual, non-commercial partner in the last year. Just one injector in five had had no commercial or casual sex in the last year, and 42 percent had both commercial and casual partners.

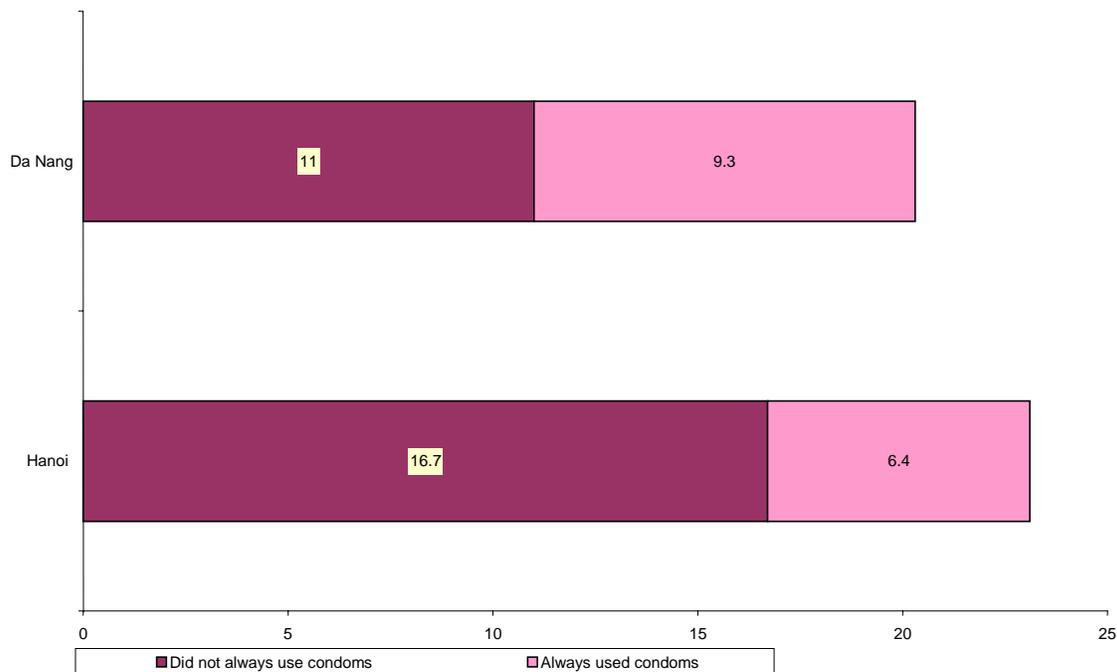


Figure 5: Percentage of drug injectors who bought sex in the last year, by consistency of condom use, Vietnam, 2000

(Source: Vietnam NASB, 2002)

In Vietnam, too, sexual activity among drug injectors was high. Figure 5 shows the proportion of drug injectors who had sex with a sex worker in the last year. Nearly a quarter of IDUs in Hanoi and over a fifth in Da Nang said they had bought sex in the past year. And as the dark part of the bar shows, most did not use condoms. In other words, a total of 17 percent of male drug injectors in some Vietnamese cities have had recent unprotected sex with a sex worker. Since HIV prevalence in this group has recently been recorded at above 60 percent in some cities in Vietnam, this clearly represents worrying potential for the wider spread of HIV.

There is another side to this equation: drug injectors are not just consumers of commercial sex, but also suppliers. In behavioural surveillance among sex workers in Vietnam's two largest cities, Hanoi and Ho Chi Minh City, for example, a significant minority of street-based sex workers said they had taken drugs. In Hanoi, one sex worker in five reported recent drug injection, while in Ho Chi Minh City, 16 percent reported injecting. Over a third of street-based sex workers did not consistently use condoms in both cities, and rates of condom use with regular clients and non-paying partners were predictably much lower. A recent sharp rise in HIV infection among female sex workers on the Indonesian island of Bali (from one percent to seven percent in a year, among samples of over 200 sex workers) is attributed by researchers to an increase in injecting drug use in that population (Dewa Wirawan, personal communication, 2002). Condom use with clients is low, so it is likely that injecting drug use may "seed" a rapid rise in concentrated heterosexual HIV transmission in Bali.

It is not, however, inevitably the case that a “wave” of HIV infection among sexually active injecting drug users will wash over other populations. A study in the Russian city of St. Petersburg, for example, found no HIV among street-based sex workers, even though over a third of their clients were reported to be drug addicts (Vozvrastcheniye Foundation and Medecins du Monde, 1999). This may be because condom use in commercial sex is common in this population. Drug users in the same city reported high levels of sexual activity with casual as well as permanent partners, but close to half of them also said they used condoms. Another factor that may limit the spread of HIV from drug injectors to others in the general population is that many drug injectors choose to have sex with other drug injectors. In the St. Petersburg study cited above, over 40 percent of addicts said they had sex with other addicts. Some 62 percent of drug injectors in Buenos Aires said they had sex with partners who also injected drugs (Rossi et al. 1999). In a study in New York City, injecting drug users were significantly more likely to use condoms with non-drug injecting sexual partners than with partners who also injected drugs (Freidman et al. 1993). This suggests that prevention programmes can be effective in limiting sexual transmission of HIV from injecting drug users to others in the general population.

The news from Eastern Europe is troubling. How a largely injection-driven epidemic spreads to a wider epidemic in non-injectors depends on the extent and shape of networks of unprotected sex. In many of the countries of the former Soviet Union there has been a rapid increase in recorded infections with sexually transmitted infections other than HIV. This is in part because of the breakdown of health services, which treat and control these infections, but it is likely to be in part, also, because of an increase in unprotected sex with multiple partners. There is as yet little evidence that HIV is coursing through the sexual networks of Eastern Europe and Central Asia, and patterns of sexual networking in this region have not been documented. But the rise in STIs suggests that if HIV did make its way into these sexual networks, it might spread rapidly. Efforts are needed to increase condom use within these sexual networks, in part to control the rising incidence of syphilis and other STIs. If increased condom use can be achieved before HIV takes hold, it will contribute to limiting the spread of the virus. But as things stand, the single most effective means of limiting the HIV epidemic in Eastern Europe will be tackling it while it is still confined largely to the relatively well-defined population of people who inject drugs.

Drugs put women and children at risk

Even in the industrialised and Latin American settings described above, the majority of injectors are men. In some Asian countries, virtually all injectors are men. Those who are sexually active are probably having sex with women who don't inject – often their wives. These women may become infected with HIV even though they do not themselves have any identifiable “risk behaviours”. If they become pregnant, their babies may also be exposed to HIV infection.

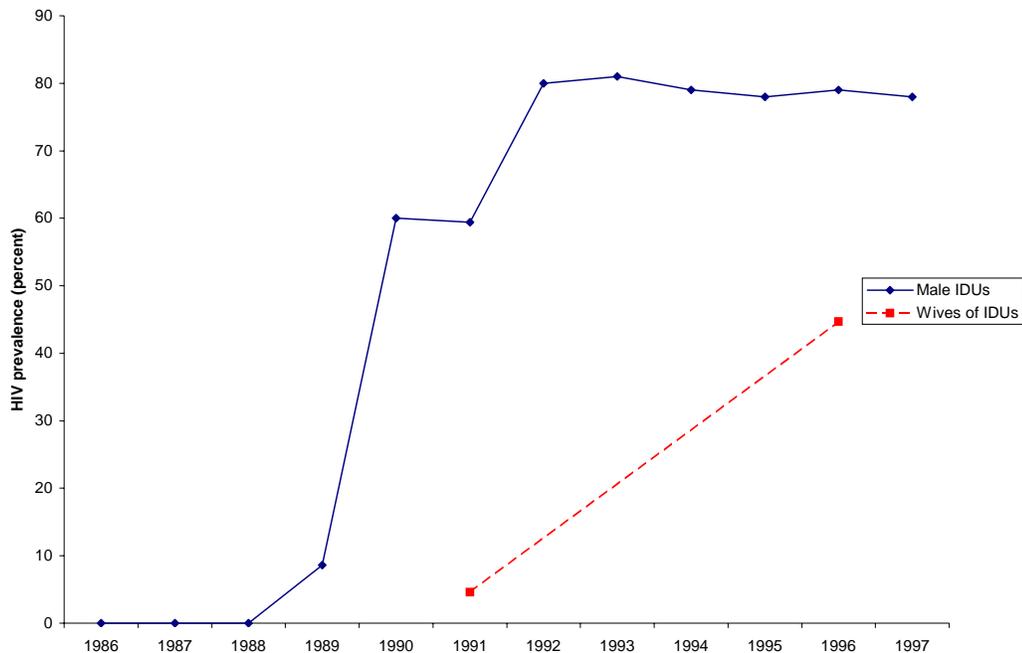


Figure 6: HIV infection among drug injectors and their wives, Manipur, India, 1986-1997

Source: Chakrabarti et al. 2000

Figure 6 shows an example from Manipur, a state in northern India, where drug injection is very common among men but little recorded among women. HIV has reached a plateau at around 70 percent among drug injectors, and is rapidly becoming well established among their non-injecting sex partners, over 45 percent of whom were found to be infected in a 1997 study (Chakrabarti et al. 2000). It is highly likely that the majority of the 1.25 percent of pregnant women who tested HIV positive in Manipur in 1998 were married to drug injectors. There is no evidence that these women commonly have other sexual partners to whom they spread HIV infection.

In most countries, the male injectors will infect some of their female partners sexually, and they may also be endangering infants. But the overwhelming majority of infections are still among men, and only a tiny minority are among children. So while equity may argue for interventions to protect children and their mothers, public health concerns still point to the need for primary prevention among men.

Figure 7 shows the results of a model based on observed trends in drug-driven epidemics in Eastern Europe. New infections grow very rapidly in men and more slowly in women, because more men than women inject drugs, because a proportion of the women are infected sexually, and because HIV is not transmitted as easily through sex as it is through needle-sharing. Since fertility in most of these countries is low, new infections in children remained low for many years. The absolute levels of infection will depend on the prevalence of drug injection, but proportionately there will be 99 adult infections for every one child likely to be infected, even 10 years into a drug-driven epidemic.

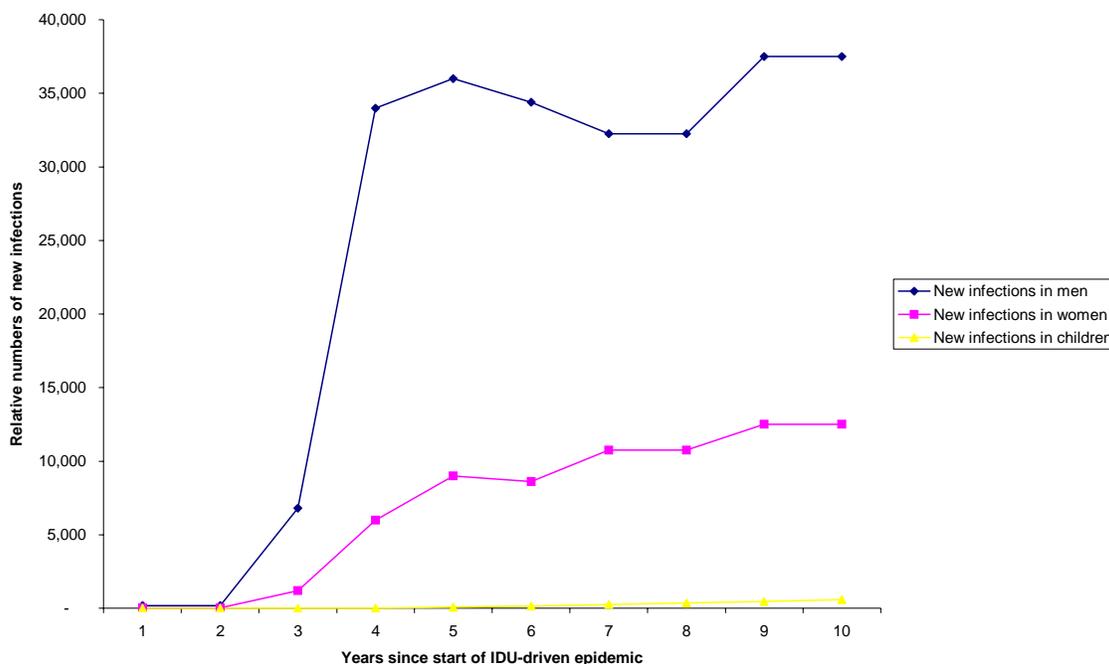


Figure 7: Relative numbers of new infections among men, women and children over time in drug-driven epidemics following Eastern European patterns

Source: UNAIDS Epidemiology unit, unpublished model

In attempting to prevent transmission from mother to infant in drug-driven epidemics, two major strategies are possible. One is to provide counselling, voluntary testing and – where necessary – preventative services to all women, including the vast majority who are at little or no risk of HIV infection. The other is to try to focus on women who either inject drugs, or have sex with men who inject drugs. The first of these options is clearly more equitable: the second is likely to be more cost-effective, and perhaps more feasible where human, technical and financial resources are pinched.

Harm reduction and demand reduction: complimentary strategies

HIV has already reached very high levels in many drug injecting communities in several countries. Their contribution to the overall extent of a national HIV epidemic will be determined by three factors: firstly the absolute size of the injecting population, secondly the patterns of needle-sharing within those populations, and thirdly the pattern of unprotected sexual networking between injectors and non-injectors. All three present opportunities for effective intervention.

Indeed, some of the best-documented HIV prevention successes have been among drug injectors. There is strong and consistent evidence from industrialised countries that harm-reduction initiatives such as needle exchange programmes, when implemented on a large enough scale, can help to reduce the risk of HIV transmission between people who already

inject drugs². Such programmes have potential in transitional economies, too. An HIV prevention programme among drug users in the Belarussian city of Svetlogorsk that included education about safe injecting and safe sex, and that provided clean needles, seems to have led to far safer behaviours among drug users. In 1997, before the prevention programme began, 92 percent of drug users surveyed said they shared syringes. By 1999, this percentage had dropped to 35 percent. While some people did continue to reuse syringes, the proportion who cleaned them before re-use rose to 55 percent, from just 16 percent before the prevention campaign (Kumaranayake L et al. 1999).

Harm reduction has always been controversial. Opponents maintain that making drug taking safer will encourage young people to take drugs. There is no evidence to support this position. If we base our statements on scientific evidence alone, then there is only one thing we can say. Harm reduction, on a large enough scale, works. The morality of denying drug users life-saving services in order to avoid political unpopularity must be questionable. Certainly, from a public health point of view, large-scale harm reduction efforts are most likely to stop the HIV epidemic in its tracks in countries where it remains concentrated among drug users.

Harm reduction will be most effective where it is implemented in conjunction with demand reduction. Over the longer term, an effective tactic to limit an HIV epidemic driven by drug injection would be to limit the number of people who inject drugs. Since most injected drugs are addictive, this means preventing people from embarking on drug use in the first place. Several countries, notably in Latin America, have attempted to do this through high-profile media campaigns that focus on the dangers of drugs. Market research shows these campaigns have been followed by lower reported drug use among young people in some countries, but the data are not widely published. More work is needed to develop and assess interventions to build negotiating skills and to otherwise reduce vulnerability to entry into drug use among young people.

The injecting drug use epidemic: a summary

We know:

- Drug injection is the major driving factor in HIV epidemics in Eastern Europe and in many areas in Latin America and Asia
- Most injecting drug users are men
- HIV infection in drug injectors quickly rises to very high levels
- Injecting behaviour often begins in the teen years
- Needle exchange programmes and other harm reduction efforts are effective in reducing HIV transmission in a variety of settings

We suspect:

- The proportion of young people injecting drugs is rising in many countries
- Drug injection may be “seeding” concentrated heterosexual epidemics in parts of Asia

There is no evidence that:

² Although the United States does not provide federal funding for needle exchange programmes, at least six studies financed by the U.S. government have concluded that needle exchange programmes reduce the risk of HIV infection while not promoting drug use.

- Harm reduction programmes increase drug use

The HIV epidemic among men who have sex with men (MSM)

Sexual transmission of HIV between men, principally during anal sex, is an important factor driving the epidemic in the industrialised world and in a number of countries in Latin America. Industrialised countries with well-organised openly gay communities have made substantial progress in reducing unprotected sex with multiple partners and other behaviours that carry a high risk of HIV infection. There are indications that risky behaviour is on the rise again in these communities, especially among younger men. This is partly because gay men, many of them too young to remember the devastation that AIDS caused in their community in the 1980s, are growing complacent as life-prolonging therapy becomes more effective and more

HIV prevalence among men who have sex with men, various studies

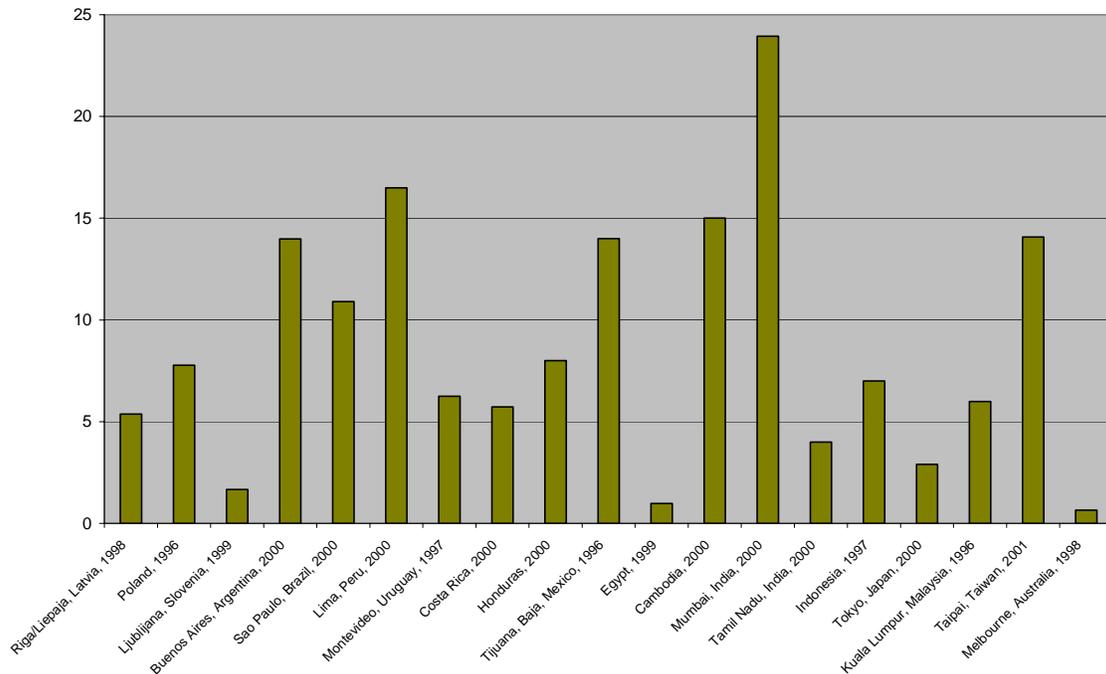


Figure 8: HIV prevalence among men who have sex with men, various studies

Source: US Census Bureau database and published studies

easily available (CDC 2000, Ekstrand et al 1999, Van de Van 1999, Valleroy 2000). The “gay” epidemic in the developing world is somewhat different. In many countries, particularly those in Latin America, homosexual activity is deeply frowned upon and men who are attracted to other men have difficulty identifying themselves openly as gay. This means that men whose sexual relations with other men put them at high risk for HIV infection are often hard to identify, and therefore hard to reach with preventative services.

In some countries, homosexual HIV epidemics remain contained within a population of men that only rarely interacts sexually with women. Because HIV surveillance systems often focus on pregnant women, they completely miss epidemics driven by sex between men in these countries. As a result, the magnitude of the HIV crisis within this group sometimes gets

ignored. HIV prevalence levels among gay men often approach the very high levels recorded in the general population in the worst affected countries in the world. Figure 8 shows, by way of example, the HIV prevalence rates recorded among men who have sex with men in various locations in recent years.

An important initiative in epidemics driven by sex between men will be to try to reduce the denial of homosexual activity and the marginalisation of those men who choose to have sex with other men. To stem the HIV epidemic in many countries in Latin America and North Africa and some in Southeast Asia, it will be critical to provide young men with links to services that can reduce their sense of social isolation and help them protect themselves if they do choose to have sex with other men.

And the women they also have sex with

In countries where homosexual activity is highly stigmatised and pressure to conform to heterosexual norms is strong, men who regularly have sex with other men often also have sex with women, including wives. Reliable data exist from countries as diverse as Bangladesh, Brazil, Cambodia, Colombia, India, Mexico, Pakistan and Thailand confirming that men who have unprotected sex with other men also have unprotected sex with women.

Figure 9 shows data for men who have sex with men in Dhaka, Bangladesh. This cohort of men excluded men who sell sex. Since these data reflect only partnerships in the last month, it is clear that among these men, high proportions are having regular sex with both men and women.

Overall, 68 percent of men who had sex with men in the last month also had sex with women, and half of those bought sex from female sex workers. Most of these men report not using condoms with either their male or their female partners. HIV surveillance data show that Bangladesh has so far escaped the worst of the HIV epidemic, but it is clear that with the patterns of sexual networking described, once the virus does get established among MSM it is unlikely to be isolated within that sub population. If such patterns of networking are common, it is likely that risky sex between men will translate into HIV infection among women and their children even in epidemics driven initially by sex between men. Indeed many documents warn of the dangers of bisexually active men acting as a “bridge population”, potentially turning a homosexually driven epidemic into a heterosexually driven one. However few (if any) studies have actually traced infection in women to the homosexual activities of their sex partners. Studies that use a combination of epidemiological and behavioural surveys and epidemic modeling are now underway in some Asian countries to try to ascertain the potential contribution of male-male sex to any wider population.

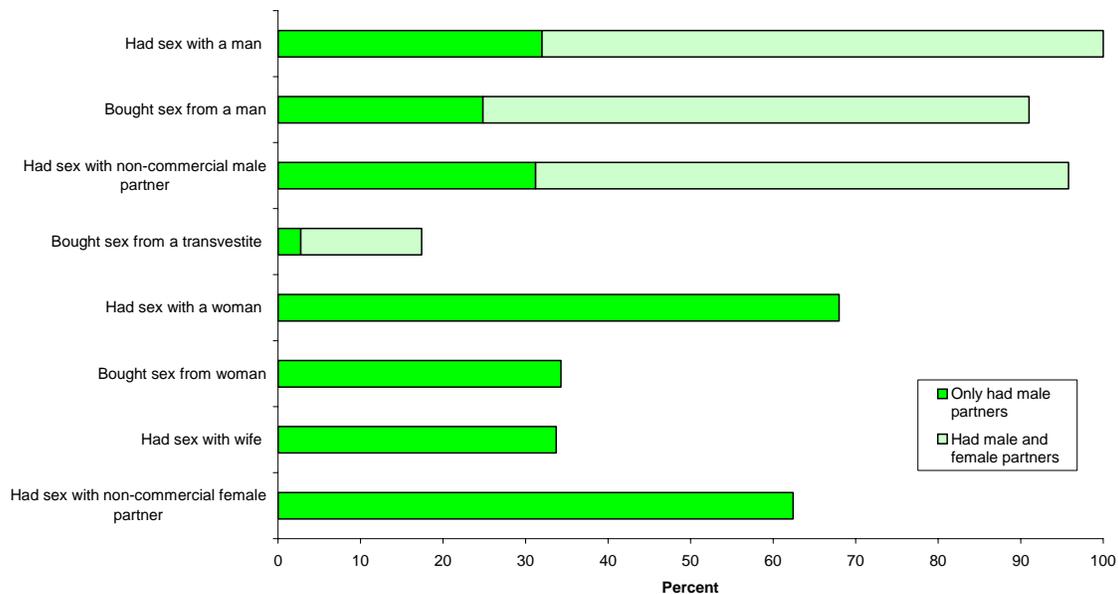


Figure 9: Partnership types in the last month among men who have sex with men but do NOT sell sex, Dhaka, Bangladesh, 2000. For men with different male partner types, proportions also having sex with women are shown
Source: Bangladesh sentinel surveillance data, author's analysis)

What we do know is that the “bridge” runs in both directions. Some men choose to have sex with men for pleasure, but have sex with women too for reasons of social acceptability. Other men choose to have sex with women, but also have sex with men, often for economic reasons. Among this latter group, male sex workers can actually act as a bridge to carry infection INTO the homosexual community from a heterosexual or drug-driven epidemic.

Evidence of this comes from a study in Cambodia, which tested men anonymously for HIV and asked them about their sexual behaviour. The majority of the men in the study were male sex workers, selling sex to other men to make a living or to supplement other income. Forty percent of them had sex with women as well as with men in the previous month, and a third had bought sex from female sex workers. Unless condoms are used consistently, this is a dangerous thing to do in Cambodia, a country with a concentrated heterosexual epidemic, which rates as the highest in Asia. While prevention campaigns are beginning to show results, HIV prevalence among female sex workers at the time of the study was on the order of 30 percent. Although all the men in the study had sex with other men and only a minority consistently used condoms, it was men who reported sex with female sex workers who had the highest rates of HIV infection. Some 30.4 percent of those who had had unprotected sex with a female sex worker in the past month were infected with HIV, roughly three times the prevalence of those who did not report this behaviour. This was the most significant behavioural risk factor for HIV infection recorded in the study (Girault et al, 2002). In other words, it is likely that a significant proportion of the infected men had contracted HIV during unprotected sex with female sex workers. Their male-male sexual behaviour carried a risk

that they would act as a “bridge”, carrying the virus into the population of men who had sex with men.

The epidemic among men who have sex with men: a summary

We know:

- Male-male sex is the major driving factor in HIV epidemics in many areas in Latin America and contributes significantly to the epidemic in some countries in Asia
- Many of these men are socially marginalised and difficult to reach with interventions
- Men who have sex with men also have sex with women: in some countries a majority of men who have sex with men report bisexual behaviour.
- Prevention successes in some gay communities are being eroded, especially among young people

Heterosexual HIV epidemics

The overwhelming majority of people living with HIV in the world were infected during unprotected sex with someone of the opposite sex. Since unprotected sex between men and women also results in pregnancy, it accounts indirectly for virtually all HIV infections in infants and young children, who acquire infection from their mothers, in the womb, at birth or during breastfeeding.

At the start of most heterosexual epidemics, professional sex workers and the men who pay them have played an important role. Because a large number of men pay a relatively small number of women for sex, these professional women become an efficient nexus of infection. High client turnover means that one infected sex worker can pass infection on to a large number of clients, and they can in turn infect other partners, including other sex workers. Men who have sex with sex workers typically also have sex with other women, including wives and girlfriends. In Indonesia, for example, behavioural surveillance conducted among seafarers and truck drivers in 2000 found that fully 75 percent of men who had bought sex in the last year had also had non-commercial sex with a wife, girlfriend or casual partner (Data provided by the HIV/AIDS Prevention Project, author’s analysis). These patterns of sexual networking provide a conduit for HIV infection into the general population. The ultimate level and shape of a heterosexual epidemic, and the appropriate response to it, depends on two things: the proportion of the male population that has sex with sex workers and the extent to which their non-commercial female partners also have sex with other men. If women who have sex with “high-risk” men are linked into sexual networks with other people who also have unprotected sex with multiple partners, an HIV epidemic will rapidly become self-sustaining in the general population. In other words, HIV would still continue to spread significantly in such an epidemic, even if professional commercial sex were taken out of the equation entirely. This type of epidemic, referred to as a generalised heterosexual epidemic, is found throughout Sub-Saharan Africa, and in parts of the Caribbean basin. The course of generalised heterosexual epidemics, which account for around two thirds of all HIV infections to date, is discussed at greater length below.

