



Government of the People's Republic of Bangladesh

NATIONAL HIV SEROLOGICAL SURVEILLANCE, 2011 BANGLADESH

9th Round Technical Report
CONDUCTED JOINTLY BY IEDCR AND icddr,b



জাতীয় এইডস/এলটিডি প্রোগ্রাম
স্বাস্থ্য অধিদপ্তর, স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়



NATIONAL AIDS/STD PROGRAMME
Directorate General of Health Services
Ministry of Health and Family Welfare

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Printed under the guidance of:

Dr. Md Abdul Waheed
Line Director NASP
Directorate General of Health Services
Ministry of Health and Family Welfare

Printed under the supervision of:

Dr. S. M. Idris Ali, Programme Manager, NASP
Dr. Mahmud Hasan , Deputy Programme Manager, NASP
Dr. Anisur Rahman, Deputy Programme Manager, NASP
Dr. Sydur Rahman, Deputy Programme Manager, NASP

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Surveillance conducted and report prepared by:

Dr. Tasnim Azim, Senior Scientist and Director, Centre for HIV and AIDS, icddr,b
Prof. (Dr.) Mahmudur Rahman, PhD, Director, IEDCR, DGHS
Dr. Mustafizur Rahman, Associate Scientist, Virology Laboratory, icddr,b
Dr. M. Mushtuq Husain, Principal Scientific Officer (PSO), Dept. of Medical Social Science, IEDCR
Mr. Ahmed Shahriar, Field Research Manager, Centre for HIV and AIDS, icddr,b
Dr. Imtiaz Ashraf Chowdhury, Curator, IEDCR, DGHS
Dr. Md. Shah Alam, Senior Programme Manager Centre for HIV and AIDS, icddr,b
Mr. Masud Reza, Statistician, Centre for HIV and AIDS, icddr,b
Dr. Sultana Shahana Banu, Principal Scientific Officer, Virology, IEDCR
Dr. Khondoker Mahbuba Jamil, Senior Scientific Officer, Virology , IEDCR
Mrs. Mahmuda Khatun, Senior Scientific Officer, Centre for HIV and AIDS, icddr,b
Mr. Safiullah Sarker, Senior Research Officer, Centre for HIV and AIDS, icddr,b

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FOREWORD

Bangladesh has been regularly collecting information on HIV prevalence in the country since 1998 by conducting HIV surveillance among populations who are considered to be most at risk. This year the 9th round of HIV serological surveillance was carried out, the findings of which are presented in this report. As before, surveillance was conducted on behalf of the Government of Bangladesh by the International Centre for Diarrhoeal Diseases, Bangladesh (icddr,b) and the Institute of Epidemiology, Disease Control and Research (IEDCR), DGHS.

The findings in this report are in general very encouraging as it shows that the overall prevalence of HIV in populations most at risk remains below 1% and most importantly, HIV prevalence has declined among people who inject drugs in Dhaka from 7% to 5.3%. Moreover, hepatitis C has also declined which is a marker for unsafe injecting practices. Thus, the data suggest that our intervention programmes are having a positive effect. Overall the most number of HIV positive people, irrespective of population groups, were in Dhaka despite the decline in the proportion of HIV positives among people who inject drugs.

Being alert in understanding where new infections may be emerging is one of the objectives of surveillance. The data show that most at risk populations living in border towns such as Hili are particularly vulnerable and this is likely due to cross border mobility. Our programmes need to take this into account so that vulnerabilities related to such mobility are addressed.

Through HIV surveillance monitoring of hepatitis C and syphilis infections is also done and the data presented here clearly show that in some groups the rates documented are unacceptably high. We need to take this into account and strengthen our programmes accordingly.

The Government of Bangladesh has from the very beginning taken an evidence based approach towards HIV programming. Prevention programmes have been scaled up among sex workers, people who inject drugs, males who have sex with males and hijra. The findings of the 9th round of serological surveillance will feed into the existing programmes such that due attention is given to areas of concern. Also, we will ensure that this trend of reversing the epidemic will be maintained by ensuring that harm reduction programmes for people who inject drugs are continued and strengthened. Vigilance in Dhaka and border towns is essential with both provision of adequate services and continuous surveillance.

Finally, while we continue to work with people who are most marginalized and stigmatized, we need to be constantly aware of protecting their right to health services and be open minded and humane. Coordination among and cooperation from all stakeholders is essential for us to be able to achieve our goal of halting the HIV epidemic.

Dr. Md Abdul Waheed
Line Director NASP
Directorate General of Health Services
Ministry of Health and Family Welfare

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The 9th round of HIV serological 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 9th round was conducted by the International Centre for Diarrhoeal Diseases, Bangladesh (icddr,b) together with the Institute of Epidemiology, Disease Control and Research (IEDCR) and the funding was provided by the Govt. of Bangladesh under the Health Nutrition and Population Sector Programme (HNPS). A large number of non-government organisations (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 4.

The Principal Investigators (PIs) were Dr. Tasnim Azim, Centre for HIV and AIDS, icddr,b and Prof. (Dr.) Mahmudur Rahman, PhD, Director, IEDCR. Dr. Mustafizur Rahman, icddr,b, Dr. M. Mushtuq Husain, IEDCR, Mr. Ahmed Shahriar, icddr,b and Dr. Imtiaz Ashraf Choudhury, IEDCR were co-investigators. Mr. Md. Ali Imam, Mr. K. M. Zahid and Mr. Shahjahan Ali, icddr,b were involved in field management.

Laboratory tests were for the most conducted in IEDCR. Senior laboratory staff included: from IEDCR - Professor Be-Nazir Ahmed, Dr. Sultana Shahana Banu, Dr. Khandokar Mahbuba Jamil, Dr. ASM Alamgir, Dr. Fahmida Khanom; from icddr,b - Ms. Mahmuda Khatun, Mr. Md. Safiullah Sarker, Mr. Palash Chandra Karmakar, Mr. Rafique-Un-Nabi, Mr. Fahim Kabir Monjurul Haque, Mr. Md. Safiqur Rahman.

Laboratory technologists from IEDCR included Mr. Golam Mohammad Ali, Ms. Shamsun Nahar, Mr. Abdul Karim, Ms. Anjuman Ara and Mr. Md. Nurul Islam, Mr. Nitai Chandra Shaha, Mr. Kazi Masum. Field staff from IEDCR were Mr. Md. Reaz Uddin Ahmed and Mr. Mainul Islam. Field staff from icddr,b were Mr. Kazi Nurul Haque, Mr. Md. Awlad Hossain, Mr. S. M. Akramul Haque, Mr. Bikash Chandra Swar, Mr. Farid Ahmed, Mr. Md. Shah Jalal, Mr. Md. Habibur Rahman, Mr. Abdus Salam, Mr. Balay Chand Sikder, Mr. Alauddin Khandoker, Mr. Habibur Rahman Sujjan, Mr. Sharif Hossain. Mr. Shariful Islam, Mr. Nepen Chandra Das, Mr. Mazedul Bashar, Mr. Md. Aladdin, Mr. Ziaur Rahman, Mr. Mijanur Rahman Milon, Mr. Mijanur Rahman, Mr. Polash Podder, Mr. Md. Sheikh Farid, Mr. SM Hannan, Mr. Md Abu Hasan Munsil, Mr. Rakibul Hasan, Mr. Nani Gopal Majumder, Mr. Debashish Roy, Mr. Jugol Majumder, Mr. Rashedul Hasan, Mr. Md. Mostafa, Mr. Md. Enamul Huq.

Data entry was done by IEDCR and icddr,b staff who were Mst. Salima Sultana, Mr. Md. Abdul Hakim, Ms. Nigar Sultana, Ms. Farida Yasmin and Ms. Razia Sultana. Data analysis support was provided by Mr. Mohammed Sha Al Imran with technical input from Mr. Masud Reza, icddr,b.

Logistics and administrative support of the project was provided by Mr. Tarikul Islam, icddr,b.

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BSS	Behavioural Surveillance Survey
DIC	Drop in Centre
ELISA	Enzyme Linked Immunosorbent Assay
GOB	Government of Bangladesh
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HNPSP	Health Nutrition and Population Sector Programme
icddr,b	International Centre for Diarrhoeal Diseases Research, Bangladesh
PWID	People Who Inject Drugs
PWUD	People Who Use drugs
IEDCR	Institute of Epidemiology, Disease Control and Research
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
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 9th round of serological surveillance was conducted in populations most at risk of HIV- sex workers, people who inject drugs (PWID), heroin smokers, combined PWID and heroin smokers, males who have sex with males (MSM) and transgendered people (hijra). This round was conducted between December 2010 to June 2011 and 12,894 individuals were sampled from 36 geographical areas of Bangladesh. The overall prevalence of HIV and active syphilis is 0.7% and 3% respectively.

The population group with the highest rate of HIV continues to be PWID in Dhaka but the prevalence declined to 5.3% from 7% (in the 8th round). However, the decline is not statistically significant. Fortunately, the localization of the PWID epidemic to one neighbourhood of Dhaka observed in previous years has also remained. HIV was also detected in another four groups of people who use drugs (PWUD) - male PWID from Narayanganj (1.5%) and Satkhira (0.4); female combined PWID and heroin smokers from Dhaka, Narayanganj, Tongi (1.2%) and Benapole (1%). Active syphilis rates at >5% was detected among six groups of PWUD and the highest proportion was found in male PWID in Norsingdi (7.9%), followed by PWID in Chandpur (6.1%) and female PWUD in Dhaka, Tongi and Narayanganj (5.9%). High active syphilis rates suggest practice of unsafe sex.

Antibodies to Hepatitis C virus (HCV) were measured in all PWID and groups of combined PWID and heroin smokers but not in the groups consisting of only heroin smokers. The rates varied in the different cities and in six cities >50% were HCV positive. The higher prevalence for HCV was found among PWID from several cities of Rajshahi Division with Kanshat having the highest prevalence (95.7%). In Dhaka HCV rates have declined significantly ($P<0.05$) over the rounds of surveillance.

A total of 3568 female sex workers were sampled from 13 areas of Bangladesh. Overall, HIV prevalence was low (<1%) in all groups of female sex workers except in casual sex workers from Hili where two in 125 samples were positive (1.6%). Active syphilis rates at >5% was detected in three sites – street sex workers of Hili (12.5%) and Chittagong (10.3%) and hotel sex workers of Sylhet (9.3%). Male sex workers (MSW) and MSM continue to have low levels of HIV and active syphilis. Approximately 1% of hijra had HIV. Among the group of MSM, MSW and hijra, active syphilis rates were highest in hijra of Dhaka, Manikgonj (6.1%). High rates of active syphilis highlight the need for intensification of ongoing HIV/STI prevention programmes in these population groups and sites.

In this round of surveillance more population groups were sampled from border towns and Benapole was included for the first time. Male PWID, street based female sex workers, combined MSM/MSW and hijra from Hili; male PWID and female combined group of PWID and heroin smokers from Benapole; casual female sex workers from Burimari; a combined group of hotel and residence based female sex workers from Teknaf were sampled. However, for all these groups the sample size was small. HIV was detected in two groups from Hili and Benapole each but the numbers were small. Cross border mobility was more commonly reported by respondents from Hili.

In summary, this round of serological surveillance taken together with the trends obtained over the years, suggests that with continued efforts it may be possible to reverse the HIV epidemic in PWID in Dhaka. However, harm reduction services for PWID in other areas especially in Rajshahi Division need to be enhanced. Although HIV has declined in Dhaka among PWID, Dhaka in general appears to be vulnerable to an HIV epidemic as most cases were detected here. In addition, vigilance and intense programming are required in border towns.

1. INTRODUCTION

Bangladesh established a HIV and risk behaviour surveillance in 1998 following the newly developed guidelines of UNAIDS and WHO on Second Generation Surveillance (UNAIDS/WHO 2000). Serological and behavioural surveillance were carried out in parallel till the 5th round conducted during 2003-04. During the 6th (2004-05), 7th (2006) and 8th (2007) rounds, only serological surveillance was carried out. A separate round of behavioural surveillance survey (BSS) was conducted in 2006-07 and since then no further rounds of BSS have been undertaken. The last round of serological surveillance (8th round) was conducted in 2007 and now in 2011, after almost a four year interval, the 9th round of serological surveillance has been conducted the findings of which are presented in this report.

According to the guidelines of the 2nd generation surveillance (UNAIDS/WHO 2000), in countries where HIV prevalence is low, focus is on those sub-populations which are considered to be 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, transgendered population (hijra), males who have sex with males (MSM), people who inject drugs (PWID) who might share needles and syringes and heroin smokers who are at 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. Given the low prevalence of HIV, bridge groups have not been sampled since the 6th round of serological surveillance conducted in 2004-05.

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 1998-99 (round I), 1999-2000 (round II), 2000-01 (round III), 2000-01 (round III), 2002 (round IV), 2003-04 (round V), 2004-05 (round VI), 2006 (round VII), 2007 (round VIII) and 2011 (round IX).

Population group	Division	Geographical Location	1998-1999		1999-2000		2000-2001		2002		2003-2004		2004-2005		2006		2007		2011		
			Round I	Round II	Round III	Round IV	Round V	Round VI	Round VII	Round VIII	Round IX										
People who inject drugs (PWID) (Male)	Dhaka	Dhaka	✓		✓																
	Dhaka	Dhaka† Dhaka A1 Dhaka A2	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Heroin smokers (Male)	Chittagong	Mymensingh																			
		Narayanganj							✓												
		Tongi							✓												
	Rajshahi	Narsingdi																			
		Chandpur																			
		Teknaf																			
	Rangpur	Rajshahi																			
		Chapai Nawabganj								✓											
		Kanshat								✓											
		Char Norendrapur																			
		Naogaon																			
		Pabna																			
Khulna	Ishwardi																				
	Sirajganj																				
	Rangpur																				
	Dinajpur																				
	Hili																				
	Jessore																				
Sylhet	Benapole																				
	Sathkhira																				
	Srimongol																				
	Barisal																				
	Dhaka																				
	Jaipurhat																				
Barisal	Khulna																				
	Mongla																				
	Bagerhat																				
	Jhenaidah																				
	Kushtia																				
	Patuakhali																				

Population group	Division	Geographical Location	1998-1999		1999-2000		2000-2001		2002		2003-2004		2004-2005		2006		2007		2011		
			Round I	Round II	Round III	Round IV	Round V	Round VI	Round VII	Round VIII	Round IX	Round X	Round XI	Round XII	Round XIII	Round XIV	Round XV	Round XVI	Round XVII	Round XVIII	Round XIX
Combined PWID and heroin smokers (Female):	Dhaka	Dhaka, Narayanganj and Tongi (Female)											√			√				√	
	Khulna	Benapole(Female)											√							√	
Brothel based female sex workers	All brothels											√									
	Dhaka	Tangail	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
		Mymensingh		√		√		√		√		√		√		√		√		√	
		Doulatdia			√		√		√		√		√		√		√		√		√
		Narayanganj		√		√		√		√		√		√		√		√		√	√
Street based female sex workers	Khulna	Fultola, Baniasanta, Bagerhat		√		√		√		√		√		√		√		√		√	
		Jessore		√		√		√		√		√		√		√		√		√	
	Dhaka	Dhaka	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
		Tangail																			
		Chittagong																			
Hotel based female sex workers	Rangpur	Rangpur																			
		Hili																			
	Khulna	Khulna																			
	Dhaka	Dhaka																			
	Chittagong	Chittagong																			
Combined residence and hotel based sex workers	Sylhet	Sylhet																			
	Khulna	Benapole																			
	Dhaka	Narayanganj																			
		Tangail																			
		Jamalpur																			
Residence based sex workers	Chittagong	Netrokona																			
	Khulna	Teknaf																			
	Khulna	Jessore																			
	Khulna	Benapole																			
		Chandpur																			
Casual female sex workers	Chittagong	Teknaf																			
		Hili																			
	Rangpur	Burimari																			
	Barisal	Barisal																			
	Dhaka	Dhaka																			
Male sex workers (MSW)	Dhaka	Dhaka																			
	Dhaka	Dhaka																			
Males who have sex with males (MSM)	Dhaka	Dhaka																			
	Dhaka	Dhaka																			
Combined MSM/MSW	Dhaka	Dhaka																			
	Dhaka	Dhaka	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	

Population group	Division	Geographical Location	1998-1999		1999-2000	2000-2001	2002	2003-2004		2004-2005	2006	2007	2011
			Round I	Round II	Round III	Round IV	Round V	Round VI	Round VII	Round VIII	Round IX		
Hijra		Mymensingh					✓						
	Chittagong	Chittagong					✓		✓			✓	
	Sylhet	Sylhet					✓		✓				
	Rangpur	Hili											✓
	Dhaka	Dhaka					✓		✓			✓	
Partners of Hijra Babus [†]	Rangpur	Dhaka, Manikganj									✓		✓
	Dhaka	Hili						✓					
	Dhaka	Dhaka, Manikganj						✓					
		Tangail					✓						
		Doulatdia					✓						
STI patients		Jamalpur						✓					
	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							✓				
Launch workers	Khulna	Jessore											
	Dhaka	Dhaka											

[†]Dhaka represents the merged results 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 sample size estimation, sampling, testing and analyses were the same as in previous rounds of surveillance. These are described here in brief.

2.1 Population groups sampled and definitions

The population groups considered to be most at risk of HIV infection in the previous rounds were retained in this round as shown in Table 1. These population groups included PWID, heroin smokers, combined PWID and heroin smokers; different categories of female sex workers (street, hotel, residence, combined residence and hotel, and casual); male sex workers (MSW), MSM, combined MSM and MSW and *hijra*. In the 9th round of surveillance some new sites and population groups were added. The newly added site was Benapole which being a border area (adjacent to West Bengal, India) was considered to be more vulnerable. The newly added population group was residence based sex workers as a separate group who were not accessible in previous rounds; previously all residence based sex workers were combined with hotel based sex workers.

