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REVIEW

HIV and sexual risk behaviors among recognized high-risk groups in Bangladesh: need for a comprehensive prevention program

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Summary
Objective: To examine trends in HIV and related risk behaviors among recognized high-risk groups in Bangladesh, the types and extent of prevention initiatives that have been undertaken, and highlight the immediate needs.
Methods: Journal publications and conference abstracts and proceedings were reviewed. Experts involved in the development and evaluation of current programs or policy were contacted for official reports and policy documents. The trends in sexual risk behaviors over five rounds of national surveillance were tabulated. Gaps in the ongoing prevention interventions have been assessed in the light of the Anderson—May equation.
Results: Periodic surveillance on recognized high-risk groups shows that HIV prevalence has been increasing steadily. In the capital city, HIV prevalence in one subset of a high-risk group is close to the level of a concentrated epidemic (4.9%). The high prevalence of sexual risk behaviors among drug users and sex workers and their clients is alarming. Although a small increase in condom use and a reduction of syphilis have been noted among subsets of high-risk groups in recent years, this is clearly not enough to curb the threat of a possible HIV epidemic.
Conclusion: There is an urgent need for a comprehensive prevention program that should include more efforts on education and condom promotion, effective management of all sexually transmitted infections, a screening program for migrant workers, the continuation of both behavioral and serological components of HIV surveillance, and the expansion of surveillance to cover the remaining high-risk groups, with due consideration to the consistency of surveillance indicators.

Introduction

Bangladesh is considered to be at risk for a large-scale HIV epidemic because of the variety and gravity of risk factors for

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the spread of HIV. Since detection of the first case in 1989, the prevalence of HIV positive cases has increased steadily. Although the exact number of HIV cases is not known, the last two rounds of national surveillance provide a picture of rising prevalence, a high prevalence of active syphilis, and a high prevalence of risky sexual and injecting behaviors among recognized high-risk groups.[1,2]

Despite a current low prevalence, Bangladesh has all the potential for a rapid spread. A huge and densely distributed population, a poor economy, geographical and cultural proximity to two more severely affected countries (India and Myanmar), a high prevalence of other sexually transmitted infections (STIs), an enormous underground and mobile population of sex workers, a low rate of condom use, gender inequality, a rising prevalence of HIV among drug users — all these factors, combined with poor access to information on safe-sex and STIs, could fuel a change from the current low prevalence to a sudden epidemic. Even if only 1% of the general population becomes infected with HIV there will be 1.5 million people infected. This massive burden would be almost impossible to cope with should the present socio-economic structure remain unchanged.

The latest (sixth) round of sero-surveillance reported an alarming rise of HIV among injecting drug users (IDUs) in 'Central City' of Bangladesh,[2] from 1.4% in 2000 to 4.9% in 2005. The gaps in harm reduction interventions among drug users have been discussed in an earlier article.[3] In this review we examine the available reports on sexual risk behaviors in Bangladesh, identify gaps in ongoing intervention efforts, and present recommendations for future interventions.

Materials and methods

The electronic databases Medline, PubMed, EMBASE, Aidsline, CINAHL, Sociological Abstracts, and Google were searched for articles, reports, abstracts, and monographs published on HIV and HIV-related risk behaviors in Bangladesh. Reference lists of all key papers were checked for further relevant publications. As there were relatively few journal articles, the gray literature was also reviewed. Experts involved in the development and evaluation of current programs or policy were contacted for official reports and policy documents. Altogether 144 documents were identified; 46 were peer-reviewed journal articles of which five could not be collected and three were not relevant to our purpose. Three government documents could also not be collected. We have included articles/reports that relate to sexual risk behaviors, and preference has been given to more recent reports/articles in the descriptive part of this review.

Current epidemiological picture

The most recent (sixth) round of national HIV sero-surveillance (2004—5) revealed that the highest prevalence (4.9%) of HIV so far among IDUs is in the capital city categorized as Central-A. The same survey revealed a pocket in this city where the prevalence was as high as 7.1%. For the first time HIV was detected among IDUs in cities outside Central-A, in the regions referred to as Southeast-D (0.6%) and Northwest-F1 (2%), although the prevalence remains very low. Among heroin smokers, 0.5% tested positive for HIV in Central-A.

