

# **NATIONAL HIV SEROLOGICAL AND BEHAVIOURAL SURVEILLANCE, 2002 BANGLADESH**

**FOURTH ROUND TECHNICAL REPORT**



**NATIONAL AIDS/STD PROGRAMME  
DIRECTORATE GENERAL OF HEALTH SERVICES  
MINISTRY OF HEALTH AND FAMILY WELFARE  
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH**

## FOREWORD

The HIV epidemic in Bangladesh, from an epidemiological perspective, is in flux. While still a low prevalence country for overall HIV rates, a small pocket of IDU under surveillance has shown an increase in HIV prevalence, coupled with increased needle sharing behaviours. These data also indicate that the IDU population is well integrated into the surrounding urban community, socially and sexually, thus raising grave concern about the spread of HIV infection stemming from this at risk population.

The Government of Bangladesh is very concerned about the new information being presented in this report. The experience of other affected countries tells us that early action is essential to stop the spread of HIV from people injecting drugs to other groups and society at-large. It is also the most cost-effective option for a country with limited resources like ours to halt the virus before the economic burden becomes too large to bear.

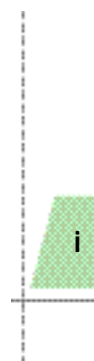
For this endeavour, a multi-sectoral approach is essential to get positive results. In order to effectively target drug injectors and other vulnerable groups, the combined efforts of many Ministries and Departments other than just the Ministry of Health are necessary. The Narcotics Department obviously will be a key player, but the Ministries of Education, Transportation, Religious Affairs, and many others all have roles to play.

This report also tells us that a further push is required for behaviour change communication in schools, colleges and universities, so that we can protect our children and youth from the risk of HIV infection. This will be accomplished through the planned HIV AIDS Prevention Program (HAPP) and Global Fund activities of the Government of Bangladesh.

As more people are infected by HIV, the care and support of people with HIV/AIDS will become a high priority. The Government of Bangladesh is committed to building that infrastructure by supporting counselling and testing centres, counsellor training facilities and promoting stigma reduction amongst caregivers and sponsoring efforts on establishing ARV guidelines. It is in our best interest for Bangladesh to start making suitable preparations for this emerging threat now.

Our nation is being confronted by HIV, and we have to respond to safeguard the future. No single agency can be solely responsible, but a collective coordinate response from the Government and donors, and NGOs and community bodies, is called for.

Line Director, HIV/AIDS  
Ministry of Health and Family Welfare  
Government of Bangladesh



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## ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BCC	Behaviour Change Communication
BCI	Behaviour Change Interventions
BSS	Behavioural Surveillance System
CA	Central-A
DFID	UK Department for International Development
DGHS	Directorate General of Health Services
FHI	Family Health International
GOB	Government of Bangladesh
HIV	Human Immunodeficiency Virus
ICDDR,B	Centre for Health and Population Research (International Centre for Diarrhoeal Diseases Research, Bangladesh)
IDU	Injection Drug User
IEDCR	Institute of Epidemiology and Disease Control Research
IMPACT	Implementing AIDS Prevention and Care Project
LSD	Laboratory Sciences Division
LIA	Line Immuno Assay
MOHFW	Ministry of Health and Family Welfare
MSM	Males who have sex with males
NASP	National AIDS/ STD Programme
NASROB	National Assessment of Situation and Responses to Opioid/Opiate use in Bangladesh
NEA	Northeast-A
NGO	Non-Government Organisation
NWA	Northwest-A
NWB	Northwest-B
PHA	People with HIV/AIDS
PHC&DC	Primary Health Care and Disease Control
PSU	Primary Sampling Unit
RPR	Rapid Plasma Reagin Test
SEA	Southeast-A
SED	Southeast-D
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
SW	Sex Worker
TPHA	Treponema pallidum Haemagglutination Assay
UNAIDS	United Nations Joint Programme on HIV/AIDS
USAID	United States Agency for International Development
WHO	World Health Organisation

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# 1. HIV SURVEILLANCE IN BANGLADESH

The national HIV surveillance system set up by the Government of Bangladesh has now been active since 1998. It is based on the UNAIDS/WHO guidelines for a revised "2nd generation HIV surveillance", a key priority of which is to improve the monitoring of developing epidemics like that in Bangladesh [1]. HIV prevalence is monitored annually among specific groups at sentinel sites spread across the country. Behaviours that carry a risk of HIV infection are evaluated in tandem. Syphilis and hepatitis are also monitored as surrogate markers to corroborate behavioural data regarding unprotected sex and unsafe injections.

This report presents the findings and conclusions from the fourth round of national HIV serological and behavioural surveillance that was conducted in 2002. The information obtained can serve as a tool to inform programme policy and interventions, to advocate for increased resources and investment in prevention, aid in targeting interventions, and in measuring their progress and impact.

All the rounds of serological surveillance to date have been conducted by ICDDR,B: Centre for Health and Population Research. The HIV/AIDS Research Centre conducted the fourth round of behavioural surveillance described here. Technical assistance for the behavioural surveillance has been provided by FHI since the second round of surveillance. The Government of Bangladesh/World Bank/DFID and FHI/USAID funded the fourth round of national surveillance.

## 2. DESIGN AND METHODOLOGY

### 2.1 POPULATION SUB-GROUPS

#### 2.1.1 Rationale for surveillance of particular groups

In countries where HIV prevalence is low, surveillance focuses on those sub-populations considered most vulnerable to HIV due to various behavioural factors or lifestyle, and also on those groups who can possibly act as an 'epidemiological bridge' from the more vulnerable groups to the wider population.

Thus, HIV surveillance in Bangladesh concentrates on groups who have unprotected sex with many partners, such as female and male sex workers, transgenders (hijras), and males who have sex with males (MSM), as well as on injection drug users (IDU) who might share injecting equipment like needles and syringes. It also monitors bridge groups of men likely to be clients of sex workers, such as truckers, rickshaw pullers, dockworkers, and STI patients. The evidence from other countries is that HIV is likely to spread among individuals in these groups first, and then spread further.

#### 2.1.2 Selection of groups for surveillance

Each successive round of serological and behavioural surveillance since 1998 has been expanded to include additional groups thought to be more vulnerable to HIV infection. Regional coverage by surveillance is also improved annually. The design of the fourth round surveillance and the groups to be sampled were agreed upon at a Surveillance Consensus Building Workshop held on 13 January 2002, which was attended by all the concerned participating institutions and organisations.

The major changes in population groups and regional coverage decided upon for the fourth round were:

- Serological surveillance was expanded to sample: heroin smokers since there is evidence that they sometimes inject (3), female sex workers working the streets in two additional cities and in hotels in one city, and a combination of male sex workers and MSM in three additional cities. For the first time hijras (transgenders), launch workers, and "babus", i.e. the boyfriends/regular partners of brothel based female sex workers, were included. In the fourth round serology was not done on rickshaw pullers, dockworkers, or IDU in treatment clinics, and the number of sites for survey of STI patients was reduced.
- Behavioural surveillance was expanded to sample male sex workers in one more city, and several additional groups: hotel-based female sex workers in one city, dormitory-based male

college/university students in one city, and IDU identified in two new geographical areas, including one city where there was no intervention.

The surveillance population sub-group definitions at the time of sampling are shown in the box below.

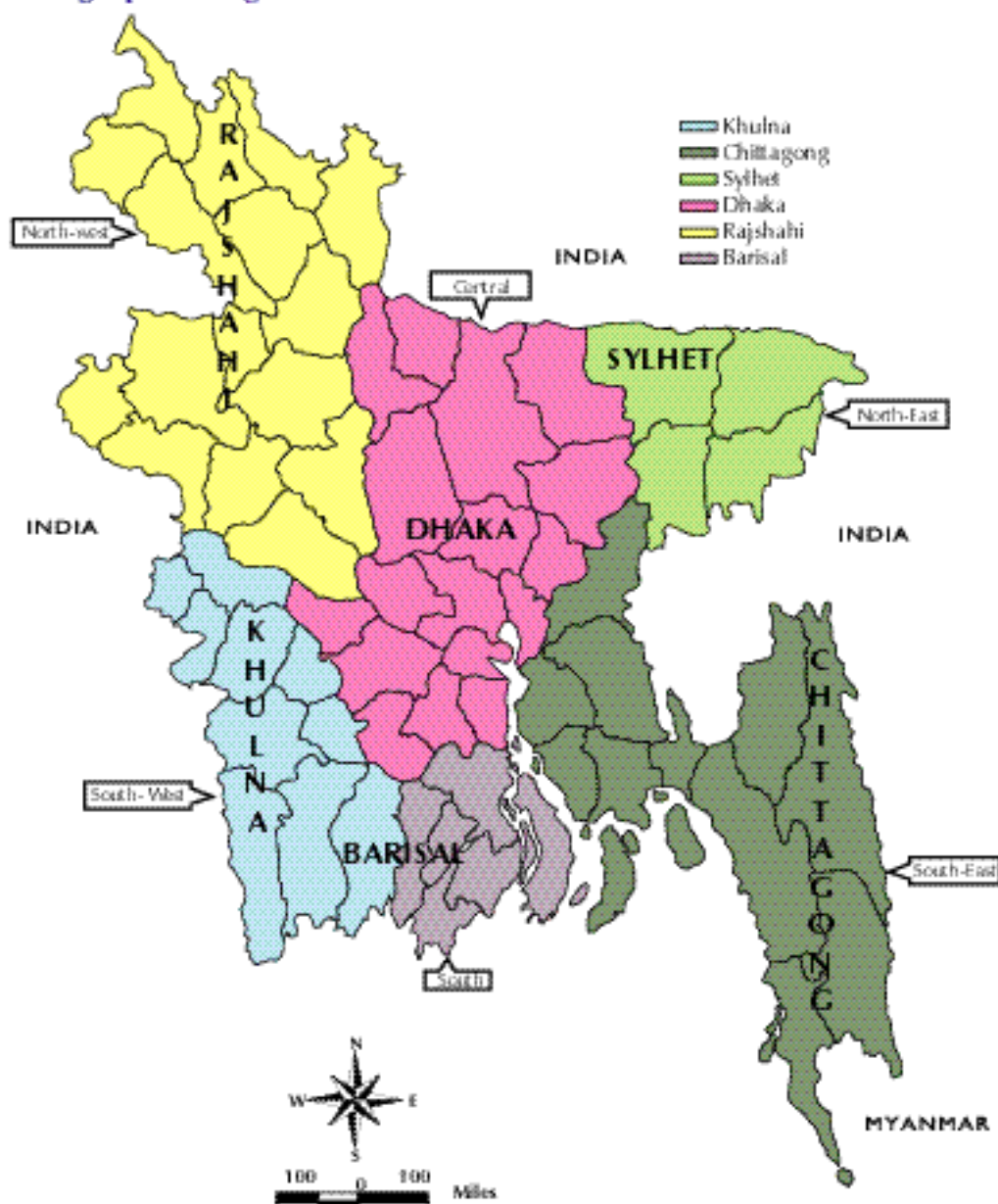
Serological surveillance	Behavioural surveillance
<p><b>Injection drug users:</b> Those who were primarily injectors and had injected in the previous year</p> <p><b>Heroin smokers:</b> Those who were primarily heroin smokers and had not injected more than twice in the previous six months</p> <p><b>Female sex workers</b>  <i>Brothel sex workers:</i> Those who were selling sex in a brothel during the previous month  <i>Street sex workers:</i> Those who were selling sex on the street during the previous month  <i>Hotel sex workers:</i> Those who were selling sex in hotels during the previous month</p> <p><b>Males who have sex with males</b>  <i>Male sex workers:</i> Males who were selling sex to other males during the previous month  <i>Non-sex workers:</i> Males who had male sex partners but did not sell sex</p> <p><b>Hijras:</b> Transgenders or third gender persons belonging to a traditional hijra sub-culture</p> <p><b>Babus:</b> Males who were the regular, fixed partners of female sex workers living in and around brothels</p> <p><b>Truckers:</b> Males currently working as truck drivers or helpers</p> <p><b>Launch workers:</b> Males working on river transport launches in the previous month</p> <p><b>STI patients:</b> Male adults (<math>\geq 15</math> years) with signs of STI (urethral discharge, inguinal buboes, genital ulcer, genital warts, condylomata lata) enrolled from the Skin and Venereal Diseases Departments of Medical College Hospitals</p>	<p><b>Injection drug users:</b> Current male injectors accessible through public injecting spots</p> <p><b>Female sex workers</b>  <i>Brothel sex workers:</i> Those who were contacted by clients in a brothel setting, with the sex act generally taking place there  <i>Street sex workers:</i> Those who were contacted by clients on the street, with the sex act taking place in public spaces or other venues  <i>Hotel sex workers:</i> Those who were contacted by clients in a hotel setting, with the sex act taking place there</p> <p><b>Males who have sex with males</b>  <i>Male sex workers:</i> Males who were selling sex to other males at the time of the survey  <i>Non-sex workers:</i> Males who had male sex partners but did not sell sex</p> <p><b>Hijras:</b> Transgenders or third gender persons belonging to a traditional hijra sub-culture</p> <p><b>Rickshaw pullers:</b> Men currently working as rickshaw pullers</p> <p><b>Truckers:</b> Men currently working as truck drivers and their helpers</p> <p><b>College/university students:</b> Males currently living in college/university dormitories.</p>

The population groups studied in the four rounds of HIV surveillance are shown in Table 1. To summarise, the fourth round serological surveillance was conducted among injection drug users and heroin smokers; female brothel sex workers, street sex workers and hotel-based sex workers; males who have sex with males; male sex workers; hijras; and several male population sub-groups, including babus, truckers, launch workers, and STI patients.

Behavioural surveillance was conducted among the same population sub-groups, with the exception of heroin smokers, babus, STI patients, and launch workers. Rickshaw pullers were included only in the behavioural surveillance and not in the serological surveillance. There was also a difference in terms of regional coverage of some of the population groups between the fourth round serological and behavioural surveillances.

For surveillance the country was divided into 6 geographical regions as per the administrative divisions: Central, Northwest, Northeast, South, Southeast and Southwest (Figure 1). For purposes of maintaining anonymity and confidentiality of the results each city under surveillance in each region was designated by a particular alphabet code, such as Central A, Southeast D, etc.

**Figure 1: Geographical regions under surveillance**



**Table 1: Sampled groups included in serological and behavioural surveillance 1998-1999, 1999-2000, 2000-2001, and 2002**

Group	Sampled groups in surveillance 1998-1999, 1999-2000, 2000-2001 and 2002		1998-1999		1999-2000		2000-2001		2002	
	Geographical location		Serology	Behaviour	Serology	Behaviour	Serology	Behaviour	Serology	Behaviour
IDUs	In-treatment	Central	✓		✓		✓		✓	
		Central		✓	✓	✓	✓	✓	✓	✓
	Out-of-treatment	Northwest		✓	✓	✓	✓	✓	✓	✓
		Southeast								
Heroin Smokers	Males	Central								
		Central				✓		✓		✓
		Southeast								
	Females	All methods		✓		✓		✓		✓
		Central								
		Southwest								
Sex workers	Beachel	Central								
		Southwest								
		Central								
		Southwest								
		Central								
	Hotel Street	Central		✓		✓		✓		✓
		Central								
		Southwest								
		Southwest								
		Central								
Hijras	Central									

**Table 1: Sampled groups included in serological and behavioural surveillance 1998 -1999, 1999-2000, 2000-2001, and 2002 (Continued)**

Group	Sampled groups in surveillance 1998-1999, 1999-2000, 2000-2001 and 2002											
	Geographical location		1998-1999		1999-2000		2000-2001		2002			
			Serology	Behaviour	Serology	Behaviour	Serology	Behaviour	Serology	Behaviour		
Males who have sex with males (MSM)	Central	A					✓		✓		✓	
	Northeast	A									✓	
MSM and male sex workers combined	Central	A	✓	✓								
	Central	C							✓			
	Southeast	A							✓			
	Northeast	A					✓		✓			
Babais (Brothel)	Central	B							✓			
	Central	D							✓			
Rickshaw pullers	Central	A					✓		✓		✓	
	Southeast	A				✓		✓			✓	
Truckers	Southwest	B					✓		✓			
	Central	A	✓	✓							✓	
Docker/workers	Southwest	B						✓				
	Southeast	A						✓				
	Southwest	C						✓				
	Central	A							✓			
Lananch workers Dormitory-based male collegiate/university students STI patients	Central	A									✓	
	Central	A	✓									
	Northeast	A	✓						✓			
	Southeast	A	✓						✓			
	Northwest	A	✓						✓			
	Central	C							✓			

\* In serology, injection drug users out of treatment include those who were under needle exchange programme (NEP)

## 2.2 SEROLOGICAL SURVEILLANCE

The methodology used for the fourth round of serological surveillance was the same as that followed in the third round (2), and is described again briefly below.

### 2.2.1 Strategy for serological surveillance

For the serological surveillance individuals were sampled only through intervention programmes or clinics for ethical reasons. Except for patients attending STI clinics, members of the populations of interest in different regions of the country were actively contacted through the participating organisations and encouraged to give blood for screening.

Male STI patients were enrolled for serological surveillance from among those attending the Skin and Venereal Disease Department of a Medical College Hospital in the Northeast (A) region of Bangladesh. At this site sampling was passive, i.e. it was done on clinic attendees and there was no effort to mobilise any community.

#### *Identifying collaborating partners*

Prior to sampling, meetings were held with organisations with access to the populations of interest to discuss the purpose of the surveillance, and the planned methodology. Interested organisations were included as collaborating partners only if they met the following criteria for inclusion:

- The capacity to access the selected population groups.
- Access to an established clinic with medical professionals providing treatment services, particularly for the diseases being screened for by surveillance.
- The availability of staff willing to collaborate with serological surveillance.

#### *Sampling*

At each sentinel site the sample size for each population group was calculated as 380 with an estimation of the HIV prevalence rate at 1%, with  $\pm 1\%$  precision and 95% confidence limit. The first four hundred individuals who came to each clinic site were included. At sites where the numbers of individuals available were less than 400, a take all approach was employed.

#### *Field preparation*

After selecting and enrolling the collaborating organisations, separate meetings were held with each organisation to plan the sampling process. The planning process included ensuring the availability of the required medical personnel and equipment, such as a refrigerator and a centrifuge.

#### *Informing the population of interest*

A series of small workshops were held with each population group (except for the STI patients) to inform them about the surveillance, and to encourage them to give blood for testing. The collaborating partners facilitated these workshops, with whatever support was required from the surveillance team, and thus the formats varied according to the site.

#### *Personnel and training*

Serological surveillance was conducted by a team from ICDDR,B. Training in blood separation, and sample labelling and transport was provided to technologists from GOB, NGO, and private institutions wherever it was required. Physicians at the STI clinic site were trained in the diagnosis of STI in male patients.

## 2.2.2 Serological sample collection and testing

The fourth round of serological surveillance screened blood samples for HIV and syphilis infection. As previously, each blood sample was split into two: one unlinked sample was screened for HIV, and the other linked sample that could be traced to the donor was screened for syphilis, so that treatment could be given if necessary. The unlinked anonymous samples were also used to assay for Hepatitis C among IDU.

Syphilis results were provided to participating organisations within two weeks of sample collection, along with the drugs for treatment. The particular clinic or intervention site personnel were then responsible for providing treatment to individuals who tested positive for syphilis.

Sample collection for serological surveillance started on 6 May 2002 and was completed on 6 November 2002. The time taken for collection of blood samples from any particular population group did not exceed 6 months. A total of 7,877 samples were collected from all the population groups in different parts of Bangladesh (see Table 2).

**Table 2: Serological surveillance sampling, 2002**

Population Groups	Geographical Location	Start Date	End Date	Number sampled
Injection Drug Users	Central-A	21.5.02	10.6.02	403
	Northwest-A	8.9.02	25.9.02	405
	Northwest-B	28.9.02	3.10.02	200
Heroin Smokers	Central-A	23.10.02	6.11.02	388
Female Sex Workers: Brothel	Central-B	10.6.02	24.6.02	406
	Central-C	10.8.02	5.9.02	152
	Central-D	22.9.02	2.10.02	402
	Southwest-A, C	14.5.02	5.6.02	241
	Southwest-B	11.6.02	18.7.02	195
	Street	Central-A	23.6.02	18.7.02
Hotel	Central-B	9.7.02	18.7.02	199
	Southwest-A	7.8.02	5.9.02	317
Hijras	Central-A	14.9.02	28.9.02	405
Male Sex Workers	Central-A	7.5.02	19.9.02	393
Males who have sex with males (MSM)	Central-A	6.5.02	24.7.02	401
MSM and Male Sex Workers combined	Central-A	6.5.02	18.7.02	406
	Central-C	18.7.02	28.10.02	400
	Northeast-A	22.7.02	31.10.02	402
Babus	Southeast-A	28.7.02	17.10.02	397
	Central-B	25.6.02	8.7.02	252
Tuckers	Central-D	9.10.02	17.10.02	200
	Central-A	2.9.02	17.9.02	402
Launch Workers	Central-A	8.10.02	21.10.02	402
STI Patients	Northeast-A	21.7.02	31.10.02	106
<b>Total</b>		<b>6.5.02</b>	<b>6.11.02</b>	<b>7877</b>

### Blood collection

A 5ml blood sample was collected from each individual by venepuncture into sterile, plain Vacutainers (Becton Dickinson, Rutherford, NJ, USA). Serum was separated by centrifugation. Whole blood and serum samples were transported to the Virology Laboratory of ICDDR,B, while maintaining the cold chain, and were stored at 20°C until testing was done.



### ***Informed consent and confidentiality***

At sites where the collaborating organisations felt comfortable about informing participants that the surveillance was for HIV, signed consent was obtained from each individual before collection of a blood sample. At other sites, blood was collected for syphilis testing, and the leftover serum was used for HIV testing. Consent was possible with all the groups except for patients at STI clinics, MSM at some sites, and hijras accessed through one of the two collaborating NGO partners.

All the sample tubes containing serum for HIV and Hepatitis C testing were unlinked and anonymous, i.e. they were labelled only with information about age, sex, site, and surveillance round. The samples were also stored in such a way that the sampling period was unidentifiable.

### ***Laboratory methods***

For HIV testing, samples were initially tested by a commercial enzyme-linked immunosorbent assay (ELISA) kit (Organon Teknika, Boxtel, The Netherlands). Positive samples were further confirmed by a Line Immunoassay (LIA; Organon Teknika). Samples with an indeterminate LIA result were considered to be HIV negative. Quality control was carried out using standard quality control sera for HIV obtained from the National Reference Centre for HIV/AIDS, Christian Medical College and Hospital, Vellore, India.

For syphilis testing, the Rapid Plasma Reagin (RPR) test (Organon Teknika) and Treponema pallidum haemagglutination assay (TPHA; Organon Teknika) were performed on all samples. Samples reactive in both assays were considered to reflect non-active syphilis, while samples that were TPHA positive with an RPR titre of  $\geq 8$  were considered to reflect active syphilis.

Sera from IDU were tested for Hepatitis C (HCV) antibodies as well. Samples were initially tested using an ELISA kit (UBI HCV EIA, United Biochemical Inc., USA). All positive samples were re-tested with a second ELISA kit (ABBOTT IMx HCV, version 3.0, ABBOTT Laboratories, Abbott Park, IL, USA). Samples yielding discrepant results were retested by Line Immunoassay (INNO-LIA HCV Ab III update, Innogenetics N.V., Ghent, Belgium). Samples positive for any two tests were considered as positive for HCV.

## 2.3 BEHAVIOURAL SURVEILLANCE

The methodology used for the fourth round of behavioural surveillance was the same as that followed in the third round (2), except that the questions asked were changed (see Section 2.3.4). The methods are described again briefly below.

### 2.3.1 Strategy for behavioural surveillance data collection

Unlike the serological surveillance, for the behavioural surveillance the respondents were not restricted only to people involved in NGO interventions or attending clinics. Instead, attempts were made to have a sample for analysis that would be representative of that entire population group within a city.

#### *Launch Workshop*

Before starting the behavioural survey an official launch workshop was held in February 2002. A wide range of participants attended, both those involved in the surveillance and others. There were representatives from government, World Bank, UN and donor organizations, NGOs and CBOs, as well as from among the population groups of interest for surveillance.

#### *Identifying data collectors and supervisors*

Efforts were made to recruit the same supervisors and data collectors who had been involved in the three previous rounds of BSS, but it was not always possible to locate them. Since data collection from MSM, male sex workers, and hijras is particularly challenging, for these groups data was collected in collaboration with a community-based organisation working with them. To access IDU, a number of ex-IDU were recruited for data collection. They were teamed up with non-IDU in order to avoid relapses to injecting.

#### *Mapping and sampling*

Sites were mapped by ward to record how many of the population of interest were seen. At some sites mapping was done with the involvement of local guides, which in the case of IDU were all current injectors.

Then, a systematic random sample was taken to select primary sampling units (PSUs). A site was considered to comprise more than one PSU if there were significant differences in the numbers available at different times of the day or on different days of the week. For the sex worker groups the primary sampling units were the cruising sites. For the hijra population in the Central region the primary sampling units were residence-based. Table 3 summarises the sampling information for all the groups under behavioural surveillance in the fourth round.

**Table 3: Summary of behavioural surveillance sampling information, 2002**

Population Group Region	Number of PSU identified through mapping	Number of randomly selected PSU	Mean population per PSU
Injection drug users			
Central-A	172	105	7
Northwest-A	75	75	12
Northwest-B	12	12	20
Southeast-D	37	37	4
Brothel sex workers National	<b>Proportional Random Sample</b>		
Hotel sex workers Central-A	121	33	15
Street Sex workers			
Central-A	84	53	15
Southeast-A	112	70	8
Hijras Central-A	131	80	5
Male sex workers			
Central-A	99	37	13
Southeast-A	47	35	25
Males having sex with males			
Central-A	90	42	16
Northeast-A	43	35	26
Rickshaw pullers			
Central-A	1486	140	15
Southeast-A	578	116	17
Truckers Central-A	183	48	14 trucks
Male college/ university students Central-A	102	35*	219
<b>Total</b>	<b>3372</b>	<b>918</b>	

\* Permission was not given to interview the students at one of these dormitories.

As previously, the behavioural surveillance used a two-stage probability sampling, with time location as the first stage and a 'fixed' or 'take all' approach as the second stage. The total sample size needed to detect a 5-22% change in behaviour over time was calculated to be 6475. In practice, 6905 completed questionnaires were obtained (see Table 4).

A 'fixed' number of interviews from each selected PSU were done for all the population groups, except brothel sex workers (all national brothels), hijras (Central-A) and IDU (Northwest and Southeast) samples. A 'take all' approach was followed for hijras, and the three different IDU samples in the Northwest-A, Northwest-B, and Southeast-D sites.

**Table 4: Time location sampling, behavioural surveillance, 2001 -2002**

Population group Region	Time location	Approach: 'Fixed' or 'Take all' from each selected PSU	Number Sampled
<i>Injection drug users</i> Central-A	8 am to 12 pm, 2 pm to 6 pm	Fixed: 5	524
Northwest-A	8 am to 12 pm, 2 pm to 6 pm	Take all	701
Northwest-B	8 am to 12 pm, 2 pm to 6 pm	Take all	180
Southeast-D	8 am to 12 pm, 12 pm to 4 pm, 4 pm to 8 pm	Take all	151
<i>Brothel sex workers</i> National	<b>Proportional national random sample</b>		738
<i>Hotel sex workers</i> Central-A	8 am to 8 pm	Fixed: 10	325
<i>Street Sex workers</i> Central-A	5 pm to 9 pm	Fixed: 10	522
Southeast-A	10 am to 2 pm, 4 pm to 8 pm	Fixed: 5	351
<i>Hijras</i> Central-A	NA	Take all	387
<i>Male sex workers</i> Central-A	6pm to 10 pm	Fixed: 10	366
Southeast-A	6 pm to 10 pm	Fixed: 10	328
<i>Males having sex with males</i> Central-A	6 pm to 10 pm	Fixed: 10	426
Northeast-A	6 pm to 10 pm	Fixed: 10	346
<i>Rickshaw pullers</i> Central-A	8 am to 12 pm, 12 pm to 4 pm, 5 pm to 9 pm	Fixed: 3	420
Southeast-A	8 am to 12 pm, 12 pm to 4 pm, 5 pm to 9 pm	Fixed: 3	342
<i>Truckers</i> Central-A	8 am to 12 pm, 1 pm to 5 pm, 5 pm to 9 pm	Fixed: 5 trucks (10 truckers)	459
<i>Male college/university students</i> Central-A	8 am to 6 pm	Fixed: 10	339
<b>Total Number of Samples</b>			<b>6905</b>

For the brothel sample, a proportional random sample was taken from all the existing registered brothels in Bangladesh (see Table 5). The total sample number required was divided proportionately between the total number of registered brothels in Bangladesh, and a target sample size for each brothel was estimated. Depending on the sample size required, every 2nd, 3rd or 4th room was selected, and a simple randomisation tool was used to select women for interview from each room.

### Personnel and training

A team from HARC conducted behavioural surveillance. The fieldwork involved in the mapping and data collection was carried out by a total of about 100 interviewers and supervisors. Interviewers were recruited on the basis of their experience with the target groups - some of them were members of the population groups of interest (hijras, MSM and IDU), while others had previous experience with the population groups as researchers or NGO workers.

**Table 5: Brothel sample, behavioural surveillance, 2002**

Brothel Name	Brothel location	# Total rooms mapped	# Rooms used by sex workers mapped	Mean # sex workers per sampled room	Estimated # sex workers per brothel	% of total brothel sex workers	Sample required per brothel	Sample size achieved
Banishanta	Mongla	380	240	1.02	245	6.5%	44	46
Bagerhat	Bagerhat	95	72	1.04	75	2.0%	14	14
Fultala	Khulna	82	77	1.04	80	2.1%	14	16
Marowari-mondir	Jessore	68	68	1.84	125	3.3%	23	23
Jhalai patti	Jessore	40	36	1.11	40	1.1%	7	8
Babu Bazar	Jessore	34	30	1.27	38	1.0%	7	8
Notun Bazar	Magura	138	127	1.38	175	4.7%	32	27
Rothkhola	Faridpur	235	210	1.29	270	7.2%	49	53
CNB Ghat	Faridpur	325	200	1.05	210	5.6%	38	42
Puran Bazaar	Madaripur	300	260	1.19	310	8.3%	56	46
Patuakhali	Patuakhali	92	80	1.06	85	2.3%	15	16
Ganginapar	Mymensingh	135	130	2.04	265	7.1%	48	57
Rani Bazar	Jamalpur	148	137	1.64	225	6.0%	41	54
Kandapara	Tangail	628	610	1.05	640	17.1%	115	130
Dalaudtia	Dalaudtia	1200	950	1.01	960	25.6%	173	198
<b>Total</b>					<b>3743</b>	<b>100%</b>	<b>675</b>	<b>738</b>

Training started immediately following the launch workshop, using an updated version of the training manual for 1999-2000. Interviewers were trained extensively on mapping techniques, HIV/AIDS, sexuality issues, and drug use, among other topics. They were also trained in practical research techniques including administering the new questionnaires, and they conducted trial interviews followed by feedback sessions. Supervisors received additional training in managing sampling, checking for errors and bias, and managing coding and checking.

### 2.3.2 Behavioural surveillance questionnaires and analysis

Behavioural data were collected between 7 March and 28 May 2002, using standard questionnaires to conduct interviews. A total of 6,905 completed questionnaires were used for analysis.

The fourth round of behavioural surveillance collected demographic information about respondents, including their age, sex, educational status, and marital status, information about children, and income and years in a profession. It also collected information about sexual behaviour, injecting drug use, condom use, knowledge and behaviour, including knowledge of modes of HIV transmission and self-perception of risk, exposure to HIV prevention programmes, self-reports of current and past STI symptoms and treatment-seeking for STI, as well as contextual factors that increase vulnerability to HIV, such as sexual violence.

### ***Incorporation of standard behavioural indicators***

For the fourth round behavioural surveillance the questionnaires used were changed. It was realized that the questionnaires used for the three previous rounds (1998/1999, 1999/2000 and 2000/2001) did not take into account some of the key standardised behavioural indicators used in other countries in Asia. Therefore, data from Bangladesh was difficult to compare with other countries in the region. To amend this, for all the groups surveyed the questionnaires were modified in the fourth round to include the standard international indicators. By doing this, the ability to compare the fourth round questions with previous rounds done in Bangladesh in order to monitor trends had to be compromised in the interests of long term comparability with other countries.

In addition to incorporating more standard indicators, the behavioural surveillance questions were also changed from a quantitative to a qualitative format in many instances. This made the questions easier to respond to in terms of ability to recall behaviour, and during analysis also served to make the interpretation of the responses less ambiguous. For example, in the third round of surveillance respondents were questioned on how many times they shared needles in the previous week, whereas in the fourth round they were simply asked to recall if they shared needles always, sometimes or never, or could not recall.

The major changes made in the questionnaires were:

- The incorporation of the internationally recognised indicator of "condom use at last sex", which is considered to have a higher accuracy for recall.
- Sex workers were questioned on condom use with "new" versus "regular" clients, since it has been found in other countries that they usually have different condom use patterns based on this factor.
- The international standard is that the concept of consistent condom use is generally regarded as a "qualitative" one, so that respondents in this round were questioned about their perception of the regularity with which they use condoms (always, sometimes, never), rather than trying to measure it quantitatively as was tried earlier.
- The same changes were incorporated with respect to sharing of needles, i.e., IDU were queried on sharing "last time" they injected, as well as last week, and on their perception of frequency of sharing (always, sometimes, never).

### ***Informed consent and confidentiality***

Interviewers were instructed to ensure that interviews were conducted in private, out of earshot of other people, and they were trained on how to do so. All potential participants were given a simple explanation about the objectives of the surveillance, and their verbal permission was sought for the interview. Potential interviewees were reassured that the information they provided would be kept confidential and anonymous, and would only be used for the purposes of the survey. They were also told that they could terminate the interview any time they wished.

### ***Refusals***

The behavioural survey aimed to complete 6,943 questionnaires, adjusting for a 5 to 10 percent refusal rate. In total, 7,007 potential interviewees were located, and there were 102 refusals (1.5%), so that finally a sample size of 6,905 completed questionnaires was achieved.

Some sex workers refused to complete an interview because they were approached by a client and did not want to lose business. Some drug users did not complete interviews either because they started to get withdrawal symptoms, or they were too drugged to answer all the questions.

Even among those refusing to be interviewed, interviewers tried to complete the basic demographic information (age, education, and marital status), location, date, and time, and to identify the reason for not completing the interview.

### ***Data coding and analysis***

All behavioural data were coded and checked by supervisors and entered at HARC computer division in MS Access. Data were double entered and compared using Epi6. After final correcting, the data were analysed, using Stata version-6.

## **2.4 LIMITATIONS OF THE SURVEILLANCE SYSTEM**

The HIV surveillance system in Bangladesh is considered to be effective and well executed, but there are still several limitations. These limitations have been discussed in detail in previous reports and are briefly listed below [2, 3].

### **1) Limited scope and coverage**

The scope of the surveillance system is limited and the groups covered may not include all vulnerable groups such as returning external migrants. There is a need to expand the scope of serological and behavioural surveillance to provide adequate and accurate data about other possible vulnerable population groups. There is also a need to expand the surveillance system to cover more geographic areas in order to achieve a better representation from the different parts of Bangladesh.

The country at present does not have reliable estimates of the sizes of the population groups practising risk behaviours, such as sex workers, IDU, and MSM. The surveillance system cannot provide estimates of sizes of the vulnerable population groups; rather it needs that information for the design of a more representative surveillance system. The surveillance system is therefore at present relying on data that it has obtained through its own mapping and through intervention programmes.

Sampling in the field with the marginalized population groups is difficult. Challenges are faced as most groups that were sampled operate in crowded areas or move around frequently. Further, political disturbances and police raids, and community reactions can all lead to displacement of people, so that the "spots" mapped may change or altogether disappear. Surveillance staff also faced problems in the field during such disturbances, including physical violence and arrest.

### **2) Bias in serological sampling**

A major criticism of the serological surveillance system in Bangladesh is that individuals are sampled through intervention programmes, and these individuals may be less likely to be at risk than those outside programmes. Therefore, this system may not be providing a true picture of the epidemic. The reasons for going through intervention programmes are mainly ethical. The serological surveillance system tests for syphilis and treatment for positive cases is ethically essential, as is providing continued intervention. Without the presence of clinical facilities and outreach programmes into the communities this would not be possible. Also, drawing blood outside a clinical setting, without an ongoing programme with those communities, may have a negative impact on acceptance of future surveillance and intervention activities.

Further, the picture provided by the serological surveillance is likely to be close to reality since intervention programmes in Bangladesh are just beginning to expand rapidly, so that many of the

groups sampled were accessed through programmes that were very new at the time sampling first started. This is true for the NEP programmes at the two sites in Northwest Bangladesh, the hijras, female sex workers in hotels, MSM groups, etc.

### **3) Bias in behavioural surveillance sampling**

The behavioural surveillance used mapping as part of the probability sampling technique. Thus, sub-populations that could not be mapped at public spots were not included in the surveillance, for example, injecting drug users or MSM who operate in hidden private circuits were excluded.

### **4) Bias due to interviewers**

The behavioural surveillance raises many sensitive issues related to sexuality. Inhibition to discussing these issues may have an impact on the answers. Involving interviewers from the same population groups as those being surveyed increases accessibility, and possibly the openness of responses, but it may also cause a bias in responses if an individual does not want to be totally honest with a peer. On the other hand, non-peer interviewers may have obtained biased answers if they were not really comfortable dealing with those under surveillance, most of who belong to strongly stigmatised groups in Bangladesh.

### **5) Fear of stigma**

Since HIV/AIDS is highly stigmatised in Bangladesh, individuals who suspect they are HIV positive, or who fear that a positive result will be revealed may be deterred from participating in surveillance. This negative selection bias may have an impact on the surveillance results.

### **6) Refusal for interviews**

The refusal rate for participation in the behavioural survey interviews was low (1.5%). One of the main reasons potential interviewees refused to participate in the survey was because taking the time to do so interfered with their work or activities.

### **7) Surveillance does not provide reasons**

The reasons behind changes in any behavioural indicator over the different rounds of surveillance cannot be explained by surveillance alone. For this, additional qualitative research is required.

1. UNAIDS/WHO, Second Generation Surveillance for HIV. 2001.
2. Govt. of Bangladesh, Report on the second national expanded HIV surveillance, 1999-2000 Bangladesh. 2000, AIDS and STD Control Programme, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh. p. 86.
3. Govt. of Bangladesh, National HIV Serological and Behavioural Surveillance, 2000-2001, Bangladesh. Third Round Technical Report. 2004, National AIDS/STD Program, Directorate General of Health Services, Ministry of Health and Family Welfare, Govt. of Bangladesh.



### 3. RESULTS

Serological and behavioural surveillance findings from the fourth round are described in this section grouped into three categories of HIV risk behaviour:

1) injection drug use, 2) male to female sex, and 3) male to male sex.

#### 3.1 INJECTION DRUG USE

##### 3.1.1 Serology

Serological surveillance focused on IDU participating in Needle Exchange Programmes (NEP) in the Central and Northwest regions. As there is evidence that heroin smokers often inject [7], heroin smokers from Central-A were also sampled by serology during the 4th round of surveillance and the results are included in this section.

##### *Demographic characteristics*

Demographic characteristics of IDU and heroin smokers sampled for serological surveillance are summarised in Table 6. IDU from Central-A were the youngest amongst all groups of IDU ( $p=0.004$  between Central-A and Northwest-A;  $p<0.001$  between Central-A and Northwest-B), and had the longest years of schooling. The heroin smokers sampled in Central-A were younger than the IDU ( $p<0.001$ ), but had been smoking heroin for a significantly longer duration than injectors had been injecting drugs ( $p=0.005$ ) in the same region. They were similar to IDU from Central-A in terms of proportions who ever attended school and years of schooling.

**Table 6. Demographic characteristics of IDU and heroin smokers, serological surveillance, 2002**

Geographical location (n)	Age in years, median (25th-75th quartiles)	Ever attended school n (%), 95% CI	Education (years), median (25th-75th quartiles)	Duration as IDU/heroin smoker (months), median (25th-75th quartiles)	Duration in NEP (months), median (25th-75th quartiles)
<b>Injection Drug Users</b>					
Central A (403)	32 (28-38)	241 (59.8), 54.8-64.6	7 (4-10)	60 (36-84)	36 (24-48)
Northwest A (405)	34 (28-40)	236 (58.3), 53.3-63.1	5 (4-10)	36 (12-96)	36 (9.1-36)
B (200)	40 (32-45)	102 (51.0), 43.9-58.1	5 (3-9)	36 (9-84)	20 (6-21)
<b>Heroin Smokers</b>					
Central A (388)	28 (25-32)	210 (54.1), 49.0-59.2	6 (4-8)	72 (36-120)	NA*

\*Not applicable

##### *HIV prevalence*

In Central-A, 4% of IDU under the NEP tested positive for HIV (Table 7). This is the highest prevalence that has ever been recorded for any population group anywhere in the country since the surveillance began. No HIV infection was found among the other IDU tested from the two NEP sites in the Northwest, nor among the heroin smokers from Central-A.