The definition of each population group is shown in Box 1.

Box 1. Definitions used for the population groups
People who inject drugs: 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 PWID 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>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. <i>Residence based sex workers:</i> Women who identified themselves as sex workers and sold sex in residences 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.

In 2010 it was apparent that many more population groups were accessible from border areas, which was not the case in the previous rounds of surveillance. As the border areas are considered to be more vulnerable (UNAIDS 2001) it was decided that as many population groups

as possible will be sampled from the different border areas. The population groups from border areas new to serological surveillance are shown in Table 2.

Table 2. Population groups from border areas new to serological surveillance

Border area	Population group
Hili	PWID (male)
	Street based female sex workers
	Combined MSM and MSW
	Hijra
Benapole	PWID (male)
	Combined PWID and heroin smokers (females)
	Residence based female sex workers
Teknaf	Combined residence and hotel based female sex workers

During sampling it became apparent that some population groups who were sampled in previous rounds were no longer accessible and these included:

1. Combined residence and hotel based female sex workers of Narayanganj and Tangail
2. Casual female sex workers of Teknaf and Barisal

These groups were therefore not included in the 9th round.

2.2 Strategies for sampling

As in previous rounds, the population groups of interest were accessed through non-government organisations (NGOs) providing HIV prevention services to those populations. Drop-In Centres (DICs) of these NGOs were the sentinel sites for sampling. 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.

For organizing sample collection at the sentinel sites, collaboration from all NGOs providing services were sought through letters from the NASP and their respective donor/management organisations. In addition, NASP, IEDCR and icddr,b conducted planning meetings with HIV programme management agencies where the sampling strategy and sample population groups were discussed.

With this background, surveillance staff conducted initial coordination meetings followed by orientation meetings with all concerned NGOs before starting sampling in their sites. Coordination meetings were conducted to provide information on the background and objectives of surveillance, identification of different sample population groups, practical issues of the field and field modalities. This led to jointly finalizing field plans for sample collection and sample collection dates. Following this, meetings were held at DICs with management level staff as well as peer educators/ outreach workers to orient them about the activities related to surveillance. Such orientation meetings were conducted in all the DICs involved in sampling. Individuals were then encouraged to attend the DICs for giving blood.

2.3 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.

As in previous rounds, PWID in Dhaka were sampled differently following a similar methodology to that in the 6th, 7th and 8th rounds which is summarised in Box 2 below:

<p>Box 2. Sampling of PWID from Dhaka</p> <p>Dhaka was divided into two areas: A1 and A2</p> <p>This was done because the findings from a research cohort study (Azim, Chowdhury et al. 2008) and the earlier rounds of surveillance showed that PWID in one neighbourhood of Dhaka were experiencing a concentrated epidemic. The areas were:</p> <p>i) A1 – this included the area covering the neighbourhood with the concentrated HIV epidemic. Attempts were made to sample as many PWID from this area as possible within a given time period i.e. a take all approach was employed.</p> <p>ii) A2 – this included the rest of Dhaka city from where approximately 400 PWID were sampled. Sampling from this area followed the same methodology as in early rounds so that PWID were sampled from the areas covered by the DICs of the NGO running the needle/syringe programme (NSP). Each DIC covers a known number of PWID and in order to obtain 400 samples, proportionate sampling from the areas covered by each DIC was carried out.</p> <p>The data obtained from Dhaka A1 and A2 were merged to reflect Dhaka.</p>
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2.4 Personnel and training

Serological surveillance was conducted by a team from icddr,b and IEDCR comprising of laboratory and field staff. Prior to sampling, a six day (December 23, 2010 to January 01, 2011) training was provided to the 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 staff was provided on Universal Precautions, serum separation, labelling, de-linking, sample transportation and storage. Trained team members and other resource persons from IEDCR and the HIV/AIDS Programme of icddr,b conducted the training.

2.5 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 IEDCR, 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 antibodies to hepatitis C virus (HCV) among PWID and combined group of PWID and heroin smokers.

2.6 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.

2.7 Questionnaire

A brief questionnaire was administered to all participants where a few demographic questions were asked. In border areas, additional questions on mobility and risk behaviours were asked.

2.8 Laboratory methods

Tests were done for syphilis, HIV and HCV (among PWID and the group consisting of combined PWID and heroin smokers 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 HCV, sera were initially tested using an Enzyme Linked Immunosorbent Assay (ELISA) kit (Hepanostika, HCV Ultra, Beijing United Biomedical Co., China), and all positive samples were re-tested with a second kit (ARCHITECT Anti-HCV, chemiluminescent microparticle immunoassay [CMIA] test, Abbott Laboratories, ABBOTT, Wiesbaden, Germany). Discrepant results in the two ELISAs were confirmed by Line Immunoassay (LIA, INNO-LIA HCV Score, Innogenetics NV, Gent, Belgium). Samples positive for any two tests were considered as positive. For HIV, samples were initially tested by a commercial ELISA kit (Vironostica HIV Uni-Form II plus O, Biomerieux BV, Boxtel, The Netherlands) and positive results were confirmed by LIA (INNO-LIA HIV I/II Score, Innogenetics NV, Gent, Belgium). An indeterminate result by LIA was considered as negative.

2.9 Syphilis result and treatment

As in previous rounds, syphilis results were provided to participating organisations within two to three 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.

2.10 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 (<http://www.nrl.gov.au>), which is a WHO collaborating centre. In addition, internal quality assurance was also conducted for HIV during the surveillance period.

2.11 Data entry and analysis

The demographic data were entered twice using Epi Info (version 3.5.1) and laboratory data were entered using Statistical Package for Social Sciences (SPSS, version 15.0 for Windows, SPSS Inc., Chicago, IL, USA). Data analysis was carried out using SPSS and Epi Info. For comparison of continuous non-parametric data between any two sites/groups 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, IEDCR has been working in close collaboration with icddr,b. In more recent years this collaboration has been not only in the implementation of the surveillance activities in the field and the laboratory but also in the design of the methodology and the reporting of results. Thus the design of the 9th round of serological surveillance was jointly finalised by the Principal Investigators of icddr,b and IEDCR.

Over the rounds of surveillance, icddr,b trained different technical, laboratory and field staff of IEDCR on different aspects of surveillance. During the 9th 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. Six 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 December 23, 2010 to January 01, 2011 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, some tests for HCV were conducted at icddr,b. Data from the questionnaire was entered at icddr,b. Regular meetings were held between icddr,b and IEDCR to address the issue of technology transfer. In addition, the Principal Investigators of the two institutions met to share the progress of the surveillance at regular intervals.

4. RESULTS

During the 9th round of serological surveillance a total of 12,894 samples were collected from 36 geographical areas from 16 January to 2 June 2011. 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
People Who Inject Drugs (PWID):		
Dhaka (1243) [†]	12.04.11	11.05.11
Dhaka- A1 (835)	23.04.11	11.05.11
Dhaka-A2 (408)	12.04.11	17.04.11
Mymensingh (375)	23.03.11	31.03.11
Narayanganj (261)	2.05.11	5.05.11
Tongi (149)	23.04.11	26.04.11
Norsingdi (101)	9.04.11	12.04.11
Chandpur (115)	3.04.11	7.04.11
Teknaf ((96)	22.02.11	27.02.11
Rajshahi (401)	30.01.11	4.02.11
Chapai Nawabganj (220)	31.01.11	3.02.11
Kanshat (92)	5.02.11	9.02.11
Char Norendrapur (124)	5.02.11	9.02.11
Rangpur (103)	20.03.11	24.03.11
Naogaon (382)	2.02.11	15.02.11
Pabna (101)	8.02.11	14.02.11
Ishwardi (57)	8.02.11	9.02.11
Sirajganj (344)	6.02.11	14.02.11
Hili (138)	13.03.11	17.03.11
Dinajpur (385)	13.03.11	17.03.11
Jessore (190)	14.05.11	18.05.11
Sathkhira (285)	10.05.11	17.05.11
Srimongol (79)	31.05.11	2.06.11
Barisal (404)	20.03.11	23.03.11
Benapole (96)	14.05.11	19.05.11
Heroin Smokers:		
Dhaka (388)	13.04.11	19.04.11
Combined PWID and heroin smokers (male):		
Jaipurhat (98)	12.03.11	16.03.11
Khulna (400)	23.05.11	25.05.11
Mongla (93)	10.05.11	12.05.11
Bagerhat (134)	10.05.11	14.05.11
Jhenaidah (80)	9.05.11	11.05.11
Kushtia (136)	7.05.11	11.05.11
Patuakhali (105)	8.02.11	11.02.11

Population Groups, Geographical Location (n)	Start date	End date
Combined PWID and heroin smokers (female): Dhaka, Narayanganj, Tongi (256) Benapole (98)	19.04.11 14.05.11	8.05.11 18.05.11
Street based female sex workers: Dhaka (394) Chittagong (400) Khulna (365) Rangpur (207) Hili (32)	2.03.11 22.02.11 16.05.11 21.03.11 13.03.11	7.03.11 2.03.11 22.05.11 24.03.11 21.03.11
Hotel based female sex workers: Dhaka (401) Chittagong (172) Sylhet (225) Benapole (69)	9.03.11 22.02.11 30.05.11 14.05.11	31.03.11 3.03.11 2.06.11 26.05.11
Residence based female sex workers: Benapole (258)	14.05.11	26.05.11
Combined residence and hotel based female sex workers: Jamalpur (218) Teknaf (119) Netrokona (245) Jessore (236)	28.03.11 22.02.11 27.03.11 14.05.11	3.04.11 27.02.11 3.04.11 21.05.11
Casual female sex workers: Chandpur (58) Burimari (44) Hili (125)	4.04.11 20.03.11 13.03.11	7.04.11 24.03.11 14.05.11
Male sex workers (MSW): Dhaka (402)	13.02.11	24.02.11
Males who have sex with males (MSM): Dhaka (400)	13.02.11	24.02.11
Combined MSM/MSW: Chittagong (399) Hili (158)	20.02.11 13.03.11	27.02.11 22.03.11
Hijra: Dhaka, Manikganj (407) Hili (31)	16.01.11 15.05.11	27.01.11 15.05.11

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

Results for the 9th round of the serological surveillance are reported under the following groups and described below.

- PWID, heroin smokers and combined PWID and heroin smokers
- Female sex workers
- MSM, male sex workers and *hijra*

4.1 PEOPLE WHO INJECT DRUGS (PWID), HEROIN SMOKERS AND COMBINED PWID AND HEROIN SMOKERS

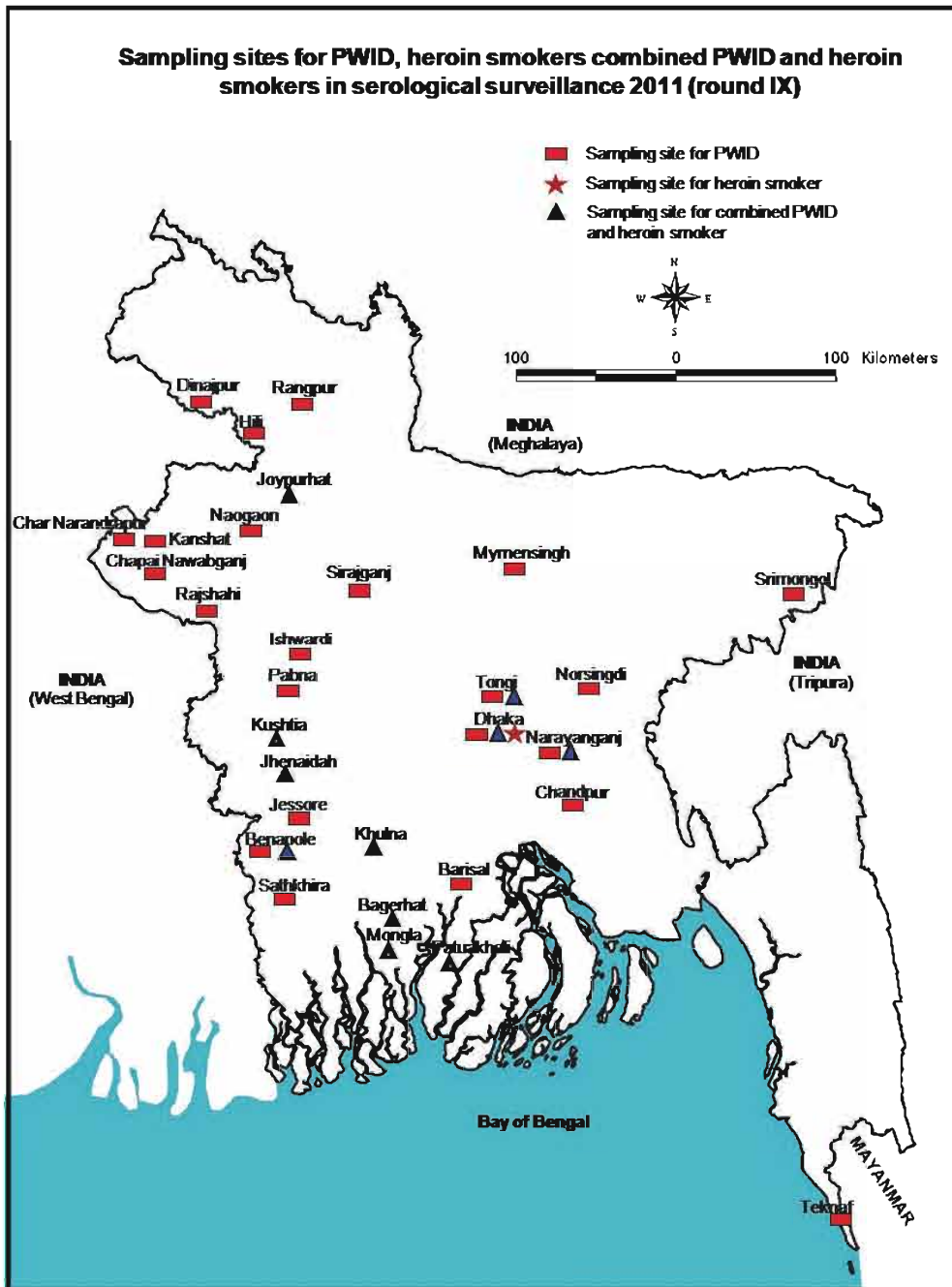
People who use drugs (PWUD), which included PWID, heroin smokers and the combined group of PWID and heroin smokers were sampled from 30 different areas of Bangladesh (Fig 1). A total of 7529 PWUD were sampled in this round.

New cities from where samples were drawn for this round included:

- PWID, two cities – Hili and Benapole
- Combined PWID and heroin smokers, one city- Benapole

As with the previous rounds, heroin smokers were sampled from Dhaka city only. All PWUD were under the coverage of the needle/syringe programme (NSP).

Fig. 1. Sampling sites for PWID, heroin smokers and combined PWID and heroin smokers.



Demographic characteristics

Demographic characteristics of all groups of PWUD are shown in Table 4. Among PWID those from Chapai Nawabganj were the oldest ($P<0.05$) while amongst the group of combined PWID and heroin smokers, those in Kushtia were the oldest ($P<0.05$). In Dhaka, heroin smokers were younger than PWID ($P<0.05$). The most educated PWID were in Srimongol and Barisal ($p<0.05$

for all comparisons). PWID in Char Norendrapur were injecting drugs for the longest time and at the same time their involvement with the NSP was also longer than those in all other sites ($p < 0.05$ for all comparisons). Amongst the combined group of PWID and heroin smokers, those in Kushtia reporting injecting for the longest duration and they also reported participation in the NSP for the longest time ($P < 0.05$).

All female PWUD sampled belonged to the group of combined PWID and heroin smokers. All among the exclusive groups of PWID and heroin smokers were male.

Among the female PWUD, those in Benapole were older ($P < 0.001$) and more educated than those in Dhaka, Narayanganj, Tongi ($P < 0.05$). In Benapole, involvement in NSP was relatively new. Comparison of male PWID from Dhaka with females from Dhaka, Tongi, Narayanganj showed that males were older ($P < 0.001$), more had attended school and had more years of schooling ($P < 0.001$ for both comparisons) and had injected for longer with a longer duration of participation in the NSP ($P < 0.001$ for both comparisons).

