CENTRE FOR HEALTH AND POPULATION RESEARCH

HSB

Health and Science Bulletin

Vol. 3 No. 1 ISSN 1729-343X March 2005

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HIV surveillance in Bangladesh: the present scenario

Annual surveillance for HIV infection and risk behaviours has been conducted among populations at elevated risk for HIV infection since 1998. The last round of surveillance was conducted between June 2003 and March 2004. Among the 10,445 persons tested 35 (0.3%) were HIV infected. Among injecting drug users participating in a needle/syringe exchange program in one city, 4% were HIV infected and in one neighbourhood in that city, 8.9% were HIV infected. Behaviours that can transmit HIV were common. Continued efforts to reduce high-risk behaviours are needed.

In accordance with UNAIDS/WHO guidelines (1), HIV surveillance in Bangladesh has focused on selected groups of individuals known to be at high risk for acquiring HIV infection. This includes sex workers, drug users, males who have sex with males, and Hijras (male transvestites). In addition, particular population sub-groups that may eventually be the source of spread of the epidemic into the general population, such as regular partners of sex workers or mobile male workers, including truckers and rickshaw pullers, are evaluated. In each of the past four annual surveillance rounds, the pooled level of HIV prevalence was <0.5% among all the vulnerable population groups tested (2-7).

The most recent round of surveillance was conducted between June 2003 and March 2004 using methods similar to the previous rounds. The country was divided into six geographical regions according to the administrative divisions: central, northwest, northeast, south, southeast and southwest. Cities within the administrative divisions are referred to by letter. For behavioural surveillance a two-stage cluster sample was used where geographic locations were selected,

and then individuals recruited from these locations. For serological surveillance, individuals belonging to the vulnerable population were identified through intervention organisations.

Field workers administered structured questionnaires. Blood samples were collected at the drop-in centres of the intervention organisations and were tested for HIV and syphilis. Blood collected from injecting drug users was also tested for hepatitis C virus (HCV). Testing for HIV and HCV was unlinked and anonymous while that for syphilis was linked to the subject so that treatment could be provided to individules. For HIV, samples were initially tested by an ELISA kit and positive results were confirmed by line immunoassay (LIA). An indeterminate result by LIA was considered as negative. Syphilis was tested by the rapid plasma reagin (RPR) test and confirmed either by treponema pallidum haemaglutination assay (TPHA) or treponema pallidum particle agglutination (TPPA) test. Samples positive for TPHA or TPPA with an RPR titre ≥8 were considered to reflect active syphilis. For antibodies to HCV, sera were initially tested using ELISA kit and all positive samples were re-tested with a second ELISA kit. Discrepant results in the two ELISAs were confirmed by LIA. Samples positive for any two tests were considered as positive.

Among 10,445 persons at high risk for HIV infection tested, 35 (0.3%) were HIV infected (Table 1).

Table 1: HIV infections among vulnerable population groups sampled for serological surveillance in Bangladesh, June 2003-March 2004

Study population	Number HIV antibody positive	Number tested	Percent HIV positive
Drug user			
Injecting drug users	16	1,619	1.0
Heroin smokers	3	391	0.8
Female sex worker			
Brothel	6	2,204	0.3
Hotel	3	698	0.4
Street	1	1,206	0.1
Casual (part-time)	2	679	0.3
Male			
Males who have sex with males*	2	1,871	0.1
Hijras	1	405	0.2
Boyfriends of female sex workers	0	482	0.0
Partners of Hijras	0	88	0.0
Rickshaw pullers	1	802	0.3
Total	**35**	**10,445**	**0.3**

** This includes both male sex workers and non-sex workers, since they were not distinguished at all surveillance sites*

Drug Users

One percent of injecting drug users were HIV infected (Table 1). These infections were concentrated in specific areas. Four percent of injecting drug users in Central City A were HIV infected. No HIV was detected in any injecting drug users from any city except Central City A. Within Central City A, rates of HIV prevalence varied among the neighbourhood needle/syringe exchange programme drop-in centres (Table 2). In the neighbourhood covered by one drop-in centre, 8.9% of injecting drug users were HIV positive and in a second centre, 2.1% were HIV positive. None of the injecting drug users sampled from the other five neighbourhood centres were HIV positive (Table 2). The two centres with identified HIV infected clients, represent 62% of the total samples tested in the city. The prevalence of hepatitis C virus antibodies was also highest among injecting drug users from these same two neighbourhood centres.

