HIV risk: is it possible to dissuade people from having unsafe sex?

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Abstract

The cumulative number of HIV infections world-wide has reached 60 million in little over 30 years. HIV continues to spread despite detailed understanding of the manner in which it spreads and measures which can prevent spread. Some governments have been highly successful in containing the spread of HIV through blood products and from mother to child and among injecting drug users. Lack of political will, lack of resources or challenges to widely accepted scientific evidence have held back similar interventions in other countries. It has proved much more difficult to reduce the sexual transmission of HIV in both high and low income countries. A wide range of strategies have been identified but it remains unclear which strategies deserve priority and what methods of promoting them have the greatest impact.

There is ample evidence that awareness of HIV and changes in sexual behaviour have occurred widely but the penetration of information remains poor in some vulnerable groups especially adolescents and women in poorer countries. Further obstacles face those in possession of information about risk. The subordinate position of women and desire for large families are important obstacles to condom negotatiation and use. Urbanization, poverty, conflict and declining public services all exacerbate unsafe sexual behaviour. We argue that so-called "structural" interventions directed at these wider contexts of unsafe behaviour merit greater attention. Such approaches have the added benefit of being less susceptible to the phenomenon of

"risk compensation" which has the potential to undermine strategies directed at reducing HIV transmission efficiency.

Key words: HIV, risk, sexual behaviour

1. Introduction

The cumulative number of HIV infections has reached 60 million in about 30 years with no end in sight (UNAIDS, 2002). HIV is transmitted mainly by sex but transmission through blood products, contaminated needles and from mother to child also occurs. In this article we start by examining sources of information about risk. We then examine how this information has been communicated at both individual level and to governments. We will show that widespread and highly effective interventions have resulted in some spheres (e.g. safe blood) whereas in others the impact has been much more limited (e.g. sexual transmission). We then ask if is right to view the continued spread of HIV as a failure of risk communication or whether other factors need to be considered. Finally we speculate whether communication about risk reduction in HIV can sometimes be harmful or wasteful.

2. Main sources of information on HIV risk

Resources have been poured into HIV research on an unprecedented scale, making it possible to describe in nearly every country in the world the prevalence of infection in representative population samples. Regularly updated data on seroprevalence in such groups as antenatal mothers, attenders at sexually transmitted infection clinics, injecting drug users, sex workers, truck drivers and armed forces are available in a great many countries and are collated by UNAIDS. Supplementary information about sexual risk behaviour is regularly captured by large-scale surveys of sexual behaviour, such as the National Surveys of Sexual Attitudes and Lifestyles conducted in the UK in 1990 and 2000 (Johnson *et al.* 1994, 2001) and

Demographic and Health Surveys carried out in 39 African, Asian and Latin American developing countries (United Nations, 2002). These surveys provide important information about the frequency with which people expose themselves to potential risk of infection with HIV and the extent to which they take measures designed for protection such as the use of condoms.

More detailed research has made it possible to estimate with increasing precision the risks associated with specific forms of sexual behaviour (Royce *et al.* 1997) and how these risks are modified by factors such as circumcision status (Weiss, 2000), and the presence of other sexually transmitted infections in either the HIV transmitting carrier or the susceptible recipient (Fleming and Wasserheit, 1999). Recent research has shown that infectivity correlates closely with HIV viral load in the carrier (Quinn *et al.,* 2000) and that levels of virus in genital secretions can rise sharply in the presence of other sexually transmitted infections (Cohen *et al,* 1997).

Information about HIV reaches the public through numerous channels that include government-sponsored national information giving campaigns, efforts of an array of health professionals working in the community and within health-care settings, activities of non-governmental and activist groups, journalists in various media and finally from personal experience. The work of activists has been particularly important in pushing HIV up the political agenda as can be seen in recent efforts to widen access to antiretroviral treatment.

3. Examples of successful risk communication leading to decisive action

The near elimination of HIV transmission through blood products has proved relatively straightforward in richer countries, although conspicuous failures to implement effective safe blood policies have been seen in poorer countries such as China (Shan *et al.*, 2002). Likewise, substantial success in reducing mother-to-child transmission is now feasible through a combination of maternal screening, use of Caesarean section and antiviral therapy in countries which can afford these measures (Brocklehurst and Volmink, 2002). Harm reduction programmes among injecting drug users have delivered impressive results where political

obstacles to their introduction have been surmounted but continuing difficulties in introducing and sustaining such programmes illustrate very clearly how the scientific evidence, however strong *per se*, is often insufficient to change policy (Des Jarlais, 2000).