Some confusion has been generated by the use of proxy measures of HIV prevalence to distinguish between “generalised” and “concentrated” epidemics. In many documents related to AIDS published by international agencies, epidemics are described as “generalised” once HIV prevalence in pregnant women in cities passes the one percent mark. This numerical proxy was chosen as a rough guide to help countries think about what types of surveillance

systems and interventions are most appropriate to their type of epidemic. But it has come to obscure matters as much as to illuminate them. The crucial point is not the absolute level of HIV infection, but the pattern of its spread. To put it simply, a “concentrated” epidemic is one that could be reversed if effective prevention programmes were universally implemented for certain well-defined “risk groups”³. A “generalised” epidemic is one in which HIV transmission would continue at epidemic levels, even if effective prevention among defined “risk groups” took them out of the equation of HIV transmission. Numerical proxies based on HIV prevalence rates are not sensitive enough properly to distinguish between these two epidemic types.

Concentrated heterosexual epidemics

Concentrated epidemics are usually the norm where most of the women who have sex with “high risk” men do not also have sex with other people. In these cases, men who have become infected with HIV during paid sex typically infect other sex workers, but also their wife or other regular partners. These women may pass the infection on to their babies, but the virus will not spread any further than that. In these epidemics, known as concentrated heterosexual epidemics, the extent of the HIV epidemic is determined largely by the proportion of the male population that has unprotected sex with professional sex workers. Where this proportion is high, rates of infection in the general population can also reach significant levels. In northern Thailand for example, 57 percent of randomly selected military recruits aged 21 reported having bought sex from a sex worker in the last year in 1991, before aggressive HIV prevention campaigns began. HIV prevalence in this cohort was over 11 percent, despite their young age (Nelson et al, 1996). There was little evidence at the time of HIV transmission in this cohort outside of the commercial sex setting. This suggests that if a high enough proportion of men are having unprotected sex with sex workers, HIV prevalence at least among men can rise to rates similar to the worst affected countries in Africa, even where sexual activity among women remains limited.

Clearly, some of these men will pass infection on to non-commercial female partners, including their wives. Indeed HIV infection among pregnant women in Northern Thailand did, at the peak of the epidemic, reach 3.5 percent. This is clearly well above the “threshold” for a generalised epidemic. And yet patterns of sexual networking in Thailand suggested that HIV transmission remained concentrated in commercial sex transactions, and prevention programmes focused on reducing the consumption of commercial sex and on increasing condom use. This strategy was vindicated: recent unprotected sex with sex workers among military recruits dropped from 22 percent to 2 percent between 1991 and 1995, STI rates fell by 62 percent and HIV prevalence nearly halved (Nelson et al, 1996). It is highly unlikely that prevention programmes aiming at the “general population” would have had as dramatic an effect.

Available information suggest that similar patterns of sexual networking exist in many other countries in Asia, including Bangladesh, Cambodia, India, Indonesia and Vietnam. Professional sex workers – that is, women who sell sex as their primary or only income generating activity – typically have a very high client turnover. Behavioural surveillance among sex workers in several Asian cities showed that brothel based sex workers in Bangladesh were averaging around 74 clients a month, while among karaoke-based sex

³ The term “risk group” is controversial, because it is thought to be stigmatising. The phrase is used here as short-hand for definable sub-populations with higher than average rates of HIV infection and risk behaviour. No judgement is intended.

workers in Haiphong, Vietnam, rates were even higher at 88 clients a month. (Pisani and Winnithana, 2001) Similarly high rates have been reported in Cambodia and Mumbai, India (Gorbach 1999, Bhave 1995). These high rates of partner turnover compare with as few as five clients per month in similar studies in Kenya (Egesah 1999). A high proportion of men who have sex with professional sex workers on a regular basis, and many also have sex with wives or regular girlfriends. In a household based survey of men in Cambodia in 2000, some 17 percent of men (including 15 percent of married men) said they had bought sex from a professional in the last year (Sopheab, Heng, 2001), nine percent had girlfriends and 11 percent casual partners. Household data are not available for women, but it appears that women are far less likely to have sex outside marriage. In behavioural surveillance among unmarried, urban factory workers in Cambodia three years earlier, only 5.5 percent reported being sexually active, and just nine percent of all women (including those who were married) reported having a boyfriend (Cambodia, 1998).

In general, then, only a very small proportion of women who are infected with HIV as a consequence of the risky sexual behaviour of their husbands or regular partners are likely to pass the infection on to another partner. That means they are unlikely to continue the chain of HIV transmission. Despite all the dire warnings to the contrary found in advocacy documents, it is virtually impossible for these concentrated epidemics to reach the levels of HIV prevalence seen in Africa, as long as these patterns of sexual behaviour persist. Epidemics of this type can be controlled by cutting the proportion of men regularly buying sex, increasing condom use in commercial sexual encounters, and maintaining the relatively low levels of pre-marital and extramarital sex among men and women in the general population outside of the context of commercial sex.

Sexual behaviour is dynamic

Thailand provides an example where the broad application of the first two interventions have contributed to a dramatic fall in new HIV and STI infections among young men (Nelson et al 1996). The replication of this example – and on a similarly massive scale – in other countries with concentrated heterosexual epidemics will do much to control HIV epidemics of this type. The Thai example, however, comes with a warning: Sexual behaviour can become more risky in one part of the population just as it is becoming safer in another. Recent evidence suggests that while young men are less likely than before to have sex with professional sex workers, they are more likely to have pre-marital sexual relationships with young women who are not sex professionals. This is reflected in a dramatic rise in reported sexual activity among young women: In behavioural surveillance in the northern Thai province of Chiang Rai, 12.5 percent of pregnant women reported sex with a casual partner or boyfriend in 1997, four times the proportion recorded just two years earlier (Kilmarx et al. 2000). Similar changes in sexual behaviour in formerly conservative societies have been recorded elsewhere in Asia.

The sexual behaviour of youth in Japan, for example, also appears to have changed significantly in the last few years. Chlamydia among females and gonorrhoea infections among males are on the rise, and induced abortions among teenage women have nearly doubled in the past five years. These findings suggest increased rates of unprotected sexual intercourse and are supported by results of a nationwide sexual behaviour survey conducted in 1999. Compared with earlier surveys, results from 1999 showed that 18-24 year-olds started having sex younger, had more casual partners and more partners at any one time. All of these changes were most pronounced among young girls, cutting the gap in reported risk behaviour between boys and girls.

In the 1999 survey, over a third of women under 25 reported having sex with five or more men in their lives, far higher than among older women who grew up when the restrictions on premarital sex were far more stringent. In fact, among 18-24 year-olds, there was virtually no difference in multiple partnerships reported by men and women.

A physical symptom of this growth in sexual activity among young people can be seen in Figure 10, which shows the number of induced abortions among Japanese women over the 1990s. The abortion rate has come down overall, but among teenage women it has risen dramatically. Teenagers were half as likely to have an abortion as women of all reproductive ages at the start of the 1990s. By the end of the decade, there was no difference between the two groups.

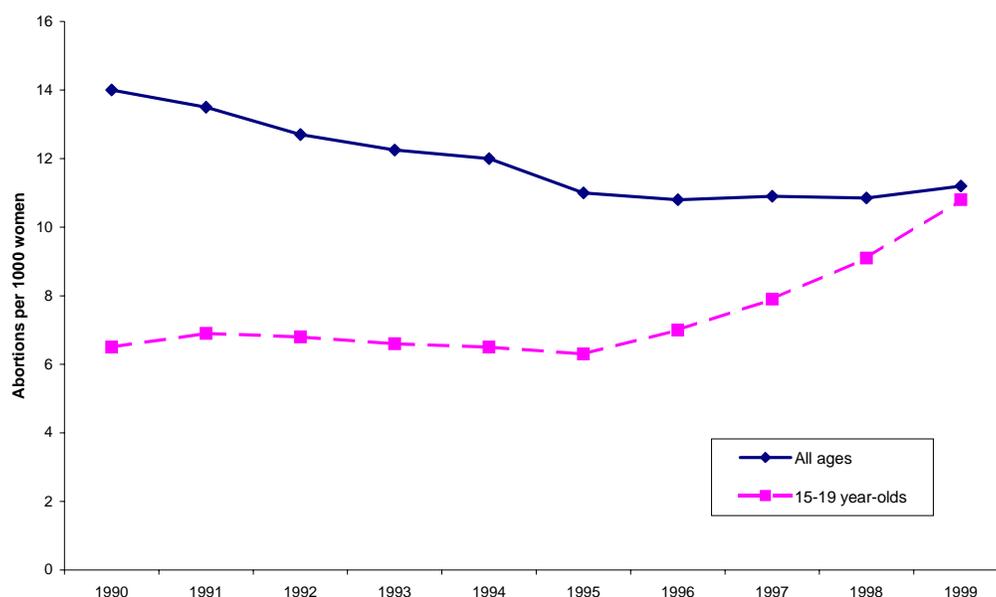


Figure 10: Number of induced abortions per 1,000 women, among women all ages and teenage women, Japan 1990-1999

Source: Kamakura, Mitsushiro, Masahiro Kihara, Ryuichi Komatsu. *The current status, trends, and determinants of the HIV epidemic in Japan. Presentation to a meeting of Monitoring the AIDS Pandemic Group, Melbourne, October 2001.*

Changes such as these should put us on alert. The fact that patterns of sexual behaviour have been relatively safe in many countries in the past does NOT mean they will remain safe forever. As economies and societies change, it may not be possible to maintain traditional patterns of sexual networking – indeed it may not be desirable to, given that many traditional systems allow men to have as many partners as they want while severely restricting sexual activity for “respectable” women. These systems tend to favour the high rates of commercial sex which provide an efficient “core” for the rapid transmission of HIV. Changing sexual norms do, however, present an opportunity. If norms around sexual partnerships are changing, then there is no reason why norms around condom use should not change as well. HIV prevention programmes in these areas should focus their energies on shaping safe behaviours from the outset of people’s sexual lives.

Indeed there is evidence that young people are more willing to adopt safe behaviours than their older peers, as long as they are provided with the opportunity to do so. This applies even to those in very high-risk professions.

Eventually, risk will always translate into HIV infection

In some countries in Latin America, and (to a greater extent) Asia, risk behaviour among defined sub-populations such as sex workers and their clients has been recorded for many years without any significant rise in HIV infection. This has led many countries to believe they were somehow “protected” by their culture or other physiological factors from an HIV epidemic. There are, indeed, some cultural/physiological factors, such as widespread male circumcision, that can slow the onset of an epidemic. Slow, not stop. One by one, the “low HIV” countries of Asia are falling to the virus: China, Indonesia, Nepal and Vietnam are all examples of countries that have recently registered sharp increases in HIV infection in some groups.

Consider

Figure 11, which shows stubbornly low condom use in commercial sex, reported by both sex workers and their clients in Indonesia. For many years, no HIV epidemic surfaced, despite the fact that around nine out of 10 men and women engaging in commercial sex said they did not always use condoms. Until the late 1990s, it appeared that dire predictions of a widespread epidemic would not be fulfilled.

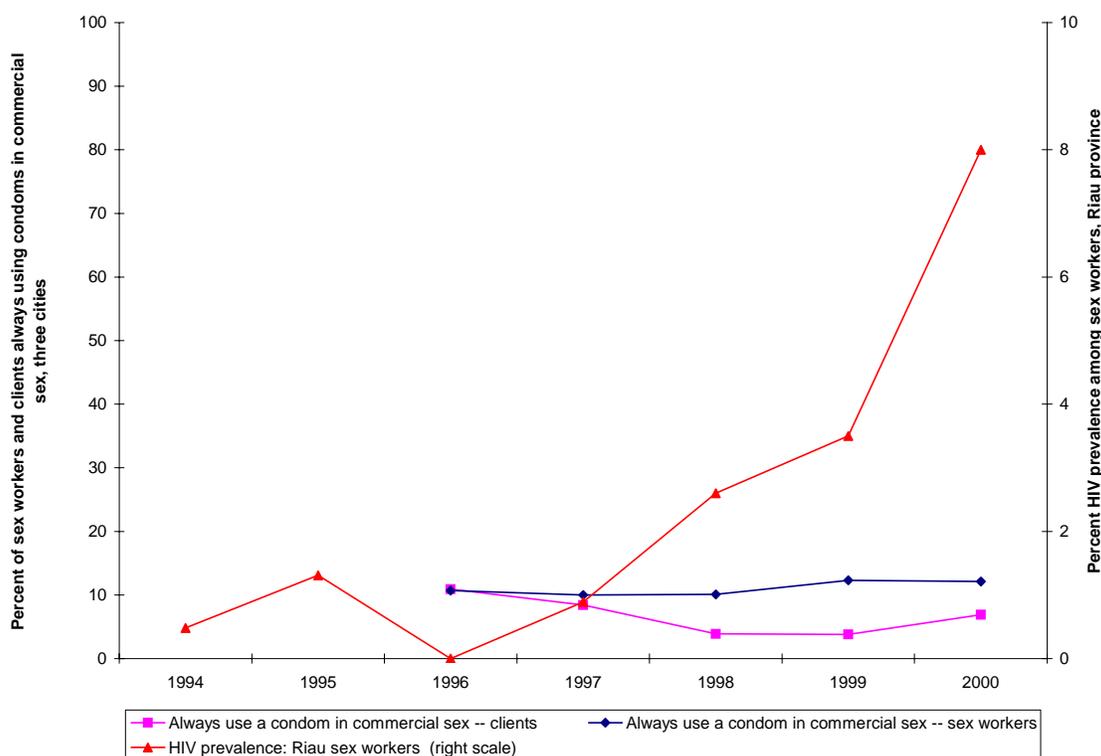


Figure 11: In Indonesia, low condom eventually led to sharp rises in HIV

Source: Indonesian AIDS Control Board

Then, at the end of the 1990s, the picture began to change. Years of risky behaviour in commercial sex in Indonesia have, eventually, led to a “take-off” in HIV prevalence. It turns

out that Indonesia was not protected by its culture, its traditions or its geography: it was only protected by time, and time has now run out. No country can predict exactly when the “tipping point” will be reached. But it seems clear that countries that register high levels of needle sharing among drug users or high levels of unprotected sex within an active sex industry will, sooner or later, become home to a concentrated HIV epidemic.

Concentrated heterosexual epidemics: a summary

We know:

- Where a significant proportion of men buy sex from professional sex workers and condom use is low, a heterosexual epidemic will eventually begin. HIV will initially be concentrated among professional sex workers with high client turnover, and the men that buy sex from them.
- Infection will be passed on to the regular partners of clients of sex workers, with whom condom use is very low. This puts infants at risk, too.
- The virus will not spread widely through the general population as long as rates of premarital and extramarital sex among women in the general population are low.
- Raising condom use in commercial sex can be an effective prevention tool in these settings.

We suspect:

- There may be a shift away from commercial sex for young men and virginity for young women, towards new norms of higher rates of premarital sex

Generalised heterosexual epidemics

Most of the remainder of this paper concentrates on the generalised heterosexual HIV epidemic, which accounts for at least eight out of 10 new infections worldwide. To date, this type of epidemic has been seen only in Sub-Saharan Africa and parts of the Caribbean basin. Unless sexual behaviour becomes radically more risky in other parts of the world, that is likely to remain the case. The generalised heterosexual HIV epidemic is by far the largest of the world’s discrete HIV epidemics. Anyone wishing to have an impact on the AIDS epidemic globally will need to focus attention in this area.

In 12 countries in Sub-Saharan Africa, at least one in 10 adults is estimated to be infected with HIV. Southern Africa is particularly hard hit. In Malawi, Namibia, South Africa and Zambia, over one adult in five is currently living with the virus, while in Botswana, Lesotho, Swaziland and Zimbabwe a third of the adult population or more has contracted the fatal virus. West Africa has historically been less affected than other parts of the region, although some countries are catching up with others on the continent: Burkina Faso, Cameroon, Central African Republic and Côte d’Ivoire are all around or above the 10 percent prevalence mark. HIV prevalence has already peaked in some East African countries, notably Uganda, but others are still on the rise. HIV prevalence in Kenya is estimated to have hit 15 percent at the end of 2001, twice as high as any other country in East Africa. In the generalised heterosexual epidemics of the Caribbean basin Haiti has the highest prevalence, with 6.1 percent of adults currently living with HIV.

These statistics are well known. Less well understood are the dynamics of these very high prevalence epidemics, or their determinants. Studies in Kenya, the Democratic Republic of the Congo, Rwanda, Côte d’Ivoire and elsewhere suggest that the early stages of

generalised heterosexual epidemics were very similar to the beginnings of concentrated heterosexual epidemics (for a review see Hunter, 1993, Schwartländer et al. 1998). A large number of men buying sex from a much smaller number of women, each of whom had many partners, created a pool throughout which HIV spread rapidly. The infected men passed the virus on to their wives and regular partners. Here the epidemic types diverge. Traditions of polygamy, of high fertility, and of fecundity demonstrated by pregnancy early in a relationship have contributed to patterns of sexual behaviour which conspired to spread HIV more widely into the general population (Caldwell, 2000). In more than a decade of research on sexual behaviour, men and women in Africa have consistently reported more pre-marital and extra-marital partners than respondents in other parts of the world, and they report less condom use, too (Caraël, 1995, National Research Council 1996). In other words, African women who are not professional sex workers and who may have been infected by their husbands or regular partners are more likely to pass the virus on to other men than women who do not sell sex in other parts of the world.⁴ These men will in turn put their other female partners at risk, and so the chain of transmission continues.

As HIV prevalence in the general population rises, the dynamics of transmission change. Higher background prevalence means a higher likelihood of encountering an infected partner and becoming infected close to the start of one's sexual activity. Women are biologically more susceptible to HIV infection than men, and the gap widens at younger ages, when less than fully mature genitalia increase the risk of contracting HIV for women but appear to decrease it for men. Data from Kenya, Zambia and South Africa show that in HIV epidemics with very high levels of prevalence, many young women are getting infected virtually as soon as they start having sex. HIV prevalence was an astounding 18 percent among women who said they were virgins a year or less before the study in Zambia, while in Kenya infection rates in these recently sexually active women was 14 percent (Buvé et al. 2001). In South Africa, six percent of sexually active women under 16 years of age, and 21 percent of those aged 16-18 were infected with HIV (Auvert 2001).

It has always been believed that HIV is not, in fact, a very infectious virus. Studies in Western countries looking at rates of transmission between spouses in couples where one person is HIV-infected have estimated that HIV is transmitted in only one out of every 1,000 acts of sex with an infected partner, with the virus passed more easily from men to women than from women to men (Royce et al. 1997). The infection rates observed among young, recently sexually active men and (especially) women in African settings show a very different picture. For reasons that are not well understood but are likely to include co-infections with other viral STIs (see page 31) and sex at ages when vaginal tracts are immature, HIV appears to be transmitted far more easily in East and Southern Africa than in the West.

⁴ A relatively high proportion of women in many African settings report receiving money, goods or services in exchange for sex. Most certainly do not approach the partner turnover common among women who earn their whole livelihood from sex. A number of studies across Kenya, for example, find that even women defined as "sex workers" average just one or two commercial partners per week. Women who supplement their household income by exchanging sex for something they need will have a far lower partner turnover. But even occasional income supplementation can add considerably to the total number of lifetime sexual partners, and therefore the potential for contracting and then transmitting HIV. Because very few of these women would consider themselves to be professional sex workers, interventions aimed at sex workers will do little to protect these women or their partners.

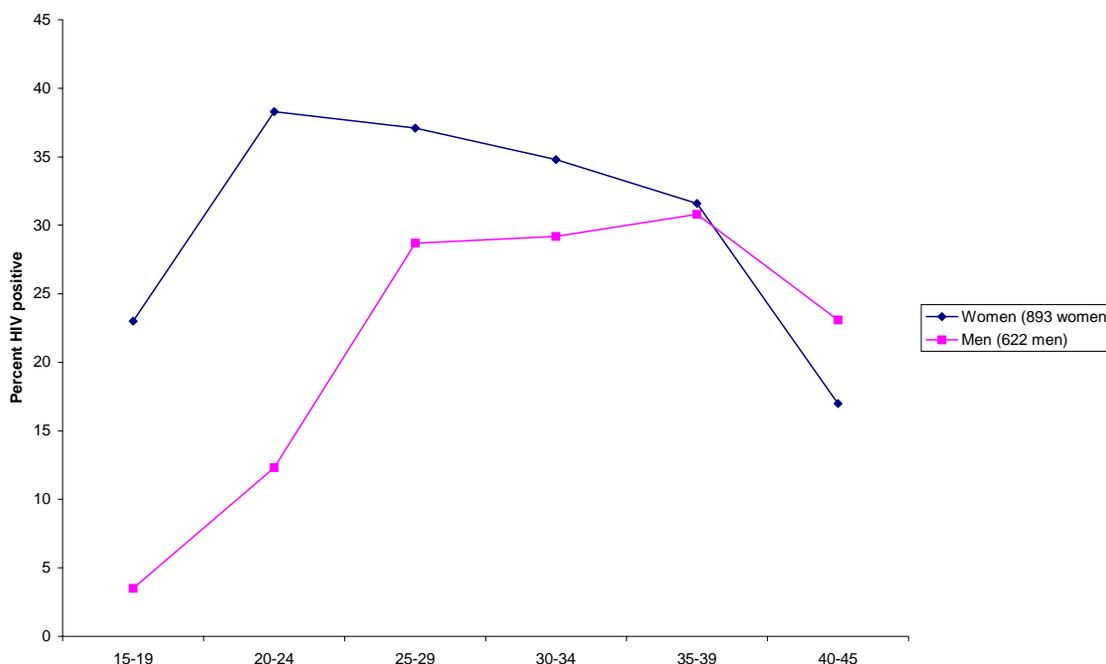


Figure 12: HIV prevalence by age among men and women in a household study, Kisumu, Kenya, 1997

Source: *Buvé et al., 2001*

Consider Figure 12, which shows HIV prevalence recorded in a study of men and women in randomly selected households in the town of Kisumu, in Western Kenya.⁵ Clearly, HIV infection rates are vastly higher in young women than in young men. These data suggest that the majority of these young women have become infected in pre-marital sex with significantly older men. Sexual behaviour data collected from the same individuals show that the young men in the study are indeed having sex, largely with women of their own age or slightly younger. Indeed they report rather more sexual partners than young women do. And yet they do not appear to be infected until far later in their sexual careers. One explanation for this is that while young men may have sex with a variety of partners, they do not necessarily have sex very frequently with any one partner. So even if they have unprotected sex with a young woman who is herself HIV-infected, they may escape contracting the virus. Once they get married and have sex repeatedly with that same woman, however, the chances are that they will eventually become infected with HIV. This explanation seems to be supported by the data from Kisumu and from another wing of this four-city study – Ndola, in Zambia. Young men who were married were far more likely to be HIV-infected than young men who were unmarried, as Figure 13 shows.

⁵ A single data set is presented for the purposes of clarity. However very similar patterns are seen in recent community-based studies in a number of other sites, including sites in South Africa, Tanzania, Zambia and Zimbabwe.

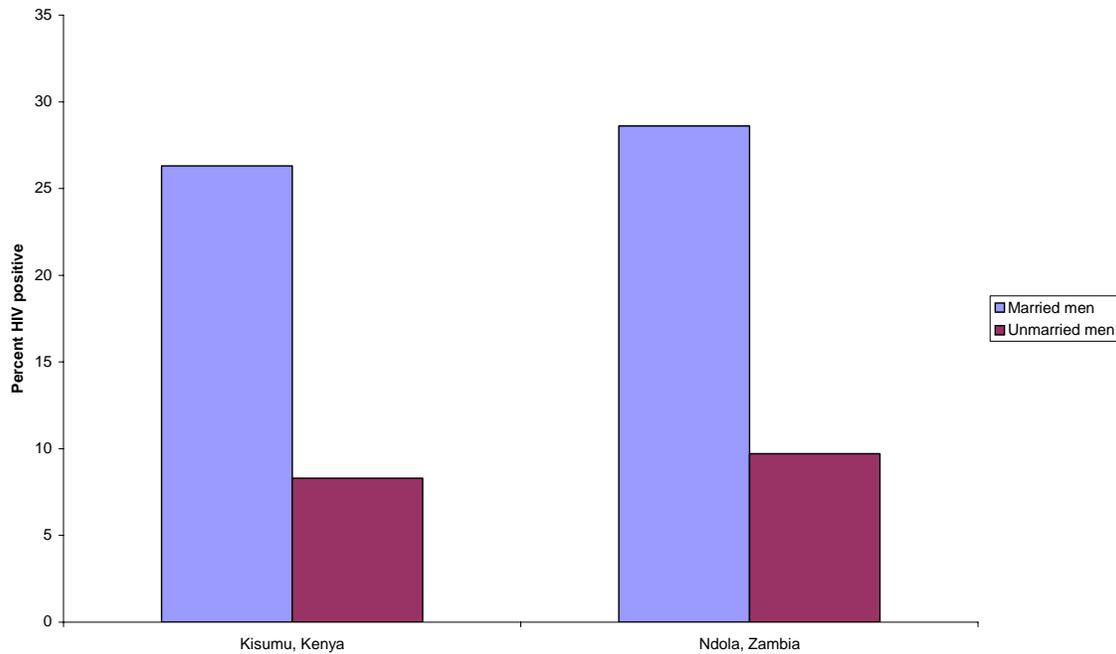


Figure 13: HIV prevalence among men aged 20-24 by marital status, two East African cities

Source: Glynn 2000

Unmarried men were also far less likely to be infected with HIV than unmarried women of the same age. Unmarried teenage women were between five and six times as likely to be infected with HIV as unmarried teenage men, while among 20-24 year-olds, unmarried women were four times as likely to be infected as unmarried men. It is probably worth drawing attention once again to the absolute levels of HIV infection among these randomly selected young women. Over a third of unmarried women in their early 20s were living with HIV in both study sites.

The same pattern is seen in a recent population-based study of men and women aged 14-24 in South Africa, except that their HIV prevalence levels were even higher. Forty four percent of married men in the sample were HIV-infected, compared with ten percent of unmarried men.

So the pattern of HIV infection seems to have taken a new turn in high-level generalised HIV epidemics. It appears that young women frequently become infected with HIV during premarital sex with older men. These young women often go on to infect the men whom they marry or with whom they establish stable sexual partnerships. Data collected from women aged 15-24 in rural Zimbabwe found that most sexually active women reported that their most recent sex partner was between five and 10 years older than themselves. Among 15-19 year-olds, HIV prevalence rose in clear relation to the age of their most recent partner. HIV prevalence among teenage girls whose last partner was less than five years older than themselves was in the region of 16 percent. Among girls with partners 10 or more years older, prevalence was twice as high (Gregson 2000).

While marriage to women infected during premarital sex is a growing risk factor for young men in generalised epidemics, marriage can also be very dangerous for young women. But

only, it seems, if the husband is much older. Figure 14 shows HIV prevalence among married teenage women in western Kenya, according to the age of their husband.