However, HIV prevalence has remained low (<1%) amongst all groups of female sex workers (FSWs) except the casual FSWs in the city referred to as Northwest-K1, where the rate was found to be 1.7% (95% CI 0.2—5.9). Similarly all other sentinel groups for sexual transmission of HIV had a low prevalence (<1%); for example, only two males who have sex with males (MSM) tested HIV positive out of a sample of 919. Only three transvestites/transsexuals out of a sample of 381 tested positive for HIV, while none of the male sex workers (MSWs) and none of the bridge population (rickshaw pullers, truckers, and dockworkers), who are reported to be major users of sex workers, was HIV positive.

HIV-related risk behaviors among the recognized sentinel groups

Bangladesh has been undertaking periodic national surveillance since 1998 based on the Joint United Nations Programme on HIV/AIDS (UNAIDS)/World Health Organization (WHO) guidelines for second generation HIV surveillance.[4] The first five rounds of surveillance included both serological and behavioral assessments conducted in tandem on similar groups, but not on the same individuals, and the methodologies for sampling for the two assessments were different. However, in the sixth round only serological assessment was conducted. Therefore, between the six rounds an accurate statistical comparison of the risk behaviors within and among the sentinel groups is difficult.

Available data suggest that vulnerability and risk factors for HIV transmission remain high (Table 1). Only 17% of the most-at-risk populations can both correctly identify the ways of preventing sexual transmission of HIV and reject major misconceptions about HIV transmission.[5] HIV risk behaviors of individual risk groups are discussed in more detail below.

Drug users

IDUs have remained the risk group with the highest prevalence of HIV, and there is significant potential for sexual spread of HIV from IDUs to the remainder of the population. The sixth round surveillance found that approximately 44% of female IDUs ($n = 119$) were current sex workers (SWs) and 9.2% (95% CI 4.7—15.9%) of these had active syphilis.

More than 80% of the male drug users reported sex with multiple partners (either commercial or non-commercial partners).[6] An HIV prevention program in Dhaka found that after one year, 78% of a cohort of 3200 IDUs continued stably exchanging needles and syringes, but their rate of reported condom use in commercial sex encounters remained disturbingly low, improving from only 7.8% to 17.7%.[7] Group hire sex was also common among IDUs, with up to one in six (8.0—17.7%) reporting having engaged in group-sex in the fourth round surveillance. Anecdotal reports suggest that group sex may be encouraged by financial constraints, with male clients pooling money to share a FSW.[8] Group-sex is a particularly risky activity, for men take the additional risk of being exposed to the semen of other men,[9] and the woman is likely to experience trauma and abrasion.

Three studies reported that IDUs engage in more risky sexual behaviors than non-IDUs.[10—12] Among 505 'drug addicts' studied in Dhaka, those who were HIV positive

Table 1 Sexual risk behaviors among some recognized high-risk groups over the five rounds of national surveillance

Indicator	Round 1	Round 2	Round 3	Round 4	Round 5
% of unprotected sex IDUs reported in their last sexual act with a CSW (pooled %)	87.0	~81.0	80.0	~76.0	~75.0
Mean number of clients received by brothel-based FSWs in the last week	18.0	18.5	18.8	16.3	16.0
% of brothel-based FSWs who reported condom use with new and regular clients in last sexual act	22[a]	21.0	19.9	35.6[b] (27.2)[c]	39.7[b,d] (24.1)[c,d]
Mean number of clients received by MSWs in Central-A in the past week	3.0	6.2	8.6	9.5	9.0
% of last sexual acts of MSWs with new and regular clients covered by condom in Central-A	26.0	41.6	28.7	32[b] (28.9)[c]	43.6[b,d] (34.8)[c,d]
% of last sexual acts of hijras with new and regular clients covered by condom in Central-A[e]	-	9.4	3.4	15.1[b] (12.6)[c]	15.6[b,d] (17)[c,d]
Prevalence of syphilis among street-based FSWs in Central-A					
% non-active syphilis	56.8	42.8	42.7	29.8	32.9
% active syphilis	33.8	24.3	16.7	8.4	9.7
Prevalence of syphilis among brothel-based FSWs in Central-B					
% non-active syphilis	45.7	32.3	32.2	23.2	22.5
% active syphilis	13.8	6.2	8.1	3.9	3.2

IDU, injecting drug users; CSW, commercial sex worker; FSW, female sex worker; MSW, male sex worker.
[a] Reported condom use last week.
[b] With new clients.
[c] With regular clients.
[d] Percentage has been calculated among those who had clients in the past week.
[e] Among those who reported anal sex with clients in the previous week.