Table 2: HIV and hepatitis C antibody prevalence among injecting drug users from the drop-in centres of the needle/syringe exchange programme in different neighbourhoods in Central City A

Needle/syringe exchange centre ID (n)	HIV n (%)	HCV n (%)
1 (157)	14 (8.9)	115 (73.2)
2 (94)	2 (2.1)	63 (67.0)
3 (59)	0	27 (45.8)
4 (25)	0	8 (32.0)
5 (24)	0	6 (25.0)
6 (32)	0	12 (37.5)
7 (13)	0	8 (61.5)
Total (404)	**16 (4.0)**	**239 (59.2)**

In Central City A, although coverage of injecting drug users by the needle/syringe exchange programmes increased from 45% to 88% over the previous year, injecting drug users continued to frequently report high-risk behaviours for HIV infection. Eighty-six percent reported borrowing used needles/syringes within the preceding week; 35% of the injecting drug users had commercial female sex partners and 36% had non-commercial female sex partners in the last year. Sixteen percent used a condom during their most recent sex with a female commercial partner. Seven percent of injecting drug users had sold their blood in the past year.

Of the heroin smokers sampled in Central City A, 0.8% were infected with HIV

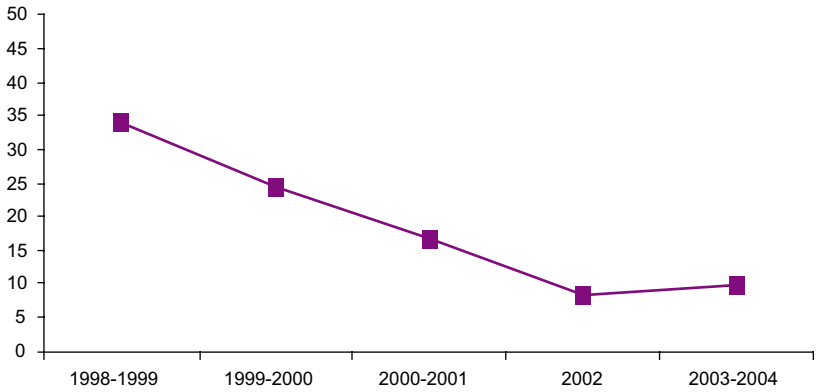
and 2.6% were actively infected with syphilis. Thirty-four percent reported injecting drugs in the last six months, of whom 96% had shared their needles/syringes during the last injection. Moreover, 74% of heroin smokers reported buying sex in the past year; 14% reported group sex, and less than 1% reported consistently using condoms.

Female sex workers

Among the 4,787 female sex workers tested, 12 (0.25%) were HIV infected. The highest HIV prevalence among female sex workers was noted from the border city of Northwest K1 (2%) and from hotels of Southeast A (1.5%). In all other groups of female sex workers, HIV prevalence was below 1%. Within the last year, 60-92% of casual (part-time) sex workers in two northwest cities reported selling sex across the border.

Intervention efforts were increasingly effective in reaching female sex workers in Central City A; 96% reported contact with the intervention programme compared to 51% in the preceding round ($p < 0.001$). In the same group, the proportion of female sex workers reporting consistent condom use in the last week increased from 1.7% to 12% with new clients and from 1.7% to 15% with regular clients between the fourth and fifth rounds ($p<0.001$ for both). Among female sex workers in Central City A, the prevalence of active syphilis has declined markedly during the course of surveillance ($p<0.001$) (Figure 1).

Figure 1: Prevalence of active syphilis among female sex workers from the streets of Central A



Males who have sex with males (MSM)

Among 1,871 males who reported having sex with males, 2 (0.1%) were HIV positive. Of the male sex workers accessed from Central City A, 6.2% had active syphilis; 54% reported group sex.

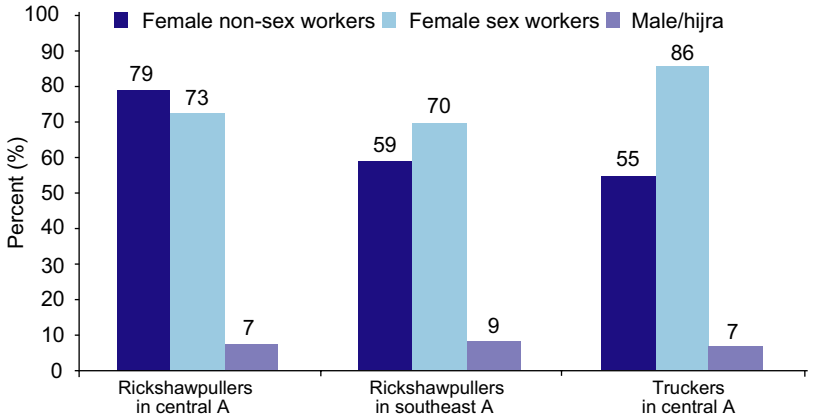
Hijras (transvestites)

Among the 405 Hijras tested, only 1 (0.2%) was HIV infected, although 10.4% were actively infected with syphilis. Hijras reported a mean of 31 clients in the preceding week; 75% reported having more than 20 clients in the last week. Only 2.2% reported using condoms regularly with new clients.

