

**NATIONAL HIV SEROLOGICAL SURVEILLANCE, 2007
BANGLADESH**

8th Round Technical Report

**National AIDS/STD Programme (NASP)
Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the Peoples Republic of Bangladesh**

FOREWORD

ACKNOWLEDGEMENTS

The 8th round of annual HIV surveillance is the result of the combined efforts and contributions of many individuals and organisations. Thanks are due to all those listed below as well as to the many participants who gave their blood and shared some of their personal information.

The National AIDS/STD Programme (NASP), Directorate General of Health Services, Ministry of Health and Family Welfare, is responsible for HIV surveillance in Bangladesh. The 8th round was conducted by ICDDR,B in close collaboration with the Institute of Epidemiology, Disease Control and Research (IEDCR) and the funding was provided by GOB/DFID/IDA.

A large number of NGOs, private organisations and community groups participated in the surveillance by providing access to the vulnerable population groups and helped in various aspects of the surveillance. These organisations are listed in annexe 3.

The Principal Investigators (PI) were Dr Tasnim Azim, HIV/AIDS Programme, ICDDR,B and Prof (Dr) Mahmudur Rahman, PhD, Director, Institute of Epidemiology, Disease Control and Research (IEDCR). Dr Md Shah Alam, HIV/AIDS Programme, ICDDR,B was a co-investigator and Dr Imtiaz Ashraf Choudhury, IEDCR, DGHS helped in coordination of field activities. Mr Md Humayun Kabir and Mr Md Wazed Ali, HIV/AIDS Programme, ICDDR,B provided support in the field management as and when required. Staff supervising and performing laboratory tests were Dr Khandokar Mahbuba Jamil, Dr ASM Alamgir, Mr Md Zafrul Hasan, Mr Palash Chandra Karmakar, Mr Md Zahid Hassan, Mr Kamal Uddin Pervez, Mr Sk Abdul Matin, Mr A Karim, Mrs Anjuman Ara and Mr Md Nurul Islam. Field staffs for serological surveillance were Mr Md Reaz Uddin Ahmed, Mr Md Mahbubur Rahman, Mr Golam Mohammed Ali, Mr Gour Nitai Halder, Mr Ashish Kumar Sarker, Mr Kazi Nurul Haque, Mr Parimol Sarker, Mr Abdus Salam, Mr Md Saiful Alam, Mr Md Awlad Hossain, Mr SM Akramul Haque, Mr Bikash Chandra Swar, Mr Sayed Hossain Ali, Mr Raquibur Rahman Humayun, Mr Md Abul Kalam, Mr Farid Ahmed, Mr Md Alimuzzaman, Mr Md Shah Jalal, Mr Abdur Rouf Siddique, Mr Amal Sarker, Mr Md Ibrahim Sarder, Mr Md Abul Kalam, Mr Md Aynal Sarder, Mr Md Ahsan Ullah, Mr Mohammad Abdur Rahim, Mr Sankar Chandra Sarker, Mr Abu Emran Md Motiur Rahman, Mr Md Habibur Rahman, Mr Md Reaz Ahmed, Mr Milton Rangsa, Mr Md Hamidul Islam and Mr Md Jamal Uddin. Data analysis support was provided by Mr Masud Reza, HIV/AIDS Programme, ICDDR,B and data entry was done by Mr Mohammed Sha Al Imran, Mst Salima Sultana and Mr Md Abdul Hakim. All logistics and administrative support was provided by Mr Mohammed Ishaque, HIV/AIDS Programme, ICDDR,B.

The Surveillance Advisory Committee, which is chaired by the chairperson of the TC-NAC, provided advice and direction throughout the surveillance round. The members of the Surveillance Advisory Committee are listed in annexe 4.

ACRONYMS AND ABBREVIATIONS

| | |
|---------|---|
| AIDS | Acquired Immune Deficiency Syndrome |
| BSS | Behavioural Surveillance Survey |
| DFID | Department for International Development |
| DIC | Drop in Centre |
| DGHS | Directorate General of Health Services |
| ELISA | Enzyme Linked Immunosorbent Assay |
| GOB | Government of Bangladesh |
| HIV | Human Immunodeficiency Virus |
| HCV | Hepatitis C Virus |
| ICDDR,B | International Centre for Diarrhoeal Diseases Research, Bangladesh |
| IDA | International Development Association |
| IDU | Injection Drug User |
| IEDCR | Institute of Epidemiology, Disease Control and Research |
| LSD | Laboratory Sciences Division |
| LIA | Line Immuno Assay |
| MARP | Most at Risk Population |
| MOHFW | Ministry of Health and Family Welfare |
| MSM | Males Who Have Sex With Males |
| MSW | Male Sex Worker |
| NASP | National AIDS/ STD Programme |
| NSP | Needle/syringe Programme |
| NGO | Non-Government Organisation |
| RPR | Rapid Plasma Reagin |
| SAC | Surveillance Advisory Committee |
| STD | Sexually Transmitted Disease |
| STI | Sexually Transmitted Infection |
| TPPA | <i>Treponema Pallidum</i> Particle Agglutination Assay |
| UNAIDS | Joint United Nations Programme on HIV/AIDS |
| WHO | World Health Organisation |

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EXECUTIVE SUMMARY

As in previous years the 8th round of serological surveillance was conducted in most at risk population groups- sex workers, injection of drug users (IDU), heroin smokers, males who have sex with males (MSM) and transgender (Hijra). This round was conducted between July and December 2007 and 12,786 individuals were sampled from 35 cities of Bangladesh.

The population group with the highest rates of HIV continues to be IDU in Dhaka but the prevalence has not increased since the 7th round conducted in 2006, i.e. 7%. And fortunately, the localization of the IDU epidemic to one neighbourhood of Dhaka observed in previous years has also remained. However, HIV is being detected in IDU from a few more cities; four cities in 2006 and now, in 2007 there are five cities with HIV positive IDU.

Antibodies to Hepatitis C (HCV) were measured in all IDU and combined IDU and heroin smokers but not in the groups consisting of only heroin smokers. The rates vary in the different cities and in seven cities $\geq 50\%$ were HCV positive. However, a consistent decline in HCV is being documented in five cities including Dhaka. In two cities, Patuakhali and Bagerhat, none of the drug users had HCV.

In this round of surveillance a new population group has been identified that requires careful monitoring; casual female sex workers from Hili. The HIV prevalence rate documented in this group is 2.7%; this is the highest prevalence recorded in any group other than Dhaka IDU. In all other female sex workers population groups, HIV remains below 1%. Most Hili female sex workers report crossing the border to India (89.3%) and among those who did 98.5% sold sex while in India. HIV has not been detected in sex workers sampled from two other bordering towns, Teknaf and Burimari.

The highest active syphilis rates have been recorded in female IDU combined with heroin smokers from Dhaka, Narayanganj and Tongi (14.6%), followed by IDU in Teknaf (11.1%) and street based female sex workers in Chittagong (10.9%). The fact that drug users have high syphilis rates confirms their practice of unsafe sex and raises concerns about transmission of HIV to their commercial and non-commercial sex partners, once HIV enters this community.

Male sex workers and MSM continue to have low levels of HIV. Active syphilis rates have remained at approximately 5% in the male sex workers. Hijra, have a relatively high rate of active syphilis (7.7%) and this has been the case since 2002.

The overall prevalence of HIV and active syphilis among 12,786 individuals accessed is 0.7% and 3.3% respectively.

1. INTRODUCTION

Bangladesh has been following the “2nd generation HIV surveillance” described by UNAIDS/WHO since 1998 (UNAIDS/WHO 2000). It consists of both serological and behavioural surveillance systems which are not integrated but carried out on similar population groups. HIV prevalence is monitored annually through the serological surveillance system among specific most at risk population groups at sentinel sites spread across the country. Till the end of the 5th round (2003-2004) of surveillance, both serological surveillance and behavioural surveillance were carried out in tandem. During the 6th (2004-2005), 7th (2006) and 8th (2007) rounds of surveillance, only serological surveillance were carried out. A separate round of behavioural surveillance was conducted in 2006-2007.

According to the guidelines of the 2nd generation surveillance, in countries where HIV prevalence is low, focus is on those sub-populations which are considered most at risk of HIV due to various behavioural factors or lifestyle, and also on those groups who can possibly act as an ‘epidemiological bridge’ from the more at risk 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, transgender (hijra), and males who have sex with males (MSM), as well as on injecting drug users (IDUs) who might share needles and syringes and heroin smokers who are risk both through unprotected sex and occasional injections where needles/syringes are often shared. It also monitors bridge groups of men who are on the move and are likely to be clients of sex workers, such as truckers and rickshaw pullers. The evidence from other countries is that HIV is likely to spread among individuals in these groups first, and then spread further.

The population groups so far sampled in the different rounds of serological surveillance are shown in Table 1 below.

Table 1: Population groups sampled in serological surveillance 1998-1999 (round I), 1999-2000 (round II), 2000-2001 (round III), 2002 (round IV), 2003-2004 (round V), 2004-2005 (round VI), 2006 (round VII) and 2007 (round VIII).

| Population group | | Division | Geographical Location | 1998-1999 | 1999-2000 | 2000-2001 | 2002 | 2003-2004 | 2004-2005 | 2006 | 2007 | |
|----------------------------------|-------------------------------|------------|-----------------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|------------|---|
| | | | | Round I | Round II | Round III | Round IV | Round V | Round VI | Round VII | Round VIII | |
| Injection drug users (IDU) | Detoxification clinics | Dhaka | Dhaka | √ | √ | √ | | | | | | |
| | Out of detoxification clinics | Dhaka | Dhaka [†] | | √ | √ | √ | √ | √ | √ | √ | |
| | | | Dhaka A1 | | | | | | √ | √ | √ | |
| | | | Dhaka A2 | | | | | | √ | √ | √ | |
| | | | Mymensingh | | | | | | √ | √ | √ | |
| | | | Narayanganj | | | | | √ | √ | √ | √ | |
| | | | Tongi | | | | | √ | √ | √ | √ | |
| | | | Narsingdi | | | | | | | | √ | |
| | | Chittagong | Chandpur | | | | | √ | √ | √ | √ | |
| | | | Teknaf | | | | | | √ | √ | √ | |
| | | Rajshahi | Rajshahi | | √ | √ | √ | √ | √ | √ | √ | |
| | | | Chapai Nawabganj | | | √ | √ | √ | √ | √ | √ | |
| | | | Kanshat | | | | | √ | √ | √ | √ | |
| | | | Char Norendrapur | | | | | √ | | | √ | |
| | | | Rangpur | | | | | | | √ | √ | |
| | | | Naogaon | | | | | | √ | √ | √ | |
| | | | Pabna | | | | | √ | √ | √ | √ | |
| | | | Ishwardi | | | | | √ | √ | √ | √ | |
| | | | Sirajganj | | | | | | √ | √ | √ | |
| | | | Dinajpur | | | | | | | √ | √ | |
| | | Khulna | Jessore | | | | | | √ | √ | √ | |
| | | | Sathkhira | | | | | | √ | √ | √ | |
| | | Sylhet | Srimongol | | | | | | | | √ | |
| | | Barisal | Barisal | | | | | | √ | √ | √ | |
| Heroin smokers | | Dhaka | Dhaka | | | | √ | √ | √ | √ | √ | |
| Combined IDU and heroin smokers: | | Rajshahi | Jaipurhat | | | | | | | | √ | |
| | | Khulna | Khulna | | | | | | | √ | √ | |
| | | | Mongla | | | | | | | | √ | |
| | | | Bagerhat | | | | | | | | | √ |
| | | | Jhenaidah | | | | | | | | | √ |
| | | | Kushtia | | | | | | | | | √ |
| | | Barisal | Patuakhali | | | | | | | | | √ |

| Population group | Division | Geographical Location | 1998-1999 | 1999-2000 | 2000-2001 | 2002 | 2003-2004 | 2004-2005 | 2006 | 2007 |
|--|--------------|-------------------------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|------------|
| | | | Round I | Round II | Round III | Round IV | Round V | Round VI | Round VII | Round VIII |
| Brothel based female sex workers | All brothels | | | | | | √ | √ | √ | |
| | Dhaka | Tangail | √ | √ | √ | √ | | | | |
| | | Mymensingh | | √ | | √ | | | | |
| | | Doulatdia | | | √ | √ | | | | |
| | | Narayanganj | √ | | | | | | | |
| | Khulna | Fultola, Baniasanta, Bagerhat | | √ | √ | √ | | | | |
| Jessore | | | | √ | √ | | | | | |
| Street based female sex workers | Dhaka | Dhaka | √ | √ | √ | √ | √ | √ | √ | √ |
| | | Tangail | | | | √ | | | | |
| | Chittagong | Chittagong | | | | | √ | √ | √ | √ |
| | Rajshahi | Rangpur | | | | | | | | √ |
| | Khulna | Khulna | | | | √ | √ | | | √ |
| Hotel based female sex workers | Dhaka | Dhaka | | | | √ | √ | | | √ |
| | Chittagong | Chittagong | | | | | √ | √ | √ | √ |
| | Sylhet | Sylhet | | | | | √ | √ | √ | √ |
| Combined residence and hotel based sex workers | Dhaka | Narayanganj | | | | | | | | √ |
| | | Tangail | | | | | | | | √ |
| | | Jamalpur | | | | | | | | √ |
| | | Netrokona | | | | | | | | √ |
| | Khulna | Jessore | | | | | | | | √ |
| Casual female sex workers | Chittagong | Chandpur | | | | | | √ | √ | √ |
| | | Teknaf | | | | | | √ | √ | √ |
| | Rajshahi | Hili | | | | | √ | √ | √ | √ |
| | | Burimari | | | | | √ | √ | √ | √ |
| | Barisal | Barisal | | | | | √ | √ | √ | √ |
| Male sex workers (MSW) | Dhaka | Dhaka | | | √ | √ | √ | √ | √ | √ |
| Males who have sex with males (MSM) | Dhaka | Dhaka | | | √ | √ | √ | √ | √ | √ |
| Combined MSM/MSW | Dhaka | Dhaka | √ | √ | | | | | | |
| | | Mymensingh | | | | √ | √ | | | |
| | Chittagong | Chittagong | | | | √ | √ | √ | | √ |
| | Sylhet | Sylhet | | | | √ | √ | √ | | |
| Hijra | Central | Dhaka | | | | √ | | | | |
| | | Dhaka, Manikganj | | | | | √ | √ | √ | √ |

| Population group | Division | Geographical Location | 1998-1999 | 1999-2000 | 2000-2001 | 2002 | 2003-2004 | 2004-2005 | 2006 | 2007 |
|--------------------|-----------------------|-----------------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|------------|
| | | | Round I | Round II | Round III | Round IV | Round V | Round VI | Round VII | Round VIII |
| Partners of Hijra | Dhaka | Dhaka, Manikganj | | | | | √ | | | |
| Babus [‡] | Dhaka | Tangail | | | | √ | √ | | | |
| | | Doulatdia | | | | √ | √ | | | |
| | | Jamalpur | | | | | √ | | | |
| STI patients | Dhaka | Dhaka | √ | √ | | | | | | |
| | Chittagong | Chittagong | √ | √ | √ | | | | | |
| | Rajshahi [*] | Rajshahi, Rangpur | √ | √ | √ | | | | | |
| | Sylhet | Sylhet | √ | | √ | √ | | | | |
| Truckers | Dhaka | Dhaka | √ | | √ | √ | | | | |
| | Khulna | Jessore | | | √ | | | | | |
| | | Benapole | | | | | | | √ | |
| Dockworkers | Chittagong | Chittagong | | | √ | | | √ | | |
| | Khulna | Khulna | | | √ | | | | | |
| Rickshaw pullers | Dhaka | Dhaka | | | | | √ | √ | | |
| | Chittagong | Chittagong | | | √ | | √ | | | |
| | Khulna | Jessore | | | √ | | | | | |
| Launch workers | Dhaka | Dhaka | | | | √ | | | | |

[†]Dhaka represents the merged result of Dhaka A1 and Dhaka A2

[‡]Babus are boyfriends/regular partners of brothel based female sex workers

^{*}In the first round, sampling was done only in Rajshahi, in the subsequent rounds sampling was done for Rajshahi and Rangpur and these two sites together represent a single site

2. METHODOLOGY

The methodology followed for selection of population groups, sample size estimation, sampling, testing and analyses were the same as in previous rounds of surveillance. These are described here in brief.

