

and threaten populations in poor and wealthy countries alike.

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Back to basics in HIV prevention: focus on exposure

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Despite worldwide efforts to prevent HIV infection, the number of people affected continues to rise. The authors of this article argue that a commonsense approach based on simple country by country analyses could improve the situation

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Every year, the United Nations releases new estimates of the number of people living with HIV infection. Despite 20 years of experience with prevention programmes, this number continues to rise. To date, around 60 million people have been infected with this preventable, fatal viral infection—a sad indictment of the world’s prevention efforts so far.¹

Why have we not done better? Some people suggest that we have focused too much on the behaviours that spread the virus, rather than on the social and economic conditions that promote such behaviours.² We believe, rather, that many countries are failing because they are not paying enough attention to who is becoming infected and how. Plans for prevention are often built on broad categorisations of type of epidemic rather than on a careful analysis of where new infections are occurring.

Countries do need to tackle the structural factors that support risky behaviour. Structural change takes time, however, so even this work must be focused on the factors that are most likely to enable people in a particular country to reduce their exposure to HIV. Almost all new HIV infections occur when an infected person shares body fluids with an uninfected person, so prevention programmes must focus on situations in which this is happening.³⁻⁴ This should be obvious, but many countries are being sold “off the peg” prevention packages based on arbitrary numerical thresholds: “If HIV is over

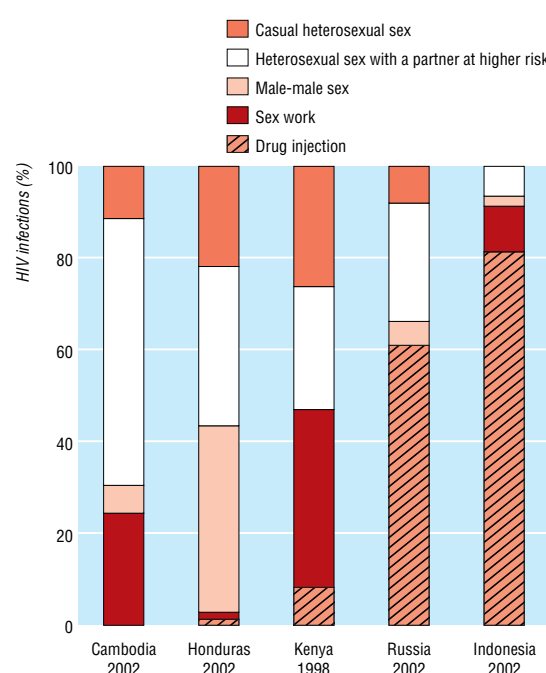


Fig 1 Distribution of new HIV infections by type of exposure in selected countries, 1998-2002. Data on behaviour and HIV prevalence drawn from references 7-17

1% in pregnant women, do this; if not, do that.” This approach is no substitute for careful analysis of patterns of transmission within a country, and such analysis is rarely undertaken.^{5,6} Indeed, many countries do not even collect the information they need to determine which behaviours are responsible for most new HIV infections. We believe that relatively simple analyses can highlight the differences in categories of exposure between prevalent and incident cases of HIV, can point to important shifts in patterns of transmission, and can in turn lead to better prevention programming.

Methods

We examined current levels and trends in patterns of prevalence and incidence of HIV in five countries that differ by level, category, and age of epidemic: Cambodia, Indonesia, Honduras, Russia, and Kenya. We obtained information on prevalence of HIV and sexually transmitted infections from recent surveys completed in the five countries.⁷⁻¹⁷ The description of the analytical approaches and the software used for the analyses presented here are available at www.epidem.org.

Results

Incidence by category of exposure (fig 1) varied widely between countries, including countries considered to have the same “type” of epidemic, defined as low level, concentrated, or generalised. Kenya, Cambodia, and Honduras are all classified as having generalised epidemics, with a prevalence of HIV infection over 1% in the adult population. Cambodia and Honduras have similar levels of adult prevalence—2.7% and 1.6%.¹⁸ The three countries have very different patterns of exposure, however. Russia and Indonesia have concentrated epidemics, with prevalence in adults below 1%, but again there are clear differences in exposure.