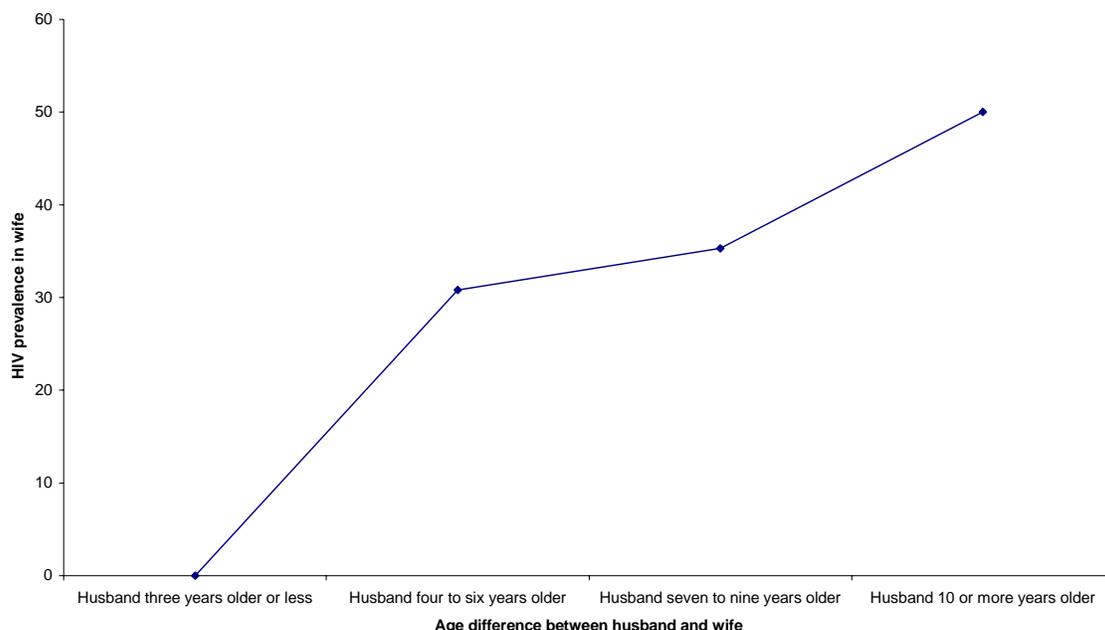


Figure 14: HIV prevalence among married women under 20, according to age difference between husband and wife. Kisumu, Kenya, 1997

Source: Glynn 2000

No woman who was married to a man three years or less older than herself was infected with HIV, compared with fully half of those who had husbands 10 years or more older than themselves. It is apparent that age mixing between young women and old men, whether inside marriage or outside it, is one of the major engines driving the spread of HIV in high prevalence, generalised epidemics. Issues to consider in designing effective interventions for these epidemics include whether and how to change norms of sex between older men and younger women, how better to promote condom use in all non-reproductive relationships, and whether to promote premarital HIV testing where large numbers of unmarried women are likely to test positive. Sexual behaviour among young people will be considered further later in this document.

Other epidemiological considerations in generalised epidemics

Sexually transmitted infections

It is well-established that co-infection with other sexually transmitted infections (STIs), especially with those that cause ulceration in the genital area, can increase the likelihood that HIV will be passed from an infected to an uninfected partner during unprotected sex (Plummer et al. 1991, Laga et al., 1991, Hayes et al 1995, Ghys et al. 1997). There is, however, not quite so much consensus around what to do about it. A study in a relatively low HIV prevalence area of Tanzania suggested that the effective syndromic management of STIs could contribute to a cut of as much as 40 percent in new HIV infections (Grosskurt et al, 1995). A Ugandan study that mass-treated the population of a higher HIV-prevalence region for STIs whether or not they reported any symptoms recorded no effect on HIV

transmission (Wawer et al. 1999). The differences between the studies have been much discussed. Incurable viral STIs are higher in the Ugandan than in the Tanzanian settings, the legacy of past high-risk behaviour. But risk behaviour in Uganda appears to have fallen considerably in recent years, resulting in lower rates of curable STIs. These persist at higher rates in Tanzania, which has recorded less behaviour change. Programmes that effectively managed these curable infections are likely to have had a more substantial impact on HIV transmission in a setting where there were fewer incurable infections; in other words it is probable that the different histories of risk and infection with curable and incurable STIs in Uganda and Tanzania explain the differences in the study results.

In particular, the viral STI known as HSV-2 (herpes simplex virus type 2) seems to be playing a key role. HSV-2 causes genital ulcers, and since it is incurable, these ulcers reappear periodically throughout a person's life. It is hard to track the history of HSV-2 with any certainty since it is only recently that affordable and reliable tests for the virus have become available. Recent studies in several East and Southern African countries suggest that HSV-2 has overtaken chancroid and other infections as the leading cause of genital ulcers (Chen et al. 2000, Obasi et al. 1999, Morse et al 1997). A study in Zimbabwe suggests that HSV-2 and HIV combine in a vicious circle, with each increasing the risk of contracting and passing on the other (McFarland et al 1999). These findings have been confirmed by a recent study in Tanzania, in which HSV-2 positive men were six times more likely to contract HIV as those who were not already infected with HIV. The effect was weaker in women, but the study still concluded that a fifth of HIV infection in women this population and three quarters of HIV infection in men could be eliminated if HSV-2 were wiped out (del Mar Pujades Rodriguez, 2002). Certainly, levels of HSV-2 infection are already very high in many countries with high prevalence HIV epidemics. By their mid-20s, for example, 79 percent of women and 38 percent of men in one Kenyan study tested positive for HSV-2 (Kenya NASCOP 1999). Researchers analysing data from a study designed to investigate whether differences in sexual behaviour could explain differences in HIV prevalence in African populations concluded to their surprise that variation in HIV prevalence rates had more to do with background prevalence of HSV-2 than it did with differences in sexual behaviour (Weiss et al., 2001) Among a cohort of Zimbabwean factory workers, 40 percent of men had antibodies to HSV-2 (McFarland et al 1999). In Tanzania, 22 percent of men and 44 percent of women were found to be infected with the virus in one region (Hayes et al. 1998). In a population-based study of men and women aged 14-24 in South Africa, two thirds of HIV-infected men and 92.2 percent of HIV-infected women were also infected with HSV-2 (Auvert et al. 2001)

These high levels of an incurable viral STI that is a common cause of genital ulcers should lead researchers to rethink intervention priorities. Improving STI management is an important health goal in its own right, but where HSV-2 is common, programme planners should lower their expectations about the contribution that STI management will make to control the spread of HIV.

Other co-infections

It has been suggested that other infections, particularly helminthic infections (caused by various parasitic worms) and protozoal infections (including malaria, Chaga's disease and leishmaniasis), may both increase susceptibility to HIV infection and speed up progression of the disease in co-infected people (for a full review see Bentwich et al., 2000). If this is the case, then stepping up prevention and control efforts for these other threats to public health may have the secondary effect of reducing HIV transmission and delaying its impact.

However few studies have looked systematically at these potential effects, and it is not possible to draw clear conclusions yet.

Male circumcision

After many years of debate, a consensus is finally emerging around the protective effects of male circumcision. Recently published data from an ongoing cohort study as well as a carefully controlled meta-analysis of 27 past studies confirm that the removal of the foreskin before puberty is protective against HIV-infection. Cross-sectional studies that controlled for confounding factors found that uncircumcised men were more than twice as likely to be HIV infected as circumcised men (Weiss et al., 2000). These findings were confirmed in a longitudinal study of discordant couples in Uganda. Among uncircumcised men with HIV positive partners, HIV incidence was 16.7 percent. Not a single circumcised man with an HIV-infected partner became HIV-infected during the course of the study (Gray et al, 2000). The association between circumcision status and risk of HIV infection persists even among men of the same ethnic group and religious conviction, with similar sexual behaviour (Kahindo et al, 1998). It appears to be linked at least in part to the high concentration in the foreskin of Langerhans cells, which act as efficient conduits for HIV into the body.

Before rushing to promote universal circumcision as preventative intervention, it is important to note several factors. Firstly, circumcision only appears to be protective when it is performed before puberty and the onset of sexual activity (Gray et al. 2000, Kelly et al. 1999). Secondly, there are dangers associated with circumcision as an isolated intervention, in particular the danger that circumcised men will believe themselves to be protected from HIV infection and will therefore be less likely to adopt safe sexual behaviours.

Although pre-pubertal circumcision does not by any means eliminate the risk of HIV infection, it does substantially reduce it at a population level. Organisations with access to infants and young children may consider using that access to promote the safe, clinical circumcision of young boys as a contribution to rolling back the HIV epidemic in the long term.

Generalised heterosexual epidemics: a summary

We know:

- This epidemic type predominates in Sub-Saharan Africa and parts of the Caribbean basin
- HIV in generalised epidemics is spread through unprotected sex between men and women, and would continue even in the absence of identified “high risk” groups
- Many older adult populations are already “saturated” with HIV. Older men are passing HIV infection on to the next generation though sex with younger women.
- Young women get infected with HIV much more rapidly than young men once they start having sex, so young women are a major source of infection for young men.
- Other factors besides sexual behaviour (such as prevalence of circumcision and viral STIs) contribute to the more rapid spread of HIV in some areas, but if young people were not having unprotected sex, these other factors would be of no consequence.

HIV AND YOUNG PEOPLE

It is no news to anyone that adolescence is a time of exploration and discovery. Experimentation with drugs is common among young people, and sexual identities and behaviours shaped in this period often persist throughout life. For example a recent analysis of household surveys of sexual behaviour in three African and one Asian site shows a remarkable congruence between sexual risk behaviour over a lifetime. Men who started having sex before they were 15 were up to nine times as likely to have an extramarital partner later in life than men who were virgins until they were at least 20. And the more premarital partners a man had had, the more likely he was to have extramarital sex later in life (White et al, 2000).

Many organisations, including national AIDS programmes, recognise in principle that safe behaviour among young people is key to successful HIV prevention. However the principle has not always been translated into practice, often because of social or political hypocrisy. While sex is a part of life for the majority of young people in countries with generalised heterosexual HIV epidemics, it is a reality that many parents, religious leaders and politicians would rather deny. Because helping young people to make safe choices is politically unpalatable, even international organisations and NGOs often shy away from providing the necessary services for fear of damaging their relationships with government. Instead of entering into controversy by ensuring that every teenager in need has easy access to clean needles or condoms, many organisations choose to focus on less fractious areas such as promoting “awareness”.

Indeed promoting awareness of AIDS among young people has been one of the most common responses of programmes claiming to focus on prevention in this age group. The logic is that if young people know that unprotected sex might endanger their lives, they will be less likely to have sex, or will be more likely to use condoms. AIDS prevention efforts among young people commonly promote abstinence or monogamy, and some encourage condom use. Abstinence can be practiced with no further support. Mutual monogamy is only protective if the HIV status of both partners is known, implying the need for easy access for young people to HIV counseling and testing services. Condom use is possible where condoms are made easily available to all young women and men who might want to use them. That means ensuring that condoms are completely affordable, and are available in locations and at times when young people have sex.

The following sections of this report examining the extent to which young people in countries with substantial AIDS epidemics are aware of the risk of HIV, are abstaining from sex or having sex only with one partner, or are using condoms. The focus is largely on Sub-Saharan Africa, because it is in this region that unprotected sex with a partner who does not belong to a defined “risk group” carries the highest risk of HIV infection.

How much do young people know about HIV and risky sex?

There is no doubt that there have been substantial increases in knowledge of AIDS, how it is spread and how it can be avoided. This is especially true in badly affected countries, where any young person having unprotected sex is in imminent danger of HIV infection. Over nine teenagers in 10 have heard about AIDS in most countries in Sub-Saharan Africa for which

data are available. However, when it comes to whether or not these young people have sufficient knowledge to protect themselves from infection (they can both correctly identify ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission or prevention), the picture becomes less encouraging, as Figure 15 shows.

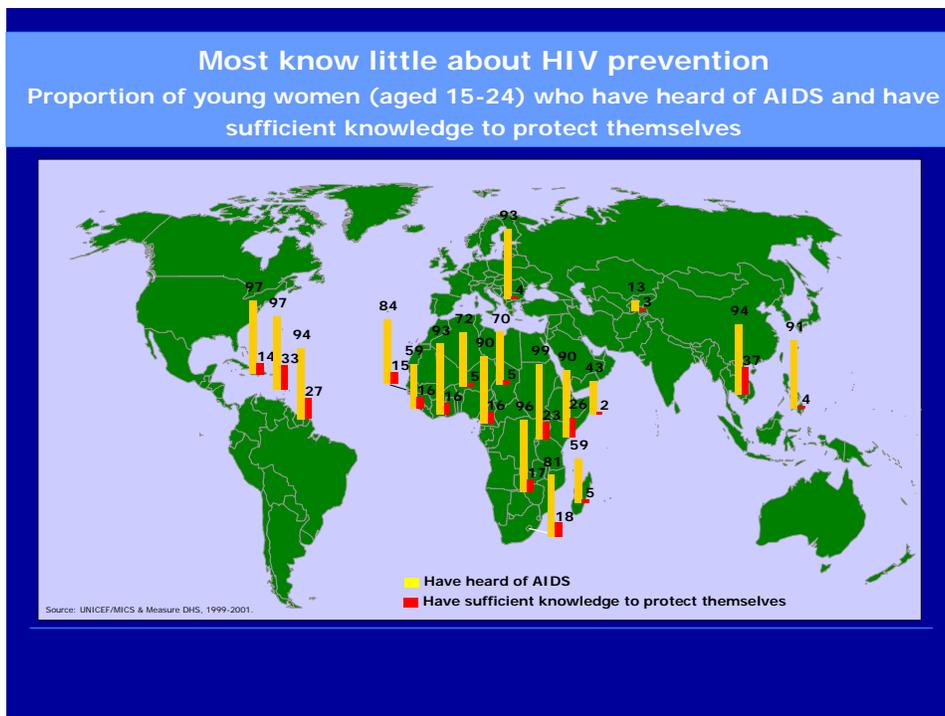


Figure 15: Percent of 15-19 year-olds who do not have sufficient knowledge to protect themselves against AIDS
 Source: DHS data

While everyone has a need and a right to know about threats to their health, only one adult in 5,000 is estimated to be infected with the virus in Bangladesh, and a large proportion of them are in defined risk groups such as drug injectors. What's more, extramarital sex at young ages is reported to be rare. The likelihood of a young person having unprotected sex with an infected partner is, therefore, comparatively slim; ignorance is unlikely to be life-threatening for the majority of teenagers in Bangladesh. The same cannot, however, be said for a country like Mozambique, where three quarters of women and over six in 10 young men could not name a single way of protecting themselves against HIV in a 1997 survey. At that time, one adult in 7 in Mozambique was estimated to be infected with HIV. That means that a young sexually active person in Mozambique would be over 700 times more likely to encounter an HIV-infected partner as a young sexually active person in Bangladesh, even if the pattern of sexual behaviour in the two countries was the same. And needless to say, it is not the same. In Mozambique 65 percent of young men and 70 percent of young women were sexually active, even though virtually none of the men and fewer than half the women were married. In Bangladesh, extra-marital sex among young people was considered so rare that unmarried people were not even interviewed about their sexual behaviour.

Every effort should be made to eliminate ignorance about HIV, how it is transmitted and how it can be prevented, wherever that ignorance exists. There is no room for complacency even where knowledge has reached relatively high levels. It is worth bearing in mind that for the 17

percent of teenage women in Zimbabwe who cannot name a way to protect themselves against HIV, ignorance amounts to a real threat of premature death. It is worth noting, too, that even relatively low levels of ignorance recorded in the population as a whole can mask significant gaps in knowledge. Women are consistently less well informed than men, and people living in rural areas are less likely to have absorbed potentially life-saving information than people in towns.

Misconceptions persist alongside correct knowledge, potentially undermining the protective value of that knowledge even where it does exist. A young person may, for example, be aware that a fatal sexually transmitted virus that causes AIDS can be avoided by using condoms during sex. But if they are unaware that a healthy-looking person can be infected with the virus, they are unlikely to feel the need to use condoms as long as their sex partners look “normal”. In a recent survey of school children in Botswana, a steep rise in understanding of HIV with increasing level of schooling did not wipe out this important misunderstanding. Around two thirds of boys and girls in their last year of primary school thought you could tell someone was HIV positive just by looking at them. By the time they were in senior secondary school, around a fifth of pupils still believed that they could effectively screen out risky partners on looks alone (Botswana, 2000). In a country where one in three of their potential sex partners is infected with HIV, the dangers of such a misconception are obvious.

The same study spotlighted another interesting issue relating to knowledge. The percent of students believing that condoms were an effective way of preventing AIDS actually fell with more years of schooling. Needless to say, this fall took place against a steep increase in sexual activity. And it seemed to run counter to information actually imparted. Over half of the youngest students said that they had never been taught about protected sex, while all of the senior secondary students reported having covered the topic in class. This begs the question: is people’s behaviour conditioned by their knowledge, or is what they report as their “knowledge” rather conditioned by their behaviour?

Does knowledge translate into behaviour?

Clearly, there is still a long way to go before all young people have enough information in order to protect themselves fully against HIV. But what indications are there that those who do have the knowledge are acting on it to avoid HIV infection? The analysis of available data are not yet complete, but the indications are that young people do not adequately translate the abstract knowledge they may have about HIV into safe behaviour in their own lives. In Zambia, for example, where 21.5 percent of the population is infected with HIV, six out of 10 teenaged men who are already sexually active say they do not feel that they are at any risk of HIV. A third of unmarried men who were sexually active (and fully half of sexually active teenage men) said they had never used a condom, while HIV prevalence among the teenage women who are their likely partners ranges between eight and 23 percent in various Zambian studies. It seems, then, that there is every likelihood that these young men are seriously underestimating their risk for HIV infection.

In Kenya, where 15 percent of the population is infected with HIV, among 15-19 year-old boys who volunteered that abstinence was protective against AIDS, some 40 percent were sexually active. Over a third of those who said sticking to one partner could prevent AIDS had had sex with two or more women in the previous year. And fully 57 percent of sexually active teenage men who said condoms were protective had themselves had unprotected sex

in the previous year (DHS 1998, author’s analysis)⁶. Only a tiny fraction of teenage boys volunteered all three ways of preventing AIDS, but those that did were no more likely to have safe behaviour than those that did not.

Teenage women were far less likely than their male counterparts to say that condoms protected against AIDS: just a third volunteered this information compared to over half of all young men. Women who did give this answer were no more likely than men to act on their knowledge: 56 percent of the single, sexually active 15-19 year old girls who said that condoms were protective said they had had recent unprotected sex.

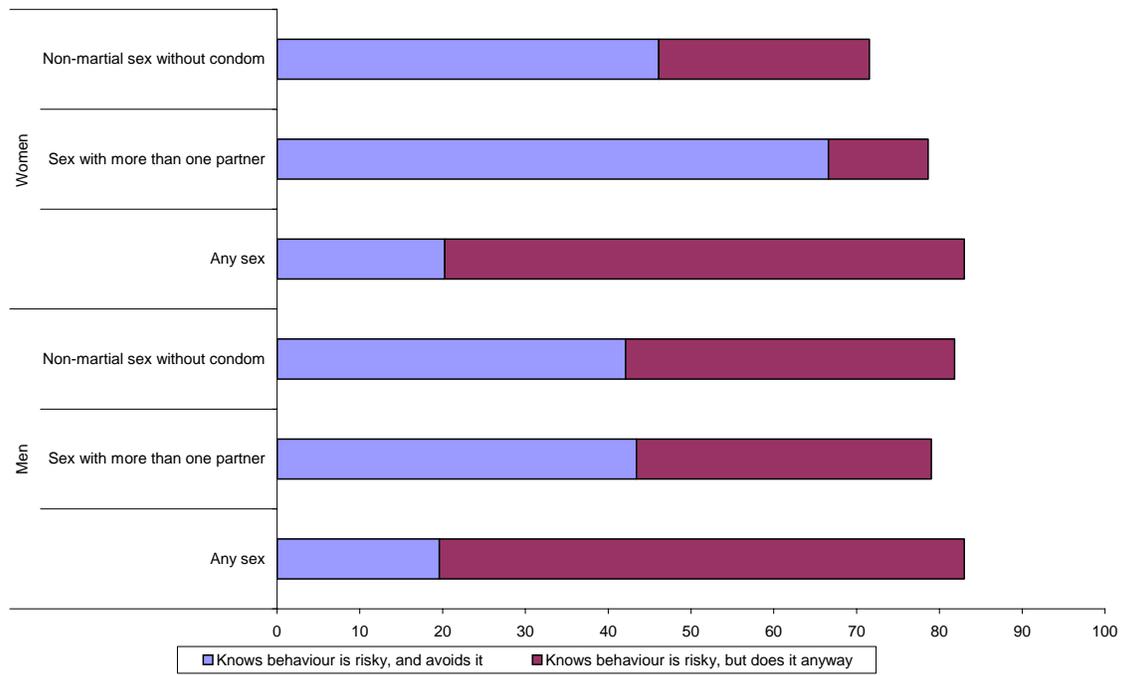


Figure 16: Knowledge and behaviour: a disconnect among young people, Tanzania, 1999

Source: DHS data, author’s analysis

Figure 16 shows the percentage of male and female respondents aged 15-24 in a national survey in Tanzania who know various prevention methods. Knowledge about most of the three major prevention methods promoted by HIV prevention programmes among young people (abstinence, monogamy and condom use) is high. And yet as the dark part of the bars show, a very high proportion of those who know that a behaviour is risky go ahead and engage in it anyway.

The difference between abstract knowledge and the deeply held beliefs that drive our behaviour is little understood, but it clearly contributes to perpetuating risky behaviour. A recently documented example from a survey of 368 sex workers in Western Kenya, while it

⁶ In this DHS survey, respondents were not prompted for correct answers, merely asked to volunteer ways of protecting against AIDS. It is to be expected that people are more likely to volunteer the prevention methods they actually use themselves. In surveys with prompted answers, the mismatch between “knowledge” and behaviour is likely to be still greater.

does not relate directly to young people, serves to illustrate the difference between the conventional “knowledge” most commonly measured in surveys, and the actual beliefs which drive behaviour. Some 89 percent of the sex workers questioned knew that the majority of the people living with the virus looked healthy. But when these same women were asked about the men they sold sex to, nearly two thirds said that there was no chance that any of their own clients were infected. In other words, while they could spit out correct “knowledge” in answer to survey questions, they did not actually translate that knowledge into something that was relevant to their own situations (Kimani and Costigan, 2000).

This is true, too, of risk assessment. Young people who have all the correct knowledge appear not to apply that knowledge to themselves when they are weighing the risks of what they have done in the past. This can again be seen in data from Kenya, where in 1998, 18.7 percent of all women aged 15-24 and 31.7 percent of men the same age reported at least some recent unprotected sex with a person they were not married to. Of those who reported clearly risky behaviour, only a third said they felt at any significant risk for HIV infection. If young people are so little able to assess the risk associated with their behaviour in retrospect, it is doubtful whether their decision-making skills will be any better in a situation where they are aroused and the prospect of sex is imminent.

Clearly there is a disconnect between “knowledge”, risk perception and behaviour. Young people’s behaviour is shaped by all manner of forces, and there is no reason to expect that information imparted by HIV prevention campaigns should dominate over other forces in the absence of other skills or services. A young person’s sense of social “belonging”, their relationships with adults in their family, at school and elsewhere, and their networks of friends and peers can all act as powerful influences shaping their behaviour. These influences are just beginning to be investigated in developing countries, and no firm conclusions can be drawn about their relative importance, let alone how they can practically be harnessed to promote safe behaviour. More information about the social context in which young people make decisions is desperately needed.

Sexual norms among young people: an unhealthy reality

It is safe to say, then, that we really don’t have the full picture about what drives sexual behaviour among young people. Hormones obviously play a significant (but often ignored) role. Young people are discovering their bodies, forming relationships, realising their independence: all of these factors will contribute to sexual decision-making. Power relations play a part too, and this works in both directions. Some young people experience sexual violence or coercion: in other words they are the victims of people more powerful than themselves. But many more have sex out of curiosity and for fun. Of nearly 1,000 students questioned in a study in Zambia, for example, one in five said they had been propositioned before the age of 14. Most of those who described the circumstances of this very early sexual behaviour said it was voluntary, and while sexual experimentation between children of similar ages was common, the majority of those having sex around puberty had consensual sex with adults. Just eight percent said early age sex was forced (Haworth et al., 1996)⁷. In fact, many young people discover that their sexuality is a source of power. It gives them leverage in relationships and can be a path to anything from affection or a desirable lifestyle to money or good marks in school. Liaisons of this sort may play an important part in young people’s lives, and are not always negative, especially from the young person’s point of view. A study among young people in poor urban areas in Zambia, for example, found that thieves

⁷ 28 percent of respondents who had sex before 14 did not describe the circumstances of that sex.

were the most sought-after sex partners among young women because “they have a lot of money”. In fact, young women rated them as nearly 10 times as desirable as sex partners compared with their own classmates. Truck, minibus and taxi drivers were the next most desirable partners, because “they have a lot of money, and give free rides” (Fetters 1998).

Very little research in countries badly affected by HIV has focused on why young people engage in risky sexual behaviour even when they know that their behaviour might lead to an early and unpleasant death. Even less is known about the perhaps more important area of *safe* behaviour. After all, not all young people have unprotected sex with multiple partners. Some work is now being initiated to explore the determinants of safe behaviour. Work in industrialised countries suggests that feeling connected to family and society and optimistic about the future may be critical to the choices a young person makes about their sexual behaviour. If this is the case it does not augur well for the African countries worst affected by HIV. Political instability, conflict, economic mismanagement and AIDS itself are among the factors contributing to the disintegration of family ties and falling standards of living in several African countries. Indeed for several Sub-Saharan Africa countries, GDP per capita was lower at the end of the 1990s than it had been in the mid-1970s (UNDP 2000). Life expectancy and schooling have also been falling in recent years in several countries. Many young people –especially those who have themselves been affected by crumbling social and economic infrastructure – have difficulty envisioning a prosperous and fulfilling future. And yet HIV prevention programmes continue to ask young people to give up the pleasure of sex today in exchange for a longer life, an uncertain benefit that will in any case not be delivered for many years to come. It cannot be surprising that many young people at the height of their sexual curiosity or attraction will choose the immediate gratification of sexual relations.

This begs a question about the time-frame for cost-benefit analysis in young people’s minds – a question that has not been adequately explored in relation to sex. HIV-related sickness and death come only a very long time after the risk behaviour that caused them. Young people’s time horizons may not stretch that far. It is possible that a renewed focus on the short term consequences of unprotected sex – STIs, pregnancy and school dropout etc. – would prove better deterrents to risk behaviour than a focus on HIV alone. More information is needed to determine whether this is true.

More effective HIV prevention programmes will depend on a better understanding of why some young people choose not to have risky sex despite peer pressure, social and cultural norms, and the benefits associated with sexual partnerships. Certainly current approaches to HIV prevention – which centre on information and exhortation to abstain, stick to one partner, or use condoms – are inadequate. Regardless what is driving their behaviour, the data below show very clearly that young people in countries badly affected by AIDS are having sex before marriage, that they are not always monogamous, and that they do not use nearly enough condoms to stay safe.

Young people just say no – to abstinence

By far the most effective way to avoid any sexually transmitted disease is not to have sex at all. But having sex is something that we are hormonally as well as socially programmed to do. On top of that it is often a pleasure, and one for which no particular infrastructure, training, equipment or (generally) wealth are required. Small wonder, then, that exhortations to abstain from sex are not always successful. The extent of their failure is shown in Figure

17 and Figure 18.⁸ In most countries with generalised heterosexual epidemics for which comparable data are available, over two thirds of young people have sex while still in their teens, and substantial proportion of them have given up abstaining from sex by the time they turn 15.