**Table 7. Prevalence of HIV and syphilis among IDU and heroin smokers, serological surveillance, 2002**

Population sub-group, Region	Number sampled	HIV positive n (%), (95% CI)	Syphilis positive n (%), (95% CI)	
			Non-active	Active
Injection drug users				
NEP* Central-A	403	16 (4.0), (2.3-6.4)	78 (19.4), (15.6-23.6)	14 (3.5), (1.9-5.8)
NEP Northwest-A	405	0 (0-0.9)	38 (9.4), (6.7-12.7)	7 (1.7), (0.7-3.5)
NEP Northwest-B	200	0 (0-1.8)	22 (11.0), (7.0-16.2)	4 (2.0), (0.5-5.0)
Heroin smokers				
Central-A	388	0 (0-0.9)	54 (13.9), (10.6-17.8)	13 (3.4), (1.8-5.7)

\*Needle Exchange Programme

In Central-A, HIV prevalence in IDU has increased significantly over the 2nd, 3rd and 4th rounds of surveillance ( $p = 0.018$ ) (Table 8).

**Table 8. Prevalence of HIV among IDU in needle exchange programme over three rounds of serological surveillance, 1999-2000, 2000-2001 and 2002**

Population sub-group, Region	HIV Positive, n (%) (95% CI), Total number tested		
	1999-2000 Round II	2000-2001 Round III	2002 Round IV
Injection drug users			
NEP Central-A	6 (1.4), (0.5-3.1), 418	7 (1.7), (0.7-3.6), 401	16 (4.0), (2.3-6.4), 403
NEP Northwest-A	0 (0-0.9), 416	0 (0-0.9), 402	0 (0-0.9), 405
NEP Northwest-B	ND	0 (0-3.0), 120	0 (0-1.8), 200

\*Not determined

### Syphilis prevalence

Active syphilis rates were similar among IDU from NEP sites (Table 7). Active syphilis rates for heroin smokers were comparable to those from IDU in Central-A.

Active syphilis rates have declined over the 2nd, 3rd and 4th rounds in IDU from two NEP sites, Central-A ( $p < 0.001$ ) and North West-A ( $p = 0.029$ ) (Table 9). This decline was significant between 2nd and 3rd rounds ( $p < 0.001$  for Central-A and  $p = 0.033$  for Northwest-A), but there were no significant differences between rounds three and four. Non-active syphilis rates remained similar over the rounds in IDU from all three NEP sites.

**Table 9. Syphilis prevalence among IDU in needle exchange programmes over three rounds of serological surveillance, 1999-2000, 2000-2001 and 2002**

Population sub-group, Region	1999-2000 Round II	2000-2001 Round III	2002 Round IV
	Non-active syphilis, n (%), (95% CI), Total number tested		
Injection drug users:			
NEP Central-A	96 (23.0), (19.0-27.3), 418	73 (18.2), (14.5-22.3), 401	78 (19.4), (15.6-23.6), 403
NEP Northwest-A	52 (12.5), (9.5-16.1), 416	37 (9.2), (6.6-12.5), 402	38 (9.4), (6.7-12.7), 405
NEP Northwest-B	ND	12 (10.0), (5.3-16.8), 120	22 (11.0), (7.0-16.2), 200
Active syphilis, n (%), (95% CI), Total number tested			
Injection drug users:			
NEP Central-A	39 (9.3), (6.7-12.5), 418	10 (2.5), (1.2-4.5), 401	14 (3.5), (1.9-5.8), 403
NEP Northwest-A	17 (4.1), (2.4-6.5), 416	6 (1.5), (0.5-3.2), 402	7 (1.7), (0.7-3.5), 405
NEP Northwest-B	ND	2 (1.7), (0.2-5.9), 120	4 (2.0), (0.5-5.0), 200

\*Not determined

### Hepatitis C (HCV) prevalence

HCV rates were very high in IDU. In the 4th round surveillance of the Northwest region, IDU from Northwest-B had higher rates of HCV than those from Northwest-A ( $p < 0.001$ ). In Central Bangladesh where the HIV prevalence is 4%, HCV prevalence was 62.3% (Table 10). There were no significant changes in HCV rates between the 2nd and 4th rounds.

**Table 10. Prevalence of HCV among IDU, 1999-2000 and 2002**

Population group	HCV positive, n (%), (95% CI) (Total number tested)		
	1999-2000 (Round II)	2002 (Round IV)	P value <sup>*</sup>
IDU from NEP: Central-A	278 (66.5), (61.8-71.0) (418)	251 (62.3), (57.4-67.0) (403)	NS**
Northwest-A	248 (59.6), (54.7-64.8) (416)	242 (59.8), (54.8-64.6) (405)	NS**
Northwest-B	ND <sup>‡</sup>	159 (79.5), (73.2-84.9) (200)	

<sup>‡</sup>ND = Not determined

<sup>\*</sup> Chi square statistic was used to compare the rounds

<sup>\*\*</sup>NS = Not significant

### 3.1.2 Behaviour

Behavioural surveillance focused on people who were active IDU at the time of surveillance, and were injecting drugs in public spaces or in so-called 'shooting galleries' at sites in Central, Northwest and Southeast Bangladesh.

#### Demographic characteristics

Demographic characteristics for the groups sampled in the behavioural surveillance are summarised in Table 11. The findings on mean age of the IDU were similar to those from serological surveillance in the Central and Northwest regions (see Table 6), with those in the Northwest B region being the oldest. The group sampled by behavioural surveillance in the Southeast region was younger than the others. The exposure to schooling of IDU in the behavioural surveillance was higher (86 to 96 percent had some schooling) than those under serological surveillance. A high proportion (42.4 to 87.8 percent) of IDU were married, except in the Southeast region (25.8%).

As seen in previous surveillances, rickshaw pulling is one of the major occupations of IDU, except for the sample from Southeast-D. Almost one out of four injection drug users from Central-A and one out of three from both the Northwest-A and Northwest-B regions mentioned rickshaw pulling as their major source of income in the previous six months. The average income of the IDU ranged from Taka 2,700 to a little over Taka 4,000 per month.

**Table 11. Socio-demographic characteristics of injection drug users, behavioural surveillance**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
Mean age	32.7 (31.9-33.6) Med:32	37 (36.4-37.6) Med:36	39.7 (38.3-41.1) Med:40	25.8 (25-26.5) Med:26
Proportion with no schooling	14.1 (10.7-18.5)	13.5 (10.8-16.9)	3.9 (1-13.4)	4 (1.2-12)
Proportion currently married	42.4 (37.3-47.6)	55.2 (51-59.3)	87.8 (81.5-92.1)	25.8 (19.6-33.1)
Mean age at first sex (among those with sexual experience)	17 (16.7-17.3) Med:17 n=491	19.6 (19.2- 20.1) Med:18 n=591	19.7 (19.1-20.3) Med:19 n=173	16.2 (15.9-16.6) Med:16 n=151
Main source of income last six months	Rickshaw: 26.5 (22.9-30.5) Selling: 33.8 (29.5-38.3) Salary: 16.6 (13.3-20.6) Others:23.1 (19.5-27.1)	Rickshaw:35.8 (32-39.8) Selling:19.9 (17-23.3) Salary:15.1 (12.5-18.2) Others:29.1 (25.7-32.8)	Rickshaw:38.9 (32-46.2) Selling:4.4 (2.3-8.4) Salary:4.4 (1.7-10.9) Others:52.2 (43.2-61.1)	Rickshaw: 3.3 (1.5-7.2) Selling:21.8 (14.7-31.3) Salary:18.5 (13.3-25.3) Others:56.3 (47.5-64.7)
Other income sources (descending order)	Family, unemployed, begging, shop/house rent, business, van driver, day labour (tokai), etc.	Stealing/ snatching/ smuggling, picking pockets, family, begging, day labour, etc.	Business, farmer, sweeper, driver, student, family, day labour, van driver, etc.	Business, family, politics, stealing, etc.
Mean income past month	3925 (3727-4123) Med:3500	3250 (3106-3394) Med:3000	2737 (2538-2935) Med:2600	4167 (3580-4753) Med:3000

**History of drug use**

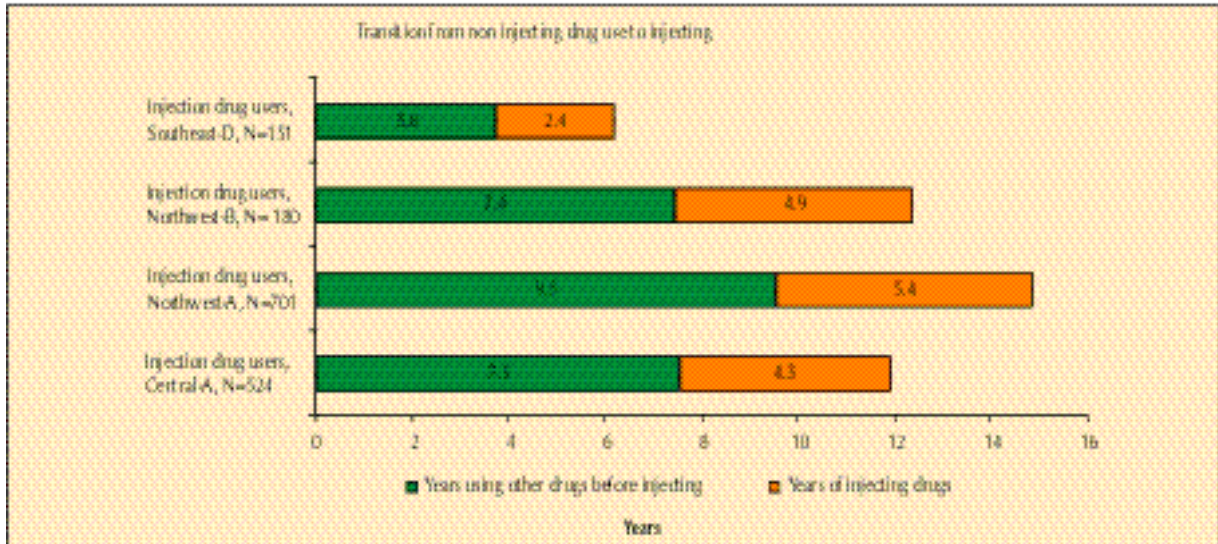
The average age of starting injection drug use was about 28 to 35 years at the Central and Northwest sites (Table 12). IDU at the Southeast site had started injecting at a slightly younger age.

**Table 12: History of drug use by drug injectors**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
Mean age of starting any kind of drug use (excluding cigarettes)	20.9 (20.3-21.4) Med: 20.5	22.1 (21.5-22.8) Med: 21	27.3 (26.3-28.4) Med: 26	19.6 (19-20.3) Med: 19
Mean age of starting injection drug use	28.4 (27.7-29.1) Med: 27	31.6 (31.1-32.2) Med: 30	34.8 (33.3-36.2) Med: 35	23.4 (22.7-24.1) Med: 23
Years of any kind of drug use	11.9 (11-12.7) Med:10	14.9 (14-15.7) Med:14	12.3 (11.5-13.2) Med:12	6.1 (5.6-6.6) Med:6
Years of injection drug use	4.3 (4-4.7) Med:4	5.3 (5.1-5.6) Med:5	4.9 (4.3-5.5) Med:4.5	2.4 (2.1-2.6) Med:2

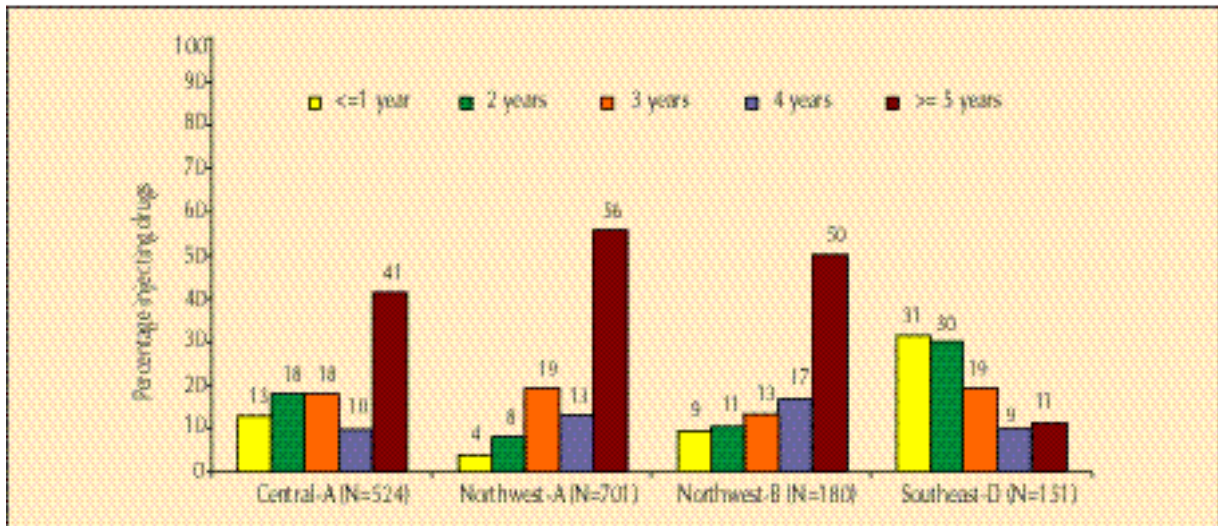
The age of starting any kind of drug use (excluding cigarettes) was lower. All the IDU had taken other drugs for an average of 4 to 10 years before switching to injection drug use as shown in Figure 2. In the Southeast, current IDU reported taking other drugs for slightly less than 4 years before they had switched to injection drug use.

**Figure 2: Transition from other drugs to injection drug use**



Surveillance found that injection drug use appears to be increasing as well. Each year for the past five years, roughly 10 to 20 percent of drug users started injecting (Figure 3). The IDU sampled in the Southeast site were comparatively new to injection drug use - 60% had started just in the last two years

**Figure 3: Influx of new drug injectors per year**



Over half of the injection drug users had tried to quit injecting drugs at some time in their lives, on the average three times (Table 13). The main places IDU mentioned for seeking help to quit drugs were at a drug clinic or hospital. In the Northwest where there is an active needle exchange programme, quitting through an NGO was also mentioned. They also tried quitting by migrating to another village, or by joining a religious gathering for an extended time. Sometimes, they become dependent on using other drugs, such as phensidil or heroin, in the attempt to stop injection drugs.

**Table 13: Injection drug users: efforts to quit injection drug use**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N= 180)
Proportion ever tried quitting drugs	55.1 (50.2-60)	61.3 (54.6-67.7)	71.7 (63.6-78.6)	55 (45.8-63.8)
Mean number of times tried quitting among those who reported quitting drugs	3.1 (2.8-3.4) Med: 2 n=289	3.3 (3-3.5) Med: 2 n=430	2.9 (2.6-3.2) Med: 3 n=129	3.2 (2.7-3.7) Med: 2 n=83
Proportion IDU ever been to jail last year	16 (13.3-19.2)	26.8 (23.6-30.3)	31.1 (22.7-40.9)	22.5 (15.5-31.5)
<b>Places IDU reported seeing help during effort to quit drugs (multiple answers given):</b>				
Drug clinic	53.3 (46-60.5)	52.6 (46.6-58.4)	3.1 (1.2-7.5)	28.9 (19-41.3)
Hospital	20.8 (15.4-27.4)	9.8 (7.2-13)	15.5 (10.6-22.1)	2.4 (0.5-9.9)
NGO	2.4 (1.1-5)	19.3 (15.4-23.9)	11.6 (7.4-17.7)	0
Village	39.8 (32.2-47.9)	21.9 (16.8-27.9)	8.5 (5-14.1)	2.4 (0.5-9.9)
Other places	Jail, self custody in own house, advice from friend /doctor, took heroin/phensidil	Self custody in own house, jail, private clinic, detoxification centre	Jail, self custody in own house, doctor/ pharmacy, tablique jamaat (extended religious gathering)	Self custody in own house, doctor/pharmacy

Between 16 to 32 percent of IDU were found to have had jail experience in the previous year. Injectors reported sometimes intentionally committing a crime in order to go to jail as a method of quitting drugs. Sometimes, parents also send their sons to jail to get them to quit.

### **Patterns of drug use and sharing of injecting equipment**

Table 14 shows the patterns of drug use and sharing of injection paraphernalia by drug injectors. IDU in the Northwest and Central sites reported about the same mean number of injections the previous day (about 2.5) and per week (17 to 18 injections), but those in the Southeast injected slightly less (around 2 injections per day and 13 per week).

Buprenorphine (tidijesic, local names: Madraj, Hyderabad, Sada mal) was the main drug injected at all the sites surveyed. At the Southeast-D site 8% of the IDU mentioned pethidine as the main injection drug they used.

A very common phenomenon among the IDU in all the four geographical locations was 'cocktailing' drugs (mixing different injection drugs). Phenergan, avil, sedil, or pethidine are generally used to make the cocktail. Cocktailing drugs can have negative health consequences, because it makes the vein inactive faster, and enhances abscess formation. Thirty to fifty percent of the IDU said that they had experienced abscesses in the past year.

Sharing of injecting equipment is common among injection drug users in Bangladesh. This can take the form of either active sharing, i.e. an IDU who uses a new syringe/needle passes this used syringe/needle on to somebody else, or it can be passive, i.e. an IDU injects with a needle/syringe used by somebody else. Passive sharing is the more dangerous habit in terms of HIV infection. About half the IDU from Central-A and Southeast-D sites passively shared injection equipment the last time they injected. One

out of twenty IDU in Central-A mentioned that they had not even once used a new needle-syringe in the past week (Table 14). In the Northwest region the sharing reported was much less, although still high - about 20 to 30 percent

In the Northwest, almost three out of four drug injectors use the services of professional injectors, who normally use the same injection equipment for many individuals. However, now NEP are working through them to promote safe injections. About 95% of the drug injectors in the Central and Southeast-D region reported never having used the services of professional injectors the previous week.

For all the IDU samples, the median size of the sharing groups was found to be about 2 injectors per injection. The injection drug users were also queried about their mobility with regards to injecting behaviour. About 10 to 15 percent of the IDU in Central-A and Northwest-A had injected in another city or country in the past year. This percentage was about double for IDU in Northwest-B (29.4%), and double that at the Southeast-D site (60.3%). It was not determined whether IDU had acquired drugs for injecting from the city they travelled to, or whether they had visited another place for some reason, and carried their own drug supply to inject with while there.

**Table 14. Injection drug use behaviour**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
Mean injections taken yesterday	2.4 (2.4-2.5) Med: 2	2.5 (2.4-2.6) Med: 2	2.6 (2.4-2.7) Med: 2	1.9 (1.7-2.1) Med: 2
Mean injections taken last week	17.5 (17-18) Med: 16.5	17.4 (16.6-18.1) Med: 14	18.1 (17.2-19.1) Med: 17	13.1 (12-14.3) Med: 14
Proportion of IDU shared passively last time	46.4 (41.3-51.6)	21.1 (16.5-26.5)	31.7 (27.5-36.1)	51 (44-57.9)
Proportion of IDU shared actively last time	60.5 (54.2-66.4)	21.4 (16.2-27.8)	32.8 (27.2-38.9)	46.4 (37.3-55.7)
Proportion of IDU shared injection (actively or passively) last time	70.2 (63.4-76.2)	28.5 (23.1-34.6)	47.2 (42.4-52.1)	74.2 (66.2-80.8)
Proportion of IDU shared injections passively last week	65.8 (60.1-71.1)	27.5 (22.4-33.3)	47.2 (42.4-52.1)	74.2 (66.2-80.8)
Proportion of IDU used a new needle/syringe last week	Always new: 34.2 (28.9-39.9) Sometimes new: 61.1 (55.7-66.2) Never new: 4.8 (3.1-7.2)	Always new: 72.5 (66.7-77.6) Sometimes new: 27.5 (22.4-33.3) Never new: 0	Always new: 52.8 (47.9-57.6) Sometimes new: 47.2 (42.4-52.1) Never new: 0	Always new: 25.8 (19.2-33.8) Sometimes new: 74.2 (66.2-80.8) Never new: 0
Proportion of IDU took injection from professional injectors last time	2.9 (1.6-5.2)	72.2 (66.9-76.9)	76.1 (69.6-81.6)	0
Proportion of injections taken from professional injectors last week	Always: 0 Sometimes: 5.5 (3.5-8.6) Never: 94.5 (91.4-96.5)	Always: 59.2 (52-66) Sometimes: 29.5 (24.4-35.2) Never: 11.3 (8.1-15.4)	Always: 51.7 (42.6-60.6) Sometimes: 35 (25.7-45.6) Never: 13.3 (9.5-18.4)	Always: 0 Sometimes: 4.6 (2.1-9.9) Never: 95.4 (90.1-97.9)
Mean size of sharing group among IDU who shared last time, and could recall this number (n)	2.1 (2-2.3) Med: 2 n=368	2.5 (2.3-2.7) Med: 2 n=162	1.6 (1.5-1.8) Med: 2 n=66	1.7 (1.6-1.8) Med: 2 n=112
Proportion of IDU injecting in another city/district last year (including outside of the country)	9.9 (7.7-12.7)	14.3 (11.5-17.6)	29.4 (23.7-35.9)	60.3 (52.8-67.2)

About one half to three quarters of the drug injectors sampled reported they tried to clean the needle/syringe in between use. The remainder who did not, could be a part of the proportion of IDU who actually did not share in the last injecting episode. The methods mentioned for cleaning injecting equipment were ineffective in terms of destroying HIV, such as cleaning with water, cloth/cotton, leaves, blowing the needle-syringe, and using a few drops of the drug itself, among others.

### ***Changes in sharing by IDU over the years of surveillance***

The indicator that was used to measure passive sharing in BSS rounds two and three (quantitative) is not strictly comparable with the indicator that was used in round 4, as the question was posed differently in round 4 (qualitatively). Therefore, a statistical comparison cannot be made, but the proportion of IDU who share passively seems to have remained stable between rounds two and four for the Central-A sample, and to have declined among IDU in the Northwest-A sample.

**Table 15: Changes in passive needle sharing over the rounds of surveillance**

Indicators Proportion of IDU shared passively last week	Round 2	Round 3	Round 4
Injection Drug users, Central-A	63.4	82.9	65.8
Injection Drug users, Northwest-A	52.3	58.2	27.5
Injection Drug users, Northwest-B	-	-	47.2
Injection Drug users, Southeast-D	-	-	74.2

## **Sexual behaviour**

### ***Sexual networks***

A high proportion of injection drug users were sexually active and had both regular and commercial partners (Table 16). In the Northwest, about one out of five drug injectors had sex with a commercial female in the previous year. This was even more common in the Central-A and Southeast-D sites, with more than half the IDU having had commercial female partners (Figure 4). Over 10% of the IDU surveyed at the latter sites had more than 10 sexual partners in the past year.

Only a small percentage of injectors in the Northwest (0.5 to 1.7 percent) had sex with commercial male or hijra partners, but around 5 to 10 percent of IDU in the Central and Southeast sites did so. A considerable percentage of IDU (8 to 17.7 percent) reported having engaged in group-sex. Drug injectors reported selling sex (to either male or female partners) in exchange for drugs or money as well, especially in the Southeast area (8.6%).



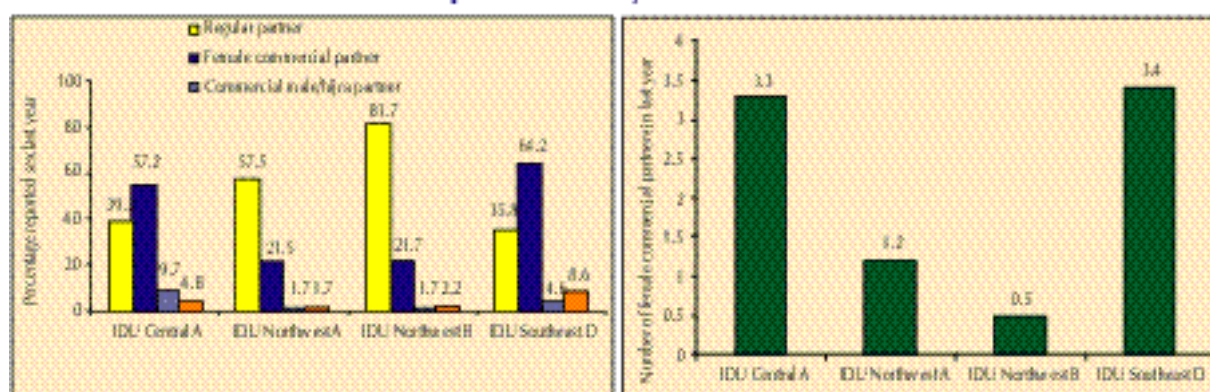
**Table 16: Sexual behaviour of injection drug users**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N=180)	IDU Southeast-D (N=151)
Proportion reported sex with regular partner last month	36.6 (31.3-42.3)	54.6 (50.8-58.4)	75.6 (70.1-80.3)	34.4 (27.9-41.7)
Proportion reported sex with regular partner last year	39.3 (33.8-45.1)	57.5 (53.4-61.4)	81.7 (76.7-85.8)	35.8 (29.4-42.7)
Proportion reported sex with commercial female last month	40.1 (34.1-46.4)	18.5 (15.8-21.6)	15.6 (9.3-24.8)	46.4 (37.9-55.1)
Proportion reported sex with commercial female last year	57.2 (52.1-62.2)	21.5 (18.5-24.9)	21.7 (15.3-29.8)	64.2 (55-72.5)
Proportion reported sex with commercial male or hijra last month	9.7 (7.3-12.9)	1.1 (0.4-2.9)	0.5 (0.1-5)	4.6 (2.6-8.2)
Proportion reported sex with commercial male or hijra last year	9.7 (7.3-12.9)	1.7 (0.8-3.6)	1.7 (0.5-4.9)	4.6 (2.6-8.2)
Proportion sold sex (to male/female) in exchange for money or drugs last month	4.8 (3.3-6.9)	1.7 (0.7-3.9)	2.2 (0.6-7.3)	8.6 (4.4-16.1)
Proportion sold sex (to male/female) in exchange for money or drugs last year	4.8 (3.3-6.9)	1.7 (0.7-3.9)	2.2 (0.6-7.3)	8.6 (4.4-16.1)
Proportion sold sex to male in exchange for money or drugs last month	4.8 (3.3-6.9)	1 (0.3-3.2)	0.5 (0.1-4.7)	0
Proportion reported group sex last month	17.7 (14.2-21.9)	8 (5.9-10.7)	8.9 (4.3-17.4)	14.6 (10.7-19.6)
Mean number of partners (female commercial) last year	3.3 (2.7-3.8) Med:1 Max:60	1.2 (1-1.4) Med:0 Max:25	0.5 (0.3-0.7) Med:0 Max:6	3.4 (2.4-4.3) Med:2 Max:20
<b>Proportion IDU reported the following number of female commercial partners in last year:</b>				
0 partner	42.7 (37.7-47.9)	78.5 (75.1-81.5)	78.3 (70.2-84.7)	35.8 (27.5-45)
1 to 5 partners	37.6 (32.7-42.7)	13.3 (10.8-16.2)	21.1 (14.6-29.4)	45 (36.4-54)
6 to 9 partners	7.8 (5.6-10.9)	4 (2.7-5.9)	0.5 (0.06-4.7)	5.3 (2.9-9.4)
10 or more partners	11.8 (9.1-15.3)	4.3 (3.1-5.9)	0	13.9 (8.2-22.6)

**Changes in IDU commercial sex habits over the years of surveillance**

Overall, there was a statistically significant fluctuation in IDU buying sex from female/male/hijra commercial partners last month ( $p=0.000$ ) in the Central-A sample (Table 17). The decrease that was observed between rounds two and three was not significant ( $p=0.098$ ), however, the increase between rounds three and round four is significant ( $p=0.000$ ), as is the increase comparing rounds two and four ( $p=0.001$ ). For the Northwest-A sample, the fluctuation in the proportion of IDU buying sex from commercial partners over the rounds was found to be significant ( $p=0.003$ ). The slight increase between rounds three and four was not significant ( $p=0.529$ ).

**Figure 4: Injection drug users: types of sexual partners reported last year and mean number of female commercial partners last year**



**Table 17: Changes in proportion of IDU buying sex from male/ female/hijras partners in the last month**

Indicators	Round 2	Round 3	Round 4
Injection Drug users, Central-A	31.6	26.4	43.3
Injection Drug users, Northwest-A	25.4	17.7	19.1
Injection Drug users, Northwest-B	-	-	16.1
Injection Drug users, Southeast-D	-	-	49

### Condom use by injection drug users

Condom use was low among injection drug users at all the sites sampled (Table 18). Condom use in the last sex act varied from 16 to 20 percent with regular female partners (including wives) at the Central-A, Northwest-A, and Southeast-D sites, and was higher at the Northwest-B site with about 48% reporting. Condom use at last sex with commercial female partners varied from about 17 to 30 percent.

The consistent condom use reported with commercial and non-commercial female partners was even lower, ranging from about 2 to 16 percent across the four sites (Table 18). The consistent condom use with commercial female partners was generally higher than with regular partners, except in the Northwest-B site. IDU in Northwest-B were more likely to use condoms consistently with their regular partners than those at other sites (16% versus 2 to 7 percent), possibly because 88% of them were married, and therefore they might have used condoms for family planning purposes. However, this was not queried.

A small proportion of IDU reported having had sex with a commercial male or hijra partner in the previous year (Table 16). Condom usage in the last such sexual encounter in Central-A (7.8%) was much lower than with commercial female partners, and at all sites consistent condom use with male/hijra partners (0 to 8.3 percent) was worse than with commercial female partners. None of the IDU in the Northwest-B or Southeast-D regions used a condom with male/hijra partners, albeit very few (3 and 7 injectors, respectively) reported such sexual encounters.

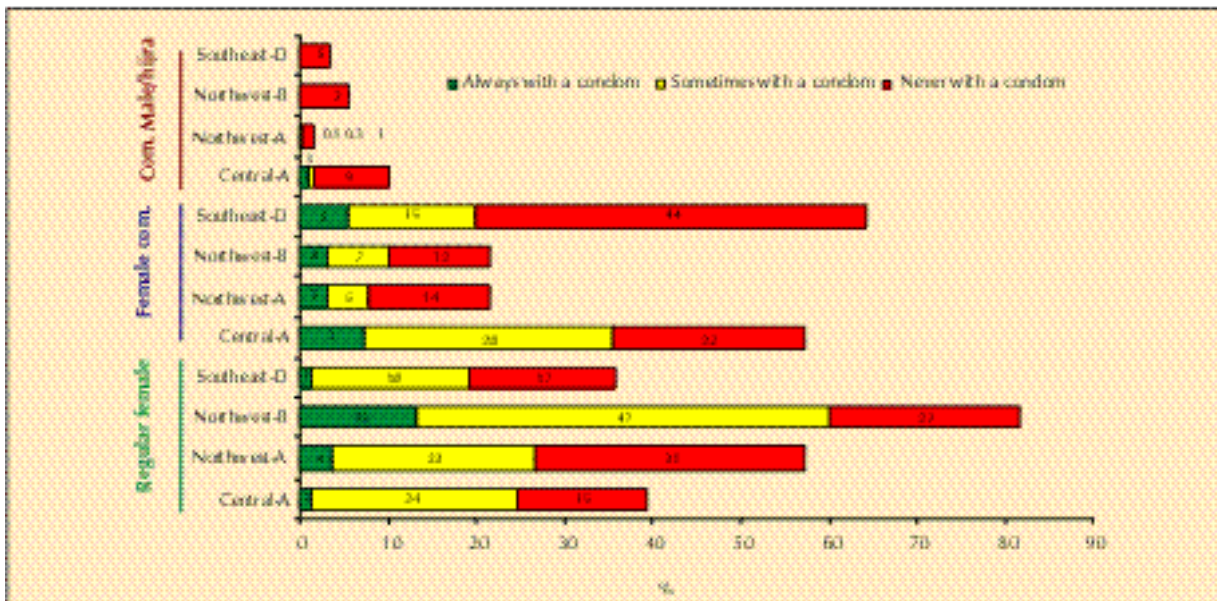
**Table 18: Condom use behaviour of injection drug users**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
<b>Last time condom use of IDU who reported sex last year with:</b>				
Regular partners	16.5 (12-22.3) n <sup>*</sup> =206	16.4 (13.1-20.3) n=403	48.3 (41.4-55.2) n=147	20.4 (11.6-33.3) n=54
Commercial female partners	29.3 (23.5-35.9) n=300	17.2 (11.4-25.1) n=151	30.8 (19.4-45.7) n=39	17.5 (10.9-27) n=97
Commercial male/hijra partners	7.8 (2.8-20.2) n=51	16.7 (2.8-57.8) n=12	0 n=3	0 n=7
<b>Consistent condom use of IDU who reported sex last year with:</b>				
Regular partners	1.9 (0.7-5) n=206	6.7 (4.5-9.9) n=403	16.3 (10.3-24.9) n=147	3.7 (0.9-14.5) n=54
Commercial female partners	12.7 (8.6-18.2) n=300	14.6 (9.2-22.3) n=151	15.4 (6.8-31.2) n=39	8.3 (4.1-16) n=97
Commercial male/hijra partners	5.9 (1.8-17.8) n=51	8.3 (0.6-58.4) n=12	0 n=3	0 n=7

\*The denominator used for calculating the percentage, i.e., the number of IDU who reported sex with a particular kind of partner (regular/commercial female/male/hijra) last year.

Hence, as shown in Figure 5, the sexual behaviour of the drug injectors sampled puts them at considerable risk with respect to HIV infection- they had different types of sexual liaisons, and condom use was extremely low in all their encounters.

**Figure 5. Injection drug users: condom use with different types of sexual partners in the past year**



### ***Changes in condom use by IDU over the years of surveillance***

In round four, last time condom use by IDU was measured separately with their female and their male/hijra partners, but this was not done in the previous two rounds ( Table 19). Therefore, a strict statistical comparison is not possible, but in Central-A there was an increase apparent in last time condom use, at least with respect to female partners. In Northwest-A, there was a decrease in last time condom use over rounds two to four, although there was an increase between rounds three and four.

**Table 19: Changes in IDU condom use over the rounds of surveillance**

Indicators	Round 2	Round 3	Round 4	
	Female/male/hijra	Female/male/hijra	Female	Male/hijra
Injection Drug users, Central-A	15.1	26.7	29.3	7.8
Injection Drug users, Northwest-A	25	13.5	17.2	16.7
Injection Drug users, Northwest-B	-	-	30.8	0
Injection Drug users, Southeast-D	-	-	17.5	0

### ***STI and treatment seeking***

From a quarter to a half of the IDU who had sexual experience reported at least one STI symptom in the previous year, and about one-third to half of them had sought formal medical treatment facilities to treat their last STI symptoms (Table 20). A higher proportion of IDU in the Central and Southeast regions reported having had STI symptoms than those in the Northwest regions. The most common symptoms reported by IDU were pain when urinating, genital sores, discharge from the penis, and pain in the genitals.

**Table 20: Injection drug users: STI treatment seeking behaviour**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
Proportion reported at least one STI symptom last year among those with sexual experience	41.1 (36.4-46) n*=491	24 (20.3-28.2) n=591	23.1 (17.9-29.4) n=173	45.7 (38.1-53.4) n=151
Proportion sought formal medical treatment for STI in the first intent ionamong those with sexual experience who reported STI in past year	42.6 (35.4-50) n*=202	45.8 (36.8-55) n=142	30 (18.7-44.4) n=40	39.1 (25.7-54.4) n=69
Mean waiting days for treating last STI among those with sexual experience who reported STI in past year and sought treatment	6.7 (5.9-7.6) Med:5 n=201	5 (4.6-5.5) Med:5 n=137	12.2 (5-19.5) Med:5.5 n=28	6.8 (5.2-8.4) Med:5 n=69
<b>First choice of STI treatment:</b>				
Hospital	12.9 (8.5-19)	15.2 (9.4-23.6)	7.5 (2.3-22)	0
Drug seller	33.7 (27.5-40.5)	33.8 (25.3-43.4)	15 (6.7-30)	23.2 (13.6-36.6)
Private doctor	20.8 (15.3-27.9)	26.2 (18.3-36.1)	15 (7.4-28)	39.1 (25.7-54.4)
Private clinic	3.9 (2-7.8)	0	0	0
NGO clinic	4.9 (2.4-10)	3.4 (1.5-7.5)	7.5 (2.5-20.6)	0
Traditional healer	16.8 (12-23)	15.9 (10.8-22.7)	2.5 (0.3-18.4)	34.8 (21.6-50.7)
Advice/treatment from friend	2 (0.7-5.2)	2.1 (0.7-6.1)	2.5 (0.3-17.5)	1.4 (0.2-10.7)
Self-medication	3.9 (1.8-8.3)	0	7.5 (2.1-23.4)	1.4 (0.2-10.7)
Did not seek treatment	0.5 (0.7-3.5)	3.4 (1.3-8.6)	30 (18-45.5)	0
Other	0.5 (0.7-3.4)	0	12.5 (6.9-21.6)	0

\* The denominator used for calculating the percentage, i.e. for first row of table it is the number of IDU who reported sexual experience, for the second row it is the number of IDU with sexual experience who reported an STI in the previous year, and for the third row it is the number of IDU with sexual experience who reported an STI in the previous year and sought treatment.

The mean number of waiting days before seeking treatment ranged from 5 to 7 days at the Northwest-A, Central, and Southeast sites, but was up to 12 days at the Northwest-B site. Those who sought treatment for their last STI were most likely to visit drug sellers or private doctors, or traditional healers.

### **Exposure to an intervention programme and its effects**

A majority of the drug injectors at the Northwest sites reported that they had participated in an HIV prevention intervention in the previous year (Table 21) - coverage in Northwest-A was particularly high (87.6%). Only about half the IDU in Central-A had been exposed to an intervention (46%). No HIV intervention targeting IDU existed in Southeast-D at the time of the survey.

The IDU in Central-A reported participation in the prevention program every alternative day, those in Northwest-B roughly once a week, and those in Northwest-A attended almost every day of the week. Intervention programmes in Central and Northwest-A mostly involved drug injectors in needle-syringe exchange programmes, and much less so in education, condom promotion, and STI

treatment activities. However, in the Northwest-B region, among those who were involved with the programmes, the programme appeared stronger in involving about half the injectors in an education programme and in providing condoms to them, besides the majority participating in needle-syringe exchange.

The effects of intervention programmes on injection drug users can be assessed through the difference in various behaviour patterns as described below:

**Table 21: Injection drug users: exposure to intervention programmes**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N= 151)
Exposure to intervention in past year	46 (36.1-56.2)	87.6 (82.6-91.3)	60 (52.1-67.4)	0
Proportion under needle exchange program in past year	44.5 (34.6-54.8)	87.6 (82.6-91.2)	53.3 (44.7-61.7)	0
Mean number of times participated in intervention program last month	14.8 (13.3-16.3) Med:15	25.7 (25-26.3) Med:28	5.9 (4.4-7.3) Med:4	-
Number involved in interventions	n=241	n=614	n=108	n=0
Proportion under needle exchange program	96.7 (92.8-98.5)	100	88.9 (78.6-94.6)	-
Proportion under education program	6.2 (3.5-10.9)	24.9 (19.7-30.9)	49.1 (41.1-57.1)	-
Proportion under condom promotion program	7.5 (4-13.6)	7.6 (4.9-11.7)	51.8 (45.5-58.1)	-
Proportion under STI treatment program	2.9 (1.3-6.1)	1.5 (0.7-2.9)	6.5 (3.2-12.6)	-

### ***Effect of intervention programmes on sharing of injecting equipment***

As shown in Table 22, active or passive sharing or sharing in either direction during the last injecting episode were found to be significantly less ( $p < 0.05$ ) among injection drug users under the needle-syringe exchange program in all three geographical locations sampled, as compared to those who were not in a NEP. Passive sharing of injecting equipment over the past week was also found significantly higher ( $p < 0.05$ ) among the injection drug users reported to be outside the coverage of a NEP.