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

Geographical Location (Number sampled)	Age in years Median (IQR)*	Ever attended school % (n)	Education (years) (Among those who attended school) Median (IQR)	Duration as injector/smoker (months) Median (IQR)	Duration in NSP [‡] (months) Median (IQR)
PWID[§] (male):					
Dhaka (1243) [†]	35 (30-41)	47.7 (593)	5 (4-8)	72 (36-120)	48 (24-84)
Dhaka- A1 (835)	35 (30-43)	44.1 (368)	5 (4-8)	72 (48-120)	48 (24-96)
Dhaka-A2 (408)	35 (29-40)	55.1 (225)	7 (4-8)	60 (36-117)	36 (12-60)
Mymensingh (375)	30 (26-33)	71.7 (269)	8 (5-10)	60 (36-84)	12 (6-36)
Narayanganj (261)	34 (30-40)	46.0 (120)	5 (4-8)	48 (30-96)	30 (18-60)
Gazipur (149)	32 (28-36)	64.4 (96)	8 (5-10)	48 (24-66)	17 (11-30)
Narsingdi (101)	33 (30-37)	44.6 (45)	7 (5-9)	60 (36-114)	36 (12-60)
Chandpur (115)	30 (27-35)	59.1 (68)	8 (5-10)	72 (48-120)	60 (24-84)
Teknaf (96)	30 (28-34)	50.0 (48)	6 (3-8)	48 (30-72)	24 (12-36)
Rajshahi (401)	38 (31-45)	52.1 (209)	5 (3-8)	84 (36-156)	48 (24-96)
Chapai (220)	42 (36-50)	47.7 (105)	6 (3-9)	84 (36-144)	60 (24-96)
Nawabganj (92)	32 (28-38)	48.9 (45)	7 (4-10)	48 (24-114)	48 (24-72)
Char Norendrapur (124)	42 (37-47)	36.3 (45)	4 (2-6)	90 (51-144)	60 (48-72)
Rangpur (103)	33 (30-36)	49.5 (51)	8 (5-10)	48 (36-84)	48 (24-60)
Naogaon (382)	30 (26-35)	83.8 (320)	9 (5-10)	48 (30-84)	8 (4-25)

Geographical Location (Number sampled)	Age in years Median (IQR)*	Ever attended school % (n)	Education (years) (Among those who attended school) Median (IQR)	Duration as injector/smoker (months) Median (IQR)	Duration in NSP [‡] (months) Median (IQR)
Pabna (101)	40 (34-45)	56.4 (57)	8 (6-9)	84 (60-138)	48 (15-60)
Ishwardi (57)	30 (27-36)	59.6 (34)	7 (5-9)	84 (54-120)	42 (24-55)
Sirajganj (344)	35 (30-40)	52.0 (179)	8 (5-10)	48 (24-96)	18 (11-48)
Hili (138)	36 (28-45)	53.6 (74)	7 (4-9)	26 (12-60)	18 (12-36)
Dinajpur (385)	32 (28-40)	75.8 (292)	8 (5-10)	60 (36-96)	36 (24-60)
Jessore (190)	30 (26-35)	52.1 (99)	8 (5-10)	27 (18-60)	21 (10-48)
Sathkhira (285)	30 (27-35)	82.1 (234)	8 (5-10)	36 (24-57)	24 (12-36)
Srimongol (79)	29 (26-35)	88.6 (70)	9 (7-12)	36 (24-60)	36 (24-60)
Barisal (404)	27 (23-30)	87.6 (354)	9 (8-12)	36 (18-60)	12 (6-36)
Benapole (96)	32 (28-35)	36.5 (35)	7 (5-9)	18 (14-29)	10 (6-12)
Heroin Smokers (male):					
Dhaka (388)	30 (25-36)	50.8 (197)	6 (4-8)	60 (30-120)	NA**
Combined PWID and heroin smokers (male):					
Jaipurhat (98)	31 (26-37)	77.6 (76)	9 (5-10)	11 (7-36)	8 (4-12)
Khulna (400)	28 (25-30)	68.3 (273)	8 (5-9)	24 (18-36)	12 (6-24)
Mongla (93)	28 (24-29)	81.7 (76)	9 (7-10)	24 (18-42)	18 (7-24)
Bagerhat (134)	28 (27-30)	92.5 (124)	8 (6-10)	24 (18-48)	24 (12-48)
Jhenaidah (80)	30 (25-36)	78.8 (63)	8 (4-10)	24 (12-59)	9 (6-29)
Kushtia (136)	32 (29-40)	61.0 (83)	7 (5-9)	60 (36-84)	60 (36-72)
Patuakhali (105)	24 (21-28)	85.7 (90)	9 (7-10)	18 (12-36)	12 (6-24)
Combined PWID and heroin smokers (female):					
Dhaka, Narayanganj, Tongi (256)	27 (25-30)	31.6 (81)	4 (3-5)	24 (12-48)	24 (12-36)
Benapole (98)	30 (25-35)	43.9 (43)	5 (4-8)	24 (12-24)	12 (12-24)

[‡] NSP = needle/syringe programme

*IQR refers to inter quartile range

[§]PWID = people who inject drugs

[†]Dhaka-A1 and Dhaka-A2 were merged together to represent Dhaka

**NA = Not asked

Other characteristics of PWUD in border areas

Generally it is perceived that people residing in border areas frequently cross over to neighbouring countries for different reasons. Therefore, in the border areas of Benapole and Hili, questions related to mobility and injection taking behaviour were asked and these are shown in Table 5. More males from Hili crossed the border to India in the last year than either males or females from Benapole ($P < 0.05$). However, injecting drugs while abroad was more commonly reported by both males and females from Benapole than by males from Hili ($P < 0.001$ for both comparisons).

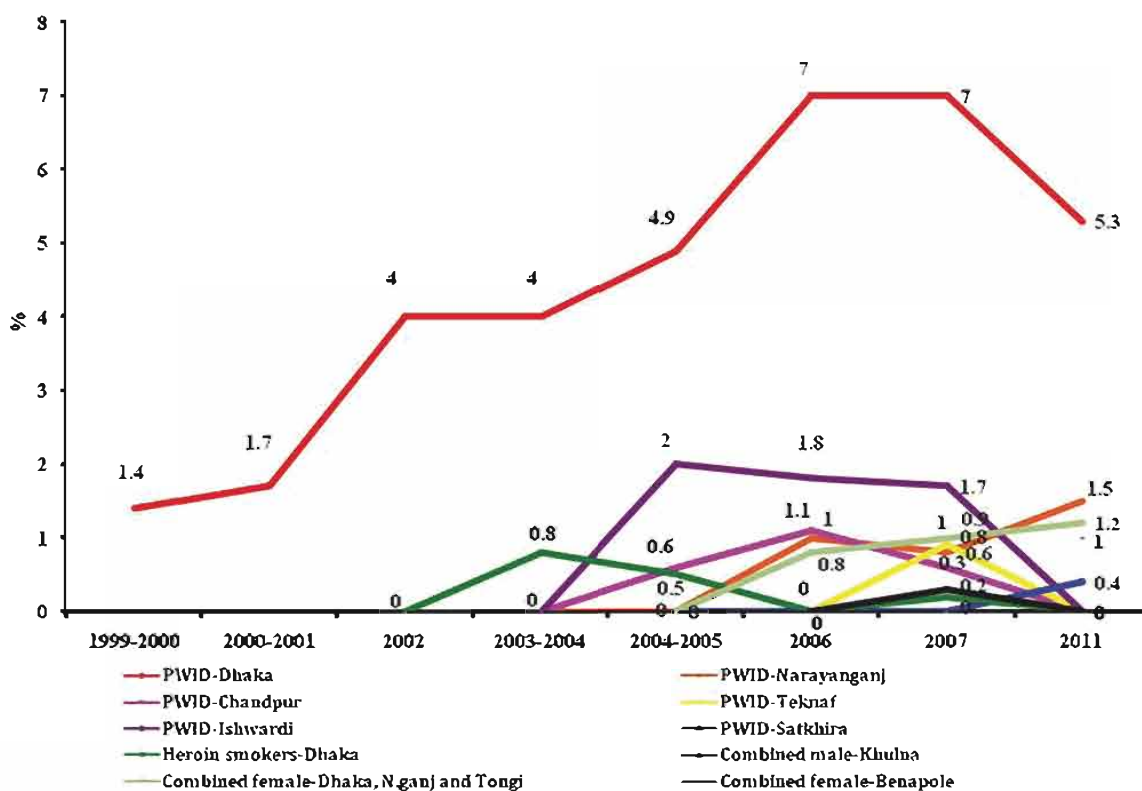
Table 5. Cross border mobility in the last year of PWUD in border areas

Variables	Benapole-Female N=98, unless otherwise stated % (n)	Benapole-Male N=96, unless otherwise stated % (n)	Hill-Male N=138, unless otherwise stated % (n)
Crossed the border to India in the last year	22.4 (22)	65.6 (63)	79.7 (110)
Injected drugs while abroad in the last year (Among those who crossed the border in the last year)	N=22 59.1 (13)	N=63 52.4 (33)	N=110 19.1 (21)

HIV and syphilis

HIV prevalence among all PWUD sampled is shown in Annexe 1. In this round, HIV was detected in five groups of PWUD with highest rates being among male PWID from Dhaka (5.3%). The other four groups include male PWID from Narayanganj (1.5%) and Satkhira (0.4); female combined PWID and heroin smokers from Dhaka, Narayanganj, Tongi (1.2%) and Benapole (1%) (Fig 2). In the previous round HIV was detected in low numbers among PWUD in another five cities but no HIV was found in this round from these sites. These include PWID in Chandpur, Teknaf, Ishwardi; heroin smokers in Dhaka; combined PWID and heroin smokers in Khulna (Annexe-1 & Fig 2).

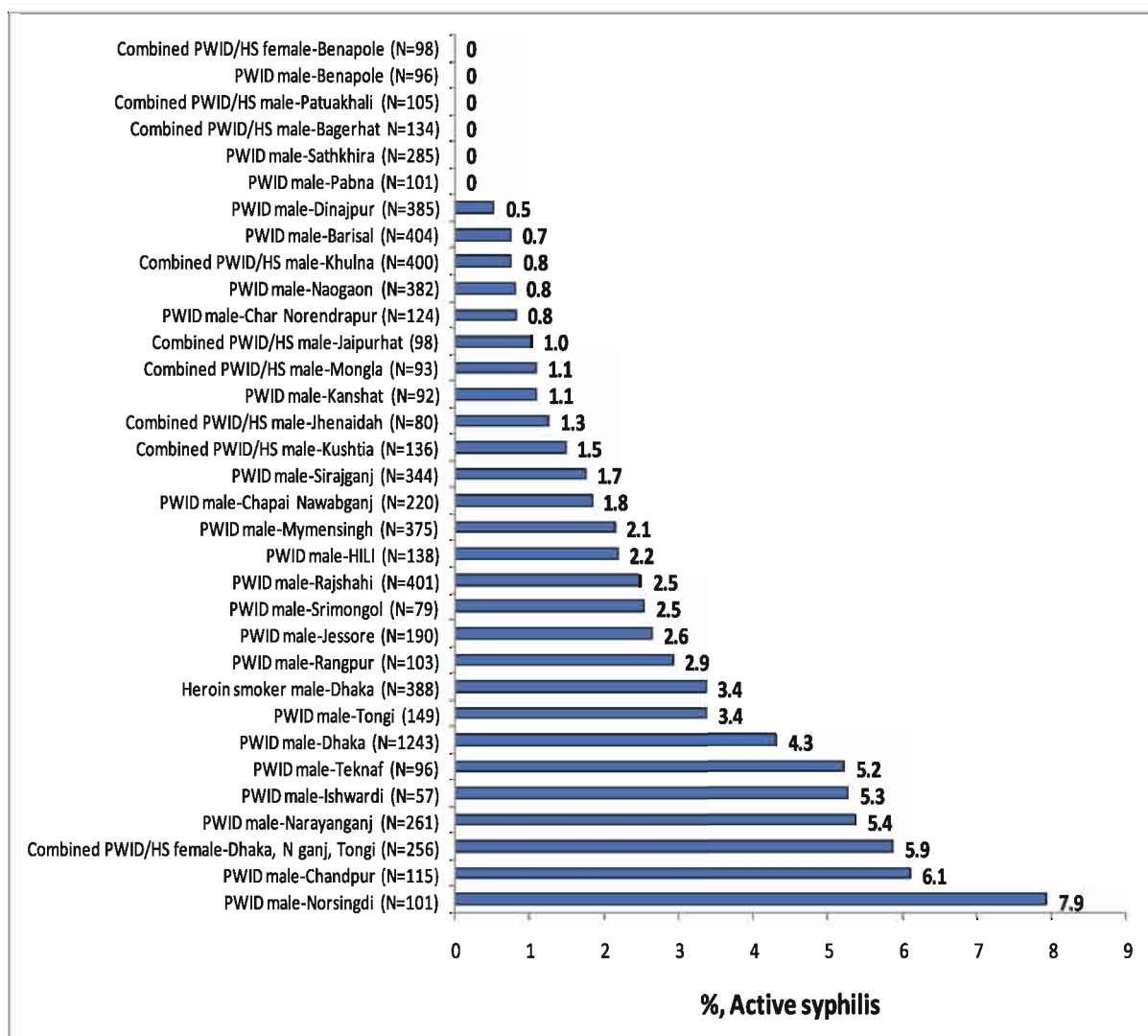
Fig. 2. HIV in people who use drugs over the rounds of surveillance



Although the prevalence rate of HIV in Dhaka PWID has declined in this round of surveillance, the overall trend for HIV still shows an increase ($P < 0.05$) (Fig 2). No changes were observed in all other PWUD groups where HIV was detected in either the 8th or the 9th rounds of surveillance.

In six cities none of the PWUD had active syphilis and one of these included female PWUD from Benapole (Fig 3 and Annexe 2). However, in another six cities, >5% PWUD had active syphilis and the highest proportion was found in male PWID in Norsingdi (7.9%). This was followed by PWID in Chandpur (6.1%) and female PWUD in Dhaka, Tongi and Narayanganj (5.9%) (Fig 3).

Fig. 3. Active syphilis in PWID, heroin smokers and combined PWID and heroin smokers, 2011



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

Comparison of active syphilis rates among PWUD was done for those cities where three or more consecutive rounds of data were available (Figs 4, 5 and 6). The comparison showed that active

syphilis rates declined significantly over time ($P < 0.05$) in Dhaka but there were no significant changes observed for other cities.

Fig. 4. Active syphilis in PWUD over the rounds, Dhaka and Barisal divisions

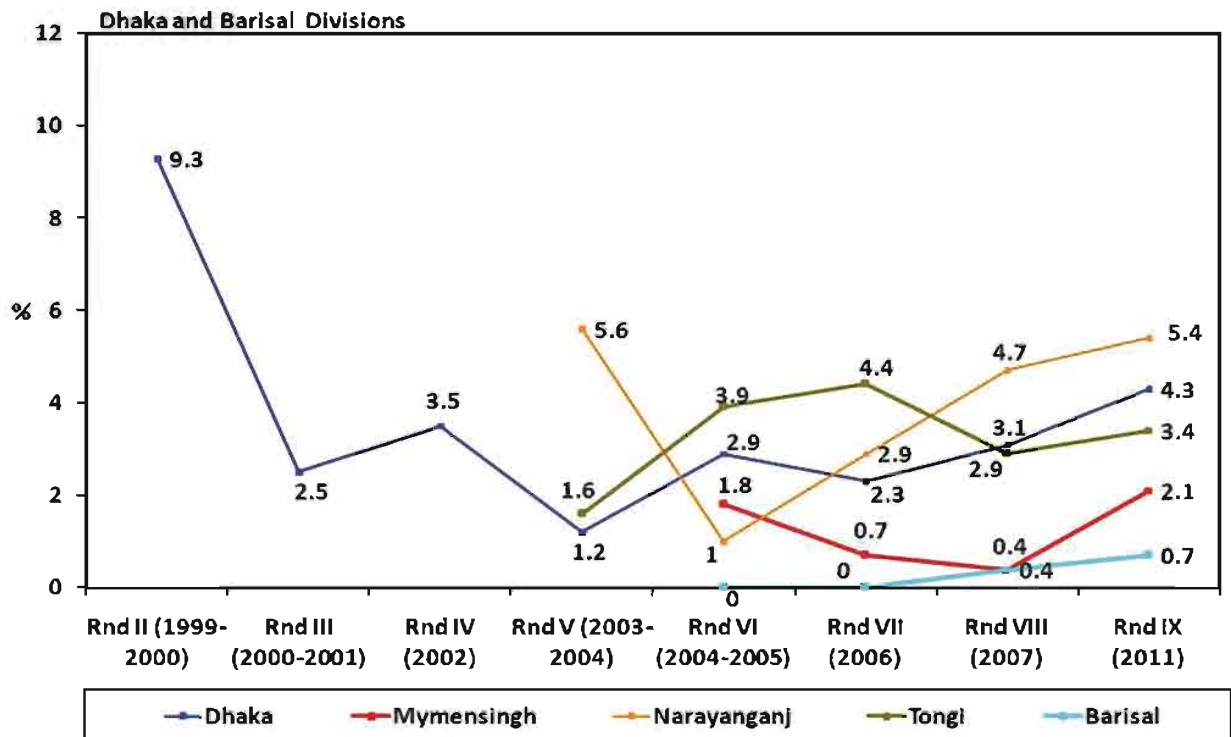


Fig. 5. Active syphilis in PWUD over the rounds, Chittagong, Khulna and Rangpur divisions