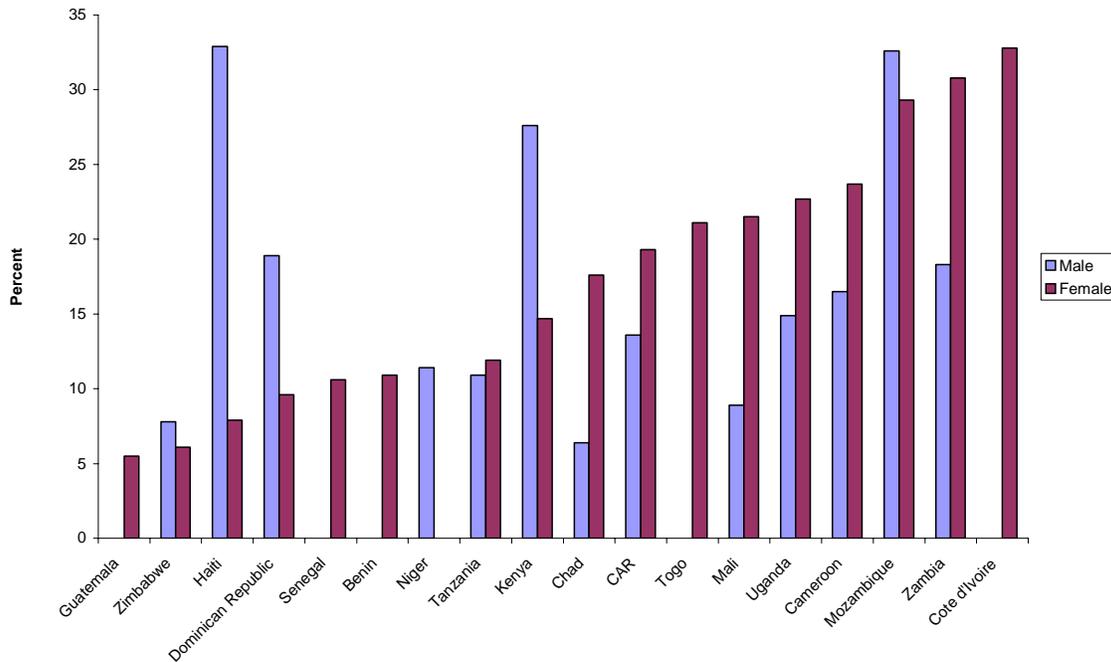


Figure 17: Percent of 15-19 year-olds who lost their virginity before they were 15, various countries

Source: DHS

In some countries, particularly those in West Africa, much of the very early sexual activity for women shown in Figure 17 and Figure 18 will take place within marriage. This is a public health problem in its own right, and should be of concern to those aiming to protect the welfare of young women. Early marital sex carries the threat of HIV infection in areas where HIV prevalence is high, since older polygamous men often acquire very young women as wives when they are themselves already infected with HIV. But, as discussed on page 26, extramarital sex carries an even higher risk for young women (and for the young men they eventually marry) in high prevalence epidemics. And as Figure 19 shows, there is often a yawning gap between sexual activity and marriage.

⁸ Ongoing work by the MEASURE Evaluation project, which examines changes in reporting of early sex by the same age cohort over time, suggest that respondents in large household surveys such as DHS tend to underreport early sexual activity. In some countries, such as Zimbabwe, the under-reporting can reach substantial levels. On the other hand it should be noted that many studies which report very early average ages at first sex do not use life-table analysis. In other words, they report the average age at first sex only for those who have already had sex. Where a significant proportion of the age group is still virgin, this will bias estimates of average age at first sex downwards, often very substantially. No such studies are reported here.

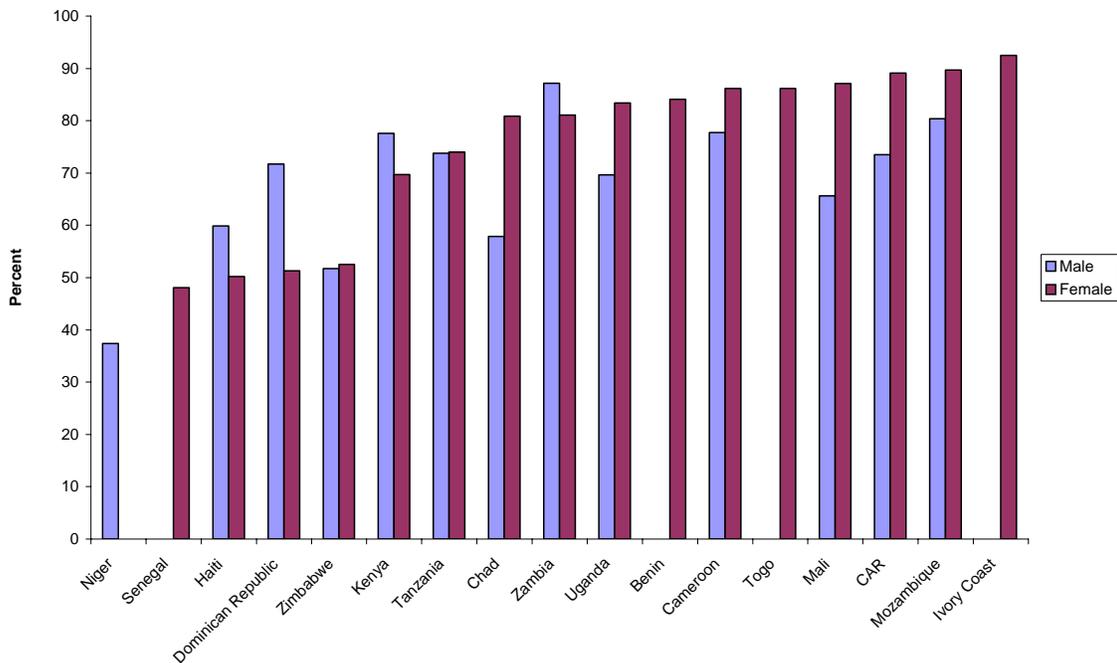


Figure 18: Percent of 19 year-olds who are no longer virgin, various countries
 Source: DHS

There is limited evidence that young people are delaying first sex in some countries where the effects of HIV are becoming visible, and for the most part it is men rather than girls who are staying virgins longer. Some evidence for a rise in median age at first sex among women comes from cross-sectional surveys in urban Uganda (Asiimwe-Okiror et al, 1997). Longitudinal surveys in rural areas fail to confirm this. They find no difference in age at first sex among young women between 1993 and 1997, with a median age at first sex of 16.7 throughout. Men, on the other hand, did appear to be waiting longer before embarking on their sexual lives. The median age at first sex among young men rose from 17.5 to 18.2 over the course of the study. (Kamali et al. 2000). In Zambia, too, young men appeared to be reducing exposure to sex more than young women. The proportion of unmarried men who said in national surveys that they had abstained from sex for at least the last year rose from just over a third in 1996 to a little over half in 1998. (Bloom et al. 1999) Among women, no changes were recorded.

The USAID-funded MEASURE Evaluation project is currently undertaking a systematic study of trends in age at first sex in a number of African countries for which time series data are available. Preliminary analyses suggest that Uganda and Ghana are the only countries in Africa to measure a real rise in the age at first sex, and this rise is, in the case of Uganda, not as great as the urban surveys mentioned above would suggest (Zaba et al. 2002). Ugandan women started off with the lowest age at first sex recorded in these multi-country studies. The median age at first sex calculated using life-table analysis shifted upwards by fourteen months nationwide in the decade plus between 1989 and 2000, and some of this gap was closed after controlling for differences in age, education and residence. Ghana recorded a similar rise, from a higher base level. But most countries recorded no real change over time

in the late 1980s and 1990s. Evidence to date suggest that for now the “no sex until marriage” message is not selling well.

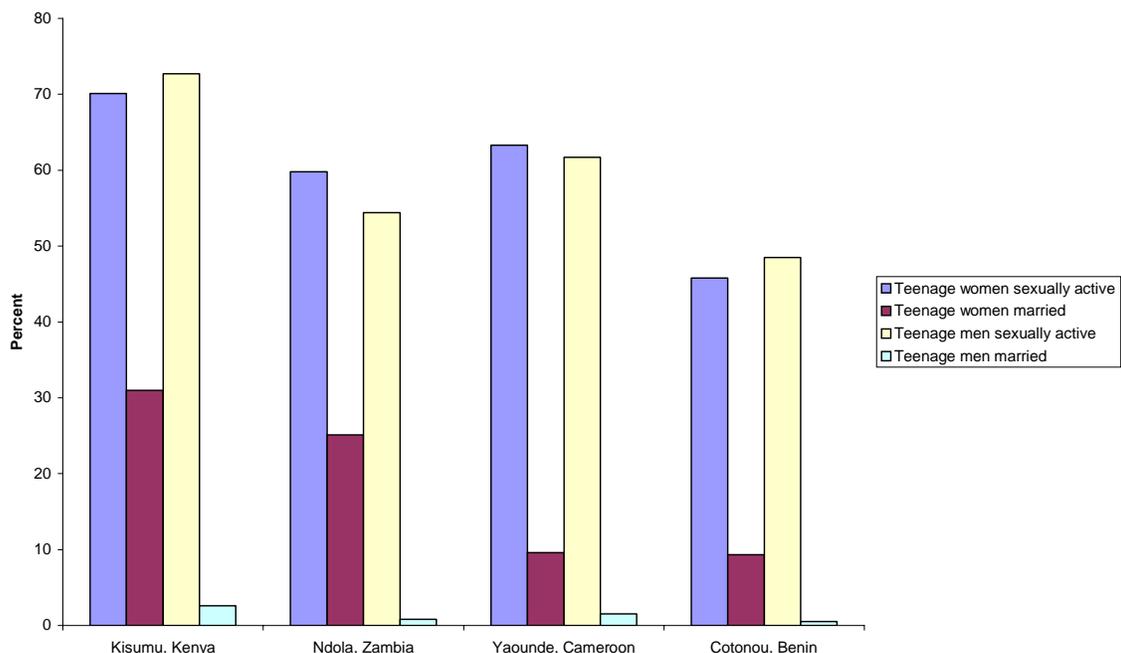


Figure 19: Sex within and outside marriage. Teenagers in four African cities.

Source: Buvé et al., 2001

Sticking to one partner, or one at a time?

Young people who do not abstain from sex are told to stick to one partner. The proportion of young people who have sex with only one partner (to whom they are married or who they eventually go on to marry) is difficult to assess with any accuracy. This is partly because most surveys of sexual behaviour concentrate on sexual partnerships in the last year. It appears from qualitative work that many young people interpret “sticking to one partner” as “sticking to one partner at a time”. Unless partner turnover is very rapid, serial monogamy will not be fully reflected in cross-sectional surveys. But even working with the data we have, it is clear that quite high proportions of young people have had sex with more than one person. In South Africa and urban Zambia, between a quarter and half of sexually active young people surveyed said they had sex with two or more people in the last three months or less. (Social Research Africa, 2000, Fetters et al, 1998). Young men typically report more multiple partnerships than young women. In a national survey in Kenya, for example, over half of sexually active 15-19 year-old men reported sex with more than one partner in the last year, compared with just 13 percent of women the same age. However because young women may have sex more frequently with each of their partners, they may be at greater risk of infection by an HIV-infected partner than young men with a higher partner turnover, even after physiological differences are taken into account. And of course, if young women are having sex with older men, who are themselves more likely to be infected with HIV than men the woman’s own age, this will again raise the likelihood that they will become infected. As HIV prevalence rises, so does the likelihood that ANY sexual partner will be infected. In very high-prevalence epidemics reduction in partner numbers therefore becomes a less

effective protection against HIV infection. But even in these epidemics, young people are more likely to be infected with HIV the more partners they have. Figure 20 shows significantly higher HIV prevalence in young women with more sexual partners in a household based study in western Kenya. As expected, multiple partnerships do not seem to increase the risk of HIV infection among young men in nearly the same way.

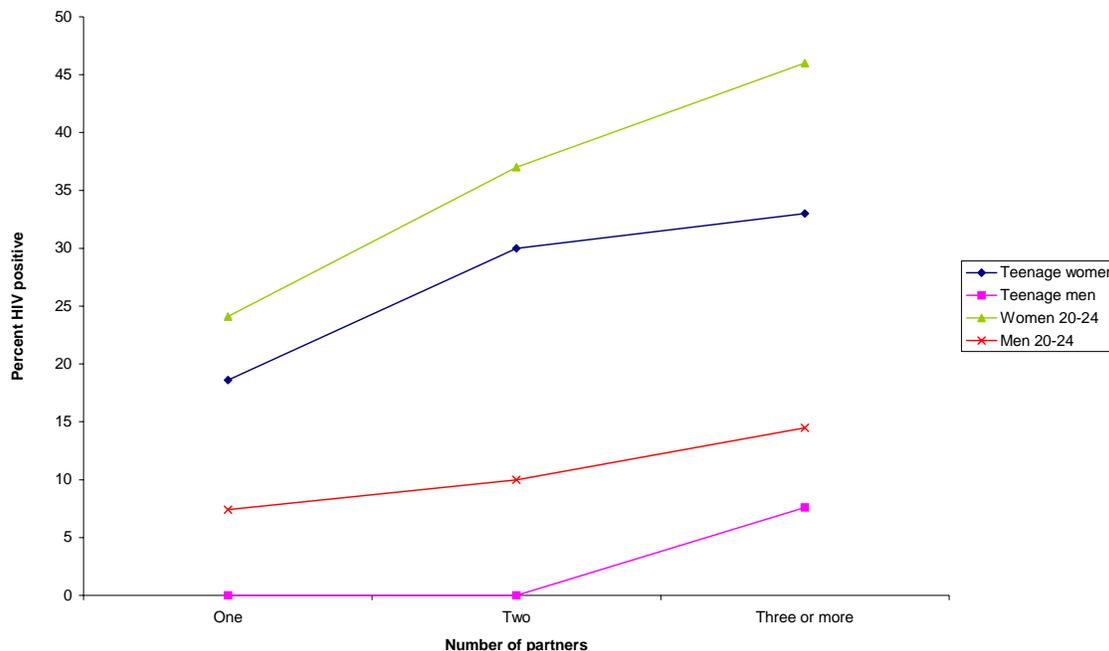


Figure 20: HIV prevalence among young people, by lifetime number of sex partners, Kisumu, Kenya

Source: Glynn 2001

Some idea of young people’s understanding of the “stick to one partner” message can be gleaned from looking at the differences between the behaviour they have adopted because they believe it is “safe” and their actual behaviour. DHS surveys ask about sexual behaviour, but also about whether people are doing anything to avoid AIDS. In the Kenyan DHS survey of 1998, some 30 percent of young men and 37 percent of young women said they had changed their behaviour to avoid HIV infection by sticking to one partner. But of single young men who said they were sticking to one partner, around a third also reported having sex with two or more women in the past year. And seven percent of single young women reported similarly contradictory behaviour (DHS data, author’s analysis). A similar pattern is seen in Tanzania in 1999, where people were asked if they thought they were at risk for AIDS and if not, why not. One in five of the young men who responded that they were not at risk for AIDS because they were sticking to one partner reported that they had had sex with two or more women in the last year. This suggests that young people believe they are avoiding AIDS by sticking to one partner, even when that turns out to mean sticking to one partner at a time.

There is another danger in the interpretation of the “stick to one partner” message. In a high prevalence HIV epidemic, protection is only afforded by sticking to one partner who is HIV negative and also has no other partners. Given the relatively high rates of multiple partnerships, it is evident that the second condition is frequently not fulfilled. And since HIV testing and disclosure remains rare in virtually every country with a high prevalence HIV epidemic, the likelihood that partners both know their HIV status and share that knowledge

before embarking on a sexual relationship is extremely slim. Uganda is frequently given as an example of a country where voluntary counselling and HIV testing is widespread. There has certainly been a rise in numbers tested in urban areas, and the proportion of tests that are taken by couples planning to get married has risen dramatically, from six percent of those tested in 1992 to 33 percent in 1997 (Turyagyenda, 2000). And yet people who say in a survey that they would like to know their HIV status frequently do not present for HIV testing when counselling and testing services are made available. In two long-standing field trials in rural areas of Uganda where free, high quality HIV testing is provided and actively promoted, uptake has been poor (principal investigators, personal communication). Reluctance to be tested has also been noted elsewhere. In Zambia, fewer than one in 10 of the people who said they would be willing to use counselling and testing services actually showed up when the services were provided, and half of those who did get tested did not come back for their results (Fylkesnes et al. 1999). What's more, many people who do come to know their HIV status do not share it with their sex partners, and such sharing is critical to the effectiveness of the "stick-to-one-partner" message. (Lie and Biswalo 1996, Gaillard et al. 2000)

It seems, then, that many young people interpret the "stick to one, uninfected, completely faithful partner" message only partially. They respond by sticking to one partner at a time, by sticking to one partner who may have other partners, or to one partner whose HIV status they do not know. In high prevalence epidemics, serial monogamy is no protection against HIV infection. As long as the monogamy message is only partially understood or selectively acted upon, it will continue to put young people who feel they are protecting themselves at high risk of HIV infection. Under these circumstances, promoting the "stick to one partner" message may be considered carefully in programme design.

Condoms take the lead among young people

Although the promotion of condom use among young people remains controversial in many countries, including those with high prevalence HIV epidemics, a high proportion of young people know that condoms can prevent AIDS. Indeed in most countries where surveys have been taken, young people are more likely to volunteer this as a way of avoiding AIDS than any other prevention method (DHS data).

As with other areas of prevention, of course, condoms are far more likely to be talked about as a prevention method than to be used. A very high proportion of sexually active young people have *never* used a condom. While a young, single person who has had sex and never used a condom is clearly at risk of HIV infection, so is the young single person who has had sex and only occasionally used a condom. The higher the HIV prevalence, the greater the risk associated with using condoms only occasionally. Indeed even if condoms were 100 percent effective against HIV in real-world conditions, a young person in high HIV-prevalence Botswana would have to use a condom over 99 percent of the time with new partners to achieve the same risk of HIV infection as a young person in Madagascar who never uses a condom at all (see page 79).

Consistent use of condoms with partners of unknown HIV status is an important goal for prevention programmes among young people. And yet virtually no measures of consistent condom use exist. Validation studies that compare reported condom use with biological markers of recent unprotected sex such as curable STIs show that if people are asked to report whether they use condoms always/sometimes/never they tend to over-report condom use (Vera et al. 1998, Zenilman et al 1995, Konings et al 1994). A more robust measure, and

one that is commonly used in population-based surveys of sexual behaviour, is condom use at last sex. Clearly if consistent condom use rises this measure, too, will rise. In general, men report condom use more than women do, as Figure 20 shows.

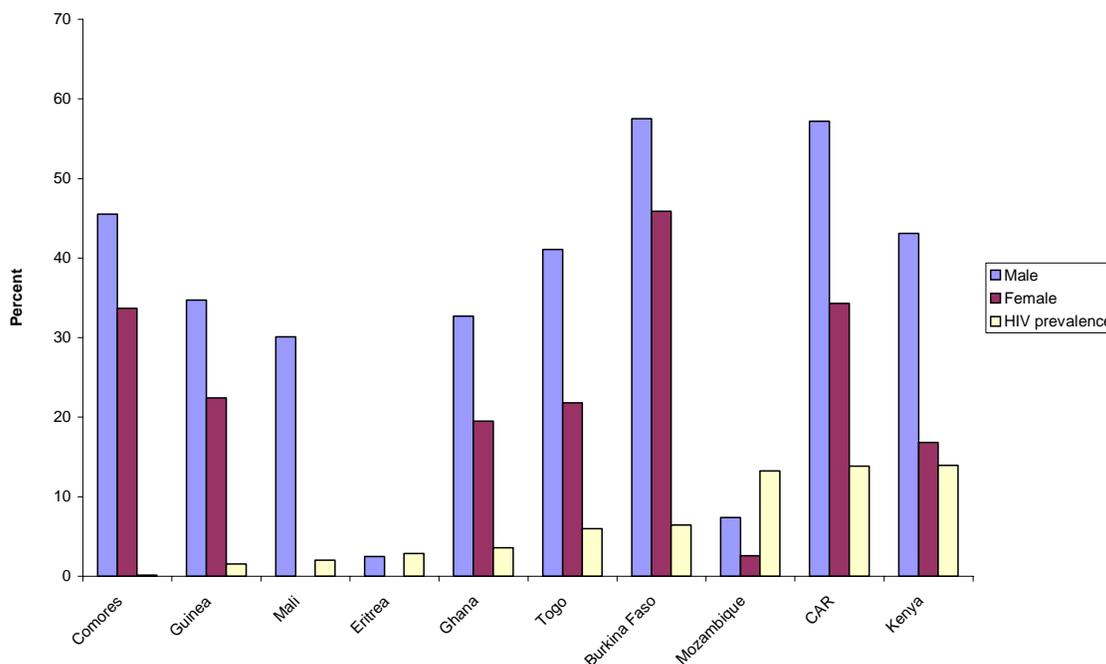


Figure 20: Percent of unmarried 15-19 year-olds who report using a condom the last time they had sex.

Source: DHS

Both sexes are also far more likely to say they used a condom recently with a partner they consider to be a “casual” partner than with a partner they consider to be a regular partner. This can be dangerous among young people, because partnerships are inherently unstable: Your current regular partner may have been someone else’s regular partner just a few weeks or months ago. However it does seem that those with multiple partnerships may also be more likely to have used condoms to avoid AIDS. Some 45 percent of single teenage women with multiple partners in the previous year said they had used condoms to prevent HIV in the Kenya 1998 DHS, for example, compared with 23 percent of those who had sex with just one partner.

An unacceptably high proportion of young people are still having unprotected sex at least some of the time, even with partners that they themselves consider to be “casual” or higher risk. And yet it can only be encouraging that condom use among young people has grown so rapidly. Clearly many young people are prepared to use condoms. Condoms have the added advantage of providing protection against pregnancy. For many young people, the threat of pregnancy is far more immediate than the threat of HIV, and promoting condoms as an effective contraceptive may very well prove a more compelling argument for their use than promoting them to avoid the threat of a distant and currently invisible illness. A study in Nigeria, for example, found that adolescents were far more likely to use a condom to avoid pregnancy than to avoid AIDS or STIs (Osotimehin, 1996).

It is notable that young people are more willing to adopt condom use than their older peers, and in some cases this seems to be making a significant difference to their risk of infection.

In a rural Ugandan population, for example, the proportion of men and women who had ever used condoms rose in all age groups between 1994 and 1998, but the rise was most dramatic in young people under the age of 25.

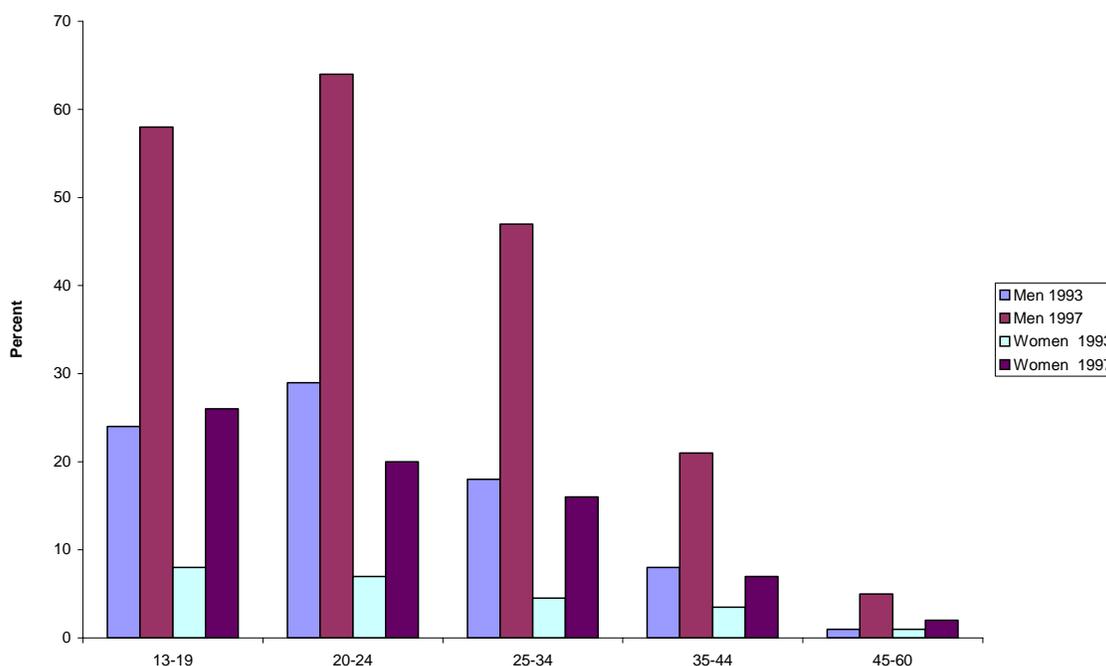


Figure 21: Ever-use of condoms by age in Masaka, rural Uganda, 1994 and 1998

Source: Kamali 2000

These data do not necessarily reflect consistent use, and in high-prevalence HIV epidemics, consistent use of condoms among young people must be the goal. They do, however, demonstrate that young people are willing to initiate condom use, and initiation is the first step towards making this behaviour a norm among people at the start of their sexual lives. Organisations wishing to promote safe behaviour among young people must now rise to the challenge of ensuring that condoms are readily available to young people at the time and in the location where they are making decisions about having sex, that they are affordable, that they can be acquired without fear of disapproval from a nosy adult, and that young people have been taught how to negotiate their use.

When there is no choice

Many young people are at risk for HIV infection because they make ill-informed or unhealthy choices in their sex lives. But some are also at risk because they have no choice, because they are coerced into having unprotected sex, or raped. Children, too, are being exposed to HIV infection through rape.

It is very difficult indeed to quantify the extent of rape and sexual abuse of children and young people. Very high proportions of young people typically tell interviewers that they were tricked or coerced into first sex, or that their first sexual experience was unwanted (Garcia-Moreno and Watts, 2000). These numbers are hard to interpret. Definitions and the understanding of those definitions differ from survey to survey and from child to child. And there is evidence that young people report being coerced into sex in order to reduce social

disapproval of their sexual activity. In Tanzania, for example, young women were far less likely to say they had been coerced into sex when they were answering a completely anonymous written questionnaire than when they were faced with an interviewer who they may have feared would disapprove of their “promiscuous” behaviour (Mary Plummer, personal communication). Even if allowance is made for some over-reporting, however, rates of unwanted sex are high.

Reported rape is on the rise in many countries, although it appears that the majority of women in many situations do not report sexual abuse. In children and young people, sexual abuse often comes to light only if the victim is seriously injured physically, or if they develop a symptomatic sexual infection. In Botswana, a review of police and court records shows a steady rise in reported rape cases, from 466 in 1984 to over two and a half times that many by 1997. Many of these cases involved very young women. Over two fifths of all rape cases that reach the courts involve victims under the age of 16, while 58 percent are aged between 11 and 20. Men accused of rape are also typically very young. Court records show that 72 percent of all accused rapists are in their teens or 20s, and just 18 percent are aged over 35 (Emang Basadi WA, 1998). In Uganda, abusers appear more likely to be adult men. In 1998, 2637 cases of “defilement” (the term used in East Africa to describe the sexual abuse of children) were reported to police, and 70 percent of the abusers were adult men (Nabalonzi, 2000). It is an indication of the scant importance accorded to the rights of children that in many African legal codes, rape of a child is considered a lesser offence than rape of an adult.

Figures from a clinic for sexually abused children in the Zimbabwean capital Harare confirm that very young girls are frequent targets for abusers. Over half of all the children seen in the first two years of the clinic’s operation were aged 12 or under, and 16 percent – some 331 children – were under five, with the youngest just a few months old. Violent sex greatly increases the likelihood of lesions and damage to membranes and vaginal tissue, especially in girls and young women whose reproductive tracts are not fully mature. This means that if the rapist is infected with HIV or other sexually transmitted infections, the probability of transmission is high. A high proportion of children presenting at the clinic in Harare were HIV-infected. Many sero-converted between their first and later visits to the clinic, indicating that the infection was probably a direct consequence of the rape. Eight percent of the 5-8 year-olds at the clinic were infected with HIV, even though this is the age group in which HIV infection is extremely unlikely to be a consequence of maternal transmission or voluntary sexual activity (Family Support Trust, 2000).

HIV and conflict

In conflict situations, which are not uncommon in countries where HIV-prevalence is high, rape is used as a weapon of war. With rates of HIV even higher in the military than in the civilian population, this amounts to just one more way of killing people. In a nation-wide HIV survey taken after the genocide in Rwanda, 15 percent of women who said they had been raped were infected with HIV, compared with 11 percent of those who did not report rape. And using a measure of more recent exposure to risky sex – genital sores in the last 12 months – women who reported rape were more than three times as likely to be affected as those said they had not been raped.⁹

⁹ Genital sores can be caused by both curable and incurable STIs. It is likely that some of the exposure to risk in these women therefore took place longer than 12 months before the survey.