**Table 22: Injection drug users: testing the significance of exposure to a needle exchange program (NEP) in the past year on sharing indicators**

Indicators (95% CI)	IDU Central-A		IDU Northwest-A		IDU Northwest-B	
	Exposed to NEP		Exposed to NEP		Exposed to NEP	
	Yes	No	Yes	No	Yes	No
Proportion of IDU shared passively last time	37.8 (30.5-45.7) n=233	53.3 (47-59.5) n=291	15.8 (12.1-20.4) n=614	58.6 (43.9-71.9) n=87	16.7 (10.2-26.1) n=96	48.8 (36.7-61) n=84
	p=0.003		p=0.000		p=0.002	
Proportion of IDU shared actively last time	44.6 (37-52.5) n=233	73.2 (66.4-79.1) n=291	14.6 (10.9-19.5) n=614	69 (52.1-81.9) n=87	18.7 (11.8-28.5) n=96	48.8 (35.7-62.1) n=84
	p=0.000		p=0.000		p=0.007	
Proportion of IDU shared actively or passively last time	51.9 (43.8-59.9) n=233	84.9 (77.3-90.2) n=291	21.7 (17.5-26.5) n=614	77 (58.1-89) n=87	26 (17.2-37.3) n=96	71.4 (55.3-83.5) n=84
	p=0.000		p=0.000		p=0.002	
Proportion of IDU shared passively last week	58.8 (50-67) n=233	71.5 (64-78) n=291	21.2 (17.1-25.9) n=614	72.4 (54.3-85.3) n=87	26 (17.2-37.3) n=96	71.4 (55.3-83.5) n=84
	p=0.030		p=0.000		p=0.002	

**Effect of intervention programmes on condom use**

A significantly higher ( $p < 0.05$ ) proportion of injection drug users under an intervention program in Central-A and Northwest-B had used a condom with regular partners during their last sex acts, as compared to their non-intervention counterparts (Table 23). In Northwest-A, though the last time condom use with regular partners was higher among the participants of the intervention programme compared to the non-exposed IDU, the difference was not significant ( $p = 0.243$ ).

With commercial female sex partners, the last time condom use was found to be significantly higher ( $p < 0.05$ ) for IDU under the intervention program in Central-A region. In Northwest-A and Northwest-B though the last time condom use with commercial female partners was higher among the IDU exposed to HIV intervention, the difference when compared to the non-exposed IDU was not significant ( $p = 0.051$  and  $p = 0.222$ , respectively).

No significant differences were found at any of the sites in last time condom use with commercial male or hijra partners based on intervention exposure. This may be due to the smaller sample sizes in this category.

**Table 23: Injection drug users: testing the significance of exposure to an intervention programme in the past year on last time condom use with regular and commercial sexual partners**

Indicators (95% CI)	IDU Central-A		IDU Northwest-A		IDU Northwest-B	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Last time condom use with regular female partner	26.4 (17.6-37.5) n=72	11.2 (6.9-117.6) n=134	17 (13.5-21.3) n=370	9.1 (2.9-24.8) n=33	58.5 (48.1-68.2) n=94	30.2 (21.3-40.8) n=53
	<b>p=0.004</b>		<b>p=0.243</b>		<b>p=0.002</b>	
Last time condom use with commercial female partner	42.2 (31.2-54.1) n=116	21.2 (15.5-28.3) n=184	20.8 (13.7-30.2) n=125	0 n=26	41.2 (22.6-62.6) n=17	22.7 (9.9-43.9) n=22
	<b>p=0.001</b>		<b>p=0.051</b>		<b>p=0.222</b>	
Last time condom use with commercial male/hijra partner	0 n=10	9.7 (3.4-24.8) n=41	33.3 (6.3-78.7) n=6	0 n=6	0 n=2	0 n=1
	<b>p=0.327</b>		<b>p=0.169</b>		<b>Not applicable</b>	

It was also found that a significantly higher proportion ( $p < 0.05$ ) of IDU reported to be involved with intervention activities in Central-A but not in Northwest regions used condoms consistently with commercial female partners in the past year (Table 24). No such difference ( $p > 0.05$ ) was detected with regular or commercial male/hijra partners.

**Table 24: Injection drug users: testing the significance of exposure to an intervention programme in the past year on consistent condom use with regular and commercial sexual partners**

Indicators (95% CI)	IDU Central-A		IDU Northwest-A		IDU Northwest-B	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Consistent condom use with regular female partner last year	2.8 (0.7-10.9) n=72	1.5 (0.4-5.5) n=134	6.7 (4.4-10.2) n=370	6.1 (1.5-21) n=33	21.3 (12.2-34.4) n=94	7.5 (2.7-19.2) n=53
	<b>p=0.518</b>		<b>p=0.877</b>		<b>p=0.078</b>	
Consistent condom use with commercial female partner last year	23.3 (14.8-34.6) n=116	6 (3.2-12.9) n=184	17.6 (11-26.9) n=125	0 n=26	17.6 (4.4-49.9) n=17	13.6 (4.4-35.2) n=22
	<b>p=0.000</b>		<b>p=0.081</b>		<b>p=0.753</b>	
Consistent condom use with commercial male/hijra partner last year	0 n=10	7.3 (2.1-21.7) n=41	16.7 (1-79.2) n=6	0 n=6	0 n=2	0 n=1
	<b>p=0.397</b>		<b>p=0.402</b>		<b>Not applicable</b>	



### Effect of intervention programmes on STI and treatment-seeking

The other effect of intervention coverage that was analysed on the basis of behavioural surveillance data was the health and treatment seeking behaviour of injection drug users (Table 25).

At the Northwest-A site significantly more IDU outside an intervention reported having had at least one STI symptom in the past year compared to those who were exposed to an intervention ( $p=0.000$ ); and significantly less time was wasted by IDU in interventions in waiting before seeking treatment. In Northwest-B a significantly higher proportion of those outside interventions had an STI symptom compared to those in interventions ( $p=0.037$ ), but the difference was not significant in Central-A. Compared to IDU not in an intervention, more IDU in the Central-A intervention sought formal medical treatment for STI and they spent significantly less days waiting before doing so. In Northwest-B more IDU in interventions sought medical attention for STI, but the waiting period before that was not significantly less than those outside interventions ( $p=0.146$ ).

**Table 25: Injection drug users: testing the significance of exposure to an intervention programme in the past year on health seeking behaviour**

Indicators (95% CI)	IDU Central-A (N=524)		IDU Northwest-A (N=701)		IDU Northwest-B (N=180)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Proportion reported at least one STI symptom in last year among those with sexual experience)	37.2 (30.4-44.5) n=226	44.5 (38-51.2) n=265	16.7 (13.2-21) n=532	89.8 (76.4-96) n=59	16.2 (9.9-25.3) n=105	33.8 (22.5-47.4) n=68
	$p=0.130$		$p=0.000$		$p=0.037$	
Proportion sought formal medical facilities in first intention for STI among those with sexual experience who reported STI in past year	50 (40-59.9) n=84	37.3 (28.1-47.5) n=118	50.6 (37.9-63.1) n=89	37.7 (24.2-53.5) n=53	52.9 (33.2-71.8) n=17	13 (2.3-48.5) n=23
	$p=0.083$		$p=0.214$		$p=0.064$	
Mean waiting days for treating last STI among those with sexual experience who reported STI in past year and sought treatment	4.9 (4-5.9) n=83	8 (6.8-9.2) n=118	4.2 (3.7-4.8) n=85	6.3 (5.6-7) n=52	6.8 (3.5-10.1) n=15	18.5 (3.3-33.7) n=13
	$p=0.000$		$p=0.000$		$p=0.146$	

### HIV/AIDS-related Knowledge Issues

#### Knowledge on modes of HIV transmission and confidential HIV testing

More than eighty percent of the injection drug users in the Central-A, Northwest-A and Southeast-D regions knew that using condoms and avoiding sharing injecting equipment could help in preventing HIV transmission (Table 26). In the Northwest-B sample around 70% of the drug injectors responded with this knowledge. However as shown by previous data, this was not reflected in their injection-sharing behaviour or in their condom use (see Tables 14 and 18).

Injection drug users in Northwest-B and Southeast-D were about three times more likely than those in the Central-A and Northwest-A sites to know where a confidential HIV test could be performed.

The high proportion of drug injectors in the Southeast-D sample with correct knowledge on the modes of HIV transmission (86 to 92 percent) and confidential HIV testing (30.5%) may be considered somewhat surprising when it is an area with no HIV prevention intervention. It should be noted, however, that this group did have a higher educational level than the other groups of IDU sampled.

**Table 26: Injection drug users: knowledge on modes of HIV transmission and confidential HIV testing**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N=180)	IDU Southeast-D (N=151)
Proportion of IDU who mentioned condom use as a mode of prevention	82.8 (77.4-87.1)	80.7 (75.9-84.8)	72.2 (65.4-78.2)	86.1 (79.4-90.9)
Proportion of IDU mentioned one can be infected by sharing injection equipment	82.2 (74.9-87.8)	86.7 (82.2-90.2)	73.9 (65.3-81)	92 (86.9-95.3)
Proportion of IDU who know where confidential HIV testing can be done	8.6 (5.2-13.9)	9.4 (6.7-13)	27.8 (18.5-39.4)	30.5 (22.9-39.2)

**Knowledge on sources of needle- syringe**

Almost every drug injector sampled knew where new needles/syringes could be obtained. Most of them mentioned availability at a pharmacy or through NGO workers as the main sources (Table 27). It should be noted that although in the Central-A site only 45% of the respondents said they participated in a needle-syringe exchange program (see Table 21), around 64% knew that clean needles and syringes could be obtained from NGO workers. For the Northwest-A and Northwest-B samples, there was a good correlation between the proportion who reported they were covered by a needle-syringe exchange program and those who mentioned NGO workers as a source of new needles/syringes. At these two sites a quarter to a third of those sampled also quoted drug sellers as a source - possibly due to the use of professional injectors at these sites. In the Southeast site where there is no intervention, besides getting needle-syringes at a pharmacy, IDU mentioned friends, fellow drug users, and drug sellers themselves, as sources of injecting equipment.

**Table 27: Injection drug users: knowledge on sources of needle- syringe**

Indicators (95%CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N=180)	IDU Southeast-D (N=151)
Proportion knew where new needle-syringe can be found	100	100	97.2 (94.5-98.6)	98.7 (94.6-99.7)
<b>Proportion that mentioned:</b>	<b>n=524</b>	<b>n=701</b>	<b>n=175</b>	<b>n=149</b>
Pharmacy	97.7 (95.4-98.9)	87 (83.1-90.1)	50.9 (43.5-58.1)	100
Health facility	0.8 (0.3-1.9)	6 (3.8-9.4)	1.1 (0.2-5.1)	7.4 (3.3-15.8)
Friend	1.1 (0.4-3.1)	0.4 (0.1-1.3)	1.1 (0.2-5.2)	22.1 (15.7-30)
Fellow drug users	8.2 (5.4-12.4)	2.3 (1.2-4.3)	4.6 (2.2-9.2)	15.4 (10.7-21.8)
NGO worker	63.9 (55.6-71.5)	84.4 (79.6-88.3)	53.1 (47.2-59)	0
Drug seller	8.8 (6.3-12.1)	32.5 (27.9-37.5)	25.1 (18.7-32.9)	13.4
Others	0.4 (0.1-1.5)	1.7 (0.7-3.9)	36(CARE) (30.7-41.7)	0.7 (0.1-4.3)

### Knowledge on sources of condoms

Although most of the sexually active IDU sampled knew where to get condoms, a disturbingly high proportion of them reported (Table 28) that they had never once used a condom in their life (30 to 67 percent). Between 2 to 18 percent of the total sample acknowledged that they had experienced condom breakage in the past month.

**Table 28: Injection drug users: knowledge on sources of condoms**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N=180)	IDU Southeast-D (N=151)
Proportion of IDU never used condoms among those who had sexual experience	39.5 (34.5-44.7) n=491*	63.1 (57.4-68.4) n=591	30.1 (22.4-39) n=173	66.9 (58.5-74.3) n=151
Proportion of IDU reported easy access to condoms	80.7 (73.7-86.1) n=264**	91.6 (84.8-95.5) n=215	65 (53.9-74.6) n=117	98 (87.5-99.7) n=50
Proportion had a condom break last month	13.7 (11.1-17)	1.4 (0.7-2.7)	17.2 (12.2-23.8)	2 (0.7-5.5)

\* The denominator used for calculating the percentage, i.e., the number of IDU who had sexual experience.

\*\* The reason for the smaller sample size for this indicator is that a large proportion of IDU said they had not used condom in the previous month or had never used one.

### Knowledge on means to avoid HIV and other sexually transmitted infections

Almost everyone sampled in the Central-A and Southeast-D regions had heard about HIV/AIDS, and in the Northwest sites nearly nine out of ten IDU had. But in spite of the majority of injection drug users responding correctly regarding the two main modes of HIV transmission, and knowing where to get condoms and clean needles, about 25 to 60 percent of the IDU at the Central-A, Northwest-B, and Southeast-D sites said that they do not take any precautionary measures to avoid HIV or sexually transmitted infections (Tables 29). In the Northwest-A sample, more respondents reported taking steps to avoid HIV than at the other sites (about 88%).

About one quarter to a half of the IDU at the Central-A, Northwest-B and Southeast-D sites mentioned never sharing injection equipment as a means to avoid getting HIV/STI. A higher proportion of IDU in Northwest-A (82%) said they always use clean syringes and needles to avoid HIV. It is interesting to note that in the Northwest a larger proportion of IDU mentioned not sharing needles as a means to protect against HIV, as compared to what they said regarding STI.

Another means of avoiding HIV and most STI, i.e. consistent condom use, was reported by very few of the respondents in Southeast-D, and by only 4 to 7 percent of the IDU in Central-A and Northwest-A. A higher proportion of IDU in Northwest-B were aware that using condoms was protective against HIV/STI (15 to 19 percent). In contrast, around one out of ten IDU mentioned washing with urine or 'Dettol' after sex acts to avoid STI.

**Table 29: Injection drug users: measures taken to avoid STI and HIV**

Indicators (95% CI)	IDU Central-A (N=524)	IDU Northwest-A (N=701)	IDU Northwest-B (N= 180)	IDU Southeast-D (N=151)
<b>Steps taken by sexually experienced IDU to avoid STI: *</b>				
Do nothing	52.6 (47.4-57.6)	24.7 (20.7-29.2)	37.6 (31.44-6)	62.9 (55.3-69.9)
Never share needles/syringes	26.5 (21.8-31.8)	33 (27.1-39.5)	46.5 (40-53.1)	24.5 (17.5-33.2)
Wash with Dettol or urine	12.8 (9.5-17.1)	9.8 (6.6-14.4)	6.4 (3.1-12.7)	13.2 (7-23.7)
Always use condoms	4.5 (2.8-7)	6.8 (3.9-11.3)	19.1 (13.4-26.4)	0.7 (0.08-5.1)
Take medicine	0.8 (0.3-2.2)	0.3 (0.09-1.3)	1.7 (0.6-5.3)	0.7 (0.08-4.9)
Others**	13.6 (10.7-17.3)	35.4 (30.1-41)	4 (1.4-11.1)	13.9 (8.3-22.4)
Proportion who had not heard of HIV/AIDS	0.8 (0.3-2)	10.6 (7.2-15.1)	12.8 (9.5-16.9)	2 (0.6-6.2)
<b>Number who had heard of HIV/AIDS</b>	<b>n=520</b>	<b>n=627</b>	<b>n=157</b>	<b>n=148</b>
<b>Steps taken to avoid HIV: *</b>				
Do nothing	58.8 (53.2-64.3)	11.8 (8.9-15.4)	33.8 (25.5-43.1)	60.8 (53.8-68)
Never share needles/syringes	29.4 (24.2-35.2)	81.7 (76.9-85.6)	57.3 (50-64.3)	26.3 (19.6-34.4)
Always use condoms	4.4 (2.8-7)	5.3 (2.9-9.3)	15.3 (10.2-22.2)	2 (0.6-6.4)
Wash with Dettol or urine	6.7 (4.5-9.9)	5.7 (3.7-8.8)	7 (4.1-11.7)	10.1 (6.6-15.2)
Take medicine	0.4 (0.1-1.6)	0.3 (0.08-1.2)	0	1.3 (0.3-5.7)
Others	11.5 (9-14.7)	10.7 (8.3-13.6)	1.3 (0.1-10.4)	13.5 (8.4-20.9)
Text of others	Don't have sex outside, sex with wife only, sometimes use a condom, use clean syringe, remain clean	Don't have sex with sex workers, sex with wife only, don't have sex, sometimes use a condom, use clean needle-syringe, remain careful about taking others' blood, remain clean	Don't have sex, only sometimes share	Don't have sex with sex workers, sometimes use a condom, use clean needle-syringe, remain clean

\* Multiple answers were allowed

\*\* The text of some of the answers included: don't have sex outside/with sex workers, sex with wife only, sometimes use condoms/try to use condoms, use condom with sex workers, take a bath after sex, remain clean, use soap, only sometimes share needle-syringe, and am careful.

**Self-perception of HIV/AIDS risk and the rationale**

At the three sites with HIV prevention interventions (Central-A, Northwest-A, and Northwest-B) about a third to half of the IDU did not know whether they were at risk of contracting HIV (Table 30). As might be expected, at the Southeast-D site where no intervention coverage existed at the time of the survey, a higher proportion of IDU did not know whether they were at risk of HIV infection (67%).

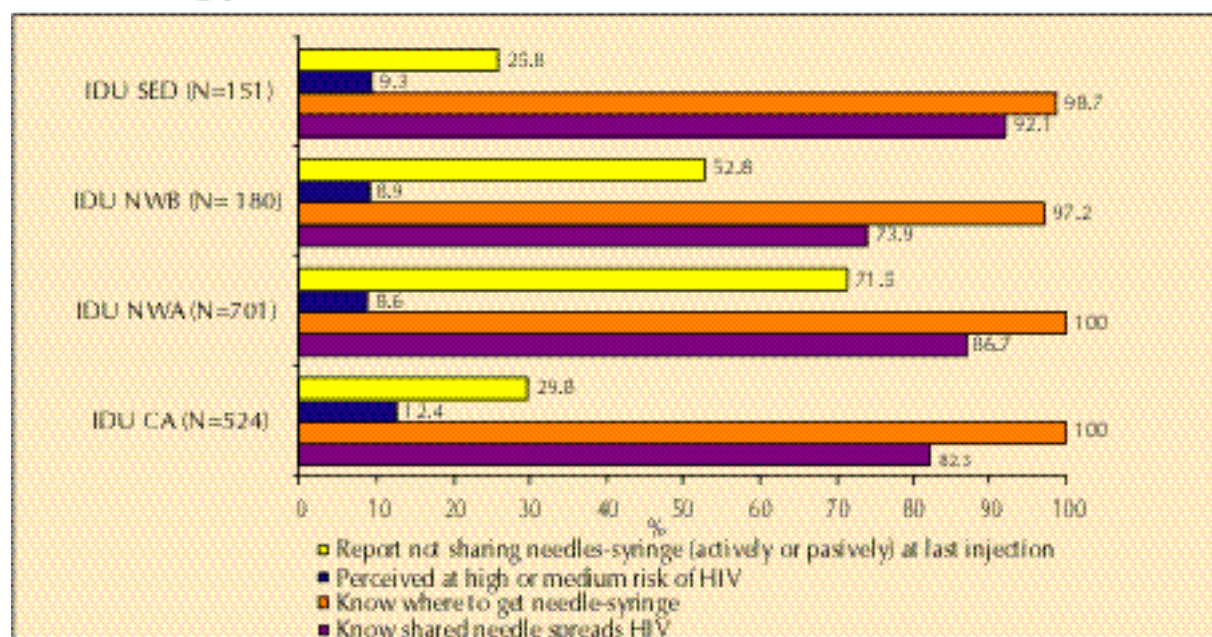
Less than about twelve percent of all the respondents believed they were at a high or medium risk of getting HIV, and about 20 to 60 percent thought they had little or no chance of HIV infection.

The rationale behind their answers is given in Table 30 below. Although the responses appear indicative of having absorbed knowledge on the main modes of HIV transmission, there is still a massive gap between knowledge, risk perception, and safe behaviour as shown in Figure 6.

**Table 30 : Injection drug users: self-perception of risk of HIV infection and rationale**

Sampled groups	Self-perception of risk of HIV infection				Proportion under HIV intervention coverage in past year
	High	Medium	Low or no risk	Don't know	
IDU, Central-A, (N=524)	3.2 (1.9-5.4)	9.2 (6.7-12.4)	42.7 (37.6-48.1)	44.8 (39.3-50.5)	44.8 (39.3-50.5)
IDU, Northwest-A, (N=701)	3.6 (2.4-5.2)	5 (3.3-7.5)	62.3 (57.4-67)	29.1 (24.3-34.4)	87.6 (82.6-91.3)
IDU, Northwest-B, (N=180)	5.5 (3.1-9.9)	3.3 (1.4-7.6)	49.4 (45.4-53.5)	41.7 (36-47.5)	60 (52.1-67.4)
IDU, Southeast-D, (N=151)	0.7 (0.08-5.1)	8.6 (4.5-15.9)	23.8 (16-34)	66.9 (54.4-77.3)	0
<b>Rationale for self-perception of risk (multiple answers exist):</b>					
<b>IDU, Central-A (N=524)</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: sharing injections (80%), multiple partners (25%), don't use condoms (34%), and others (12%, i.e. most often that they use condoms only sometimes, and have sex with sex workers.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: don't share injection equipment (50%), always use condoms (13%), have sex with clean partners (6%), avoid sex with foreigners (3%), and others (34%), i.e. most often that they don't have sex outside/have sex with wife only, have fewer partners, good health, self-confidence, and remain clean.</p>				
<b>IDU, Northwest-A (N=701)</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: sharing injections (63%), multiple partners (7%), don't use condoms (15%), and others (28%), i.e. most often that they use condoms only sometimes, and that sometimes without thinking they share syringe-needles.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: don't share injection equipment (93%), always use condoms (7%), have sex with clean partners (1%), avoid sex with foreigners (4%), and others (20%), i.e., most often that they don't go to sex workers, careful about receiving blood, try to use clean needles, and use condoms sometimes.</p>				
<b>IDU, Northwest-B (N=180)</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: sharing injections (88%), multiple partners (0%), don't use condoms (19%), and other (6%) - drug addiction was mentioned.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: don't share injection equipment (88%), always use condoms (16%), sex with clean partners (6%), avoid sex with foreigners (0%), and others (11%), i.e., most often that they use condoms sometimes, only sometimes share, and wash with urine/soap.</p>				
<b>IDU, Southeast-D (N=151)</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: sharing injections (79%), multiple partners (7%), don't use condoms (21%), and others (7%).</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: don't share injection equipment (39%), always use condoms (8%), sex with clean partners (11%), avoid sex with foreigners (6%), and use others (64%), i.e., most often that they don't go to sex workers, have sex with wife only, use condoms sometimes, share needles, and they remain clean.</p>				

**Figure 6: Injection drug users: gap between knowledge, risk perception, and safe injecting practices**



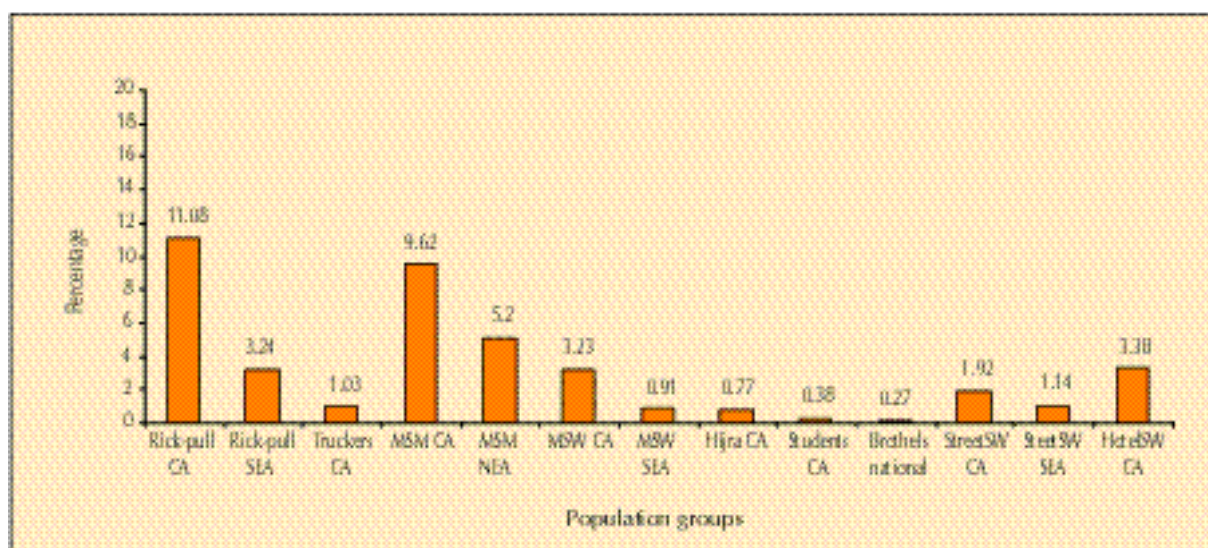
### **Injection drug use in other population groups**

Behavioural surveillance also assessed injection drug use in the other population groups that were sampled at the different geographical sites, namely, female sex workers (in brothels, street-based, and hotel-based), male sex workers, hijras, and males who have sex with males.

Injection drug use was very low among all the female sex workers sampled (Table 31 and Figure 7), although almost one in four of the street-based sex workers and one in five of the hotel-based sex workers at the Central-A site reported taking other kinds of drugs (besides alcohol) in the year prior to surveillance. Hotel sex workers in Central-A (3.4%) reported the most injection drug use, and women in brothels the least (0.3%). However, female sex workers are linked to drug injectors through their sexual networks - around 10 to 20 percent of the female sex workers reported that they had clients who were IDU, and 5 to 10 percent of the sex workers with non-commercial partners reported that their partners injected drugs.

**Table 31. Injection drug use among female sex workers and their partners**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of SW using drugs other than alcohol in past year	7.4 (5.7-9.6)	24.7 (20.5-29.4)	10.3 (6.3-16.2)	20.6 (16.8-25)
Proportion injecting drugs in past year	0.3 (0.07-1.1)	1.9 (0.9-4.1)	1.1 (0.3-3.8)	3.4 (1.9-6)
Proportion of SW reported their clients are injection drug users	9.1 (7.2-11.4)	14.9 (11.4-19.4)	10 (6-16)	17.8 (14.3-22)
Proportion of SW with non-commercial partners in the past month who reported their partners inject drugs	4.9 (2.6-8.9) n=205	9.2 (6.1-13.8) n=347	8.6 (4-17.5) n=105	9.5 (6-14.9) n=262

**Figure 7: Injection drug use among other vulnerable groups surveyed**

All the male groups and hijras sampled reported taking drugs other than alcohol in the past year, including injection drugs (Table 32). Students and hijras reported less drug use in general (8 to 10 percent) than the other groups of men sampled (about 25 to 40 percent), and particularly less injection drug use (less than 1%). The two groups of MSM in Central-A and Northeast-A reported the most drug use in general, and their injection drug use was also higher than most of the other groups of men sampled. But as was the case in the previous rounds of behavioural surveillance, the highest proportion of injection drug users was among rickshaw pullers - 11 percent of the rickshaw pullers in Central-A reported injecting drugs in the past year (Figure 7). Injection drug use among the rickshaw pullers in Southeast-A, truckers, and male sex workers was less than 4 percent.

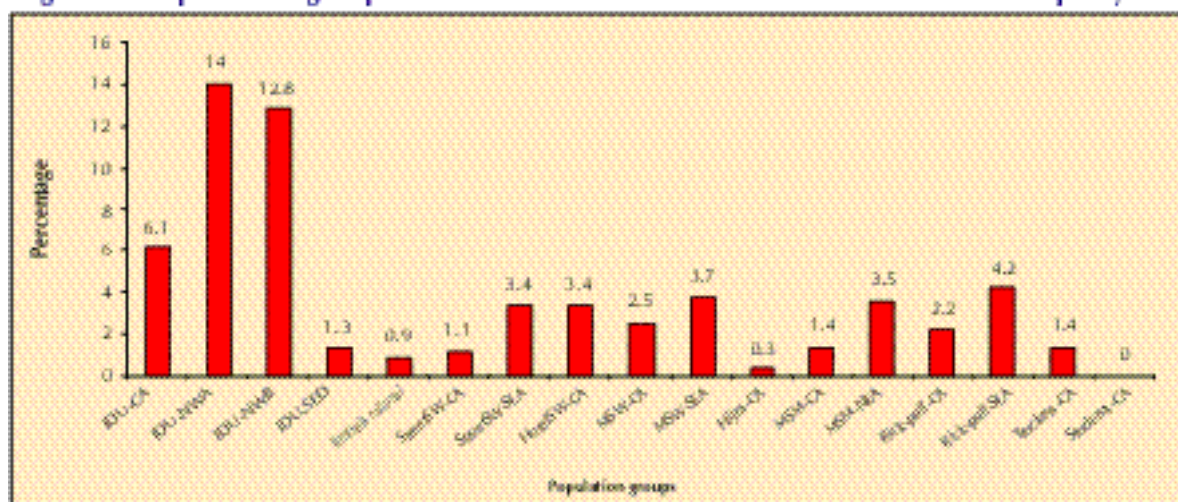
**Table 32. Injection drug use among male groups and hijras**

Population Groups	Indicators (95% CI)	
	Proportion reported using drugs other than alcohol in past year	Proportion injected drugs in past year
Rickshaw pullers, Central-A (N=420)	30.2 (24.5-36.6)	11.1 (8.4-14.5)
Rickshaw pullers, Southeast-A (N=342)	27.8 (22.7-33.5)	3.2 (1.7-5.9)
Truckers, Central-A (N= 459)	28.7 (24.3-33.4)	1.03 (0.4-2.7)
Students, Central-A (N=339)	7.9 (4.5-13.3)	0.4 (0.05-2.9)
MSW, Central-A (N=366)	27.1 (22.4-32.3)	3.2 (1.9-5.5)
MSW, Southeast-A (N=328)	26.2 (19.4-34.3)	0.9 (0.3-2.8)
Hijras, Central-A (N=387)	10.3 (6.3-16.6)	0.8 (0.2-2.4)
MSM, Central-A (N=426)	39.9 (34.5-45.6)	9.6 (6.5-13.9)
MSM, Northeast-A (N=346)	43.1 (38.1-48.1)	5.2(3.2-8.4)

### ***Selling of blood by groups under behavioural surveillance***

Some proportion of all the vulnerable groups under behavioural surveillance had sold blood in the previous year, except for the students in Central-A (Figure 8). Among all the groups sampled, the most IDU had sold blood. At the Northwest-A and -B sites, 13 to 14 percent of the IDU surveyed had donated blood for money in the past year, and in the Central-A site half that percentage had sold blood. Only 3 to 4 percent of the groups sampled in the Southeast area reported selling blood, and few of the IDU did (1.3%). But about twice the proportion of the rickshaw pullers in Southeast-A (4.2%) reported selling blood compared to those in Central-A (2.2%). Only a small percentage of the truckers group (1.4%) had

**Figure 8: Proportion of groups under behavioural surveillance that sold blood in the past year**



## **3.2 MALE-TO-FEMALE SEX**

### **3.2.1 Serology**

Serological surveillance measured HIV and syphilis prevalence among several population sub-groups under the category of 'male-to-female sex'. These included: brothel-based female sex workers from nine brothels located within three sentinel sites in the Central region and two sentinel sites in the Southwest region each of which were comprised of three brothels; street-based female sex workers in two cities in the Central region and one Southwest city; and hotel-based female sex workers at a Central sentinel site.

Male population sub-groups sampled were: babus who were the boyfriends/regular partners of female sex workers in brothels in two cities in the Central region; truckers and launch workers at one sentinel site each in the Central region; and male STI clinic patients in one city in Northeast Bangladesh.

#### ***Demographic characteristics***

Demographic information on the female groups sampled for serological surveillance, and on babus and truckers among the male groups, is summarised in Table 33. For launch workers and STI patients, information was obtained only on age, as it was not possible to administer the full questionnaire.

Brothel-based sex workers from Central-B were the youngest among the sex workers sampled at the three sites in the Central region ( $p < 0.001$  between Central-B and Central-C;  $p = 0.049$  between Central-B and Central-D), and those from Central-D were younger than those from Central-C ( $p < 0.001$ ). Brothel-based sex workers from the Southwest region were similar in terms of age, proportions who ever attended school, years of schooling, and duration in the profession.

Among the street-based sex workers, those from Central-A were the youngest ( $p < 0.001$  between Central-A and Central-B;  $p < 0.001$  between Central-A and Southwest-A). Street-based sex workers from Southwest-A were younger than those from Central-B ( $p = 0.008$ ). They attended school for a similar duration in all three sites.



**Table 33: Demographic characteristics of female sex workers and male groups, serological surveillance, 2002**

Geographical location (n)	Age in years, median (25th-75th quartiles)	Ever attended school n (%), 95% CI	Education (years) median (25th - 75th quartiles)	Duration in profession (months)* median (25th -75th quartiles)	Duration at same site as sex worker (months)** median (25th -75th quartiles)
<b>Brothel - based female sex workers</b>					
Central B (406)	22 (18-28)	101 (24.9), 20.7-29.4	4 (3-6)	48 (18-96)	36 (12-84)
C (152)	25 (22-34)	19 (12.5), 7.7-18.8	5 (3-8)	93 (36-180)	60 (18-153)
D (402)	23 (19.8-30)	96 (23.9), 19.8-28.4	4.5 (2.3-5)	72(24-120)	48 (12-96)
Southwest A, C (241)	25 (20-30)	64 (26.6), 21.1-32.6	5 (3-6.8)	60 (36-120)	60 (24-120)
B (195)	25 (20-30)	52 (26.8), 20.6-33.5	4 (3-6.8)	84 (36-168)	84 (34.5-156)
<b>Street - based female sex workers</b>					
Central A (403)	25 (20-30)	119 (29.5), 25.1-34.2	5 (3-6)	48 (18-72)	36 (18-72)
B (199)	28 (24-35)	52 (26.1), 20.2-32.8	5 (3-7)	36 (12-72)	36 (12-72)
Southwest A (317)	26 (20-35)	140 (44.2), 38.6-49.8	5 (3-7)	24 (12-60)	24 (12-60)
<b>Hotel - based female sex workers</b>					
Central A (405)	20 (18-22)	233 (57.5), 52.6-62.4	7 (5-7)	12 (5 - 24)	12 (4-24)
Central B (252)	30 (25-35)	163 (64.7), 58.4-70.6	8 (5-10)	24 (12-60)	300 (180-360)
D (200)	30 (22.3-36)	132 (66.0), 59.0-72.5	7 (5-10)	72 (36-144)	180 (96-300)
<b>Truckers</b>					
Central A (402)	28 (22-35)	332 (82.6), 78.5-86.2	5 (4-8)	60 (30-144)	ND <sup>§</sup>
<b>Launch Workers</b>					
Central A (402)	28 (22-35)	ND	ND	ND	ND
<b>STI Patients</b>					
Northeast A (106)	23 (20.8- 8)	ND	ND	ND	ND

\* For babus, this is the duration of coming to the brothel

\*\* For babus, this is the duration of living in the same city

§ Not determined

Hotel-based sex workers in Central-A had a median age of 20 years, more than half (57.5%) ever attended school for a median of seven years, and they had been in the profession for a median of one year.

The male groups sampled ranged in age from a median of 23 to 30 years. About 65% of the babus were educated for a median of 7 to 8 years, while most of the truckers (83%) had attended school, but for a median of 5 years. The truckers had been in the profession for a median of 5 years.

### HIV prevalence

Although HIV infection was found among some groups of the female sex workers tested in the country, the prevalence was very low. Not more than 0.7% of brothel, street, or hotel-based sex workers were infected at any sentinel site (Table 34).

None of the hundreds of male clients of female sex workers sampled by serological surveillance (truckers, launch workers, STI patients and babus) were infected with HIV.

**Table 34: Prevalence of HIV and syphilis in female sex workers and male groups, serological surveillance, 2002**

Population sub-group, Region	Number sampled	HIV positive n (%) (95% CI)	Syphilis positive n (%) (95% CI)	
			Non-active	Active
<i>Brothel-based female sex workers:</i>				
Central-B	406	1 (0.2), (0-1.4)	94 (23.2), (19.1-27.6)	16 (3.9), (2.3-6.3)
Central-C	152	0 (0-2.4)	61 (40.1), (32.3-48.4)	14 (9.2), (5.1-15.0)
Central-D	402	3 (0.7), (0-2.2)	131 (32.6), (28.0-37.4)	27 (6.7), (4.5-9.6)
Southwest-A, C	241	0 (0-1.5)	42 (17.4), (12.9-22.8)	12 (5.0), (2.6-8.5)
Southwest-B	195	1 (0.5), (0-2.8)	51 (26.2), (20.1-32.9)	7 (3.6), (1.5-7.3)
<i>Street-based female sex workers:</i>				
Central-A	403	1 (0.2), (0-1.4)	120 (29.8), (25.4-34.5)	34 (8.4), (5.9-11.6)
Central-B	199	0 (0-1.8)	24 (12.1), (7.9-17.4)	6 (3.0), (1.1-6.4)
Southwest-A	317	0 (0-1.2)	43 (13.6), (10.0-17.8)	15 (4.7), (2.7-7.7)
<i>Hotel-based female sex workers:</i>				
Central-A	405	1 (0.2), (0-1.4)	46 (11.4), (8.4-14.9)	20 (4.9), (3.0-7.5)
<i>Babus:</i>				
Central-B	252	0 (0-1.5)	27 (10.7), (7.2-15.2)	4 (1.6), (0.4-4.0)
Central-D	200	0 (0-1.8)	46 (23.0), (17.4-29.5)	12 (6.0), (3.1-10.2)
<i>Truckers:</i>				
Central-A	402	0 (0-0.9)	28 (7.0), (4.7-9.9)	4 (1.0), (0.3-2.5)
<i>Launch workers:</i>				
Central-A	402	0 (0-0.9)	20 (5.0), (3.1-7.6)	6 (1.5), (0.5-3.2)
<i>STI patients:</i>				
Northeast-A	106	0 (0-3.4)	4 (3.8), (1.0-9.4)	1 (0.9), (0-5.1)

### Syphilis prevalence

Syphilis rates were high among the various groups of female sex workers. Overall, brothel-based sex workers from Central-C had the highest rates of both active and non-active syphilis (9.2% and 40.1% respectively), while street-based sex workers from Central-B had the lowest rates of active syphilis, and hotel-based sex workers from Central-A had the lowest non-active syphilis rates (3.0% and 11.4%, respectively).

Among the male groups, babus had the highest rates of both active and non-active syphilis. Comparison of both active and non-active syphilis rates between babus and the sex workers of the corresponding brothels was done. There were no significant differences in active syphilis rates, however, non-active syphilis rates were higher in the sex workers compared to the babus from the corresponding brothels ( $p < 0.001$  and  $p = 0.019$  for brothels from Central-B and Central-D respectively).

Trends in syphilis prevalence over the four rounds of surveillance are different in the different brothels (Table 35). Brothel B of Central Bangladesh, which was sampled over all four rounds, showed a significant decline in both non-active and active syphilis rates over the four rounds ( $p < 0.001$  for both non-active and active syphilis) and also between the 3rd and 4th rounds

( $p=0.005$  and  $p=0.018$  for non-active and active syphilis respectively). In brothel D in Central Bangladesh, which was sampled over the 3rd and 4th rounds, significant declines in non-active and active syphilis rates were observed ( $p=0.003$  and  $p<0.001$  for non-active and active syphilis respectively). However, brothel C in Central Bangladesh, sampled in 2nd and 4th rounds, showed a significant increase in the non-active syphilis rates ( $p = 0.002$ ) and no change was observed in the active syphilis rates. In brothel A, C of the Southwest Bangladesh, syphilis rates declined between the three rounds of sampling ( $p<0.001$  and  $p= 0.003$  for non-active and active syphilis respectively). Although there was a decline in non-active syphilis rates between 3rd and 4th rounds ( $p = 0.007$ ) in this brothel, there were no differences in active syphilis rates. No changes in the non-active and active syphilis rates were observed between the 3rd and 4th rounds in brothel B of Southwest Bangladesh.