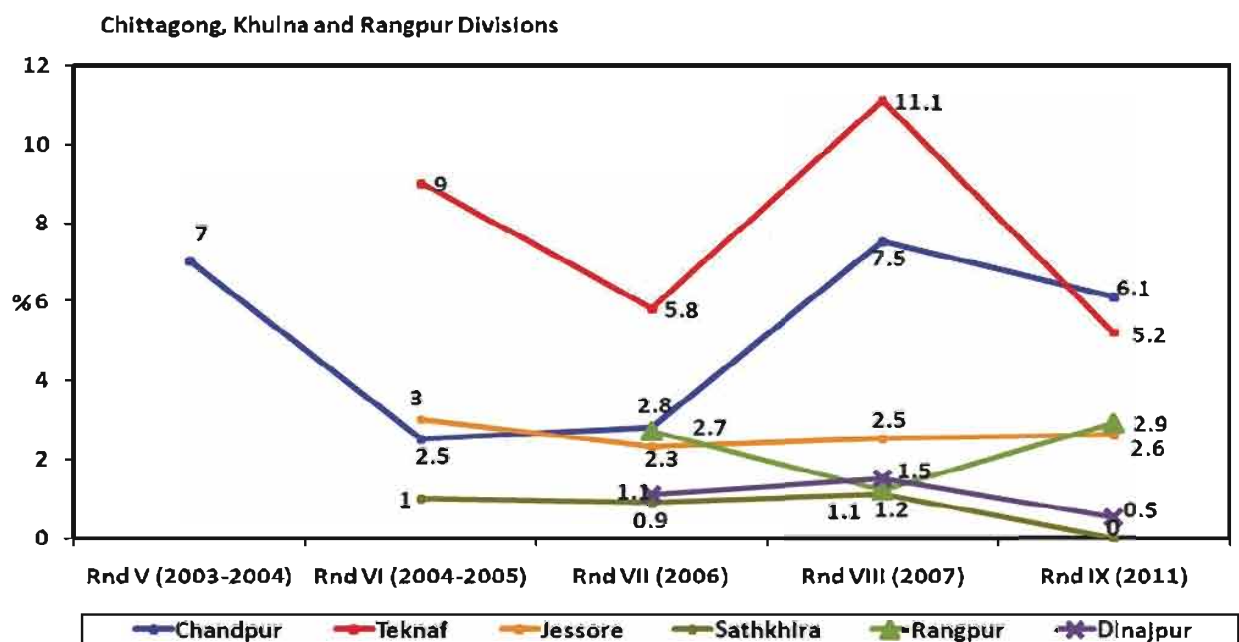
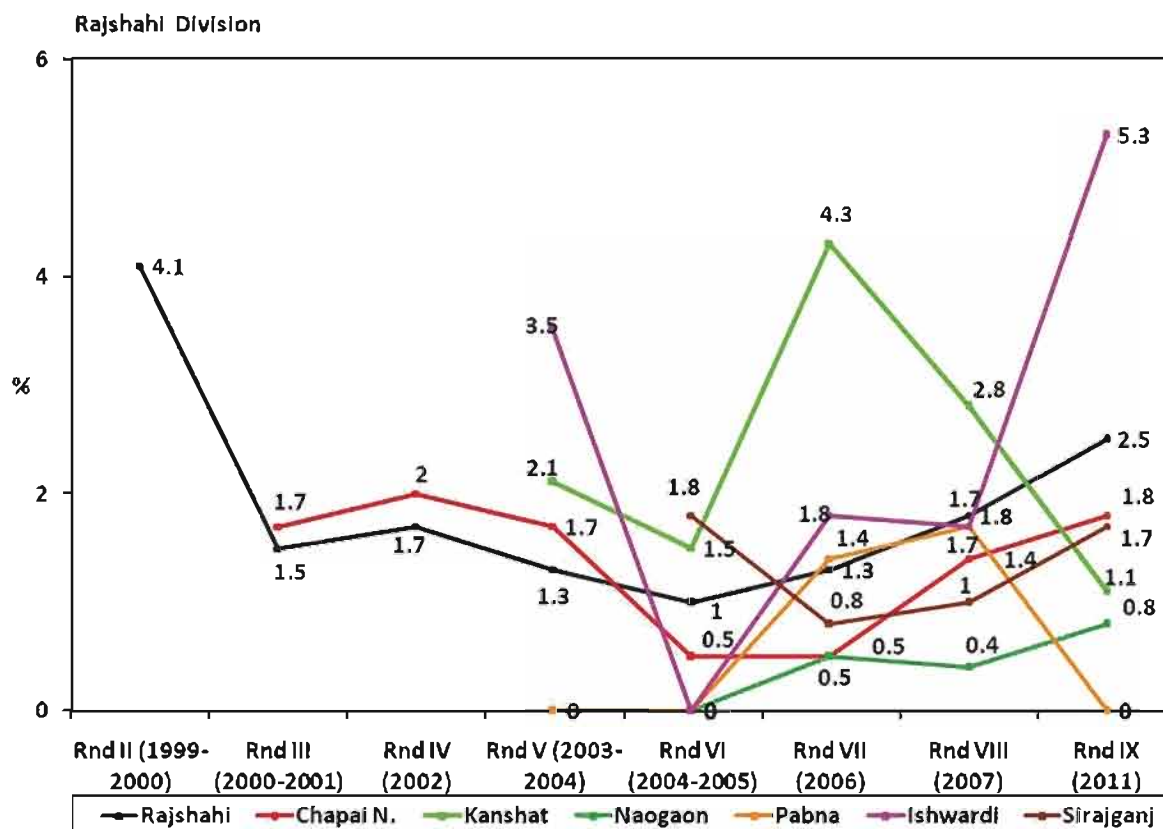


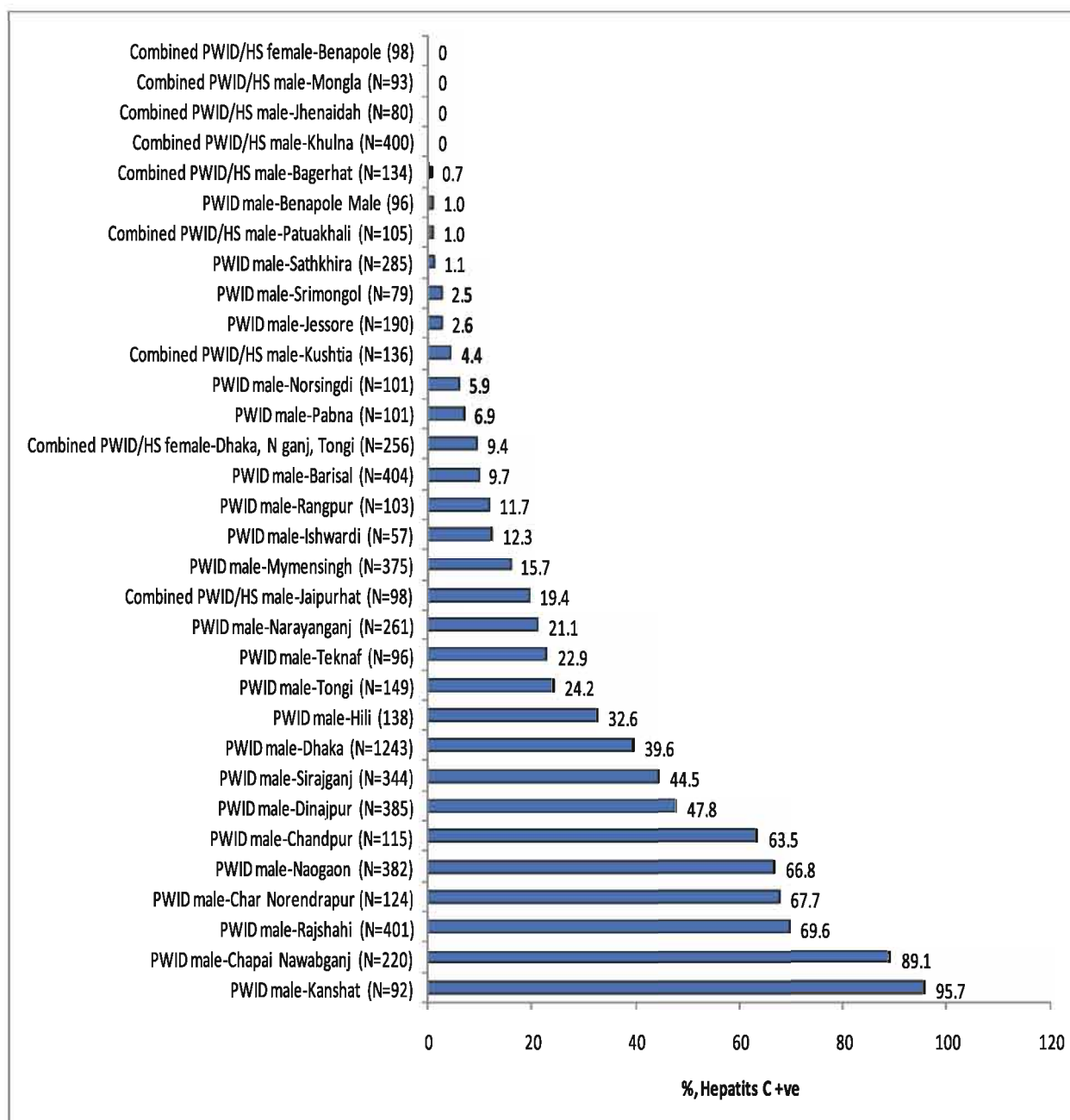
Fig. 6. Active syphilis in PWUD over the rounds, Rajshahi division



Hepatitis C in PWID

Other than the group consisting exclusively of heroin smokers, all PWUD were tested for antibodies to HCV (Annexe 3 and Fig 7). None tested positive in four cities among the combined group of PWID and heroin smokers which include females in Benapole and males in Mongla, Jhenaidah and Khulna. However, in six cities more than 50% of PWUD were HCV positive. The higher prevalence for HCV was found among PWID from several cities of Rajshahi division with Kanshat having the highest prevalence (95.7%) (Fig 7).

Fig. 7. HCV prevalence among PWID and combined PWID and heroin smokers, 2011



Note: Combined PWID/HS refers to the combined group of PWID and heroin smokers. Numbers in brackets refer to the total numbers of PWUD sampled in each site

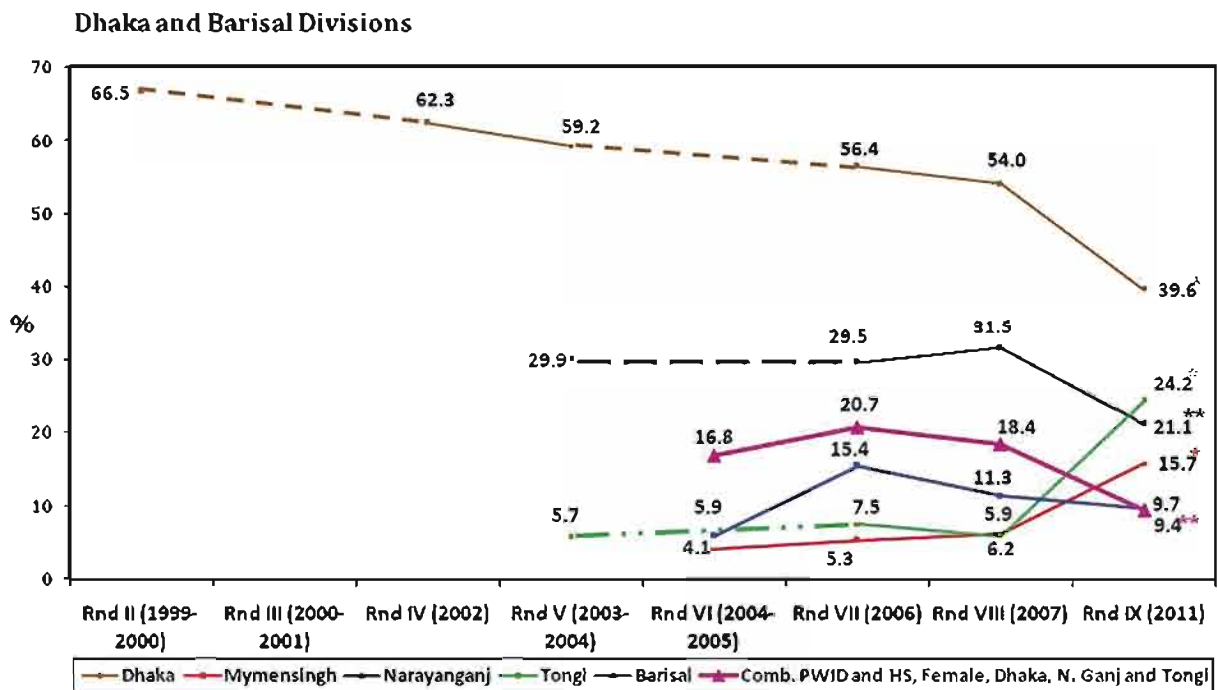
Comparison of HCV rates over the surveillance rounds was done for those sites where three or more rounds of data were available (Figs. 8, 9 and 10). In some sites significant decline in HCV rates were observed while in others rates increased significantly which was mainly observed within Rajshahi Division. Following is a list of sites where HCV rates rose significantly ($P < 0.05$):

- Dhaka Division:
 - Mymensingh, Tongi
- Rajshahi Division:
 - Rajshahi, Chapai Nawabganj, Kanshat, Chor Narendrapur

Sites were significant decline in HCV rates were recorded ($P < 0.05$) are:

- Dhaka Division:
 - Dhaka (male PWID), Female combined PWID and heroin smokers from Dhaka, Tongi, Narayanganj, Narayanganj
- Chittagong Division
 - Teknaf
- Rajshahi Division:
 - Ishwardi
- Rangpur Division
 - Dinajpur
- Khulna Division
 - Jessore

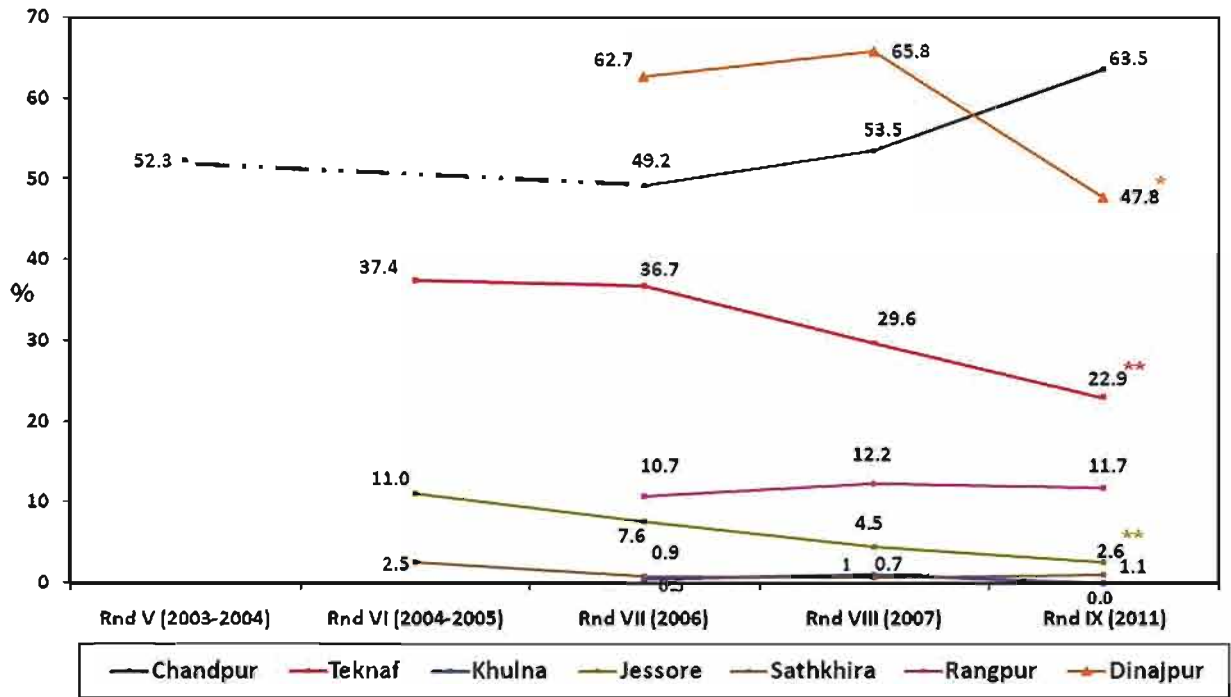
Fig. 8. HCV prevalence among PWID over the rounds in Dhaka and Barisal divisions



* $P < 0.001$

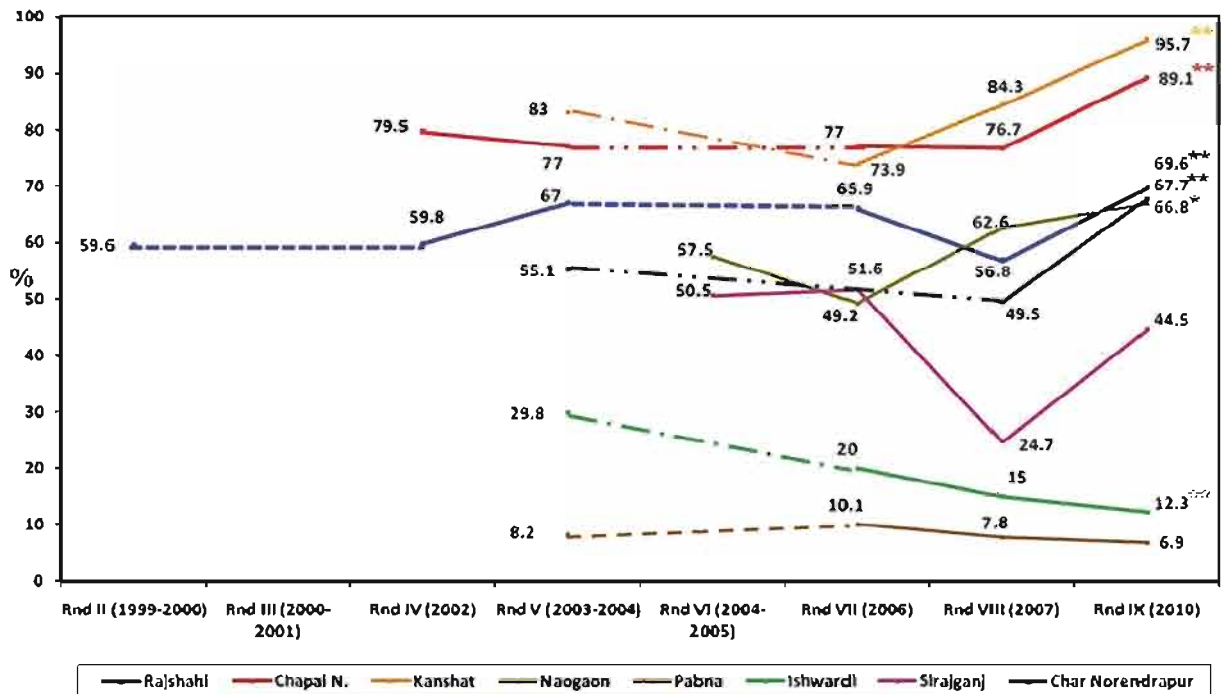
** $P < 0.05$

Fig. 9. HCV prevalence among PWID over the rounds in Chittagong, Khulna and Rangpur divisions
Chittagong, Khulna and Rangpur Divisions