Population groups sampled and definitions

As in earlier rounds, the population groups considered most at risk of HIV infection were selected (Table 1) through discussions in the Surveillance Advisory Committee (SAC) meeting held on January 24, 2007. For the 8th round, the following key changes were suggested:

- Sample IDU from more cities
- Sample street based female sex workers from more cities
- Include residence based sex workers
- Reduce/exclude females sex workers from brothels

The inclusion criteria defining each of the population group are the same as in previous years and are shown in Box 1 below:

| Box 1. Definitions used for the population groups |
|--|
| Injection drug users: Those who were primarily injectors and had injected in the previous year. |
| Heroin smokers: Those who were primarily heroin smokers and had not injected more than twice in the previous six months. |
| Combined injection drug users and heroin smokers: When injection drug users and heroin smokers could not be distinguished from each other and were therefore sampled as single, combined group. |
| Female sex workers: <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. <i>Casual sex workers:</i> Those who were selling sex either in the street, residence or hotel during the previous month and had either one or more main sources of income. <i>Combined residence and hotel sex workers:</i> Women who identified themselves as sex workers and sold sex in residences or in both residences and hotels in the last month. |
| Males who have sex with males: <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. |
| Hijra (Transgender or third gender): Those who identified themselves as belonging to a traditional Hijra sub-culture. |

Strategies for sampling

As in previous rounds, the population groups of interest were accessed through intervention organisations working with those populations. Clinics of these organisations were the sentinel sites for sampling and where clinics were not available, temporary clinics were set up. Sentinel sites were identified on the basis of the following selection criteria: the capacity to access the selected population groups, the availability of a clinic with medical professionals providing services, and the availability of staff willing to collaborate with serological surveillance.

Where possible, prior to sampling a series of small workshops were held with the population groups of interest to provide information about surveillance. Following the workshops, individuals were encouraged to attend the on-site clinics for giving blood. The strategy used in those sites where workshops were not held, was that outreach workers informed people while working in their respective fields of the provision of free syphilis testing with results and treatment if they would attend the respective sentinel clinics. Signed consent was obtained from each study participants before collection of a blood sample.

In four sampling sites, services that were provided previously by NGOs were no longer available because of a lack of funds (Table 2).

Table 2. Population groups in different geographical areas where there was no intervention coverage at the time of sampling, 2007

| Population Groups, Geographical Location | 2007 Round VIII |
|---|--------------------|
| Street based female sex workers: Rangpur | √ |
| Casual female sex workers: Hili | √ |
| Burimari | √ |
| Males who have sex with males (MSM): Dhaka | √ |

However, surveillance was conducted in those sites and the following strategies were taken to overcome difficulties associated with accessibility and service provision:

1. Local guides were recruited to help access the population groups of interest. Most of these guides were ex-employees of those organisations who were previously providing the intervention services.
2. Recruited local guides were informed about the purpose and methodology of surveillance who then disseminated this information in the field and encouraged participants to give blood.
3. A temporary clinic site was set up where participants attended to provide blood. Local physicians were recruited who provided treatment for syphilis.

4. Syphilis results were distributed to the participants with the help of the local guides along with surveillance field staff.

Sampling from IDU in Dhaka was done following a similar methodology to that in the 6th and 7th rounds but different from earlier rounds. The reasons for doing so were the same as in the 6th and 7th rounds, i.e. this was because of several ongoing research studies. The sampling methodology of IDU in Dhaka is summarised in Box 2 below:

Box 2. IDU sampling from Dhaka

Dhaka was divided into two areas: A1 and A2

This was done because the findings from a research cohort study and the 5th and 6th rounds of surveillance showed that IDU in one neighbourhood of Dhaka were experiencing a concentrated epidemic and also as IDU cohort research studies of ICDDR,B and CARE, Bangladesh were covering a large proportion of male IDU from that neighbourhood. The areas were:

i) A1 – this included the area covering the neighbourhood with the concentrated HIV epidemic. Attempts were made to sample as many IDU from this area as possible; i.e. a take all approach was employed. The IDU included in this area were those:

- who were part of the ICDDR,B HIV positive cohort study during 23.9.07 to 13.11.07
- who were part of the ICDDR,B HIV negative male cohort study during 23.9.07 to 13.11.07
- who were specifically sampled from that area for surveillance during 17.9.07 to 24.9.07 and who were not members of the cohort studies

ii) A2 – this included the rest of Dhaka city from where approximately 400 IDU were sampled. Sampling from this area followed the same methodology as in early rounds so that IDU were sampled from the areas covered by the Drop-In Centres (DICs) of the NGO running the needle/syringe programme (NSP). Each DIC covers a known number of IDU and in order to obtain 400 samples, proportionate sampling from the areas covered by each DIC was carried out.

The data obtained from Dhaka A1 and A2 were combined to reflect Dhaka.

Personnel and training

Serological surveillance was conducted by a team from ICDDR,B and IEDCR comprising of laboratory and field staffs. Prior to sampling, a five day (1-5 July 2007) training was provided to the field staff covering areas on basic concepts of HIV and AIDS, current situation of HIV and AIDS in Bangladesh and interview techniques. In addition, hands on training for the field staffs were provided on Universal Precaution, serum separation, labelling, de-linking, sample transportation and preservation. Trained team members and other resource persons from the HIV/AIDS Programme of ICDDR,B conducted the training.

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.

As in previous rounds, 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 individual was screened for syphilis, so that treatment could be given if necessary. The unlinked anonymous samples were also used to assay for hepatitis C (HCV) among IDU.

Informed consent and confidentiality

Informed and signed consent was obtained from all study participants prior to drawing blood. The summary of the consent paper was read out for those who could not read and the left thumb impression was obtained from those who could not sign.

All the sample tubes containing serum for HIV and HCV 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. Tubes containing serum for syphilis tests were labelled with all information so that the test results could be linked back to the individuals for the purpose of treatment.

Questionnaire

A brief questionnaire was administered to all participants where a few demographic questions were asked. The exception was with female casual sex workers, where questions on other occupations, client accessing spots and mobility were also asked.

Laboratory methods

Tests were done for syphilis, HIV and HCV (among IDU only). Syphilis was tested by the Rapid Plasma Reagin (RPR) test (Nostion II, Biomerieux BV, Boxtel, The Netherlands)) and Treponema Pallidum Particle Agglutination (TPPA) test (Serodia TPPA, Fujirebio Inc., Japan). Tests were done for active syphilis only. Samples positive for TPPA with an RPR titre of ≥ 8 were considered to reflect active syphilis. TPPA test was carried out only when RPR is positive.

For antibodies to hepatitis C (HCV), sera were initially tested using ELISA kit and all positive samples were re-tested with a second ELISA kit. Discrepant results in the two ELISAs were confirmed by Line Immunoassay (LIA). Samples positive for any two tests were considered as positive. For HIV, samples were initially tested by a commercial Enzyme Linked Immunosorbent Assay (ELISA) kit (Organon Teknika) and positive results were confirmed by a Line Immunoassay (LIA, Organon Teknika). An indeterminate result by LIA was considered as negative.

Syphilis result and treatment

As in previous rounds, 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. However, in sites where there were no intervention programmes, local guides and clinical staffs were recruited by the surveillance team for distribution of the results and to provide treatment for the syphilis positive cases.

Quality control

In the Virology Laboratory, ICDDR,B, tests for HIV, HCV and syphilis are under an external Quality Control Scheme of the National Serology Reference Laboratory of Australia, which is a WHO collaborating centre.

Sample size

The sample size was calculated as 380 with an estimation of 1% HIV prevalence, 1% precision and 95% confidence level. It was decided to take the first four hundred individuals who came to the clinic. At sites where the numbers of individuals available were less than 400, a take all approach was employed.

Data entry and analysis

All data were entered in the Statistical Package for Social Sciences (SPSS, version 15.0 for Windows, SPSS Inc., Chicago, IL, USA). Data analyses were carried out using SPSS and Epi Info Windows version 3. For comparison of continuous non-parametric data between any two sites the Mann-Whitney U test was used. For categorical data, chi-square statistic was used. For comparison of data over time chi-square for trends was used.

3. TECHNOLOGY TRANSFER TO IEDCR

Since the inception of the Second Generation HIV surveillance in 1998, the Institute of Epidemiology, Disease Control & Research (IEDCR) has been working in close collaboration with ICDDR,B. Over the rounds of surveillance, ICDDR,B trained different technical and laboratory staff of IEDCR on different aspects of surveillance. During the 8th round, along with the Director IEDCR (who was the counterpart Principal Investigator) the following personnel from IEDCR were actively involved with the surveillance:

1. One field coordinator
2. Two laboratory scientists
3. Four laboratory technicians
4. Two field assistants
5. Two data entry personnel
6. Two laboratory attendant

Personnel from IEDCR actively participated during the weeklong training held in July 2007 prior to the commencement of sampling in the field. Personnel from IEDCR worked alongside those from ICDDR,B both in the field and the laboratory. All samples were received, stored and tested in the IEDCR laboratory. Test results for syphilis was prepared and delivered from the IEDCR laboratory. However, as all laboratory equipment required for HCV testing were not available at IEDCR, tests for HCV were conducted at ICDDR,B. Data from the questionnaire was entered at IEDCR. Regular meetings were held between ICDDR,B and IEDCR to address the issue of technology transfer.

4. RESULTS

A total of 12,786 samples were collected during the 8th round of serological surveillance and the dates of sample collection for each population group from the different sentinel sites are shown below (Table 3).

Table 3. Population groups sampled with sampling dates

| Population Groups, Geographical Location (n) | Start date | End date |
|---|------------|----------|
| Injection Drug Users: | | |
| Dhaka (1045) [†] | 17.9.07 | 13.11.07 |
| Dhaka- A1 (646) | 23.9.07 | 13.11.07 |
| Dhaka-A2 (399) | 17.9.07 | 24.9.07 |
| Mymensingh (260) | 5.8.07 | 15.7.07 |
| Narayanganj (127) | 7.8.07 | 16.8.07 |
| Tongi (68) | 7.8.07 | 13.8.07 |
| Norsingdi (77) | 2.9.07 | 6.9.07 |
| Chandpur (159) | 6.8.07 | 22.7.07 |
| Teknaf ((108) | 21.11.07 | 2.12.07 |
| Rajshahi (400) | 7.7.07 | 23.7.07 |
| Chapai Nawabganj (210) | 11.7.07 | 24.7.07 |
| Kanshat (71) | 25.7.07 | 1.8.07 |
| Char Norendrapur (101) | 6.8.07 | 14.8.07 |
| Rangpur (164) | 22.10.07 | 1.11.07 |
| Naogaon (270) | 17.10.07 | 31.10.07 |
| Pabna (116) | 24.10.07 | 1.11.07 |
| Ishwardi (60) | 24.10.07 | 1.11.07 |
| Sirajganj (300) | 24.10.07 | 4.11.07 |
| Dinajpur (400) | 1.9.07 | 13.9.07 |
| Jessore (202) | 22.10.07 | 1.11.07 |
| Sathkhira (279) | 22.10.07 | 8.11.07 |
| Srimongol (200) | 23.10.07 | 1.11.07 |
| Barisal (275) | 7.7.07 | 16.7.07 |
| Heroin Smokers: | | |
| Dhaka (402) | 5.8.07 | 13.8.07 |

| Population Groups, Geographical Location (n) | Start date | End date |
|---|------------|----------|
| Combined injection drug users and heroin smokers: | | |
| Jaipurhat (65) | 17.10.07 | 24.10.07 |
| Khulna (397) | 19.8.07 | 29.8.07 |
| Mongla (130) | 24.10.07 | 1.11.07 |
| Bagerhat (140) | 22.10.07 | 31.10.07 |
| Jhenaidah (149) | 22.10.07 | 31.10.07 |
| Kushtia (130) | 22.10.07 | 1.11.07 |
| Patuakhali (100) | 22.10.07 | 1.11.07 |
| Female: | | |
| Dhaka, Narayanganj, Tongi (103) | 19.11.07 | 5.12.07 |
| Street based female sex workers: | | |
| Dhaka (409) | 29.7.07 | 5.8.07 |
| Chittagong (404) | 22.7.07 | 2.8.07 |
| Khulna (270) | 21.8.07 | 29.8.07 |
| Rangpur (246) | 22.10.07 | 1.11.07 |
| Hotel based female sex workers: | | |
| Dhaka (399) | 22.8.07 | 13.9.07 |
| Chittagong (122) | 22.7.07 | 2.8.07 |
| Sylhet (180) | 4.8.07 | 11.9.07 |
| Combined residence and hotel based female sex workers: | | |
| Narayanganj (277) | 6.11.07 | 15.11.07 |
| Tangail (352) | 6.11.07 | 22.11.07 |
| Jamalpur (300) | 6.11.07 | 21.11.07 |
| Netrokona (241) | 6.11.07 | 15.11.07 |
| Jessore (380) | 6.11.07 | 26.11.07 |
| Casual female sex workers: | | |
| Chandpur (121) | 20.8.07 | 29.8.07 |
| Teknaf (246) | 21.11.07 | 3.12.07 |
| Hili (150) | 28.11.07 | 28.11.07 |
| Burimari (300) | 14.11.07 | 29.11.07 |
| Barisal (400) | 7.7.07 | 26.7.07 |
| Male sex workers (MSW): | | |
| Dhaka (400) | 22.7.07 | 6.9.7 |
| Males who have sex with males (MSM): | | |
| Dhaka (399) | 23.7.07 | 10.9.07 |
| Combined MSM/MSW: | | |
| Chittagong (290) | 22.7.07 | 13.9.07 |
| Hijra: | | |
| Dhaka, Manikganj (392) | 17.7.07 | 30.9.07 |

† Dhaka has been divided into two geographical areas: Dhaka A1 and Dhaka A2

Results for the 8th round of the serological surveillance are reported under the following groups and described below.

- Injection drug users (IDU), heroin smokers and combined IDU & heroin smokers
- Female sex workers
- Males who have sex with males (MSM), male sex workers and Hijra

4.1 INJECTION DRUG USERS (IDU), HEROIN SMOKERS AND COMBINED IDU AND HEROIN SMOKERS

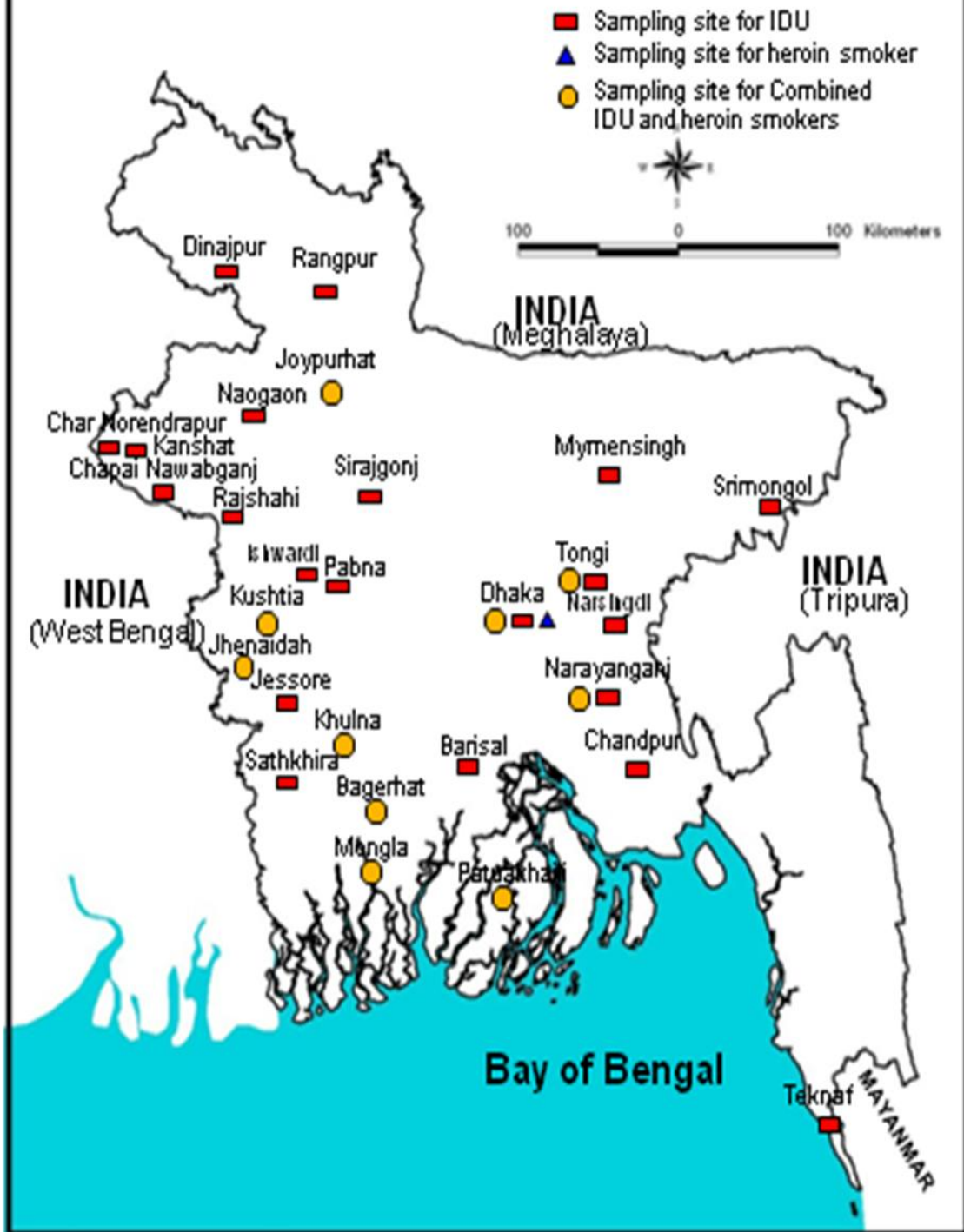
Drug users, which included IDU, heroin smokers and the combined group of IDU and heroin smokers (N=6508), were sampled from 28 different cities of Bangladesh; IDU were sampled from 21 and the combined group of IDU and heroin smokers from seven cities (Fig 1).