Sexual abuse in childhood has many long-term consequences. Some of these have implications for the further spread of HIV. For example, evidence from industrialised countries suggests that sexual abuse of young girls may also lead to greater sexual risk-taking in adolescence, perhaps in part because abused children have lowered self-esteem and find it harder to assert themselves in sexual negotiation in later life (Stock et al 1997, Fiscella et al 1998, Widom and Kuhns, 1996).

The sexual abuse of orphans cared for in foster homes has been described in several countries, but no systematic information on this subject is available.

Consequences of prevention failure:

Very high HIV infection among young people in some areas

Some of the graphs in earlier sections of this paper have given an idea of HIV prevalence rates among young people in the hardest hit regions of the world: East and Southern Africa. But readers will have noticed the regular recurrence of just a handful of studies: The reality is that there is very little systematic monitoring of HIV infection in these age groups.

Most regular HIV reporting systems only give information for people aged 15-49. They do not usually break the data down into narrower age bands. When they do, the age groupings are not always comparable, and the sample size is sometimes missing, so that no total figure for HIV prevalence among 15-24 year-olds can be calculated. UNICEF and partner agencies have previously attempted to estimate the proportion of people living with HIV aged between 15 and 24. These estimates are based on HIV prevalence among 15-49 year-olds, apportioned according to the age structure of reported AIDS cases in a country adjusted for the time lag between initial infection and symptomatic AIDS. The methodology is extremely plausible, but its robustness has yet to be tested. Until it is, it would be unwise to use these estimates as a baseline against which to measure progress in slowing the spread of HIV.

Data collected among pregnant women are also subject to a number of biases, as described on page 56. Recently, a number of studies of HIV prevalence among young men and women in the general population have become available, and these probably give a better idea of true levels of infection.

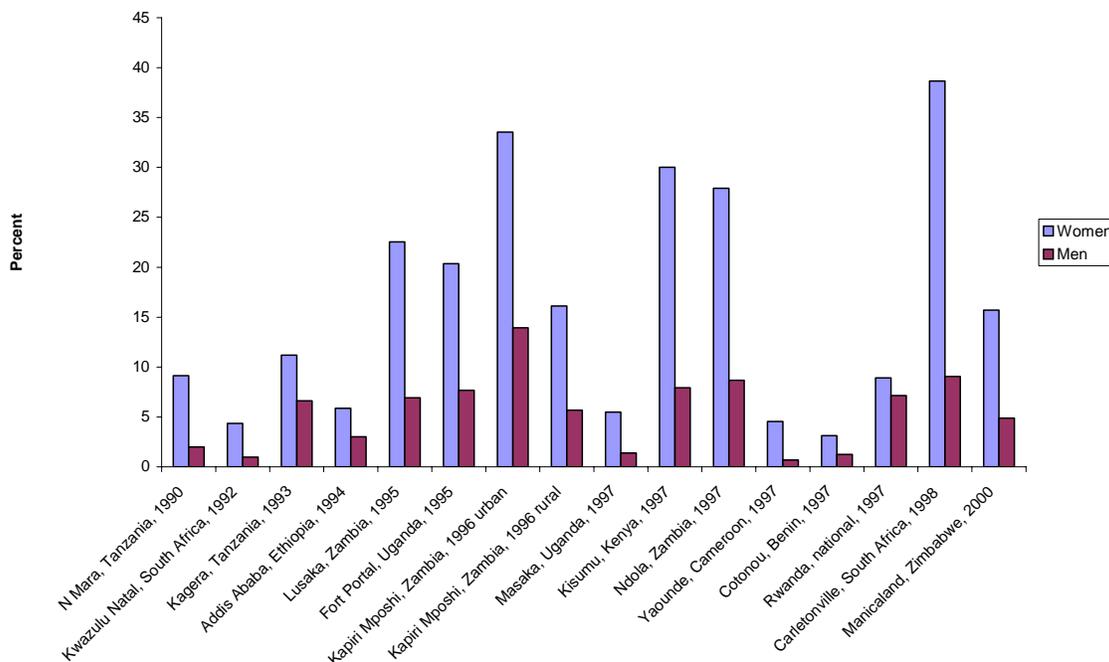


Figure 22: HIV prevalence among 15-24 year-old men and women, various studies

Sources: published studies.

Figure 22 summarises some of these data. The differences in infection rates between young men and young women are striking, but they should not be allowed to detract attention from the absolute levels of infection, which are nothing short of tragic. By their mid-20s, more than one in five young women are infected with HIV in Kenya, South Africa, Uganda and Zambia, and infection rates in other countries are nudging those levels too. On average, young women are 3.3 times more likely to be infected as boys are their own age.

Data on the age structure of new infections (or HIV incidence) is even more scarce than data on the total number of existing infections (HIV prevalence). Only a handful of studies representative of the general population have managed to measure new infections over time, and almost all of them are from East Africa. Figure 23 shows data from population-based studies. It shows the proportion of all new HIV infections distributed according to the age at which they occur. The pattern of infection is quite clear: In virtually all the studies, the cumulative curve crosses the 50 percent mark at a point under 25, meaning that at least half the total number of new infections occur in people under the age of 25.

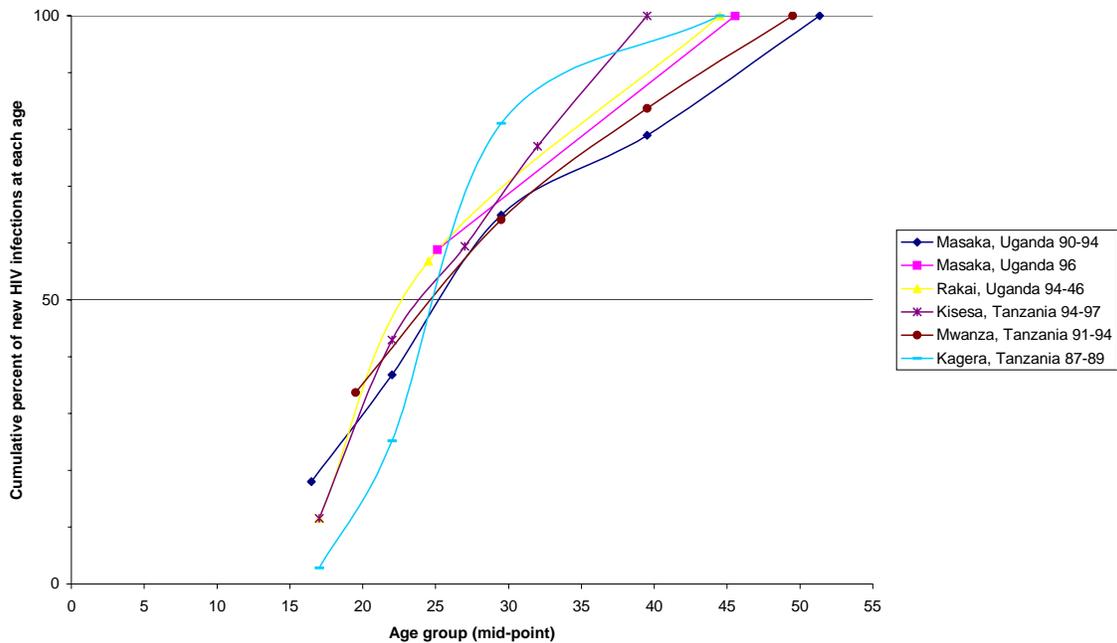


Figure 23: Cumulative proportion of new HIV infections, distributed according to the age at which people become infected. Various population-based studies in Africa, 1987-1997

Source: various published studies, author's analysis.

The data shown in Figure 23 are for both sexes combined. They represent population-based studies of incidence published from developing countries. New incidence studies are currently being undertaken in Zimbabwe and South Africa, but no results are yet available. Some of the studies also report incidence rates separately for men and women. Predictably, women become infected earlier than men. For ease of interpretation, Figure 24 shows this information for a single recent study, but the pattern is the same in all studies. The majority of new HIV infections in young women occurred when they were under 22 years old. Among young men, the median age for HIV incidence was five years later, at 27 years.

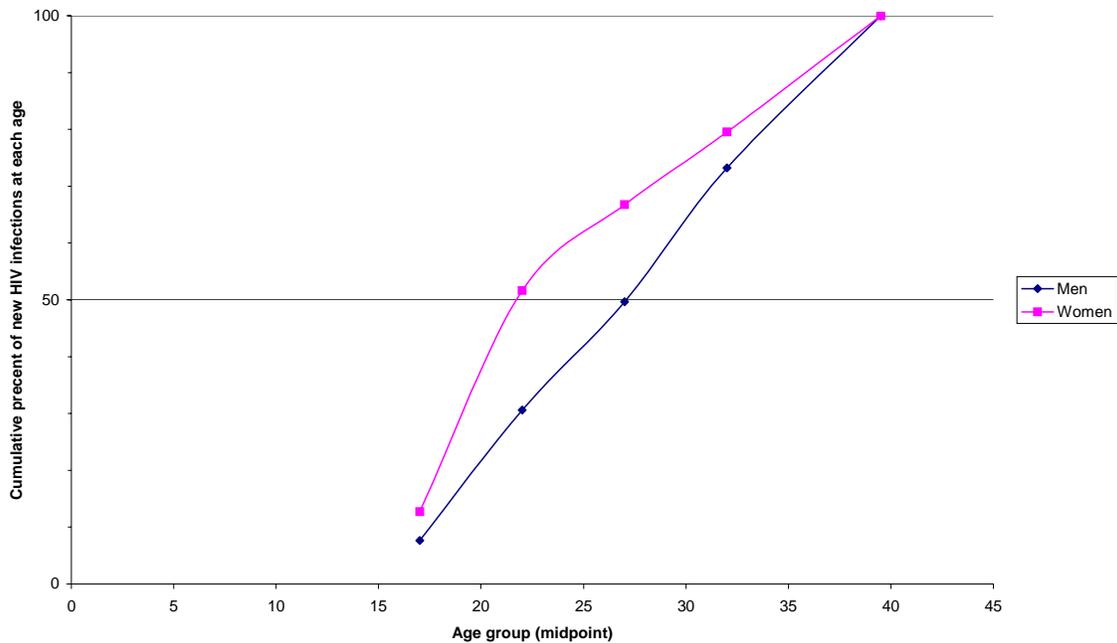


Figure 24: Cumulative proportion of new HIV infections by age, for men and women, Kisesa, Tanzania 1994-1997

Source: Boerma et al. 1999

Of course this does mean that the other half of all infections will take place after these ages. Assuming that few people under 25 have already died of HIV, and therefore that prevalence roughly equals cumulative incidence, the final proportion of any cohort infected with HIV in their lifetimes will be just about twice the prevalence rate at age 25. This rate will itself be considerably higher than the proportion of 15-24 year-olds infected with HIV, since there will be many young people included in the count at younger ages who are not yet infected but who will go on to become infected by age 25. Preliminary calculations indicate that unless patterns of infection change drastically in the very near future, over two thirds of young people now aged 15 will eventually die of AIDS in countries where adult HIV prevalence is over 10 percent, even taking into account other causes of death (Zaba et al, 2000).

In most populations, the bulk of new HIV infections in the 15-24 year age group are contracted in the early 20s. But as Figure 25 shows, even among teenagers, HIV infection rates can rise sharply. In this sample, taken from a random household survey in rural Zimbabwe, one in five girls was infected with HIV before she turned 20, and over one in three by age 25.

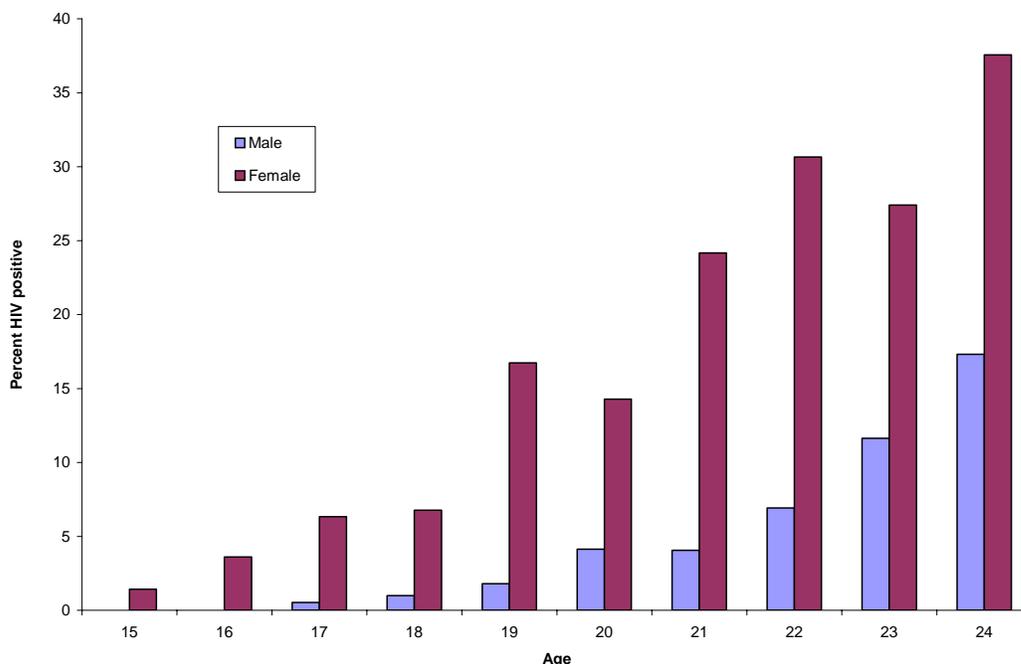


Figure 25: Percent of 15-24 year-old girls and boys infected with HIV, Manicaland, Zimbabwe, 1999
Source: Gregson 2001¹⁰

Unfortunately, data are not robust enough in any population to examine trends over time in age at infection with HIV. Evidence of very high infection rates among people aged under 25 in many countries does, however, suggest that new infections are increasingly concentrated in men and (especially) women at younger ages. This conclusion is entirely compatible with the laws of epidemiology: As HIV prevalence in the pool of potential partners rises, people are more likely to become infected closer to the start of their sexual lives unless consistent condom use rises dramatically.

HIV and young people: a summary

We know

- Percent of young people who have heard about HIV is rising, but young people still have insufficient knowledge to protect themselves
- Knowledge alone is not enough to prompt people to adopt safe behaviours
- In generalised epidemics, people start having sex in their teens, and many in their early teens
- Young people often engage in serial monogamy.
- Young people are more likely to use condoms than older people when they are made readily available. Condom use has risen dramatically among young people in many African populations.

¹⁰ *Note: men under 17 were not included in the survey*

- Nevertheless, the majority of sexual contacts outside of marriage still take place without condoms in most countries with generalised epidemics.
- Forced and coerced sex are common, but by no means the norm

We suspect

- Young people very rarely know their partner's HIV status when they embark on a new sexual relationship.

We don't know

- What drives those who do choose safe behaviours in developing countries to do so.

EDUCATION: A DOOR TO A SAFER FUTURE?

Globally, there is an association between low education and higher HIV prevalence. However the picture of the high prevalence epidemics of Africa differs from the rest of the world, and has been a cause of some discussion.

Several careful reviews of available data recently published or currently queued for publication point in the same direction (Blanc, 2000, Hargreaves et al. 2000, Gregson et al. 2000) In the early years of the generalised HIV epidemics of Africa, more educated people were more likely to be HIV infected. This was probably at least in part because more education translated into more money and more mobility, which in turn translated into higher risk behaviour. Educated people of both sexes certainly reported more extramarital sex than men with no education, for example.

However that relationship is being eroded, particularly in countries with the highest HIV prevalence. In these countries, educated men now report less risky sex than men with little education, while among less educated men, risk behaviour remains broadly similar regardless of HIV prevalence. In other words, as HIV prevalence rises, and as HIV prevention campaigns start providing people with information and services which they can use to protect themselves, the educated are the first to reduce their risky behaviour. In high prevalence HIV epidemics, education is gradually turning from a liability into a protective asset. The effect is seen most clearly among young people.

Figure 26 shows HIV prevalence among young women in Fort Portal, Uganda, by level of education. In the early 1990s, more educated women were more likely to be HIV-infected than less educated women. By the late 1990s, the opposite was true. While still having unprotected sex (all the women in this study were pregnant) more educated women appeared to be making significant reductions in their exposure to HIV infection overall, perhaps by avoiding unprotected sex with higher risk partners. It is important to note that HIV-specific education was included in the school curriculum in the area studied. It is possible, then, that it is appropriate sex and life skills education which contributes to reduced risk of HIV infection, rather than education *per se*.

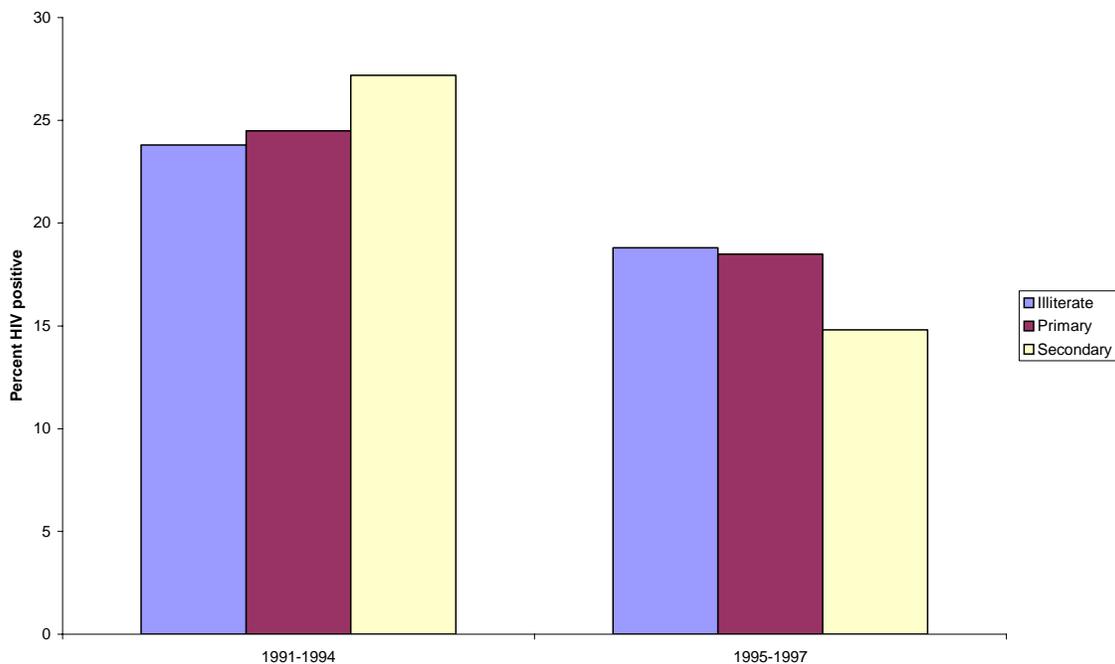


Figure 26: HIV prevalence among pregnant 15-24 year-old women by educational status, Uganda

Source: Kilian et al 1999

There are many complexities still to be unravelled in examining the relationship between education and HIV-related risk. For example, pregnancy is a common cause of school dropout for girls in many African settings. In Kenya, 23 percent of young women who did not complete primary school dropped out because they were pregnant or got married, while nearly one in three secondary school dropouts left because they were pregnant (DHS 1998). It is therefore possible that HIV-related risk is a cause, as well as an effect, of less schooling. And it is possible that the protective effect of education seen among younger age groups, especially among men, is simply because young people have not yet had the time to turn higher education into the higher mobility and spending power that can lead to more risky sex. Perhaps the biggest question outstanding is: Does education itself confer protection against HIV, or is education about the virus and how to avoid it a critical part of the equation?

Consider for a moment Figure 27, which plots the primary-age school enrolment against adult HIV prevalence. The graph shows that schooling is, on the whole, *higher* in the countries with the highest HIV prevalence. This suggests that if education does confer a protective advantage against HIV, that advantage is relative, rather than absolute. In other words, in any given society, the more educated are more able to protect themselves against HIV than the less educated.

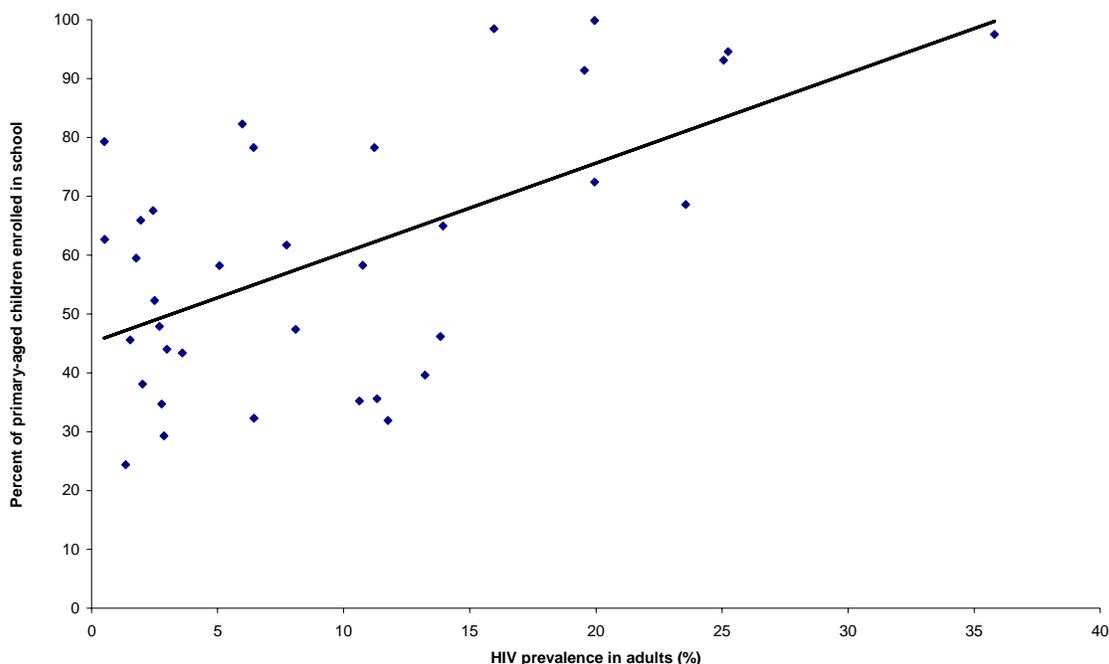


Figure 27: Primary age school enrolment ratio and HIV prevalence, sub-Saharan Africa, 1997

Source: Data UNDP 2000 and UNAIDS 2000, author's analysis

Unfortunately, reliable information on the HIV-related content of schooling in African countries is not available. But it should be noted that the convincing evidence presented in Figure 26 comes from a country and an area where HIV prevention efforts have been particularly strong. A UNAIDS review of evaluations of 53 sex education programmes concluded that young people exposed to correct information about sexual and reproductive health are less likely to engage in early sexual activity and more likely to protect themselves against unwanted pregnancy and infection when they do start having sex (UNAIDS 1997). However, few of the studies reviewed come from high HIV-prevalence countries. A number of controlled studies are now underway (including community randomised trials in Tanzania, Uganda and Zimbabwe) to determine more precisely the effect of school-based HIV prevention programmes on risk behaviour among young people. The trials are also investigating the effect of different mixes of in and out of school activities, of service provision for young people, and of non-traditional teaching methods such as the use of peer educators.

Will educational systems stand the strain of HIV?

The other side of the education and HIV equation is the toll that the virus is taking on schooling and the systems that provide it. It is widely believed that many children drop out of school when their parents become sick with HIV, first because they stay home to care for their parents, and later because spending on sickness or loss of income due to sickness and eventually death eats away at money available for school fees. This is very probable. However this dynamic has rarely been documented in any systematic way and cannot for now be supported with reliable data. A study in Botswana, where a rampant HIV epidemic is only just beginning to turn into an epidemic of AIDS or of funerals, found very little school absenteeism occasioned by caring for family needs. No senior secondary school

absenteeism was registered because students were “needed at home”, and just two percent of students, all boys, were reported to have taken time off school because of sickness in the family. At junior levels, rates of absenteeism because of sickness or duties at home was twice as high among boys as among girls, but did not exceed 3.7 percent. The dropout rate was negligible at the primary and junior levels for both sexes (Botswana 2000). High unemployment among older siblings or relatives who have left school and a short school day which leaves time for caring after school hours may contribute to the relatively limited impact of family illness on school attendance in Botswana and other countries. Orphanhood was also found to cause less school dropout than expected. Between seven and 12 percent of registered orphans in districts investigated in 2000 were out of school. A report by the Ministry of Education concluded that school dropout rates among orphans were not significantly different from dropout rates among other children. (Botswana 2000) This may be in part because orphans in need are entitled to food rations and other material support for uniforms, transport and accommodation. Orphans who had lost both of their parents were, however, significantly more likely to stop attending primary and junior secondary school on a temporary basis than children who had lost neither parent. School dropout among orphans is discussed at greater length on page 71.

It is worth noting that while Botswana is hard hit by HIV, its heavy investment in education has produced exceptionally high schooling rates that are not typical of much of Sub-Saharan Africa. Interestingly, though, a study in Kenya where school dropout rates are much higher produced similar findings: Orphans were no more likely to drop out of school permanently than non-orphans. In a district of Western Kenya where around a third of adults are infected with HIV, only 55 percent of children had two healthy parents. Of children enrolled in the last three years of primary school at the start of 1998, 8.7 percent of girls and 6.8 percent of boys did not finish the school year. But when school dropouts were compared with people of the same sex and class who were still in school, children who had lost their parents were not significantly more likely to drop out of school than children whose parents were both alive. (Ferguson and Johnston, 1999). Two out of two studies thus challenge the conventional wisdom that sick or dead parents lead kids to drop out of school when they would otherwise have stayed. But this evidence is far too slim to form the base of any serious policy decisions. More sound information about the relationship between parental sickness and death and school attendance is desperately needed.

What is certain is that, HIV epidemic or no, many school-aged children in countries threatened by HIV are not in school. In Sub-Saharan Africa as a whole, just 56.2 percent of primary-aged children are in school, while at secondary ages that figure drops to 41.4 percent (UNDP 2000). These school enrolment rates are far lower than those recorded in any other region of the world. A few countries, such as Gabon, Malawi, Namibia and Swaziland have achieved rapid and sustained increases in school enrolment. In many other countries, however, school enrolment has stagnated over the last three decades, and in some, including some of the best performers, the proportion of school-aged children in school is actually falling. In Zimbabwe, for example, the primary and secondary enrolment ratio peaked at 97.9 in 1986. A decade later it had slipped back to 86.4. In Cameroon the enrolment ratio for school-aged children fell by 16 percent between 1987 and 1994 (UNESCO, 2000). In several countries, the inability to pay school fees and associated levies is overwhelmingly the biggest cause of school dropout at both the primary and secondary levels (DHS). But a lack of teaching capacity and limited educational infrastructure are also at fault.