Other male groups

These included boyfriends/regular partners of female sex workers in three brothels, regular sex partners of Hijras from central A, and rickshaw pullers in central A and southeast A. Other than one rickshaw puller from central A, all those sampled from the male groups were HIV negative. Boyfriends/regular partners of female sex workers from central D had the highest (6.3%) active syphilis rate and rickshaw pullers from central A had the lowest (0.2%) active syphilis rate. A large proportion of rickshaw pullers and truckers reported having both commercial and non-commercial sex partners (Figure 2); consistent condom use in the last week with different partner types ranged from 3-6%.

Figure 2: Proportions of mobile men reporting different types of sex partners in the last year



Reported by: Programme on HIV/AIDS, ICDDR,B

Supported by: Government of Bangladesh; World Bank; Department for International Development (DFID), United Kingdom; and United States Agency for International Development (USAID)

Comment

This round of surveillance among persons engaging in high-risk behaviours in Bangladesh continues to demonstrate a low overall prevalence of HIV

infection (<1%). There are, however, two primary causes of concern. First, there is an outbreak of HIV among injecting drug users in one city in Bangladesh. Because people who inject drugs also donate blood and are sexually active, the outbreak represents a broad risk to public health.

Second, behaviours that facilitate the transmission of HIV are commonly reported among these population groups that are most at risk. Indeed the high rates of HCV among injecting drug users and the high rates of syphilis among sex workers demonstrate that risky behaviours are frequent enough to transmit pathogens. Unless behaviours change, as the prevalence of HIV increases, a large outbreak of HIV will occur in Bangladesh.

Compared to previous surveillance rounds, the current data are notable for the stable overall rate of HIV prevalence but an increase in the proportion of injecting drug users who borrowed a used needle/syringe in the last week from 66 % to 86%. The reduction in the prevalence of active syphilis in street female sex workers of Central City A following intervention suggests that prevention efforts can be effective.

Overall, these data suggest that public health efforts to reduce high-risk behaviour should remain a high priority. More effective programmes are urgently required to prevent an epidemic.

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Assessing chlorine shock treatment of tube wells

In response to severe flooding in July and August 2004, UNICEF collaborated with the Department of Public Health Engineering of the Government of Bangladesh to disinfect flooded tube wells using chlorine shock treatment. We investigated the water quality of recently submerged tube wells, and the effect of tube well pumping and shock chlorination on improving bacteriological quality. The study team identified 26 tube wells that had been flooded in the preceding three weeks and were contaminated with faecal coliform bacteria. The tube wells were randomly assigned to shock chlorination versus control. There was no change in the proportion of water samples that had no detectable faecal coliform bacteria immediately before chlorine shock treatment (n=4, 23%) and 60 minutes following chlorine shock treatment (n=4, 23%). There was no difference in the proportion of water samples that had zero colony forming units of faecal coliforms per 100 ml between tube wells treated with bleach shock treatment compared to control wells 7-18 days later (31% versus 23% p=0.66). Shock chlorine treatment of inundated tube wells in Bangladesh three to six weeks after the flooding did not improve drinking water quality, and is not recommended in future flooding.

In July and August 2004 Bangladesh experienced severe flooding. Approximately two-thirds of the land mass of the country was submerged, including an estimated two million tube wells. When a tube well becomes submerged, surface water contaminated with sewage can backflow through the hand pump and contaminate the superficial aquifers that supply drinking water. In response UNICEF collaborated with the Department of Public Health Engineering of the Government of Bangladesh to disinfect flooded tube wells using chlorine shock treatment. Chlorine shock treatment involves removing the head of the tube well and adding a mixture of hypochlorite bleaching powder and water into the well, and letting it sit for 30 minutes. This shock chlorination protocol is based on engineering assumptions about water disinfection, but its effect on water quality has not been rigorously evaluated in the field (1). Thus, a collaborative study team from ICDDR,B, UNICEF and the Department of Public Health Engineering investigated the water quality of recently submerged tube wells, and the effect of tube well pumping and shock chlorination in improving bacteriological quality.

The study was conducted in Brahmanbaria upazilla, an area heavily affected by the flooding. The first task was to identify recently inundated tube wells that were contaminated with faecal coliform bacteria. The Department of Public Health Engineering identified tube wells that had been recently inundated. For