* P<0.001 ** P<0.05

Fig. 10. HCV prevalence among PWID over the rounds in Rajshahi Division
Rajshahi Division



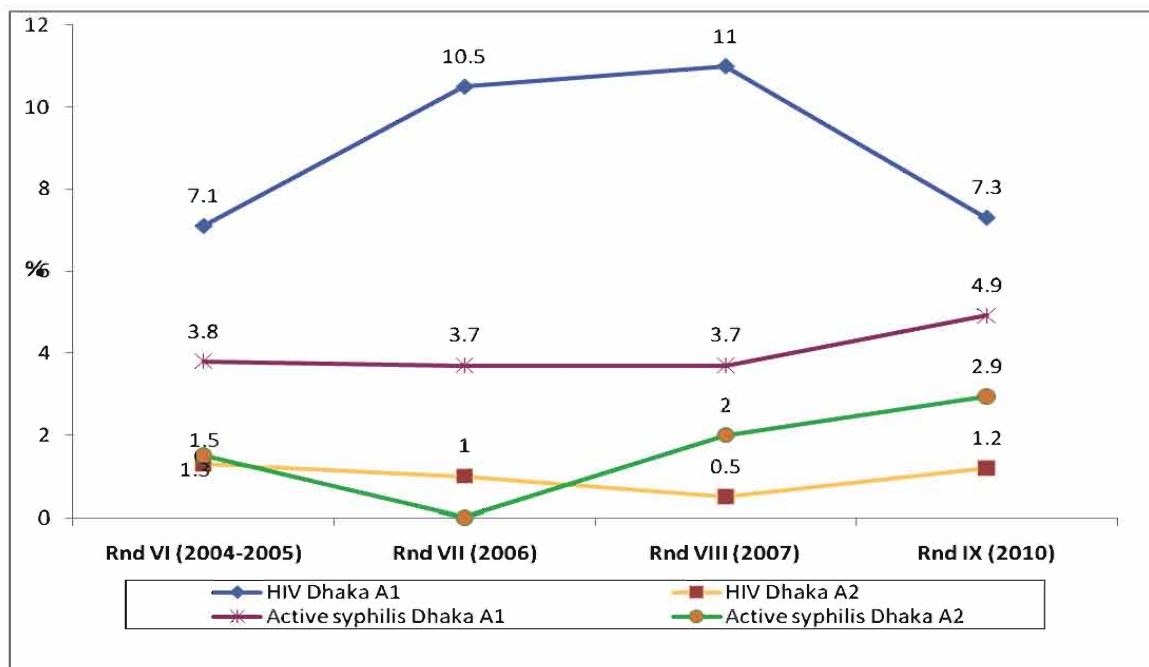
* P<0.001, ** P<0.05

Neighbourhoods of Dhaka

The HIV epidemic in PWID 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 separately in each surveillance round. During this round, a similar picture was obtained with PWID in Dhaka-A1 continuing to have the highest HIV prevalence (7.3%) while 1.2% of PWID in Dhaka-A2 were HIV positive (Fig. 11). Although there has been a decline in HIV in the A1 neighbourhood, there is no significant difference in the trend. The difference in HIV rates between Dhaka A1 and A2 remains significant in the 9th round ($P < 0.001$).

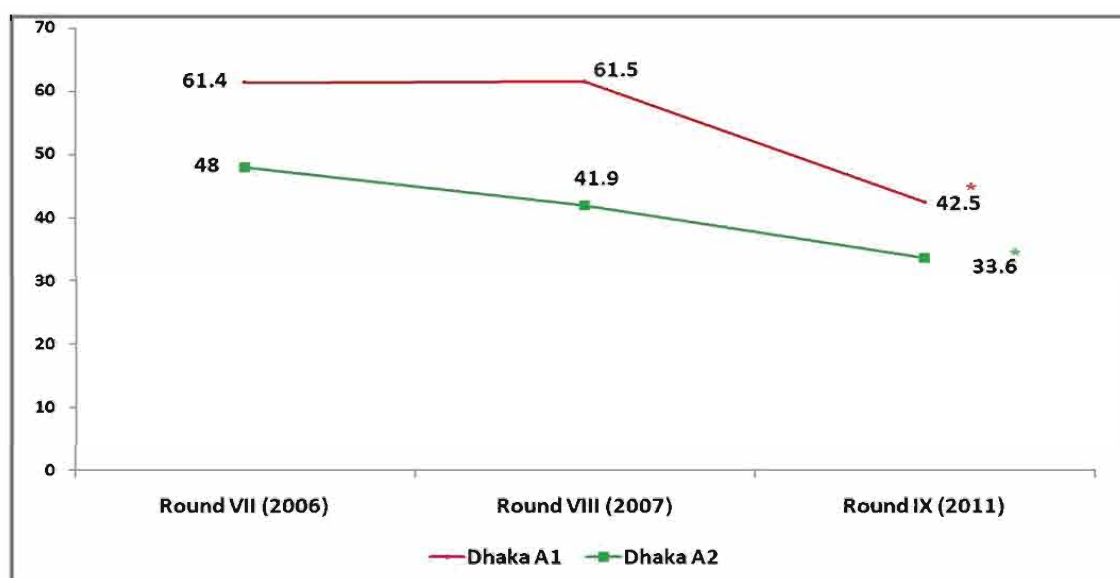
Active syphilis rates did not change over the rounds in each of the two neighbourhoods and there was no significant difference between the two neighbourhoods in this round (Fig. 11).

Fig. 11. HIV and active syphilis rates among the PWID in two neighbourhoods from Dhaka



Significant decline in HCV rates were observed over the rounds in PWID from both neighbourhoods ($P < 0.001$ for both) (Fig 12). However, significantly more PWID in Dhaka A1 had HCV than those in A2 in the 9th round ($P < 0.05$).

Fig. 12. HCV among the PWID in two neighbourhoods from Dhaka



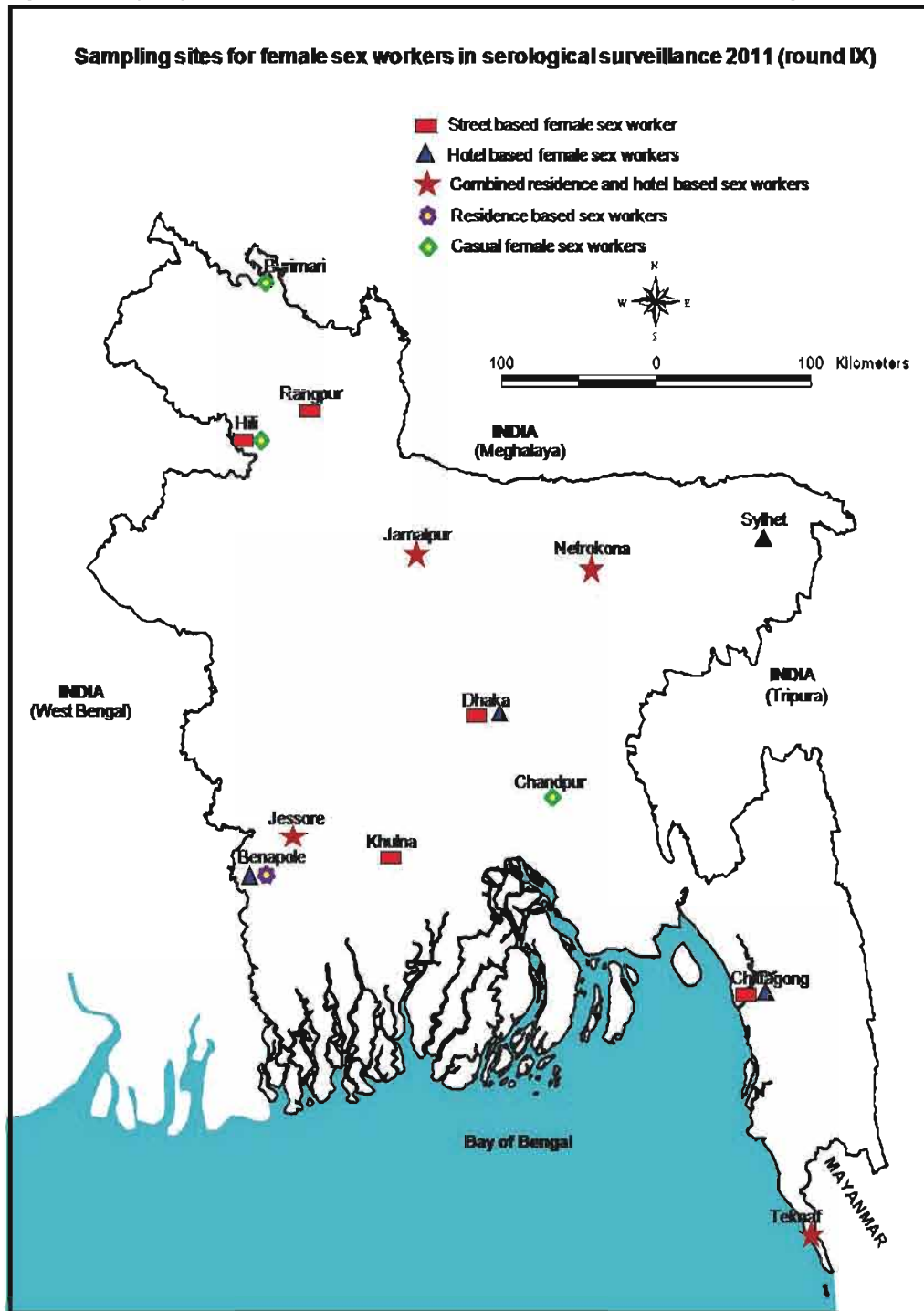
* P<0.001

4.2 FEMALE SEX WORKERS

A total of 3568 female sex workers were sampled from 13 cities/towns of Bangladesh from different venues (Fig 13). For the first time, an exclusive group of residence based sex workers were accessible. The following points summarise the categories of female sex workers and venues from where they were sampled (Table 1):

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

Fig. 13. Sampling sites for female sex workers for the 9th round of serological surveillance, 2011



Demographic characteristics

Among all groups of female sex workers, generally casual female sex workers were older. The proportion of female sex workers who ever attended school was highest in hotel based female sex workers from Benapole ($P < 0.05$ for all except hotel based Chittagong sex workers where proportions were similar) and the median duration of education was also highest among

Benapole hotel sex workers. Combined residence and hotel based female sex workers in Jamalpur were selling sex for a longer duration ($P < 0.05$ for all except street based female sex workers from Dhaka) (Table 6).

Table 6. Demographic characteristics of female sex workers

Geographical Location (Number sampled)	Age in years Median (IQR)*	Ever attended school % (n)	Education (years) (Among those who attended school) 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 (394)	25 (21-30)	36.3 (143)	5 (3-7)	48 (24-84)	45 (24-72)
Chittagong (400)	25 (20-33)	31.0 (124)	5 (3-7)	36 (24-72)	36 (12-60)
Khulna (365)	28 (23-33)	49.0 (179)	7 (5-9)	48 (24-72)	48 (24-60)
Rangpur (207)	28 (22-39)	21.7 (45)	5 (5-8)	36 (30-60)	36 (24-60)
Hili (32)	26 (24-32)	37.5 (12)	6 (5-7)	NQ [§]	NQ [§]
Hotel based female sex workers:					
Dhaka (401)	20 (18-25)	58.1 (233)	5 (4-8)	12 (7-36)	12 (6-36)
Chittagong (172)	21 (20-25)	58.7 (101)	7 (4-8)	24 (12-48)	24 (12-48)
Sylhet (225)	25 (22-29)	38.7 (87)	5 (3-8)	36 (18-48)	36 (18-48)
Benapole (69)	22 (20-26)	71.0 (49)	9 (8-10)	12 (12-24)	12 (12-24)
Combined residence and hotel based female sex workers:					
Jamalpur (218)	26 (25-30)	31.2 (68)	5 (3-7)	60 (36-72)	60 (36-72)
Teknaf (119)	25 (22-26)	18.5 (22)	5 (5-5)	24 (12-36) [†]	24 (12-36) [†]
Netrokona (245)	28 (25-35)	24.1 (59)	4 (4-7)	24 (24-36)	24 (24-36)
Jessore (236)	24 (21-26)	52.5 (124)	7 (5-8)	24 (18-48)	24 (18-48)
Residence based female sex workers:					
Benapole (258)	25 (21-30)	45.3 (117)	8 (5-9)	18 (12-30)	18 (12-30)
Casual female sex workers:					
Chandpur (58)	29 (23-35)	34.5 (20)	7 (5-9)	24 (18-36)	24 (18-36)
Hili (125)	30 (26-35)	24.0 (30)	5 (3-6)	NQ [§]	NQ [§]
Burimari (44)	30 (29-33)	31.8 (14)	6 (5-10)	NQ [§]	NQ [§]

*IQR refers to inter quartile range

[§]NQ=Not questioned

[†]Data from one individual was missing

Other characteristics of female sex workers in border areas

Questions were asked to female sex workers from the four border cities (Teknaf, Hili, Burimari and Benapole) on whether they had ever crossed the border to India or Myanmar and if they had whether they had sold sex while in those countries (Table 7). As with the previous rounds of surveillance, the proportion of the sex workers who crossed the border were highest in casual sex workers of Hili compared to all others ($P < 0.001$ for all). From all four cities, large proportions of sex workers who said they had travelled to the neighbouring countries had also sold sex there (Table 7).

Table 7. Cross border mobility in the last year of female sex workers in border areas

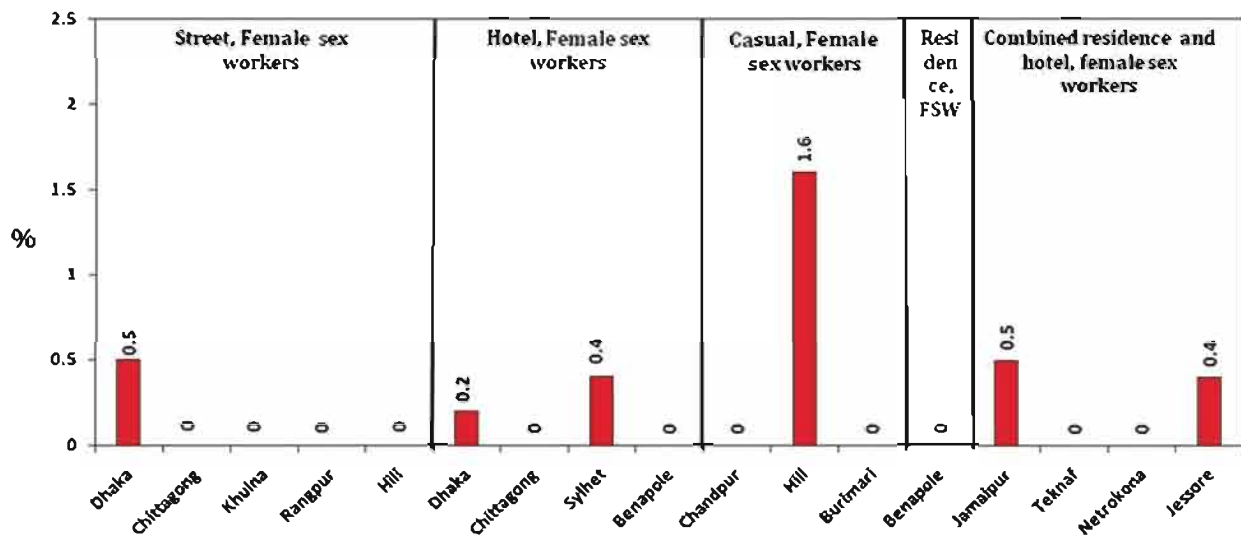
Variables	Residence and hotel based female sex workers- Teknaf N=118 [†] , unless otherwise stated % (n)	Casual female sex workers-Hili N=125, unless otherwise stated % (n)	Street based female sex workers-Hili N=32, unless otherwise stated % (n)	Casual female sex workers-Burimari N=44, unless otherwise stated % (n)	Residence based female sex workers-Benapole N=258, unless otherwise stated % (n)	Hotel based female sex workers-Benapole N=69, unless otherwise stated % (n)
Crossed the border to India or Myanmar in the last year	5.9 (7)	87.2 (109)	15.6 (5)	6.8 (3)	4.7 (12)	8.7 (6)
Sold sex while abroad in the last year (Among those who had crossed the border in the last year)	71.4 (5) N=7	79.8 (87) N=109	60.0 (3) N=5	66.7 (2) N=3	66.7 (8) N=12	100 (6) N=6
Used condom during last episode of selling sex while abroad in the last year (Among those who had crossed the border in the last year and sold sex while abroad)	80.0 (4) N=5	79.3 (69) N=87	66.7 (2) N=3	100 (2) N=2	75.0 (6) N=8	83.3 (5) N=6

[†]Data from one individual was missing

HIV and syphilis

HIV prevalence among female sex workers in different setting was <1% except those from Hili where two samples tested positive out of 125 samples (1.6%) (Fig. 14 and Annexe 1).