These limitations will almost certainly be aggravated by HIV. In the longer term, HIV will cut fertility, so total potential demand for education will be lower than it would have been without the epidemic. The government of Botswana, for example, estimates that the school-age population will be 30 percent smaller by 2010 than it would have been without the AIDS epidemic. That will lead to a decrease not just in the projected size of the school-age population, but in absolute numbers. There are expected to be 366,000 children aged between 5 and 14 in Botswana in 2010, down 15 percent from the 1999 total. The effect is dramatic in Botswana, where HIV prevalence rates are exceptionally high and where contraceptive use has risen markedly in recent years. In other countries it will develop more gradually. In the meantime, HIV has the potential to undermine the supply of teachers far more rapidly than it can affect the potential demand for education.¹¹

Skilled teachers are a precious commodity in most countries. In some parts of the world, HIV is eroding classroom expertise. UNICEF and its partners have estimated the number of children losing teachers in several badly-affected countries, but only a handful of countries have actually measured teacher illness and death. A recent study in Manicaland, Zimbabwe, found that 19.2 percent of male teachers and 28.8 percent of female teachers were infected with HIV – almost exactly the same proportion as working men and women in the general population (Gregson et al. 2000). South Africa's 443,000 teachers make up the country's single biggest employment group. Some 12 percent of them are currently infected, implying 53,000 teacher deaths in the next decade, unless life-prolonging therapy becomes widely available. (Coombe, 2000). In Zambia, the Ministry of Education has recorded a doubling in the number of teachers dying in recent years. By 1998, the country was seeing four teachers die every day, and many more show up to teach class only sporadically because of HIV-related illness (Kelly 1999). Swaziland, which is similarly affected, has estimated that it will have to train 13,000 teachers over the next 17 years just to keep services at their 1997 levels – 7,000 more than it would have to train if there were no AIDS deaths. (Swaziland 2000). Together with sickness and death benefits, these extra hiring and training costs are expected to drain the treasury of some 1.725 billion USD by 2016 – more than the total government budget for all goods and services in 1998-1999. Central African Republic, where around one in every seven adults is estimated to be infected with HIV already has a third fewer primary school teachers than it needs. Of the teachers who died in service over the study period, some 85% were HIV infected. Researchers expect the shortage of teachers in Central African Republic to get worse, and calculate that over 71,000 children aged between 6 and 11 will be deprived of a primary education by the year 2005 (UNICEF/UNDP, 1999). In Côte d'Ivoire, an average of five teachers die of AIDS every week of the school year between 1996 and 1998, and confirmed cases of the disease are now responsible for seven out of 10 teacher deaths (Fassa et al. 1998).

These figures are dire. But from Botswana comes an indication that the most skilled teachers may be at least risk of dying from AIDS. Some 43 percent of Botswana's public employees are in the education sector. Two thirds of them are women, and an even higher proportion are single. HIV prevalence data are not available for this occupational group, but deaths among teachers show an age distribution very similar to AIDS deaths nationally. In the year before April 2000, primary school teachers, who tend to be less educated and more mobile than teachers at more senior levels, registered the highest death rates, at 12.1 per 1,000 among men and 7.6 per 1,000 among women. This compares with death rates of 9.1 and 5.3

¹¹ Real demand may be affected already, if increasing HIV-related poverty is contributing substantially to school dropout. As mentioned, however, this has not been systematically recorded.

per 1,000 among other government employees of the same grade – not an encouraging finding (Botswana 2000). Among higher grades such secondary teachers, however, mortality was much lower. No deaths were recorded among head teachers or deputy heads of junior or secondary schools in the year to mid-2000. Time series data suggest that mortality rates may have reached a plateau among teaching staff. This would mean that HIV prevalence among teachers is lower and/or falling faster than among the rest of the population. If, as HIV epidemics progress, educated people do indeed adopt safe behaviours before less educated people do, then there are grounds to hope that the major impact on the teaching core will be overcome earlier and more rapidly than in other parts of the population. In that case, HIV will have a less devastating effect on education systems than is currently predicted.

For all their limitations, schools are an essential gateway

When discussing increasing school-based HIV prevention programmes in Africa, many objections are typically raised. A high proportion of young people are not in school, or drop out of school before reaching an age where HIV-related information is deemed appropriate. Students in a single class can span a wide age range, making it difficult to plan a curriculum appropriately. Teachers are already overstretched and many object to teaching young people about sex. The list goes on, but none of these objections can over-ride the fact that the school system is the single easiest access point to young people before they become sexually active. A majority of young people attend school at some point in their lives in every country – almost all of them before they start having sex. In high HIV-prevalence countries, no excuse is good enough to justify neglecting this important entry point for equipping young people with the skills they need to protect themselves from HIV.

HIV and education: a summary

We know

- In generalised epidemics, HIV is more prevalent in countries with the highest levels of schooling.
- In the past, in countries with generalised epidemics, those with more education have reported more risky sexual behaviour, and they have also been more likely to be infected with HIV. This may no longer be true.
- HIV-specific education generally leads to safer behaviour in young people.
- Young people who have received quality HIV-related education in school have become less likely to be infected with HIV than those with less schooling in at least one high-prevalence setting.
- The HIV epidemic is likely to strain resources available for schooling at both a family and a national level in the worst-affected countries.
- HIV is killing teachers in substantial numbers.

We suspect

- Education is becoming more protective in most countries with well-established HIV epidemics.
- The challenge of getting children into school and keeping them there is likely to grow as HIV epidemics advance.

HIV, MOTHERS AND CHILDREN

It is estimated that 3 million children under the age of 15 were living with HIV/AIDS at the end of 2001, some 800,000 of them infected with HIV during the course of 2001 alone. New infections outpaced child deaths only slightly: 580,000 HIV-infected children died last year, bringing the total number of AIDS deaths among children since the beginning of the epidemic to an estimated 5 million.

While there may be murky patches in our understanding of HIV infection in young people, our knowledge about HIV among children is a positive black hole. It is assumed that almost all HIV-infected children were born to HIV-infected women and acquired the virus from their mothers. Virtually nothing is known about new HIV infection among children aged between three and 14 anywhere in the world, and UNAIDS estimates do not include any new infections in these age groups. The age structure of reported AIDS cases suggests that children over five have not, so far, been heavily infected with HIV, but no direct measures of infection are available. Our knowledge about exposure to HIV infection in children is similarly scanty. Although some young people report retrospectively that they initiated sex or drug-taking during childhood or around puberty, and although sexual violence against children is far from insignificant in many countries, it has been considered too difficult to ask children directly about any risky behaviour or possible exposure to HIV. It is generally thought that the opposition from parents, teachers, or others whose permission for collecting such information may have to be sought would be overwhelming. And yet these may well be the ages at which attitudes towards sexuality are being shaped, and behavioural norms formed. As Figure 17 shows, in at least eight countries for which data are available one young person in five has had sex before the age of 15, that is, before the age that researchers consider appropriate to start investigating HIV and related risks (DHS data). In at least one household study, one in every 12 15-year-old girl is already infected with HIV (Kenya NASCOP, 1999). Certainly, a strong case must be made for collecting more information about what children under the age of 15 know about HIV, and to what extent they are exposed to risk of infection.

Until more information is available, the bulk of attention of those focusing on HIV and children will probably continue to be focused in two areas: HIV transmission from mother to child, and children whose parents are ill or have died because of HIV.

Transmission of HIV from mothers to their children

HIV is transmitted from mothers to their children in three ways: in utero, during the process of birth, and during breastfeeding. A recent comprehensive review of a large number of studies of HIV transmission has estimated maximum and minimum transmission rates for each of these three stages of pregnancy, and these are shown in Table 2.

Timing	No breastfeeding, %		Breastfeeding through 6 months, %		Breastfeeding through 18 to 24 months, %	
	Low	High	Low	High	Low	High
Intrauterine	5	10	5	10	5	10
Intrapartum	10	20	10	20	10	20
Postpartum breastfeeding			5	10	5	10
Early (first 2 months)			5	10	5	10
Late (after 2 months)			1	5	5	10
Overall	15	30	25	35	30	45

Table 2: Percent of children born to HIV-infected mothers who become infected at different stages

Source: de Cock et al., 2000

Sickness and death in HIV-infected children

A few studies have been able to document mortality in HIV infected children. These include community-based studies as well as research designs. As is to be expected, HIV-infected children have far higher death rates than the uninfected, in every population.

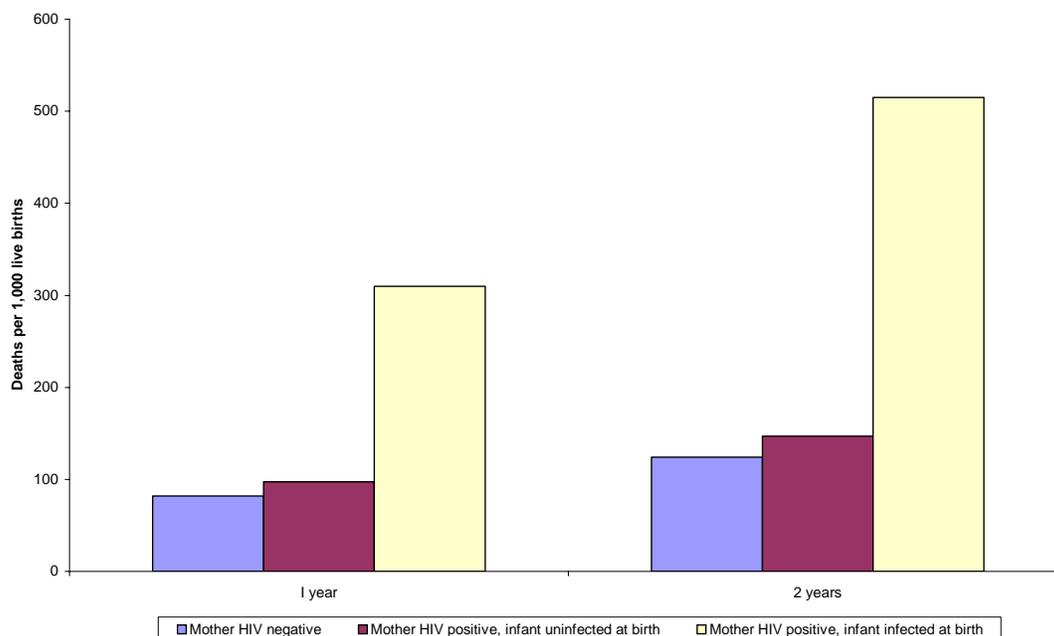


Figure 28: Deaths per 1000 live births at ages one and two years, by HIV status of mother and infant, Rakai district, Uganda

Source: Brahmhatt 2000

Figure 28 shows the difference among children infected before or during birth in a rural population in Uganda. In the first two years of life, children born HIV-infected are around three times as likely to die as children born uninfected.

Mortality in children born HIV-infected is clearly high. A recent study in Malawi recorded 89 percent mortality by age three in children who were infected at birth and still alive at six months (Taha et al., 2000). This is higher than recorded elsewhere, possibly because children infected through breast milk were largely excluded from the study. In Rwanda, for example, some 38 percent of HIV-infected children were still alive at five years (Spira et al, 1999). Progression from infection in infants to sickness and death is not well understood, but it is clear that a significant fraction of children progress very quickly to death, while others survive considerably longer. It appears likely that children infected during breastfeeding survive longer than those infected before or during birth. The Rwandan study found that the risk of death was five times higher among children infected at birth or in the first three months of life compared with those infected later on, through breastfeeding. Several studies are currently underway to investigate this association and other factors that could help explain the commonly observed “bimodal” pattern of death in HIV-infected children.

Currently, it is believed that survival at five years ranges between 25 and 38 percent for children infected with HIV at birth. Survival at five years among children infected during breastfeeding will be longer even if there is no difference in progression, since on average they do not become infected until several months after birth. (See Figure 29)

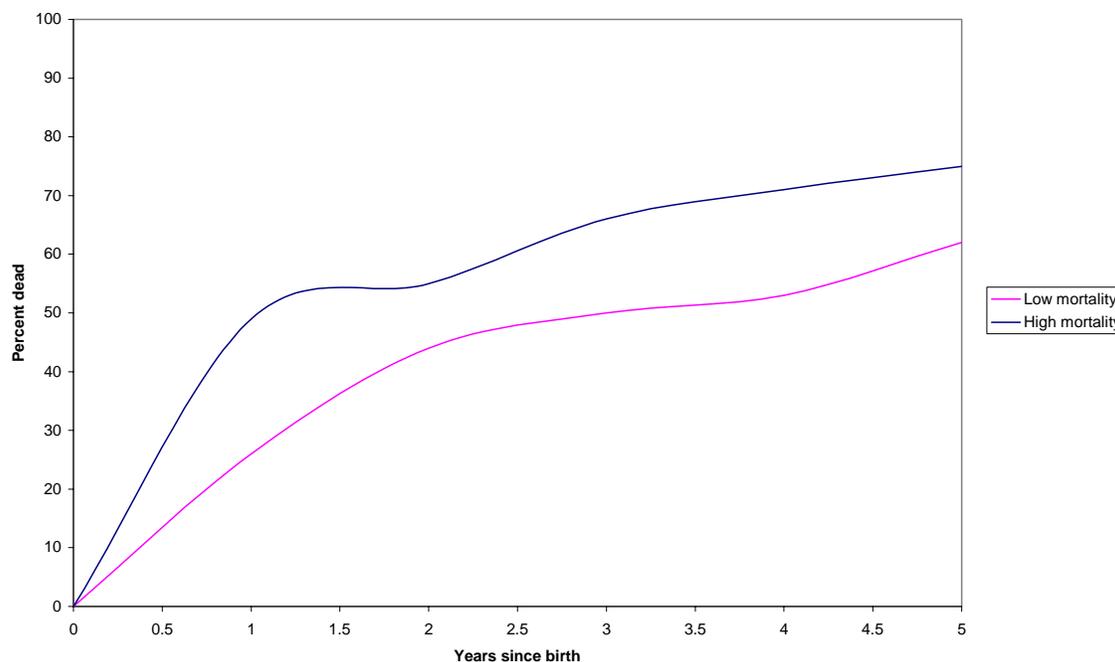


Figure 29: Cumulative mortality over five years in children born HIV-positive

Source: Walker et al. 2002, Estimates based on review of published studies

With such high mortality among HIV-infected children, it cannot come as a surprise that HIV is responsible for deteriorating child survival statistics in countries where HIV infection among pregnant women is common and preventative interventions are few. Overall, it is estimated that HIV infection accounted for 7.7 percent of all deaths in children under 5 in sub-Saharan Africa at the end of 1999, up from 1.8 percent in 1990. Figure 30 shows the rise over time in the proportion of deaths in children under age five attributable to HIV infection in selected countries for which data are relatively reliable. After taking other causes of death in HIV-infected children into account, the virus was responsible for over one in five child deaths in Kenya and twice that proportion in Botswana.

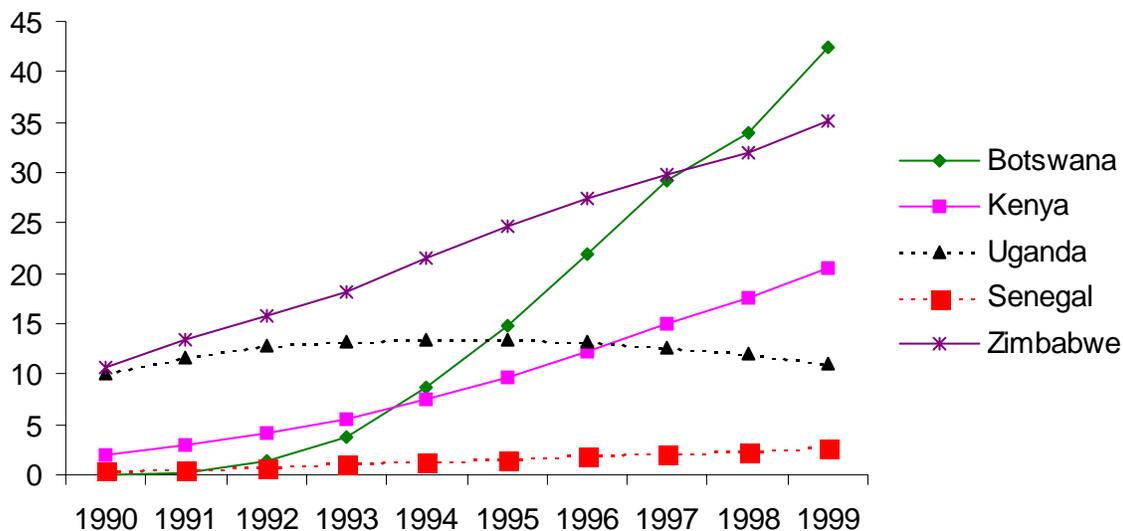


Figure 30: Percent of deaths in children under 5 attributable to HIV infection, 1990-1999, selected countries

Source: Walker et al 2002

In several hard hit countries, including Botswana, Namibia, South Africa and Zimbabwe, a higher percentage of children under five are dying now than was the case fully 15 years ago. Hospital studies in South Africa have recorded a dramatic rise in HIV infection in children admitted for care. In Soweto, HIV prevalence among children tested in a paediatric hospital rose from 2.9 percent in 1992 to 20 percent in 1997. HIV-infected children had much higher mortality than HIV negative children. While mortality among uninfected children actually fell, the rising proportion of children with HIV contributed to a 42 percent rise in mortality at the hospital over the five-year period of the study. By 1997, over half of all the deaths among children at the hospital were HIV-related. (Zwi et al 1999). At a rural hospital in South Africa, 26 percent of all children admitted between October 1996 and January 1997 were infected with HIV. One in five of the HIV-infected children died in hospital, compared with one in 14 of the uninfected children (Yeung et al., 2000).

It is the countries that have made most progress against other diseases of early childhood, which are likely to register most clearly the impact of HIV on child death. Kenya, for example, saw child mortality fall rapidly between the 1960s and the early 1980s. Since the late 1980s, however, there has been a dramatic turnaround in these rates, with child mortality increasing by as much as 25 percent. Certainly, HIV prevalence rose substantially during this period, but it was also a time of economic backsliding, and immunization, school enrolment and

other indicators of child welfare have also fallen. So how much of the increase in child death was attributable to HIV and how much to general meltdown of the infrastructure of social welfare? A careful analysis of population-based data recently sought to answer this question by controlling for a number of socio-economic and health variables, including HIV prevalence in the district of birth at the time a child was born. It was found that neither deteriorating socio-economic conditions nor other health status factors could explain rising child mortality. There was, however, a very strong association between rising HIV prevalence and rising child mortality, and the association was consistent with patterns of HIV prevalence across districts. The authors conclude that despite the deterioration in other indicators of child welfare, rising HIV infection levels in adults explain most of the rise in death among children (Hill et al, 2000).

Of course HIV is not the only thing threatening child health and welfare. Countries without severe HIV epidemics have also suffered setbacks in child survival in recent years. Niger, for example, has recorded an absolute rise in under five mortality in that period even though HIV accounts for half of one percent of child deaths. In Senegal, DHS data suggest under-5 mortality rose from 131.8 to 139.1 between 1993 and 1997, even though HIV is estimated to contribute just two deaths per 1,000 (Walker et al, 2002). Other factors must be at work. Many countries have, in the 1990s, recorded drops in immunization coverage and use of oral rehydration therapy, for example, and this is likely to affect child survival. Even in settings where HIV prevalence is high, children are threatened by a host of other diseases. For example a study of infant mortality in Malawi, which ranks among the 10 countries most affected by HIV in the world, found that HIV contributed just 15 percent to infant deaths (Vaahtera et al, 2000). Paediatric AIDS is a critical child health issue in much of sub-Saharan Africa, but it should not be allowed to obscure the importance of other infectious diseases which continue to kill the majority of under-fives in almost all countries. Proven and affordable interventions are available for most of these diseases: implementing these interventions more aggressively would benefit HIV-infected and non-infected children alike.

Causes of death in HIV-infected children

There are few studies of the causes of death in children with HIV, and fewer still of sickness. But it appears that in developing countries, in contrast with the industrialised world, children with HIV suffer from much the same illnesses as children whose immune systems are not compromised. The difference between the two groups is that the same condition in HIV-infected children is likely to recur more frequently, be more severe, be less amenable to treatment and more likely to lead to death than in uninfected children. Among children admitted to hospital with TB in South Africa, 10 times as many HIV-infected children died, compared with uninfected children (Madhi et al., 2000). Malnutrition can be especially severe in HIV-infected children, with high case fatality. In South Africa, over half of HIV positive children admitted to hospital were severely malnourished, compared with 17 percent of uninfected children (Yeung et al. 2000). A study in Malawi found that over a third of severely malnourished children over the age of one were HIV-infected. These children were 60 percent more likely to die than similarly malnourished children who were not infected with HIV (Kessler et al, 2000). Respiratory tract infections are also extremely common. An autopsy study of children in Ivory Coast found that 94 percent of children who died with HIV infection has suffered respiratory tract infections, compared with 68 percent of uninfected children (Lucas et al, 1996). In Kenya, respiratory tract infections was the principal cause of death in 64 percent of HIV positive children in a recent autopsy study, exactly the same proportion as was reported in a hospital study in South Africa. (Chakraborty, 2001, Zwi et al, 2000). In Kenya, bacterial meningitis was also very common. Clinicians working with HIV-

infected children in developing countries are increasingly recommending aggressive prophylaxis for bacterial infections, and aggressive treatment of tuberculosis using a low-threshold diagnosis. While the efficacy of different regimens remains poorly understood, the weight of evidence has prompted the World Health Organization to recommend the use of cotrimoxazole as a prophylactic against opportunistic infection in HIV-infected children over the age of six weeks as well as in adults (WHO 2000a).¹²

Antiretroviral therapy appears to have increased survival among HIV-infected children in developed countries. In a population-based study in Italy, for example, children taking triple combination therapy were seventy percent less likely to die than those not on any therapy, while single drug therapies or a two-drug combination reduced the risk of death between 30 and 40 percent (de Martino et al, 2000). Nothing is known about the efficacy of antiretrovirals among children living with HIV in developing countries. A small number of children are among the beneficiaries of an access to drugs effort promoted by the Ugandan government, but survival data have so far only been analysed for the adults in the group.

Uninfected children of HIV-positive mothers

It is often posited that uninfected children of infected women will be worse off than those of healthy women, in part because their mothers will be unable to give them the attention they need. A few studies have compared sickness and death in the HIV-negative children of HIV positive and HIV negative women, and most have found little or no difference in morbidity or mortality (e.g. Spira 2000, Taha et al. 1995, Taha et al. 1999, Brahmhatt 2000). Other indicators of childhood development may be more affected, but these have not been measured.

Preventing transmission of HIV to children

Table 2 showed the proportion of HIV-positive women who will pass HIV on to their babies if no preventative measures are taken. Such preventive measures are now available. Intrauterine and peripartum transmission of HIV can be reduced by giving antiretroviral drugs to the mother and the newborn, and Caesarean section delivery can reduce peripartum infection still further. Substituting infant formula milk or other foods can eliminate HIV transmission through breastfeeding. Taken together, these interventions have virtually eliminated HIV transmission from mother to their infants in industrialised countries.

In the developing world, and especially in Sub-Saharan Africa, the picture is very different. Firstly, HIV infection rates among women are higher. Secondly, women have more children, on average. Thirdly, pregnant women are less likely to be offered tests to find out if they are HIV positive – a prerequisite for prevention interventions. Fourthly, breastfeeding is almost universal, and safe alternatives to breast milk harder to come by. Finally, the drug regimes used in industrialised countries are too expensive and complicated to be practical for wide-scale use in poor countries. Because of these differences, over nine in ten of all children born with HIV or infected in infancy in 1999 were born in Sub-Saharan Africa.

Some of these difficulties are being overcome. Studies in Thailand in early 1998 showed that a relatively simple drug regime -- a short course of the antiretroviral drug AZT given to HIV-infected mothers late in pregnancy -- could halve the rate of HIV transmission to their infants

¹² There is some concern that the frequent use of cotrimoxazole as a prophylactic in HIV-infected adults and children will increase resistance and dilute its efficacy as a weapon against common diseases of childhood in the uninfected majority. (De Cock, 2001)

as long as women also avoided breastfeeding. This is one option in a menu of possible interventions, which can reduce HIV transmission by varying amounts. Figure 31 shows the proportion of children born to HIV-infected mothers that will acquire HIV infection from their mothers, according to different intervention scenarios.

In late 1999, a study in Uganda showed that results similar to or better than those achieved through short-course AZT therapy could be achieved by giving HIV-positive mothers Nevirapine at the onset of labour, and then to the child in its first three days of life. Nevirapine is being made available free of charge to developing countries by its manufacturer. While

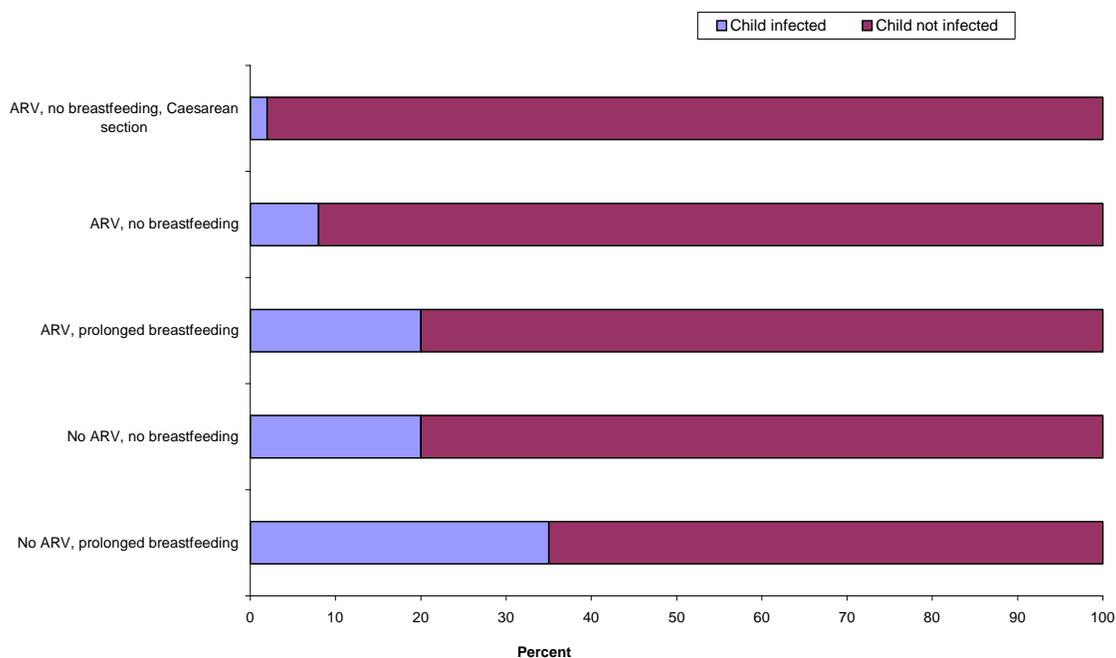


Figure 31. Contribution of different prevention strategies to reducing HIV transmission from mother to child

Source: data based on published studies, compiled by UNICEF

there is an ongoing debate about the toxicity of antiretroviral drugs and the effects they may have on the course of HIV infection in the mother, most evidence available today suggest that the benefits of these drugs in reducing the transmission of HIV from mother to child largely outweighs any risks linked to their use. The development of strains of the virus resistant to Nevirapine or other antiretrovirals used to prevent HIV transmission to infants is a further cause for concern, and needs to be carefully monitored. This is especially true since Nevirapine is a key ingredient in the most affordable regimen of highly active antiretroviral therapy, or triple therapy, which programmes in Uganda have shown to be highly effective in prolonging life among HIV-infected adults. A panel of technical experts convened by WHO in October 2000 reviewed all existing evidence on antiretroviral resistance and toxicity and concluded that the benefits of Nevirapine and other antiretrovirals (Zidovudine and Lamivudine) in averting HIV infection in children born to HIV positive mothers outweighed any risks associated with their use. The panel recommended their widespread use in prevention programmes for pregnant women worldwide (WHO 2000). Recently published data suggest that at least one of these drugs, Zidovudine, is effective only in women whose

CD4 count is greater than 500/ml at the time she gives birth – in other words, in women whose HIV disease is not very advanced (Leroy et al., 2002).

Since 1998, UNICEF has been involved in providing support to governments to help HIV-infected women give birth to healthy children. A four pronged approach is being promoted: primary prevention; prevention of unintended pregnancies; prevention of HIV transmission from an HIV infected pregnant woman to her baby; care and support for the mother, her child and family. The experience of these programmes spotlight some of the hurdles that prevention programmes face, and suggest solutions which may help expand programming in the future.