(3.7%) were mainly IDUs, and every IDU with HIV reported sharing needles. Those drug users with HIV were also more likely to report unprotected sex (76.4%), multiple sex-partners (87.1%), and the presence of STIs (64.2%).[13]

Of the IDUs registered with CARE-Bangladesh (3900–4400), a non-governmental organization (NGO), 55% were reported to be married. IDUs are encouraged to bring their spouses to the drop-in center for STI management, but there is no formal contact-tracing program. In 2003 only 87 spouses received STI treatment from the drop-in center.[14]

Female sex workers

The total number of FSWs is unknown, however a 1995 estimate reported around 100 000 in the country.[15] Although there are 15 registered brothels[16] in Bangladesh, the legal status of brothels is unclear.[17] SWs register their names with a magistrate, signing an affidavit that they are entering the profession of their own will and are over 18 years of age. However, in reality they have often become SWs in response to poverty and other problems in their families. Police can raid brothels in order to remove women under 18 or to search for criminals. All other sex-working venues, e.g., hotel-based sex work (HSW), street sex work (SSW), or residential-based sex work (RSW) are clearly illegal. Between 1998 and 2000, after the closure of one brothel and the eviction of FSWs from two others, the average number of clients per FSW rose by a small but significant amount. This may have had the undesired consequence of increasing the risk of HIV transmission.[18]

The sixth round HIV surveillance reported that FSWs from Bangladeshi cities close to India and Myanmar frequently cross borders to sell sex. From cities in the region labeled as Northwest-K1, more than two out of every three (71%) FSWs had crossed into another country for sex work. A study of 867 FSWs in brothels in Kolkata, India, found that nearly one in five (18%) were from Bangladesh.[19] This possibly explains the predominance of subtype C HIV strains in Bangladesh that are closely related to the strains from India, Myanmar, and China.[20]

Brothel-based sex workers (BSWs) in Bangladesh report an average of 18.8 clients per week, which is among the highest turnover of clients anywhere in Asia. Among HSWs it is even higher, averaging 44.0 clients a week.[21] In addition, riskier forms of sexual intercourse are reasonably common. In the fourth round surveillance, almost one in five SWs reported anal sex with new or regular clients in the past week. Except among BSWs, group sex was common, reported by 47–63% of all the SWs sampled.[22]

A study on BSWs found that only 36% of sex acts were protected by a condom during the last working day, and only 3.7% of FSWs used condoms consistently during their last two working weeks.[23] The low rate of condom use is a combined

result of clients' dislike of condoms, lack of knowledge, low risk perceptions, and poor situational availability of condoms inter alia. Offering a condom to a client is a major trigger for violence and contributed to around 36% of all the violence experienced by BSWs.[24] Safer sex practices are even more difficult for SSWs as the level of harassment is substantial. Accordingly, condom use is reported to be lower among SSWs compared to workers in other venues.[25]

A study conducted among 269 SSWs in Dhaka found that overall 84% were positive for at least one STI pathogen,[26] and a more recent study among 439 SWs in four brothels found 67.4% were positive for at least one cervical and/or vaginal infection.[27]

Over the rounds, condom use by SWs has increased (Table 1), which suggests that there may have been some positive effects from interventions. There has also been a significant decline in active syphilis among the SSWs of Central-A over the rounds, from 33.8% to 6.2%. Brothels show a mixed picture with active syphilis rates declining in three cities and remaining unchanged in six. It is not possible to determine the extent to which this decline in syphilis rates is due to prevention programs or the enhanced treatment for syphilis among FSWs.

Males who have sex with males

Male-to-male sex in Bangladesh is an offense under section 377 of the Bangladesh penal code.[28] As in other parts of the world, males who have sex with males constitute a diverse population in terms of identities, preference, and practices. To avoid confusion we will use the term MSWs for those men who sell sex and MSMs for those men who have sex with males but do not sell sex.