New cities for this round included:

- IDU, two cities - Norsingdi and Srimongol
- Combined IDU and heroin smokers, six cities - Jaipurhat, Mongla, Bagerhat, Jhenaidah, Kushtia and Patuakhali

As with the previous rounds, heroin smokers were sampled from Dhaka city only. Female drug users were sampled as a combined group of IDU and heroin smokers from Dhaka, Narayanganj and Tongi and these three geographically related areas were considered together as a single sampling site. It is to be noted that female drug users were only sampled within this combined group in Dhaka; no female IDU were available at other sites. All drug users were under the coverage of the NSP.

Figure 1: Sampling sites for IDU, heroin smokers and combined IDU and heroin smokers, 2007



Demographic characteristics

Demographic characteristics of the drug users are shown (Table 4). IDU from Chapai Nawabganj were the oldest ($P<0.05$) amongst all groups of drug users. Though the median duration of education was lowest ($P<0.05$) among the combined female IDU and heroin smokers from Dhaka, Narayanganj and Tongi, but the proportion who ever attended school were similar between sites. Duration of taking drugs (smoking or injecting) and the duration of coverage by NSP was similar across groups and sites.

The proportion of heroin smokers who ever attended school was less than those of IDU ($P<0.001$) from Dhaka. However, the median duration of education was similar to that of IDU from the same area.

Table 4. Demographic characteristics of the IDU, heroin smokers and combined IDU and heroin smokers, 2007

| Geographical Location (N) | Age in years median (IQR*) | Ever attended school, % (n) | Education (years) median (IQR) | Duration as injector/ smoker (months) (IQR) | Duration in NSP (months) Median (IQR) |
|---|----------------------------|-----------------------------|--------------------------------|---|---------------------------------------|
| IDU: | | | | | |
| Dhaka (1045) [†] | 34.9 (29-40) | 56.3 (588) | 5 (3-8) | 83.2 (48-120) | 53.2 (24-84) |
| Dhaka- A1 (646) | 35 (29.7-42) | 52.2 (337) | 4 (2-7) | 88.6 (55.9-136.3) | 60 (34.8-89.8) |
| Dhaka-A2 (399) | 32 (28-38) | 62.9 (251) | 6 (5-8) | 60 (36-120) | 36 (18-60) |
| Mymensingh (260) | 28 (27-32) | 85.0 (221) | 9 (7-12) | 36 (15.3-60) | 12 (5-36) |
| Narayanganj (127) | 35 (30-40) | 50.4 (64) | 6 (3-9) | 84 (36-132) | 30 (12-60) |
| Tongi (68) | 30 (28-33) | 80.9 (55) | 9 (7-10) | 36 (19.3-58.5) | 24 (12-36) |
| Norsingdi (77) | 30 (27-33) | 42.9 (33) | 8 (5-10) | 36 (24-60) | 24 (24-36) |
| Chandpur (159) | 28 (26-32) | 71.1 (113) | 8 (5-10) | 60 (24-96) | 36 (18-36) |
| Teknaf (108) | 30 (26-32) | 68.5 (74) | 5 (4-8) | 24 (12-46.5) | 6 (3-12) |
| Rajshahi (400) | 37 (30-44) | 53.3 (213) | 5 (4-9) | 75 (48-120) | 60 (36-84) |
| Chapai Nawabganj (210) | 42 (38-48) | 39.0 (82) | 7 (4-9) | 72 (48-120) | 36 (24-48) |
| Kanshat (71) | 37 (32-44) | 62.0 (44) | 9 (4-10) | 48 (36-108) | 40 (24-48) |
| Char Norendrapur (101) | 40 (32-45) | 34.7 (35) | 5 (4-8) | 96 (48-144) | 48 (33-48) |
| Rangpur (164) | 35 (28.5-40) | 61.6 (101) | 8 (6-10) | 24 (9.3-48) | 12 (6-24) |
| Naogaon (270) | 29 (26-33) | 80.7 (218) | 9 (6-10) | 24 (12-60) | 12 (6-24) |
| Pabna (116) | 33.5 (30-40) | 69.8 (81) | 8 (5-10) | 72 (48-96) | 36 (24-36) |
| Ishwardi (60) | 30.5 (28-36) | 60.0 (36) | 6 (4-9) | 30 (12-60) | 12 (6-36) |
| Sirajganj (300) | 35 (29.3-40) | 46.3 (139) | 8 (5-9) | 24 (12-72) | 18 (7-36) |
| Dinajpur (400) | 33 (29-38) | 75.5 (302) | 9 (7-12) | 36 (24-60) | 18 (8-36) |
| Jessore (202) | 34 (28-38) | 68.8 (139) | 8 (5-10) | 36 (24-60) | 12 (6-24) |
| Sathkhira (279) | 30 (27-33) | 78.5 (219) | 8 (6-10) | 18 (8-36) | 7 (4-18) |
| Srimongol (200) | 28 (26-31) | 82.5 (165) | 8 (5-9) | 18 (12-30) | 12 (6-18) |
| Barisal (275) | 26 (22-29) | 92.4 (254) | 9 (7-10) | 12 (7-36) | 7 (4-15) |
| Heroin Smokers: | | | | | |
| Dhaka (402) | 30 (27-36) | 52.2 (210) | 5 (3-8) | 120 (72-180) | NA |
| Combined IDU and heroin smokers: | | | | | |
| Jaipurhat (65) | | | | | |
| Khulna (397) | 33 (29-38) | 70.8 (48) | 5 (4-8) | 20 (8-54) | 7 (4-12) |

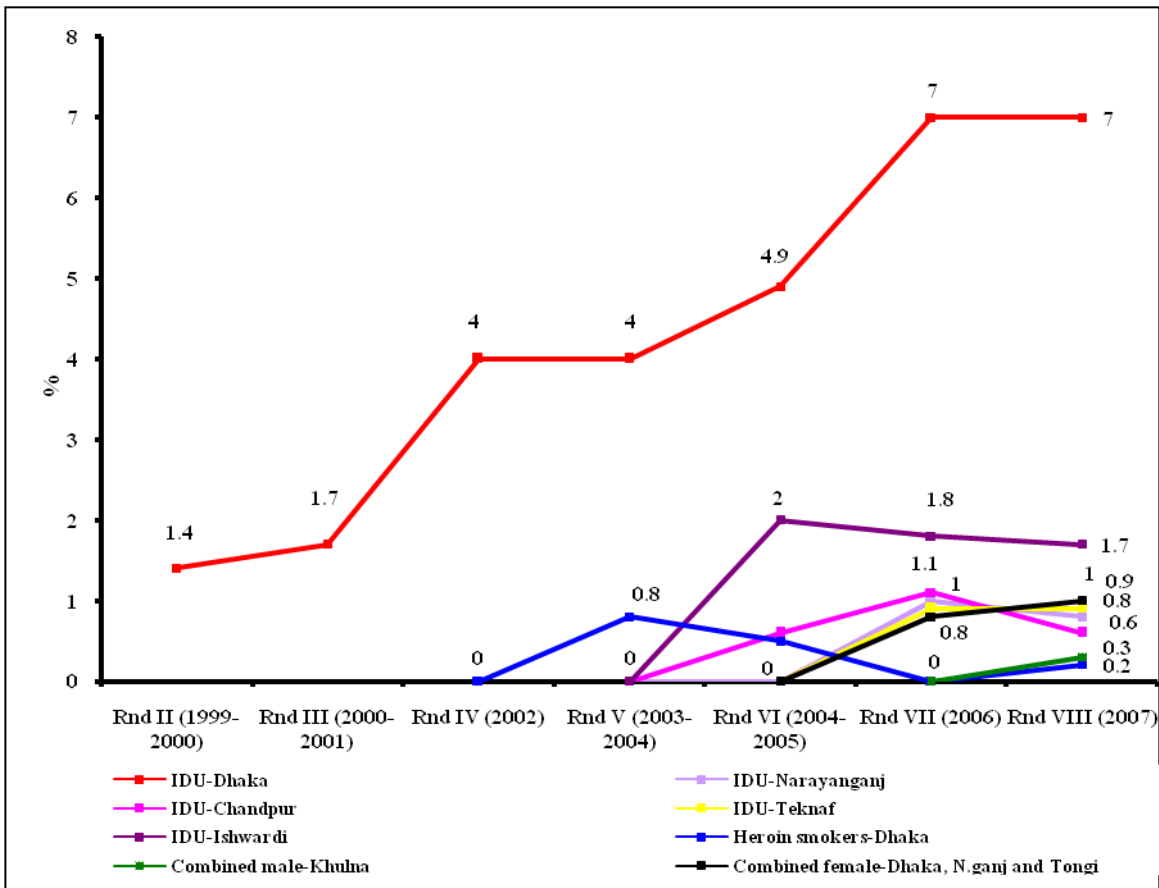
| Geographical Location (N) | Age in years median (IQR*) | Ever attended school, % (n) | Education (years) median (IQR) | Duration as injector/ smoker (months) (IQR) | Duration in NSP (months) Median (IQR) |
|---|----------------------------|-----------------------------|--------------------------------|---|---------------------------------------|
| Mongla (130) | 27 (24-30) | 72.5 (288) | 8 (5-9) | 18 (7-36) | 8 (5-18) |
| Bagerhat (140) | 26 (22-30) | 82.3 (107) | 8 (5-10) | 18 (12-36) | 8 (5-12) |
| Jhenaidah (149) | 27 (25-30) | 75.7 (106) | 8 (5-10) | 16 (12-24) | 12 (6-12) |
| Kushtia (130) | 32 (27.5-37) | 69.8 (104) | 6 (3-9) | 36 (15-72) | 4 (2.5-7) |
| Patuakhali (100) | 27 (24-30) | 66.2 (86) | 9 (8-10) | 18 (7-36) | 10 (3.8-24) |
| Female: Dhaka, Narayanganj, Tongi (103) | 25 (22-29) | 86.0 (86) | 10 (8-12) | 24 (12.3-36) | 5 (3-6) |
| | 26 (24-32) | 40.8 (42) | 4 (3-5) | 36 (22.5-64.5) | 36 (12-48) |

[†]Dhaka-A1 and Dhaka-A2 were merged together to represent Dhaka; [§]NA = Not asked; *IQR refers to inter quartile range

HIV and syphilis

HIV prevalence among all 6,508 drug users sampled from 28 different cities is shown in Annexe 1. HIV was detected in IDU from five cities with highest rates being among male IDU from Dhaka (7%). The other four other cities include Narayanganj (0.8%), Chandpur (0.6%), Teknaf (0.9%) and Ishwardi (1.7%) (Fig 2). In addition, HIV was also found among heroin smokers in Dhaka (0.2%); combined IDU and heroin smokers in Khulna (0.3%) and females from Dhaka, Narayanganj and Tongi (1%) (Annexe-1 & Fig 2).

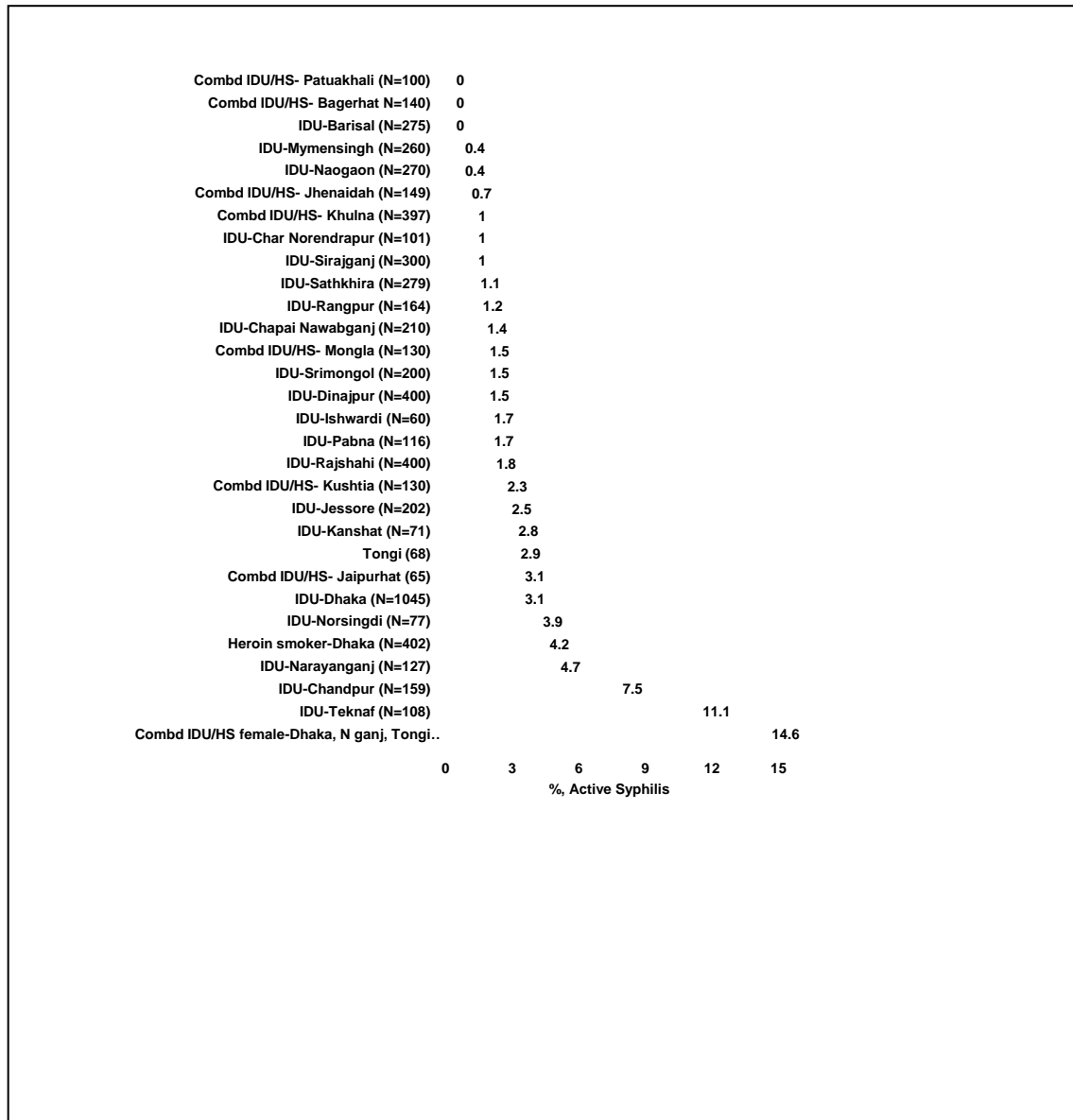
Figure 2. HIV in drug users over the rounds



Although the prevalence rates in Dhaka IDU has increased significantly over the rounds of surveillance since 1998 ($P < 0.001$), there has been no change between the 7th and 8th rounds (Fig 2). Heroin smokers were sampled from Dhaka since the 4th round and female drug users from Dhaka, Narayanganj and Tongi were sampled since the 6th round of surveillance. No changes in prevalence rates were observed in either group (Fig 2).

Active syphilis rates varied from as low as 0.4% to as high as 14.6% among all drug users from different cities (Fig 3 and Annexe 2). The highest rate (14.6%) was found among the combined group of female IDU and heroin smokers from Dhaka, Tongi and Narayanganj. This was followed by IDU in Teknaf (11.1%) and those in Chandpur (7.5%) (Fig 3).

Figure 3. Active syphilis in IDU, heroin smokers and combined IDU and heroin smokers, 2007



Note: *Combd IDU/HS refers to the combined group of IDU and heroin smokers.*
Numbers in brackets refer to the total numbers of drug users sampled in each city

Comparison of active syphilis rates among drug users was done for those cities where three or more consecutive rounds of data were available (Figs 4 and 5). Such a comparison in Dhaka and Rajshahi showed that the active syphilis rates declined significantly over time ($P < 0.001$ and $P = 0.017$ respectively) but there were no significant changes observed for other cities.