**Table 35: Prevalence of syphilis among brothel -based female sex workers over four rounds of serological surveillance, 1998-1999, 1999-2000, 2000-2001 and 2002**

Population sub-group, Region	1998-1999 Round I	1999-2000 Round II	2000-2001 Round III	2002 Round IV
	Non-active syphilis, n (%) (95% CI), Total number tested			
<i>Brothel-based female sex workers:</i>				
Central-B	179 (45.7) (40.7-50.7), 392	130 (32.3) (27.8-37.2), 402	131 (32.2) (27.7-37.0), 407	94 (23.2) (19.1-27.6), 406
Central-C	ND*	83 (25.8) (21.1-30.9), 322	ND	61 (40.1) (32.3-48.4), 152
Central-D	ND	ND	166 (43.2) (38.2-48.4), 384	131 (32.6) (28.0-37.4), 402
Southwest-A, C	ND	116 (33.0) (28.1-38.2), 351	91 (27.2) (22.5-32.3), 335	42 (17.4) (12.9-22.8), 241
Southwest-B	ND	ND	60 (32.1) (25.5-39.3), 187	51 (26.2) (20.1-32.9), 195
<b>Active syphilis, n (%) (95% CI), Total number tested</b>				
<i>Brothel-based female sex workers:</i>				
Central-B	54 (13.8) (10.5-17.6), 392	25 (6.2) (4.1-9.0), 402	33 (8.1) (5.6-11.2), 407	16 (3.9) (2.3-6.3), 406
Central-C	ND	33 (10.2) (7.2-14.1), 322	ND	14 (9.2) (5.1-15.0), 152
Central-D	ND	ND	57 (14.8) (11.4-18.8), 384	27 (6.7) (4.5-9.6), 402
Southwest-A, C	ND	41 (11.7) (8.5-15.5), 351	20 (6.0) (3.7-9.1), 335	12 (5.0) (2.6-8.5), 241
Southwest-B	ND	ND	15 (8.0) (4.6-12.9), 187	7 (3.6) (1.5-7.3), 195

\*Not determined

Street-based female sex workers from Central-A were sampled in all four rounds (Table 36). Syphilis prevalence rates declined significantly in this sub-population group over the rounds ( $p < 0.001$  for both non-active and active syphilis) as well as between 3rd and 4th rounds ( $p < 0.001$  for both non-active and active syphilis).

**Table 36: Prevalence of syphilis among street-based female sex workers in Central-A over four rounds of serological surveillance, 1998-1999, 1999-2000, 2000-2001 and 2002**

Population sub-group, Region	1998-1999 Round I	1999-2000 Round II	2000-2001 Round III	2002 Round IV
	<b>Non-active syphilis, n (%) (95%CI), Total number tested</b>			
<i>Street-based female sex workers:</i> Central-A	227 (56.8) (51.7-61.7), 400	181 (42.8) (38.0-47.7), 423	179 (42.7) (37.9-47.6), 419	120 (29.8) (25.4-34.5), 403
<b>Active syphilis, n (%) (95%CI), Total number tested</b>				
<i>Street-based female sex workers:</i> Central-A	135 (33.8) (29.1-38.6), 400	103 (24.3) (20.3-28.7), 423	70 (16.7) (13.3-20.6), 419	34 (8.4) (5.9-11.6), 403

### 3.2.2 Behaviour

In the male-to-female sex category, behavioural surveillance sampled female sex workers of three types: brothel-based sex workers from brothels throughout the country, street-based sex workers in one Central and one Southeast city (Central-A and Southeast-A), and hotel-based sex workers in one Central city (Central-A).

The male groups sampled at the Central-A site were rickshaw pullers, truckers, and male college or university students who lived in dormitories. Rickshaw pullers at the Southeast-A site were also surveyed by behavioural surveillance.

### Demographic characteristics

#### *Female sex workers*

The socio-demographic information collected on the female sex workers sampled by behavioural surveillance is summarised in Table 37. The mean age of all the sampled women was in the same range (21 to 24 years). Except for the hotel-based sex workers, the women sampled were younger than those under serological surveillance. A high percentage of the brothel-based sex workers and the street-based sex workers in Southeast-A had never been to school, but the majority of the others had some schooling.

**Table 37: Socio-demographic characteristics of female sex workers, behavioural surveillance**

Indicators (95% CI)	Brothel, National* (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Mean age in years	23.8 (23.4-24.2) Med: 23**	21.1 (20.8-21.4) Med: 20	22.3 (21.6-23) Med: 21	20.2 (20-20.4) Med: 20
Proportion with no schooling	66.4 (62.9-69.7)	17.8 (14-22.3)	41.9 (35-49.1)	13.2 (10.2-16.9)
Proportion currently married	9.6 (7.7-12)	15.7 (12.8-19.2)	12 (8.9-15.8)	21.2 (18.6-24.1)
Mean age at first sex among those who recalled it	14.4 (14.3-14.5) Med: 14 n=738	13.8 (13.6-14) Med: 13 n=448	13.7 (13.3-14.1) Med: 13 n=293	14.7 (14.6-14.9) Med: 14 n=279
Mean years in profession	6.8 (6.4-7.1) Med: 6	3.6 (3.4-3.9) Med: 3	4.7 (4.2-5.1) Med: 4	3.4 (3.3-3.6) Med: 3
Proportion less than 1 year in profession	6.4 (4.8-8.4)	13.6 (11.1-16.6)	5.4 (3.5-8.3)	12 (9.7-14.8)
Mean years in brothel/ street/ hotel	5.2 (4.8-5.5) Med: 4	3.2 (3-3.4) Med: 3	4.1 (3.8-4.5) Med: 3	2.7 (2.5-2.9) Med: 2
Proportion less than 1 year in brothel/ street/ hotel	10 (8-12.4)	15.3 (12.6-18.6)	6.3 (4.3-9)	17.5 (14.8-20.6)
Mean income previous month	4610 (4424-4796) Med: 4000 n=727	4049 (3670-4427) Med: 3800	2455 (2293-2617) Med: 2200	15792 (15453-16130) Med: 15000

\*Values inside the parentheses are 95% confidence intervals for the estimates. \*\* Median values.

The mean age of the first penetrative sexual experience was similar among all the sex worker groups, and it was when they were just adolescents of around 14 years of age. Only about 10 to 20 percent of the sex workers were married at the time of survey.

Most of the sex workers sampled had been in the profession longer than one year. Sex workers in brothels had been in the profession longer than the other three groups - for about 7 years versus about 3 to 5 years, respectively. More of the hotel sex workers under behavioural surveillance had been working in the profession for a longer period (median 3 years), compared to those under serological surveillance (median 1 year).

Hotel sex workers earned almost four times more in the previous month than the brothel and street sex workers in Central-A sites, and almost eight times more than the street sex workers in the Southeast-A sample.

### Male groups

The profiles of the various male clients of sex workers were also assessed through the behavioural questionnaires (Table 38). The mean ages of the rickshaw puller and trucker samples were similar (about 28 to 30 years), and were in the same range as those sampled by serology. As observed in the last round of surveillance, rickshaw pullers sampled at the Central-A site were less likely than truckers to have attended school; about one third of them had not gone to school. Most of the other male groups (more than 90%), including rickshaw pullers from the Southeast region, had some schooling.

**Table 38: Socio-demographic characteristics of male groups, behavioural surveillance**

Indicators (95% CI)	Rickshaw pullers Central-A (N=420)	Rickshaw pullers Southeast-A (N=342)	Truckers Central-A (N= 459)	Students Central-A (N=339)
Mean age	30.4 (29.7-31.1) Med:30	28.2 (27.6-28.9) Med:28	29.8 (29-30.7) Med:28	22.6 (22-23.1) Med:22
Proportion with no schooling	30.9 (25.6-36.8)	9 (6-13.3)	7.9 (5.7-10.8)	0
Proportion currently married	73.4 (68.2-78.1)	64.2 (58.3-69.7)	54.1 (47.7-60.3)	4.6 (2.3-9)
Mean age at first sex among those with sexual experience	17.3 (17-17.6) Med:17, n=404	18.9 (18.4-19.3) Med:19, n=330	17.3 (16.7-17.8) Med:16, n=418	18.3 (17.5-19.1) Med:18, n=175
Years in profession	7.2 (6.6-7.7) Med:6	6 (5.5-6.5) Med:5	7.8 (7.2-8.4) Med:6	Not questioned
Proportion less than 1 year in profession	2.3 (1.2-4.5)	0.4 (0.1-1.3)	3.2 (1.4-7)	Not questioned
Mean income previous month	3266 (3163-3370) Med:3000	3173 (3065-3280) Med:3000	5046 (4855-5237) Med:4000	3054 (2562-3546) Med:2500

Between half to three-quarters of the rickshaw pullers and truckers were married. The students were substantially younger than the other groups with an average age of around 23 years, and very few of them were married (4.6%). The mean age at first sex was between 17 to 19 years of age for all the male groups.

Other than the students, the male groups had been working for an average of 6 to 8 years. The truckers earned substantially more than the other groups sampled.

## Sexual behaviour

### *Sexual networks of female sex workers*

As shown in Table 39, the hotel sex workers sampled in Central-A had by far the highest number of clients per week. They had had sex with about 44 clients in the previous week, many of which were new clients. Street sex workers at the same geographical location had the second highest number of clients about 18 clients in the previous week. Almost all the hotel sex workers (92%) had entertained more than 20 clients in the previous week, in contrast to the Southeast-A street sex workers, few of whom had that many clients (3.1%). About a third of the other female sex workers sampled reported more than 20 clients per week. The brothel sex workers tended to have had more regular clients the previous week than new clients, while the street sex workers in the Southeast-A site had more new clients than regulars.

All the women sampled also reported sex with non-commercial partners in the previous month. More of the hotel and street sex workers at the Central-A site reported having had non-commercial sex than the female sex workers from the other two locations, which correlates with the data that more of the former were married.

**Table 39: Female sex workers: number and type of sexual partners reported**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Mean clients (new or regular) in the past week	16.3 (15.7-16.8) Med:16	17.7 (17.1-18.3) Med:17	10.4 (9.6-11.1) Med:10	43.8 (43.2-44.4) Med:42
Proportion reported greater than 20 clients in the past week	27.6 (24.5-31)	29.1 (25-33.6)	3.1 (1.6-6.2)	92 (88.9-94.3)
Proportion reported new clients in the past week	73.8 (70.5-76.9)	98.5 (96.8-99.3)	95.2 (92.1-97.1)	100
Mean new clients in the past week	6.2 (5.7-6.6) Med:5	11.8 (11.4-12.2) Med:12	7.8 (7.1-8.5) Med:7	31.5 (30.8-32.3) Med:30
Proportion reported regular clients in the past week	94.6 (92.7-96)	94.8 (92.2-96.6)	68.9 (62.8-74.5)	96 (93.8-97.4)
Mean regular clients in the past week	10.1 (9.7-10.4) Med:10	5.9 (5.5-6.3) Med:6	2.5 (2.2- 2.9) Med:2	12.2 (11.7-12.7) Med:11
Proportion reported non-commercial partner in the past month	27.8 (24.7-31.1)	66.5 (61.3-71.2)	29.9 (24.4-36)	80.6 (76-84.5)

**Table 40: Female sex workers: occupational profile of clients**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Don't know clients' occupations	6.4 (4.8-8.4)	2.7 (1.5-4.9)	20.2 (15.5-25.9)	20.6 (17.6-24)
Know clients occupations <sup>2</sup>	n=691	n=508	n=280	n=258
<b>Occupations of clients:<sup>3</sup></b>				
Businessman	<b>#1</b> 75.7(72.3-78.7)	<b>#1</b> 71.8 (64.2-78.4)	<b>#2</b> 56.8 (49.7-63.6)	<b>#1</b> 97.7 (92.9-99.3)
Rickshaw pullers	<b>#3</b> 39.9(36.3-43.6)	<b>#2</b> 54.3 (46.5-62)	<b>#1</b> 59.3 (52.5-65.7)	<b>#3</b> 6.6 (4.1-10.4)
Students	<b>#2</b> 42(38.3-45.7)	37.8 (30.1-46.1)	<b>#3</b> 55.7 (48.9-62.3)	<b>#3</b> 53.5 (48.5-58.4)
Civil servant	18.1 (15.4-21.1)	40.9 (34.3-47.9)	17.9 (13.5-23.2)	<b>#2</b> 82.6 (76-87.6)
Day labourers/ Coolies	23.1 (20.1-26.5)	<b>#3</b> 43.5 (36.4-50.9)	38.2 (31.7-45.2)	7.7 (4.9-12)
Men in uniform	29.4 (26.1-32.9)	28.9 (23.2-35.4)	17.1 (11.5-24.8)	30.2 (23.5-37.9)
Unemployed	16.35 (13.8-19.3)	8.1 (5.4-11.8)	11.4 (7.8-16.5)	19.8 (14.7-26)
Others	30.8 (27.5-34.4)	13.4 (8.9-19.7)	13.9 (9.7-19.5)	0.8 (0.1-5.7)

\*The numbers in bold form show the ranking of the three most common occupations of the clients of the different types of female sex workers

Based on the responses of the sex workers who were aware of their clients' occupations, the three most common professions of the clients were businessmen, rickshaw pullers, and students (Table 40). The majority of sex workers ranked businessmen as the number one clients. Rickshaw pullers were identified as the most common clients of the street sex workers at the Southeast-A site, and were ranked second by the street sex workers at the Central-A site. Students ranked as the second or third most common clients of all the sex workers, except those on the street in Central-A. Hotel sex workers in the Central region ranked civil servants as the second most usual client.

Among the other client occupations mentioned by the women (except the hotel sex workers), a high proportion were drivers of different categories and day labourers. Day labourers also made up the third most common clients of the street sex workers in the Central-A region. Men in uniform also comprised a significant percentage (up to a third) of the clients of all the groups of sex workers.

### **Changes in female sex workers' client numbers over the years of surveillance**

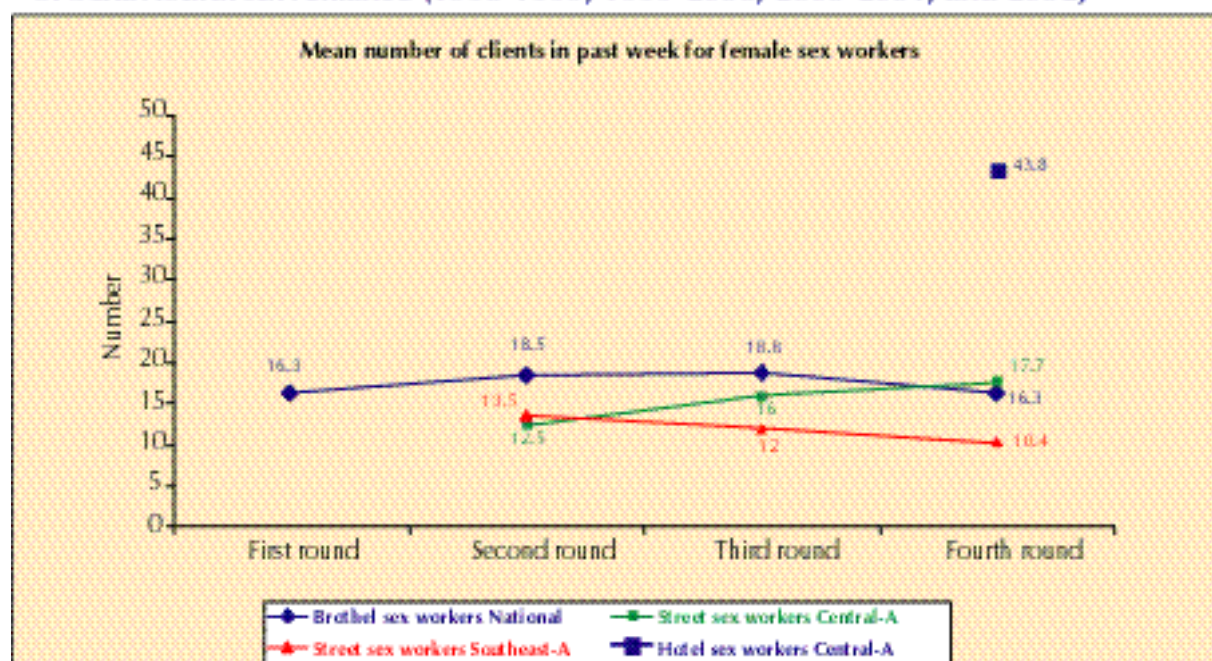
In the first round of the behavioural surveillance in Bangladesh all the samples of female sex workers were convenient samples, with the exception of the brothel sample where proportional random sampling was applied. Starting from round two, probability-sampling techniques were followed for all groups to ensure subsequent comparability between rounds. Thus, the data can be examined for trends in client numbers for all the female sex workers from round two onwards.

As shown in Figure 9, for brothel sex workers the fluctuation in mean client numbers (in the previous week) over the four years of surveillance is significant ( $p=0.000$ ). A significant drop in client numbers can be noticed only between round 3 and round 4 of surveillance ( $p=0.000$ ).

Similarly for the female street sex workers in Central-A, examination of the data since the second round of surveillance shows significant fluctuation in mean client numbers over three rounds of surveillance ( $p=0.000$ ). But in this case there is a significant increase ( $p=0.000$ ) in client numbers observed between round 2 and round 4, between round 2 and round 3 ( $p=0.000$ ), and also between round 3 and round 4 ( $p=0.007$ ).

Among the female sex workers in the Southeast-A, there is a significant fluctuation in mean client numbers over the past week over three rounds ( $p=0.000$ ) of surveillance. The decrease is also significant between round 2 and round 4 ( $p=0.000$ ), and between round 3 and round 4 ( $p=0.037$ ). However, no significant change ( $p=0.158$ ) in client numbers is observable between round 2 and round 3.

**Figure 9: Trends in client numbers of female sex workers over four rounds of behavioural surveillance (1998-1999, 1999-2000, 2000-2001, and 2002)**





### **Sexual practices of female sex workers**

Apart from vaginal sex with clients, female sex workers also reported acts of anal, oral, and non-penetrative sex in the previous week (Table 41). Almost one out of five sex workers sampled at the different geographical locations reported anal sex with new or regular clients in the previous week. About half the hotel sex workers reported oral sex with clients, which in some cases was more than twice the proportion reporting among the other three groups. Similarly, the highest proportion of the hotel sex workers reported non-penetrative sex with new clients in the preceding week. Except among sex workers in brothels, group sex was also a common practice; it was reported by 47 to 63 percent of all the women sampled.

In terms of different sexual practices according to whether clients were new or regular, a higher proportion of the brothel sex workers reported anal or oral sex with regular clients, while the opposite was true among the other three groups - these practices were reported with new clients by more of the sex workers.

**Table 41. Sexual practices of female sex workers**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion reported anal sex with new clients past week	5.3 (3.8-7.2)	13.8 (11.6-16.4)	16.8 (13.5-20.8)	17.5 (15.2-20.2)
Proportion reported anal sex with regular clients past week	15.2 (12.8-18)	7.3 (5.4-9.7)	13.1 (9.8-17.2)	8.9 (6.4-12.2)
Proportion reported anal sex with new or regular clients past week	18.3 (15.7-21.3)	17.6 (14.8-20.9)	23.9 (19.4-29.1)	17.5 (15.2-20.2)
Proportion reported oral sex with new clients past week	15.4 (13-18.2)	21.6 (18.9-24.7)	21.1 (17.6-25.1)	51.1 (47.5-54.7)
Proportion reported oral sex with regular clients past week	21 (18.2-24.1)	18 (14.5-22.2)	9.4 (7.2-12.1)	40 (36.3-43.8)
Proportion reported oral sex with new or regular clients past week	26.7 (23.6-30)	31.2 (27.3-35.4)	25.6 (21.7-30)	51.1 (47.5-54.7)
Proportion reported non-penetrative sex with new clients last week	2.2 (1.3-3.5)	39.1 (31.4-47.3)	12.2 (9-16.4)	46.5 (41.2-51.8)
Proportion reported group sex last month	7.05 (5.4-9.1)	63.4 (58.4-68.2)	57 (50.5-63.2)	46.5 (42.5-50.5)

### **Sexual networks of male groups**

Between 54 and 74 percent of the rickshaw pullers and truckers sampled were married (see Table 38), but behavioural surveillance found that their sexual networks extended well beyond just their spouses/regular partners, and included non-commercial girl friends, female sex workers, male/hijra sex workers, and other men. Almost half of them reported ten or more sexual partners over the previous one year, and in fact, female sex workers clearly tended to outnumber the other partner types (Table 42 and Figure 10).

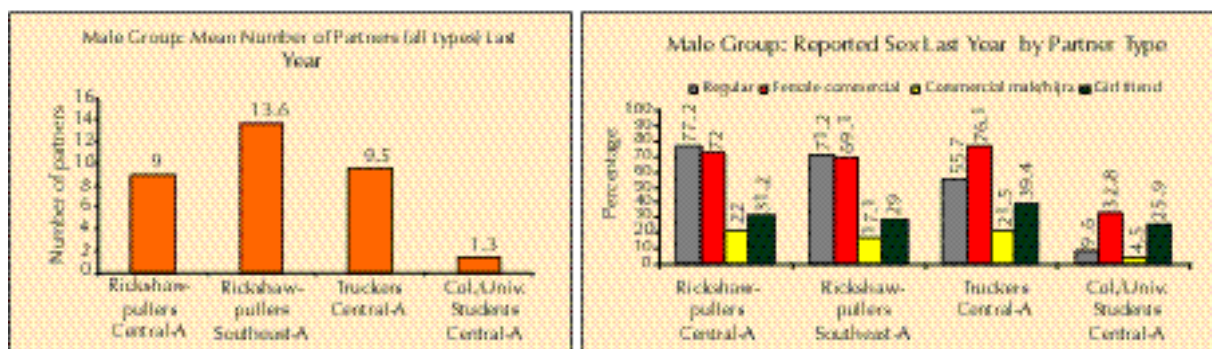
**Table 42: Sexual networks of male groups**

Indicators (95% CI)	Rickshaw Central-A (N=420)	Rickshaw Southeast-A (N=342)	Truckers Central-A (N= 459)	Students Central-A (N=339)
Proportion reported sex with regular partner last month	71.9 (67.3-76.1)	66.7 (61.1-71.8)	52.5 (45.9-59)	9.6 (6.1-14.9)
Proportion reported sex with regular partner last year	77.2 (72.7-81.2)	71.2 (65.9-75.9)	55.7 (49.4-61.9)	9.6 (6.1-14.9)
Proportion reported sex with commercial female last month	65.9 (60.8-70.8)	61.6 (56.1-66.7)	67.7 (63.5-71.7)	18.2 (13.4-24.3)
Proportion reported sex with commercial female last year	72 (66.8-76.6)	69.1 (64-73.7)	76.1 (71.9-79.8)	32.7 (26.4-39.8)
Mean number of commercial female partners last year	8 (7.1-8.9) Med:7	12.4 (9.8-15) Med:6	7.9 (6.9-9) Med:5	0.9 (0.7-1.1) Med:0
Proportion reported sex with girl friend last month	26.6 (21.9-31.8)	23.3 (18.4-29.1)	31.7 (25.7-38.5)	18.5 (14-23.9)
Proportion reported sex with girl friend last year	31.2 (26.5-36.5)	29 (23.8-34.8)	39.4 (32.1-47.2)	25.9 (22.2-29.9)
Mean number of girl friends last year	0.4 (0.3-0.5) Med: 0	0.4 (0.3-0.5) Med: 0	0.8 (0.6-1) Med: 0	0.3 (0.3-0.4) Med: 0
Proportion reported sex with commercial male/hijra last month	14.9 (11.5-19)	14.4 (10.9-18.8)	15.9 (12-20.8)	2.7 (1.21-6.1)
Proportion reported sex with commercial male/hijra last year	22 (17.5-27.3)	17.1 (13.5-21.5)	21.5 (16.8-27)	4.5 (2.2-9.2)
Mean number of commercial male/ hijra partners last year	0.6 (0.5-0.8) Med: 0	0.8 (0.5-1) Med: 0	0.7 (0.5-1) Med: 0	0.7 (0.01-0.1) Med: 0
Proportion reported group sex last month	32 (27.5-36.9)	17.9 (14-22.6)	30.7 (23.6-38.8)	2.2 (0.8-5.8)
Mean number of partners (commercial/non-commercial) last year	9 (8.1-9.9) Med:8 Max:62	13.6 (10.9-16.2) Med:7 Max:129	9.5 (8.2-10.8) Med:8 Max:60	1.3 (1-1.5) Med:0 Max:15
<b>Number of partners in the last year among male groups</b>				
0 partner	6.8 (4.7-9.9)	15.3 (11.4-20.1)	19 (15.2-23.5)	53.8 (47.6-59.9)
1 to 5 partners	31.9 (26.8-37.4)	25.5 (20.6-31.1)	27.2 (21.1-17.5)	41.1 (36.2-46.1)
6 to 9 partners	16.1 (12.6-20.2)	12.6 (9.3)	12.9 (9.4-17.5)	5 (2.8-8.7)
10 or more partners	45.2 (38.8-51.8)	46.6 (40.5-52.8)	40.9 (34.9-47.1)	0.1 (0.01-0.9)

Almost three-quarters of the rickshaw pullers and truckers sampled reported sex with a commercial female in the preceding year. Approximately a third had sex with what they defined as girlfriends in that time period. About one in five also reported paying for sex with a male partner or hijra the previous year. Rickshaw pullers and truckers living in the Central-A region were more likely to have participated in group sex in the month prior to sampling than the other two groups.

A much lower proportion of the students sampled reported sex with regular or with commercial female or male partners, but the proportion that reported sex with 'girlfriends' was more comparable to the other groups (Figure 10). About half of the students reported no sex in the previous year, and those that did have sex had a much lower partner number than rickshaw pullers or truckers. But still, around 41% of them had had one to 5 sexual partners the previous year, and 5.1% had had 6 sexual partners or more. About one third of the students interviewed had had sex with a commercial female partner the previous year, and less than 5% were sexually active with other males or with hijras during that period.

**Figure 10: Male groups: mean number and types of partners reported last year**



**Changes in male groups' partner profiles over the years of surveillance**

The mean partner number indicator was measured in the same way in rounds 2 and 3 of the surveillance, but differently in round 4. Therefore, for rickshaw pullers in the Southeast-A the figures are not directly statistically comparable over the rounds of surveillance. But in three rounds of surveillance from 1999 to 2002, the decline in commercial female partners overall is significant (p=0.000). For the proportion of rickshaw pullers in Southeast-A visiting female sex workers in the previous month a significant drop was noticed between round two and round 4 (p=0.000), but between round three and round four no significant difference (p=0.48) was observed (Table 43).

In Central-A, rickshaw pullers reported a slight increase in partner number between round 3 and 4, while for truckers the partner numbers seemed to be stable. The change in the proportion reporting

**Table 43: Male groups: trends in mean partner numbers and proportion reporting sex with commercial female partners in the last month over three rounds of behavioural surveillance (1999-2000, 2000-2001, and 2002)**

Indicators	Round 2	Round 3	Round 4
<b>Mean partner number reported last year:</b>			
Rickshaw Central-A	-	7	9
Rickshaw Southeast-A	45.6	9.9	13.6
Truckers Central-A	-	10.1	9.5
<b>Proportion reported commercial female partners last month:</b>			
Rickshaw Central-A	-	69.4%	65.9%
Rickshaw Southeast-A	93.2%	58.8%	61.6%
Truckers Central-A	-	70.4%	67.7%

sex with female sex workers in the past month between rounds three and four was not found to be significant for either the rickshaw pullers (p=0.299), or the truckers (p=0.345).

**Condom use by female sex workers**

Condom use for the last sex act with new or regular clients as reported by all types of female sex workers was low, especially so for acts of anal sex (Table 44). During the last vaginal sex act with new clients about 36 percent of the brothel and street women in the Central-A region used a condom, as compared to about 22 to 24 percent of the sex workers on the street in Southeast-A and in hotels in Central-A. Condom use for anal sex with new clients ranged from 5 to 13 percent for brothel and hotel sex workers in Central-A and street sex workers in Southeast-A, while street sex workers in Central-A reported none.

Condom use during either vaginal or anal sex with new clients was generally higher than with regular clients by several percent, except among the street and hotel sex workers in Central-A who did report

higher condom use with regular clients for anal sex than with new clients. Last time condom use with non-commercial partners was generally even lower than with clients, ranging from about 3 to 11 percent.

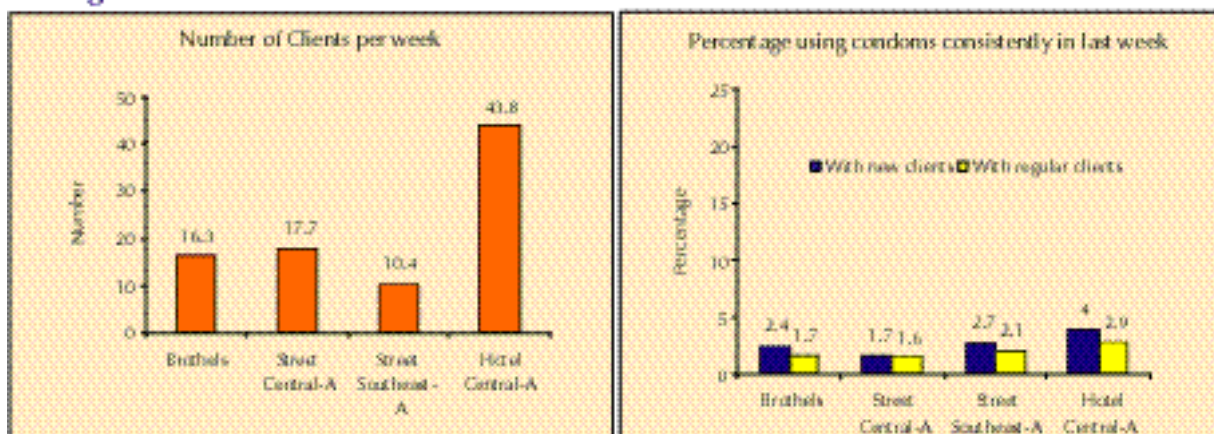
**Table 44: Condom use behaviour of female sex workers**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
<b>Last time condom use by female sex workers who reported last week</b>				
Vaginal sex with new clients	35.6 (31.7-39.7) n=545	35.6 (32.7-38.66) n=514	21.6 (17.4-26.3) n=334	24.3 (20.1-29) n=325
Vaginal sex with regular clients	27.2 (24-30.6) n=698	30.3 (27.2-33.6) n=495	20.7 (15.4-27.1) n=242	16.7 (12.7-21.5) n=312
Anal sex with new clients	12.8 (5.2-28.2) n=39	0 n=72	5.1 (1.7-14.5) n=59	8.8 (3.1-22.5) n=57
Anal sex with regular clients	6.2 (3-12.7) n=112	2.6 (0.3-18.6) n=38	2.2 (0.3-15.5) n=46	10.3 (3.4-27.6) n=29
Vaginal or anal sex with non-commercial partners*	2.9 (1.3-6.4) n=205	2.3 (0.9-5.6) n=347	11.4 (6.8-18.5) n=105	5 (1.8-13) n=262
<b>Consistent condom use by female sex workers in vaginal sex last week with:</b>				
New clients	2.4 (1.4-4.1) n=545	1.7 (0.8-3.8) n=514	2.7 (1.4-4.9) n=334	4 (1.2-12.3) n=325
Regular clients	1.7 (1-3) n=698	1.6 (0.8-3.1) n=495	2.1 (0.8-4.9) n=242	2.9 (0.7-11.3) n=312
Non-commercial partner *	1 (0.2-3.8) n=205	2 (0.9-4.5) n=347	3.8 (1.4-9.8) n=105	1.5 (0.4-5.1) n=262

\* For non-commercial partners, the table covers the previous month, not week.

The proportion of sex workers who consistently used condoms worked out to be extremely low. Among all the female sex workers sampled consistent condom use with new or regular clients or with non-commercial partners ranged from just 1 to 4 percent (Figure 11).

**Figure 11: Comparison of client numbers and condom use of different categories of female sex workers**



### ***Changes in condom use by female sex workers over the years of surveillance***

The difference in condom use for the last commercial sex act between round two and round three for both the brothel and street sex workers was not found to be significant ( $p>0.05$ ). A statistical comparison over all the three rounds of surveillance cannot be made, because the clients were categorized as new and regular only in round 4. For the brothel and street sex workers in Central-A, there does however appear to be an increasing trend in condom use from round 2 to round 4. For the street sex workers in Southeast-A, the trend in last time condom use seems downward comparing round 2 and round 4, although a slight increase is noticed between round 3 and round 4 (Table 45).

**Table 45: Female sex workers: trends in condom use for last commercial sex act with clients over three rounds of behavioural surveillance (1999-2000, 2000-2001, and 2002)**

Population group	Second round	Third round	Fourth round*	
	New & Regular Clients	New & Regular Clients	New Clients	Regular Clients
Brothel sex workers National	21.0%	19.9%	35.6%	27.2%
Street sex workers Central-A	24.5%	28.8%	35.6%	30.3%
Street sex workers Southeast-A	24.2%	18.9%	21.6%	20.7%
Hotel sex workers Central-A	-	-	24.3%	16.7%

\* Last time condom use for vaginal sex only. For rounds two and three the numbers are for last time condom use during commercial sex with clients.

### ***Condom use by male groups***

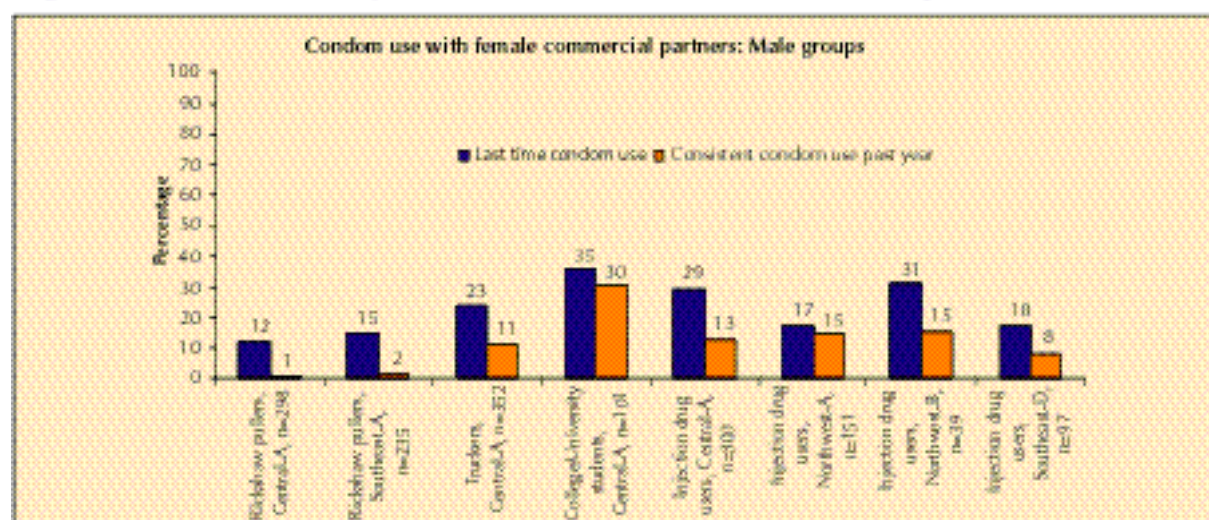
Condom use by rickshaw pullers during the last sex act with all types of sexual partners was very low, with only about 4 to 15 percent reporting it. Roughly double the proportion of truckers (about 10 to 23 percent) reported condom use with the different categories of partners. The highest last time condom use by both male groups was reported with female sex workers (Table 46).

Consistent condom use reported by these male groups was even worse than last time use (Figure 12). Among all the groups surveyed, rickshaw pullers reported the lowest consistent condom use with female sex workers (less than 2%), while truckers used condoms most consistently during sex with female sex workers (11 percent).

The students reported more last time and consistent condom use with all types of sexual partners than the other male groups sampled. A little more than a third used condoms for their last sex act with regular partners, girlfriends, and female sex workers. Consistent condom use with regular and commercial female partners was reported by one third of the students, but with 'girlfriends' only about a quarter of the students used condoms consistently. However, last time condom use with commercial male or hijra partners was about half that with other partners (18.8%), and condoms were used consistently with male/hijra partners by less than 10 percent of the student sample.

**Table 46: Condom use behaviour of male groups**

Indicators (95% CI)	Rickshaw pullers Central-A (N=420)	Rickshaw pullers Southeast-A (N=342)	Truckers Central-A (N= 459)	Students Central-A (N=339)
<b>Last time condom use by males who reported sex last year with:</b>				
Regular partners	4.1 (2.3-7) n=328	3.2 (1.6-6.5) n=252	11.6 (7.8-16.8) n=248	39.4 (18.2-65.6) n=29
Commercial female partners	12.2 (8.3-17.5) n=298	15.1 (10.3-21.7) n=235	23.4 (18.9-28.6) n=352	35.3 (24.5-47.9) n=101
Girl friends	7.1 (3.4-14.2) n=125	1.2 (5.9-23.1) n=95	14.3 (9.7-20.5) n=187	32.2 (22.2-44.1) n=84
Commercial male/hijra partners	9.8 (5.3-17.5) n=97	12.2 (5.4-25.2) n=56	9.8 (5.1-18) n=107	18.8 (4.7-52.3) n=14
<b>Consistent condom use by males who reported sex last year with:</b>				
Regular partners	1.6 (0.7-3.9) n=328	0.3 (0.04-2.3) n=252	6 (3.2-11) n=248	30.6 (12.1-58.5) n=29
Commercial female partners	1.2 (0.5-2.8) n=298	1.7 (0.6-4.4) n=235	11.2 (7.8-15.8) n=352	30.2 (18.8-44.8) n=101
Girl friends	1.8 (0.6-5.8) n=125	9.3 (3.9-20.3) n=95	8.6 (4.5-15.8) n=187	24.5 (14.9-37.5) n=84
Commercial male/hijra partners	1.4 (0.3-5.8) n=97	3.1 (0.72-12.4) n=56	4.6 (1.6-13) n=107	8.6 (0.7-56.6) n=14

**Figure 12: Condom use by male clients with female commercial partners**

### ***Changes in condom use by males over the years of surveillance***

This indicator is also not comparable statistically over the rounds of surveillance as the relevant questions were asked in different ways in the different rounds<sup>1</sup>. But from examination of the data it appears that some increase has been achieved in condom use among the rickshaw pullers and truckers sampled over the rounds, although this difference may just be a consequence of the change in the question asked.

**Table 47: Male groups: trends in condom use with last commercial female partner over three rounds of behavioural surveillance (1999-2000, 2000-2001, and 2002)**

Indicators	Round 2	Round 3	Round 4
Rickshaw pullers, Central-A	-	4.3%	12.2%
Rickshaw pullers, Southeast-A	5.6%	6.1%	15.1%
Truckers, Central-A	-	7.8%	23.4%

### ***STI and treatment seeking behaviour***

As might be expected the occurrence of STI symptoms as reported by female sex workers was very high, especially among street and hotel sex workers in Central-A, where around 85% self-reported at least one STI symptom in the previous year (Table 48a). The lowest proportion of brothel women reported an STI symptom (70%), and they were more likely to have sought formal medical treatment than the other groups, which was done within 5 days, in contrast to the other groups who waited from 8 to 10 days. The street sex workers in Southeast-A had the lowest treatment-seeking tendencies - only 37% sought formal medical treatment, although 80% reported STI symptoms. It is noticeable that a larger proportion of the women had sought formal medical treatment facilities (Government hospital/ private doctor/ private or NGO clinic) for treatment of their last STI when compared to the third round behavioural surveillance.

Self-reporting of STI symptoms by the male groups varied between 31 and 62 percent, with the highest proportion of rickshaw pullers in Southeast-A reporting at least one STI symptom, and the lowest STI among the students (who were also the least sexually active, see Table 48b). More of the truckers (60%) and students (51%) than the rickshaw pullers (around 20%) sought formal medical treatment facilities for their last STI episode, although the truckers did wait the longest among the groups to do so (mean 13 days versus 7 to 9 days). As compared to the third round surveillance data, the number of truckers seeking treatment through formal medical facilities increased, while the number of rickshaw pullers who did so decreased. However, the mean waiting days before treating the last episode of STI symptoms has been reduced for the rickshaw pullers and truckers as compared to the third round.

<sup>1</sup>. In rounds two and three the questions were: "With the last sex worker, how many bouts of sex did you have (ejaculation)?" and "Were condoms used for all or some or none of these bouts of sex?" But in round four the question was: "The last time you paid a woman for sex, did you use a condom? Yes/No".