An NGO, as part of its community-based STI/HIV intervention, claimed that it reached a total of 1454 MSMs and MSWs between July 2000 and June 2001.[29] Condom use was found to be increasing slowly both among MSWs and MSMs. In the fifth round surveillance around 45% of MSWs both from Central-A and Southeast-A reported condom use in commercial sex with new clients in the past week. However, another study outlined the vulnerability of female sex partners of MSMs.[30] Half of the MSMs surveyed in a port city in 2000 performed unsafe anal sex with females including their wives. MSMs often do not disclose their MSM practices to their female partners.

Transgender (hijra) sex workers

Hijras are traditional transvestites or transsexuals from the Indian subcontinent. Some are born phenotypically male and some are said to have ambiguous genitalia. Traditionally those who are born with ambiguous genitalia have their external genitalia removed surgically and become eunuchs. They wear women's clothing and usually behave like women. An NGO working with this group estimated around 5000 hijras live in Dhaka alone,[31] though the method of this estimation was not clear. By becoming eunuchs they are held as semi-sacred and earn money blessing the health and fertility of newlyweds and newborns. However, today this source of income is poor indeed[16] and most of them work as commercial sex workers (CSWs) and practice receptive anal sex.[32]

In the fifth round almost all hijras (99%) were reported to have sold sex in the last week, but only 17% of these reported condom use. In keeping with these data, hijras had the highest rate of active syphilis (10.4%) amongst all the groups sampled in the fourth round. Nonetheless, the proportion that reported condom use in the last sex act with clients (15.0% with new clients and 12.6% with regular clients) had risen compared with the third round (3.4% with both new and regular clients).

Bridging populations

Certain population groups act as an 'epidemiological bridge' from the most-at-risk populations to the general population.[4] The strategic plan of the National AIDS Programme of Bangladesh (1997—2002) defines this group as including transport workers (including truckers, their helpers and cleaners and rickshaw pullers), uniformed forces, young people, working children, women in domestic work or in the workplace setting and in particular female garment-workers, internal and international male migrants, slum-dwellers, and tribal people.[33] However surveillance and individual studies have concentrated their efforts on rickshaw pullers, truckers, slum-dwellers, and students.

Truck drivers and rickshaw pullers

A study in Dhaka (n = 388) found that 54% of subjects (truck driver/helper) had had relations with at least one CSW in the past year, and their mean number of sexual partners in the previous year was 4.6.[34] Premarital and extramarital sex was common, often with CSWs. Only 31% had ever used a condom and most had used condoms only once or occasionally. However, the sample was not randomly recruited and participants were from only one truck stand. The data were collected through self-reports in oral interviews, so responses may have been influenced by perceived social desirability.

It is estimated that there are about 0.3 million rickshaw pullers in Dhaka.[35] Many of these have migrated from rural Bangladesh and have left their wives behind. In a study of 1000 randomly chosen rickshaw pullers in Dhaka, most (about 80%) had some knowledge about HIV/AIDS but more than 30% visited a brothel on a regular basis and 22% had a history of STIs.[35] Among the married rickshaw pullers, 35% had been practicing extramarital sex (including sex in a brothel) and only 8% of them regularly used condoms. In the fourth round surveillance only 4—15% of rickshaw pullers reported condom use during their last sex act.

Other bridging populations

In the fourth round national surveillance, students were among the three most common groups of clients seen by SWs (based on responses of SWs who were aware of their clients' occupations). However, students reported more condom use (both last time and consistently) than other male groups sampled.

One study (n = 1534) on slum-dwellers found that half of the male subjects paid for sex at some time, though only 6.6% reported sexual intercourse with CSWs in the previous month.

Table 2 Current status of HIV prevention measures in Bangladesh. Interventions are examined that target the risk factors for HIV infection based on the Anderson–May equation