Figure 4. Active syphilis in drug users over the rounds, Dhaka, Chittagong and Khulna divisions

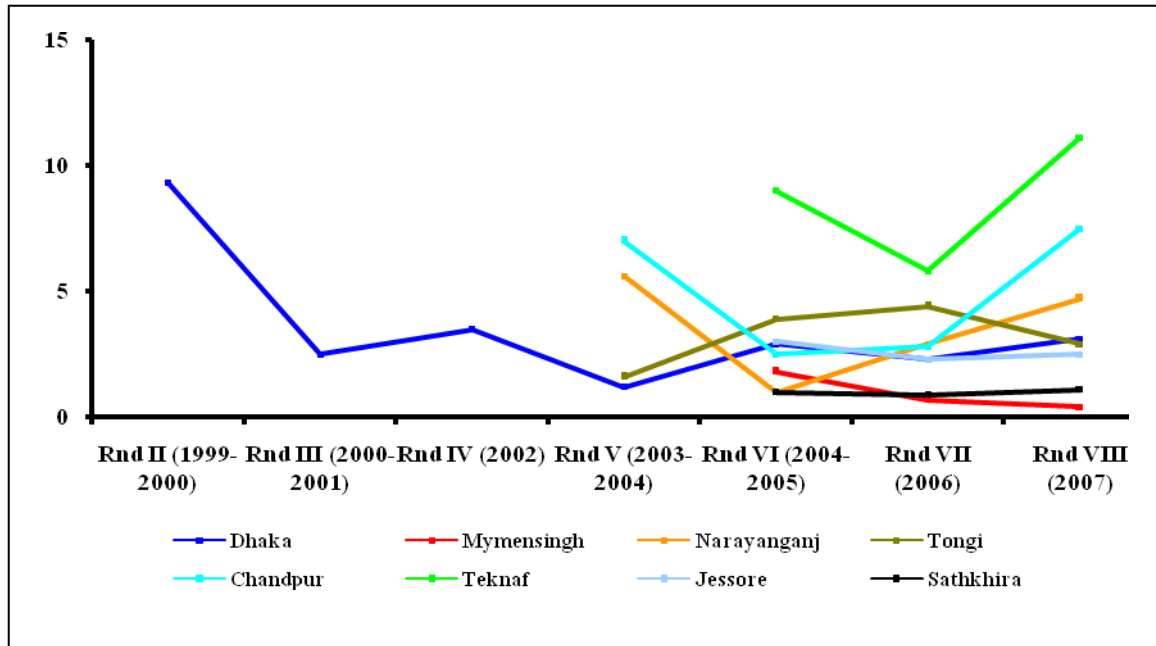
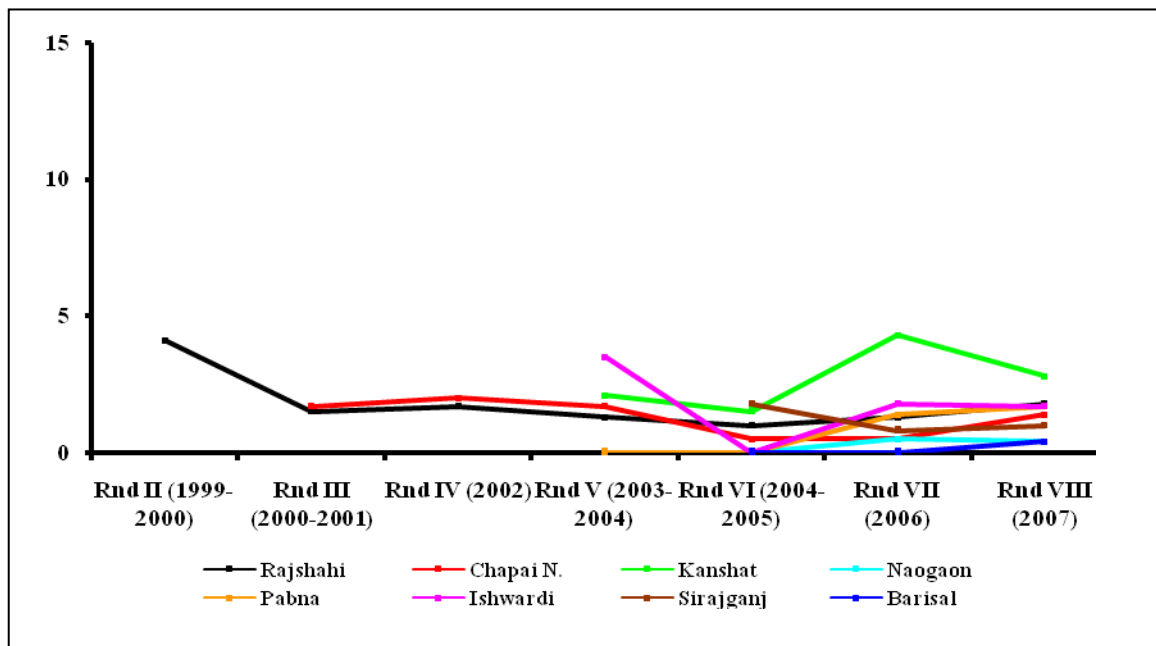
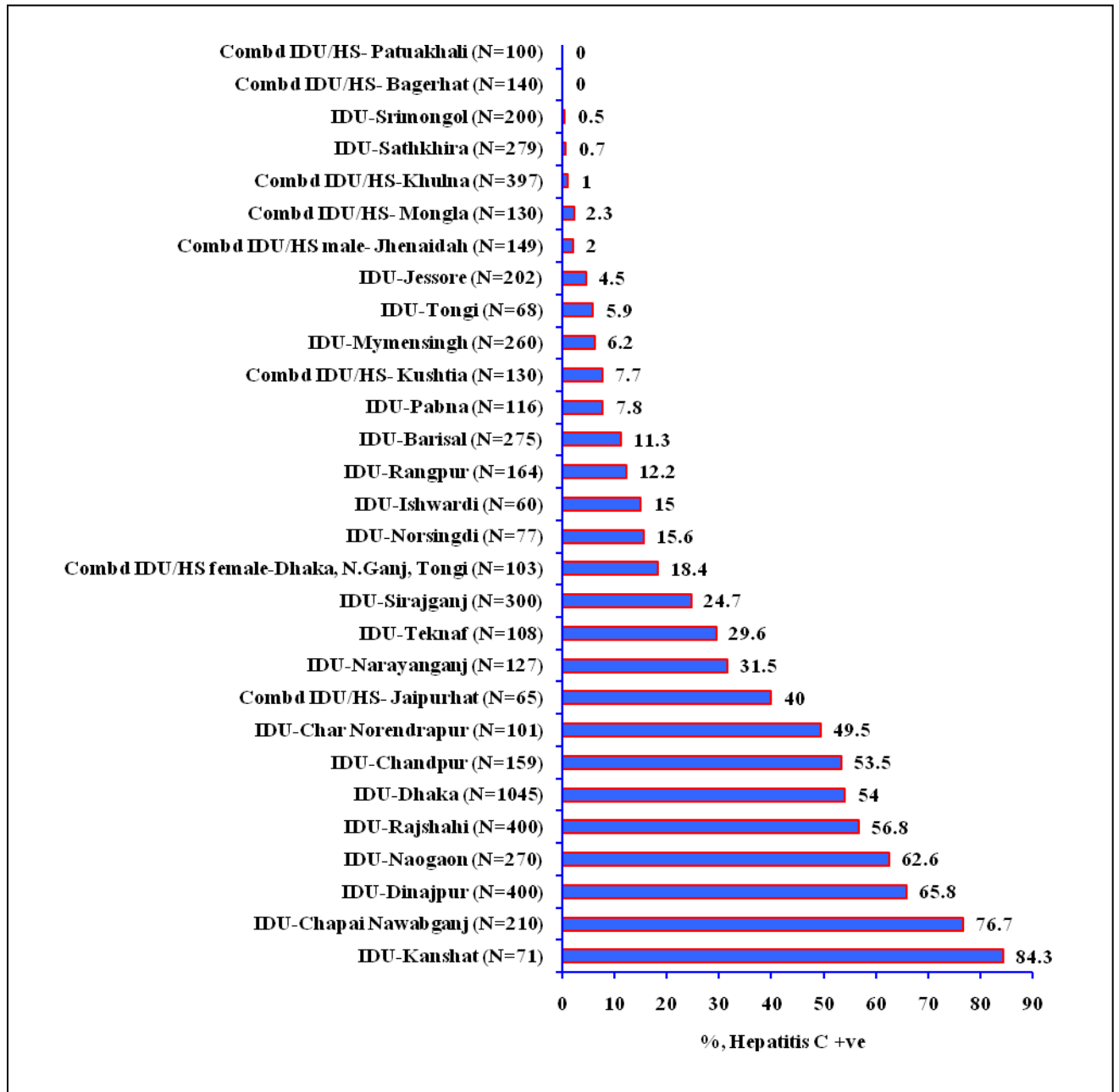


Figure 5. Active syphilis in drug users over the rounds, Rajshahi and Barisal divisions



Drug users, other than the group consisting of only heroin smokers, were tested for antibodies to HCV (Fig 6). None tested positive in Bagerhat and Patuakhali but in seven cities more than 50% of drug users were HCV positive. Generally the prevalence for HCV was high and IDU from Kanshat had the highest prevalence (84.3%) (Fig 6).

Figure 6. HCV prevalence among IDU and combined IDU and heroin smokers, 2007



Note: Comb d IDU/HS refers to the combined group of IDU and heroin smokers.
Numbers in brackets refer to the total numbers of drug users sampled in each city

Comparison of HCV rates over the surveillance rounds was done for those cities where three or more rounds of data were available. In some cities, there was a gap in HCV data for some years and those years are marked as dotted lines in Figs 7 and 8. A significant decline in HCV prevalence was observed in IDU from Dhaka ($P<0.001$), Jessore ($P=0.033$), Rajshahi ($P=0.032$), Ishwardi ($P=0.049$) and Sirajganj ($P<0.001$). For other cities, there were no changes over the rounds.

Figure 7. HCV prevalence among IDU over the rounds in Dhaka, Chittagong and Khulna divisions

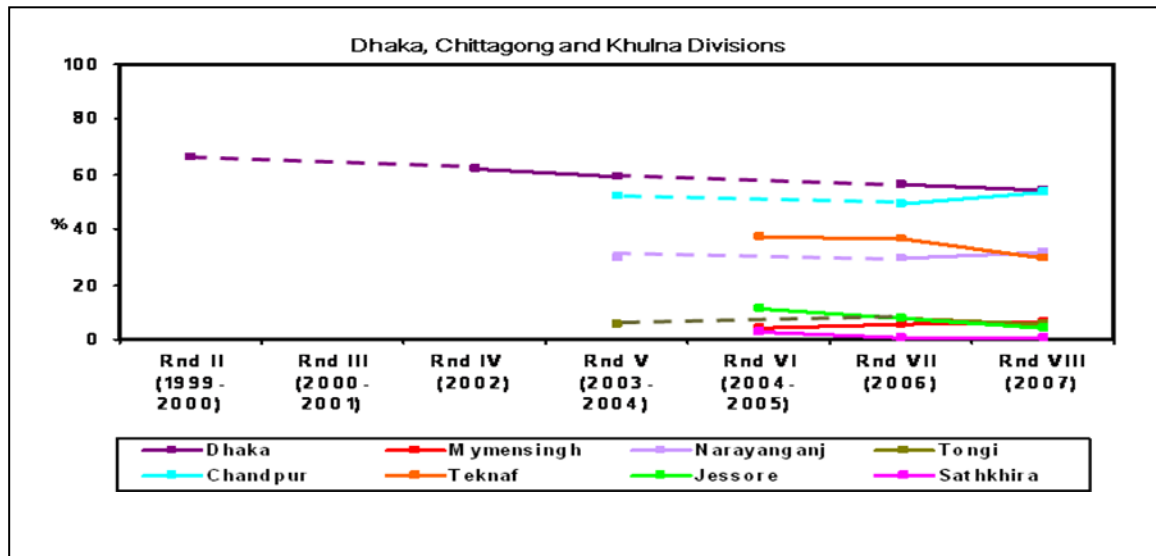
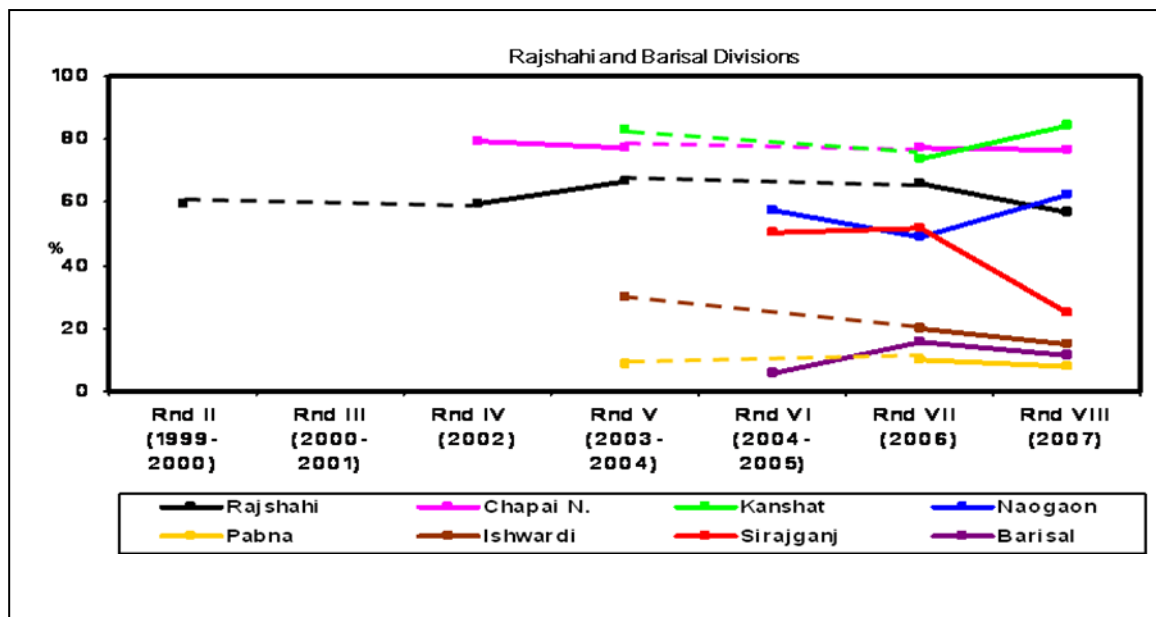


Figure 8. HCV prevalence among IDU over the rounds in Rajshahi and Barisal divisions

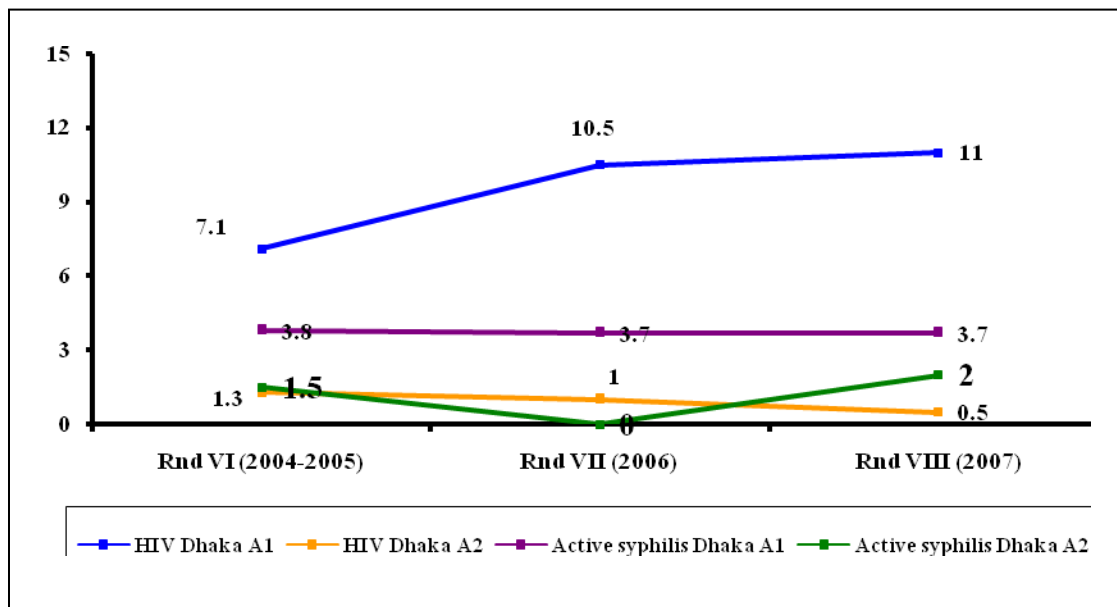


Neighbourhoods of Dhaka

The HIV epidemic in IDU in Dhaka was shown to be localised in one neighbourhood (A1) during the 6th round of surveillance and since then the Dhaka neighbourhoods (A1 and A2) are being monitored in each surveillance round. During this round, a similar picture was obtained with IDU in Dhaka-A1 continuing to have the highest HIV prevalence (11%) while 0.5% of IDU in Dhaka-A2 were HIV positive; these differences were significant ($P < 0.001$). The prevalence in Dhaka A1 has increased over time, although there were no differences between the 7th and 8th rounds (Fig 9).