Possibly the most striking changes in sexual behaviour that have been described in relation to HIV occurred among gay men at a time when the virus had not been identified, when morbidity and deaths were rising rapidly, fear was pervasive and there was growing suspicion that a sexually transmitted infection was involved. Sometimes unplanned events have had spectacular, although generally transient, effects on public awareness, with demand for HIV testing exceeding that seen with planned campaigns. A good example was the public disclosure of basketball star, "Magic" Johnson's HIV status (Kalichman, 1994).

4. An example of failed risk communication at government level

President Mbeki of South Africa, one of the worst hit countries in the world, has yet to be convinced by scientists that AIDS is caused by HIV (Sidley, 2000). His denial of single dose antiviral treatment to HIV infected pregnant mothers is estimated to have caused 35 000 preventable infections in children in 2001 and despite a court order to make treatment available this year, implementation of the order is being obstructed (McGreal, 2002).

5. Sexual transmission of HIV: what information should be communicated?

There are two sharply contrasting approaches to reducing the risk of sexually transmitted HIV. One is to advocate measures that make sex safer, primarily condom use, but also a range of other interventions listed in Box 1. A notable aspect of these interventions is that none of them require the individual to restrict the number of their sexual partners.

Box **1. Interventions to reduce sexual transmission of HIV which do not require restriction of sexual partners**

- Condom promotion
- Adoption of non-penetrative sexual practices
- Treatment for sexually transmitted infections (which enhance HIV transmission)
- Treatment of HIV positive persons with antiviral therapy
- Voluntary testing and counselling for HIV
- Antiviral prophylaxis following exposure to HIV
- Male circumcision
- Vaginal microbicides (in development)
- Vaccines for HIV and other sexually transmitted infections (in development)

The other approach is to advocate delayed onset of sexual activity, mutual monogamy and avoidance of multiple partners and concurrent sexual relationships ("zero grazing"). The successful but contrasting HIV prevention programmes of Thailand and Uganda demonstrate how either of these approaches can deliver impressive results. In Thailand the government has introduced and enforced a 100% condom policy in brothels, which appears to have lowered rates of both HIV and sexually transmitted infections (Rojanapithayakorn and Hanenberg, 1996). In Uganda, strong leadership and an approach focused on openness about HIV, fighting discrimination, delay of sexual activity and reduction in the number of sexual partners has delivered results that compare very favourably with neighbouring countries (USAID, 2002). Condom promotion was opposed in Uganda for religious reasons and, although it forms part of the prevention strategy, it has contributed much less than it has in Thailand.

The relative merits of these two approaches are debated. The first has been the most widely promoted but is theoretically susceptible to compensating behaviours as described below (section 9). The second approach is attracting renewed interest as a result of experience in Uganda and elsewhere (Green, in press). In practice most programmes advocate both approaches, with a heavy bias towards condom promotion

among high-income countries and a stronger emphasis changing sexual behaviour in countries where there is religious opposition to condom promotion.

6. Sexual transmission of HIV: who should be targeted and which risk communication strategies work best?

The groups at highest risk have been identified in many countries. In developing countries they will usually include adolescents, single males working away from home and females wholly or partially dependent on the exchange of sex for day to day living. In high-income countries those at risk are more likely to include injecting drug users, indigenous minorities, migrants from high prevalence countries and homosexual men. While most preventive work targets HIV negative individuals, it has been pointed out that successful targeting of those who are HIV positive would have a disproportionately greater impact (King-Spooner, 1999, Cohen, 2000). So far, this has proved difficult in practice. Important occasions for delivery of messages are at school, prior to engaging in sexual activity, and in health-care settings accessed by the vulnerable populations described above. Although success has been claimed with a wide variety of communication strategies, rigorous, controlled evaluations using valid outcome measures are difficult to design and have rarely been attempted (Yzer, *et al.* 2000). It is often impossible to distinguish between the effects of a strategy and the effects of other unplanned external influences. In the UK, comparison of two national surveys of sexual behaviour conducted 10 years apart (Johnson *et al.* 1994, 2001) shows that rates of condoms use have increased but we have no way of identifying which channels of risk communication had the greatest impact in changing this social norm. Furthermore, while encouraging increases in condom use were reported, other social norms have changed risk in the opposite direction, e.g. an earlier onset of sexual activity and a rise in the numbers of sexual partners was reported in the 2000 survey.

Successful strategies require careful planning and piloting and may not work when transferred to different settings or groups. A recent review describes success with strategies as varied as individual counselling, mass communication and multiple-component motivation and skills education (Elwy *et al.* 2002). The

ways of conveying information to high-risk groups that have attracted most interest have been the use of peer educators and one-to-one counselling.