Reducing transmission probability (β)	Reported implementation of measures	Reducing number of sexual partners (c)	Reported implementation of measures	Reducing duration of infectiousness (D)	Reported implementation of measures
Condom	Very little overall condom use	Sex education	Almost none	Contact tracing	Poorly established
Effective treatment of other STIs	Insufficient	HIV education and safe sex messages	Recently introduced into the secondary school curriculum	Partner notification	Poorly established
Reduce disassortative mixing	No systematic effort	Add quality to relationships and development of skills for sustaining marital fidelity	No systematic effort	Routine screening	Insufficient
HIV awareness among mass population	Not sufficient, need more effort	Moral education	Efforts have been made to encourage moral education (e.g., religious-leader training)	Social support to reduce stigma and encourage HIV testing	No systematic effort
Post-exposure prophylaxis (PEP), prevention of mother-to-child transmission	No reported intervention	Interventions to high-risk group	Interventions are in place but need more effort	Education about early symptoms (to people at risk and health staff)	Insufficient
Counseling for HIV positive people	Insufficient	Delayed first sex	No systematic effort	Accessible clinical services	Insufficient
Circumcision	Mostly circumcised	Structural support to the bridging populations to be able to keep their spouses with them	No reported effort	Quality of accessibility and treatments	Insufficient

STI, sexually transmitted infection.

Current syphilis infection was found in 9.3% of men and 4.5% of women.[36]

National response to HIV prevention

Despite its enormous other health problems, Bangladesh acknowledged HIV as one of the emerging health and social problems in 1985, before its first case was detected in 1989. However, it still took a number of years for specific interventions to be initiated. The introduction of a periodic surveillance system, the establishment of 98 safe blood transfusion centers, and the enactment of the 'Safe Blood Transfusion Law' from 2004 followed.[37] Recently the Government introduced life-skills education, and a curriculum has been developed for students in grades six to twelve, which has been piloted in 88 educational institutions across urban and rural Bangladesh. Teaching of issues relating to HIV/AIDS has been found to be accepted by both teachers and students from religious and social points of view.[38]

An Armed Forces HIV/AIDS education and life-skills program has been introduced, and it has been reported that of a total of 55 000 HIV negative Bangladeshi Peacekeepers deployed to missions in countries with very high HIV prevalence, only three persons have become HIV positive.[39] In 1998, the Imam (religious leader) Training Academy added HIV/AIDS awareness and prevention, primary health care, reproductive health, and STIs to its curriculum. More than 20 000 Imams, including some female religious leaders, have now received training on HIV prevention.[40,41] As the Imams command credibility and respect in their communities, their role in HIV prevention is potentially important. They can also manage the social taboo of discussing HIV/AIDS as they address a male-only or female-only congregation.

The majority of the Government's current HIV/AIDS prevention activities is conducted through NGOs with management support from the United Nations Children's Fund (UNICEF), WHO, and the United Nations Fund for Population Activities (UNFPA).[5] In addition NGOs have implemented some independent programs. More than 380 NGOs have been involved in HIV prevention in different parts of the country.[5] However, the quality of the interventions implemented by the NGOs varies considerably due to their limited capacity.[42]

Despite these efforts, a number of areas for intervention have so far lacked attention. Efforts to reduce HIV rates typically target the infectivity of the causative agent, partner selection characteristics of infected persons, and the duration over which the infection can be transmitted to others (the Anderson—May equation).[43] Several basic interventions, which address these factors, have been shown to be effective in HIV prevention elsewhere, but are currently not well addressed in Bangladesh (Table 2).

Discussion

Although Bangladesh is still a low HIV prevalence country, the Central City is clearly approaching a concentrated epidemic among IDUs, with prevalence close to 5%. The increasing trend in HIV prevalence and its increasing geographic spread, the continued high-risk behaviors of IDUs, and substantial mixing of most-at-risk groups with the bridging populations, remind us that HIV may not remain confined to any specific sub-population or neighborhood. The considerable prevalence of risky sexual behaviors among almost all the sentinel groups is of grave concern. The negative effects of existing risk behaviors could potentially outweigh the positive effects of the slowly increasing trend in condom use and knowledge of HIV, unless further steps are swiftly taken.

Subgroups like prison inmates, uniformed personnel, international migrants, street children, slum-dwellers, and garment-workers have not been included as vulnerable populations in national surveillance. Despite the fact that the international migrant group has been reported to have the highest number of recorded cases of HIV,[39] no data are available on their risk behaviors.

The HIV prevention programs undertaken by the Government have mostly been implemented by NGOs. The dependence of these NGOs on national and international funding can make program sustainability uncertain. For instance, during the sixth round surveillance it was noted that the NGOs that were previously conducting interventions were no longer working, but instead newly funded NGOs were preparing to start. This transitional gap and the reported poor management of many NGOs are deterrents to effective prevention. As a result, there are wide gaps in coverage of vulnerable groups and estimates of coverage are speculative at best. In many districts numerous FSWs and IDUs have been identified, but no specialized skills for working with these groups are available. Therefore, the Government needs to make further efforts to facilitate more coordinated and comprehensive activities.