**Table 48a: Female sex workers: STI treatment seeking behaviour**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of female sex workers reported at least one STI symptom in the past year	69.6 (66.2-72.9)	85.6 (82.5-88.3)	79.8 (73.3-85)	84.3 (80-87.9)
Proportion of female sex workers sought formal medical treatment for last STI among those who reported STI symptoms in the past year	80 (76.3-83.2) n=514	65.3 (60.8-69.6) n=447	36.8 (29.8-44.4) n=280	72.3 (68-76.2) n=274
Mean waiting days for STI treatment among those who sought treatment	5.4 (4.9-5.8) Med: 4 n=455	8.2 (7.6-8.8) Med:7 n=432	7.1 (5.5-8.7) Med: 4 n=188	9.8 (9.3-10.2) Med:10 n=269
<b>First choice of STI treatment:</b>				
Hospital	1.4 (0.6-2.8)	16.1 (12.3-20.8)	7.5 (4.6-12)	11.3 (8.2-15.4)
Drug seller	3.9 (2.5-5.9)	14.1 (11.2-17.6)	21.1 (16.3-26.7)	15.7 (12.9-19)
Private doctor	26.5 (22.8-30.5)	10.9 (8.1-14.6)	17.5 (11.2-26.2)	29.2 (24.7-34.1)
Private clinic	11.1 (8.6-14.1)	0.2 (0.03-1.6)	0	6.5 (4-10.5)
NGO clinic	41 (36.9-45.4)	38 (32.1-44.4)	11.8 (8.4-16.3)	25.2 (21-29.9)
Traditional healer	4.5 (3-6.6)	7.4 (5.6-9.6)	3.2 (1.6-6.4)	5.5 (3-9.6)
Advice/treatment from friend	0	7.1 (5.2-9.8)	1.1 (0.2-4.6)	4.7 (2.7-8.1)
Self-medication	0	2.7 (1.5-4.7)	5 (2.8-8.7)	0
Did not seek treatment	11.5 (9-14.5)	3.3 (2-5.4)	32.8 (26.5-39.9)	1.8 (0.7-4.3)
Other	0.2 (0.03-1.4)	0	0	0



**Table 48b: Male groups: STI treatment seeking behaviour**

Indicators (95% CI)	Rickshaw Central-A (N=420)	Rickshaw Southeast-A (N=342)	Truckers Central-A (N=459)	Students Central-A (N=339)
Proportion of males reported at least one STI symptom in the past year among those with sexual experience	56.5 (50.7-62.2) n=404	62 (55-68.6) n=330	46.9 (40.4-53.6) n=418	31.1 (27-35.5) n=175
Proportion of males sought formal medical treatment in first intention for STI among those with sexual experience who reported STI in past year	20.9 (15.6-27.4) n=226	21.6 (15.7-28.9) n=205	60.3 (52.8-67.4) n=215	50.5 (38-62.9) n=53
Mean waiting days for treating last STI among those with sexual experience who reported STI in past year and sought treatment	9.1 (8.3-10) Med:10 n=192	6.6 (5.9-7.3) Med:6 n=188	12.9 (11.8-14.1) Med:10 n=199	9.4 (6.9-11.8) Med:7 n=37
<b>First choice of STI treatment:</b>				
Hospital	8.3 (5.1-13.3)	11.1 (7.2-16.7)	3.6 (1.6-7.9)	28.5 (17.1-43.5)
Drug seller	29 (23.1-35.7)	31 (24-38.9)	17.6 (11.3-26.4)	16.4 (7-33.6)
Private doctor	10.5 (6.8-15.8)	7.1 (3.9-12.6)	36.6 (29.8-44.1)	14.8 (7.3-27.9)
Private clinic	0	0	2.5 (0.9-6.6)	7.1 (2.2-20.6)
NGO clinic	2 (0.7-5.6)	3.3 (0.9-11.2)	17.5 (12.2-24.4)	0
Traditional healer	16.1 (11.3-22.3)	21.7 (16.4-28)	10 (6.5-15)	0
Advice/treatment from friend	3.3 (1.1-9.3)	10.4 (6.7-15.9)	1.8 (0.6-5.6)	0
Self-medication	10.6 (6.7-16.3)	6.3 (3.1-12.5)	1.7 (0.5-5.7)	5.5 (1.6-16.9)
Did not seek treatment	14.8 (10.7-20)	6.3 (3.7-10.5)	7.4 (4.2-12.9)	27.6 (14.6-46.1)
Other	5.3 (3.1-9)	2.6 (1.1-6)	1 (0.2-4.2)	0

**Violence-related risk**

A considerable number of the women who did sex work on the streets or in hotels reported being beaten or raped in the year previous to the surveillance (37 to 63 percent, Table 49), especially street sex workers in the Central-A region. They were also subject to being arrested. The brothel sex workers seemed to experience much less violence (about 5% reported it), although the violence in brothels may be under reported.

The people mainly responsible for the violence against sex workers were reported to be mastaans (musclemen/gang members), men in uniform, and clients. Sometimes the women also faced violence from their relatives, pimps, sardarni/madam/mashi (in brothels), or hotel staff (in hotels).

**Table 49: Violence experienced by female sex workers**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of sex workers reported being beaten or raped past year	4.6 (3.3-6.4)	63.2 (58.3-67.9)	37.3 (30.4-44.8)	43.7 (37.7-49.9)
Proportion of sex workers reported violence perpetrated by men in uniform among those who reported violence	11.8 (4.2-28.6) n=34	58.5 (53.2-63.6) n=330	25.9 (19-34.3) n=131	31 (23.7-39.3) n=142
Proportion of sex workers reported violence perpetrated by mastaans among those who reported violence	50 (33-67) n=34	8 (33.8-44.9) n=330	61.1 (51.9-69.5) n=131	41.5 (32-51.8) n=142
Proportion of sex workers reported being arrested in past 12 months	2.3 (1.4-3.7)	40 (36-44.2)	28.2 (22-35.3)	38.1 (34.2-42.2)

**Exposure to an intervention programme and its effects**

Intervention coverage as reported by brothel-based sex workers was very high (Table 50). The majority of female sex workers in the Central-A region of Bangladesh also reported having had exposure to an HIV prevention intervention. However, sex workers in the Southeast-A city had had much less involvement in HIV/AIDS/STI prevention activities than the others in the previous year (only 21% had exposure).

**Table 50: Female sex workers: exposure to intervention programmes**

Indicators (95%CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of female sex workers attended an organized meeting of sex workers in past year	49.5 (45.8-53.1)	28.2 (23.7-33.1)	2.8 (1.3-6.2)	20.9 (17.1-25.4)
Proportion of female sex workers participated in an NGO intervention in past year	85.5 (82.8-87.9)	51.3 (47.6-55.1)	20.5 (15.6-26.4)	72 (61-80.9)
<b>Number reported exposure to an intervention</b>	<b>n=631</b>	<b>n=268</b>	<b>n=72</b>	<b>n=234</b>
<b>Among those who reported exposure to an intervention:</b>				
Proportion reported getting help in changing behaviour	80.7 (77.4-83.6)	32.1 (26.5-38.3)	33.3 (22.5-46.2)	12 (7.7-18)
Proportion reported receiving useful information but it did not lead to changing behaviour	13.6 (11.2-16.5)	60.4 (53.6-66.9)	50 (38.3-61.7)	67.9 (61.8-73.5)
Proportion reported information was hard to understand	5.2 (3.7-7.2)	6.7 (4.3-10.4)	9.7 (5-18)	17.1 (12.3-23.3)
Proportion reported information was not relevant to their needs	0	0.7 (0.2-2.9)	4.2 (1.2-11.7)	3 (1.4-6.4)
Other	0.5	0	2.8 (0.6-11)	0
Text of others	Learnt about diseases and AIDS	-	Heard about utility of condom use	-

Among those who reported being in touch with a prevention program, 81% of the brothel women, about 30% of the street sex workers, but only 12% of the hotel sex workers acknowledged the contribution of the prevention program in changing their sexual behaviour. Most of the remaining women (14 to 68 percent) mentioned that while they received useful information from the program, it did not effect a change in their behaviour. Between 5 to 20 percent of the sex workers reported that the information they received was hard to understand or irrelevant to their needs.

Compared to the female sex workers very few of the rickshaw pullers sampled had been exposed to an HIV/AIDS prevention intervention in the year previous to the surveillance (about 5 to 12 percent, Table 51). More of the truckers in Central-A had attended an intervention program (41%) about once a month. The majority of those who had been in interventions mentioned having participated in an education program, and less of them had been in a condom promotion programme. More of the truckers reported exposure to interventions, but only a small percentage had been in a condom promotion programme (only 7%), although about a quarter of them had been in a STI treatment program. The student group was not asked whether they had participated in any NGO-run HIV prevention activity.

**Table 51: Rickshaw pullers and truckers: exposure to intervention programmes**

Indicators (95% CI)	Rickshaw Central-A (N=420)	Rickshaw Southeast-A (N=342)	Truckers Central-A (N= 459)
Proportion of males who reported exposure to intervention in past year	4.7 (2.9 -7.3)	11.6 (8.2 -16.2)	40.7 (34.8 -46.8)
<b>Number involved in interventions</b>	<b>n=19</b>	<b>n=34</b>	<b>n=185</b>
<b>Among those who reported exposure to an intervention:</b>			
Proportion under education program	84.3 (49.6-96.7)	92.8 (73.1-98.4)	87.5 (81-92)
Proportion under condom distribution program	36.3 (15.4-64.1)	31.2 (14.8-54.3)	7 (4.2-11.6)
Proportion under STI treatment program	0	0	24.4 (17.6-32.8)
Mean number of times participated in intervention program last month	0	0.4 (0.2-0.6)	1.1 (0.9-1.2) Med:1

### **Effect of interventions on condom use of Female sex workers**

Female sex workers who reported being exposed to an intervention were significantly more likely ( $p < 0.05$ ) to use a condom for the last vaginal sex act with both new and regular clients than those who were not, as shown in Table 52. However, no significant difference was found in condom use during anal sex with either type of clients. Except for the street sex workers in Southeast-A ( $p = 0.010$ ), the other three female sex worker groups showed no significant difference ( $p > 0.05$ ) based on involvement in intervention programmes in last time condom use with non-commercial partners.

**Table 52: Female sex workers: testing the significance of exposure to an intervention programme in the past year on last time condom use for vaginal and anal sex with new and regular clients, and non-commercial partners<sup>2</sup>**

Indicators (95% CI)	Brothel, National (N=738)		Street, Central-A (N=522)		Street, Southeast-A (N=351)		Hotel, Central-A (N=325)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No	Yes	No
Last time condom use in vaginal sex with new clients	40 (35.6-44.6) n=455	14.1 (7.8-23.7) n=78	51.1 (45.5-56.7) n=266	22.4 (17.5-28.3) n=196	32.3 (23.1-43.2) n=68	18.2 (13.8-23.6) n=214	31.2 (25-38.2) n=234	7.1 (3.6-13.3) n=85
	<b>p=0.000</b>		<b>p=0.000</b>		<b>p=0.010</b>		<b>p=0.000</b>	
Last time condom use in vaginal sex with regular clients	29.5 (26-33.3) n=606	12.5 (6.8-21.7) n=80	42.2 (36.6-48) n=256	20.3 (15.6-26) n=187	32.2 (21.1-45.9) n=62	16 (10.-23.8) n=156	20.1 (14.7-26.8) n=224	8.5 (5-14.1) n=82
	<b>p=0.001</b>		<b>p=0.000</b>		<b>p=0.020</b>		<b>p=0.005</b>	
Last time condom use in anal sex with new clients	15.1 (6.2-32.6) n=33	0 n=6	0	0	7.1 (1.2-33) n=14	5.7 (1.3-21.2) n=35	8.2 (2.4-24.6) n=49	12.5 (1.5-57.6) n=8
	<b>p=0.304</b>		NA		<b>p=0.841</b>		<b>p=0.715</b>	
Last time condom use in anal sex with regular clients	7.4 (3.5-14.8) n=95	0 n=11	6.7 (0.8-39.1) n=15	0 n=20	9.1 (1.1-48.2) n=11	0 n=28	8.7 (2-30.9) n=23	16.7 (1.9-67.5) n=6
	<b>p=0.346</b>		<b>p=0.260</b>		<b>p=0.128</b>		<b>p=0.598</b>	
Last time condom use in vaginal or anal sex with non-commercial partner	3.2 (1.4-7) n=188	0 n=16	3.1 (1.4-6.7) n=192	1.5 (0.2-10.7) n=132	24.1 (12.3-41.8) n=29	6 (2.2-14.9) n=67	5.8 (1.8-17.2) n=191	3.1 (0.8-11.4) n=65
	<b>p=0.465</b>		<b>p=0.430</b>		<b>p=0.010</b>		<b>p=0.477</b>	

Consistent condom use by female sex workers with clients or non-commercial partners was very poor as shown previously (see Table 44). However, when testing whether there is any significant difference in consistent condom use among the sex workers who had reported some exposure to an intervention in the past year versus those who did not, some significant difference was noticed among some groups (Table 53). Consistent condom use in the past week with both new and regular clients was not significantly higher among the brothel women in interventions. It was significantly higher ( $p=0.012$ ) with regular clients among the street sex workers in Central-A interventions, while the same was true with new clients for street sex workers in Southeast-A interventions. Although the proportion of women reporting consistent condom use with non-commercial partners was higher among all the groups of women exposed to interventions in the past year, the difference was found to be non-significant.

<sup>2</sup> For the analysis the denominator for exposure to interventions is different for the women who reported new or regular clients because in each case it excludes those who could not recall if they had any contact by the intervention workers in the past year.

**Table 53: Female sex workers: testing the significance of exposure to an intervention programme in the past year on consistent condom use in vaginal or anal sex with new and regular clients, and non-commercial partners**

Indicators (95%CI)	Brothel, National (N=738)		Street, Central-A (N=522)		Street, Southeast-A (N=351)		Hotel, Central-A (N=325)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No	Yes	No
Consistent condom use with new clients last week	2.9 (1.7-4.9) n=455	0 n=78	3 (1.3-6.9) n=266	0.5 (0.1-.37) n=196	7.4 (3.4-15.3) n=68	1.4 (0.4-4.4) n=214	5.6 (1.7-16.4) n=234	0 n=85
	p=0.127		p=0.072		p=0.011		p=0.261	
Consistent condom use with regular clients last week	2 (1.1-3.5) n=606	0 n=80	3.1 (1.6-6) n=256	0 n=187	4.8 (1.6-13.8) n=62	1.3 (0.3-5.3) n=156	4 (1-15.2) n=224	0 n=82
	p=0.201		p=0.012		p=0.123		p=0.364	
Consistent condom use with non- commercial partners last month	1.1 (0.3-4.2) n=188	0 n=16	3.1 (1.5-6.5) n=192	0.8 (0.1-5.5) n=132	10.3 (3.2-28.5) n=29	1.5 (0.2-10.4) n=67	2.1 (0.6-7) n=191	0 n=65
	p=0.678		p=0.102		p=0.054		p=0.355	

#### **Effect of interventions on condom use of male groups**

A significantly higher ( $p < 0.05$ ) condom use for the last sex act with commercial female partners was reported by all the male respondents who had reported some exposure to an intervention in the past year (Table 54).

No significant difference ( $p > 0.05$ ) was found in last time condom use for sex with regular partners among the respondents in all the male groups except in rickshaw pullers in Southeast-A ( $p = 0.028$ ) based on whether they had some exposure to interventions or not in the past year (even though the proportions who used condoms were higher in all cases in intervention areas).

At both sentinel sites the numbers of rickshaw pullers in interventions who reported last time condom use with commercial male/hijra partners or girlfriends were too small to make any inference from the data. The same was true for rickshaw pullers with respect to consistent condom use with any of the categories of sex partners.

**Table 54: Male groups: testing the significance of exposure to an intervention programme in the past year on last time condom use for sex with commercial and non-commercial partners**

Indicators (95% CI)	Rickshaw pullers Central-A		Rickshaw pullers Southeast-A		Truckers Central-A	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Last time condom use with regular female partners	10.3 (1.4-47) n=19	3.7 (2.1-6.4) n=309	9.7 (3.3-25.3) n=23	2.5 (1-6) n=229	14.1 (7.8-24.1) n=106	9.7 (5.6-16.5) n=142
	p=0.295		p=0.028		p=0.358	
Last time condom use with commercial female partners	41.9 (18.4-69.7) n=15	10.6 (7.2-15.3) n=283	43.1 (24.3-64.2) n=26	10.9 (7.1-16.3) n=209	35.2 (26.7-44.9) n=153	14.1 (10.5-18.7) n=199
	p=0.000		p=0.000		p=0.000	
Last time condom use with commercial male/hijra partners	100 n=1	8.9 (4.6-16.7) n=96	26.7 (7.5-62.2) n=8	9.3 (3.1-24.3) n=48	17.2 (8-33.2) n=42	4.9 (1.4-15.7) n=65
	p=0.003		p=0.153		p=0.065	
Last time condom use with non-commercial girl friends	0 n=5	7.3 (3.5-14.7) n=120	47.2 (19.9-76.3) n=12	6.3 (2.6-14.6) n=83	16.2 (9.8-25.7) n=84	12.8 (7.7-20.6) n=103
	p=0.587		p=0.000		p=0.448	

A significantly higher proportion of the truckers in Central-A ( $p=0.005$ ) also reported consistent condom use with commercial female partners if they had been under intervention coverage (Table 55). But truckers from Central-A showed no statistical difference in last time or consistent condom use with either their non-commercial girlfriends or commercial male/hijra partners ( $p>0.05$ ) based on involvement with HIV prevention interventions in the previous year. This group reported the highest exposure to interventions, but their coverage by condom promotion interventions was very low (7%).

**Table 55: Male groups: testing the significance of exposure to an intervention programme in the past year on consistent condom use for sex with commercial and non-commercial partners**

Indicators (95% CI)	Rickshaw pullers Central-A		Rickshaw pullers Southeast-A		Truckers Central-A	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Consistent condom use with regular female partners last year	0 n=19	1.7 (0.7-4.1) n=309	0 n=23	0.4 (0.04-2.6) n=229	7.4 (2.7-18.4) n=106	5 (2-11.8) n=142
	p=0.583		p=0.728		p=0.572	
Consistent condom use with commercial female partners last year	0 n=15	1.2 (0.5-3) n=283	13.1 (4.9-30.7) n=26	0 n=209	17.8 (11.7-26.5) n=153	6.1 (3.2-11.2) n=199
	p=0.620		p=0.000		p=0.005	
Consistent condom use with commercial male/hijra partners last year	0 n=1	1.5 (0.3-5.9) n=96	18.7 (4.1-55.4) n=8	0 n=48	7.7 (1.8-27.2) n=42	2.6 (0.6-10.7) n=65
	p=0.900		p=0.003		p=0.257	
Consistent condom use with non-commercial girl friends last year	0 n=5	1.9 (0.6-6.1) n=120	47.2 (19.9-76.3) n=12	3.1 (0.8-11.8) n=83	8.4 (3.5-18.9) n=84	8.7 (4.2-17.3) n=103
	p=0.773		p=0.000		p=0.934	

### Effect of interventions on STI and treatment seeking of female sex workers

As shown in Table 56, female sex workers with some exposure to intervention activities in the previous year were less likely to have experienced an STI symptom than those who had no exposure. Although this difference is not significant for the brothel women and street sex workers in Southeast-A, it is statistically significant for sex workers on the street ( $p=0.002$ ) and in hotels ( $p=0.010$ ) in the Central-A surveillance sites. In terms of seeking formal medical facilities for their last STI treatment (among those who had experienced STI symptoms), again a higher proportion of sex workers in interventions reported doing so, although the difference is significant only for both the street women samples. However, there was no effect of interventions on how quickly women sought medical treatment after the onset of STI symptoms, as shown by the lack of any statistical difference in mean number of waiting days.

**Table 56: Female sex workers: testing the significance of exposure to an intervention programme in the past year on STI-treatment seeking behaviour**

Indicators (95% CI)	Brothel, National (n=724)		Street, Central-A (n=469)		Street, Southeast-A (n=298)		Hotel, Central-A (n=319)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No	Yes	No
Proportion of female sex workers with at least one STI symptom in the past year	68.6 (64.9-72.1) n=631	72 (62.1-80.2) n=93	80.2 (74-85.3) n=268	91.5 (86-94.6) n=201	80.6 (69.4-88.3) n=72	84.1 (77.8-88.8) n=226	81.6 (75.6-86.4) n=234	90.6 (85.1-94.4) n=85
	<b>p=0.505</b>		<b>p=0.002</b>		<b>p=0.474</b>		<b>p=0.010</b>	
Proportion of female sex workers sought formal medical treatment for last STI symptom among those who reported STI symptoms in past year	81.5 (77.6-84.9) n=433	73.1 (61.3-82.4) n=67	72.5 (66.5-77.9) n=215	63 (56.2-69.4) n=184	62.1 (46.1-75.8) n=58	32.6 (24.4-42.1) n=190	74.9 (68.6-80.2) n=193	64.9 (55.1-73.7) n=75
	<b>p=0.108</b>		<b>p=0.027</b>		<b>p=0.001</b>		<b>p=0.089</b>	
Mean waiting days for STI treatment among those female sex workers who sought treatment of any kind (formal and other)	5.5 (5-6) n=389	4.6 (3.6-5.7) n=54	8.4 (7.4-9.3) n=207	8.4 (7.6-9.2) n=179	7.9 (4.9-11) n=44	6.9 (5.1-8.7) n=124	9.7 (9.2-10.3) n=187	9.8 (9.1-10.6) n=76
	<b>p=0.135</b>		<b>p=0.963</b>		<b>p=0.538</b>		<b>p=0.846</b>	

### Effect of interventions on STI and treatment seeking of male groups

As with sex workers, exposure to intervention programs resulted in a lower proportion of the rickshaw pullers and truckers in Central-A reporting STI symptoms in the previous year as compared to those who were not exposed, and they were more likely to have sought formal medical facilities (Table 57). These effects of interventions were only statistically significant, however, in the case of the rickshaw pullers ( $p=0.000$ ). There was no statistical difference in the mean number of days waited before seeking treatment for either group.

In contrast, among the rickshaw pullers sampled in Southeast-A, more of those who were under intervention coverage reported experiencing an STI symptom in the past year, but more of them sought medical treatment, although the differences were not statistically significant ( $p>0.05$ ) when compared to those not in programmes. Nor was the difference in days spent before seeking treatment significant.

**Table 57: Male groups: testing the significance of exposure to an intervention programme in the past year on STI-treatment seeking behaviour**

Indicators (95% CI)	Rickshaw pullers, Central-A (N=420)		Rickshaw pullers, Southeast-A (N=342)		Truckers, Central-A (N=459)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Proportion reported at least one STI symptoms in past one year among those with sexual experience	37.7 (18.1-62.3) n=19	57.5 (51.6-63.1) n=385	75 (56.7-87.3) n=34	60.3 (53-67.1) n=296	41.8 (33-51.1) n=176	50.7 (43.1-58.3) n=242
	p=0.112		p=0.102		p=0.105	
Proportion sought formal medical facilities in first intention for STI among those with sexual experience who reported STI in past year	71.7 (34.8-92.3) n=8	19.2 (13.9-25.8) n=218	30.6 (16.4-49.7) n=25	20.1 (14.4-27.3) n=180	66.4 (52.2-78.1) n=87	56.7 (47.6-65.3) n=128
	p=0.000		p=0.188		p=0.245	
Mean waiting days for treating last STI among those with sexual experience who reported STI in past year and sought treatment of any kind (formal and other)	11.4 (6.2-16.6) n=7	9.1 (8.2-9.9) n=185	6.1 (4.4-7.8) n=24	6.7 (5.9-7.4) n=164	11.8 (9.9-13.7) n=85	13.7 (12.2-15.2) n=114
	p=0.381		p=0.542		p=0.135	

## HIV/AIDS-related Knowledge Issues

### *Knowledge on modes of HIV transmission and confidential HIV testing*

A high proportion of brothel sex workers sampled said they knew that people could reduce the risk of HIV by using a condom correctly every time they have sex with a partner (95%), and by not sharing needles or syringes (84%). Between 54 and 75 percent of the other three groups of sex workers sampled knew that condom use is a mode of prevention, but only one in five hotel sex workers and about one in three street sex workers knew that HIV can also be transmitted through sharing needles/syringes (Table 58).

Overall, very few of the sex workers knew where they could go for a confidential HIV test, even though a high proportion of the brothel (86%) and hotel sex workers (72%) stated they were in contact with an HIV prevention intervention.

**Table 58: Female sex workers: knowledge of HIV transmission and confidential testing**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of SW mentioned condom use as a mode of prevention	94.4 (92.5-95.9)	75.1 (70.6-79.1)	60.7 (53.5-67.5)	53.5 (50.3-56.7)
Proportion of SW mentioned not sharing needles as a mode of prevention	83.5 (80.6-86)	38.1 (32.4-44.2)	32.2 (25.5-39.8)	20.3 (17.3-23.6)
Proportion of SW knew where HIV can be tested confidentially	9.9 (7.9-12.3)	7.5 (4.8-11.4)	3.4 (1.5-7.8)	0



Most of the students (97%) knew that condom use could reduce their risk of HIV, but a lower proportion of rickshaw pullers and truckers surveyed (39 to 67 percent) knew this (Table 59). Nearly all the students and 83% of the truckers knew that sharing needles and syringes also poses a HIV risk, while only one-third to one-half of the rickshaw pullers were aware of this fact. Again, the students were more knowledgeable about where they could go for confidential HIV testing (about one third knew), but hardly any of the rickshaw pullers had any information on this, and just about 8% of the truckers did.

**Table 59: Male groups: knowledge of HIV transmission and confidential testing**

Indicators (95% CI)	Rickshaw Central-A (N=420)	Rickshaw Southeast-A (N=342)	Truckers Central-A (N= 459)	Students Central-A (N=339)
Proportion mentioned condom use as a mode of prevention	38.6 (33.5-44.1)	60 (54.7-65.1)	66.9 (62.7-70.8)	96.7 (92.4-98.6)
Proportion mentioned not sharing needles as a mode of prevention	30 (24.6-35.9)	47.8 (41.5-54.1)	83 (79.5-86.1)	98.7 (96.6-99.5)
Proportion knew where HIV can be tested confidentially	0.5 (0.1-2.1)	0.8 (0.3-2.2)	7.8 (5.3-11.3)	33.3 (26.7-40.5)

#### **Knowledge on sources of condoms**

Almost 50 percent or more of the sex workers were able to show a male condom to the interviewers (except for only 20% of the street sex workers in Southeast-A), and also reported easy access to condoms (Table 60), although as shown previously this was clearly not reflected in their condom use (Table 44). The highest reporting was from the brothel women, who also reported the maximum involvement in NGO interventions in the past year. However, they also reported the highest condom breakage. Very few sex workers had used a female condom.

There were a few common responses as to why sex workers did not have easy access to condoms. They mentioned condoms cost too much, the shop/pharmacy was closed or too far away, they were too shy to buy condoms, or that they don't want to carry condoms.

**Table 60: Female sex workers: knowledge on sources of condoms**

Indicators (95% CI)	Brothel, National (N=738)	Street, Central-A (N=522)	Street, Southeast-A (N=351)	Hotel, Central-A (N=325)
Proportion of SW showed a male condom to the interviewers	71.3 (67.9-74.4)	51.3 (45.9-56.8)	20.2 (15.9-25.4)	48.6 (43.7-53.5)
Proportion of SW reported access to condoms easy	95.7 (93.9-96.9)	60.3 (54.2-66.2)	48.7 (41.6-55.9)	55.4 (50.9-59.8)
Proportion of SW who had a condom break last month	35.6 (32.2-39.2)	19 (15.7-22.8)	17.4 (13-22.8)	10.5 (6.5-16.4)
Proportion of SW who have ever used a female condom	18.3 (15.7-21.3)	5 (3.2-7.7)	0	0.6 (0.1-4.5)

A high proportion of the sexually active males sampled had never used a condom (about 40 to 70 percent), although most of them knew sources of condoms (Table 61). It is interesting to note that a higher proportion of rickshaw pullers and truckers who were unexposed to HIV interventions had never used a condom as compared to those under intervention coverage, although this difference is only significant for the rickshaw pullers sampled in Southeast-A ( $p=0.001$ ). The overall low proportion of reported condom breakage is probably attributable to the fact that a large proportion had never used condoms, rather than actual experience. The reported condom breakage in the past month was the highest among the truckers group in Central-A.

**Table 61: Male groups: knowledge on sources of condoms**

Indicators (95% CI)	Rickshaw Central-A (N=420)	Rickshaw Southeast-A (N=342)	Truckers Central-A (N= 459)	Students Central-A (N=339)
Proportion never used a condom among those with sexual experience	67.2 (60.4-73.3) n=404	66.4 (60.9-71.5) n=330	58.7 (52.9-64.2) n=418	41.3 (31.9-51.3) n=175
Proportion knew places/ persons where condoms can be obtained among those with sexual experience who identified a male condom	96.2 (93.5-97.8) n=385	96 (93-97.8) n=284	98.7 (96.5-99.5) n=414	100
Proportion who had a condom break last month	1.1 (0.3-3.2)	0.8 (0.3-2.2)	10.1 (6.5-15.3)	2.6 (1.1-6.1)

### ***Female sex workers: knowledge on means to avoid HIV and other sexually transmitted infections***

As shown previously, the majority (51-72%) of the female sex workers sampled in the Central-A site had participated in HIV prevention interventions (see Table 50), thus most of them had heard of HIV/AIDS. Only among the street sex workers in Southeast-A, where only 21% were in interventions, was the proportion unaware of HIV/AIDS as high as almost a quarter of those sampled.

Despite HIV/AIDS awareness, only most of the brothel women seemed to take some steps to avoid HIV and STI (about 98%, Table 62). Among the street and hotel sex workers approximately 15 to 30 percent do nothing to avoid HIV or other sexually transmitted diseases. In fact, except for street sex workers in Central-A, a slightly higher proportion of the female sex workers in the other groups do nothing to avoid HIV as compared to what they said about STI.

Only a small proportion of all the sex workers cited using condoms always as their means of avoiding sexual diseases (2 to 8 percent) or HIV (0 to 12 percent). None of the hotel sex workers used condoms to reduce their risk, even though about 86% of them had heard of HIV. In the other groups a marginally higher percentage of women said they always used condoms against HIV compared to using condoms to protect themselves from STI.

A high proportion of the sex workers mentioned washing their genitals with Dettol or urine after sex as a way of avoiding STI/HIV. The other precautions that were mentioned to avoid HIV or STI stressed the concept of hygiene to avoid these diseases - keeping clean, washing with soap or hot water, using Savlon cream, having sex with only clean clients, etc.

**Table 62: Female sex workers: Measures taken to avoid STI and HIV**

Indicators (95% CI)	Brothel, (N=738) National	Street, Central-A (N=522)	Street, (N=351) Southeast-A	Hotel, Central-A (N=325)
<b>Steps taken to avoid STI*</b>				
Do nothing	0.7 (0.3-1.6)	18 (14.9-21.5)	22.5 (16.4-30.1)	28.3 (25.1-31.8)
Always use condom	3.2 (2.2-4.8)	2.1 (1.2-3.7)	8.3 (5.4-12.4)	2.5 (0.5-11.2)
Wash with Dettol or urine	98.4 (97.2-99.1)	76.2 (71.4-80.5)	72.6 (64.3-79.7)	49.5 (45-54.1)
Take medicine	0.3 (0.07-1.1)	12.3 (8.4-17.6)	4.8 (2.7-8.4)	14.5 (10.5-19.6)
Others	34.1 (30.8-37.6)	44.8 (38.7-51.1)	8.5 (5.6-12.8)	49.5 (44.9-54.2)
Proportion who had not heard of HIV/AIDS	1.8 (1-3)	8 (5.6-11.4)	23 (16-31.5)	13.8 (9.3-20.2)
<b>Number who had heard of HIV/AIDS</b>	<b>n=725</b>	<b>n=480</b>	<b>n=271</b>	<b>N=325</b>
<b>Steps taken to avoid HIV*</b>				
Do nothing	2.2 (1.3-2.6)	15.8 (12.8-19.4)	30.3 (22.5-39.4)	31.4 (26.7-36.5)
Always use condom	4.1 (2.9-5.9)	3.1 (2-4.7)	11.8 (8.1-16.8)	0
Wash with Dettol or urine	95.9 (94.1-97.1)	76.5 (71-81.1)	62.7 (53.1-71.5)	22.5 (16.4-30)
Take medicine	0.1 (0.01-1)	12.5 (8.2-18.5)	1.8 (0.6-5.1)	10.7 (7.3-15.5)
Others	34.2 (30.8-37.7)	54.6 (48.4-60.6)	6.3 (3.8-10.2)	64.3 (59-69.3)
Text of others	Wash with water / soap/hot water, use Savlon cream, have sex with clean clients, remain clean	Sometimes use a condom, have sex with clean partners, wash with soap/boiled water, use Savlon cream, use a condom with new clients, take few clients, remain clean	Have sex with clean clients, test blood, remain clean, use potash	Sometimes use a condom, have sex with clean clients

\* Multiple answers were allowed

**Male groups: knowledge on means to avoid HIV and other sexually transmitted infections**

The male groups were not very aware of how to protect themselves from sexually transmitted infections (Table 63). The proportion of males sampled who had not heard of HIV/AIDS was less than 15%, and yet between 37 to 77 percent do not take any precautionary measures to avoid HIV. Between about half to almost three-quarter of them also reported not taking any measures to avoid STI, though a high percentage had reported commercial sex in the previous month.

As with the female sex workers, for the male groups consistent condom use was not a major response to avoiding HIV/STI, but rather they cited other strategies like cleanliness, sporadic condom use, not visiting sex workers, or having sex only with their wives, among others. More of the truckers and students reported consistent condom use as a method of preventing sexually transmitted diseases, but the proportion was still too low. Only among the students sample had more of them tried some measure to protect themselves against HIV compared to what they did for STI.

**Table 63: Male groups: Measures taken to avoid STI and HIV**

Indicators (95% CI)	Rickshaw Central-A (n=404)	Rickshaw Southeast-A (n=330)	Truckers Central-A (n=418)	Students Central-A (n=175)
<b>Steps taken by sexually experienced males to avoid STI: *</b>				
Do nothing	70.4 (64.3-75.8)	52.8 (46.4-59.1)	28.5 (24.1-33.4)	61.2 (51.6-69.9)
Always use condoms	0.4 (0.1-1.7)	0	6.4 (3.8-10.5)	14 (9.3-20.7)
Wash with Dettol or urine	9.4 (6.4-13.6)	27.1 (21.2-33.9)	48.5 (43.6-53.4)	6.3 (2.7-14)
Take medicine	1.6 (0.7-3.6)	3.5 (2-6.3)	0.4 (0.1-1.8)	1.8 (0.5-6.1)
Others	21.3 (16.7-26.8)	18.1 (14-23.2)	20 (16.2-24.5)	21.5 (14.9-29.9)
Text of others	Sometimes use a condom, bathe everyday, wash with water/soap, use mustard oil/ointment, drink lemon juice, avoid sex workers, sex with wife only	Sex with wife only, sometimes use a condom, use cream/ointment, keep clean	Sometimes use a condom, sex with clean partners, don't go to sex workers, wash with soap/boiled water	Sometimes use a condom, remain careful, don't go to sex workers, remain clean
Proportion who had not heard of HIV/AIDS	1.2 (9-15.8)	14.5 (11-18.8)	3.6 (2.1-5.9)	0
<b>Number who had heard of HIV/AIDS</b>	<b>n=368</b>	<b>n=289</b>	<b>n=444</b>	<b>n=339</b>
<b>Steps taken to avoid HIV *</b>				
Do nothing	76.8 (71.2-81.5)	52.4 (46.2-58.4)	37.5 (32.6-42.8)	38.5 (28.2-50.1)
Always use condoms	0.4 (0.1-1.9)	0.7 (0.2-2.8)	6.2 (3.7-10)	7.5 (4.8-11.6)
Wash with Dettol or urine	4.6 (2.5-8.1)	16.3 (11.1-23.5)	38.6 (33.1-44.3)	3.6 (1.7-7.3)
Take medicine	0.7 (0.2-2.7)	0.8 (0.2-3.4)	0	0.4 (0.05-3.2)
Others	19 (14.5-24.5)	32.1 (26.9-37.8)	21 (17.9-24.6)	54.4 (43.4-64.9)
Text of others	Sometimes use a condom, don't go to sex workers, sex with wife only, remain careful, remain clean, sex with clean partner	Sometime use a condom, sex with clean partners, AIDS does not exist in Bangladesh, sex with wife only, remain careful	Don't have sex with sex workers, sometimes use condoms, use condoms for sex outside, don't take unknown persons' blood	Abide by religion, don't go to sex workers, use disposable syringes, remain careful, sometimes use a condom, faithful to sex partner

\* Multiple answers were allowed

## Self perception of HIV/AIDS risk and its rationale

### ***Female sex workers: self-perception of HIV/AIDS risk and the rationale***

Very few of the female sex workers seemed to perceive that they were at risk of getting infected with HIV, and between 30 to 60 percent were completely unable to assess their risk of HIV. Even though a high percentage of the women working in brothels nationally, and in hotels in the Central-A site, were exposed to intervention programs (Table 64, last column), a third of the former and more than half of the latter could not even assess their level of risk. Among the street sex workers in Central-A the proportion who did not know their HIV risk was equivalent to the proportion not covered by interventions, but among those working on the streets in Southeast-A although 79% were not in interventions, only 46% did not know if they were at risk of infection.

Between 27 to 39 percent of the sex workers thought they were at a high or medium risk of getting HIV, but 12 to 34 percent thought they had only a small chance or no risk. The rationale for these answers is also given in Table 64. It was clear that the majority understood that their profession put them at risk, and that using condoms would protect against HIV infection, but yet as seen previously (Table 44), this knowledge did not translate into behaviour change as reflected by the last time or consistent condom use. Again as mentioned before, female sex workers incorrectly believe that simple hygienic measures like washing after sex, or having sex only with 'clean' clients are adequate measures for protection from HIV infection.

### ***Male groups: self-perception of HIV/AIDS risk and the rationale***

A high proportion of rickshaw pullers in both the samples were not able to assess their own risk of getting HIV (61% and 45%), and one in five of the truckers mentioned that they did not know about their risk status (Table 65). In spite of the fact that a high percentage of rickshaw pullers and truckers reported sex in the past month with commercial females and males/hijras, and very little condom use, only between 10 to 30 percent thought that they were exposed to a high or medium risk of HIV infection. Those who did place themselves in the high to medium risk category understood that having sex with multiple partners, and not using condoms were risky behaviours. Those who thought they were at no risk of getting HIV or at small risk generally cited the reasons as being that they had sex only with clean partners, or did not have commercial sex. Very few cited consistent condom use as their rationale for low risk.

Most of the students (94%) placed themselves in the 'low or no' HIV risk category, and as shown previously about half of them were in fact not sexually active (see Table 42). They seemed to more or less understand the importance of minimizing risk by condom use and not having commercial sex or multiple partners, as shown by their rationales for self risk perception in Table 65, but like the other male groups also cited having sex with 'clean partners' as a reason for low HIV risk.