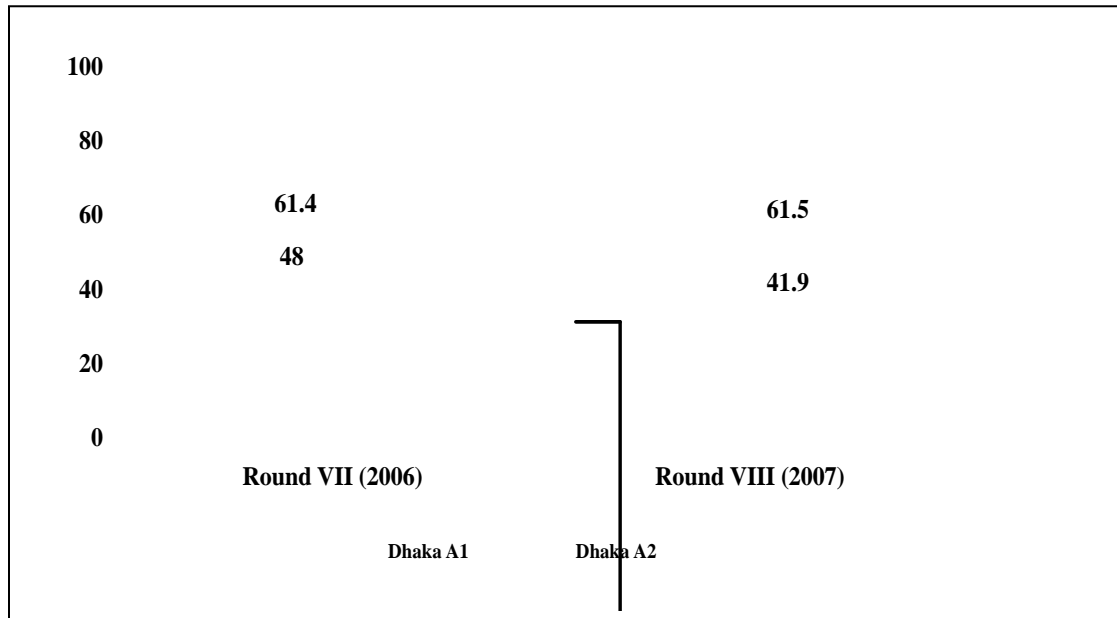
Active syphilis rates did not change over the rounds in each of the two neighbourhoods. Although there were a significant difference between the rates in A1 and A2 during the 6th and 7th rounds, this difference was not observed in the 8th round (Fig 9).

Figure 9. HIV and active syphilis rates among the IDU in two neighbourhoods from Dhaka



HCV rates between 7th and 8th round did not change in the two neighbourhood of Dhaka city (Fig 10). However, HCV rates between neighbourhoods A1 and A2 were significantly different in both rounds ($P < 0.001$ for both rounds).

Figure 10. HCV among the IDU in two neighbourhoods from Dhaka

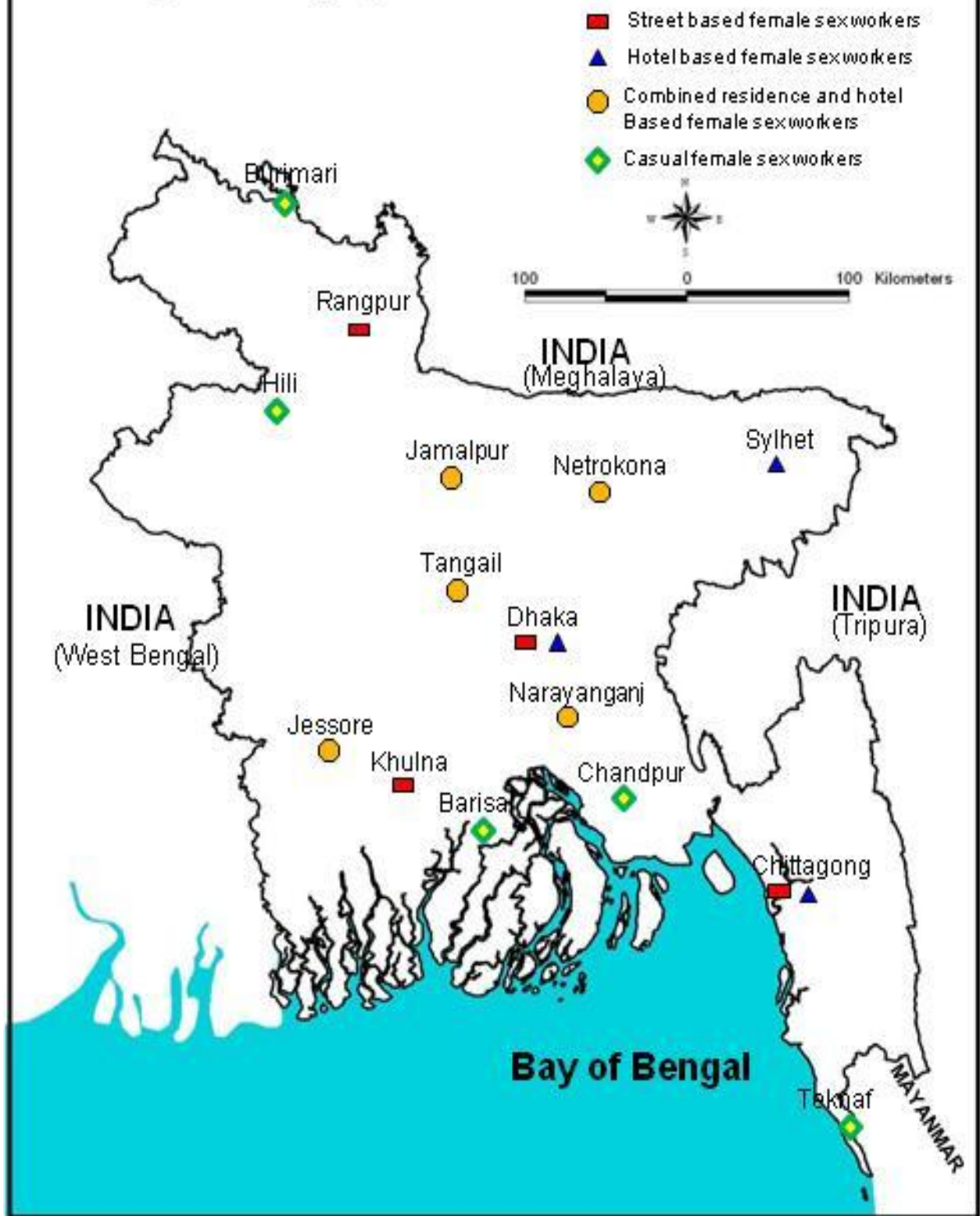


4.2 FEMALE SEX WORKERS

A total of 4797 female sex workers were sampled from 15 cities of Bangladesh from different venues (Fig 11).

- Female street sex workers were sampled from four cities and for the first time they were sampled from Rangpur
- Female sex workers from hotels were sampled from three cities
- Casual female sex workers were sampled from five cities and of these, three were cities bordering neighbouring countries; Hili and Burimari border India and Teknaf borders Myanmar
- Combined residence and hotel based sex workers were sampled from five cities for the first time

Figure 11: Sampling sites for female sex workers, 2008



Demographic characteristics

Among all groups of female sex workers, casual female sex workers from Hili were the oldest ($P < 0.05$). Although the proportion of female sex workers who ever attended school was lowest in casual female sex workers from Teknaf ($P < 0.05$) but the median duration of education was lowest among the casual female sex workers from Hili ($P < 0.05$). Street based female sex workers from Dhaka were selling sex for a longer duration ($P < 0.05$) and also living in the same city for a longer duration ($p < 0.05$) than other female sex workers (Table 5).

Table 5. Demographic characteristics of female sex workers, 2007

| Geographical Location (N) | Age in years, median (IQR*) | Ever attended school, % (n) | Education (years), median (IQR) | Duration as sex worker (months), median (IQR) | Duration at same site as sex worker (months), median (IQR) |
|---|-----------------------------|-----------------------------|---------------------------------|---|--|
| Street based female sex workers: | | | | | |
| Dhaka (409) | 25 (20-30) | 34.0 (139) | 5 (3-6) | 60 (24-120) | 60 (24-108) |
| Chittagong (404) | 25 (20-30) | 29.5 (119) | 5 (3-6) | 36 (12-60) | 36 (12-60) |
| Khulna (270) | 24 (20-28) | 60.0 (162) | 5 (3-7) | 24 (12-48) | 24 (8-48) |
| Rangpur (246) | 28 (23-38) | 19.5 (48) | 5 (3-5) | 48 (24-60) | 48 (24-60) |
| Hotel based female sex workers: | | | | | |
| Dhaka (399) | 20 (18-24) | 68.2 (272) | 6 (5-8) | 12 (7-24) | 12 (7-24) |
| Chittagong (122) | 20 (18-20) | 68.9 (84) | 5 (4-7) | 16 (7-38) | 15 (6-38) |
| Sylhet (180) | 22 (19-26) | 37.2 (67) | 5 (4-7) | 24 (7-36) | 12 (3-36) |
| Combined residence and hotel based female sex workers: | | | | | |
| Narayanganj (277) | 25 (20-30) | 47.8 (132) | 5 (4-8) | 36 (12-60) | 30 (12-60) |
| Tangail (352) | 30 (25-35) | 30.7 (108) | 6(4-8) | 42 (24-84) | 40 (24-48) |
| Jamalpur (300) | 25 (22-30) | 33.0 (99) | 5 (4-9) | 36 (24-60) | 36 (18-60) |
| Netrokona (241) | 25 (21-30) | 36.1 (87) | 5 (4-5) | 48 (36-60) | 36 (24-60) |
| Jessore (380) | 25 (20-30) | 53.4 (203) | 6 (5-9) | 24 (12-36) | 24 (12-36) |
| Casual female sex workers: | | | | | |
| Chandpur (121) | 30 (22-35) | 43.0 (52) | 6 (3-9) | 36 (24-60) | 36 (24-60) |
| Teknaf (246) | 23 (19-27) | 11.8 (29) | 5 (5-7) | NQ | NQ |
| Hili (150) | 33 (28-37) | 27.3 (41) | 3 (2-5) | NQ | NQ |
| Burimari (300) | 30 (23-35) | 46.3 (139) | 4 (3-6) | NQ | NQ |
| Barisal (400) | 26 (23-30) | 46.3 (185) | 4 (3-5) | 36 (24-60) | 36 (24-60) |

Other characteristics of casual female sex workers

Generally it is perceived that people residing in border areas frequently cross over to neighbouring countries for different reasons. For this reason, questions were asked to casual female sex workers from the three border cities (Hili, Burimari and Teknaf) whether they had ever crossed the border to India or Myanmar respectively and if they had whether they had sold sex while in those countries (Table 6). As with the previous round of surveillance, the proportion of the sex workers who crossed the border were highest in Hili compared to those from Burimari and Teknaf ($P < 0.001$ for both). From all three cities, large proportions of sex workers who said they had travelled to the neighbouring countries had also sold sex there (Table 6).

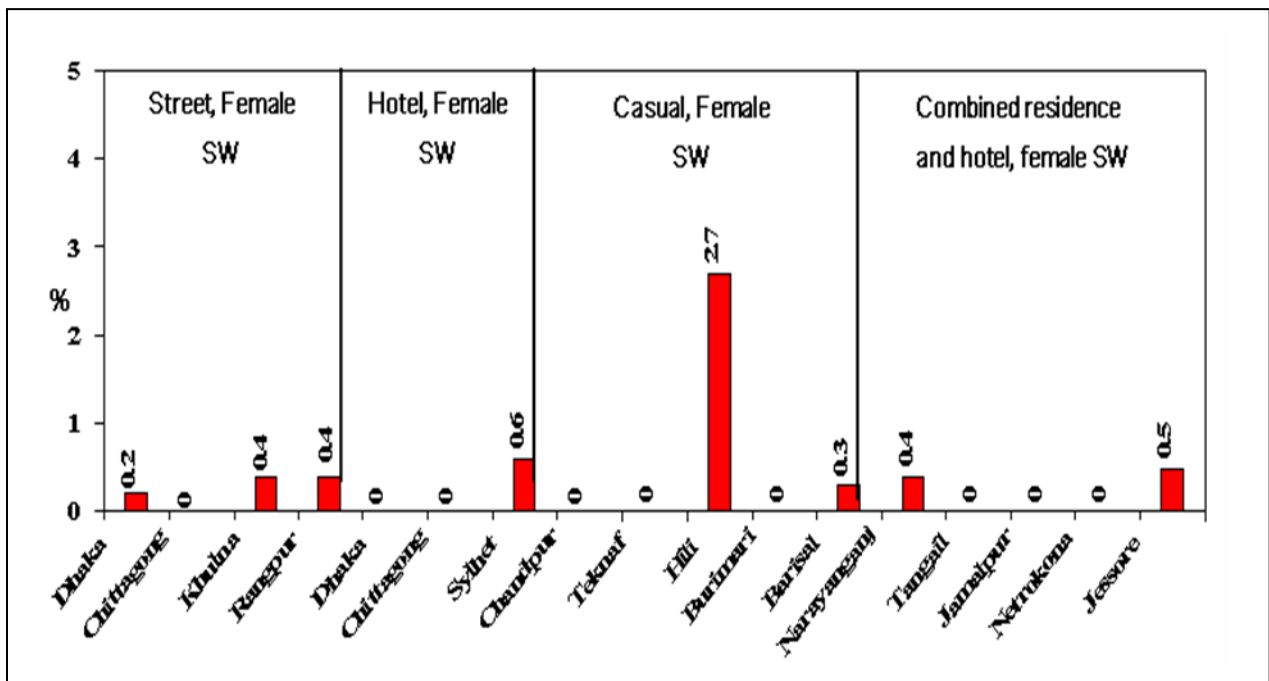
Table 6. Mobility of the casual female sex workers in the border area, 2007

| Variables | Teknaf N=246 | Hili N=150 | Burimari N=300 |
|---|-----------------|---------------|-------------------|
| Crossed the border to India or Myanmar, n (%) | 6.5 (16) | 89.3 (134) | 9.3 (28) |
| Sold sex while in the neighbouring country, % (n) | 87.5 (14) | 98.5 (132) | 100 (28) |

HIV and syphilis

HIV prevalence among female sex workers in different setting was <1% except those from Hili where four samples tested positive out of 150 samples (2.7%) (Fig 12 and Annexe 1). This is the highest rate documented for any sex worker population in all the rounds of surveillance conducted so far.

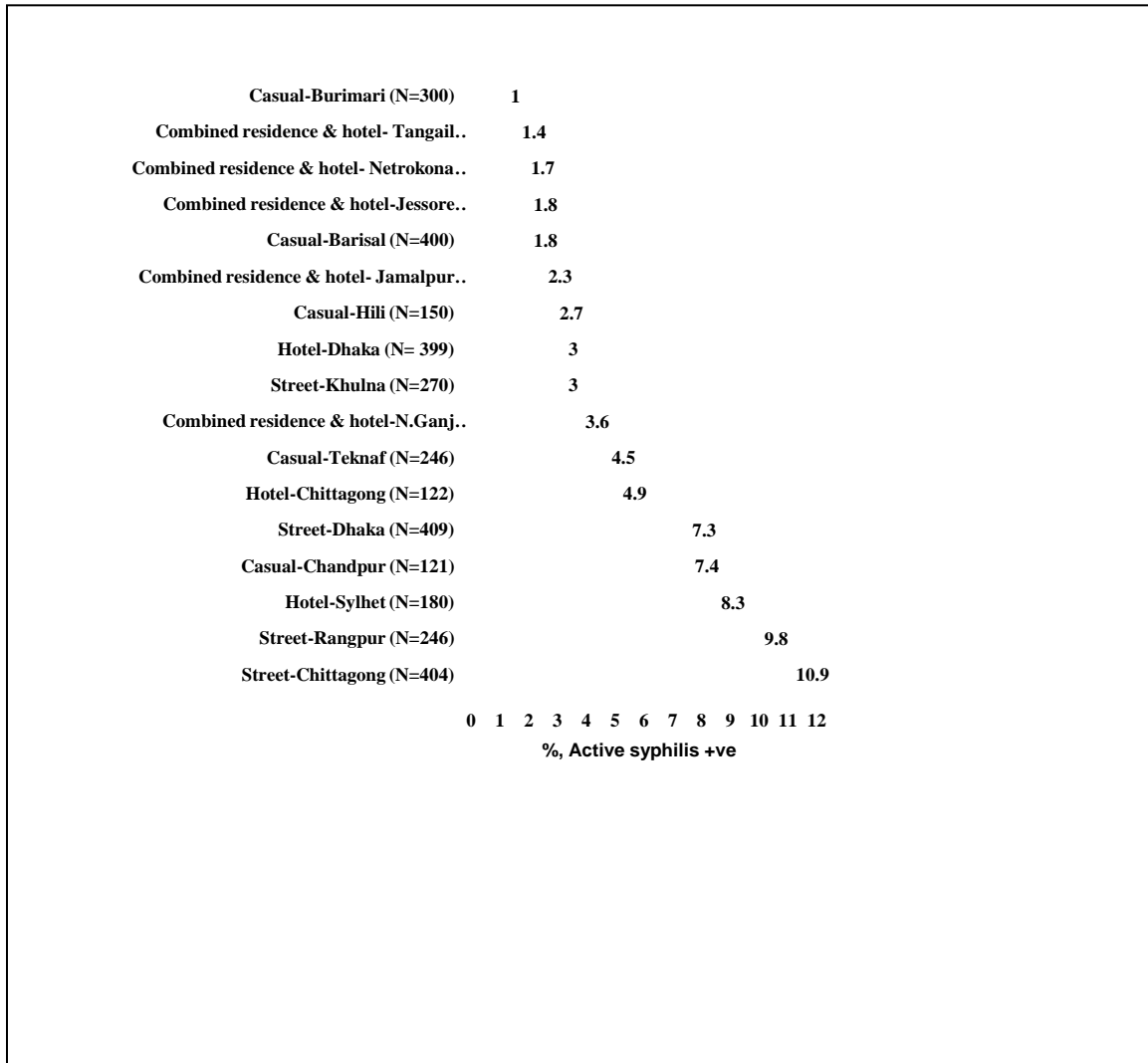
Figure 12. HIV prevalence among female sex workers, 2007



Note: SW refers to sex workers

Active syphilis rates varied among female sex workers in different venues and cities and in five cities the prevalence rate was more than 5%. As in the previous year, active syphilis rate was highest among the street based female sex workers from Chittagong (10.9%) (Fig 13 and Annexe 2).