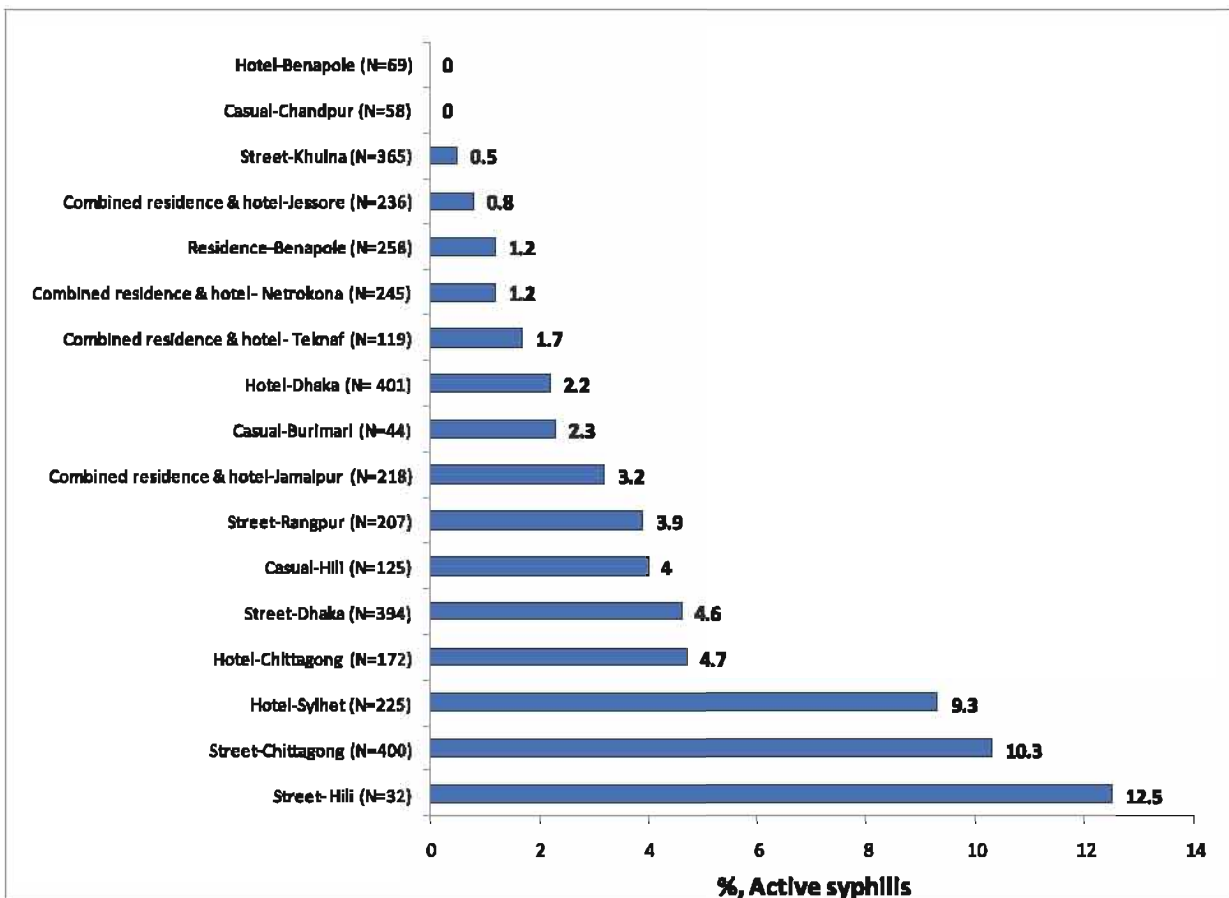
Fig. 14. HIV prevalence among female sex workers, 2011



Note: FSW refers to female 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%. The highest rate was recorded among street based sex workers of Hill (12.5%) (Fig. 15 and Annexe 2) which is a population group that was sampled for the first time in serological surveillance. As in the previous year, active syphilis rate was very high among the street based female sex workers from Chittagong (10.3%).

Fig. 15. Prevalence of active syphilis among female sex workers, 2011

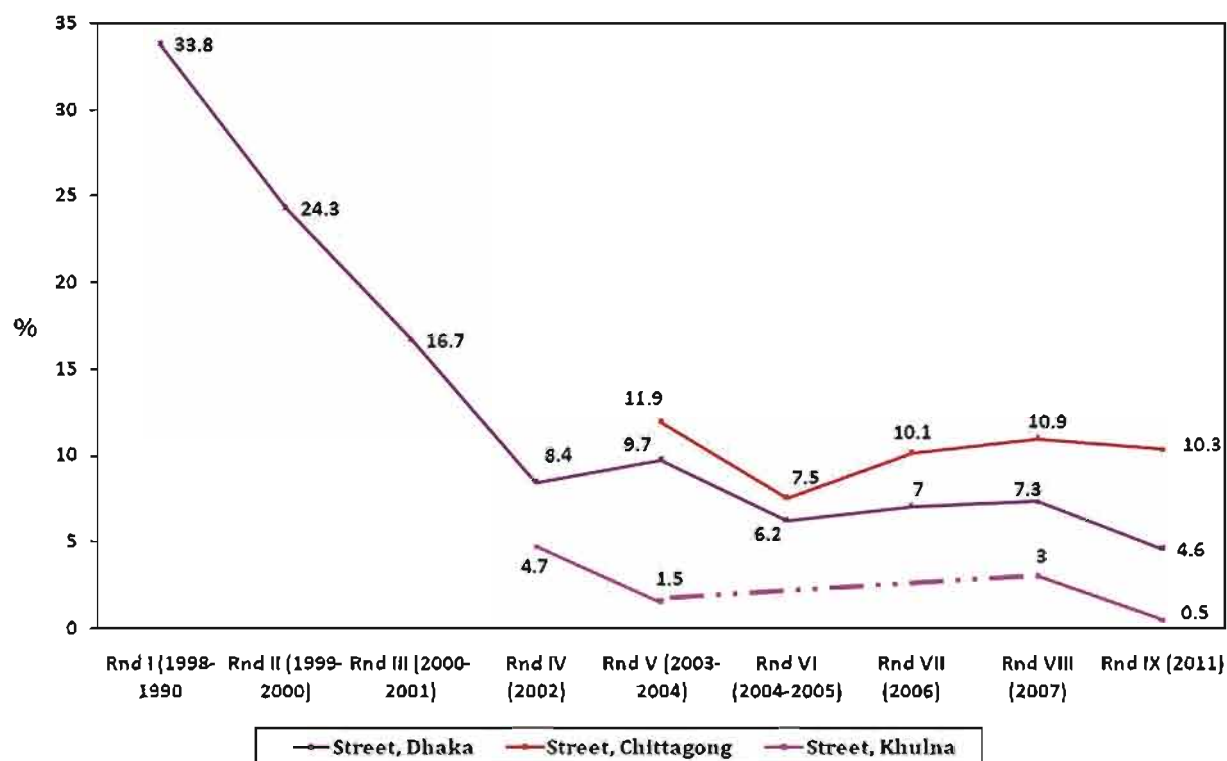


Comparison over the rounds

Over the rounds, HIV prevalence among female sex workers has been low (Annexe 1). For sites where HIV was detected over the rounds, the changes were not significant.

Active syphilis rates are shown in Annexe 2 and comparisons over the rounds among street, hotel and residence based sex workers and casual sex workers are shown in Figs 16-18 (where data for three or more rounds are available). In three of the four sites for street based female sex workers, active syphilis rates declined significantly (Dhaka, Khulna and Rangpur)(Fig. 16) over the rounds. However, in Chittagong rates were high (10.3%) during the 9th round and no significant change was observed over the rounds.

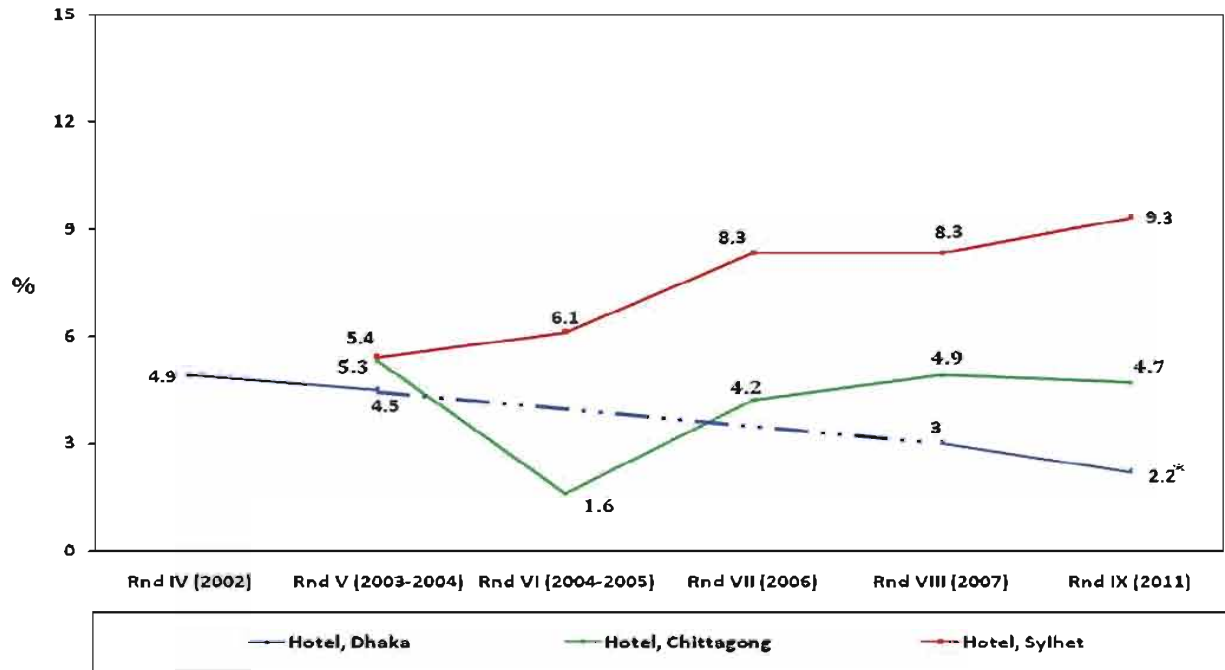
Fig. 16. Active syphilis rates in street based female sex workers over the rounds



* p<0.05

Among hotel based sex works, the only site where significant change was observed was in Dhaka hotels, where rates declined over time (P<0.05) (Fig. 17). As none of the sites for hotel and residence based sex workers were sampled before the 8th round, trend analyses for these sites were not conducted.

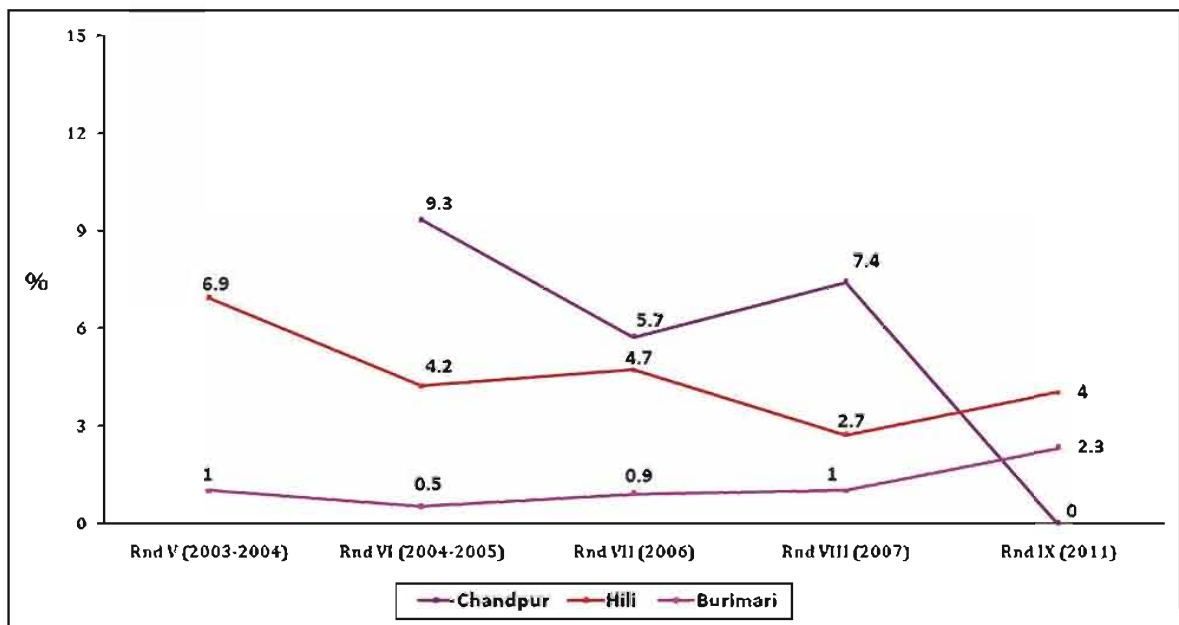
Fig. 17. Active syphilis rates in hotel and combined hotel and residence based female sex workers over the rounds



* p<0.05

Over the rounds, no changes were observed in active syphilis rates among casual female sex workers (Fig 18).

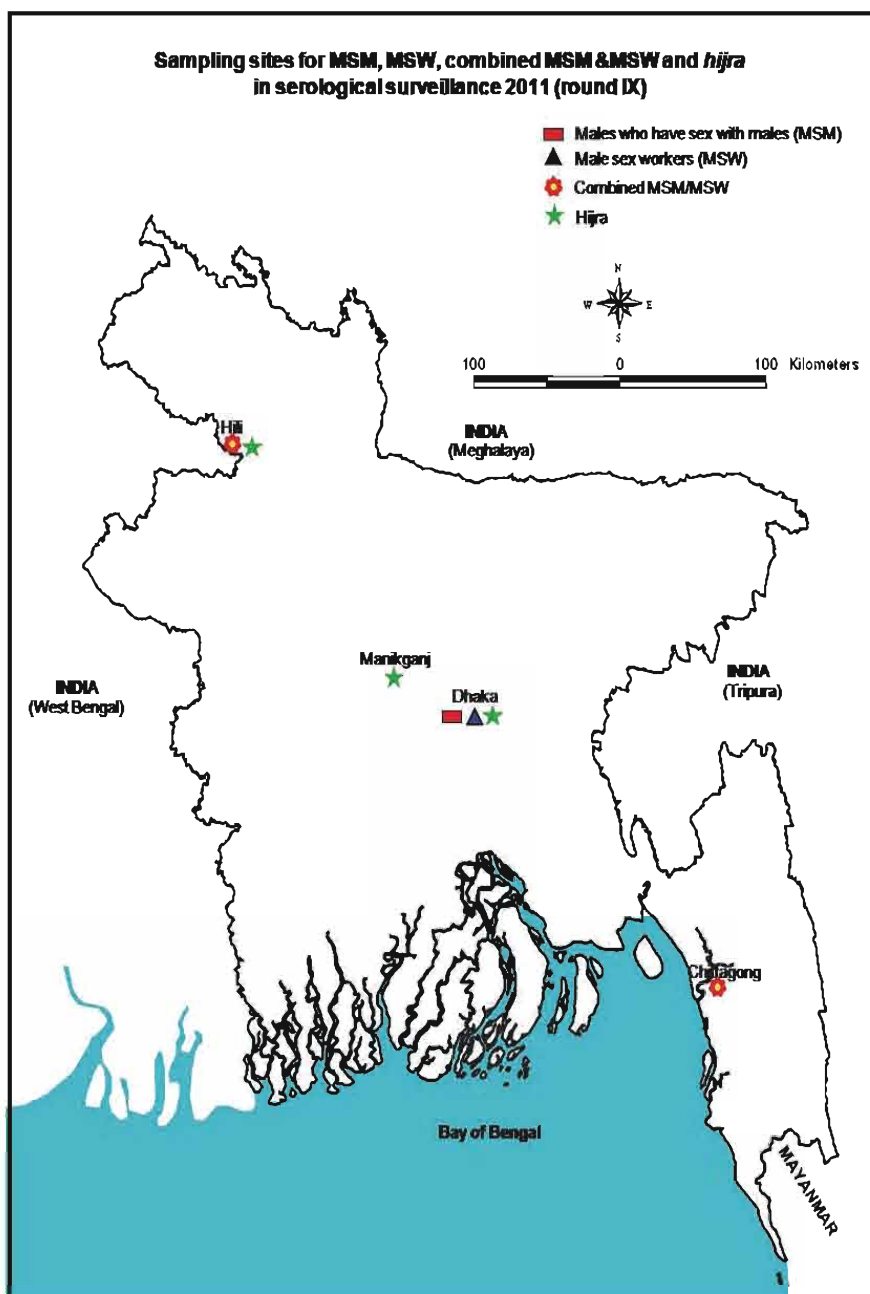
Fig. 18. Active syphilis rates in casual female sex workers over the rounds



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

The different sampling sites for MSM, MSW and hijra are shown in Fig. 19. MSM and MSW were sampled from Dhaka, combined MSM/MSW were sampled from Chittagong and Hili and hijra were sampled from Dhaka, Manikganj and also from Hili. Hili was a new sampling site for these population groups in this round of surveillance.

Fig. 19. Sampling sites for MSM, MSW and hijra in the 9th round of serological surveillance



Demographic characteristics

Hijra in Hili were the oldest group among MSM, MSW, combined MSM/ MSW and hijra sampled ($P<0.05$ for all comparisons), (Table 8). Proportions who ever attended school were significantly higher in MSW Dhaka and combined MSM/MSW in Hili than in other sites ($P<0.05$). Among hijra, those in Dhaka, Manikganj reported selling sex for a longer time than those in Hili ($P<0.05$).