Many countries use prevalence data to guide planning of prevention, but as figure 2 illustrates huge differences can exist between prevalent and incident infections. Whereas drug injection and sex work accounted for roughly the same proportion of existing infections in Indonesia in 2002, a rapidly escalating epidemic of injecting drug use means that unsafe injecting will account for over 75% of new infections in



Fig 2 Distribution of prevalent and incident HIV infections by type of exposure in Indonesia, 2002. Data on behaviour and HIV prevalence drawn from references 10, 11, and 17

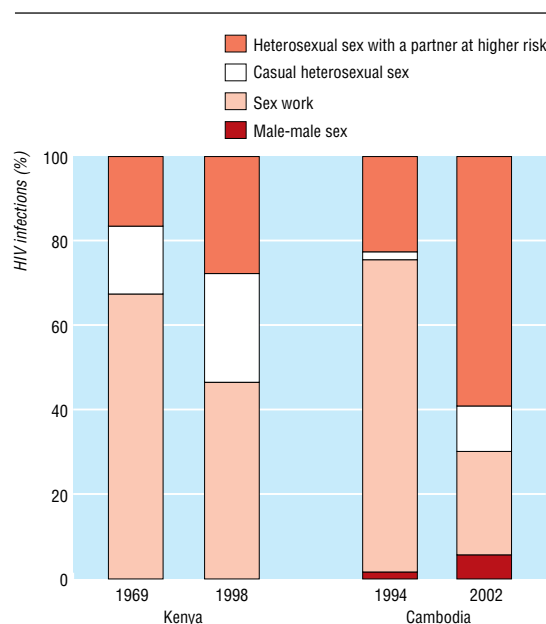


Fig 3 Distribution of new HIV infections by type of exposure, Kenya 1989-98 and Cambodia 1994-2002. Data on behaviour and HIV prevalence drawn from references 8, 9, 15, and 16

2003. Clearly, failure to examine current patterns of incidence can lead to inappropriate prevention efforts.

Current patterns of HIV incidence may differ from current patterns of prevalence but are clearly not independent of them. This is illustrated in figure 3, which shows the changing distribution of transmission in Kenya and Cambodia.

In Cambodia, HIV infection was driven for years by an active sex industry. Prevention efforts focused on decreasing unprotected sex work transactions have been remarkably successful. The proportion of men in mobile occupations buying sex has dropped from 76% to 32% in the past five years, and condom use has doubled to 87% over the same period.⁶ This has had a dramatic impact on the total number of new infections, which plummeted from an estimated 40 000 in 1994 to 6500 in 2002. Because HIV infection acquired through sex work has fallen so radically the proportion of new infections transmitted within marriage has grown from 11% to 46%. Clearly, more attention should now be given to prevention strategies aimed at reducing transmission between spouses who may previously have been exposed to HIV through buying or selling sex, while sustaining existing prevention efforts focused on sex work.

Cambodia is classified as having a “generalised” epidemic, and indeed the current nexus of infection has shifted beyond groups with identifiable “high risk” behaviours; however, the epidemic is not necessarily spreading widely in the general population. People becoming infected are largely those in partnerships in which at least one partner had high risk behaviours in the past. If Cambodia maintains its success in reducing risk in sex work transactions while also cutting into transmission between spouses, HIV prevalence will probably fall to the very low endemic levels recorded in many industrialised nations.

Kenya—another country with a “generalised” epidemic—has had a radically different experience.

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The epidemic was already well advanced by 1989, when national prevalence of HIV in adults was nearly 4%. Prevalence of HIV infection among sex workers in Nairobi at that time was 60-70%.⁸ A substantial proportion of men bought sex, and, as figure 3 shows, as many as two thirds of new HIV infections were among sex workers and their clients. Kenya's prevention programme has increased in variety and scope over the years, but neither the proportion of men buying sex nor the proportion of men and women having sex outside marriage has changed much. Use of condoms at latest sexual intercourse with a non-marital partner had risen from very low levels in 1989 to 42% by 1998, but this has not been sufficient to reduce prevalence dramatically.⁹ The result is that the absolute number of new infections each year more than doubled over the decade in Kenya. The pattern of new infections has changed as the epidemic has evolved, as seen in figure 3, but transmission through commercial sex remains a key factor.

Discussion

Many approaches to the prevention of HIV infection exist. Recently, emphasis has been on altering structural factors such as poverty and sexual inequity that affect people's ability to protect themselves from HIV. In consequence, some public health officials have taken their attention off the virus and the specific behaviours that spread it. Yet an understanding of the dynamics of a country's HIV epidemic, how it changes over time, and who is currently at greatest risk is essential to guiding decisions about effective prevention. Long term structural changes are desirable, but they are often beyond the control of the public health community. In the short term, people planning HIV prevention programmes will make most difference by focusing where most new infections are occurring, while other partners such as religious and political leaders take the lead in changing the social and cultural factors that influence people's sexual and drug taking habits.