Figure 13. Prevalence of active syphilis among female sex workers, 2007



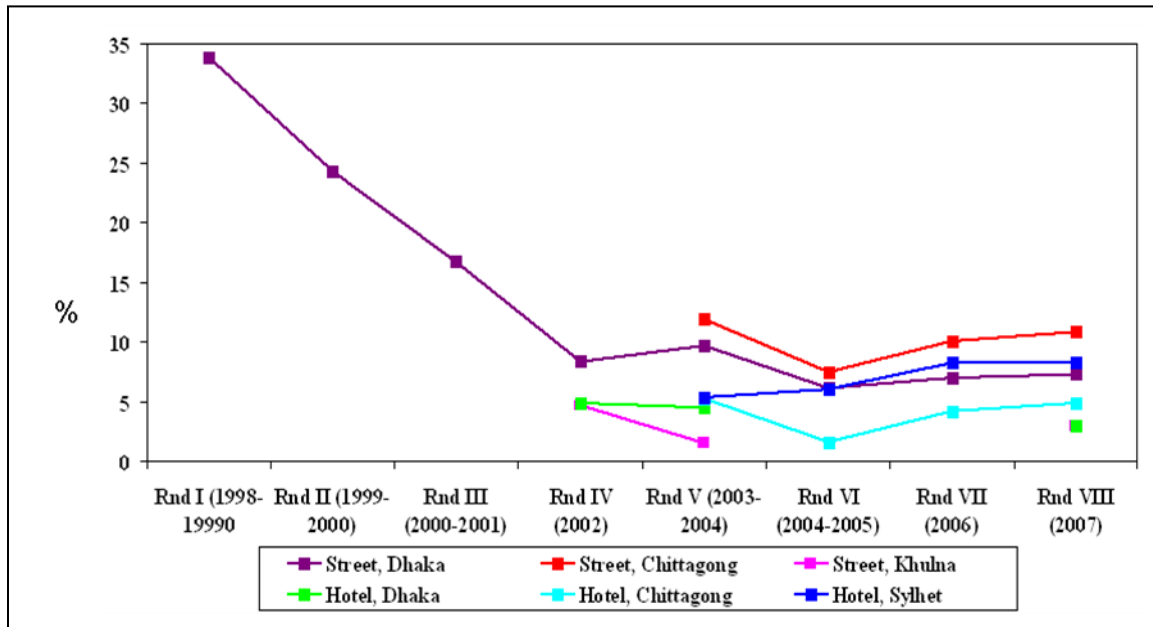
Comparison over the rounds

Over the rounds HIV prevalence among female sex workers was low (Annexe 1). For sites where HIV was detected over the rounds, the changes were not significant, even for those in Hili.

As with the previous rounds, active syphilis rates declined significantly ($P < 0.001$) for street based female sex workers in Dhaka. However, after the 4th round, there has been a plateau in the proportions of sex workers with active syphilis rates hovering at

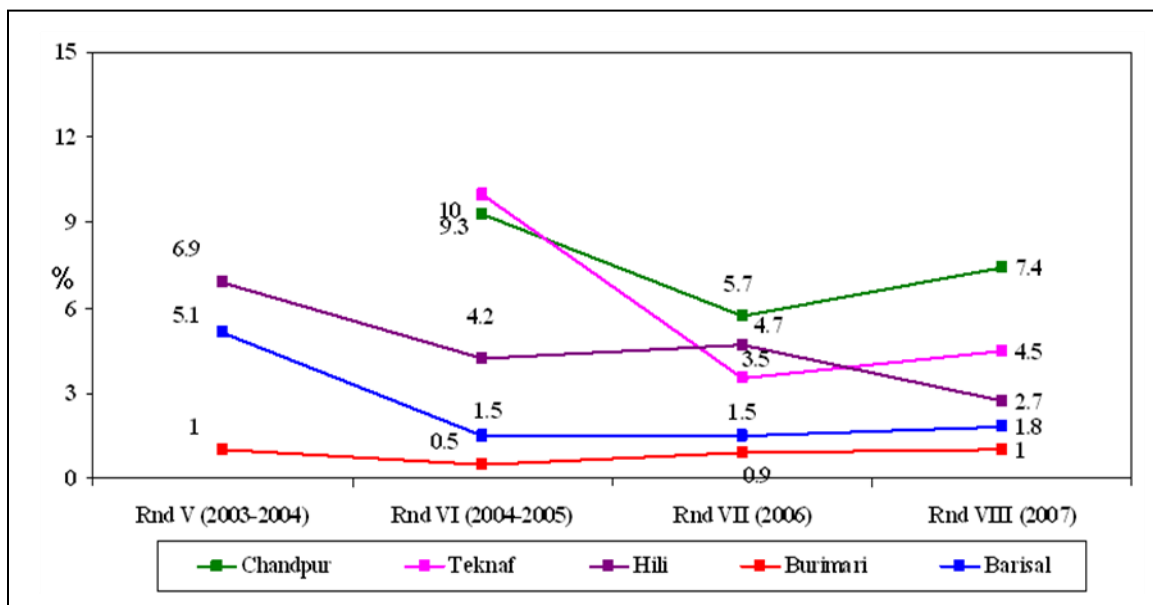
approximately 7%. The changes were not significant for street sex workers from Chittagong, Khulna and hotel based female sex workers from Dhaka, Chittagong and Sylhet (Fig 14).

Figure 14. Active syphilis prevalence in female street and hotel based sex workers over the rounds



Over the rounds, active syphilis rates for the casual female sex workers declined significantly in Barisal ($P=0.049$) and Teknaf ($P=0.037$). Changes for active syphilis were not significant in Chandpur, Burimari and Hili (Fig 15).

Figure 15. Active syphilis prevalence in casual female sex workers over the rounds



4.3 MALES WHO HAVE SEX WITH MALES (MSM), MALE SEX WORKERS (MSW), COMBINED MSM/ MSW AND HIJRAS

As with the previous rounds of surveillance, MSM and MSW were sampled from Dhaka, combined MSM/MSW were sampled from Chittagong and Hijra were sampled from Dhaka and Manikganj.

Demographic characteristics

Median ages of MSM, MSW, combined MSM/ MSW and Hijra were similar. Proportions who ever attended school were significantly lower in Hijra compared to MSM (P=0.007) and MSW (P=0.11). The median duration of education was similar for all four groups. Hijra reported selling sex for a longer time (P<0.001) than MSW and combined MSM/MSW (Table 7).

Table 7. Demographic characteristics of MSM, MSW, combined MSM/MSW and Hijra, 2007

| Geographical location (N) | Age in years median (IQR*) | Ever attended school % (n) | Education (years) median (IQR) | Duration as male/Hijra sex worker (months) median (IQR) | Duration at the same site as male/Hijra sex worker (months) median (IQR) |
|---|----------------------------|----------------------------|--------------------------------|---|--|
| Males who have sex with males (MSM): | | | | | |
| Dhaka (399) | 22 (20-27) | 81.5 (325) | 7 (5-9) | NA | 144 (60-240) |
| Male sex workers (MSW): | | | | | |
| Dhaka (400) | 22 (20-28) | 81.0 (324) | 8 (5-10) | 60 (24-120) | 48 (24-106) |
| Combined MSM/MSW: | | | | | |
| Chittagong (290) | 24 (20-30) | 79.7 (231) | 8 (5-9) | 60 (24-93) | 144 (70.5-240) |
| Hijra: | | | | | |
| Dhaka, Manikganj (392) | 23 (20-26) | 73.5 (288) | 7 (5-8) | 96 (48-144) | 84 (48-120) |

*IQR refers to inter quartile range; §NA = Not applicable

HIV and syphilis

None of the MSM in Dhaka tested positive for HIV and as with the previous round HIV prevalence remained <1% in MSW, combined MSM/MSW and Hijra (Table 8). The prevalence of active syphilis was significantly higher in Hijra compared to MSW (P=0.003) and it was similar between MSM and MSW from the same city (Table 8).

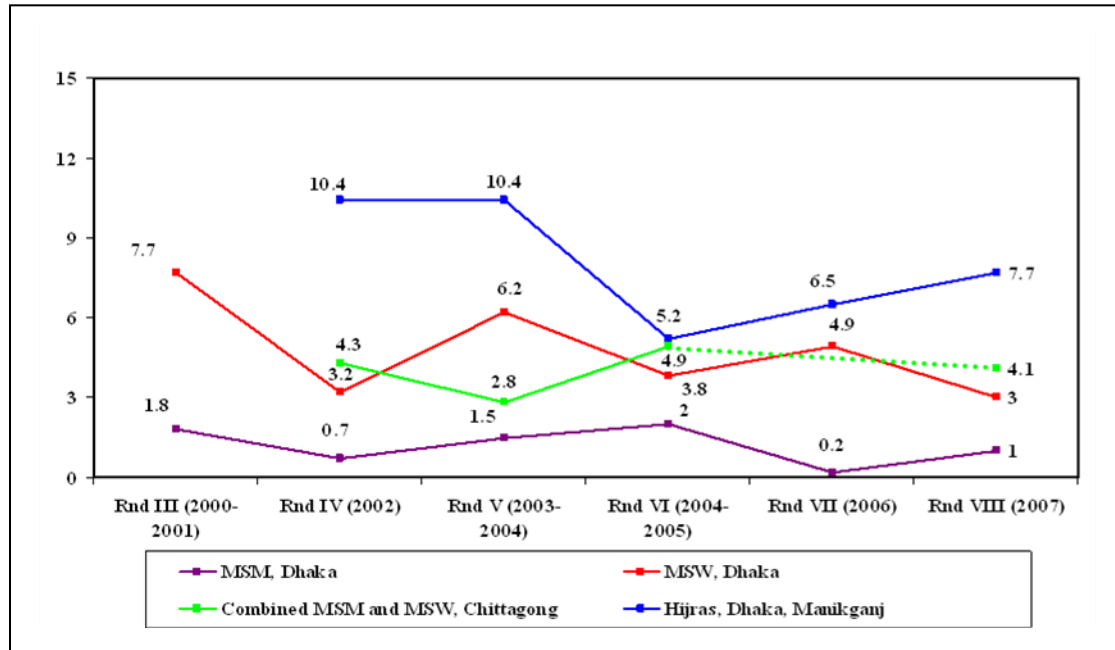
Table 8. Prevalence of HIV and syphilis among MSM, MSW, combined MSM/MSW and Hijra, 2007

| Study Populations, Geographical Location (N) | HIV % (n) | Active syphilis % (n) |
|--|-----------|-----------------------|
| Males who have sex with males: Dhaka (399) | 0 | 1.0 (4) |
| Male sex workers: Dhaka (400) | 0.3 (1) | 3.0 (12) |
| Combined MSM/MSW: Chittagong (290) | 0.3 (1) | 4.1 (12) |
| Hijra: Dhaka, Manikganj (392) | 0.3 (1) | 7.7 (30) |

Comparison over the rounds

There were no changes in the rates of active syphilis over the rounds in MSM from Dhaka and combined MSM/MSW from Chittagong (Fig 16). However, significant declines in rates were observed in MSW from Dhaka (P=0.04) and in Hijra from Dhaka and Manikganj (P=0.032) (Fig 16).

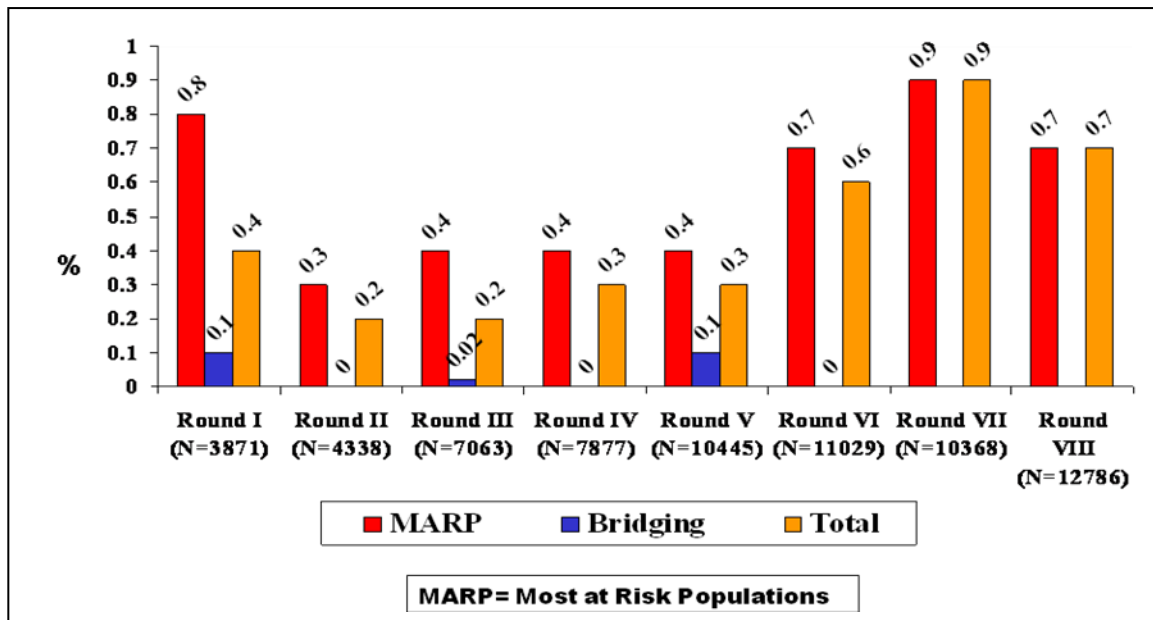
Figure 16. Prevalence of active syphilis among MSM, MSW, combined MSM & MSW and Hijra over the rounds



5. SUMMARY OF FINDINGS, DISCUSSION AND CONCLUSION

The overall HIV prevalence has remained <1% over the rounds of surveillance irrespective of whether the total population is considered or when segregated for the most at risk and bridge populations (Fig 17).

Figure 17. HIV prevalence over the rounds



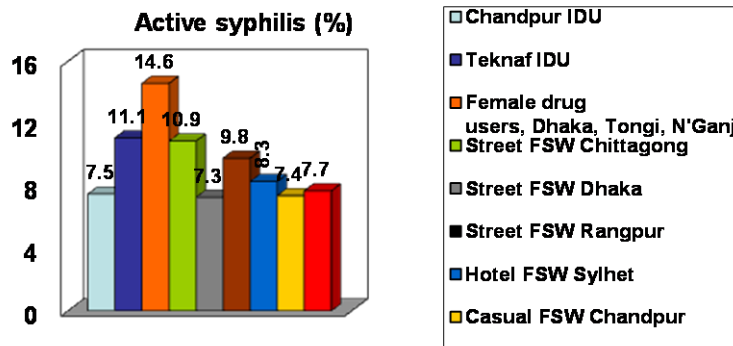
Moreover, this is also the situation for the HIV epidemic in IDU in Dhaka where it is still localized to one neighbourhood. However, during this 8th round, another population group appears to be emerging with a relatively higher HIV prevalence rate - female sex workers in Hili where for the first time the HIV rate increased beyond 1% (2.7%). A large proportion of female sex workers from Hili said that they had crossed the border over to India where they sold sex and all four who were HIV positive said they had done so. Anecdotal data from female sex workers in Uttar Dinajpur of West Bengal in India shows rising levels of HIV in female sex workers (NACO, India, personal communication). Mobility and migration are known to enhance vulnerability to HIV and women are particularly vulnerable (Blanchet, Biswas et al. 2003). But little is known about the sex workers operating in Hili and the behavioural surveillance system of the country does not sample sex workers from Hili (Govt. of Bangladesh 2007). While sampling for serological surveillance it was apparent that most sex workers are part time and scattered.