**Table 64: Female sex workers: self - perception of risk of HIV infection and rationale**

Sampled groups	Self-perception of risk of HIV infection				Proportion under HIV intervention coverage in past year
	High	Medium	Low or no	Don't know	
Brothel, National (N=738)	11.6 (9.5-14.2)	25.3 (22.3-28.6)	33.5 (30.1-37)	29.5 (26.3-32.9)	85.5
Street, Central-A (N=522)	3.8 (2.5-5.7)	23.4 (19-28.4)	24.7 (21.6-28.1)	48.1 (43.6-52.6)	51.3
Street, Southeast-A (N=351)	26.2 (18.1-36.3)	12.2 (8.5-17.4)	15.4 (11.3-20.5)	46.2 (37.4-55.1)	20.5
Hotel, Central-A (N=325)	7.7 (6-9.8)	20.6 (18.1-23.4)	12 (10.2-14.1)	59.7 (56.8-62.5)	72
<b>Rationale for self-perception of risk (multiple answers exist)</b>					
<b>Brothel, National</b>	<p>The key reasons respondents perceived themselves to be under the <b>high or medium</b> risk category included: risky work (86%), not using condoms (62%), frequent anal sex (1%) and others (3%).</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no</b> risk category included: always using condoms (13%), have sex with clean partners (73%), avoid sex with foreigners (5%), and others (69%), including, wash with Dettol/Savlon/urine/hot water, sometimes use condoms, and remain clean.</p>				
<b>Street, Central-A</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: risky work (60%), not using condoms (79%), and others (22%), in which case almost everyone reported for reason not using a condom always.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: always using condoms (5%), have sex with clean partners (92%), avoid sex with foreigners (19%), and others (85%), i.e., notably, wash with Dettol/Savlon/urine/hot water, sometimes use condoms, and remain clean.</p>				
<b>Street, Central-A</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: risky work (76%), not using condoms (38%), frequent anal sex (4%), sharing needle-syringe (1%), and others (7%), in which case almost everyone reported due to their sex work profession.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: always using condoms (26%), have sex with clean partners (74%), and avoid sex with foreigners (7%), and others (39%), including, wash with Dettol/Savlon/urine/hot water.</p>				
<b>Hotel, Central-A</b>	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: risky works (41%), not using condoms (3%), frequent anal sex (2%), and others (95%), in which case almost everyone reported for reason not using a condom always.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> risk category included: have sex with clean partners (100%), avoid sex with foreigners (3%), and others (77%), including, wash with Dettol/Savlon/urine/hot water, and sometimes use condoms.</p>				

**Table 65: Male groups: Self-perception of risk of HIV infection and rationale**

Sampled groups	Self-perception of risk of HIV infection				Proportion under HIV intervention coverage in past year
	High	Medium	Low or no risk	Don't know	
Rickshaw pullers, Central-A (N=420)	3.7 (2-6.8)	13.6 (10.3-17.7)	21.4 (17.2-26.3)	61.3 (54.9-67.3)	4.7
Rickshaw pullers, Southeast-A (N=342)	8.4 (5.6-12.4)	21.1 (16-27.4)	25.2 (20.1-31)	45.3 (39.1-51.6)	11.6
Truckers, Central-A (N=459)	1.9 (0.8-4.6)	8 (5.7-11.1)	70.4 (65.6-74.8)	19.6 (15.7-24.2)	40.7
Students, Central-A (N=339)	1.8 (0.7-4.7)	4.4 (2.5-7.7)	93.8 (89.6-96.3)	0	-
Rationale for self-perception of risk (multiple answers exist)					
<b>Rickshaw, Central-A (N=420)</b>	<p>The key reasons respondents perceived themselves to be under the <b>high or medium risk</b> category included: multiple partners (71.6%), don't use condoms(41%), and others (28.4%), mostly: only sometimes use condom, have sex with sex workers/girlfriend.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no risk risk</b> category included: always use condom (2.8%), sex with clean partner (14.5%), and others (79%), notably including, don't go to sex workers, have sex with wife only, sometimes use condom, and remain clean.</p>				
<b>Rickshaw, Southeast-A (N=342)</b>	<p>The key reasons respondents perceived themselves to be under the <b>high or medium risk</b> category included: multiple partners (64%), don't use condom(36%), and others (56%), in which case almost all of them cited sometimes use condom.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no risk risk</b> category, included: always use condom (0%), sex with clean partner (53%), and others (58%), notably including, sex with wife only, don't go to sex workers, sometimes use condom, wash with Dettol/urine, and remain clean.</p>				
<b>Truckers, Central-A (N=459)</b>	<p>The key reasons respondents perceived themselves to be under the <b>high or medium risk</b> category included: multiple partners (60%) don't use condom(53%), and others (22%), in which case the majority mentioned sometimes use condom.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no risk risk</b> category included: always use condom (8%), sex with clean partners (31%), and others (64%), notably including, sometimes use condom, don't go to sex workers, don't have sex outside often, and wash with Dettol/urine.</p>				
<b>Students, Central-A (N=339)</b>	<p>The key reasons respondents perceived themselves to be under the <b>high or medium risk</b> category included: multiple partners (23%), don't use condom(47%), and others (45%), in which case the majority mentioned sometimes use condom, and some of them said remain careful using needle, and lack of knowledge of HIV.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no risk risk</b> category included: always use condom (9%), sex with clean partners (16%), and others (80%), including, don't have sex/never have had sex, avoid risk factors, use disposable syringes and new blades, faithful to partner, abide by religious rule, etc.</p>				

### 3.3 MALE-TO-MALE SEX

The results included under this section are from the serological and behavioural surveillance conducted on males who have sex with males (MSM); male sex workers (MSW); and hijras, i.e. persons belonging to a traditional sub-culture of transgender or third gender people.

#### 3.3.1 Serology

In Central-A, serological surveillance measured HIV and syphilis prevalence separately among MSM, MSW, and hijras. However, MSW and MSM were sampled as a combined group from Central-C, Northeast-A and Southeast-A, because at those sites it was not possible to differentiate MSM from MSW. It was not possible to administer the full demographic questionnaire to hijras or at combined MSM/MSW sites, so that only age was recorded for these groups.

#### *Socio-demographic characteristics*

MSM and MSW sampled from Central-A were similar in age, proportions who ever attended school and median years of schooling (Table 66). Among the combined MSM/MSW sites, those from Central-C were the youngest ( $p < 0.001$  between Central-C and Southeast-A;  $p = 0.003$  between Central-C and Northeast-A), and MSM/MSW from Northeast-A were younger than those from Southeast-A ( $p = 0.005$ ).

**Table 66: Socio-demographic characteristics of MSM, MSW and hijras, serological surveillance, 2002**

Geographical location (n)	Age in years median (25th-75th quartiles)	Ever attended school n (%)	Education (years) median (25th-75th quartiles)	Duration in profession (months) median (25th-75th quartiles)	Duration at same site as sex worker (months) * median (25th-75th quartiles)
<b>Male sex workers</b>					
Central-A (401)	24 (20-29)	344 (85.8)	8 (5-10)	60 (36-120)	60 (36-120)
<b>Males who have sex with males</b>					
Central-A (406)	23 (20-28)	337 (83.0)	8 (5-10)	ND**	144 (60-252)
<b>Males who have sex with males/Male sex workers combined</b>					
Central-C (400)	22 (18-26)	ND	ND	ND	ND
Southeast-A (397)	25 (20-30)	ND	ND	ND	ND
Northeast-A (402)	23 (20-27)	ND	ND	ND	ND
<b>Hijras</b>					
Central-A (393)	24 (20-30)	ND	ND	ND	ND

\* For MSM, this is the duration of living in the same city.

\*\* Not determined (applicable).

#### *HIV prevalence*

None of the blood samples collected from MSW and combined MSM/MSW sites were found to be HIV positive (Table 67). There was one sample positive for HIV among MSM in Central-A. However, hijras from Central-A had the second highest rate (0.8%) of HIV infection.



**Table 67: Prevalence of HIV and syphilis in MSM, MSW and hijras, serological surveillance, 2002**

Population sub-group, Region	Number sampled	HIV positive n (%) (95% CI)	Syphilis positive n (%) (95% CI)	
			Non-active	Active
Male sex workers: Central-A	401	0 (0-0.9)	57 (14.2) (10.9-18.0)	13 (3.2) (1.7-5.5)
MSM (non sexworkers): Central-A	406	1 (0.2) (0-1.4)	15 (3.7) (2.1-6.0)	3 (0.7) (0.2-2.1)
Male sex workers and MSM combined: Central-C	400	0 (0-0.9)	35 (8.8) (6.2-12.0)	9 (2.3) (1.0-4.2)
Southeast-A	397	0 (0-0.9)	47 (11.8) (8.8-15.4)	17 (4.3) (2.5-6.8)
Northeast-A	402	0 (0-0.9)	25 (6.2) (4.1-9.0)	12 (3.0) (1.6-5.2)
Hijras: Central-A	393	3 (0.8) (0.2-2.2)	137 (34.9) (30.2-39.8)	41 (10.4) (7.6-13.9)

**Syphilis prevalence**

Hijras from Central-A had the highest rate of active syphilis (10.4%) and second highest rate of non-active syphilis (34.9%) amongst all the groups sampled in the fourth round of surveillance (Table 67).

MSM from Central-A had the lowest rate of active syphilis (0.7%) amongst all the groups sampled in the fourth round. Among MSM, MSW and combined MSM/MSW groups, the highest active syphilis rate was recorded from Southeast-A (4.3%).

There were no significant changes in both non-active and active syphilis rates between the third and fourth rounds of surveillance in MSM and MSW from Central-A (Table 68).

**Table 68: Prevalence of syphilis among MSM and MSW in Central Bangladesh over two rounds of serological surveillance, 2000-2001 and 2002**

Population sub-group, Region	2000-2001 Round III	2002 Round IV
	Non-active syphilis, n (%), (95% CI), Total number tested	
Male sex workers: Central-A	56 (18.1) (13.9-22.8), 310	57 (14.2) (10.9-18.0), 401
MSM (non sex workers): Central-A	21 (5.3) (3.3-7.9), 399	15 (3.7) (2.1-6.0), 406
Active syphilis, n (%), (95% CI), Total number tested		
Male sex workers: Central-A	24 (7.7) (5.0-11.3), 310	13 (3.2) (1.7-5.5), 401
MSM (non sex workers): Central-A	7 (1.8) (0.7-3.6), 399	3 (0.7) (0.2-2.1), 406

### 3.3.2 Behaviour

In the male-to-male sex category, behavioural surveillance focused on male sex workers sampled in two different locations, Central-A and Southeast-A; on hijras from Central-A only; and also on males who have sex with males in two different locations, Central-A and Northeast-A.

#### *Demographic characteristics*

The socio-demographic information collected by behavioural surveillance on those who had male-to-male sex and on hijras is summarised in Table 69. The hijras and MSM sampled were older (28 to 32 years) than both the male sex worker samples (about 24 to 27 years), and for groups sampled in two locations the mean ages of the Central-A samples were higher than the comparable groups in Southeast-A and Northeast-A. The hijras and MSM sampled by the serological surveillance reported being younger by a few years than those under behavioural surveillance, but the male sex workers were about the same age group. Almost all the men sampled had a formal education.

Ten to 15 percent of the male sex workers were married. Between one third to half of the MSM respondents were married at the time of surveillance. The first penetrative sexual experience for the male sex workers and hijras was at 13 years of age, while the MSM were older (15 to 16 years).

Hijras had been involved in sex work for several more years than male sex workers, an average of about 12 years versus about 8 to 9 years. None of the hijras and only very few of the male sex workers (0.5 to 1.8 percent) had been in the profession for less than one year.

Male sex workers earned slightly more than hijras. The income of MSM was higher than both these groups, and the Central respondents earned almost one and a half times more than those in the Northeast. More than fifty percent of the MSM respondents said they were businessmen or in service, and one out of seven were drivers.

The table of socio-demographic characteristics also indicates the different terms that the males who have sex with males, male sex workers, and hijras use to identify themselves.

**Table 69: Socio-demographic characteristics of those who have male-to-male sex and hijras, behavioural surveillance**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Mean age in years	26.5 (25.8-27.1) Med: 26	23.7 (22.5-24.9) Med: 22.5	29.1 (28-30.2) Med: 27	31.5 (30.5-32.6) Med: 29	28 (27.3-28.7) Med: 27
Proportion with no schooling	3.3 (1.8-6)	5.5 (3-9.8)	2.6 (1.1-6.2)	0.5 (0.1-1.9)	3.5 (1.6-7.5)
Proportion married	10.1 (7.6-13.4)	15.2 (10.7-21.2)	1.8 (0.8-3.8)	47.2 (41.9-52.5)	32.9 (27.1-39.3)
Mean age at first sex among those who recalled	13.3 (13.1-13.5) Med: 13	13.4 (12.9-14) Med: 13	13 (12.5-13.5) Med: 12	15 (14.8-15.3) Med: 15	15.8 (15.4-16.2) Med: 15
Mean years in profession	9 (8.2-9.7) Med: 8 n=365	7.5 (6.5-8.5) Med: 6.5	11.7 (10.8-12.6) Med: 10	NA*	NA*
Proportion less than 1 year in profession	0.5 (0.1-2.1)	1.8 (0.8-3.9)	0	NA	NA
Mean years in profession in city	7.5 (6.7-8.3) Med: 6	6.2 (5.3-7.2) Med: 5	NA	NA	NA
Proportion less than 1 year in profession in city	1.6 (0.8-3.3)	3 (1.6-5.6)	0.3 (0.03-1.9)	NA	NA
Mean income previous month	2924 (2754-3094) Med: 2500	3126 (2950-3303) Med: 3000	2554 (2382-2725) Med: 2500	7895 (6852-8937) Med: 5000	5390 (5050-5729) Med: 4250
Sources of income	NA	NA	NA	Business: 31.7% (26.9-36.9) Service: 29.1% (25.3-33.3) Driving: 14.5% (9.9-21) Teaching: 9.4% (6.1-14.1) Others: 15.3% (12.1-19.1)	Business: 28.9% (23.9-34.5) Service: 26.3% (20.8-32.6) Driving: 15.9% (10.4-23.6) Teaching: 0.3% (0.04-2.1) Others: 28.6% (21.9-36.4)
Self-recognized identity	Koti: 68.8%; Magi/Maigga: 8.2%; Doporata: 6.8%; Half ladies: 2.7%; Panthi: 4.1%; Others: 9.3%	Koti: 59.4%; Magi/Maigga: 11.6%; Doporata: 14.6%; Half ladies: 5.2%; Panthi: 1.8%; Others: 7.3%	Hijra: 93.3%; Female/women: 2.3%; Female sex worker: 0.5%; Housewife: 0.5%; Others: 3.3%	Man/manly/general population: 52.8% (48-57.6); Pa nikh: 8.9% (6.2-12.7); Good man/honest man: 17.8 (13.6-23.1); Film hero: 3.3% (1.9-5.6); Others: 17.7% (13.2-21.9)	Man/manly/general population: 62.1% (56-67.9); Pa nikh: 15.3% (11.7-19.8); Good man/honest man: 17.6% (12.7-23.9); Film hero: 2% (0.9-4.5); Others: 29% (1.4-5.7)

\*Not asked by questionnaire

## Sexual behaviour

### *Sexual networks of male sex workers and hijras*

Less than 10 percent of the hijras and male sex workers in Central-A said they had had more than 20 clients in the previous week (Table 70). Hijras reported the highest number of clients in the past week (about 13 clients), while the client numbers of male sex workers in Central-A was almost double that of their counterparts sampled in Southeast-A (10 clients versus 6 clients, respectively). The hijras reported sex with about four times more regular clients in the previous week than the others. More of the male sex workers tended to have had new clients in the past week compared to the hijras.

About 4 to 11 percent of all the male sex workers and hijras had bought sex from other males or hijras in the past month. Besides that, around nine out of ten hijras and half of the male sex workers reported that they had had a hijra/non-commercial male sexual partner in the previous month.

The sexual networks of the male sex workers also included women. About 5 percent of the male sex workers had sold sex to females in the previous month, and 16% of them in the Southeast-A site had bought sex from females. About one in ten of the male sex workers had also had a non-commercial female partner during the past month.

**Table 70: Male sex workers and hijras: number and type of sexual partners reported**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
Mean clients (new or regular) in the past week	9.5 (8.8-10.2) Med: 8	5.7 (5.3-6) Med: 5	12.6 (11.5-13.7) Med: 12
Proportion reported greater than 20 clients in the past week	5.2 (3.2-8.3)	0	8.2 (5.3-12.6)
Proportion reported new clients in the past week	90.4 (86.7-93.2)	92.7 (88.5-95.4)	59.7 (50.7-68)
Mean new clients in the past week	6.7 (5.9-7.4) Med: 5	3.5 (3.2-3.8) Med: 3	4.3 (3.6-5.5) Med: 4
Proportion reported regular clients in the past week	81.1 (76.9-84.7)	81.4 (75-86.5)	91.2 (85.7-94.7)
Mean regular clients in the past week	2.8 (2.6-3.1) Med: 3	2.2 (1.9-2.4) Med: 2	8.3 (7-9.7) Med: 6
Proportion reported buying sex from male or hijra past month	8.5 (5.8-12.2)	10.7 (7-15.9)	3.6 (2-6.4)
Proportion reported non-commercial male/hijra partner in the past month	55.5 (49.5-61.3)	43.3 (37-49.8)	93 (86.7-96.5)
Proportion reported selling sex to female past month	6.3 (4.5-8.6)	4.6 (2.6-7.9)	Not asked
Proportion reported buying sex from female past month	1.4 (0.6-3.1)	16.2 (11.5-22.3)	Not asked
Proportion reported non-commercial female partner past month	9.8 (7.1-13.5)	13.7 (9.8-18.8)	Not asked

Practically all the male sex workers and hijras could report on the occupations of their clients. Businessmen or drivers or men in uniform ranked within the top three occupations of clients for all three groups sampled (Table 71). Businessmen and drivers were the main clients of the male sex workers in Southeast-A and men in uniform ranked third, while for the sex workers in Central-A businessmen and men in uniform were the top two clients, and students ranked as the third most likely clients. Drivers and rickshaw pullers were the main two occupational groups reported by the hijras, and businessmen comprised the third.

The highest percentage among the other client occupations mentioned by both male sex worker samples was men in different types of service professions (including political leaders and ward commissioners). Some other occupations mentioned were: film hero/director, butcher, Mazar (shrine) visitors, naval staff, and boatmen. Hijras reported night guards, boatmen/milkmen, political leaders, and truck drivers as some of their other clients.

**Table 71. Male sex workers and hijras: occupational profile of clients**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
Don't know clients' occupations	0	0.6 (0.1-2.5)	0
Know clients' occupations	n=366	n=326	n=387
<b>Occupations of clients: *</b>			
Businessman	<b>#1</b> 68.3 (59.9-75.6)	<b>#1</b> 78.2 (71.7-83.6)	<b>#3</b> 53.5 (46.9-59.9)
Driver	32.8 (28-37.9)	<b>#2</b> 61.3 (54.9-67.4)	<b>#1</b> 74.7 (67.2-80.9)
Police/Military	<b>#2</b> 50.8 (42.8-58.8)	<b>#3</b> 39.9 (31.6-48.8)	33.6 (28.2-39.4)
Rickshaw pullers	30.6 (24.6-37.3)	20.2 (12.7-30.7)	<b>#2</b> 72.3 (65.5-78.3)
Students	<b>#3</b> 40.7 (34.9-46.8)	31.9 (25.5-39.1)	17.8 (13.3-23.5)
Day labourers /Coolie	30.9 (23.8-38.9)	23.9 (17.9-31.3)	30.5 (23.7-38.2)
Unemployed	5.5 (3-9.6)	14.1 (7.8-19.9)	9.3 (6.1-13.9)
Others	37.2 (29.7-45.2)	24.5 (17.6-33.1)	8 (5-12.5)

\* The numbers in bold font show the ranking of the three most common occupations of the clients of the male sex workers and hijras.

### **Sexual practices of male sex workers and hijras**

A high proportion of male sex workers reported anal sex with both their new or regular clients in the past week (about 80 to 90 percent, Table 72). About 40 to 55 percent of the male sex workers reported having non-commercial male/hijra partners, and the same proportion reported anal sex with such partners (compare Tables 70 and 72). More of the hijras had reported regular clients and

non-commercial partners, hence a corresponding large percentage (90-92%) reported anal sex with these partners. Hijras reported more anal/oral sex with regular clients than with new clients, but the reverse was true for the male sex workers.

Less of the male sex workers or hijras reported oral sex compared to anal sex, but the hijras had more oral sex with regular clients or non-commercial partners than the male sex workers did. Almost one in four male sex workers and one in three hijras reported that they had also had non-penetrative sex with new clients in the past week.

Participation in group sex was also common for these groups. At the Central-A site, almost half of the male sex workers and more than that of hijras reported that they had participated in a group sex encounter the previous month, and about a quarter of the male sex workers in Southeast-A had done so.

**Table 72: Sexual practices of male sex workers and hijras**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
Proportion reported anal sex with new clients past week	90.4 (86.7-93.2)	92.7 (88.5-95.4)	59.7 (50.7-68)
Proportion reported anal sex with regular clients past week	81.1 (76.9-84.7)	81.4 (75-86.5)	90.2 (84.6-93.9)
Proportion reported anal sex with non-commercial male/hijra partners past month	55.5 (49.5-61.3)	43.3 (37-49.8)	92 (85.5-95.7)
Proportion reported oral sex with new clients past week	7.4 (6.7-79.4)	36.6 (30.8-42.8)	37.5 (30.1-45.4)
Proportion reported oral sex with regular clients past week	55.3 (55.2-63.2)	29.3 (24.1-35)	67.4 (60-74.1)
Proportion reported oral sex with non-commercial male partner past month	43.2 (37.2-49.4)	7.3 (4.4-11.9)	59.9 (50.8-68.5)
Proportion reported non-penetrative sex with new clients last week	24.3 (19.8-29.4)	22.6 (17.3-28.8)	33.8 (25.6-43.2)
Proportion reported group sex last month	44.5 (40-49.2)	24.4 (18.3-31.7)	51.9 (44.2-59.6)

### **Sexual networks of males who have sex with males**

The males who have sex with males at the two sites sampled by behavioural surveillance were found to have extensive bisexual networks as shown in Table 73. Between 33 and 47 percent of them were married, and a third of them reported sex with non-commercial female partners in the last month, i.e., these partners were likely to have been their wives. In addition, they had both paid and unpaid sexual liaisons with other men, and paid for sex with hijras and female sex workers. During the month previous to surveillance between 84 to 88 percent reported sex with a commercial male, about one third had sex with a commercial female, and between 7 to 10 percent paid for sex with hijras. They also reported having had sex with non-commercial male partners in the past month. The majority of MSM at the Central-A site had done so (81%), which was roughly double the proportion of those at the Northeast-A site (45%). Around thirty percent of the MSM sampled also had participated in group sex in the past month.

Taking into consideration all the types of sexual partners, the average number of partners reported by the MSM at both sites ranged from 5 to 7 in the past month (Figure 13). More than two-thirds of MSM in Central-A and a third in Northeast-A had as many as six or more sexual partners in the past month.

**Table 73: Sexual networks of males who have sex with males**

Indicators (95% CI)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Proportion reported sex with commercial male partners last month	88 (83.3-91.6)	84.1 (78.8-88.2)
Mean commercial male partners last month	3.4 (3.1-3.8) Med:3	3.3 (2.7-3.9) Med:3
Proportion reported sex with commercial hijra partners last month	10.3 (7.1-14.7)	7.2 (4.8-10.8)
Mean number of commercial hijra partners last month	0.2 (0.1-0.3)	0.09 (0.05-0.14)
Proportion reported sex with non-commercial male partners last month	80.7 (75.2-85.3)	45.1 (37.7-52.7)
Mean non-commercial male partners last month	2.4 (2.1-2.6) Med:2	0.6 (0.5-0.8) Med:0
Proportion reported sex with commercial female partners last month	28.2 (19.9-38.2)	34.7 (29.5-40.2)
Mean number of commercial female partners last month	0.7 (0.47-0.91)	0.7 (0.6-0.9)
Proportion reported sex with non-commercial female partners last month	33.8 (29.2-38.7)	31.8 (25.3-39.1)
Mean number of non-commercial female partners last month	0.4 (0.3-0.5)	0.3 (0.3-0.4)
Proportion reported group sex last month	30.5 (25.7-35.7)	26.6 (21.9-31.8)
Mean number of partners (commercial/non-commercial) last month	7.1 (6.6-7.6) Med:7	5.1 (4.5-5.7) Med:4
Number of partners in the last month:		
0 partner	0	0
1 to 5 partners	36.4 (31.3-41.8)	69.6 (58.9-78.6)
6 to 9 partners	41.5 (36.3-47)	20.2 (14.2-28)
10 or more partners	22.1 (16.8-28.5)	10.1 (6.3-15.8)

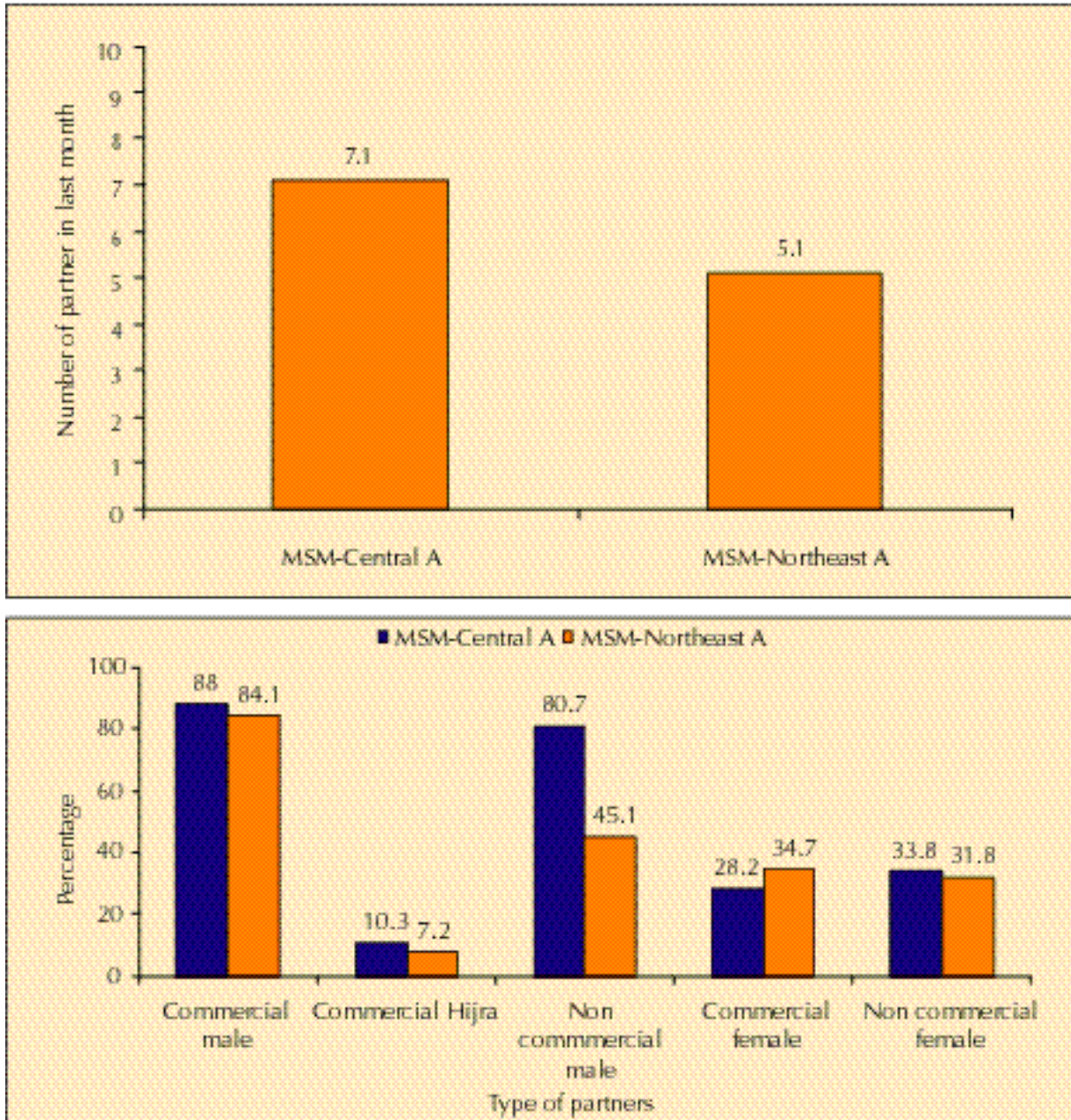
***Changes over the years of surveillance in partner numbers of those who have male-to-male sex and hijras***

Overall the fluctuation in client numbers in the past week of male sex workers in Central-A over the rounds of surveillance (Table 74) is significant ( $p=0.000$ ). The increase in client numbers observed between round 3 and round 4 is significant ( $p=0.049$ ), and is significant between round 2 and round 3 ( $p=0.000$ ), and also between round 2 and round 4 ( $p=0.000$ ).

Among the hijras in Central-A, the increase in client numbers in the past week is significant ( $p=0.000$ ) between rounds 3 and 4. A comparison cannot be made with round two, because the sample was not random as it was in subsequent rounds.

The proportions of MSM in Northeast-A that reported commercial partners of any type (male/female/hijra) in the past month are not directly comparable between the third and fourth rounds of surveillance, because the third round sample was a mixed sample of MSM (60%) and MSW (40%). The proportions are comparable for the MSM sampled in Central-A, and though a bit

**Figure 13: Males who have sex with males: mean number and types of partners reported last month**



of an increase is noticed as shown in Table 74; it is not statistically significant ( $p=0.256$ ). When the results are compared for the proportion of MSM that reported non-commercial male/female/hijra partners, a significant reduction is noticeable between the third and fourth surveillances for respondents in both areas sampled ( $p=0.012$  in Central-A and  $p=0.020$  in Northeast-A).

Overall the MSM mean partner number over the third and fourth rounds of surveillance seems to have declined. However, once again this has to be interpreted with caution, as the data are not directly comparable because the questions were posed differently in the third and fourth rounds.



**Table 74: Trends in partner numbers of male sex workers, hijras, and MSM over three rounds of behavioural surveillance (1999-2000, 2000-2001 and 2002)**

Population groups	Second round	Third round	Fourth round
<b>Male sex workers and hijras mean client numbers in the past week:</b>			
Male sex workers Central-A	6.2	8.6	9.5
Male sex workers, Southeast-A§	-	-	5.7
Hijras, Central-A	12.9*	10.5	12.6
<b>Percentage MSM reported commercial male/female/hijra partners past month:</b>			
MSM, Central-A	-	91.1	93.2
MSM, Northeast-A	-	-	91.6
Mixed sample: 40% MSW and 60% MSM, Northeast-A	-	97.8 buying/selling sex ** 60.7 only MSM portion of mixed sample	-
<b>Percentage MSM reported non-commercial male/female/hijra partners past month:</b>			
MSM, Central-A	-	99.5	93.7
MSM, Northeast-A	-	79.5	71.7
<b>MSM mean partner numbers in the past month:</b>			
MSM, Central-A	-	9.6	7.1
MSM, Northeast-A	-	-	5.1
Mixed sample: 40% MSW and 60% MSM, Northeast-A	-	10.4** 13.1 (n=183 for MSW) 8.4 (n=259 for MSM)	-

A. Sampled for the first time in BSS round-IV

\* Hijra sample for the second round of BSS was not a random sample.

\*\* The first average represents the mean of the total mixed MSMA sample (sex workers and non-sex workers)

### **Condom use by male sex workers and hijras**

Overall the condom use of the male sex workers and hijras sampled was very low for the last anal sex act with commercial or non-commercial male/hijra partners (Table 75). It was higher among male sex workers from Central-A with these partners (24 to 32 percent selling/buying sex) than it was among male sex workers in Southeast-A, or hijras in the Central-A sample. The latter two groups reported similar last time condom use when selling sex to male or hijra partners (12 to 15 percent), but while 17% of the male sex workers in Southeast-A reported they used condoms last time they bought sex from males or hijras, none of the hijras did.

With female clients or commercial female partners condoms were used for the last vaginal or anal sex act by about the same proportion of both groups of male sex workers as for last sex with male or hijra partners. But condom use with non-commercial female partners was lower (19% and 7% for male sex workers in Central-A and Southeast-A, respectively).

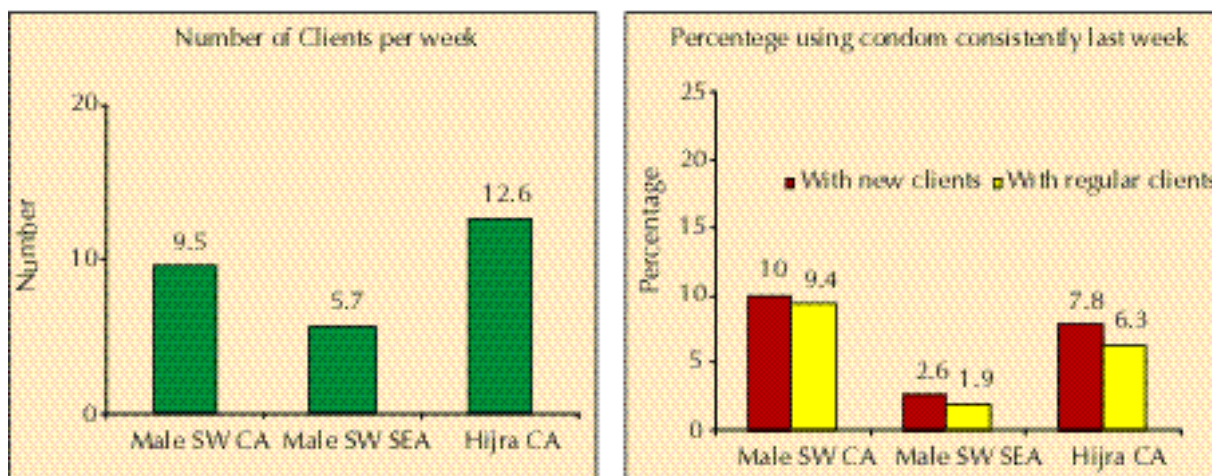
As with other groups sampled by surveillance, the use of condoms consistently by male sex workers and hijras was lower than last time use (Table 75, Figure 14). Around 10% of the male sex workers in Central-A, 2% of the male sex workers in Southeast-A, and between 4 to 8 percent of the hijras reported using condoms every time with their commercial and non-commercial male/hijra sexual partners (or female non-commercial partners for male sex workers). A higher proportion of the male sex workers in Central-A used condoms with female clients consistently (13%), but none of them did when buying sex from women. The opposite was true for the male sex workers in Southeast-A - 3.8% used condoms consistently with commercial females, but none did with their female clients.

**Table 75: Condom use behaviour of male sex workers and hijras**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
<b>Last time condom use by male sex workers/hijras who reported:</b>			
Anal sex with new clients past week	32 (26.8-37.8) n=331	14.8 (10.4-20.6) n=304	15.1 (8.3-26) n=231
Anal sex with regular clients past week	29 (23.4-35.2) n=297	12.7 (8.4-18.9) n=267	12.9 (8-20.2) n=349
Anal sex when buying sex from commercial male/ hijra partners past month	25.8 (14.8-41) n=31	17.1 (7.6-34.4) n=35	0 n=14
Anal sex with non- commercial male/hijra partners past month	24.1 (17.3-32.6) n=203	8.4 (5-13.8) n=142	8.4 (4.5-15.1) n=356 <sup>1</sup>
Vaginal/anal sex with female clients past month	30.4 (11.5-59.5) n=23	13.3 (2.4-48.6) n=15	Not asked
Vaginal/anal sex with commercial female partners past month	20 (0.8-88.9) n=5	9.4 (3.3-24.1) n=53	Not asked
Vaginal/anal sex with non- commercial female partners past month	19.4 (7.9-40.4) n=36	6.7 (2-19.7) n=45	Not asked
<b>Consistent condom use by male sex workers/hijras in:</b>			
Anal sex with new clients past week	10 (6.7-14.5) n=331	2.6 (1.4-5) n=304	7.8 (3.6-16) n=231
Anal sex regular clients past week	9.4 (6.5-13.4) n=297	1.9 (0.8-4.4) n=267	6.3 (3.5-11.1) n=349
Anal sex when buying sex from commercial male/hijra partners past month	9.7 (2.9-27.7) n=31	2.9 (0.3-20.2) n=35	0 n=14
Anal sex with non-commercial male/hijra partners past month	9.4 (5.3-15.9) n=203	2.1 (0.6-6.7) n=142	3.9 (1.9-8) n=356
Vaginal/anal sex with female clients past month	13 (2.8-43.4) n=23	0 n=15	Not asked
Vaginal/anal sex with commercial female partners past month	0 n=5	3.8 (0.9-14) n=53	Not asked
Vaginal/anal sex with non- commercial partners female past month	8.3 (1.8-31.3) n=36	2.2 (0.3-15.3) n=45	Not asked

<sup>1</sup> Only 4 hijras did not have anal sex with their non-commercial male/hijra partners in the past month.

**Figure 14: Comparison of client numbers and condom use of male sex workers and hijras**



**Changes in condom use by male sex workers and hijras over the years of surveillance**

The decline in condom use for the last commercial sex act by the male sex workers in Central-A between round two and round three was found to be significant ( $p=0.003$ ). A statistical comparison cannot be made over rounds 2 to 4 because the clients were categorized according to whether they were new or regular only in round 4 (Table 76). For the hijra sample round 2 and round 4 are also not comparable because non-probability sampling was done in round 2. But there was some increase in last time condom use by hijras evident in round four.

**Table 76: Male sex workers and hijras: trends in condom use for last commercial sex act with clients over three rounds of behavioural surveillance (1999-2000, 2000-2001, and 2002)**

Population group	Second round	Third round	Fourth round	
	New & Regular Clients	New & Regular Clients	New Clients	Regular Clients
Male sex workers Central-A	41.6%	28.7%	32%	28.9%
Male sex workers, Southeast-A	-	-	14.8%	12.7%
Hijras, Central-A	9.4%	3.4%	15.1%	12.6%

**Condom use by males who have sex with males**

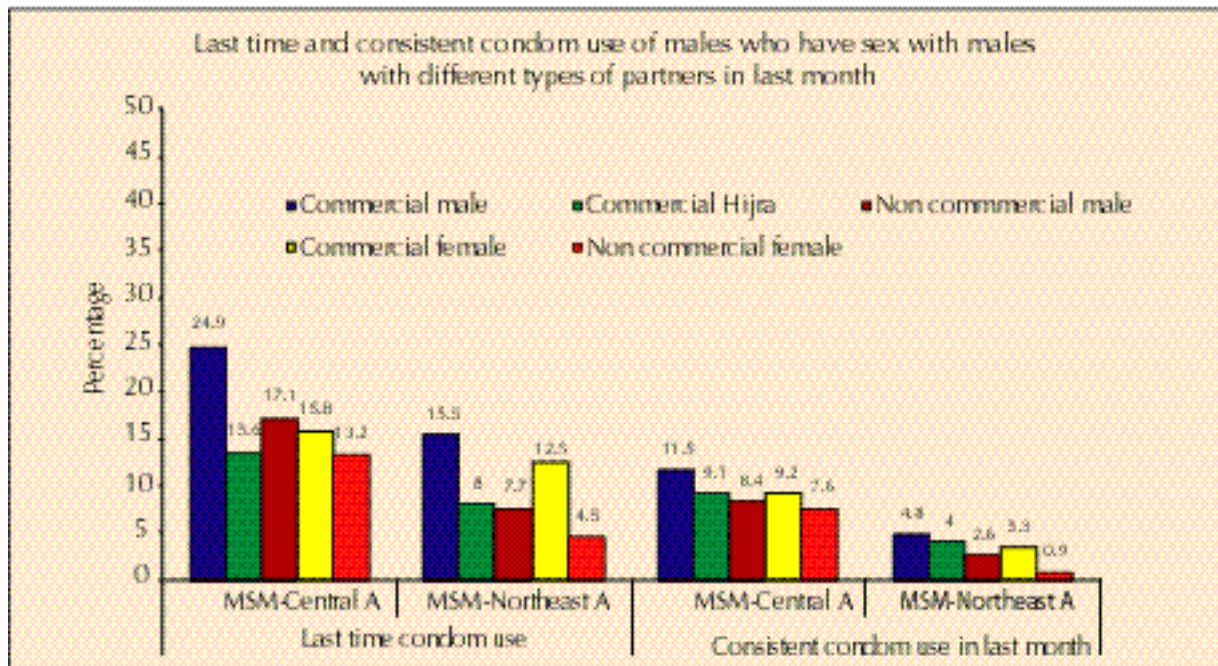
As with other male groups, the last time condom use of the MSM group with commercial or non-commercial partners was not appreciable, ranging from 5 to 25 percent (Table 77, Figure 15). The proportion of MSM that used condoms with the different types of partners was even lower than the proportion of male sex workers that did (compare Tables 75 and 77), although with male partners it was higher than reported by some of the other male groups sampled (compare with rickshaw pullers and truckers, Table 46). More of the MSM respondents used condoms for the last sex act with male or hijra partners in the previous month than they did with female partners. The last time condom use of the MSM group sampled in the Central-A region was higher than the group sampled in the Northeast-A - in some cases more than double.

Consistent condom use with the different types of partners in the past month ranged from as low as 0.9% of the MSM in Northeast-A with non-commercial female partners to 11.2% of the MSM in Central-A with commercial male partners. It was much lower than the last time condom use of the two groups of MSM respondents, and in the same range as consistent condom use of male sex

**Table 77: Condom use behaviour of males who have sex with males**

Indicators (95% CI)	MSM, Central-A (N=426)	MSM, Northeast-A (N=346)
<b>Last time condom use by males who reported last month:</b>		
Anal sex with commercial male partners	24.9 (20.4-30.1) n=357	15.5 (11.4-20.6) n=291
Anal sex with commercial hijra partners	13.6 (4.9-32.5) n=44	8 (1.9-28.4) n=25
Anal sex with non-commercial male partners	17.1 (12.8-22.6) n=344	7.7 (3.4-16.4) n=156
Vaginal/anal sex with commercial female partners	15.8 (8.3-28) n=120	12.5 (6.9-21.4) n=120
Vaginal/anal sex with non-commercial female partners	13.2 (7.7-21.7) n=144	4.5 (1.5-12.7) n=110
<b>Consistent condom use by males who reported last month:</b>		
Anal sex with commercial male partners	11.5 (8-16.2) n=357	4.8 (2.7-8.3) n=291
Anal sex with commercial hijra partners	9.1 (2-33.1) n=44	4 (0.5-26.7) n=25
Anal sex with non-commercial male partners	8.4 (4.7-14.7) n=344	2.6 (0.7-8.4) n=156
Vaginal/anal sex with commercial female partners	9.2 (3.6-21.4) n=120	3.3 (1.2-8.8) n=120
Vaginal/anal sex with non-commercial female partners	7.6 (3.9-14.3) n=144	0.9 (0.1-6.8) n=110

workers. As compared to the Northeast-A sample, MSM in Central-A were as much as three times more likely to have used condoms consistently with male and female partners in the past month.