7. Have we identified reliable and reproducible ways to change human sexual behaviour?

The HIV epidemic has attracted enormous attention by social scientists seeking to induce individuals to adopt less risky patterns of sexual behaviour. Much of this work has been poorly evaluated and no simple, dependable solutions have emerged. It has been relatively easy to demonstrate increases in awareness and knowledge but much more difficult to demonstrate changes in behaviour sufficient to influence HIV transmission and to demonstrate changes in behaviour that can be reliably attributed to a specific intervention. No behavioural intervention trials that demonstrate impact on HIV transmission have been conducted.

A small number of behavioural interventions have examined impact by measuring hard biological endpoints such as incidence of other sexually transmitted infections (STIs). A systematic review of 12 well designed randomised controlled trials of sexual behaviour interventions for HIV/STD prevention in the US and UK showed little evidence of impact (Stephenson *et al*., 2000). A recent trial conducted in the UK showed impact in the wrong direction (Imrie *et al.,* 2001).

It is interesting that the use of incentives, one of the simplest and most reliable approaches to changing human behaviour, has not yet been tested as a means to HIV prevention (Good, 1994) although it has proved feasible in population control. The success of incentive schemes for safe driving (Harano and Hubert, 1974) and occupational safety (McAfee and Winn, 1989) suggest that a voluntary scheme which rewards individuals for staying HIV negative merits consideration. There would be a host of complicated issues of design, monitoring and ethics to resolve before attempting such an intervention. In particular there would be concerns around confidentiality and the management of those who test positive. Great care would be needed to avoid the coercion and human rights abuses that have arisen in population control programmes (Hartmann, 1995).

8. Barriers to changing human sexual behaviour – a historical perspective

The sexual revolution

HIV emerged at a time of "sexual revolution" in many high-income countries, when sexual repression was being replaced by the notion that sexual activity should be enjoyed. Sexual activity and its consequences had never been safer. Maternal mortality had dropped dramatically in affluent countries, sex outside marriage was becoming a social norm in the West, bacterial STIs such as syphilis were now amenable to treatment and state provision of oral contraception and legalized abortion were removing the fear of unwanted pregnancy from millions. Homosexual behaviour was being decriminalized and gay men were fighting back against discrimination. Meanwhile a new culture of heavily commercialized gay sex with high rates of partner change was developing in many large cities.

Denial

When the HIV epidemic emerged in the USA epidemiological studies rapidly identified sexual behaviour and injecting drug use as behavioural risks (Jaffe *et al.,* 1983). The emphasis placed on observations that those sexually infected were mostly homosexual, practising anal sex and reporting large numbers of partners, made it possible for the majority of the population to distance itself physically and psychologically from the infected and to feel free to continue to enjoy the sexual revolution. This psychological response to epidemics has been observed elsewhere and remains important with HIV (Ranger and Slack, 2001).

The appearance of HIV among Haitians, many of whom were marginalized, impoverished immigrants, gave many a further excuse to assume HIV would not affect their own lives. Instead of being viewed as evidence that the infection could spread through heterosexual contact, there was speculation that Haitians owed their susceptibility to "unnatural" behaviours (voodoo?) that made them as susceptible to HIV as

homosexual men and injecting drug users (Garrett, 1995). Haitians were then further stigmatized while denial of risk to heterosexuals continued. This led to the widespread view of HIV infection as something affecting marginalized groups with unacceptable behaviour. Religious groups hostile to the sexual revolution, were quick to interpret HIV as just punishment inflicted on the wicked. Over equivalent time periods the Reagan administration allocated $9 million to investigate a new respiratory infection affecting 29 delegates at a legionnaires' convention, but no more than $1 million for the more lethal HIV which had already claimed 500 victims.

As in the USA, there has been a strong desire to explain away the epidemic and deny risk in Africa and other parts of the developing world. The low profile of homosexuality and injecting drug use in these countries initially made this tempting. When the presence of HIV in Africa became undeniable, conspiracy theories sprang up in many communities, and continue to flourish. Examples include HIV being man-made in a CIA laboratory, condoms being impregnated with HIV, condom promotion being population control through stealth and, more recently, HIV originating from a contaminated oral polio vaccine (Hooper, 1999). Alongside these myths are high levels of denial which continue to exasperate observers of the African epidemic. Such denial results, at government level, in failure to acknowledge the importance of HIV, followed by failure or delay in committing resources to prevention (Ammann, and Nogueira, 2002).