The family planning campaign that started in the eighties achieved immense popularity and could form a potential platform for HIV/STI prevention. This department has a huge staff network throughout the country already working with men and women of reproductive age. It has been reported that condoms purchased by the Department of Family Planning can only be used for family planning, and NGOs working on HIV/STI prevention do not get condoms unless they declare they are working on family planning.[44] Cooperation between these two government departments and involvement of family planning workers in HIV/STI prevention could ensure that the dual benefits of condoms in both birth control and STI/HIV are more effectively fulfilled.

Training of traditional healers and unqualified medical practitioners in STI/HIV prevention is needed, as in many remote areas they are the first points of contact for rural people. Such training was found to be effective in Nepal.[45] Traditional healers in Bangladesh are reported to have insufficient knowledge about HIV/STI prevention.[46] They allegedly misdirect young people in the name of treatment for sexual dysfunction.[47]

The need for flexibility in the national surveillance system has to be balanced against the need for consistency and systematization of methodology.[48] In most rounds, the surveillance in Bangladesh has undergone changes in the sampling methods and survey tools for measuring indicators, which has limited comparison of findings between the rounds. In addition, the sixth round did not include a behavioral component, which further limits the scope for comparison.

Sex between men occurs in all societies and is highly unsafe if unprotected. However, a lack of attention towards MSMs is observed in culturally strict countries. In Bangladesh, although some NGOs are claiming to reach high numbers of

MSMs, this mode of sexual practice often remains hidden, which makes prevention activities difficult. Highly targeted and culturally acceptable behavioral change communication is needed to address this.

Infections with other STIs increase the chances of spreading or acquiring HIV. Effective treatment of STIs is one of the proven methods for preventing HIV. In Bangladesh, however, the HIV-prevention campaign seems to be more effective than the general STI treatment/prevention campaign. A study on 311 health service providers from both urban and rural areas found that they had good knowledge on HIV/AIDS but they lacked knowledge on other STIs.[49]

Information dissemination through Imams is clearly valuable, however there are reportedly limitations in the information the Imams give out.[40] For instance, one trained Imam confessed that he touches on the risks of promiscuity and stresses morality in relation to sexuality but leaves out condom use, which Islamic leaders say is wrong. The use of condoms in sexual acts outside marriage remains a difficult issue for Imams to address. Religious scholars could potentially be involved in discussions to find a potential way forward.

Although there are seven Voluntary HIV Counseling and Testing (VCT) centers in Bangladesh, full VCT facilities were reported to be available at only three sites. Better care and support services are needed for the growing number of people infected with and affected by HIV.

The present ambiguous legal status of prostitution is not supportive of comprehensive intervention. Experience has shown that prohibition can only be effective in extreme settings and where civil liberties are severely curtailed, such as during the Cultural Revolution in China.[50] An enabling environment for more public health-oriented prevention and care is the precursor to effective prevention programs.

This review should be considered in the light of several limitations. Although there was seemingly a reasonable quantity of literature, most reports were conference proceedings and so detailed information was often lacking. Moreover, some available data are of limited quality. The lack of peer review of some unpublished documents demands caution in interpreting their results.

Conclusions

Although Bangladesh has so far maintained a low prevalence of HIV, there remain numerous factors that place Bangladesh at high risk. The increasing trend of HIV among recognized high-risk groups and their high prevalence of risky behaviors might counterbalance the prevention efforts that have been put in place. The range and quality of responses to HIV risk need further improvement. The expansion of surveillance to cover the remaining high-risk groups and continuation of both behavioral and serological components of surveillance, with the use of consistency of methodology, are important. Initiatives are needed to develop a pre-departure and post-departure program for international migrants. Increased coordination among intervening agencies would help ensure a comprehensive and equitable coverage of prevention programs. Supportive care for HIV positive persons, more VCTs, and consideration of public health-oriented services for SWs are other pressing issues that need immediate attention. Steps such as these could help to prevent the immense suffering and economic cost that high rates of HIV would bring to Bangladesh.

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