**Figure 15: Last time and consistent condom use of males who have sex with males with different types of partners**

### **Changes in condom use by males who have sex with males over the years of surveillance**

In the third round of surveillance, consistent condom use by MSM in the past month was calculated for all commercial sex, i.e. with males, females, and hijras combined, but in the fourth round the questions were changed so that consistent condom use could be calculated separately for commercial sex with different types of partners. But although not directly comparable, an increase in consistent condom use is noticeable between rounds three and four (Table 78). Similarly, the consistent condom use for non-commercial sex with different partners is not directly comparable between rounds three and four, but an increase is apparent.

**Table 78: Males who have sex with males: trends in consistent condom use with commercial and non-commercial partners in the last two rounds of behavioural surveillance (2000-2001, and 2002)**

Population group	Round 3	Round 4
<b>Consistent condom use with commercial partners</b>		
MSM, Central-A	2.5 <sup>1</sup>	11.5 <sup>2</sup>
MSM, Northeast-A	1.2 <sup>1</sup>	4.5 <sup>2</sup>
<b>Consistent condom use with non-commercial partners</b>		
MSM, Central-A	1.2 <sup>3</sup>	17.1 <sup>4</sup>
MSM, Northeast-A	0.6 <sup>3</sup>	7.7 <sup>4</sup>

<sup>1</sup> Commercial sex with male, female, hijra

<sup>2</sup> Commercial sex with male only

<sup>3</sup> Non-commercial sex with male, female and hijra

<sup>4</sup> Non-commercial sex with male and hijra only

### **STI and treatment seeking behaviour**

Self reported STI symptoms were high among all the males who have sex with males (sex workers and others) and hijras (Table 79). About three out of four of the male sex workers, MSM, and hijras from Central-A, and MSM from the Northeast-A, and four out of five male sex workers in the Southeast-A sample reported at least one STI symptom in the past year. This is a slightly lower proportion than the female sex workers reporting STI in the past year, except for women in brothels.

Between half and two-thirds of the respondents who have male-to-male sex had sought formal medical treatment for their last STI from Government hospitals, private doctors, private clinics or NGO clinics, but only a little less than a third of the hijras had done so. This is an increase in comparison with the findings of the third round of behavioural surveillance. In relation to the mean waiting days before seeking treatment for the last STI some positive progress has also been made compared to the previous year's findings. Both groups of MSM sampled and the sex workers in Southeast-A waited an average of about 7 to 8 days before seeking treatment, while the sex workers in Central-A and the hijras waited from 10 to 12 days.

**Table 79: Males who have sex with males and hijras: STI treatment seeking behaviour**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Proportion reported at least one STI symptom in the past year	74.9 (69.9-79.3)	81.4 (75-86.4)	75.4 (68.5-81.3)	70.2 (65.6-74.4)	76.3 (70.2-81.5)
Proportion sought formal medical treatment in the first intention for last STI among those who reported STI symptoms in the past year	45.6 (39.4-52) n=274	61.8 (55.3-67.9) n=267	31.2 (23.7-39.7) n=292	50.2 (44.6-55.7) n=299	63.3 (56.2-69.8) n=264
Mean waiting days for STI treatment among those who sought treatment	11.8 (10.7-13) Med:9 n=257	8 (6.5-9.5) Med:6 n=259	10.2 (8.7-11.6) Med:8 n=248	7.4 (6.7-8.1) Med:7 n=269	7.4 (6.8-7.9) Med:7 n=261
<b>First choice of STI treatment</b>					
Hospital	11.7 (7.6-17.6)	5.2 (3.1-8.5)	0.3 (0.04-2.5)	9 (5.9-13.6)	6.8 (4.1-11.1)
Drug seller	23.7 (18.6-29.7)	19.8 (16.1-24.2)	13.7 (9.2-19.9)	24.4 (19.7-29.9)	28.4 (22.8-34.8)
Private doctor	2.5 (1.2-5.5)	9.3 (6.5-13.3)	7.5 (4.8-11.5)	18.7 (15.1-22.9)	19.3 (13.6-26.6)
Private clinic	1.1 (0.2-4.5)	3.7 (2-6.9)	1.4 (0.5-3.6)	3.7 (1.9-7.1)	1.1 (0.4-3.4)
NGO clinic	30.3 (24.5-36.7)	43.4 (36.5-50.6)	21.9 (15-30.9)	18.7 (14.2-24.2)	36 (28.8-43.9)
Traditional healer	11.7 (7.8-17)	6 (3.4-10.1)	16.1 (10.6-23.7)	7.7 (4.9-11.9)	6.8 (3.9-11.4)
Advice/treatment from friend	2.9 (1.3-6.3)	5.2 (2.7-9.9)	13 (7.3-22)	2.7 (1.3-5.5)	0.4 (0.05-2.9)
Self-medication	9.8 (6.4-14.8)	2.2 (1-4.8)	9.9 (6.1-15.7)	5 (3-8.3)	0
Did not seek treatment	6.2 (3.9-9.7)	3 (1.3-6.6)	15.1 (9.5-23)	10 (6.4-15.2)	1.1 (0.2-4.9)
Others	0	1.9 (0.8-4.3)	1 (0.2-4.4)	0	0

**Violence-related risk**

Like the female sex workers, male sex workers and hijras were very prone to being victims of violence (38 to 50 percent, Table 80). Hijras reported a higher level of violence than male sex workers, with one out of two hijras being beaten or raped in the year previous to surveillance.

**Table 80: Violence experienced by male sex workers and hijras**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
Proportion reported being beaten or raped past year	41 (35.4-46.8)	37.8 (30.8-45.4)	50.1 (41.2-59.1)
Proportion reported violence perpetrated by men in uniform among those who reported violence	42 (34.1-50.3) n=150	20.2 (12.9-30.1) n=124	50 (38.6-51.4) n=194
Proportion reported violence perpetrated by mastaans among those who reported violence	31.3 (25.7-37.6) n=150	49.2 (41.1-57.3) n=124	49 (37.7-60.4) n=194

The people mainly responsible for the violence against male sex workers and hijras were reported to be mastaans (musclemen/gang members), men in uniform, and clients. Sometimes they also faced violence from their relatives, night guards, political leaders, or mollahs (religious leaders).

### **Exposure to an intervention programme and its effects**

The majority of the males who have sex with males sampled, including male sex workers, had exposure to HIV prevention interventions (Table 81). At least two out of three of the male sex workers at both locations, and MSM in Central-A reported such exposure, and a high proportion of the MSM in Northeast-A (91%) did. In contrast, only one out of three hijras reported having been in touch with a prevention program in the past year.

Among those who were involved in prevention interventions, more than fifty percent of the male sex workers in Southeast-A, and the MSM and hijras in Central-A acknowledged the contribution of the program to changing their sexual behaviour, but only 27% of the male sex workers in Central-A did.

**Table 81: Males who have sex with males and hijras: exposure to intervention programmes**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Proportion participated in NGO intervention in past year	64.7 (57.5-71.4)	69.8 (62.9-76)	35.1 (26.6-44.7)	62.4 (55.8-68.5)	90.7 (86.9-93.5)
<b>Number reported exposure to an intervention</b>	<b>n=237</b>	<b>n=229</b>	<b>n=136</b>	<b>n=266</b>	<b>n=314</b>
Proportion reported getting help in changing behaviour	27 (21.2-33.7)	52.8 (44.6-60.9)	54.4 (43-65.4)	52.3 (47.3-57.1)	13 (9.5-17.6)
Proportion reported receiving useful information but it did not lead to changing behaviour	30.8 (24.3-38.1)	38.7 (31.2-47.2)	36 (24.5-49.4)	28.2 (22.7-34.5)	63.7 (56-70.8)
Proportion reported information was hard to understand	8 (5-12.6)	4.8 (2.7-8.5)	5.9 (2.7-12.3)	10.1 (7.4-13.8)	8.3 (4.8-14)
Proportion reported information was not relevant to their needs	6.3 (3.8-10.4)	0.9 (0.2-3.6)	3.7 (1.3-9.9)	7.1 (4.5-11.1)	5.4 (2.9-9.8)
Others	27.8 (21.9-34.7)	2.6 (1-6.3)	0	2.2 (1-4.7)	9.5 (5.5-16)
Text of others	Heard about AIDS/STI, proper use of condom, lubricant use, safer sex, etc.	Heard about HIV/AIDS/STI	-	Heard about AIDS and its consequences, safer sex practice, and condom use	Heard about STI/AIDS, safer sex practice, and condom use

Although a high proportion of the MSM in Northeast-A were exposed to interventions, only 13% felt they had an effect on behaviour change, but 64% did acknowledge the information they acquired was useful. Roughly 30 to 40 percent of the men in the rest of the groups and hijras mentioned that although there was no effect on their behaviour, they had received useful information from the programs. Ten percent or less of the male sex workers, MSM, and hijras reported that the information they received was hard to understand or irrelevant to their needs.

### **Effect of interventions on condom use of male sex workers and hijras**

Although the last time condom use by male sex workers and hijras was reported to be very low, a significantly higher proportion ( $p < 0.05$ ) of those exposed to prevention programs in Central-A used condoms during anal sex with their last commercial or non-commercial male partner, as compared to those who were not in prevention programs in the past year (Table 82). Though a higher proportion of the male sex workers in interventions in Southeast-A used condoms at last sex compared to those not in interventions, the difference was not significant, except for sex with non-commercial male partners. When buying sex from other males or hijras, there was only a significant effect of interventions on the condom use at last sex of the male sex workers in Central-A. However, the sample size is too small to make an inference.

The effect of interventions on the consistent condom use behaviour of male sex workers and hijras was the same as that observed for last time condom use (Table 83). Once again, a significantly

**Table 82: Male sex workers and hijras: testing the significance of exposure to an intervention programme in the past year on last time condom use for anal sex with new and regular clients, and non-commercial partners, or when buying sex.**

Indicators (95% CI)	Male sex workers Central-A		Male sex workers Southeast-A		Hijra Central -A	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Last time condom use in anal sex with new clients (male/hijra)	47.4 (40.9-54) n=213	4.2 (1.8-9.7) n=118	16.8 (11.6-23.8) n=208	10.4 (5.6-18.5) n=96	25.8 (13.4-44) n=120	3.6 (1.2-10) n=111
	<b>p= 0.000</b>		<b>p= 0.119</b>		<b>p= 0.000</b>	
Last time condom use in anal sex with regular clients (male/hijra)	40.3 (33.1-48) n=196	6.9 (3.4-13.6) n=101	14.5 (8.9-22.7) n=193	8.1 (3.8-16.3) n=74	29.4 (17.4-45.1) n=119	4.3 (2-9.2) n=230
	<b>p= 0.000</b>		<b>p= 0.182</b>		<b>p= 0.000</b>	
Last time condom use in anal sex when buying sex from male/ hijra	44.4 (29.2-60.8) n=18	0 n=13	18.5 (6.9-41) n=27	12.5 (1.8-52) n=8	0 n=3	0 n=11
	<b>p= 0.001</b>		<b>p= 0.695</b>		<b>Not applicable</b>	
Last time condom use in anal sex with non-commercial male/hijra partners	37.7 (27.8-48.7) n=122	3.7 (1.2-10.8) n=81	12.9 (7.5-21.3) n=93	0 n=49	19.2 (10.8-31.8) n=130	2.2 (0.8-5.6) n=226
	<b>p= 0.000</b>		<b>p= 0.018</b>		<b>p= 0.000</b>	



higher proportion ( $p < 0.05$ ) of the male sex workers and hijras from Central-A under intervention coverage reported always using condoms in anal sex with new or regular clients in the past week, and with non-commercial partners in the past month, but no such difference was observed for the male sex workers sampled in the Southeast-A. In this case, however, there was no effect of interventions on the consistent condom use of Central-A male sex workers when buying sex from males or hijras.

**Table 83: Male sex workers and hijras: testing the significance of exposure to an intervention programme in the past year on consistent condom use in anal sex with new and regular clients, and non-commercial partners, or when buying sex.**

Indicators (95% CI)	Male sex workers Central-A		Male sex workers Southeast-A		Hijra Central-A	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Consistent condom use in anal sex with new clients past week	15.5 (10.4-22.5) n=213	0 n=118	3.4 (1.6-6.9) n=208	1 (0.1-7.6) n=96	14.2 (6.4-28.3) n=120	1 (0.1-6.6) n=111
	<b>p=0.000</b>		<b>p=0.267</b>		<b>p=0.000</b>	
Consistent condom use in anal sex with regular clients past week	14.3 (9.9-20.3) n=196	0 n=101	2.1 (0.8-5.2) n=193	1.3 (0.2-9.8) n=74	15.1 (7.3-28.7) n=119	1.7 (0.6-4.9) n=230
	<b>p=0.000</b>		<b>p=0.700</b>		<b>p=0.000</b>	
Consistent condom use in anal sex with male/hijra past month when buying sex	16.7 (4.8-44.1) n=18	0 n=13	3.7 (0.4-25.9) n=27	0 n=8	0 n=3	0 n=11
	<b>p=0.162</b>		<b>p=0.614</b>		<b>Not applicable</b>	
Consistent condom use in anal sex with non-commercial partner past month	15.6 (8.8-26.1) n=122	0 n=81	3.2 (0.9-10.3) n=93	0 n=49	10 (5-19) n=130	0.4 (0.06-3.3) n=226
	<b>p=0.005</b>		<b>p=0.252</b>		<b>p=0.000</b>	

#### **Effect of interventions on condom use of males who have sex with males**

A significantly higher proportion ( $p < 0.05$ ) of the MSM in Central-A who were covered by interventions in the past year reported condom use for the last sex act with commercial or non-commercial male partners and with commercial hijra partners as compared to their counterparts who were not in interventions, but there was no effect on condom use with female partners (Table 84). For the MSM in Northeast-A there was no significant difference in last time condom use between those in and out of interventions with respect to last time condom use with commercial male, commercial female and with non-commercial partners.

A significantly higher proportion of the MSM respondents in Central-A with exposure to an intervention in the past year also consistently used condoms with commercial ( $p=0.002$ ) or non-commercial male ( $p=0.000$ ) partners in the past month (Table 85). No significant difference was observed between those in or out of interventions in consistent condom use with commercial hijra or female partners in the past month ( $p > 0.05$ ). As with last time condom use, MSM in Northeast-A in a prevention program reported higher consistent use of condoms with all types of partners but the result is not significant.

**Table 84: Males who have sex with males: testing the significance of exposure to an intervention programme in the past year on last time condom use for sex with commercial and non-commercial male, hijra, and female partners**

Indicators (95% CI)	MSM Central-A		MSM Northeast-A	
	Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No
Last time condom use with commercial male partner	33.6 (27.7-40.2) n=223	10.4 (6.5-16.3) n=134	16.8 (12.3-22.4) n=262	3.4 (0.4-21.7) n=29
	<b>p=0.000</b>		<b>p=0.065</b>	
Last time condom use with commercial Hijra partner	26.1 (8.9-55.8) n=23	0 n=21	8.7 (2-30.2) n=23	0 n=2
	<b>p=0.049</b>		<b>p=0.647</b>	
Last time condom use with non commercial male partner	25.4 (18.9-33.4) n=220	2.4 (0.6-9.6) n=124	7.7 (3.5-16) n=143	7.7 (0.9-42.9) n=13
	<b>p=0.000</b>		<b>p=1.000</b>	
Last time condom use with commercial female partner	21.4 (9.4-41.7) n=56	10.9 (5-22.4) n=64	13.8 (7.8-23.2) n=109	0 n=11
	<b>p=0.139</b>		<b>p=0.129</b>	
Last time condom use with non commercial female partner	19.2 (10.3-33) n=73	7 (2.6-17.7) n=71	4.8 (1.6-13.6) n=103	0 n=7
	<b>p=0.059</b>		<b>p=0.616</b>	

**Table 85: Males who have sex with males: testing the significance of exposure to an intervention programme in the past year on consistent condom use for sex with commercial and non-commercial male, hijra, and female partners**

Indicators (95% CI)	MSM Central-A		MSM Northeast-A	
	Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No
Consistent condom use with commercial male partner last month	16.1 (11.4-22.4) n=223	3.7 (1.3-10) n=134	5.3 (3.9-3) n=262	0 n=29
	<b>p=0.002</b>		<b>p=0.259</b>	
Consistent condom use with commercial Hijra partner last month	17.4 (3.5-55.1) n=23	0 n=21	4.3 (0.5-28.4) n=23	0 n=2
	<b>p=0.186</b>		<b>p=0.760</b>	
Consistent condom use with non commercial male partner last month	12.7 (6.8-22.5) n=220	0.8 (0.1-5.3) n=124	2.8 (0.8-9.2) n=143	0 n=13
	<b>p=0.000</b>		<b>p=0.627</b>	
Consistent condom use with commercial female partner last month	14.3 (5.3-33) n=56	4.7 (1-19.3) n=64	3.7 (1.3-9.5) n=109	0 n=11
	<b>p=0.110</b>		<b>p=0.469</b>	
Consistent condom use with non commercial female partner last month	10.9 (5.4-21.1) n=73	4.2 (1.5-11.5) n=71	1 (0.1-7.2) n=103	0 n=7
	<b>p=0.057</b>		<b>p=0.795</b>	

**Effect of interventions on STI and treatment seeking of male sex workers**

Significantly less ( $p < 0.05$ ) of both samples of male sex workers, and of the hijras and MSM in Central-A who had taken part in prevention interventions reported at least one STI symptom in the previous year, when compared to their counterparts without any intervention exposure (Tables 86 and 87). Though less MSM sampled in the Northeast-A reported an STI symptom in the past year if exposed to an intervention versus those not exposed, the difference was not statistically significant ( $p = 0.257$ ). In addition, the advantage of intervention exposure was observable among all groups in that those in interventions were significantly ( $p = 0.000$ ) more likely to seek formal medical treatment for their last STI symptoms compared to those who were not. Those involved with intervention programs in Central-A also wasted significantly ( $p < 0.05$ ) less time in waiting to treat their last STI symptoms than their counterparts outside intervention coverage.

**Table 86: Male sex workers and hijras: testing the significance of exposure to an intervention programme in the past year on STI-treatment seeking behaviour**

Indicators (95% CI)	MSW Central-A (N=366)		MSW Southeast-A (N=328)		Hijra Central-A (N=387)	
	Exposed to intervention		Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No	Yes	No
Proportion with at least one STI symptom in the past year	65.8 (60-71.2) n=237	91.5 (86-94.9) n=129	77.7 (70.6-83.5) n=229	89.9 (79.3-95.4) n=99	65.4 (53.2-75.9) n=136	80.9 (72.7-87) n=251
	p=0.000		p=0.023		p=0.020	
Proportion sought formal medical treatment for last STI symptom among those with who reported symptoms in past year	58.3 (51.4-64.9) n=156	28.8 (21.3-37.7) n=118	71.9 (64.4-78.4) n=178	41.6 (31.7-52.2) n=89	68.5 (54.6-89.8) n=89	14.8 (8.3-24.8) n=203
	p=0.000		p=0.000		p=0.000	
Mean waiting days for STI treatment among those who sought treatment	7.1 (6.4-7.8) n=146	18.1 (15.9-20.2) n=111	8.4 (6.5-10.4) n=177	7 (5.9-8) n=82	6.7 (5-8.5) n=86	12 (10.1-13.9) n=162
	p=0.000		p=0.152		p=0.000	

**Table 87: Males who have sex with males: testing the significance of exposure to an intervention programme in the past year on STI-treatment seeking behaviour**

Indicators (95% CI)	MSM Central-A (N=426)		MSM Northeast-A (N=346)	
	Exposed to intervention		Exposed to intervention	
	Yes	No	Yes	No
Proportion with at least one STI symptom in the past year	61.3 (54.4-67.7) n=266	85 (78.2-89.9) n=160	75.5 (68.9-81) n=314	84.3 (67.1-93.5) n=32
	p=0.000		p=0.257	
Proportion sought formal medical treatment for last STI symptom among those with who reported symptoms in past year	68.1 (60.8-74.6) n=163	28.7 (21.8-36.7) n=136	68.3 (61.9-74.2) n=237	18.5 (6.9-40.9) n=27
	p=0.000		p=0.000	
Mean waiting days for STI treatment among those who sought treatment	6.5 (5.9-7.1) n=157	8.7 (7.4-10) n=112	7.2 (6.7-7.8) n=235	8.7 (7.2-10.3) n=26
	p=0.002		p=0.067	

## HIV/AIDS-related Knowledge Issues

### *Knowledge on modes of HIV transmission and confidential HIV testing*

Overall the groups sampled in Central-A were less knowledgeable than the groups sampled at the other two sites regarding the two important methods of preventing HIV transmission, namely, using condoms and not sharing injection equipment (Table 88). While between 80 to 90 percent of the male sex workers in Southeast-A and MSM in Northeast-A knew about these two modes of HIV prevention, in Central-A only roughly 50 to 60 percent of the male sex workers and hijras, and 70 to 75 percent of the MSM did.

Knowledge about where a confidential HIV test was available was very poor amongst the hijras sampled (1.8%). MSM in Central-A (29%) were about twice more likely to know where to get tested for HIV than the other groups of males who have sex with males (around 16%).

**Table 88: Males who have sex with males and hijras: knowledge of HIV transmission and confidential testing**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Proportion mentioned condom use as a mode of prevention	61.7 (55.9-67.3)	86 (79.8-90.5)	50.6 (42.2-59)	68.5 (62.6-73.9)	90.2 (84.6-93.9)
Proportion mentioned not sharing needles as a mode of prevention	48.9 (44.6-53.2)	79.9 (74.5-84.4)	49.1 (40.5-57.7)	75.6 (70.4-80.1)	82.9 (76.2-88.1)
Proportion knew where HIV can be tested confidentially	16.9 (12.4-22.6)	16.2 (11.7-21.8)	1.8 (0.8-4.2)	28.9 (24-34.3)	15.6 (11.2-21.3)

### *Knowledge on sources of condoms*

Almost one out of two male sex workers in the Southeast-A sample could show male condoms to the interviewers, but in Central-A only around one out of three male sex workers, MSM, and hijras could, and only a small proportion of MSM sampled in Northeast-A (5%) had condoms in their possession (Table 89). Low levels of condom breakage among the male sex workers and MSM in Central-A as compared to the other groups does not necessarily reflect the fact that they know how to use condoms properly, but instead could be because almost 48% and 37%, respectively, reported not using condoms in the past month.

It is evident from Table 89 that easy access to condoms could be one of the constraints among respondents with respect to condom use - about 30 to 40 percent of most of the groups surveyed that have male-to-male sex, and in Northeast-A as high as 85% of the MSM sampled, reported they could not get condoms easily (in contrast 96% of brothel women reported easy access to condoms, see Table 60). Among all these groups the main reasons cited for not having condoms were similar, and included responses such as: "don't want to carry" or "too shy to buy" or "shop/pharmacy is too far away" or "shops/pharmacies are closed".

**Table 89: Males who have sex with males and hijras: knowledge on sources of condoms**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
Proportion showed a male condom to the interviewers	29.5 (24.3-35.3)	46.9 (37.1-57.1)	39 (31.5-47.1)	34 (29.3-39.1)	5.2 (3-8.8)
Proportion reported easy access to condoms*	57.9 (48.6-66.6) n=190	69.5 (60.5-77.2) n=328	73.3 (63.2-81.4) n=296	66.1 (58.6-72.8) n=277	14.9 (10-21.5) n=168
Number that do not have easy access to condoms	71	61	79	84	143
Proportion who had a condom break last month	7.9 (5.4-11.5)	21.6 (15.7-29)	22.2 (17.5-27.8)	6.8 (4.4-10.3)	16.8 (13.4-20.8)

\* The smaller sample size used for Central-A males sex workers and hijras, and MSM compared to the total sample size is because the remaining respondents said they never used condoms or had not used condoms in the previous month.

### **Male sex workers and hijras: Knowledge on Lubricants and their use**

Between 86 to 93 percent of the male sex workers and 56 percent of the hijras reported ever using any kind of lubricant for sex. During the last anal sex with male partners, 52% of the male sex workers in Central-A used saliva as a lubricant, 25% used water-based lubricants, 4% used oil, 4% used antiseptic cream, and 15% mentioned other lubricants. In the Southeast-A sample of male sex workers, 64% used saliva for lubrication, 12% used oil, 11% used antiseptic cream, 8% used water-based lubricants, and 5% mentioned others. The other lubricants listed by the male sex workers included Savlon cream, Vaseline, lotion, honey, shampoo, soap, cold cream, etc. Among the hijras in Central-A, 47% used saliva, 33% used water-based lubricants, 18% used oil, 2% used antiseptic cream, and 1% reported using other substances like gel, Vaseline, etc. for lubrication.

Less than half of the male sex workers or hijras had heard of lubricants specifically for use with condoms, and between 18 to 41 percent were able to name such lubricants (Table 90). Regarding consistent use of special lubricants in the past month, hijras were more likely to always use them than the male sex workers sampled. The key reasons cited for not using special lubricants consistently in the past month were the following: they used other creams, felt too shy to buy them, or felt they don't need to use them. Some others mentioned they cost too much, and a small proportion mentioned they don't know where to get them. Respondents also reported a problem in carrying lubricant, it not being available at the right time, using other creams or saliva, and that they would use such lubricants if they were given free of cost.

**Table 90: Male sex workers and hijras: knowledge of special lubricants for use with condoms**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)
Proportion had heard of lubricants specially for use with condoms	49.4 (42.7-56.2)	30.8 (23-39.9)	39 (30.4-48.4)
Proportion had heard and could name lubricants specially for use with condoms	41 (34.4-47.9)	18.3 (12.1-26.7)	34.9 (26.9-43.8)
Proportion reported using lubricants specially for use with condoms last month among those who had heard of them	Always: 16.6 (11.6-23.1) Sometimes: 45.3 (38.5-52.3) Never: 38.1 (31.1-45.7) n=181	Always: 3 (0.8-9.9) Sometimes: 62.4 (46.4-76) Never: 34.6 (21.6-50.5) n=101	Always: 53.6 (42.5-64.4) Sometimes: 41.7 (30.8-53.5) Never: 4.6 (2-10.5) n=151

### ***Males who have sex with males and hijras: knowledge on means to avoid HIV and other sexually transmitted infections***

More than half of the male sex workers in Central-A do not take any measures to avoid sexually transmitted diseases, but more of the other groups sampled in this category did do something to avoid STI (only 15 to 28 percent do nothing, Table 91). Similarly, although most of the males who have sex with males had heard of HIV/AIDS, still a considerable proportion do nothing to avoid it - more than half of the male sex workers in Central-A, and around 12% of those in Southeast-A, and about 30 to 40 percent of the MSM do nothing about it. Comparably more of the hijras sampled in Central-A had not heard of HIV/AIDS - roughly one-third - but only 12% do nothing to avoid it.

As observed with other groups sampled by behavioural surveillance, among those that have male-to-male sex and hijras one of the main methods used to supposedly avoid STI and HIV infection is to wash with Dettol or urine after sex. Thirty to 50 percent of the MSM, hijras, and male sex workers in Southeast-A do so, but only 6 to 12 percent of the male sex workers in Central-A reported this habit. As seen previously in the tables regarding sexual behaviour (Table 75 and table 77), very few of the men sampled reported consistent condom use as a means of avoiding STI or HIV. The range was from 9 to 19 percent of those sampled in Central-A, and within just 3 percent at the other two sites (Table 91).

More than half the hijras reported always using condoms as their means to avoid sexually transmitted diseases, including HIV. This is at variance with their directly reported condom use with commercial and non-commercial partners (see Table 75), and hence might be more of a reflection of their intention to use condoms consistently, which is then repressed by other factors such as poor condom negotiation power with clients.

The other methods to avoid STI/HIV mentioned by male sex workers, MSM, and hijras were similar to those responses given by other groups, namely, the use of condoms sometimes, having sex only with clean clients, keeping clean or bathing after sex, using antiseptic cream, etc.

**Table 91: Males who have sex with males and hijras: Measures taken to avoid STI and HIV**

Indicators (95% CI)	MSW Central-A (N=366)	MSW Southeast-A (N=328)	Hijra Central-A (N=387)	MSM Central-A (N=426)	MSM Northeast-A (N=346)
<b>Steps taken to avoid STI: *</b>					
Do nothing	56.6 (50.2-62.7)	17.7 (13.6-22.7)	15 (10-21.8)	21.4 (17.7-25.5)	27.5 (22.3-33.2)
Always use condom	8.5 (6-11.9)	0.9 (0.3-2.8)	51 (41.8-60)	17.8 (14.7-21.5)	2.6 (1.1-5.9)
Wash with Dettol or urine	12 (8.8-16.3)	36.6 (29.2-44.7)	50.1 (42.3-58)	37.1 (32.1-42.4)	46.8 (41.2-52.5)
Take medicine	2.5 (1.1-5.3)	3.7 (1.9-6.8)	2.1 (1-4.4)	11 (8.1-14.8)	27.8 (20.2-36.8)
Others	28.1 (23.3-33.6)	56.1 (45.9-65.8)	14.7 (9.5-22.1)	30.7 (26.2-35.7)	17.9 (13.5-23.3)
Proportion who had not heard of AIDS	7.6 (5.2-11.2)	1.2 (0.4-4)	34.9 (26.5-44.3)	5.4 (3.3-8.7)	1.4 (0.6-3.3)
<b>Number who had heard of AIDS</b>	<b>n=338</b>	<b>n=324</b>	<b>n=252</b>	<b>n=403</b>	<b>n=341</b>
<b>Steps taken to avoid HIV: *</b>					
Do nothing	59.2 (51.9-66.1)	12.6 (9-17.4)	11.9 (6.6-20.5)	29.3 (24.4-34.7)	42.5 (35.7-49.6)
Always use condom	14.8 (11-19.6)	1.8 (0.8-4)	55.2 (44.6-65.2)	18.6 (15.3-22.5)	2.9 (1.4-5.8)
Wash with Dettol or urine	6.2 (4.3-8.9)	37.6 (30.1-45.9)	42.9 (32.6-53.8)	31.3 (26.3-36.7)	40.2 (33.7-47)
Take medicine	1.8 (0.6-4.7)	1.2 (0.4-4.1)	3.2 (1.7-5.9)	5 (3-8.1)	12.3 (8.2-18.1)
Others	25.7 (20-32.4)	68.8 (61.2-75.6)	21 (13.8-30.7)	31 (26.1-36.4)	18.2 (14.1-23)
Text of others	Sometimes use condoms, sex with clean clients, use lubricants, bathe after sex, etc.	Sometimes use condoms, sex with clean clients, wash with hot water, remain clean, use Savlon cream, etc.	Sometimes use condoms, remain clean, thigh sex, take advice from NGO intervention (Shustho Jiban)	Sometimes use condoms, sex with clean/reliable partners, use antiseptic cream, wash with hot water, use lubricants, few partners, etc.	Use savlon cream, sometimes use condoms, sex with clean partners, keep penis clean.

\*Multiple answers were allowed

## Self perception of HIV/AIDS risk and its rationale

### *Male sex workers and hijras: self-perception of HIV/AIDS risk and the rationale*

Even though 65 to 70 percent of the male sex workers were involved in HIV prevention interventions in the year previous to surveillance, three-quarters of those in Central-A and about one-third of those in Southeast-A still could not assess their HIV risk (Table 92). In fact, only around 3% of the male sex workers in Central-A, as compared to about 40% of those in Southeast-A, thought they were at high to medium risk of HIV infection, and a quarter to a third of these groups thought they were only at slight risk.

In contrast, less of the hijras sampled in Central-A had participated in HIV prevention interventions, but half placed themselves in a high to medium risk category for HIV infection. Like the male sex workers, about a third felt their risk was small.

The rationale for categorizing themselves at the various risk levels is given in Table 92. As seen with the female sex workers, the majority of male sex workers understood the risk involved in their profession, especially of anal sex, and the effectiveness of condoms in preventing HIV infection, but few acted accordingly. A greater proportion of the hijras seemed to understand the risks inherent to their sexual lifestyle. An interesting result is that in Central-A 51% and 56% of the male sex workers and hijras, respectively, gave consistent condom use as their reason for putting themselves in the small or no risk category, but this is clearly not borne out by the low proportion that reported consistent condom use when they were queried directly on condom use (see results in Table 75). As with other groups, these respondents had the misconception that various hygienic measures or cleanliness of partners could be a protection against HIV.

**Table 92: Male sex workers and hijras: Self-perception of risk of HIV infection and rationale**

Sampled groups	Self-perception of risk of HIV infection				Proportion under HIV intervention coverage in past year
	High	Medium	low or no risk	Don't know	
MSW, Central-A (N=366)	0	2.7 (1.5-4.9)	22.1 (17.9-27)	75.1 (70.5-79.3)	64.7
MSW, Southeast-A (N=328)	11.3 (8.2-15.3)	29 (21.9-37.2)	30.8 (25.1-37.1)	29 (21.2-38.2)	69.8
Hijra, Central-A (N=387)	30.2 (22.8-38.9)	20.4 (13.9-28.9)	29.5 (20.5-40.3)	19.9 (14-27.4)	35.1
<b>Rationale for self-perception of risk (multiple answers exist)</b>					
MSW, Central-A	<p>The key reasons respondents perceived themselves to be under the <b>high or medium</b> risk category included: high-risk job (60%), frequent anal sex (20%), not using condoms (40%), and others (30%), in which case, only sometimes use condom was cited.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no</b> category included: always using condoms (51%), have sex with clean partners (61%), avoid sex with foreigners (10%), and others (37%), including, not having sex with female sex workers, sometimes use condoms, very few HIV people in Bangladesh, and remain clean.</p>				
MSW, Southeast-A	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: high-risk job (45%), frequent anal sex (58%), not using condoms (21%), and others (59%), in which case the majority mentioned they use condoms irregularly.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> category included: always using condoms (5%), have sex with clean partners (52%), avoid sex with foreigners (10%), and others (77%), including, sometimes use condoms, sex with faithful partner, do thigh sex, wash with Dettol/Savlon/urine, bathe with soap, etc.</p>				
Hijra, Central-A	<p>The key reasons respondents perceived themselves to be under <b>high or medium</b> risk category included: high-risk job (73%), frequent anal sex (87%), not using condoms (67%), sharing injections (35%), and others (7%), including, only sometimes use condom.</p> <p>The key reasons respondents perceived themselves to be under <b>low or no</b> category included: always using condoms (56%), have sex with clean partners (61%), avoid sex with foreigners (47%), and others (19%), including, sometimes use condoms, use herbal medicine, and because of profession.</p>				



**Males who have sex with males: self-perception of HIV/AIDS risk and the rationale**

A high percentage of MSM in Northeast-A in particular, and the majority in Central-A were exposed to HIV prevention interventions, but still almost half of them could not assess their HIV risk status (Table 93). Around 13 to 14 percent of the respondents thought they were at a high to medium risk of getting HIV. Although the proportion that used condoms consistently was in the same range as the male sex workers, more of the MSM (38 to 42 percent) felt they were at small or no risk from HIV. The risk factors cited were similar to the male sex workers and hijras. A small proportion of both MSM samples mentioned sharing injections as a reason for placing themselves in the high-risk category, as did a third of the hijras sampled. The results from the MSM in Central-A also shows up the disparity in consistent condom use between what was stated in their rationale for HIV risk perception versus direct queries on their sexual behaviour. More than other groups sampled, a significant proportion of the MSM (about 20%) and hijra (47%) respondents mentioned not having sex with foreigners decreased their risk of HIV infection.

**Table 93: Males who have sex with males: Self-perception of risk of HIV infection and rationale**

Sampled groups	Self-perception of risk of HIV infection				Proportion under HIV intervention coverage in past year
	High	Medium	Low or no risk	Don't know	
MSM, Central-A (N=426)	3.5 (2-6.1)	10.6 (7.6-14.5)	42.2 (37.6-47)	43.7 (38.5-49)	62.4
MSM, Northeast-A (N=346)	2.9 (1.5-5.6)	10.1 (7-14.3)	37.6 (31.1-44.5)	49.4 (41.9-56.9)	90.7
<b>Rationale for self-perception of risk (multiple answers exist)</b>					
MSM, Central-A (N=426)	<p>The key reasons respondents perceived themselves to be under the <b>high or medium</b> risk category included: high-risk job (15%), frequent anal sex (63%) don't use condoms (27%), share injections (2%), and others (48%), mostly: only sometimes use condom, and multiple partners.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no</b> risk category included: always use condom (42%), sex with clean partner (18%), avoid sex with foreigners (18%), and others (38%), including, not having sex with multiple partners, sometimes use condom, lubricant use, and wash with hot water/Dettol, etc.</p>				
MSM, Northeast-A (N=346)	<p>The key reasons respondents perceived themselves to be under the <b>high or medium</b> risk category included: high-risk job (36%), frequent anal sex (56%), don't use condom (27%), share injections (2%), and others (2%), in which case, only sometimes use condom was cited.</p> <p>The key reasons respondents perceived themselves to be under the <b>low or no</b> risk category, included: always use condom (5%), sex with clean partner (73%), avoid sex with foreigners (21%), and others (30%), including, sometimes use condom, did HIV test, remain clean, sex with clean partners, use Dettol, antiseptic cream, etc.</p>				

## 4. CONCLUSIONS

### 4.1 CONCLUSIONS FROM SEROLOGICAL SURVEILLANCE

The serological results from this fourth round of surveillance show that the HIV situation in Bangladesh is changing. The first three rounds of sentinel surveillance in Bangladesh found that the prevalence of HIV among the vulnerable groups surveyed was low (Annex Table A1, p.117-118) [1-5]. Now, while the overall HIV prevalence continues to remain less than 1%, HIV infection has jumped to 4% among IDU in Central Bangladesh [6]. This is the highest prevalence that has ever been recorded in the country.

HIV infection remains less than 1% among the other vulnerable groups surveyed, although it is detected among female sex workers (0.2-0.7%), males who have sex with males (0.2%), and hijras (0.8%). No infection was present amongst IDU in the Northwest, nor among male sex workers or the male clients of female sex workers (truckers, launch workers and STI patients) and 'babus', their boyfriends/regular partners.

Primarily non-injecting heroin smokers were included for the first time in serological surveillance in the fourth round, as there is evidence that they occasionally inject drugs, and that they are also vulnerable because of risky sexual behaviour [7]. However, no HIV was detected among any of the heroin smokers sampled.

Serological surveillance monitors syphilis and Hepatitis C as surrogate markers for risk of HIV transmission through the sexual and blood routes, respectively, and they also serve to corroborate the behavioural data. In this round of surveillance, the presence of active syphilis versus earlier exposure is reported for the vulnerable groups surveyed. The active syphilis levels recorded by the fourth serological surveillance are in the same range as those reported by other studies on sex workers and truck drivers in Bangladesh [8-10].

Overall, no significant changes are seen in - Hepatitis C rates among drug injectors over the years [1-5]. However, active syphilis rates have declined over the rounds in IDU in two out of three sentinel sites.

Among all the groups surveyed in this round of surveillance, active syphilis rates are the highest among hijras. Syphilis rates remain high among female sex workers, but fortunately, they are declining among some groups. Three of the five brothel sentinel sites (Central-B, Central-D, and Southwest-B) and one of the street sex worker sites (Central-A) showed a significant decrease in active syphilis rates. Many of the hotel-based sex workers are new to the trade, and this may be a reason for the lower levels of syphilis recorded among these sex workers. As might be expected, babus have amongst the highest syphilis rates obtained among the males surveyed. Interestingly, active syphilis rates in babus and in female sex workers from the corresponding brothels were similar although this was not the case for non-active syphilis rates.

Overall, it appears that better STI management is indicated which will also help reduce the transmission of HIV among the vulnerable groups. The high prevalence of syphilis among sex workers is a concern, and other studies have shown high levels of other STIs [8, 9, 11]. In addition a recent study on hotel sex workers found that almost half the women had asymptomatic STIs[9]. Programmes with males who have sex with males have found that there is a need for improving medical care and facilities for detecting and treating anal STIs.

### 4.2 CONCLUSIONS FROM THE BEHAVIOURAL SURVEILLANCE

Programme interventions have been underway in Bangladesh for several years now, and most vulnerable populations are generally aware of HIV/AIDS. But still, a high proportion of them seems

ignorant of the extent of their risk, and continues to practice behaviours that expose them to HIV infection. A summary of the major conclusions from the fourth round of behavioural surveillance is given below.