The first challenge is that of counselling pregnant women and encouraging them to find out their HIV status. Population-based surveys show that very few women even know that HIV can be passed from mother to child in many badly affected countries, let alone that it can be prevented. This means that many women have not thought at all about the possible implications of HIV infection for their babies, and are ill-prepared when clinic staff propose tests. Because clinic staff are already overstretched, they are not always able to spend as much time as needed informing women about transmission risks and prevention options before they can even suggest that a woman may want to be tested for HIV. While some countries have managed to provide counselling for all women attending pilot sites, others are struggling to reach that goal. In Zimbabwe, for example, just 29 percent of the first 7,200 pregnant women at the pilot site were pre-test counselled. In Botswana, pre-test counselling reached twice that level, but still fell far short of the ideal of universal test offers (UNICEF data). Various solutions to this problem are being tried, and some are working well. Botswana is investing in a public information campaign to increase knowledge about the possibilities for preventing transmission from mother to child even before a woman comes to the clinic. This should reduce the time taken in pre-test counselling, and increase the proportion of clients who can be fully informed of the benefits of HIV testing and the possibilities for prevention of vertical transmission in those testing positive. Other countries including Brazil, Thailand and Rwanda have used videos, public question and answer sessions and other methods to increase awareness in the community about MTCT programmes before women arrive at antenatal clinics.

The second challenge is overcoming reluctance to be tested, reluctance that may be driven in large part by a fear of stigma and social rejection in women who think they may test positive. This reluctance is by no means universal, but is common in many settings. It is expressed in two ways. Women may refuse to be tested at all -- over half of the women pre-test counselled in Botswana and Kenya made this choice (UNICEF data, Nduati 2001) Others agree to be tested, but then don't come back for the test results. Just over half the women tested in Kenya decided they would rather not find out whether or not they were infected, even if it meant potentially giving up the opportunity to reduce the risk of HIV infection in their child (Nduati 2001). The experience in Côte d'Ivoire suggests that women who think they may be HIV-infected are less likely than other women to come back for their test results. In Abidjan, four out of five women counselled agreed to be tested for HIV, but only 60 percent of those who tested positive ever came back for their results, compared with 71 percent of those who tested negative.

This reluctance to know one's HIV status may be reduced as women and men in the general population learn more about preventing HIV infection in infants. In relatively well-informed South Africa, over nine in 10 women agreed to HIV testing and almost all came back for their results, regardless of their HIV status. This suggests that public information campaigns would

probably help reduce reluctance to be tested. An investigation of refusal in Kenya suggested that many women refused to be tested because they were afraid of their partner's reaction if they tested positive. But the same study showed that women who did share their results with their partners were generally supported. Indeed women who informed their partners were significantly more likely to comply with antiretroviral therapy than those who didn't share information about their status (Kiarie, 2001). The impact of public information campaigns has not been measured, but it is possible that they will give women an opportunity to discuss HIV and potential prevention options with their partners before arriving at a clinic, reducing anxiety about partner reaction. Dropout between testing and notification of results may be reduced by the introduction of rapid tests. A Nairobi study comparing return rates among pregnant women randomised to receive rapid tests – which yield results after around 30 minutes -- or standard ELISA tests with results available after one week – found that 95 percent of women with rapid tests got their results (including all but two of the HIV positive women). A third of the women asked to come back a week later failed to do so, and only half of those testing positive in that group learned of their status (Malonza 2001).

Once women know their HIV status, another series of challenges begins. For these programmes to be most effective in preventing HIV infection in infants born to HIV positive mothers, infected women must receive the correct drugs and take the whole course prescribed, and they must avoid breastfeeding. The difficulties of providing women with the correct drugs at the right time – a problem encountered in early pilot programmes using the AZT regimen first tested in Thailand – are rapidly being overcome. There are indications that AZT can in fact be given later in pregnancy than first thought, and in what is probably the most practical regimen for sub-Saharan Africa, Nevirapine can be given in a single dose at the onset of labour. Avoiding breastfeeding may prove more intractable: the issue is discussed below.

In summary, early pilot programmes reached fewer women with the whole spectrum of intervention – pre-test counselling, testing, test results imparted in post-test counselling, a full course of antiretroviral therapy and safe replacement feeding – than planned. This is hardly surprising, since no experience of providing similar programmes in developing countries previously existed. Lessons are being learned that may help cut the proportion of women dropping out at each successive phase of the intervention, and some countries have already begun taking these programmes to a much larger scale (Kanshana et al, 2000). There is also a clear recognition now that PMTCT offers a unique entry point for primary prevention, care and support for the mother, her child and family.

The breastfeeding question

As mentioned earlier, about 10 to 20 percent of infants contract the virus through breastmilk if breastfed for two years. The risks of HIV infection have to be compared with the risks of illness and death faced by infants who are not breastfed. Breastfeeding provides protection from death due to diarrhoea and respiratory and other infections, particularly in the first months of life. During the first two months, a child receiving replacement feeding is nearly six times more likely to die from these infectious diseases, compared to a breastfed child (WHO, 2000) [ADD SOURCE. WHO. THE LANCET VOLUME 355 5 FEB. 2000, P 451-455] Breastfeeding also provides complete nutrition, immune factors and the stimulation necessary for good development, and it contributes to birth spacing.

To decrease the risk of HIV infection in breastfeeding infants UNICEF recommends:

- Shorten the duration of breastfeeding. The longer a child is breastfed by an HIV-infected mother, the higher the child's risk of HIV infection. Infants who breastfeed for six months face about one third the risk of infection of children who breastfeed for two years.
- Breastfeed exclusively in the early months. A study done in Durban, South Africa showed that exclusive breastfeeding for at least the first three months of life resulted in a lower risk of mother to child transmission than when mothers both breastfed and gave other milk foods, juices or water.
- Prevent and treat breast problems. Cracked nipples, mastitis and other forms of breast inflammation increase the risk of HIV transmission.
- Prevent HIV infection during breastfeeding. Viral load is higher shortly after infection with HIV and when AIDS develops. Consequently, if a mother is breastfeeding during these periods, it may increase an infant's risk of HIV infection via breastfeeding. Preventing HIV infection in breastfeeding mothers is therefore particularly important.
- Treat sores or thrush in the infant's mouth early. Sores in an infant's mouth make it easier for the virus to enter the infant's body.

A panel convened by WHO in October 2000 concluded that HIV-infected women ought to be fully informed of the risks and potential benefits of not breastfeeding their infants in their own socio-economic situation. "The final decision should be the woman's and she should be supported in her choice" (WHO 2000). The panel further recommended that replacement breastfeeding be provided in situations where replacement feeding is feasible, acceptable, affordable, sustainable and safe.

Other effects of MTCT prevention programmes

Experience with MTCT prevention programmes is relatively recent, and much is still unknown. The issue of counselling and HIV testing of pregnant women is a case in point. To increase the reach of programmes aiming to prevent infection of children with HIV, an increase in HIV testing among pregnant women is definitely desirable. Rapid testing definitely increases the proportion of women learning their HIV status, and mandatory testing or routine testing with the right of refusal would probably do so even further. However these options should be approached with some caution. The fact that many women who are tested do not come back for their results suggests that on reflection, they prefer not to know their status. Certainly, women have reported suffering abandonment and worse after telling their partners of a positive result to an HIV test given during antenatal care (Malonza 2001, Temmerman et al. 1995).¹³ Every effort should be made – through legislation as well as public information – to reduce the disincentives to learn one's HIV status. The enthusiasm for saving infants from infection should not, however, be allowed to ride roughshod over the right of a woman to live free from violence.

On the positive side, knowledge of sero-status can have positive effects other than enabling pregnant women to make decisions about their childbearing and infant feeding options. One important benefit is that HIV-negative women can learn more about how to stay that way, while HIV-positive women can be referred to services to provide care and support, where they exist. Referral to family planning services for HIV positive women who want to avoid

¹³ It is telling that staff at some antenatal clinics in West Africa have dubbed rapid testing in an antenatal situation "morte subite" (sudden death), because of the devastating impact learning one is infected with a fatal disease and facing death can have on women whose minds were focused on pregnancy and birth.

future pregnancies can also be provided. Introducing and expanding HIV prevention programmes may prompt health services to rethink the provision of antenatal care in general and lead to an upgrade of services for all women.

If large numbers of people aware of their sero-status find a collective voice, they may demand better services for those infected with HIV. This dynamic has been very much in evidence in Brazil, is seen in Uganda and is now surfacing in South Africa. The most obvious demand will be for care for women whose babies have benefited from HIV prevention programmes among pregnant women. Access to drugs programmes are still limited, but a start has been made. In Uganda, nearly 1,000 people, around half men and half women, have accessed antiretroviral drugs made available under a pilot programme to reduce the price of HIV-related therapy. The cost of a monthly supply of triple therapy had by the end of 2000 dropped to a low of US\$ 112 a month, and dual therapy was half that (Weidle, 2001). These prices are still high, but they are expected to drop further and may soon enter the realm of the imaginable. Prophylaxis for common opportunistic infections such as TB and bacterial infections is greatly more affordable. One autopsy study attributed half of all deaths in HIV-infected adults to preventable diseases such as TB, bacteraemia and toxoplasmosis (Greenberg et al 1998). It is not clear exactly how long prophylaxis and treatment of these conditions will prolong the lives of mothers living with HIV. A newly-published study of TB prophylaxis among HIV-infected adults in Zambia significantly reduced incidence of TB for 2.5 years, but did not reduce mortality (Quigley et al., 2001). And in a longitudinal study in rural Uganda, HIV-infected adults who were regularly screened and treated for a whole host of conditions had no better survival than HIV-infected adults who did not receive these specialised services (Morgan 2000). These findings raise serious questions about the extent to which care other than antiretroviral treatment will prolong life. There are indications, however, that prophylaxis can increase the disease-free portion of adult lives (Quigley et al., 2001). In any case, it is inevitable that pressure to provide treatment to the beneficiaries of MTCT prevention programmes will grow in months and years to come.

Even where care for mothers is provided, and especially where it is not, another demand will surface in consequence of MTCT programmes: the demand for more orphan care. The projections of children orphaned by HIV/AIDS presented below assume that some 30 percent of infants born to HIV-infected mothers will themselves be infected. The majority die by age five. If a child born to an HIV-infected mother is uninfected, there is a very high likelihood that he or she will outlive his mother, and a near certainty, if so, that he or she will be orphaned before the age of 15. Orphan estimates must therefore be raised in proportion to the coverage of successful MTCT programmes, and services must be planned to support the needs of these "extra" vulnerable children.

Successful programmes tend to breed demand. While MTCT prevention programmes guidelines include counselling for HIV positive women about future fertility limitation, it has been suggested that the availability of MTCT prevention programmes will diminish the disincentive to get pregnant in the future among women who know they are infected. This would potentially raise demand for services yet further, and may also discourage condom use, and thus expose sex partners to infection. It should be said that there is little evidence from African studies that knowledge of serostatus has acted as a disincentive to pregnancy in the past. In a study of discordant couples in DR Congo, women who knew they were HIV positive were only slight less likely to become pregnant than women who were HIV negative (Ryder et al., 2000). In an earlier study, most HIV positive women did not choose to protect themselves from pregnancy even after intensive counselling and the provision of free contraceptive services (Badi et al. 1990)

HIV, mothers and children: a summary

We know

- In the absence of interventions, about a third of children born to HIV-infected mothers will be born with HIV or infected through breastfeeding.
- This can be cut by half if women are given appropriate antiretrovirals **or** safe alternatives to breast milk. It can be cut by almost three quarters if women receive both antiretrovirals **and** breast milk substitutes.
- A high proportion of infection through breastfeeding takes place in the earliest months
- Children born with HIV have very high mortality. They are over four times more likely to die by the age of two than children born without HIV. HIV-negative children of infected mothers have no elevated risk of death compared with other HIV-negative children.
- HIV has contributed to a rise or stagnation in under-5 mortality in several countries, but is not the only factor behind these trends.
- HIV-infected children in countries with generalised epidemics die of the same things that kill most other children; they just die faster.
- Effective interventions to reduce transmission to children exist. They pose many challenges, but significant progress is being made to meeting those challenges.

We suspect

- Children infected through breastfeeding have longer survival than children infected at birth.
- Exclusive breastfeeding is safer than mixed feeding for all infants, regardless of their mother's HIV status.

We don't know

- What effect increasing care, including prophylaxis for opportunistic infections, would have on maternal or child survival.

HIV AND ORPHANS

The HIV virus threatens young people with infection and death directly, through their sexual or drug-taking behaviour. And it threatens infants born to HIV-infected mothers. But HIV looms large over the well-being of children in another important way. The lives of children are fundamentally affected by the lives of the adults that surround them. When large numbers of those adults are sick, dying or recently dead, it cannot help but have an impact on the children they care for and interact with. In heavily-affected areas, HIV is responsible for the vast majority of young adult deaths (Boerma 1998). In one area of rural Uganda where HIV prevalence was 16 percent, for example, 73.5 percent of adult deaths could be attributed to HIV infection. Among women ages 15-29 and 30-39, the ages at which women are most likely to be bearing and caring for young children, over eight deaths in 10 were HIV-related. HIV is taking a high toll on many of the adults who shape children's lives. The section on education illustrates, for example, the impact of HIV on teachers and consequently on schooling. But the death of parents must count among the greatest blows to a child's development.

Figures on children orphaned by HIV/AIDS vary widely. This is principally because, until recently, there has been no consensus on who constitutes an orphan. Definitions varied from children who had lost either parent before the age of 18 (which gave a maximum value) to children who have lost both parents and are currently under the age of 15 (which gave a minimum value). Recently, agreement has been reached that for the purposes of estimating the number of children who are “orphaned” because of HIV infection in their parents, the definition will be “any child under the age of 15 who has lost one or both parents to HIV.”

Table 3: Estimated number of children under age 15 orphaned by HIV, 2000

Region	Mother died of AIDS	Father died of AIDS	Both parents died of AIDS	Lost one or both parents to AIDS	Percent of global total
<i>Sub-Saharan Africa</i>	6,278,000	7,770,000	3,576,000	11,035,000	82%
<i>Latin America</i>	56,000	182,000	17,000	225,000	2%
<i>Caribbean</i>	169,000	236,000	66,000	356,000	3%
<i>Asia</i>	492,000	1,434,000	159,000	1,827,000	14%
Total	6,995,000	9,622,000	3,818,000	13,443,000	100%

Many assumptions are made about children orphaned by HIV, but pitifully few of these assumptions can be substantiated with reliable data. Indeed besides the estimates given in Table 3, which are made on the basis of HIV prevalence data and mortality estimates, there is virtually no data at all on orphans directly related to HIV and AIDS. While censuses and surveys do provide some measure of orphaned children, they are almost never able to ascertain the cause of parental death, and therefore not able to distinguish children orphaned by HIV/AIDS from non-AIDS orphans. And indeed from a programmatic point of view it is doubtful whether the distinction is a particularly useful one.

What can be said is that in countries heavily affected by HIV, large numbers of children under the age of 15 are growing up without their biological parents. As Figure 32 shows, a significant number of children have lived through the death of one parent to HIV/AIDS in African countries for which data are available. The death of a mother is rarer than the death of a father.¹⁴

¹⁴ Paternal death is reported more commonly than maternal death for several reasons. Firstly, all-cause mortality is higher in adult men than in adult women. Secondly, men are generally older than their wives, and so liable to die sooner. This effect is compounded by the HIV epidemic. At least in the earlier years of the epidemic, men tended to get infected before their wives, but at older ages. Since survival with HIV decreases markedly with age at infection, men infected with HIV tend to die more quickly than women do. Thirdly, in polygamous societies, the death of one father can affect the children of several mothers.

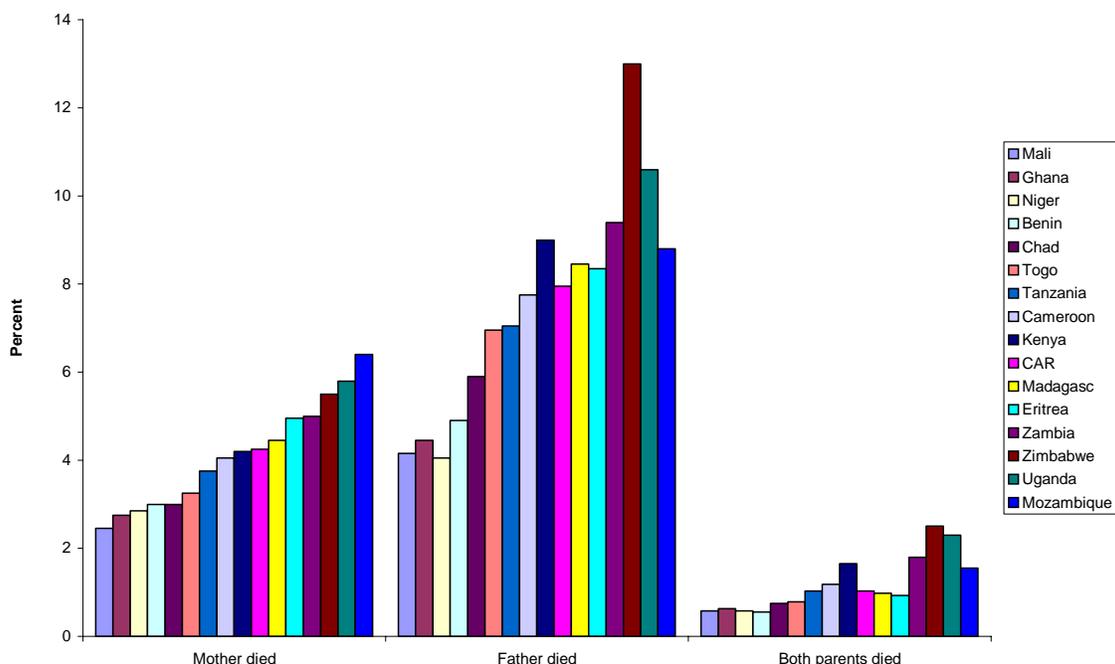


Figure 32: Children aged 0-15 by orphan status, various studies

Source: DHS

This information includes all orphans, regardless of the cause of their parent’s death. In many of these countries HIV comes on top of recent conflict, which kills both human beings and the health systems and other structures that reduce death in the population. It is worth bearing in mind, too, that while adult mortality fell in most sub-Saharan African countries before the advent of AIDS, the fall has for the most part been rather recent, taking place over just the last one or two generations. That means that high adult mortality (and consequent orphanhood) was not uncommon. Since cultural norms and social structures tend to change more slowly than life-prolonging technology, many societies are still structured around a capacity to care for orphans. The extent to which urbanisation, infrastructure development and economic change is eroding, that capacity is hotly debated. But there is no question that the HIV epidemic is testing its limits to the full.

How does becoming and orphan affect children?

Orphans are different from the majority of children because at least one of their parents is dead. But how different are they, and how do those differences shape their lives? Studies undertaken early in the HIV epidemic did not find significant difference in mortality or nutritional status between orphans and non-orphans (Ainsworth and Dayton, 2000). However that may be changing as HIV prevalence rises and the strain imposed by becoming an orphan increases. In 2000, the DHS in Ethiopia found that 22 percent of maternal orphans were severely malnourished, compared with 15 percent of non-orphans. The difference among orphans and non-orphans with moderate malnutrition was far less pronounced (Bicego 2000). And data from Tanzania presented in Figure 33 suggests that infants and children are more likely to die if their mother is already dead. Much, but perhaps not all, of the association is likely to be explained by HIV-related deaths in both mother and child.

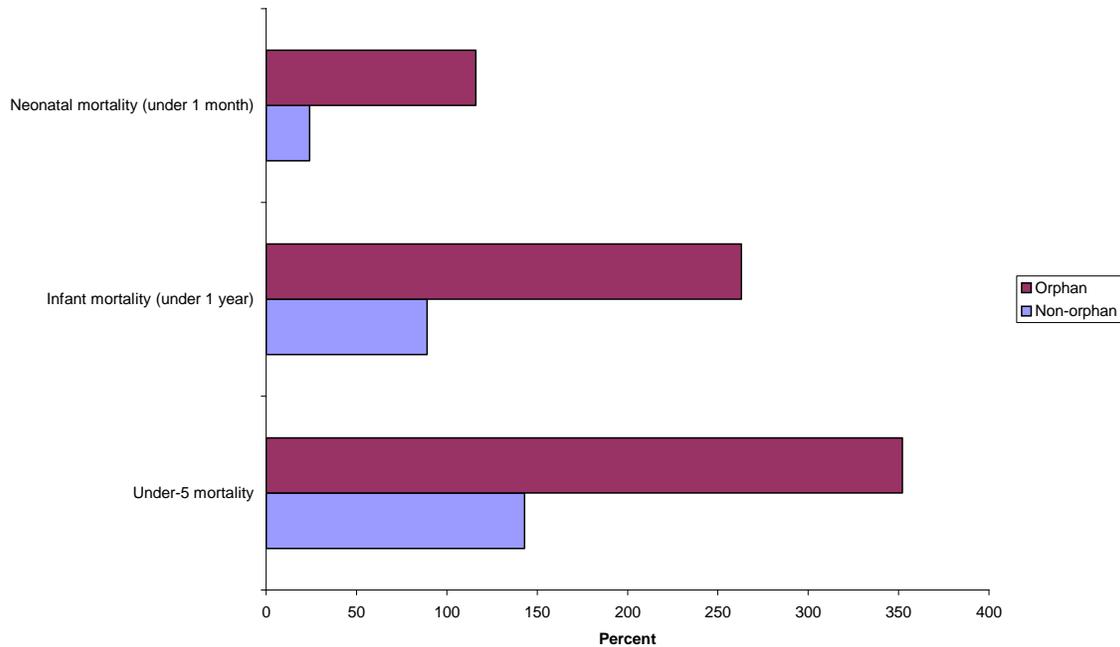


Figure 33: Death per 1,000 live births among non-orphans and maternal orphans, Kwimba District, Tanzania, 1995

Source: *Bicego et al., 1997*

By definition, orphans cannot be living with both of their natural parents. But it is worth noting that living outside the nuclear family is not an unusual experience for children in much of Sub-Saharan Africa and the Caribbean. As Figure shows, high proportions of children who are not orphaned do not live with both their parents, and a substantial proportion live with neither. Interestingly, “foster”-type living arrangements are more common in countries with high HIV prevalence than in other countries, even among non-orphans. In Figure 34, countries are arranged by rising HIV prevalence levels. On the right-hand half of the graph, i.e. the most-affected countries, around a third of all children with two parents alive are not living with both their parents, compared with an average of just over a fifth in less affected countries.¹⁵ In a survey of over 15,000 teenagers across the Caribbean, which rates as the second most affected region of the world in terms of HIV, fewer than half of all respondents lived with both parents, and fully a third lived with only their mothers (WHO 2000).

¹⁵ The observation that HIV prevalence is higher in societies where fostering is common and the nuclear family is relatively weak, raises interesting questions about “connectedness”. Is it possible that more diffuse family structures contribute to behaviours that promote the spread of HIV?

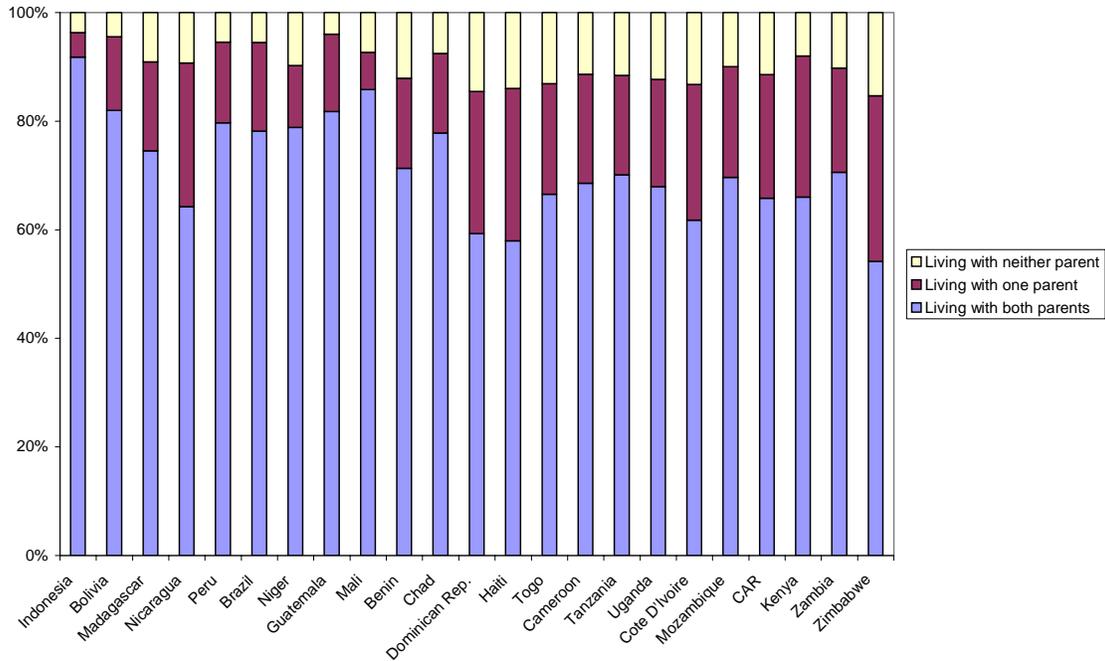


Figure 34: Living arrangements of non-orphaned children aged 0-15, various countries

Source: DHS

In sub-groups of the adolescent population, sometimes including those in school, separation from biological parents is even more common. A school-based study by the government of Botswana recorded that just 39.5 percent of primary school children with both parents alive were living with both parents. Teachers pointed out that even in these cases, it was common for parents to be away for long periods. In the words of one deputy head teacher: “Most children in this school live without parents as parents are away on the lands. So orphans are not that much different.” (Botswana 2000) One of the most commonly cited effects of orphanhood is school dropout, discussed in the section on education, above. This effect has, in fact been little measured. DHS and MICS data are available on school attendance by living arrangements [Figure 35], and have been presented in the past showing that orphans are less likely to be in school than children living with both parents.

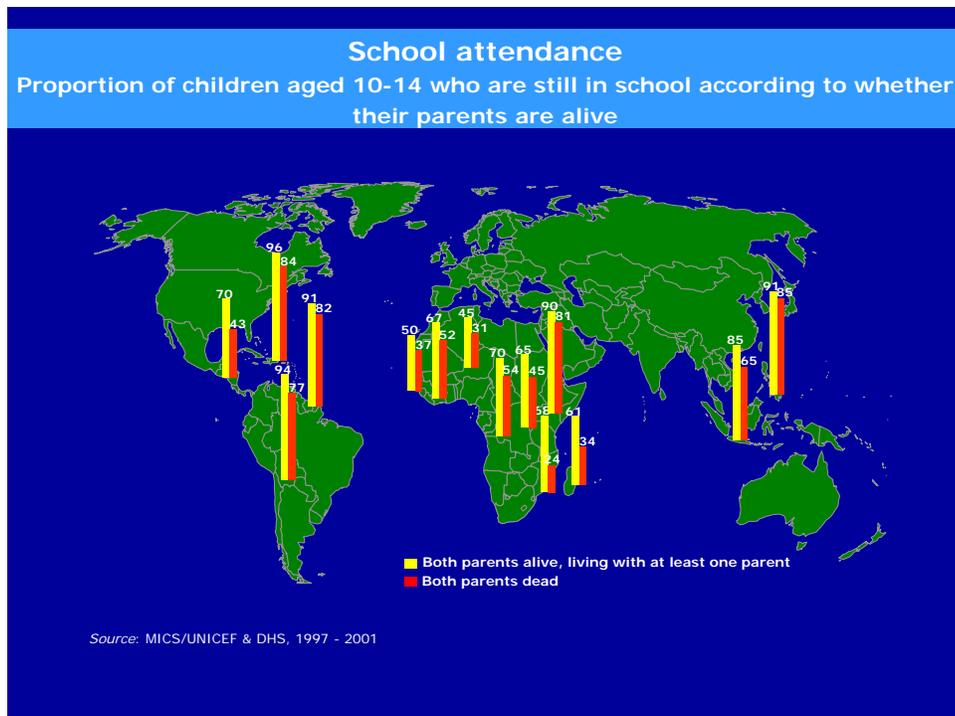


Figure 35: Percentage of orphans and non-orphans in school among 10-14 year-olds, Zambia, 1996/97

Source: DHS data

It is worth noting, however, that these data come from studies of households with at least one resident aged over 15. Therefore, by definition, they only capture children who have, at least to some extent, landed in a social safety net. Widespread anecdotal reports suggest that the number of children slipping through the net entirely and ending up as street children or in households with no resident adult has grown in many countries. However, this has never been reliably quantified, and it is therefore difficult to assess needs and plan responses. More reliable information on the number and distribution of children who have fallen through the social safety net, and on the course they followed before ending up on the streets, is badly needed if effective programmes to support them are to be planned and implemented on a large scale.