The invisibility of HIV risk

HIV risk has to be taken on trust from scientists, making the credibility of scientists a major issue. Wildly overestimated early projections of HIV/AIDS spread into heterosexual populations in developed countries did little to improve that credibility. When a prominent scientist like Peter Duesberg challenges the view that HIV causes AIDS (Duesberg, 1989) and is supported in his views by a recipient of the Nobel Prize, it is little wonder that this creates uncertainty. For conveying messages, the usefulness of trusted public figures in preference to prestigious scientists and the importance of action over words is exemplified by the tremendous impact of Princess Diana being filmed shaking hands with AIDS patients in 1987 which served both to destigmatize AIDS and to demonstrate that non-sexual contact is safe (Berridge, 1996). For

years counsellors as far away in Uganda were finding this picture a powerful image for explaining that HIV is not transmitted by touch.

Conflicting beliefs

Public understanding of science is limited in all countries and in some cultures alternative belief systems that explain disease in terms of sorcery, punishment for breaking taboos, etc are strong. Some religious groups oppose the use of condoms of but the experience of Uganda mentioned above and the low rates of HIV in most Muslim countries suggest that there are viable alternatives to condom promotion.

Structural factors

The key socio-economic and cultural factors that underlie the intensity of the epidemic in Africa have been characterized as the subordinate position of women, poverty and the decline of social services, urbanization and war (Buvé *et al.* 2002). Many would argue that it will be impossible to control the spread of HIV in sub-Saharan Africa and low income countries without making a determined effort to tackle these issues.

9. Are some risk reduction strategies counterproductive or wasteful?

1. In 1994 Blower and McLean raised the question whether a suboptimal HIV vaccine might result in increased transmission of HIV if lowered risk perception resulted in a disproportionate increase in risk behaviour (Blower and McLean, 1994). The notion of "risk compensation"(Adams, 1995) in which individuals respond to conditions of increased safety with an increased interest in the attractions of risk taking (e.g. driving faster with a seat belt on), has been explored extensively in the arena of road safety and is now supported by a large amount of evidence which is, however, controversial (Wilde, 2002). In 2000 we raised the issue whether sexual health interventions might be susceptible to similar phenomena (Richens *et al.,* 2000). Since then interest in this possibility has grown and examples are given in Box 2.

Box 2. Observed and suggested scenarios for risk compensation in sexual health interventions

Intervention	Compensating behaviours	References

	identified or suggested	
Thick v. thin condoms for anal sex	Breakage rates equal. Lubricant used less with thick condoms	Golombok *et al.,* 2001
Interventions to promote condom use	Increases in number of acts of intercourse. No increases in partners	Pinkerton, 2001
Antiretroviral therapy for HIV positive persons	Increased risk behaviour, increased HIV incidence	Kalichman, 1998, Van-de-Ven *et al.,* 1999, Scheer *et al.,* 2001, Katz *et al.,* 2002
Vaginal microbicides	Increased partners, decreased condom use	McCormack *et al.,* 2001

These examples offer tantalizing hints that behavioural adaptations to health interventions do occur and that closer investigation is needed. Many interventions to control HIV could be undermined by countervailing changes in behaviour. Since the critical risk behaviour for the sexual transmission of HIV is for an HIV-infected person to acquire a new sexual partner, any of the interventions listed in Box 1 could be undermined by behaviour changes, because they may be viewed by the infected or uninfected as making it less dangerous for them to have serial or concurrent sexual relationships.

These observations create difficulties for those charged with lowering HIV transmission risk. To combat HIV by suggesting that less sex is safer than "safe sex" would go strongly against the present climate of sexual freedom and the media portrayal of sex, adventure, excitement and risk-taking as essential ingredients for personal fulfilment. It would raise suspicions that whoever was delivering the message was acting from a moral standpoint. One approach to these difficulties is to develop an integrated response which combines interventions at a structural level (addressing factors such as poverty, education, gender inequality and social unrest) (Sweat and Denison, 1998) with those aimed at the individual. The few highly endemic countries (Uganda, Thailand, Senegal, Zambia) which have successfully reduced the number of new infections of HIV have all used such an approach, combining efforts of the Government with those of

non-Governmental groups such as community development organisations and religious leaders (USAID 2002).

10. Conclusion

The continued spread of HIV despite its highly visible and devastating impact on many societies poses an urgent challenge. Levels of awareness of the virus are generally high in the worst affected countries, yet information and education campaigns are often not resulting in significant risk reduction. We advocate a more critical evaluation of interventions susceptible to risk compensation and a stronger focus on interventions that can be shown to truly reshape individual's willingness to expose themselves to the risks of HIV. Failure to do this may prove wasteful of resources and may lead to further frustration in efforts to control the pandemic of HIV.

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