### ***Sharing of needles and injecting equipment is still frequent among injection drug users***

Injection drug use is the most efficient mechanism for spreading HIV wherever many people share needles, syringes, and other injecting paraphernalia. As seen previously [1-3, 7], the fourth behavioural surveillance shows once again that needle sharing remains too high in Bangladesh (29% to 74% IDU shared actively or passively last time). Although this indicator cannot be strictly compared statistically over the four rounds of surveillance, the proportion of IDU sharing passively (in the previous week) does not appear to have changed in the Central-A site, but there is a decline in sharing in the Northwest-A site over the rounds. The injection sharing is however significantly less among IDU within intervention programmes compared to those outside the interventions [12]. At present there is not much information about the size of sharing networks among injectors in the country.

### ***Drug use is extensive and expanding further***

Injection drug use has steadily increased in Bangladesh, since the introduction of Buprenorphine in the 1990's, and drug treatment centres have reported increases in the rate of injecting among their clients [13]. The National Assessment of the Situation and Response to Opioid/Opiate Use in Bangladesh (NASROB) found drug injectors in nineteen out of the twenty-four districts surveyed [7, 13]. Behavioural surveillance also found that injection drug use is expanding, with a constant influx of new injectors. Each year for the past five years, roughly 10 to 20 percent of drug users started injecting [15]. In the southeast of the country where injection drug use is a newer phenomenon, the high influx is particularly worrisome, with the majority of all drug injectors having started just in the last two years. Part of the influx to injection drugs results from people switching from other forms of drug use. In the NASROB study 87% of injection drug users used to smoke heroin. Behavioural surveillance indicates that there is time to prevent the change through intervention since drug users took other drugs for an average of four to ten years (less in the Southeast) before making the switch. Anecdotal evidence also points to the likelihood that heroin smokers inject occasionally when they are unable to obtain their drug of choice.

Evidence indicates that IDU do not stay confined within particular cities, but are a highly mobile population - about two-thirds of the IDU in the Southeast reported injecting in another city or country in the previous year. The behavioural surveillance did not ask specifically about whether IDU shared injecting equipment when injecting in another city, but anecdotal evidence suggests that it does happen.

### ***A mismatch exists between knowledge and safe behaviour***

The drug injectors that were sampled displayed a massive gap between knowledge and safe injecting behaviour. Only about 10% of the IDU surveyed at all the sites believed they were at high or medium risk of HIV infection, but the majority at the Central and Southeast sites still shared needles. Although the situation appeared relatively better in the Northwest region - a quarter to a half of the IDU still shared needles there. This needle sharing goes on even though the majority say they know it is unsafe, and that they know where to get clean needles and syringes.

Similarly, most of the sex workers and hijras surveyed do not use condoms consistently even though the majority report that they do know condom use is a mode of HIV prevention.

### ***The level of commercial sex with female partners is high***

The majority of the male client groups surveyed are married, but the majority also reported sex with female commercial partners in the past year. There was no significant change in this behaviour since

It was measured in the third round surveillance [1]. Nevertheless, at least for one group, rickshaw pullers in the Southeast, the trend over four years of national surveillance shows that compared to round 2 there was a significant reduction in round 4 in the proportion who reported commercial sex in the previous month. Corresponding to this, street-based sex workers in the Southeast-A region also reported significantly fewer clients in the fourth surveillance compared to the second round.

Hotel-based sex workers reported the highest average number of clients per week during the fourth surveillance (44 clients), and many of these were new clients. Since the second round of surveillance there has been a significant fluctuation in mean client numbers among female sex workers in brothels or on the streets at the Central-A site. Client numbers actually increased for street sex workers in the Central-A area between the third and fourth round surveillances.

The most common client professions reported by female sex workers were businessmen, rickshaw pullers, and students. The most common client profile of the hotel-based sex workers in the Central region was somewhat different (businessmen, civil servants, and students ranked as the first three), suggesting that they entertain a higher socio-economic class of clients, which is consistent with the higher income they reported compared to other sex workers.

It is a common belief that Bangladesh is a conservative society and that youth are not sexually active, but this is not borne out by the behavioural surveillance data. Most of the male client groups surveyed reported that the age of their first sexual experience was from 16 to 19 years. Further, more than a quarter of single male students in dormitories reported they bought sex from female and/or male sex workers, and the majority of female sex workers in turn reported students as the third most common client. Among the female sex workers who could recall it, the average age of their sexual debut was as adolescents of just 14 to 15 years.

### ***Commercial and non-commercial sex between males is also common***

A considerable percentage of rickshaw pullers, truckers, and male IDU were found to buy sex from male sex workers or hijras. Men who have sex with men have many partners, and they are often bisexual. MSM reported an average of 5 to 7 partners in the previous month, including commercial and non-commercial liaisons with other men, women and hijras. Male sex workers and hijras reported from 6 to 13 male clients in the previous week (hijras had more clients), and this represents a significant increase since the second surveillance. The majority had non-commercial partners as well. Male sex workers also bought and/or sold sex to women. The clients reported by male sex workers and hijras encompassed various and diverse professions, with businessmen, drivers, and men in uniform ranking in the top three.

### ***Alarming low condom use during commercial sex***

Condom use is still distressingly low among the people who are the most vulnerable to HIV. Less than a quarter of the truck drivers reported using a condom the last time they purchased sex. While three quarters of the rickshaw pullers reported purchasing sex, only two percent said they used condoms every time. The successive rounds of surveillance are not statistically comparable for this indicator since the way the questions were asked was changed, but there does seem to be some increase in condom use by rickshaw pullers and truckers. Nevertheless, two-thirds of rickshaw pullers and nearly as many truck drivers reported that they had never in their entire life used a condom. Students and IDU reported higher levels of condom use than the other male groups surveyed, and they are also the most educated.

On the other side of the equation, consistent condom use by female sex workers for vaginal sex with new or regular clients is also extremely low. There does seem to be an increase in the proportion of female sex workers reporting condom use since the last round of surveillance (although a strict statistical comparison is not possible due to changes in the questionnaire), and this needs to be promoted further.

Anal sex is a known high-risk activity for HIV infection, yet condom use by female sex workers during anal sex with clients is much lower than during vaginal sex. Nearly one in five brothel-based sex workers reported anal sex, but only one out of ten of these sex acts were protected by condoms. The male client groups also reported approximately half the level of condom use when buying sex from males or hijras as compared to when they bought sex from female sex workers. Male sex workers reported higher condom use during anal sex with their clients (at least twice the level) than did the female sex workers.

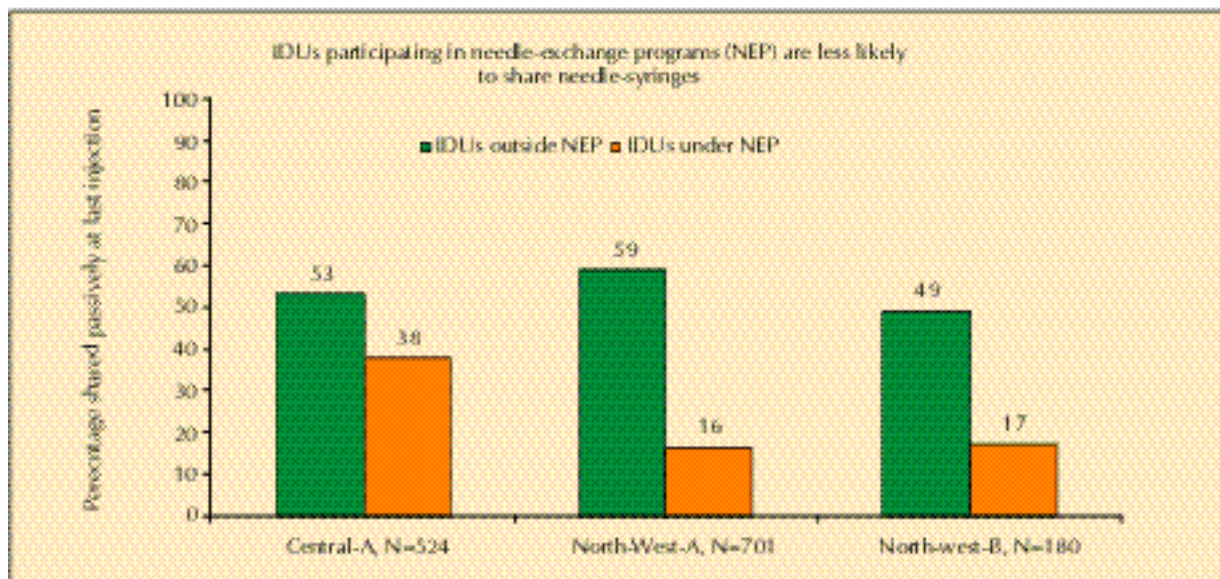
### 4.3 IMPLICATIONS OF THE FOURTH SURVEILLANCE

#### 4.3.1 The effect of HIV prevention interventions

Wherever the effects can be measured by the surveillance system, clearly HIV prevention interventions with vulnerable groups do make a difference. This makes a strong case for immediately expanding the scope and extent of effective intervention coverage in the country to have an impact on HIV infection.

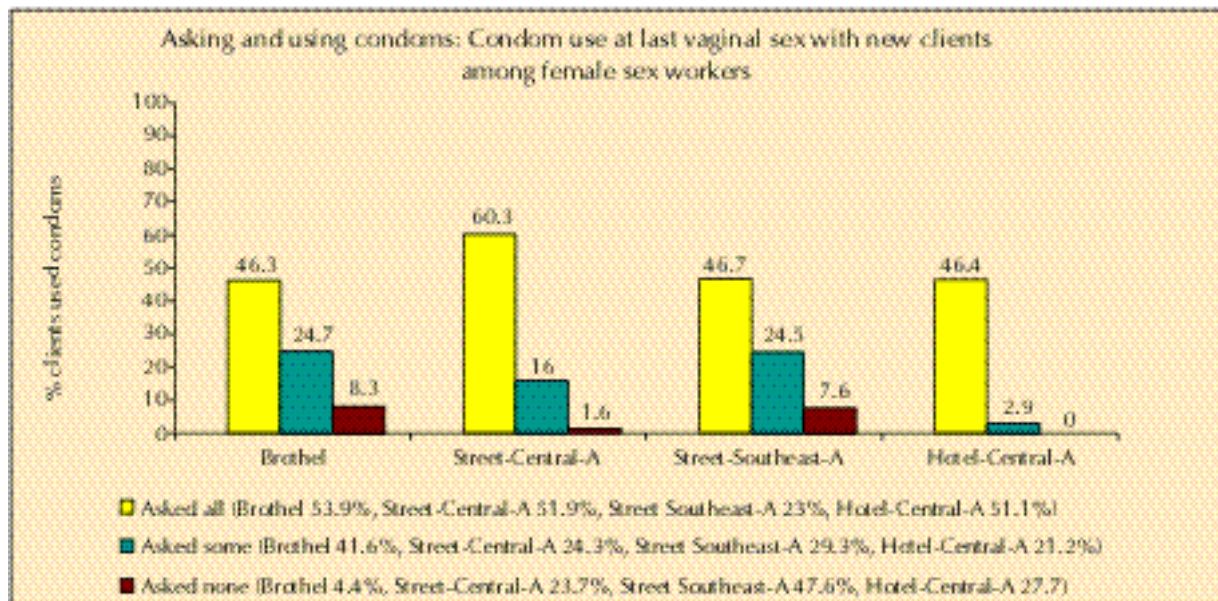
Needle sharing among IDU in needle-exchange programmes was significantly less than those not exposed to interventions (Figure 16), and their condom use was higher. Fewer IDU within interventions reported an STI symptom during the previous year, and those who did were more likely to seek formal treatment.

**Figure 16: The effect of interventions on needle sharing among drug injectors**



These positive changes in risk-behaviour mediated by exposure to interventions are apparent from the surveillance data on the other vulnerable groups as well. Consistent condom use is still low, but whenever intervention programmes have encouraged female sex workers to ask male clients to use condoms, the proportion that did was much higher (Figure 17). Even if sex workers asked only some new clients to use condoms it was effective, indicating that efforts to target clients for HIV prevention need to be increased.

As serological surveillance samples through intervention programmes, prevalence trends of surrogate markers like syphilis and Hepatitis C also to some extent reflect the quality of the programmes. Female sex workers in brothels show an interesting picture. The three brothel sites that showed a decline in syphilis rates all have effective interventions in place, so much so that one

**Figure 17: The effectiveness of female sex workers asking clients to use condoms**

brothel is cited as an UNAIDS Best Practice [14]. In the brothel where the syphilis rate has risen, intervention is weak and concentrates more on rehabilitation of sex workers. Declining syphilis rates in sex workers from many of the brothels and streets of Central Bangladesh is encouraging and may reflect the efforts of good quality interventions by the NGOs, which at present are coupled with movements to strengthen sex workers organisations to enable the sex workers to insist on condom use. On the other hand, another factor for the decline could be migration in and out of brothels with new entrants each year of which there is anecdotal evidence.

The data from the fourth surveillance is also useful in pointing out various areas where HIV prevention interventions need strengthening. It is telling that sizeable proportions of the respondents in the behavioural surveillance themselves reported that while they received useful information through exposure to interventions, it did not lead to behaviour change. In addition, the gaps in HIV-related knowledge and misconceptions regarding reducing risk (by washing with urine and antiseptic, etc.) need to be addressed strongly by programmes.

Less of the female sex workers and male client groups use condoms for anal sex, indicating the HIV risk of this activity needs to be stressed more by programmes. Overall, low proportions of the male clients surveyed report participating in prevention programmes. Accordingly, there seems to be no significant increase in consistent condom use. Few IDU at the Central-A and Northwest-A sites reported inclusion in condom distribution programs, yet the behavioural surveillance found that a significant proportion were sexually active.

Hijras had the second highest rate of HIV infection and the highest rate of active syphilis among the groups surveyed. They had many sexual partners, but they reported very low consistent condom use. These data indicate that the hijra community needs more emphasis in HIV prevention coverage. But presently, interventions with hijras are limited to areas in and around Dhaka city, although there are hijra populations in other parts of the country as well.

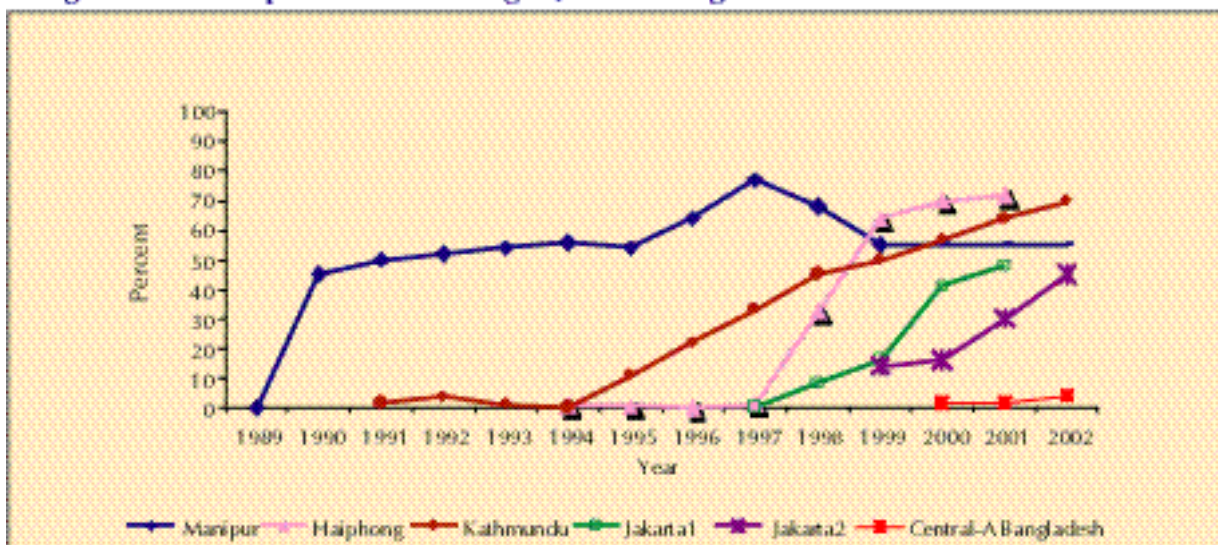
HIV prevention interventions also need to address the fact that sex workers and hijras report being at risk from rape and violence, and that the perpetrators are often men-in-uniform.

### 4.3.2 The likely future scenario for HIV/AIDS in Bangladesh

#### *A concentrated epidemic among IDU is imminent*

Bangladesh has maintained a low prevalence of HIV for years, but the data from the fourth serological surveillance shows that Bangladesh may now be at the threshold of a concentrated epidemic among IDU in Central Bangladesh [6]. Epidemics change, and many other Asian countries that were low prevalence for HIV are now reporting epidemics in IDU [13]. Typically, the pattern of HIV seen repeatedly in other Asian countries among injection drug using populations is "low and slow", until there is a sudden rapid burst of infection, especially where there is substantial needle sharing (Figure 18) [15]. Since the new evidence shows that HIV has been introduced among injectors in the Central region, and they have high levels of needle sharing, it is inevitable that if enough of them share enough needles, HIV will soon spread among injectors, and eventually go to other groups.

**Figure 18 : HIV prevalence among injection drug users in Asia**



Source : Dr. Tobi Saidel, FHI

The size of sharing networks is critical to the extent of HIV transmission among drug injectors. If sharing is confined to small groups, then rapid/epidemic transmission will not occur. In the second round of surveillance it was shown that four out of the seven HIV-positive IDU had the same virus strain [16], confirming that they constituted a sharing group. The high rates of Hepatitis C in IDU found by serology are also partly a reflection of sharing. In the fourth round of behavioural surveillance, drug injectors reported sharing needles with only a small group of fellow users. This is similar to what has been reported in Kathmandu and Jakarta (Table 94). But HIV has risen rapidly in recent years in both cities, as shown in Figure 18 [13]. More recent ethnographic research has shown that although IDU in Kathmandu were initially thought to share injecting equipment in relatively small and isolated networks, most of them actually switch injecting groups, frequently injecting in their own group in the morning but then moving on to another group in the evening [17]. Until the limited data that is available in Bangladesh is expanded through the research currently taking place [18], it is not safe to assume that sharing networks are not as diffuse as in Kathmandu.

**Table 94: The size of sharing networks in Bangladesh is comparable to those in Kathmandu and Jakarta - places where HIV has increased rapidly**

City/Country	Receptive sharing in the past week(%)	Mean size of the sharing group at last injection	Level of Diffusion among sharing	Coverage by harm reduction program	How HIV prevalence was measured	HIV prevalence by 2002(%)
Kathmandu, Nepal	46	2.3	High	~10%	NGO-based until 1995	68
Jakarta, Indonesia	86	2.8	Unknown	Minimal	Major drug treatment hospital	48
Central-A, Bangladesh	66	2.5	Unknown	46%	NGO-based until the present	4

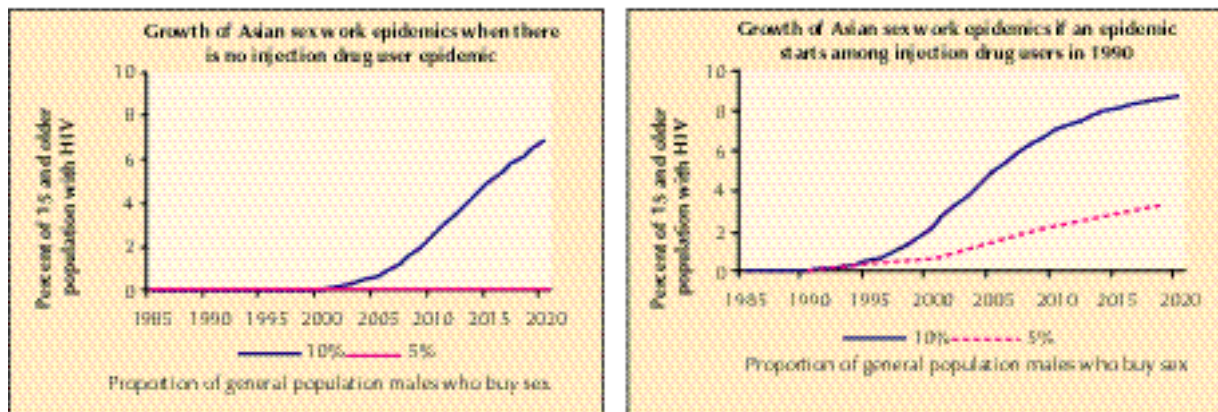
The rate of injection sharing is much less among IDU within intervention programmes [1, 7, 12, 15], which may help in slowing the epidemic, but it is unlikely to be enough to stop it. This is especially true since in Central Bangladesh the behavioural surveillance shows that more than 50% of IDU do not have access to interventions [15]. Since serological surveillance is conducted among IDU attending needle exchange programmes, it is possible that an epidemic is already taking place among IDU outside the range of such services.

In Nepal, the Lifesaving and Life-giving Society (LALS) program documented success in risk reduction among injection drug users, and low and stable HIV infection of less than 2% [19]. Since the situation seemed to be under control HIV was not monitored closely between 1994 and 1998, but then during a police crackdown in late 1997, 114 drug injectors were arrested and 94 of them tested HIV positive. Surveillance data since that time has documented HIV levels of up to 68% [20-22]. While the LALS program thought they were covering 30 to 50 percent of those injecting drugs in Kathmandu with HIV/AIDS services, more recent estimates indicate that harm reduction and outreach services were reaching fewer than 10%, with less than 3% being provided with drug rehabilitation [13].

### ***Epidemics among IDU impact broader heterosexual epidemics***

In most Asian countries, the driving force for HIV epidemics is heterosexual transmission of HIV. However, modelling studies have shown that an uncontrolled HIV epidemic in IDU has a significant impact on sexual transmission [23, 24]. Figure 19 illustrates the growth of general population epidemics in settings with or without an HIV epidemic among injection drug users, when between 5 and 10 percent of the men in the general population buy sex. As shown, introducing an epidemic among drug injectors can accelerate the general population male epidemic and pushes it to higher levels, leading to a far greater number of sexually transmitted infections.

**Figure 19: The presence of an HIV epidemic among injection drug users makes a huge difference over time in the total number of people infected.**



Source: Dr. Tim Brown, East-West Center

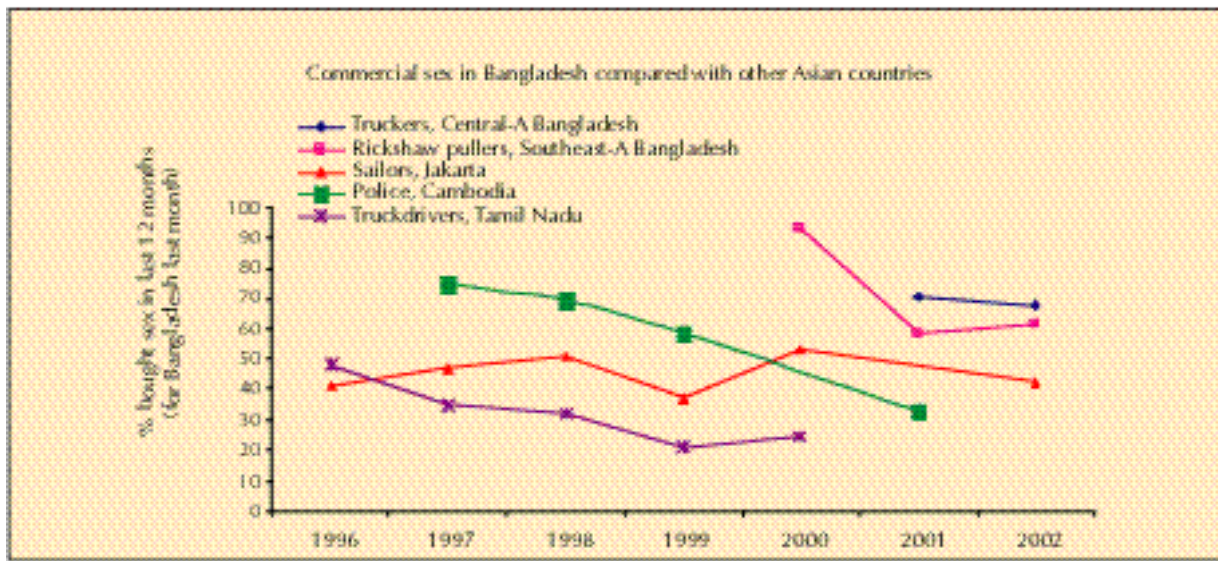


Preventing an epidemic of HIV in Bangladesh among people injecting drugs can buy several years of critical time for implementing risk reduction strategies among sex workers and their clients, thus providing an opportunity to prevent a larger epidemic from happening. The biggest impact will be if the spread among drug injectors is stopped before a heterosexual epidemic starts.

**The risk of an epidemic among sex workers and their clients**

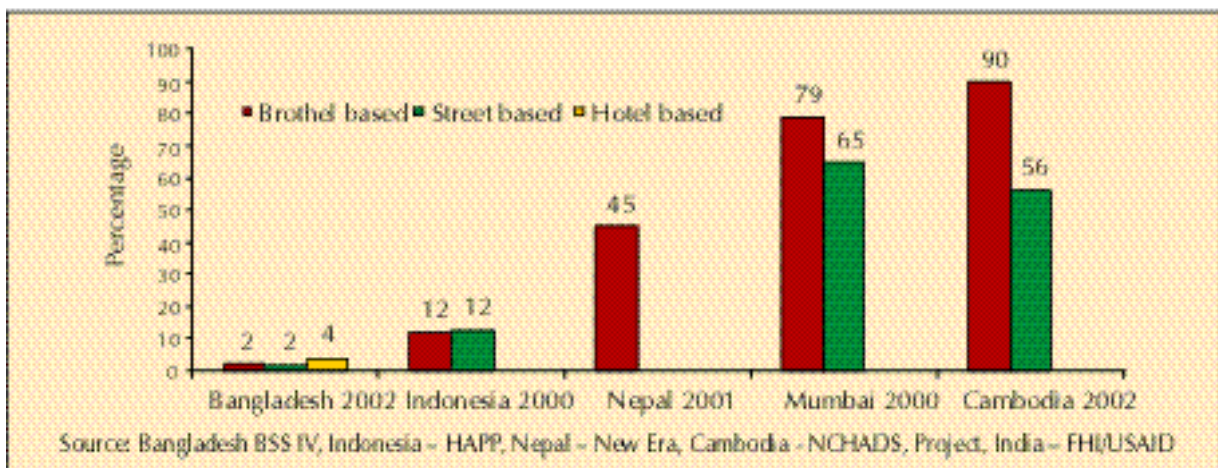
The experience of neighbouring countries is that high levels of commercial sex pave the way for rapid rises of HIV among sex workers and their clients. A similar situation may be imminent in Bangladesh. According to the behavioural surveillance a higher proportion of the rickshaw pullers and truck drivers surveyed at selected sites in Bangladesh buy sex (Figure 20) than do police in Cambodia or truck drivers in Tamil Nadu - places where HIV is already firmly established in the general population [25]. At the same time, the daily client turnover of female sex workers also remains amongst the highest in Asia.

**Figure 20 : Levels of commercial sex in Bangladesh are higher than in the rest of Asia**



Fortunately, sex workers in Bangladesh still have low levels of HIV, but sex workers are very much at risk of an epidemic because they have large numbers of partners and condoms are used very infrequently [1-3]. There is no other place in Asia where the documented level of consistent condom use by female sex workers is as low as in Bangladesh, as shown in Figure 21 [15]. In line with this serological surveillance found that of all the vulnerable groups, syphilis rates are highest among sex workers.

**Figure 21 : Consistent condom use among sex workers across Asia**



Other countries in the region that have had low HIV prevalence for many years, are now starting to see an increase among female sex workers - in spite of higher levels of condom use [15]. In Indonesia consistent condom use among sex workers in red-light areas fluctuated between 12 and 25 percent between 1996 and 2002, and remained around 12% among street based sex workers. There was no detectable HIV infection in Jakarta until 1999, but by 2002 HIV increased to 1.4% [26]. In Kathmandu, the prevalence of HIV went from under 1% to 15.6% between 1992 and 2001, with the level of consistent condom use reaching only 39.5% [20].

The factors that interfere with condom use by sex workers are complex. One factor is non-compliance by the clients. The behavioural surveillance data shows extremely low condom use by clients [1-3]. Men working in the transport industry are often clients of sex workers and this has shown to be the case for truckers, rickshaw pullers, dockworkers, and launch workers in Bangladesh [1-3, 10, 27, 28]. The high rates of syphilis and the risk behaviour documented among them by surveillance [1-3] emphasizes the need for intensifying awareness and knowledge that HIV is a threat. In fact, fewer than one in ten rickshaw pullers and one in a hundred truck drivers even think that they are at high risk of becoming infected with HIV.

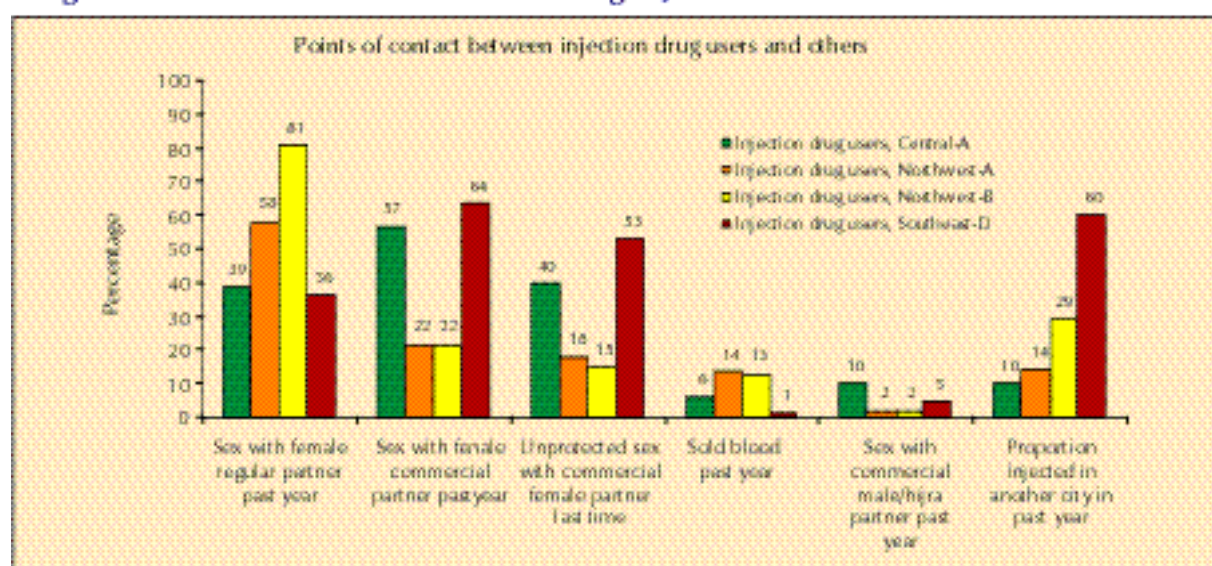
Babus, the regular partners of sex workers, who live in and around the brothels, rarely use condoms and their syphilis rates are also high. Anecdotal evidence suggests that sex workers often do not want to use condoms with their regular non-commercial partners. A similar situation has been reported from other countries [29]. Therefore, interventions that are broad based involving communities in and around brothels are essential.

An additional worry is that in Bangladesh the commercial sex scene is shifting from brothels to streets, hotels and other venues that are more difficult to access [30]. Many hotels in Bangladesh provide venues for selling sex and interventions are very new and limited. For the first time, the fourth round serological surveillance could access female sex workers from hotels through an intervention. Fortunately, the HIV infection rate was low. Hotels are not the only venues that are hard to reach; more difficult to access are the informal venues such as residences. These are very hidden populations and reaching them is a challenge.

### **Potential for spread of HIV to and from different vulnerable groups**

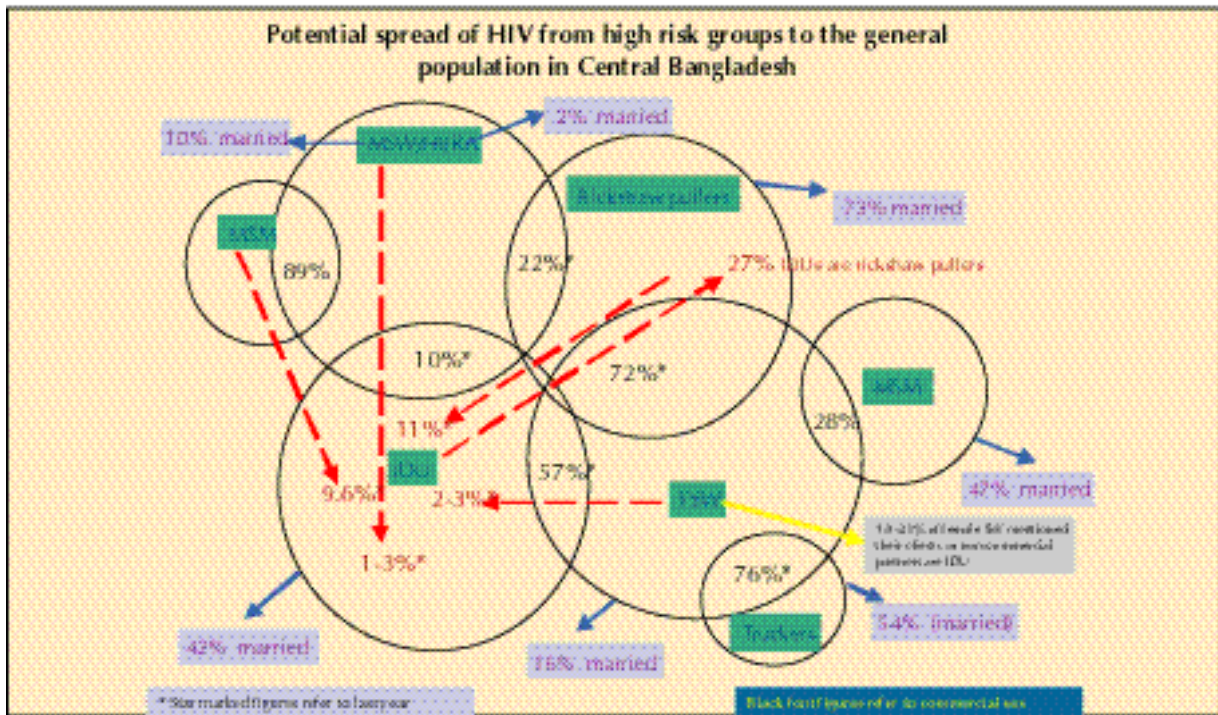
As has been shown in other countries, once an HIV epidemic begins among IDU, it is unlikely to remain limited to that population [23, 31]. This is especially true in Bangladesh since behaviour surveillance data show that IDU are not at all an isolated population. Drug injectors sell blood, they both buy and sell sex, many are married, and they rarely use condoms (Figure 22). The relatively high rates of syphilis infection in IDU confirm that IDU are practicing unsafe sex. Furthermore, IDU have been found to be a mobile population.

**Figure 22: Points of contact between drug injectors and others**



The other vulnerable populations studied by surveillance overlap in various ways, and are also linked with the general population as shown in Figure 23. The majority of the male clients surveyed are married, but their levels of commercial sex are very high, and about half of them reported ten or more partners per year. Many of the MSM and MSW under surveillance also had numerous partners, both male and female. These factors are likely to increase their own risk of HIV as well as that of their partners, and in turn, the HIV risk of others who are sexually linked with these partners.

**Figure 23: Potential spread of HIV from vulnerable groups in Central Bangladesh**



Clearly Bangladesh is now at a crossroads with only a limited time to act before a concentrated epidemic takes hold among drug injectors, which might then spread to the rest of the population. Immediate mobilization of resources at all levels in this effort is urgently required in order to avert an HIV epidemic.

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6. ANNEX  
Table A1. Prevalence of HIV over four rounds of serological surveillance, 1998-1999, 1999-2000, 2000-2001 and 2002

Study Populations, Geographical Location	HIV, number positive (%), (95% CI), total number tested			
	1998-1999 Round I	1999-2000 Round II	2000-2001 Round III	2002 Round IV
IDU:				
Detoxification clinic, Central A	10 (2.5), (1.2-4.5), 402	1 (0.2), (0-1.4), 402	0 (0-3.9), 92	ND
NEP* Central A	ND	6 (1.4), (0.5-3.1), 418	7 (1.7), (0.7-3.6), 401	16 (4.0), (2.3-6.4), 403
NEP Northwest A	ND	0 (0-0.9), 416	0 (0-0.9), 402	0 (0-0.9), 405
NEP Northwest B	ND	ND	0 (0-3.0), 120	0 (0-1.8), 200
Heroin smokers: Central A	ND	ND	ND	0 (0-0.9), 387
Breathel based female sex workers:				
Central B	0 (0-0.9), 392	0 (0-0.9), 402	2 (0.5), (0.1-1.8), 407	0 (0-1.4), 406
Central C	ND	0 (0-1.1), 322	ND	0 (0-2.4), 152
Central D	ND	ND	1 (0.3), (0-1.4), 384	3 (0.7), (0-2.2), 402
Central E	4 (1.5), (0.4-3.8), 267	ND	ND	ND
Southwest A, C,†	ND	0 (0-1.0), 351	0 (0-1.1), 335	0 (0-1.5), 241
Southwest B	ND	ND	1 (0.5), (0-2.9), 187	1 (0.5), (0-2.8), 195
Street based female sex workers:				
Central A	0 (0-0.9), 400	1 (0.2), (0-1.3), 423	2 (0.5), (0.1-1.7), 419	1 (0.2), (0-1.4), 403
Central B	ND	ND	ND	0 (0-1.8), 199
Southwest A	ND	ND	ND	0 (0-1.2), 3171
Hotel based female sex workers: Central A	ND	ND	ND	1 (0.2), (0-1.4), 405
Hijabs: Central A	ND	ND	ND	3 (0.8), (0.2-2.2), 393
MSM Group: Sex workers, Central A	ND	ND	0 (0-1.2), 310	0 (0-0.9), 401
Non-sex workers, Central A	ND	ND	0 (0-0.9), 399	1 (0.2), (0-1.4), 406

6. ANNEX  
Table A1. Prevalence of HIV over four rounds of serological surveillance, 1998-1999, 1999-2000, 2000-2001 and 2002 (Continued)

Study Populations, Geographical Location	HIV, number positive (%), (95% CI), total number tested			
	1998-1999 Round I	1999-2000 Round II	2000-2001 Round III	2002 Round IV
MSM Group (Combined sex workers and non sex workers)	1 (0.2), (0-1.4), 401	0 (0-0.9), 388	ND	ND
Central-A	ND	ND	ND	0 (0-0.9), 400
Central-C	ND	ND	ND	0 (0-0.9), 397
Southeast-A	ND	ND	ND	0 (0-0.9), 402
Northeast-A	ND	ND	ND	0 (0-1.5), 252
Babies: Central-B	ND	ND	ND	0 (0-1.8), 200
Central-D	ND	ND	ND	0 (0-1.5), 252
STI patients:				
Central-A	1 (0.3), (0-1.4), 399	0 (0-0.9), 404	ND	ND
Southeast-A	1 (0.2), (0-1.4), 409	0 (0-0.9), 404	1 (0.2), (0-1.4), 403	ND
Northwest-A, C	0 (0-0.9), 401	0 (0-0.9), 408	0 (0-0.9), 392	ND
Northeast-A	0 (0-0.9), 397	ND	0 (0-0.9), 389	0 (0-3.4), 106
Truckers:				
Central-A	0 (0-0.9), 403	ND	0 (0-0.8), 437	0 (0-0.9), 402
Southwest-B	ND	ND	0 (0-0.9), 392	ND
Dock workers:				
Southwest-C	ND	ND	0 (0-0.9), 401	ND
Southwest-A	ND	ND	0 (0-0.9), 392	ND
Rickshaw pullers:				
Southwest-B	ND	ND	0 (0-0.9), 401	ND
Southeast-A	ND	ND	0 (0-0.9), 400	ND
Launch workers:				
Central-A	ND	ND	ND	0 (0-0.9), 402
<b>Total</b>	17 (0.4), (0.3-0.7), 3871	8 (0.2), (0.1-0.4), 4338	14 (0.2), (0.1-0.3), 7063	27 (0.3), (0.2-0.5), 7877

\*MSM, Needle Exchange Programme  
 †Southwest-A and C, two geographical related areas together representing one site  
 ‡In some sites male sex workers (MSW) and non-sex worker (MSM) could not be differentiated and they were sampled as a single group  
 §In the first round, sampling was done only from Northwest-A