Table 8. Demographic characteristics of MSM, MSW, combined MSM/MSW and hijra

Geographical location (Number sampled)	Age in years Median (IQR)*	Ever attended school % (n)	Education (years) (Among those who attended school) Median (IQR)	Duration as sex worker (months) Median (IQR)	Duration of selling sex at the same site (months) Median (IQR)
Males who have sex with males (MSM):					
Dhaka (400)	24 (21-30)	76.0 (304)	8 (5-9)	NA [§]	168 (60-264)
Male sex workers (MSW):					
Dhaka (402)	25 (21-29)	85.1 (342)	8 (5-10)	96 (41-144)	72 (36-120)
Combined MSM/MSW:					
Chittagong (399, unless otherwise stated)	24 (21-30)	79.4 (317)	7 (5-9)	60 (36-144) N=205**	156 (72-264)
Hili (158, unless otherwise stated)	21 (18-26)	84.8 (134)	9 (6-10)	96 (60-144) N=43**	240 (216-300)
Hijra:					
Dhaka, Manikganj (407, unless otherwise stated)	26 (21-30)	74.7 (304)	8 (5-9)	108 (60-168) N=393 [†]	96 (48-144) N=393 [†]
Hili (31, unless otherwise stated)	30 (25-34)	26.7 (8) N=30 [‡]	6 (3-9)	60 (48-120) N=15 [†]	60 (30-120) N=15 [†]

*IQR refers to inter quartile range

[§]NA = Not applicable

**This excludes those who did not sell sex, i.e. who were MSM (Chittagong, N=194; Hili, N=115)

[†]This excludes those who did not sell sex, i.e. who were badhai hijra and traditionally do not sell sex (Dhaka, Manikganj, N= 14; Hili, N=16)

[‡]One individual could not speak (dumb person)

Other characteristics of MSM/ MSW and hijra in border areas

For the first time, MSM/MSW and hijra were sampled from a border area. Prior information suggested that hijra frequently cross the border to India and therefore hijra were sampled from Hili despite only a small number of hijra being available from this area. Similar proportions of MSM/MSW and hijra said they had visited India in the last month where some sold sex (Table 9).

Table 9. Cross border mobility in the last year of MSM/MSW and hijra from Hili

Variables	Combined MSM/MSW N=158, unless otherwise stated % (n)	Hijra N=30*, unless otherwise stated % (n)
Crossed the border to India in the last year	50.0 (79)	60.0 (18)
Sold sex while abroad in the last year, (Among those who had crossed the border in the last year)	N= 79 22.8 (18)	N=8 ⁵ 37.5 (3)
Used condom during last episode of selling sex while abroad in the last year (Among those who had crossed the border in the last year and sold sex while abroad)	N= 18 50.0 (9)	N= 3 66.7 (2)

*the questionnaire was not applied to one individual who could not speak

⁵This excludes those who did not sell sex, i.e. who were badhai hijra and traditionally do not sell sex

HIV and syphilis

None of the MSM, MSW or combined MSM/MSW sampled tested positive for HIV (Table 9). In hijra, HIV prevalence was 1% in Dhaka, Manikgonj. In Hili, the number of hijra sampled was small and one was found to be positive of the 31 hijra sampled. The prevalence of active syphilis was highest in hijra of Dhaka, Manikgonj (6.1%) (Table 10).

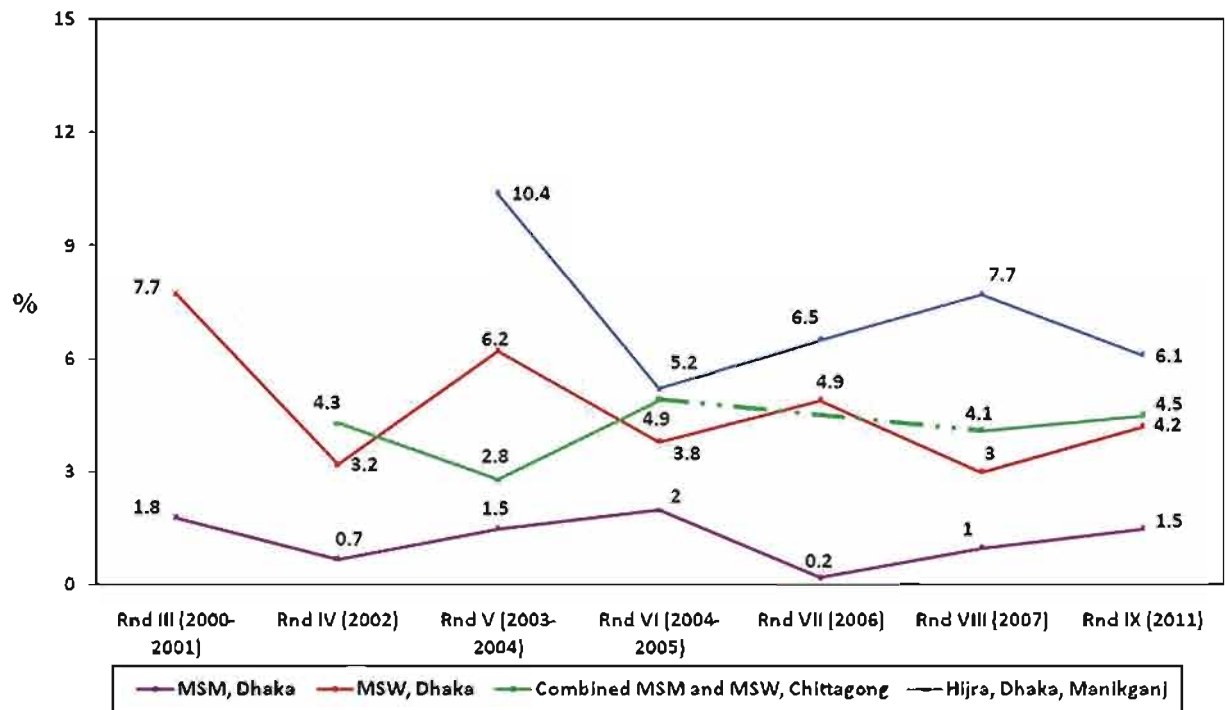
Table 10. Prevalence of HIV and syphilis among MSM, MSW, combined MSM/MSW and hijra, 2011

Study Populations, Geographical location (N)	HIV % (n)	Active syphilis % (n)
Males who have sex with males: Dhaka (400)	0	1.5 (6)
Male sex workers (MSW): Dhaka (402)	0	4.2 (17)
Combined MSM/MSW: Chittagong (399)	0	4.5 (18)
Hili (158)	0	3.2 (5)
Hijra: Dhaka, Manikganj (407)	1.0 (4)	6.1 (25)
Hili (31)	3.2 (1)	3.2 (1)

Comparison over the rounds

There were no changes in the rates of active syphilis over the rounds in MSM, combined MSM/MSW and hijra (Fig. 20).

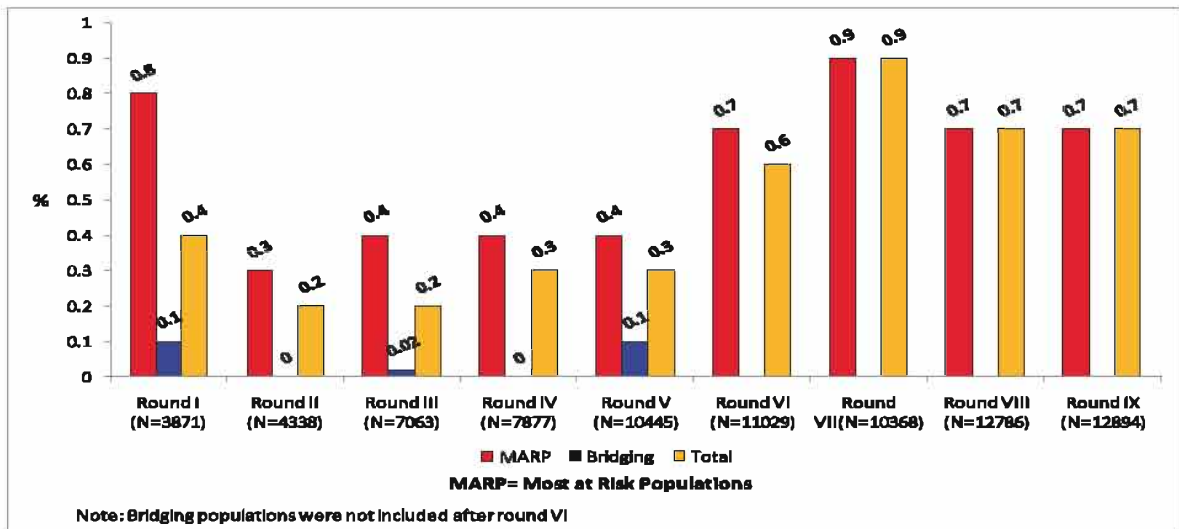
Fig. 20. Prevalence of active syphilis among MSM, MSW, combined MSM & MSW and hijra over the rounds



5. SUMMARY OF FINDINGS AND DISCUSSION

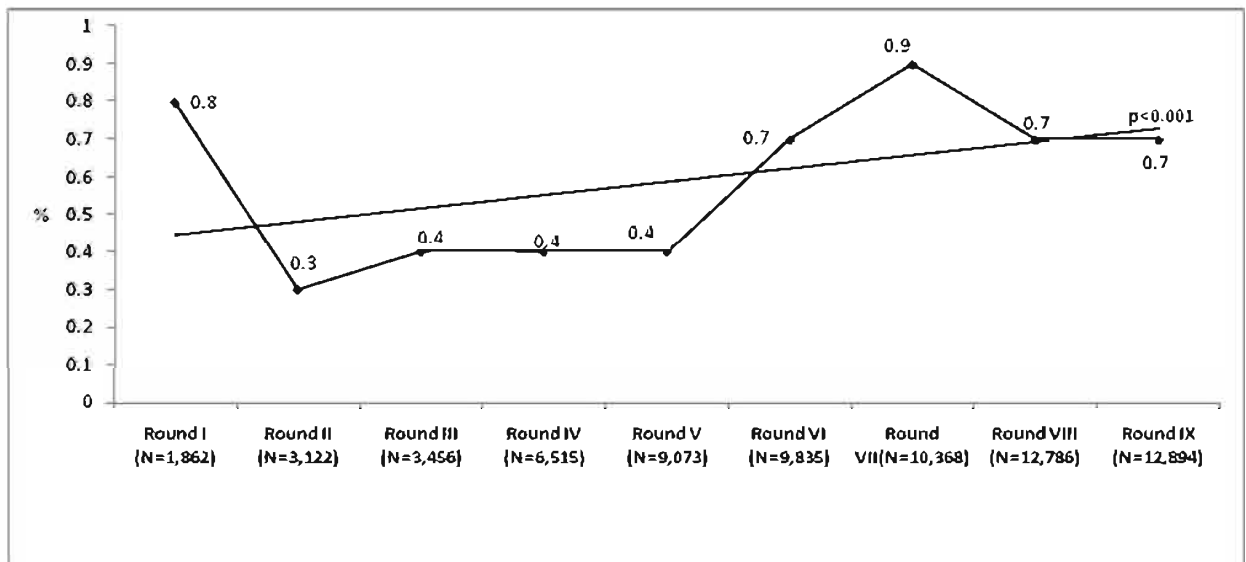
The overall HIV prevalence has remained <1% over the rounds of surveillance irrespective of whether the total population is considered or when segregated for the most at risk and bridge populations (Fig. 21). It is to be noted that bridging population groups were not sampled since the 6th round of surveillance.

Fig. 21. HIV prevalence over the rounds



Analysis of the trend of HIV prevalence in populations most at risk of HIV (not bridge populations) showed that although the HIV rate has remained below 1%, the trend is rising significantly over the years ($P < 0.001$) (Fig. 22).

Fig. 22. Trend of HIV among populations most at risk over the rounds of surveillance



As before the main population group contributing to HIV in the country is male PWID in Dhaka and particularly from one neighbourhood of Dhaka (Dhaka A1) (Annexe 1). However, it is very encouraging to observe that HIV rates have declined compared to previous years and if the downward trend is maintained over the next few years, Bangladesh will have successfully reversed the epidemic. What is additionally encouraging is the declining HCV rates in PWID of this neighbourhood and in all of Dhaka city which strongly suggests successful intervention in this population group. The scaling up of the NSP and the special attention given to PWID living with HIV (Faruque, Azim et al. 2004) are possible factors contributing to the decline in rates.

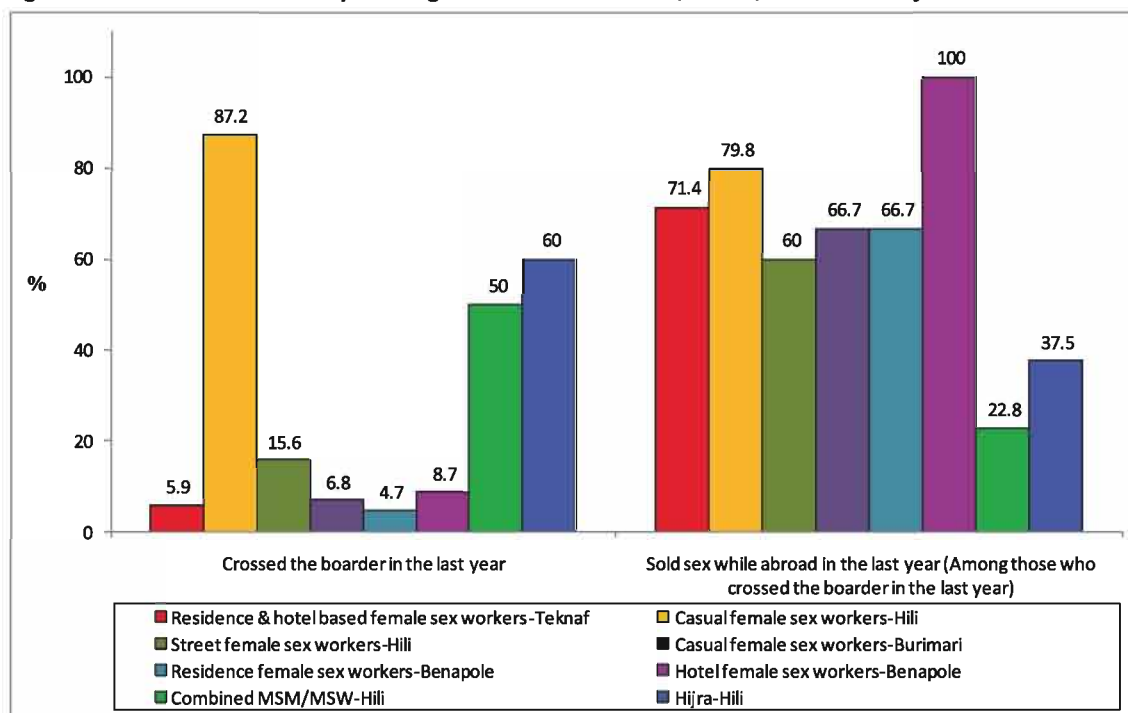
However, in many areas especially within the Rajshahi Division, high and rising HCV prevalence in PWID and combined PWID and heroin smokers were recorded; almost all PWID in Kanshat were HCV positive. Without an accompanying BSS or other surveys it is not possible to ascertain the reason behind this but rising HCV rates indicate ongoing unsafe injection practices. These data strongly suggest that harm reduction services being provided in these areas must be intensified.

Other than PWUD, the population group with more than 1% HIV was hijra; but this information needs to be treated with caution as the total numbers sampled were low. However, as with PWUD, it was Dhaka where most of the HIV positive hijra were located and that too in Dhaka A1.

Examination of the data to identify not just population groups but also geographical areas where more HIV was identified showed that the maximum number of groups in whom HIV was detected was in Dhaka – male and female PWID, female sex workers from the streets and hotels, and hijra. Thus all groups in Dhaka appear to be vulnerable to HIV and require special attention.

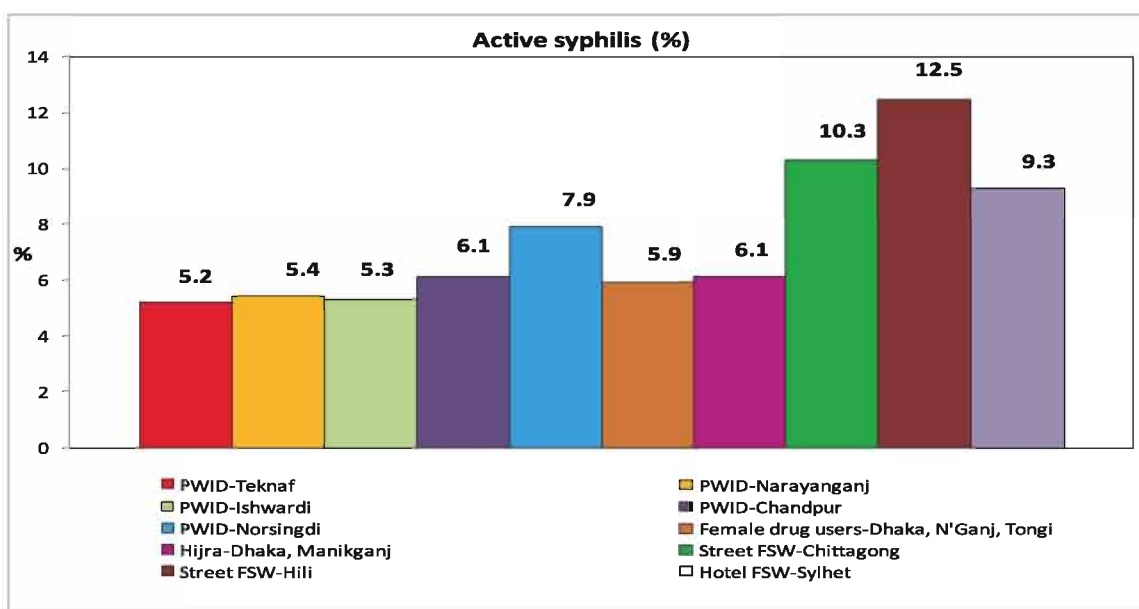
The other areas where more than one population group with HIV was detected were Benapole (female PWUD and residence based female sex workers) and Hili (hijra and casual female sex workers) both border areas, next to West Bengal, India. It is well recognised that mobility and migration can enhance vulnerability to HIV and women are particularly vulnerable (Blanchet, Biswas et al. 2003). Fig. 23 shows the percentage of female sex workers, MSM, MSW and hijra living in border areas who crossed over the border in the last year and sold sex while abroad. It shows clearly that cross border mobility is more common in Hili. Little is known about the sex workers (male, female and hijra) living in these border areas and the BSS of the country does not sample sex workers from these towns (Govt. of Bangladesh 2007). A better understanding is essential for evidence based programming.