Are children orphaned by HIV/AIDS worse off than other orphans?

So little reliable data exist on cause of death that it is virtually impossible to answer this question. It is often said that children orphaned by HIV/AIDS suffer extra discrimination: They are ostracised by relatives and school friends, and are denied access to services by health workers and others. They may spend a long period watching the painful demise of their parents, often without knowing that efforts to help them get better are doomed. Certainly, qualitative studies have described discrimination against children whose parents have died of AIDS. But these studies are rarely able to compare the experience of children orphaned by HIV/AIDS with children who have seen their parents die of other causes. Death by violence, in conflict, genocide or even within the home is unacceptably common in many countries, and it is possible that witnessing such a death would be as traumatic for a child as seeing a parent die of AIDS.

There is one major difference between children orphaned by HIV/AIDS and other orphans. Inevitably with any sexually transmitted cause of death, children orphaned by HIV/AIDS are more likely than other orphans to lose both parents, often within a relatively short space of time. Trends in double orphanhood provide a robust indication of trends in HIV-related mortality. As Figure 36 shows, double orphanhood has grown substantially in Zimbabwe, where adult HIV prevalence was around 25 percent at the time of the most recent survey. Kenya, with 14 percent infection and Tanzania with eight percent saw proportionately smaller rises in double orphanhood. The loss of both parents is probably more prejudicial to the welfare of a child than the death of a single parent.

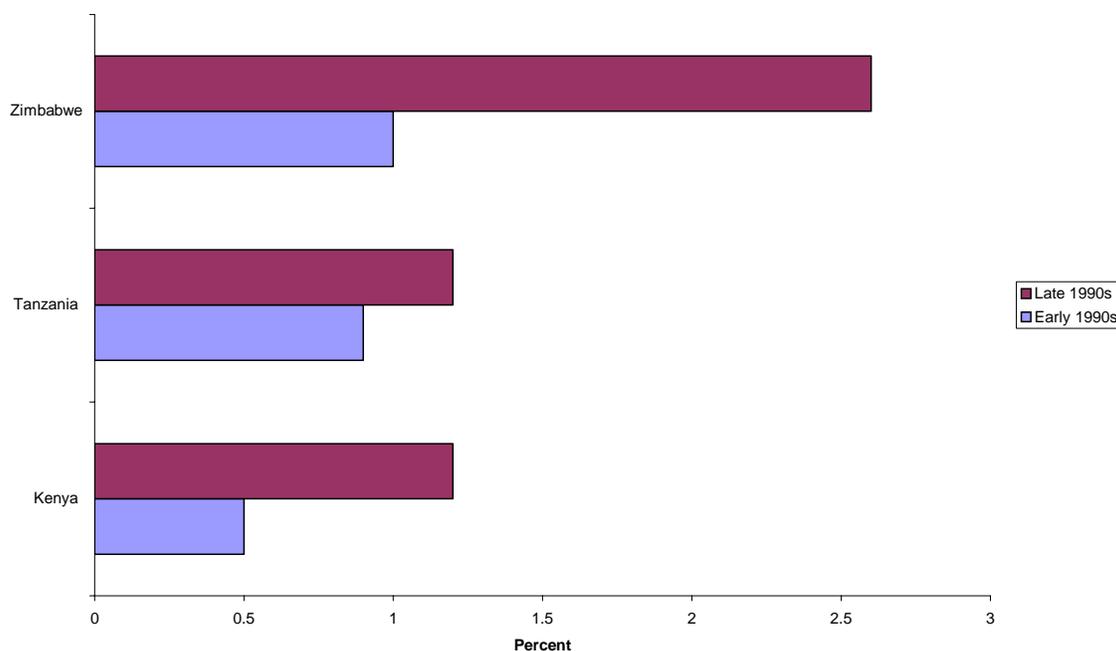


Figure 36: Trends in double orphanhood in the 1990s, various countries

Source: DHS data, analysis Bicego 2000¹⁶

Once again, however, this is difficult to discern from available data. For example, there is no significant difference in school attendance rates among 10-14 year-olds if they have lost both parents or just one in either Uganda or Zambia (DHS data, author's analysis). Double orphans may, however, be significantly more likely than single orphans to be in households headed by a child under the age of 15, to be in an institution or boarding school, or to have drifted onto the streets. In all of these cases, the children in question will have been excluded from the DHS samples. In a study in Botswana, orphans who had lost both of their parents were significantly more likely to stop attending primary and junior secondary school on a temporary basis than children who had lost neither parent.

Another factor prejudicing prospects for orphans may also be at play. Many more orphans are being absorbed into rural than into urban households, and this is especially true of double orphans. Households in rural Zimbabwe have taken in 53,000 double orphans since 1995, twice as many as were absorbed by urban households. In Kenya the effect is more

¹⁶ Zimbabwe data are for 1994 and 1999, Tanzania for 1991 and 1999, and Kenya for 1993 and 1998

dramatic yet. While rural households have somehow found a way to cope with an additional 75,000 double orphans over the last five years, the number of double orphans in urban households has actually decreased by about 4000 children (Bicego 2000). Since children in rural areas generally have less access to schooling, health services or the media, this has implications for both the development of orphaned children and for their access to information and services that could help them prevent HIV.

Without any clear indication that children orphaned by HIV/AIDS have different needs than other orphans, and without any practical way of distinguishing the two, there seems to be little justification for "AIDS exceptionalism". In other words, there is no reason that children in need who have lost their parents for other reasons should receive any less support than children whose parents died of AIDS. The key phrase is, perhaps, "children in need". The absorptive capacity of the family and the community is by no means infinite, and it will almost certainly be eroded further as the HIV epidemic progresses. But it remains true that many children who have lost one or both parents are cared for adequately within existing structures, and have needs that do not differ substantially from those of children whose parents are both alive. An orphan registration exercise in Botswana completed in November 1999, for example, found that only half of the orphans registered were in need of some kind of material support (Botswana 2000).

New analyses of information collected at an earlier stage of the epidemic in the Kagera region of Tanzania suggest that households, and the communities that support them, in fact have a remarkable capacity to cope with the rise in adult death brought on by HIV. A large study of rural households surveyed over a period of several years in the early 1990s must lead us to question some of the basic assumptions that tend to be made about what the death of young adults will do to households: Increase the number of households in which grandparents are left caring for young children, force old people to take on agricultural and other tasks to help make up for lost income, undermine the welfare of surviving children, etc. Surprisingly, the Tanzanian study – conducted at a time when HIV prevalence in the Kagera region was in the range of 10-25 percent among young adults in rural and urban areas and HIV had increased young adult mortality by two thirds – found that very few households were composed entirely of old and young people. Even though the sample was chosen to over-represent households with a recent young adult death, fewer than one household in 10 had no surviving member aged between 15 and 50 (Ainsworth and Dayton, 2000).

Community coping mechanisms are much to be admired, and it will be important to develop national policies that support them as much as possible, while providing a safety net for those who are not coping. However, it is important to recognise that there are limits to the capacity of the extended family and other mechanisms to cope in the worst affected countries. In areas where HIV has been responsible for a tripling or more of young adult death and an astronomical rise in the number of orphans, family networks are becoming strained, and community coping mechanisms are threadbare. This is especially true in countries where the majority of families are already struggling to cope with economic meltdown. In Zimbabwe, for example, almost all respondents in a study of AIDS-affected households said it was more difficult than ever to get help in coping with child support and other household needs following the death of a mother. Over half of the urban respondents and over a third of the rural respondents said this was because of the economic pressures brought about by inflation, while over a fifth in both groups said it was because they were already struggling to cope with the fallout of rising sickness and death (Mutangadura 2000). In the high HIV-prevalence district of Kweneg North in Botswana, an orphan registration exercise conducted in mid 2000 found that only 22.1 percent of those registered as caring for

orphans were employed. The rest had no productive employment, and fully 40 percent of them were grandparents or elderly relatives.

It could be argued that child support services will be most effective if they attempt to meet the needs of the children most in need, regardless of their orphanhood status. This approach is likely to include households with long-term adult sickness, and provides an opportunity to support children whose parents are dying of HIV before they actually become orphaned. A survey of over 6,500 households in Kenya which identified vulnerable households as those in which a child had lost either parent, or where a person aged 15-49 had been chronically ill and incapacitated for at least three of the preceding 12 months, found that between eight and 16 percent of households fell into this category in different parts of the country. The exception was Busia district, where the HIV epidemic has been longest established. Here, up to a third of all households qualified as vulnerable. In almost all areas, at least twice as many vulnerable households were headed by women as headed by men (Dickerson 2000). Not all of these households will necessarily need external assistance. But since 97.4 percent of the households currently fostering orphans report no assistance at all, it would be surprising if even the most acute needs are being met.

HIV and orphans: a summary

We know

- Virtually nothing specific to children orphaned by HIV/AIDS, and little about orphans in general.
- By definition, children orphaned by HIV/AIDS must be more likely to have lost both parents than children orphaned by any diseases which is not transmitted between mother and father.
- Huge numbers of orphans have been taken in by households in the countries worst affected by HIV. They are particularly likely to be taken in by rural households.
- Standardised household-based surveys probably underestimate orphanhood (and certainly underestimate its worst effects) because they exclude child-headed households, vagrants and institutionalised children.
- High proportions of children who are not orphaned live in households without either parent, and this is especially common in countries badly affected with HIV.

We suspect

- Children orphaned by HIV/AIDS may be subject to greater discrimination than other orphans
- Orphans may be especially vulnerable to sexual and other forms of abuse

There is no evidence that

- Orphans drop out of school more than non-orphans of the same age in countries with high prevalence HIV epidemics.
- Orphaned girls are more likely to drop out of school than orphaned boys.

BUILDING A MORE SUCCESSFUL RESPONSE

A review of specific prevention and care interventions is beyond the scope of this paper. However a few general observations can be made about the likelihood of success of different prevention approaches from an epidemiological point of view.

The right intervention on the right scale

The most important point is that the impact of any intervention is directly related to the level of HIV in a population. The higher the background HIV prevalence, the greater the level of safe behaviour needed just to keep prevalence static. This is because the chances of encountering an infected partner are so much greater. As an illustration, take the two extremes of the prevalence spectrum in Africa. In Botswana, 35.8 percent of adults are infected with HIV. In other words, a young person picking a new sex partner at random faces a one in three chance that the partner is infected with HIV. In Madagascar, on the other hand, adult prevalence is 0.15 percent. If a person in Madagascar never uses a condom with a new partner at all, the probability is that they can have sex with 690 people before having unprotected sex with an infected partner. In Botswana, you would have to use a condom properly 99.58 percent of the time to reduce your risk of infection to the same level as if you never used a condom at all in Madagascar.

Of course the example is an artificial one, since people do not pick their partners at random, and different partner types carry different levels of risk. But it serves to illustrate the massive levels of safe behaviour that must be achieved if there is to be any hope of making a dent in very high prevalence epidemics. In research terms, a peer education programme that reaches 600 schoolgirls and measures an 80 percent increase in negotiation skills may be considered a triumph. In programming terms, a project that reaches 20 percent of school-aged children and manages to increase condom use at first sex from four to 25 percent might look like a success. In epidemic terms, either of these approaches in a high prevalence epidemic amounts to putting a small speed bump in front of a juggernaut. In high prevalence generalised epidemics, very high coverage of interventions with measurable (if imperfect) results will have more impact than high-quality, small-scale interventions.

The right “target group” at the right time

Much has been said about the effectiveness and cost-effectiveness of targeted interventions. It is argued that in a “resource constrained environment” it is best to spend HIV prevention money trying to change the behaviour of those people who have the highest number of partners. This argument holds true in some situations. Firstly, this prevention approach will only have an impact in epidemic terms if the majority of those partners are uninfected. Secondly, it only makes sense where effective behaviour change in this group is practically achievable. Thirdly, and most importantly, it makes most sense where these identifiable and reachable groups comprise the majority of those engaging in risk behaviour in a population. Once HIV is established outside of groups with definable risk behaviour, a lower threshold of risky behaviour in the general population adds up to a greater potential for epidemic spread than very high levels of risk behaviour in a tiny fraction of the population.

The analogy often used by proponents of targeted interventions is a burning house. It is argued that when a house is on fire, it is better to take the fire truck to the house than to give everyone in the city one bucket of water. This makes perfect sense, and applies to HIV

epidemics that are concentrated among drug users, men who have sex with other men, and professional sex workers and their clients. This is an approach that should be regarded as the norm in most industrialised countries as well as Latin America, Asia and the transitional economies of Eastern Europe. Now develop the analogy to fit the reality of high prevalence generalised HIV epidemic. There is one house burning on every block in the north of the city. What to do? A firefighter's answer would be to build a firebreak, to stop the fire leaping from the affected area of the city to other areas. This, too, makes sense in terms of epidemic control. In high prevalence HIV epidemics, small levels of risky sexual behaviour translate into very high risks of HIV infection. The firebreak in this situation is people who are not yet sexually active, and not yet exposed to the risk of infection. If these young men and women can be "ring-fenced" from people who are already infected with HIV, the fire will die out. In other words, in high prevalence HIV epidemics the emphasis for effective prevention must shift from trying to stop infected people from spreading the virus, to trying to keep those who are **not** infected safe from infection.¹⁷ That means one thing: effective promotion of lifelong safe behaviour among young people.

This does not detract from the fact that HIV prevention in concentrated epidemics is most effective when targeted at people who engage in defined high risk behaviour, or people who are at risk of adopting those behaviours. Certainly, universal knowledge about HIV and other STIs, how they are spread and how they can be avoided is an important goal among young people and adults in all countries. But little should be expected of awareness and skills programmes among the general population in terms of impacting the epidemic in countries with concentrated epidemics. Here, the programmes that will have an impact are those that provide prevention skills and services on a large scale within the community most at risk. These include programmes to keep vulnerable children off drugs, needle exchange programmes for addicts and sexual health programmes for men who have sex with men. In concentrated heterosexual epidemics they will also include interventions to sustain safe behaviours among women, to discourage norms of commercial sex among men, and to promote condom use in all non-marital sex.

Sustaining prevention efforts

The HIV epidemic is sometimes described as an international emergency. In some regards, the devastation wrought by HIV is like an earthquake or a famine. The death toll is high and does not spare those who are most able and most economically active. But there are differences. Earthquakes and famines kill a lot of people but runs their course. In addition, they are hard to predict and therefore to plan for. Despite past failures to recognise the potential magnitude of the HIV epidemic, the devastation it wreaks is anything but unpredictable. Risky sexual behaviour turns into infection, infection into chronic illness, chronic illness into death. Death brings with it orphanhood and economic and social burdens for survivors. The longer effective action is delayed, the harder it becomes to change the course of the epidemic. It can now be safely predicted that in the generalised heterosexual epidemics of East and Southern Africa, HIV is here to stay. That fact should be written into the long-term planning of any organisations hoping to make a contribution to slowing down the epidemic and mitigating its consequences.

¹⁷ One of the reasons targeted interventions are so strongly supported by some international institutions is that when cost-effectiveness is calculated with "infections averted" as an outcome, it will always appear more cost effective to work with heavily infected populations. But without risk behaviour there can be no infections. If "risk averted" is used as an outcome measure, interventions aiming to keep uninfected populations uninfected become equally cost effective.

The experience of gay men in the United States illustrates the critical importance of sustaining HIV prevention efforts. In San Francisco, where HIV prevalence among gay men is, at 30 percent, equivalent to HIV prevalence among adults in the worst affected countries of Africa, the important prevention gains of the 1980s and early 1990s are being reversed. Indicators of risky sexual behaviour are on the rise, and they are confirmed by a rise in physical markers of risk such as rectal gonorrhoea. HIV incidence seems to be rising, too (Page-Shafer et al. 2000). This appears to be at least in part because of complacency associated with the availability of antiretroviral treatment. But it is judged to be in part, too, because a younger cohort of men who became sexually active after the worst of the epidemic was over no longer take the threat of infection very seriously. This “wave” effect, where generations that did not live through periods of visible high mortality relapse into the dangerous behavioural patterns that first prompted the epidemic spread of HIV, is a real medium-term possibility in high prevalence heterosexual epidemics also.

Targeting care and support

From a rights perspective, the idea of targeting care may seem anomalous. From an economic point of view it is probably inevitable, and from an epidemiological point of view it may well be desirable. Support services are likely to have the greatest impact if targeted at those least able to support themselves. Care services, on the other hand, will have the greatest impact if they reach those whose survival will most benefit the potential casualties of the epidemic. Helping young mothers to stay alive, healthy and productive for long enough to raise, care for and educate their children may do much to mitigate the damaging effects of their eventual death, for example. This is likely to be a contentious issue, and no data are currently available to support policy decisions in this area.

Social and institutional determination

Overall, the story of HIV is a story of collective failure. Individuals, governments, religious organisations and development organisations have all failed to confront the epidemic in any significant way.

To an extent this is understandable. Why deal with unpleasant topics that bring societies face to face with their hypocrisy when there are plenty of other development challenges still to meet?

In most people’s vocabulary, HIV remains an unpleasant topic. In public rhetoric, we say it is about development, poverty and gender relations. But in truth, it is largely about lust, sex and addiction. These topics do not inspire people to put money in envelopes the way dewy-eyed children in need of a village well do. And they do not make for smooth relationships with governments. A great deal can be done in human terms without upsetting the status quo. The prevention of HIV transmission to infants, a clean blood supply, drugs for infected individuals and care for orphans are intervention areas that have the advantage of being uncontroversial and politically acceptable. “Awareness creation” does not generally raise too many hackles. All of these are important intervention areas. But let it be absolutely clear: interventions in these areas will do very little to alter the course of the HIV epidemic. Individuals and organisations truly committed to reducing HIV transmission globally have to be prepared to provide young people with the skills and the means to explore their brains and their bodies safely. In Africa and the Caribbean, the immediate priorities are condoms, condoms and more condoms. Breaking the chain of transmission in high prevalence epidemics means reducing age mixing or ensuring that those condoms get used in the

highest risk encounters, in other words taking on the older men who infect young women, and the older women who turn a blind eye to this behaviour. In much of Asia it means reducing norms of commercial sex and providing the means to ensure that any changes in currently rather low levels of sexual networking in the general population are accompanied by universal condom use outside of marriage. In Latin America and parts of the Mediterranean Crescent it means reaching out to young men who are attracted to other men, and providing them with the information and skills they need to stay safe when they start having sex. And in Eastern Europe and Asia it means helping young people to stay off drugs, and helping those who do become addicted to take drugs safely. These areas are all politically unpalatable, and no single organisation has the skills or the political underpinning to take them all on. But no organisation that does not take on at least some of these areas can legitimately claim to be doing anything serious to roll back the HIV epidemic.

Building a more successful response: a summary

We know

- As HIV prevalence rises, the same amount of “successful” prevention produces less impact
- In high prevalence HIV epidemics, a few moderately successful interventions implemented on a massive scale will have more impact than scattered pilot projects, no matter how successful these may be individually
- In concentrated epidemics, prevention is most effective when serving the needs of people who practice or are at risk of practicing high-risk behaviours.
- HIV is a problem for the long haul, and prevention efforts must be sustained over time
- HIV is a messy and politically sensitive issue. It will not be possible to have an impact on the epidemic without helping young people to have sex safely, and to avoid risky drug taking. This cannot be done without upsetting governments, religious leaders and those parts of society who would prefer to close their eyes to the sex and drug-taking that exists in almost every culture

GOALS FOR THE FUTURE

At the United Nations Special Session on HIV/AIDS (July 2001) countries committed to a number of specific goals to fight against HIV/AIDS (see Box). Many of these goals were reconfirmed at the United Nations Special Session on Children (May 2002), and outlined in the outcome document *A World Fit for Children*.

All of these goals are ambitious. In Sub-Saharan Africa, where the bulk of the women at risk of bearing an HIV-infected child live, around two thirds of women have access to some antenatal care and 42 percent of births are attended by trained personnel (WHO, UNICEF data). Success in offering counseling and in providing antiretrovirals in existing MTCT pilot sites was described earlier in this paper. Rates were variable even in well-funded pilot clinics in which implementation is carefully overseen. It will certainly be a stretch to exceed these levels if these pilot programmes are scaled up to a national level. There are precedents for successful scale-up in developing countries. Following the success of a pilot MTCT site in Thailand, the Ministry of Public Health in 1998 decided to expand the service to all 89 public hospitals in seven north-eastern provinces of Thailand. Almost all women had antenatal care, and 62 percent of the women had HIV test results available at delivery. Of those who tested

HIV positive, nearly two thirds received antiretroviral drugs. This was all achieved within the first year of scale-up (Kanshana et al., 2000).¹⁸

BOX 2: Selected child and adolescent goals agreed upon in The Declaration of Commitment of the United Nations Special Session on HIV/AIDS, July 2001

- By 2003, establish time-bound national targets to achieve the internationally agreed global prevention goal to reduce by 2005 HIV prevalence among young men and women aged 15 to 24 in the most affected countries by 25 per cent and by 25 per cent globally by 2010, and intensify efforts to achieve these targets as well as to challenge gender stereotypes and attitudes, and gender inequalities in relation to HIV/AIDS, encouraging the active involvement of men and boys;
- By 2005, ensure that at least 90 per cent, and by 2010 at least 95 per cent, of young men and women aged 15 to 24 have access to the information, education (including peer education and youth-specific HIV education) and services necessary to develop the life skills required to reduce their vulnerability to HIV infection, in full partnership with young persons, parents, families, educators and health care providers;
- By 2005, reduce the proportion of infants infected with HIV by 20 per cent, and by 50 per cent by 2010, by ensuring that 80 per cent of pregnant women accessing antenatal care have information, counseling and other HIV-prevention services available to them, increasing the availability of and providing access for HIV-infected women and babies to effective treatment to reduce parent-to-child transmission of HIV, as well as through effective interventions for HIV-infected women, including voluntary and confidential counseling and testing, access to treatment, especially anti-retroviral therapy and, where appropriate, breast-milk substitutes and the provision of a continuum of care;
- By 2005, develop and make significant progress in implementing comprehensive care strategies to: strengthen family and community-based care, including that provided by the informal sector, and health care systems to provide and monitor treatment to people living with HIV/AIDS, including infected children, and to support individuals, households, families and communities affected by HIV/AIDS; and improve the capacity and working conditions of health care personnel, and the effectiveness of supply systems, financing plans and referral mechanisms required to provide access to affordable medicines, including anti-retroviral drugs, diagnostics and related technologies, as well as quality medical, palliative and psychosocial care;
- By 2003, develop and by 2005 implement, national policies and strategies to build and strengthen government, family and community capacities to provide a supportive environment for orphans and girls and boys infected and affected by HIV/AIDS, including by providing appropriate counseling and psychosocial support, ensuring their enrolment in school and access to shelter, good nutrition and health and social services on an equal basis with other children; and protect orphans and vulnerable children from all forms of abuse, violence, exploitation, discrimination, trafficking and loss of inheritance.

The prevention goal is interesting. The real goal is of course to reduce new infections in young people, rather than to reduce current infections in pregnant young women. But incidence is virtually impossible to measure. Because biases associated with death and reduced fertility are smaller in younger women than in older women, prevalence (or the proportion infected at a given point in time) is often considered a proxy for incidence (the proportion newly infected over the last year) in the 15-24 year-old age group. But this measure has biases of its own. Pregnancy and HIV infection can both result from

¹⁸ HIV prevalence among tested women was 0.9 percent. The challenges of providing antiretroviral drugs will be greater in situations where up to 30 times that many pregnant women are infected with HIV.

unprotected sex, just like HIV does. This means that women who are pregnant are more likely to be HIV-infected than women who are not pregnant, at least at the youngest ages.¹⁹ It also means that important changes in the risk of HIV infection may not be captured. This is because women who abstain or use condoms consistently to avoid HIV will not get pregnant and will never be included in the denominator of the indicator. Indeed it is quite possible that HIV prevalence rates among teenage women who get pregnant will rise or stay stable, while HIV prevalence among all teenage women is falling. The only way around this problem would be to include regular (perhaps five-yearly) population-based HIV surveys in the surveillance system.

Another problem with prevalence-based measures for HIV -- as for any incurable condition -- is that they are cumulative. Someone who was infected at age 16 will still be in the numerator five years later and beyond. This means that these measures are slow to reflect recent changes in risk behaviour. In fact, using HIV prevalence data by single year of age recorded in rural Zimbabwe and shown on page 52, it can be estimated that a halving of new infections at each age over a five year period would result in HIV prevalence among 15-24 year-olds falling by just 12 percent (author's analysis, using data from Gregson 2001). Indeed to produce a 50 percent fall in HIV prevalence over a five-year period, new infections at each age would have to fall by 97 percent over a five-year period. In other words, transmission would need virtually to stop overnight. The likelihood of this happening is, frankly, nil. Because small amounts of risky behaviour carry a high likelihood of infection in high HIV-prevalence epidemics, the goal of reducing HIV infection by 50 percent among pregnant 15-24 year-old women will be extraordinarily hard to reach. A goal expressed in terms of incidence would be easier to reach, but harder to measure, even in high prevalence epidemics, because it would make so little difference to the prevalence rate. In the case of rural Zimbabwe, a 25 percent fall in new infections over five years would cut prevalence in 15-24 year olds from its current level of 15.7 percent to a new level of 14.9 by 2005. While this may be easier to achieve, it would be hard to measure with any degree of statistical confidence, quite apart from having a limited impact on the epidemic as a whole.

As if these difficulties were not enough, there is another important limitation to using prevalence as a measure of prevention success. Since prevalence is determined by the number of people who become infected and the length of time they stay alive, both prevention and care programmes will have an effect on HIV prevalence rates. The problem is, they work in different directions. If care programmes are successful in increasing healthy lifespans, they will drive HIV prevalence upwards. So without a host of other measures, it will be difficult to tell if rising prevalence reflects prevention failures, care successes, or a mixture of both. This difficulty is less pronounced when prevalence is measured only among 15-25 year-olds, since the majority of HIV-related deaths occur after the age of 25, even among women.

This is assuming HIV prevalence in this age group is being measured. In many countries it is not. What's more, in many countries prevalence in this group is already believed to be low, and prevention success will amount to keeping it that way, rather than cutting it. In a recent meeting of health ministers from Latin American and the

¹⁹ At later ages this association changes, for two reasons. Firstly, virtually everyone at later ages is sexually active, so unless they use contraceptives, everyone is equally exposed to pregnancy. Secondly, women who are HIV-infected become progressively less likely to become pregnant, so HIV infection rates among pregnant women at older ages tend to underestimate rather than over estimate infection among women of the same age in the general population.

Caribbean, it was suggested that goals should be set that measure intermediate prevention success such as the prevalence of safe behaviours. These may include measures of life skills and safe sexual behaviour such as abstinence and condom use.

Needless to say, goals differ from targets, and are often set at levels that are practically unattainable, just to stimulate action. Those engaging to work seriously in this field might, however, think twice before setting goals that cannot even be reached technically. There is a danger that external commitment to fighting the HIV epidemic will be eroded if evaluation of progress towards stated goals shows one dismal failure after another. More modest but realistic targets might be more effective in maintaining support for those engaged in this difficult area.

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