Bangladesh has gathered considerable experience from monitoring the epidemic in IDU in Dhaka which could provide pointers in the way forward for the Hili sex workers. Two salient features are highlighted here:

- When surveillance was initiated among Dhaka IDU from the NSP in 1999, the prevalence of HIV in this group was 1.4% (Govt. of Bangladesh 2001). This steadily increased to 7% over six to seven years. One of the reasons why it was possible to detect the rise early was because of an ongoing in-depth research study among IDU in the epidemic neighbourhood. It was through this study that the localised HIV epidemic in Dhaka IDU was first observed in 2003 (Azim, Chowdhury et al. 2008 (in press)). The surveillance data then confirmed this finding. As mentioned earlier, there is no easily accessible information on female sex workers from Hili. In order to better understand the factors associated with a possible HIV epidemic, it is of utmost importance and urgency that in-depth research studies be undertaken in this population.
- IDU in Dhaka had access to NSP and other harm reduction services since 1998, well before the epidemic had taken a foothold and the NSP has been shown to have had an impact in delaying the epidemic (Foss, Watt et al. 2007). But Hili sex workers have not been under any HIV intervention programme since 2004. This is of grave concern and intervention programmes need to be initiated urgently. The program on street sex workers of Dhaka has been cited as best practice by UNAIDS (UNAIDS 2000) which has highlighted the work of self help organisation of sex workers. The same self help organisation was working previously in Hili but due to a lack of funds, their work has been interrupted.

Other than HIV, the surrogate markers of risk – active syphilis and HCV, both provide encouraging data. Where changes have been observed in these parameters, they have all been on the decline; there are no group or sites where the rates of either infection increased. However, there were some population groups that had unacceptably high levels of active syphilis (Fig 3, 13 and Table 8). Active syphilis rates at >5% were found in drug users, female sex workers and Hijra from nine cities. Among these nine, three were in drug users, five in female sex workers and one in Hijra (Fig 18).

Figure 18. Population groups where more than 5% had active syphilis



The fact that drug users had high active syphilis rates is very worrying and confirms other data showing that drug users are sexually active and practice unsafe sex (Govt. of Bangladesh 2007). The highest rate was in female drug users from Dhaka, Tongi and Narayanganj and it is known that approximately two-thirds of female drug users are street based sex workers (Azim, Chowdhury et al. 2006). But what is surprising is that fewer female sex workers from the streets of Dhaka had active syphilis (7.3%) compared to the female drug users. A possible explanation for this is that the female drug users are not receiving adequate STI services compared to female sex workers in the same city although both groups are selling sex in the streets of Dhaka.

In Teknaf, active syphilis rates in female sex workers was found to be lower than in the IDU. This is difficult to explain especially as no behavioural surveillance has been conducted in Teknaf but it does raise the question of the source of infection in IDU. In order to better understand the underlying factors behind these data it is essential to conduct behavioural surveillance and research studies. Another city where IDU had high active syphilis rates is Chandpur and the rates in IDU were similar to those in casual female sex workers in Chandpur. Behavioural surveillance has been conducted in Chandpur IDU and the data show that 56.6% bought sex from sex workers in the last year (NASP, unpublished data of BSS 2006-2007), which indicates that the drug user and sex workers populations of Chandpur are closely linked.

Another worrying feature of the active syphilis rates is that although in some of these cities rates are declining, present rates are still high such as in the street based female sex workers of Dhaka and more needs to be done for prevention and treatment of STIs.

High HCV levels in many cities among IDU confirm injection sharing behaviour. The declining levels of HCV in Dhaka IDU shown through serological surveillance

corroborates behavioural surveillance findings which have shown that borrowing of needles/syringes in the last two months declined from 86% in 2003-2004 (Govt. of Bangladesh 2007) to 55.2% in 2006-2007 (NASP, unpublished data of BSS 2006-2007). An interesting observation is the very low levels of HCV in several cities. No data are readily available from these cities to explain these low levels and this needs further research aimed at providing insights into safer injection practices.

A limitation of the serological surveillance is the sampling methodology. The participants in this surveillance have all been recruited through intervention organisations and recruitment does not follow a random sampling procedure. This obviously raises the question of representativeness and therefore, whether the surveillance data truly reflect the HIV epidemic in Bangladesh. Several mechanisms have been employed to check these data and these include comparisons with other studies where they have been conducted and with VCT data where they exist. All sources of data so far confirm the low levels of HIV reported through surveillance.

In summary, this round of serological surveillance taken together with the trends obtained through the years, suggests that an HIV epidemic may be emerging among female drug users in Hili; it confirms risky sexual behaviour in drug users including IDU, and on the more positive side, suggests the need for more insight into the reasons for very low HCV levels among IDU in some cities. It is to be borne in mind that surveillance can only monitor infection progression; it cannot provide reasons for changes observed. In order to better understand the underlying causes it is essential to conduct in-depth studies that will enable more evidenced based intervention programming. Nonetheless, even with the existing information, it is imperative that urgent measures are taken to prevent escalation of the HIV epidemic.

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ANNEXE: 1

**PREVALENCE OF HIV OVER EIGHT ROUNDS OF SEROLOGICAL SURVEILLANCE
1998-1999, 1999-2000, 2000-2001, 2002, 2003-2004, 2004-2005, 2006 AND 2007**

| Study Populations, Geographical Location | HIV % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Injection Drug Users (IDU): | | | | | | | | |
| Detoxification Clinic: Dhaka | 2.5 (10), 402 | 0.2 (1), 402 | 0 (92) | ND | ND | ND | ND | ND |
| Out of detoxification clinic: Dhaka† | ND | 1.4 (6), 418 | 1.7 (7), 401 | 4.0 (16), 403 | 4.0 (16), 404 | 4.9 (52), 1061 | 7.0 (75), 1072 | 7.0 (73), 1045 |
| Dhaka-A1 | ND | ND | ND | ND | ND | 7.1 (47), 664 | 10.5 (71), 674 | 11.0 (71), 646 |
| Dhaka-A2 | ND | ND | ND | ND | ND | 1.3 (5), 397 | 1.0 (4), 398 | 0.5 (2), 399 |
| Mymensingh | ND | ND | ND | ND | ND | 0 (395) | 0, (301) | 0 (260) |
| Narayanganj | ND | ND | ND | ND | 0 (107) | 0 (103) | 1.0 (1), 105 | 0.8 (1), 127 |
| Tongi | ND | ND | ND | ND | 0 (122) | 0 (178) | 0 (160) | 0 (68) |
| Norsingdi | ND | ND | ND | ND | ND | ND | ND | 0 (77) |
| Chandpur | ND | ND | ND | ND | 0 (86) | 0.6 (1), 159 | 1.1 (2), 178 | 0.6 (1), 159 |
| Teknaf | ND | ND | ND | ND | ND | 0 (155) | 0 (120) | 0.9 (1), 108 |
| Rajshahi | ND | 0 (416) | 0 (402) | 0 (405) | 0 (394) | 0 (398) | 0 (393) | 0 (400) |
| Chapai Nawabganj | ND | ND | 0 (120) | 0 (200) | 0 (239) | 0 (208) | 0 (200) | 0 (210) |
| Kanshat | ND | ND | ND | ND | 0 (47) | 0 (66) | 0 (69) | 0, (71) |
| Char Norendrapur | ND | ND | ND | ND | 0 (78) | ND | ND | 0 (101) |
| Rangpur | ND | ND | ND | ND | ND | ND | 0 (187) | 0 (164) |
| Naogaon | ND | ND | ND | ND | ND | 0 (120) | 0 (193) | 0 (270) |
| Pabna | ND | ND | ND | ND | 0 (85) | 0 (57) | 0 (69) | 0 (116) |
| Ishwardi | ND | ND | ND | ND | 0 (57) | 2.0 (1), 49 | 1.8 (1), 55 | 1.7 (1), 60 |
| Sirajganj | ND | ND | ND | ND | ND | 0 (111) | 0 (122) | 0 (300) |
| Dinajpur | ND | ND | ND | ND | ND | ND | 0 (279) | 0 (400) |
| Jessore | ND | ND | ND | ND | ND | 0 (100) | 0 (132) | 0 (202) |
| Sathkhira | ND | ND | ND | ND | ND | 0 (201) | 0 (226) | 0 (279) |
| Srimongol | ND | ND | ND | ND | ND | ND | ND | 0 (200) |
| Barisal | ND | ND | ND | ND | ND | 0 (202) | 0 (234) | 0 (275) |

| Study Populations, Geographical Location | HIV % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Heroin Smokers: Dhaka | ND | ND | ND | 0 (388) | 0.8 (3), 391 | 0.5 (2), 399 | 0 (401) | 0.2 (1), 402 |
| Combined Injection Drug Users and Heroin Smokers: Jaipurhat | ND | ND | ND | ND | ND | ND | ND | 0 (65) |
| Khulna | ND | ND | ND | ND | ND | ND | 0 (387) | 0.3 (1), 397 |
| Mongla | ND | ND | ND | ND | ND | ND | ND | 0 (130) |
| Bagerhat | ND | ND | ND | ND | ND | ND | ND | 0 (140) |
| Jhenaidah | ND | ND | ND | ND | ND | ND | ND | 0 (149) |
| Kushtia | ND | ND | ND | ND | ND | ND | ND | 0 (130) |
| Patuakhali | ND | ND | ND | ND | ND | ND | ND | 0 (100) |
| Female: Dhaka, Narayanganj and Tongi | ND | ND | ND | ND | ND | 0 (119) | 0.8 (1), 121 | 1.0 (1), 103 |
| Brothel Based Female Sex Workers: | | | | | | | | |
| Tangail | (0), 392 | 0 (402) | 0.5 (2), (407) | 0.2 (1), 406 | 0.5 (2), 404 | 0.2 (1), 401 | 0.3 (1), 400 | ND |
| Mymensingh | ND | 0 (322) | ND | 0 (152) | 0 (159) | 0.7 (1), 150 | 0.7 (1), 150 | ND |
| Doulatdia | ND | ND | 0.3 (1), (384) | 0.7 (3), 402 | 0.5 (2), 401 | 0.3 (1), 397 | 0.2 (1), 401 | ND |
| Narayanganj | 1.5 (4), 267 | ND | ND | ND | ND | ND | ND | ND |
| Jamalpur | ND | ND | ND | ND | 0 (136) | 0 (166) | 0 (168) | ND |
| Faridpur | ND | ND | ND | ND | 0 (376) | 0 (370) | 0 (373) | ND |
| Madaripur | ND | ND | ND | ND | 0.5 (1), 205 | 0 (190) | 0.5 (1), 222 | ND |
| Fultola, Baniasanta, Bagerhat [‡] | ND | 0 (351) | 0 (335) | 0 (241) | 0 (293) | 0.4 (1), 252 | 0 (260) | ND |
| Jessore | ND | ND | 0.5 (1), 187 | 0.5 (1), 195 | 0.6 (1), 171 | 0.6 (1), 167 | 0 (174) | ND |
| Patuakhali | ND | ND | ND | ND | 0 (59) | 0 (62) | 0 (52) | ND |
| Street Based Female Sex Workers: | | | | | | | | |
| Dhaka | 0 (400) | 0.2 (0-1.3), 1 (423) | 0.5 (2), 419 | 0.2 (1), 403 | 0.2 (1), 401 | 0.2 (1), 402 | 0.3 (1), 386 | 0.2 (1), 409 |
| Tangail | ND | ND | ND | 0 (199) | ND | ND | ND | ND |
| Chittagong | ND | ND | ND | ND | 0 (402) | 0 (402) | 0 (405) | 0 (404) |
| Khulna | ND | ND | ND | 0 (317) | 0 (403) | ND | ND | 0.4 (1), 270 |
| Rangpur | ND | ND | ND | ND | ND | ND | ND | 0.4 (1), 246 |

| Study Populations, Geographical Location | HIV % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Hotel Based Female Sex Workers: Dhaka | ND | ND | ND | 0.2 (1), 405 | 0 (400) | ND | ND | 0 (399) |
| Chittagong | ND | ND | ND | ND | 1.5 (2), 132 | 0 (128) | 0 (118) | 0 (122) |
| Sylhet | ND | ND | ND | ND | 0.6 (1), 166 | 0.6 (1), 165 | 0 (169) | 0.6 (1), 180 |
| Combined Residence and Hotel Based Female Sex Workers: Narayanganj | ND | ND | ND | ND | ND | ND | ND | 0.4 (1), 277 |
| Tangail | ND | ND | ND | ND | ND | ND | ND | 0 (352) |
| Jamalpur | ND | ND | ND | ND | ND | ND | ND | 0 (300) |
| Netrokona | ND | ND | ND | ND | ND | ND | ND | 0 (241) |
| Jessore | ND | ND | ND | ND | ND | ND | ND | 0.5 (2), 380 |
| Casual Female Sex Workers: Chandpur | ND | ND | ND | ND | ND | 0 (97) | 0 (88) | 0 (121) |
| Teknaf | ND | ND | ND | ND | ND | 0 (150) | 0 (200) | 0 (246) |
| Hili | ND | ND | ND | ND | 2.0 (2), 101 | 1.7 (2), 120 | 0.8 (1), 128 | 2.7 (4), 150 |
| Burimari | ND | ND | ND | ND | 0 (381) | 0 (200) | 0 (235) | 0 (300) |
| Barisal | ND | ND | ND | ND | 0 (197) | 0 (400) | 0 (397) | 0.3 (1), 400 |
| Male Sex Workers (MSW): Central-A | ND | ND | 0 (310) | 0 (401) | 0 (274) | 0 (235) | 0.7 (2), 284 | 0.3 (1), 400 |
| Males Who Have Sex With Males (MSM): Dhaka | ND | ND | 0 (399) | 0.2 (1), 406 | 0 (399) | 0 (405) | 0.2 (1), 401 | 0 (399) |
| MSM and MSW combined ⁸ : Dhaka | 0.2 (1), (401) | 0 (388) | ND | ND | ND | ND | ND | ND |
| Mymensingh | ND | ND | ND | 0 (400) | 0 (400) | ND | ND | ND |
| Chittagong | ND | ND | ND | 0 (397) | 0.3 (1), 398 | 0.4 (1), 283 | ND | 0.3 (1), 290 |
| Sylhet | ND | ND | ND | 0 (402) | 0.3 (1), 400 | 0.4 (1), 231 | ND | ND |
| Hijras: Dhaka | ND | ND | ND | 0.8 (3), 393 | ND | ND | ND | ND |
| Dhaka, Manikganj | ND | ND | ND | ND | 0.2 (1), 405 | 0.8 (3), 381 | 0.6 (2), 353 | 0.3 (1), 392 |
| Partners of Hijra: Dhaka, Manikganj | ND | ND | ND | ND | 0 (88) | ND | ND | ND |

| Study Populations, Geographical Location | HIV % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Babus (Brothel): Tangail | ND | ND | ND | 0 (252) | 0 (251) | ND | ND | ND |
| Doulatdia | ND | ND | ND | 0 (200) | 0 (175) | ND | ND | ND |
| Jamalpur | ND | ND | ND | ND | 0 (56) | ND | ND | ND |
| STI Patients: Dhaka | 0.3 (1), (399) | 0 (404) | ND | ND | ND | ND | ND | ND |
| Chittagong | 0.2 (1), (409) | 0 (404) | 0.2 (1), 403 | ND | ND | ND | ND | ND |
| Rajshahi, Rangpur [‡] | 0 (401) | 0 (408) | 0 (392) | ND | ND | ND | ND | ND |
| Sylhet | 0 (397) | ND | 0 (389) | 0 (106) | ND | ND | ND | ND |
| Truckers: Dhaka | 0 (403) | ND | 0 (437) | 0 (402) | ND | ND | ND | ND |
| Jessore | ND | ND | 0 (392) | ND | ND | ND | ND | ND |
| Benapole | ND | ND | ND | ND | ND | 0 (398) | ND | ND |
| Dockworkers: Chittagong | ND | ND | 0 (392) | ND | ND | 0 (395) | ND | ND |
| Mongla | ND | ND | 0 (401) | ND | ND | ND | ND | ND |
| Rickshaw pullers: Dhaka | ND | ND | ND | ND | 0.2 (1), 401 | 0 (401) | ND | ND |
| Chittagong | ND | ND | 0 (400) | ND | 0 (401) | ND | ND | ND |
| Jessore | ND | ND | 0 (401) | ND | ND | ND | ND | ND |
| Launch Workers: Dhaka | ND | ND | ND | 0 (402) | ND | ND | ND | ND |
| TOTAL | 0.4 (17), 3871 | 0.2 (8), 4338 | 0.2 (14), 7063 | 0.3 (27), 7877 | 0.3 (35), 10445 | 0.6 (70), 11029 | 0.9 (91), 10368 | 0.7 (95), 12786 |

[†]Dhaka represents the merged result of Dhaka A1 and Dhaka A2

[‡]Three geographical related areas Fultola, Baniasanta and Bagerhat 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 in Rajshahi, in the subsequent rounds sampling was done from Rajshahi and Rangpur and these together represents a single site