This approach should not allow the public health community to shirk responsibility. Indeed, it often means embracing difficulty, inasmuch as the bulk of new infections may, in many countries, be concentrated among some of the most marginalised and politically "untouchable" groups, such as drug injectors and male, female, and transvestite sex workers. We must collect the information we need to track HIV infection and risky behaviour in the populations that may be exposed and use that information to make sensible choices about which prevention efforts are most likely to reduce new infections in a particular country at a particular stage of epidemic.

Clearly, these simple analyses do not provide all the answers needed for a really effective HIV prevention plan at the country level. Like all analyses of national prevalence and incidence, those used here are only as good as the assumptions that inform them. In many cases, relatively few data points are available and these are being applied to very large populations; this is especially problematic for heterogeneous and decentralised countries such as Indonesia and Russia. As surveillance systems improve, however, this type of analysis should be possible at the regional or provincial

Summary points

Patterns of transmission of HIV vary widely between countries

Patterns of transmission also change over time within a single country, partly because of the success or failure of past efforts at prevention

Simple analyses can indicate who is currently being infected and how

Improved biological and behavioural surveillance systems are providing reliable data for input into such analyses in a growing number of countries

A clearer focus on the behaviours that are responsible for most exposure to HIV in a country should lead to more effective prevention efforts

level, and we would strongly encourage such a shift. However, even broad national analyses based on in-country data will provide a sounder basis for national prevention planning than an "off-the-peg" plan based on a simple global characterisation of epidemic type. As HIV surveillance systems expand to include biological and behavioural surveillance and focus more on the populations most likely to contribute to transmission of HIV, more countries can undertake this kind of analysis and act on it.¹⁹

To say that countries cannot begin a sensible assessment of their prevention efforts without a proper analysis of who is becoming infected with HIV and how they were exposed seems almost too obvious, and yet we so rarely undertake this analysis. With five million new HIV infections to shame us over the past year, it is time to stop stating the obvious and to start doing it.

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Public policies and the orphans of AIDS in Africa

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International help to care for Africa's orphans is essential not only for their immediate welfare but also to protect the long term prosperity of these countries. A researcher in child health and former Ugandan government peace minister assess how to make the best use of resources

The AIDS epidemic is wreaking havoc in sub-Saharan Africa. The HIV seroprevalence among young adults is nearly 40% in some countries,¹ and millions of children have lost their parents. Although the extended family can alleviate these children's plight, it is unrealistic to assume that the children can escape from poverty without massive support from agencies such as the World Bank and the United States Agency for International Development. We visited Ethiopia, Malawi, and Tanzania in March 2002 as consultants to the World Bank to assess the ongoing programmes and to suggest strategies for improving child welfare. This article outlines our findings from visiting over 20 non-governmental organisations and national ministries responsible for caring for orphans of AIDS.

Maternal and infant health

Although maternal nutrition, access to antenatal care, and vaccination programmes are important for improving infant health,²⁻⁴ the high prevalence of HIV among women in sub-Saharan Africa is a more urgent problem. The median survival time for HIV positive infants in Rwanda was 12.4 months.⁵ Antiretroviral drugs can reduce transmission from mother to infant, but so far only a tiny proportion of African women in pilot programmes have had access to these drugs.⁶

Several approaches are important for reducing the birth of HIV positive infants. The first is counselling about size of families. Demographic surveys in Ethiopia found that the ideal number of children was 5.6.⁷ However, couples' preferences depend on factors such as the need for children to generate income. When there is a drastic shock, such as parental death, to the households, parental attitudes may change. The five mothers receiving supplemental foods for their infants that we interviewed at the Abebetche Gobena orphanage in Addis Ababa, for example, wanted only



Grandparents (and other relatives) often need help with funding education of orphans

two healthy children. This was presumably a result of clinical staff talking to the mothers about fertility and healthcare issues. The annual cost of caring for an infant in Abebetche Gobena was \$471 (£314); the corresponding costs in Malawi ranged from \$250 to \$1700. These are very high for countries with gross domestic products of \$110-\$250 per capita.⁸

Secondly, the use of condoms has been emphasised in campaigns to reduce HIV transmission.⁹ In situations where women's low negotiating power makes using condoms unfeasible, it is important to provide other methods of contraception, especially if couples have surpassed their fertility goals. Improvements in the quality of family planning services will encourage their use. Recent figures show that the percentages of married women using standard Western family planning methods are 14% in Ethiopia, 45% in Malawi, and 33% in Tanzania.^{7 10 11} These figures are low and would increase with greater investments in the healthcare infrastructure.

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