ANNEXE: 2

**PREVALENCE OF ACTIVE SYPHILIS OVER EIGHT ROUNDS OF SEROLOGICAL SURVEILLANCE
1998-1999, 1999-2000, 2000-2001, 2002, 2003-2004, 2004-2005, 2006 AND 2007**

| Study Populations, Geographical Location | Active syphilis % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Injection Drug Users (IDU): | | | | | | | | |
| Detoxification Clinic: Dhaka | 4.5 (18), 402 | 4.0 (18), 402 | 4.3 (4), 92 | ND | ND | ND | ND | ND |
| Out of detoxification clinic: Dhaka† | ND | 9.3 (39), 418 | 2.5 (10), 401 | 3.5 (14), 403 | 1.2 (5), 404 | 2.9 (31), 1061 | 2.3 (25), 1066 | 3.1 (32), 1045 |
| Dhaka-A1 | ND | ND | ND | ND | ND | 3.8 (25), 664 | 3.7 (25), 668 | 3.7 (24), 646 |
| Dhaka-A2 | ND | ND | ND | ND | ND | 1.5 (6), 397 | 0 (398) | 2.0 (8), 399 |
| Mymensingh | ND | ND | ND | ND | ND | 1.8 (7), 395 | 0.7 (2), 301 | 0.4 (1), 260 |
| Narayanganj | ND | ND | ND | ND | 5.6 (6), 107 | 1.0 (1), 103 | 2.9 (3), 105 | 4.7 (6), 127 |
| Tongi | ND | ND | ND | ND | 1.6 (2), 122 | 3.9 (7), 178 | 4.4 (7), 160 | 2.9 (2), 68 |
| Norsingdi | ND | ND | ND | ND | ND | ND | ND | 3.9 (3), 77 |
| Chandpur | ND | ND | ND | ND | 7.0 (6), 86 | 2.5 (4), 159 | 2.8 (5), 177 | 7.5 (12), 159 |
| Teknaf | ND | ND | ND | ND | ND | 9.0 (14), 155 | 5.8 (7), 120 | 11.1 (12), 108 |
| Rajshahi | ND | 4.1 (17), 416 | 1.5 (6), 402 | 1.7 (7), 405 | 1.3 (5), 394 | 1.0 (4), 398 | 1.3 (5), 393 | 1.8 (7), 400 |
| Chapai Nawabganj | ND | ND | 1.7 (2), 120 | 2.0 (4), 200 | 1.7 (4), 239 | 0.5 (1), 208 | 0.5 (1), 200 | 1.4 (3), 210 |
| Kanshat | ND | ND | ND | ND | 2.1 (1), 47 | 1.5 (1), 66 | 4.3 (3), 69 | 2.8 (2), 71 |
| Char Norendrapur | ND | ND | ND | ND | 1.3 (1), 78 | ND | ND | 1.0 (1), 101 |
| Rangpur | ND | ND | ND | ND | ND | ND | 2.7 (5), 187 | 1.2 (2), 164 |
| Naogaon | ND | ND | ND | ND | ND | 0 (120) | 0.5 (1), 193 | 0.4 (1), 270 |
| Pabna | ND | ND | ND | ND | 0 (85) | 0 (57) | 1.4 (1), 69 | 1.7 (2), 116 |
| Ishwardi | ND | ND | ND | ND | 3.5 (2), 57 | 0 (49) | 1.8 (1), 55 | 1.7 (1), 60 |
| Sirajganj | ND | ND | ND | ND | ND | 1.8 (2), 111 | 0.8 (1), 122 | 1.0 (3), 300 |
| Dinajpur | ND | ND | ND | ND | ND | ND | 1.1 (3), 279 | 1.5 (6), 400 |
| Jessore | ND | ND | ND | ND | ND | 3.0 (3), 100 | 2.3 (3), 132 | 2.5 (5), 202 |
| Sathkhira | ND | ND | ND | ND | ND | 1.0 (2), 201 | 0.9 (2), 226 | 1.1 (3), 279 |
| Srimongol | ND | ND | ND | ND | ND | ND | ND | 1.5 (3), 200 |
| Barisal | ND | ND | ND | ND | ND | 0 (202) | 0 (234) | 0.4 (1), 275 |

| Study Populations, Geographical Location | Active syphilis % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Heroin Smokers: Dhaka | ND | ND | ND | 3.4 (13), 388 | 2.6 (10), 391 | 3.0 (12), 399 | 3.0 (12), 401 | 4.2 (17), 402 |
| Combined Injection Drug Users and Heroin Smokers: Jaipurhat | ND | ND | ND | ND | ND | ND | ND | 3.1 (2), 65 |
| Khulna | ND | ND | ND | ND | ND | ND | 1.0 (4), 387 | 1.0 (4), 397 |
| Mongla | ND | ND | ND | ND | ND | ND | ND | 1.5 (2), 130 |
| Bagerhat | ND | ND | ND | ND | ND | ND | ND | 0 (140) |
| Jhenaidah | ND | ND | ND | ND | ND | ND | ND | 0.7 (1), 149 |
| Kushtia | ND | ND | ND | ND | ND | ND | ND | 2.3 (3), 130 |
| Patuakhali | ND | ND | ND | ND | ND | ND | ND | 0 (100) |
| Female: Dhaka, Narayanganj and Tongi | ND | ND | ND | ND | ND | 9.2 (11), 119 | 9.9 (12), 121 | 14.6 (15), 103 |
| Brothel Based Female Sex Workers: | | | | | | | | |
| Tangail | 13.8 (54), 392 | 6.2 (25), 402 | 8.1 (33), 407 | 3.9 (16), 406 | 3.2 (13), 404 | 1.7 (7), 401 | 1.5 (6), 400 | ND |
| Mymensingh | ND | 10.2 (33), 322 | ND | 9.2 (14), 152 | 10.7 (17), 159 | 10.7 (16), 150 | 4.7 (7), 150 | ND |
| Doulatdia | ND | ND | 14.8 (57), 384 | 6.7 (27), 402 | 6.0 (24), 401 | 3.8 (15), 397 | 4.2 (17), 401 | ND |
| Narayanganj | 28.7 (81), 282 | ND | ND | ND | ND | ND | ND | ND |
| Jamalpur | ND | ND | ND | ND | 11.0 (15), 136 | 8.4 (14), 166 | 6.0 (10), 168 | ND |
| Faridpur | ND | ND | ND | ND | 8.2 (31), 376 | 3.8 (14), 370 | 2.7 (10), 373 | ND |
| Madaripur | ND | ND | ND | ND | 12.2 (25), 205 | 8.4 (16), 190 | 6.3 (14), 222 | ND |
| Fultola, Baniasanta, Bagerhat [‡] | ND | 11.7 (41), 351 | 6.0 (20), 335 | 5.0 (12), 241 | 4.8 (14), 293 | 2.8 (7), 252 | 0.4 (1), 260 | ND |
| Jessore | ND | ND | 8.0 (15), 187 | 3.6 (7), 195 | 7.6 (13), 171 | 4.2 (7), 167 | 2.9 (5), 174 | ND |
| Patuakhali | ND | ND | ND | ND | 5.1 (3), 59 | 9.7 (6), 62 | 1.9 (1), 52 | ND |
| Street Based Female Sex Workers: | | | | | | | | |
| Dhaka | 33.8 (135), 400 | 24.3 (103), 423 | 16.7 (70), 419 | 8.4 (34), 403 | 9.7 (39), 401 | 6.2 (25), 402 | 7.0 (27), 386 | 7.3 (30), 409 |
| Tangail | ND | ND | ND | 3.0 (6), 199 | ND | ND | ND | ND |
| Chittagong | ND | ND | ND | ND | 11.9 (48), 402 | 7.5 (30), 402 | 10.1 (41), 405 | 10.9 (44), 404 |
| Khulna | ND | ND | ND | 4.7 (15), 317 | 1.5 (6), 403 | ND | ND | 3.0 (8), 270 |
| Rangpur | ND | ND | ND | ND | ND | ND | ND | 9.8 (24), 246 |

| Study Populations, Geographical Location | Active syphilis % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Hotel Based Female Sex Workers: Dhaka | ND | ND | ND | 4.9 (20), 405 | 4.5 (18), 400 | ND | ND | 3.0 (12), 399 |
| Chittagong | ND | ND | ND | ND | 5.3 (7), 132 | 1.6 (2), 128 | 4.2 (5), 118 | 4.9 (6), 122 |
| Sylhet | ND | ND | ND | ND | 5.4 (9), 166 | 6.1 (10), 165 | 8.3 (14), 169 | 8.3 (15), 180 |
| Combined Residence and Hotel Based Female Sex Workers: Narayanganj | ND | ND | ND | ND | ND | ND | ND | 3.6 (10), 277 |
| Tangail | ND | ND | ND | ND | ND | ND | ND | 1.4 (5), 352 |
| Jamalpur | ND | ND | ND | ND | ND | ND | ND | 2.3 (7), 300 |
| Netrokona | ND | ND | ND | ND | ND | ND | ND | 1.7 (4), 241 |
| Jessore | ND | ND | ND | ND | ND | ND | ND | 1.8 (7), 380 |
| Casual Female Sex Workers: Chandpur | ND | ND | ND | ND | ND | 9.3 (9), 97 | 5.7 (5), 88 | 7.4 (9), 121 |
| Teknaf | ND | ND | ND | ND | ND | 10.0 (15), 150 | 3.5 (7), 200 | 4.5 (11), 246 |
| Hili | ND | ND | ND | ND | 6.9 (7), 101 | 4.2 (5), 120 | 4.7 (6), 128 | 2.7 (4), 150 |
| Burimari | ND | ND | ND | ND | 1.0 (4), 381 | 0.5 (1), 200 | 0.9 (2), 235 | 1.0 (3), 300 |
| Barisal | ND | ND | ND | ND | 5.1 (10), 197 | 1.5 (6), 400 | 1.5 (6), 397 | 1.8 (7), 400 |
| Male Sex Workers (MSW): Central-A | ND | ND | 7.7 (24), 310 | 3.2 (13), 401 | 6.2 (17), 274 | 3.8 (9), 235 | 4.9 (14), 284 | 3.0 (12), 400 |
| Males Who Have Sex With Males (MSM): Dhaka | ND | ND | 1.8 (7), 399 | 0.7 (3), 406 | 1.5 (6), 399 | 2.0 (8), 405 | 0.2 (1), 401 | 1.0 (4), 399 |
| MSM and MSW combined ⁸ : Dhaka | 7.0 (28), 401 | 6.7 (26), 388 | ND | ND | ND | ND | ND | ND |
| Mymensingh | ND | ND | ND | 2.3 (9), 400 | 2.5 (10), 400 | ND | ND | ND |
| Chittagong | ND | ND | ND | 4.3 (17), 397 | 2.8 (11), 398 | 4.9 (14), 283 | ND | 4.1 (12), 290 |
| Sylhet | ND | ND | ND | 3.0 (12), 402 | 3.3 (13), 400 | 5.6 (13), 231 | ND | ND |
| Hijras: Dhaka | ND | ND | ND | 10.4 (41), 393 | ND | ND | ND | ND |
| Dhaka, Manikganj | ND | ND | ND | ND | 10.4 (42), 405 | 5.2 (20), 381 | 6.5 (23), 353 | 7.7 (30), 392 |
| Partners of Hijra: Dhaka, Manikganj | ND | ND | ND | ND | 2.3 (2), 88 | ND | ND | ND |

| Study Populations, Geographical Location | Active syphilis % Positive (number positive), total number tested | | | | | | | |
|---|--|-----------------------|------------------------|------------------|----------------------|-----------------------|-------------------|--------------------|
| | 1998-1999 Round I | 1999-2000 Round II | 2000-2001 Round III | 2002 Round IV | 2003-2004 Round V | 2004-2005 Round VI | 2006 Round VII | 2007 Round VIII |
| Babus (Brothel): Tangail | ND | ND | ND | 1.6 (4), 252 | 2.0 (5), 251 | ND | ND | ND |
| Doulatdia | ND | ND | ND | 6.0 (12), 200 | 6.3 (11), 175 | ND | ND | ND |
| Jamalpur | ND | ND | ND | ND | 5.4 (3), 56 | ND | ND | ND |
| STI Patients: Dhaka | 11.0 (44), 399 | 5.2 (21), 404 | ND | ND | ND | ND | ND | ND |
| Chittagong | 7.6 (31), 409 | 4.2 (17), 404 | 2.2 (9), 403 | ND | ND | ND | ND | ND |
| Rajshahi, Rangpur* | 2.2 (9), 401 | 1.7 (7), 408 | 1.5 (6), 392 | ND | ND | ND | ND | ND |
| Sylhet | 8.1 (32), 397 | ND | 5.1 (20), 389 | 0.9 (1), 106 | ND | ND | ND | ND |
| Truckers: Dhaka | 2.0 (8), 403 | ND | 2.1 (9), 437 | 1.1 (4), 402 | ND | ND | ND | ND |
| Jessore | ND | ND | 1.8 (7), 392 | ND | ND | ND | ND | ND |
| Benapole | ND | ND | ND | ND | ND | 0 (398) | ND | ND |
| Dockworkers: Chittagong | ND | ND | 2.8 (11), 392 | ND | ND | 1.8 (7), 395 | ND | ND |
| Mongla | ND | ND | 1.0 (4), 401 | ND | ND | ND | ND | ND |
| Rickshaw pullers: Dhaka | ND | ND | ND | ND | 0.2 (1), 401 | 0 (401) | ND | ND |
| Chittagong | ND | ND | 1.0 (4), 400 | ND | 1.2 (5), 401 | ND | ND | ND |
| Jessore | ND | ND | 1.0 (4), 401 | ND | ND | ND | ND | ND |
| Launch Workers: Dhaka | ND | ND | ND | 1.5 (6), 402 | ND | ND | ND | ND |
| TOTAL | 11.3 (440), 3886 | 8.0 (347), 4338 | 4.6 (322), 7063 | 3.9 (311), 7877 | 4.5 (471), 10445 | 3.4 (376), 11029 | 3.1 (325), 10361 | 3.3 (416), 12786 |

†Dhaka represents the merged result of Dhaka A1 and Dhaka A2

‡Three geographical related areas Fultola, Baniasanta and Bagerhat 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 in Rajshahi, in the subsequent rounds sampling was done from Rajshahi and Rangpur and these together represents a single site

ANNEXE: 3

COLLABORATING ORGANIZATION

1. Alliance for Co-operation & Legal Aid Bangladesh (ACLAB)
2. Association for Social Advancement and Rural Rehabilitation (ASARR)
3. Badhan Hijra Sangha
4. Bandhu Social Welfare Society (BSWS)
5. Bangladesh Womens Health Coalition (BWHC)
6. CARE-Bangladesh
7. Centre for Development Services (CDS)
8. Community Development Welfare Foundation (CDWF)
9. Durjoy Nari Shangha
10. Health and Education for the Less Privileged (HELP)
11. Khulna Mukti Seba Sangstha (KMSS)
12. Let There Be Light
13. Light House
14. Marie Stopes Clinic Society (MSCS)
15. Nari Maitree
16. Organization of Bangladesh Drug Addicts Rehabilitation (BODAR)
17. Organization for Rural Advancement (ORA)
18. Peoples Resource Oriented Voluntary Association (PROVA)
19. Padakhep Manobik Unnayan Kendra
20. Prochesta
21. PIACT Bangladesh
22. Proyas Manobik Unnayan Society
23. Rural Poor Development Organization (RPDO)
24. Sustha Jibon
25. Semonti Mohila Unnayan Sangstha
26. Sylhet Jubo Academy (SJA)
27. Social Advancement Society (SAS)
28. Unnayan Sahayak Sangatha (USS)
29. Ulka Nari Sangha
30. Young Power in Social Action (YPSA)

ANNEXE: 4

MEMBERS OF THE SURVEILLANCE ADVISORY COMMITTEE

1. Major General (Rtd) A S M Matiur Rahman, Chairperson, TC-NAC
2. Dr S M Mustafa Anower, Director CME and Line Director, NASP & SBTP
3. Director General, Department of Narcotics Control
4. Director, IEDCR
5. Programme Manager, National AIDS/STD Programme, DGHS
6. Deputy Programme Managers, National AIDS/STD Programme, DGHS
7. Prof Nazrul Islam, Head, Department of Virology, BSMMU
8. Secretary General, Bangladesh Medical Association
9. Representative of the Inspector General of Police
10. Dr M Kamruzzaman Biswas, National Professional Officer, WHO
11. Dr Robert J Kelly, Country Director, FHI
12. Deputy Country Director, FHI
13. Ms Ali Forder, Health and Population Advisor, DFID
14. Dr Najmus S Sadiq, Assistant Resident Representative, UNDP
15. Ms Sheri Nouane Johnson, Deputy Team Leader, P, H & N Team, USAID
16. Dr Dinesh Nair, Focal Point HIV/AIDS, World Bank
17. Dr Asib Nasim, Project Officer HIV/AIDS, UNICEF
18. Mr Dan Odallo, Country Coordinator, UNAIDS
19. Mr Mahboob Aminur Rahman, M & E Advisor, UNAIDS
20. Ms Ismat Bhuiyan, Senior Programme Officer, The Population Council
21. Dr Imtiaz Ashraf Chowdhury, Curator, IEDCR
22. Dr G B Nair, Director, Laboratory Sciences Division (LSD), ICDDR,B
23. Dr Motiur Rahman, Head, RTI/STI Laboratory, LSD, ICDDR,B
24. Mr Masud Reza, LSD, ICDDR,B
25. Dr Md Shah Alam, LSD, ICDDR,B
26. Dr Tasnim Azim, Scientist and Head, HIV/AIDS Programme, LSD, ICDDR,B