Fig. 23. Cross border mobility among female sex workers, MSM, MSW and hijra



A surrogate marker of unsafe sex is active syphilis. The significant decline in active syphilis rates in Dhaka hotel and street based female sex workers suggests strong programming in Dhaka. However, there were some population groups that had unacceptably high levels of active syphilis and rates at >5% were found in PWUD, female sex workers and hijra from 10 cities. Among these six were in PWUD, three in female sex workers and one in hijra (Fig. 24).

Fig. 24. Population groups where more than 5% had active syphilis



The fact that PWUD had high active syphilis rates is very worrying and confirms other data showing that they are sexually active and practice unsafe sex (Govt. of Bangladesh 2007). Analysis of BSS data showed that among the services that PWID received, the proportion reporting receiving condoms were very low (Azim, Khan et al. 2009). BSS data have also shown that no population group is isolated, that everyone is networked so that infections can be transmitted across groups through unsafe sex (Govt. of Bangladesh 2003). Documentation of the highest rate of active syphilis among street based female sex workers from Hili again highlights the high vulnerability of those residing in this border town.

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 over the years, suggests that with continued efforts it may be possible to reverse the HIV epidemic in PWID in Dhaka. However, harm reduction services for PWID in other areas especially in Rajshahi Division need to be enhanced. Although HIV has declined in Dhaka among PWID, Dhaka in general appears to be vulnerable to an HIV epidemic as most cases were detected here. In addition, vigilance and intense programming are required in border towns.

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.

6. CONCLUSIONS

Given that the overall prevalence of HIV remains below 1% Bangladesh continues to maintain a low prevalence status. In addition to this overall scenario, some specific points have emerged from the 9th round of serological surveillance and are highlighted below:

- Both HIV and HCV rates have declined in PWID in Dhaka suggesting that ongoing harm reduction programmes are being effective in preventing the spread of blood borne infections in Dhaka
- Other than PWID, another vulnerable population group appears to be Hijra as HIV was detected in hijra from both sites where sampling was conducted, active syphilis rates in Dhaka, Manikganj were at 6.1% and cross border mobility was common.
- HCV in PWID from several cities of Rajshahi Division were recorded at high rates especially in Kanshat where almost all PWID were infected with HCV. This reflects unsafe injection practices.
- High rates of active syphilis (at >5%) was recorded in 10 cities amongst different population groups (Fig 24) suggesting the practice of unprotected sex.
- Geographically, Dhaka appears to be the most vulnerable as this is where the most numbers of HIV positive individuals were detected.
- Border areas particularly Hili and Benapole are also vulnerable as HIV has been detected here in different groups and cross border mobility in Hili is high.

7. RECOMMENDATIONS

Based on the findings some specific recommendations are provided:

1. Harm reduction services that are being provided to PWID in Dhaka should be continued
2. Attention needs to be given to Hijra so that HIV prevention services for Hijra are appropriate and expanded
3. Harm reduction services for PWID in Rajshahi Division needs to be intensified and awareness on HCV prevention should be enhanced
4. More attention needs to be given to increase condom use by especially those groups where active syphilis rates have been recorded at more than 5%
5. Vigilance in Dhaka and border towns is essential with both provision of adequate services and continuous surveillance

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**PREVALENCE OF HIV OVER NINE ROUNDS OF SEROLOGICAL SURVEILLANCE
1998-1999, 1999-2000, 2000-2001, 2002, 2003-2004, 2004-2005, 2006, 2007 AND 2011**

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	2011 Round IX
People who inject drugs (PWID) (Male):									
Detoxification Clinic:									
Dhaka	2.5 (10), 402	0.2 (1), 402	0 (0), 92	ND*	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	5.3 (66), 1243
Dhaka-A1	ND	ND	ND	ND	ND	7.1 (47), 664	10.5 (71), 674	11.0 (71), 646	7.3 (61), 835
Dhaka-A2	ND	ND	ND	ND	ND	1.3 (5), 397	1.0 (4), 398	0.5 (2), 399	1.2 (5), 408
Mymensingh	ND	ND	ND	ND	ND	0 (0), 395	0 (0), 301	0 (0), 260	0 (0), 375
Narayanganj	ND	ND	ND	ND	0 (0), 107	0 (0), 103	1.0 (1), 105	0.8 (1), 127	1.5 (4), 261
Tongi	ND	ND	ND	ND	0 (0), 122	0 (0), 178	0 (0), 160	0 (0), 68	0 (0), 149
Norsingdi	ND	ND	ND	ND	ND	ND	ND	0 (0), 77	0 (0), 101
Chandpur	ND	ND	ND	ND	0 (0), 86	0.6 (1), 159	1.1 (2), 178	0.6 (1), 159	0 (0), 115
Teknaf	ND	ND	ND	ND	ND	0 (0), 155	0 (0), 120	0.9 (1), 108	0 (0), 96
Rajshahi	ND	0 (0), 416	0 (0), 402	0 (0), 405	0 (0), 394	0 (0), 398	0 (0), 393	0 (0), 400	0 (0), 401
Chapai Nawabganj	ND	ND	0 (0), 120	0 (0), 200	0 (0), 239	0 (0), 208	0 (0), 200	0 (0), 210	0 (0), 220
Kanshat	ND	ND	ND	ND	0 (0), 47	0 (0), 66	0 (0), 69	0 (0), 71	0 (0), 92
Char Norendrapur	ND	ND	ND	ND	0 (0), 78	ND	ND	0 (0), 101	0 (0), 124
Rangpur	ND	ND	ND	ND	ND	ND	0 (0), 187	0 (0), 164	0 (0), 103
Naogaon	ND	ND	ND	ND	ND	0 (0), 120	0 (0), 193	0 (0), 270	0 (0), 382
Pabna	ND	ND	ND	ND	0 (0), 85	0 (0), 57	0 (0), 69	0 (0), 116	0 (0), 101
Ishwardi	ND	ND	ND	ND	0 (0), 57	2.0 (1), 49	1.8 (1), 55	1.7 (1), 60	0 (0), 57
Sirajganj	ND	ND	ND	ND	ND	0 (0), 111	0 (0), 122	0 (0), 300	0 (0), 344
Dinajpur	ND	ND	ND	ND	ND	ND	0 (0), 279	0 (0), 400	0 (0), 385
Jessore	ND	ND	ND	ND	ND	0 (0), 100	0 (0), 132	0 (0), 202	0 (0), 190
Sathkhira	ND	ND	ND	ND	ND	0 (0), 201	0 (0), 226	0 (0), 279	0.4 (1), 285
Srimongol	ND	ND	ND	ND	ND	ND	ND	0 (0), 200	0 (0), 79
Barisal	ND	ND	ND	ND	ND	0 (0), 202	0 (0), 234	0 (0), 275	0 (0), 404
Filii	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 138
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 96

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	2011 Round IX	
Heroin Smokers (Male):										
Dhaka	ND	ND	ND	0 (0), 388	0.8 (3), 391	0.5 (2), 399	0 (0), 401	0.2 (1), 402	0 (0), 388	
Combined people who inject drugs and Heroin Smokers (Male):										
Jaipurhat	ND	ND	ND	ND	ND	ND	ND	0 (0), 65	0 (0), 98	
Khulna	ND	ND	ND	ND	ND	ND	0 (0), 387	0.3 (1), 397	0 (0), 400	
Mongla	ND	ND	ND	ND	ND	ND	ND	0 (0), 130	0 (0), 93	
Bagerhat	ND	ND	ND	ND	ND	ND	ND	0 (0), 140	0 (0), 134	
Jhenaidah	ND	ND	ND	ND	ND	ND	ND	0 (0), 149	0 (0), 80	
Kushia	ND	ND	ND	ND	ND	ND	ND	0 (0), 130	0 (0), 136	
Patuakhali	ND	ND	ND	ND	ND	ND	ND	0 (0), 100	0 (0), 105	
Combined people who inject drugs and Heroin Smokers (Female):										
Dhaka, Narayanganj and Tongi	ND	ND	ND	ND	ND	0 (0), 119	0.8 (1), 121	1.0 (1), 103	1.2 (3), 256	
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	1.0 (1), 98	
Brothel Based Female Sex Workers:										
Tangail	0 (0), 392	0 (0), 402	0.5 (2), (407)	0.2 (1), 406	0.5 (2), 404	0.2 (1), 401	0.3 (1), 400	ND	ND	
Mymensingh	ND	0 (0), 322	ND	0 (0), 152	0 (0), 159	0.7 (1), 150	0.7 (1), 150	ND	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	ND	
Narayanganj	1.5 (4), 267	ND	ND	ND	ND	ND	ND	ND	ND	
Jamalpur	ND	ND	ND	ND	0 (0), 136	0 (0), 166	0 (0), 168	ND	ND	
Faridpur	ND	ND	ND	ND	0 (0), 376	0 (0), 370	0 (0), 373	ND	ND	
Madaripur	ND	ND	ND	ND	0.5 (1), 205	0 (0), 190	0.5 (1), 222	ND	ND	
Fultola, Baniassanta, Bagerhat [†]	ND	0 (0), 351	0 (0), 335	0 (0), 241	0 (0), 293	0.4 (1), 252	0 (0), 260	ND	ND	
Jessore	ND	ND	0.5 (1), 187	0.5 (1), 195	0.6 (1), 171	0.6 (1), 167	0 (0), 174	ND	ND	
Patuakhali	ND	ND	ND	ND	0 (0), 59	0 (0), 62	0 (0), 52	ND	ND	
Street Based Female Sex Workers:										
Dhaka	0 (0), 400	0.2 (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	0.5 (2), 394	
Tangail	ND	ND	ND	0 (0), 199	ND	ND	ND	ND	ND	
Chittagong	ND	ND	ND	ND	0 (0), 402	0 (0), 402	0 (0), 405	0 (0), 404	0 (0), 400	
Khulna	ND	ND	ND	0 (0), 317	0 (0), 403	ND	ND	0.4 (1), 270	0 (0), 365	
Rangpur	ND	ND	ND	ND	ND	ND	ND	0.4 (1), 246	0 (0), 207	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 32	

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	2011 Round IX	
Hotel Based Female Sex Workers:										
Dhaka	ND	ND	ND	0.2 (1), 405	0 (0), 400	ND	ND	0 (0), 399	0.2 (1), 401	
Chittagong	ND	ND	ND	ND	1.5 (2), 132	0 (0), 128	0 (0), 118	0 (0), 122	0 (0), 172	
Sylhet	ND	ND	ND	ND	0.6 (1), 166	0.6 (1), 165	0 (0), 169	0.6 (1), 180	0.4 (1), 225	
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 69	
Combined Residence and Hotel Based Female Sex Workers:										
Narayanganj	ND	ND	ND	ND	ND	ND	ND	0.4 (1), 277	ND	
Tangail	ND	ND	ND	ND	ND	ND	ND	0 (0), 352	ND	
Jamalpur	ND	ND	ND	ND	ND	ND	ND	0 (0), 300	0.5 (1), 218	
Netrokona	ND	ND	ND	ND	ND	ND	ND	0 (0), 241	0 (0), 245	
Jessore	ND	ND	ND	ND	ND	ND	ND	0.5 (2), 380	0.4 (1), 236	
Teknaf	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 119	
Residence Based Female Sex Workers:										
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0.4 (1), 258	
Casual Female Sex Workers:										
Chandpur	ND	ND	ND	ND	ND	0 (0), 97	0 (0), 88	0 (0), 121	0 (0), 58	
Teknaf	ND	ND	ND	ND	ND	0 (0), 150	0 (0), 200	0 (0), 246	ND	
Hili	ND	ND	ND	ND	2.0 (2), 101	1.7 (2), 120	0.8 (1), 128	2.7 (4), 150	1.6 (2), 125	
Burimari	ND	ND	ND	ND	0 (0), 381	0 (0), 200	0 (0), 235	0 (0), 300	0 (0), 44	
Barisal	ND	ND	ND	ND	0 (0), 197	0 (0), 400	0 (0), 397	0.3 (1), 400	ND	
Male Sex Workers (MSW):										
Dhaka	ND	ND	0 (0), 310	0 (0), 401	0 (0), 274	0 (0), 235	0.7 (2), 284	0.3 (1), 400	0 (0), 402	
Males Who Have Sex With Males (MSM):										
Dhaka	ND	ND	0 (0), 399	0.2 (1), 406	0 (0), 399	0 (0), 405	0.2 (1), 401	0 (0), 399	0 (0), 400	
MSM and MSW combined ¹ :										
Dhaka	0.2 (1), 401	0 (0), 388	ND	ND	ND	ND	ND	ND	ND	
Myrmensingh	ND	ND	ND	0 (0), 400	0 (0), 400	ND	ND	ND	ND	
Chittagong	ND	ND	ND	0 (0), 397	0.3 (1), 398	0.4 (1), 283	ND	0.3 (1), 290	0 (0), 399	
Sylhet	ND	ND	ND	0 (0), 402	0.3 (1), 400	0.4 (1), 231	ND	ND	ND	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 158	
Hijras:										
Dhaka	ND	ND	ND	0.8 (3), 393	ND	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	1.0 (4), 407	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	3.2 (1), 31	

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	2011 Round IX	
Partners of Hijra: Dhaka, Manikganj	ND	ND	ND	ND	0 (0), 88	ND	ND	ND	ND	
Babus (Brothel): Tangail	ND	ND	ND	0 (0), 252	0 (0), 251	ND	ND	ND	ND	
Douladiala	ND	ND	ND	0 (0), 200	0 (0), 175	ND	ND	ND	ND	
Jamalpur	ND	ND	ND	ND	0 (0), 56	ND	ND	ND	ND	
STI Patients: Dhaka	0.3 (1), 399	0 (0), 404	ND	ND	ND	ND	ND	ND	ND	
Chittagong	0.2 (1), 409	0 (0), 404	0.2 (1), 403	ND	ND	ND	ND	ND	ND	
Rajshahi, Rangpur**	0 (0), 401	0 (0), 408	0 (0), 392	ND	ND	ND	ND	ND	ND	
Sylhet	0 (0), 397	ND	0 (0), 389	0 (0), 106	ND	ND	ND	ND	ND	
Truckers: Dhaka	0 (0), 403	ND	0 (0), 437	0 (0), 402	ND	ND	ND	ND	ND	
Jessore	ND	ND	0 (0), 392	ND	ND	ND	ND	ND	ND	
Benapole	ND	ND	ND	ND	ND	0 (0), 398	ND	ND	ND	
Dockworkers: Chittagong	ND	ND	0 (0), 392	ND	ND	0 (0), 395	ND	ND	ND	
Mongla	ND	ND	0 (0), 401	ND	ND	ND	ND	ND	ND	
Rickshaw pullers: Dhaka	ND	ND	ND	ND	0.2 (1), 401	0 (0), 401	ND	ND	ND	
Chittagong	ND	ND	0 (0), 400	ND	0 (0), 401	ND	ND	ND	ND	
Jessore	ND	ND	0 (0), 401	ND	ND	ND	ND	ND	ND	
Launch Workers: Dhaka	ND	ND	ND	0 (0), 402	ND	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	0.7 (89), 12894	

*ND = not done

† 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

PREVALENCE OF ACTIVE SYPHILIS OVER NINE ROUNDS OF SEROLOGICAL SURVEILLANCE
1998-1999, 1999-2000, 2000-2001, 2002, 2003-2004, 2004-2005, 2006, 2007 AND 2011

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	2011 Round IX
People who inject drugs (PWID) (Male):									
Detoxification Clinic:									
Dhaka	4.5 (18), 402	4.0 (18), 402	4.3 (4), 92	ND*	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	4.3 (53), 1243
Dhaka-A1	ND	ND	ND	ND	ND	3.8 (25), 664	3.7 (25), 668	3.7 (24), 646	4.9 (41), 835
Dhaka-A2	ND	ND	ND	ND	ND	1.5 (6), 397	0 (0), 398	2.0 (8), 399	2.9 (12), 408
Mymensingh	ND	ND	ND	ND	ND	1.8 (7), 395	0.7 (2), 301	0.4 (1), 260	2.1 (8), 375
Narayanganj	ND	ND	ND	ND	5.6 (6), 107	1.0 (1), 103	2.9 (3), 105	4.7 (6), 127	5.4 (14), 261
Tongi	ND	ND	ND	ND	1.6 (2), 122	3.9 (7), 178	4.4 (7), 160	2.9 (2), 68	3.4 (5), 149
Norsingdi	ND	ND	ND	ND	ND	ND	ND	3.9 (3), 77	7.9 (8), 101
Chandpur	ND	ND	ND	ND	7.0 (6), 86	2.5 (4), 159	2.8 (5), 177	7.5 (12), 159	6.1 (7), 115
Teknaf	ND	ND	ND	ND	ND	9.0 (14), 155	5.8 (7), 120	11.1 (12), 108	5.2 (5), 96
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	2.5 (10), 401
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	1.8 (4), 220
Kaushat	ND	ND	ND	ND	2.1 (1), 47	1.5 (1), 66	4.3 (3), 69	2.8 (2), 71	1.1 (1), 92
Char Norendrapur	ND	ND	ND	ND	1.3 (1), 78	ND	ND	1.0 (1), 101	0.8 (1), 124
Rangpur	ND	ND	ND	ND	ND	ND	2.7 (5), 187	1.2 (2), 164	2.9 (3), 103
Naogaon	ND	ND	ND	ND	ND	0 (0), 120	0.5 (1), 193	0.4 (1), 270	0.8 (3), 382
Pabna	ND	ND	ND	ND	0 (0), 85	0 (0), 57	1.4 (1), 69	1.7 (2), 116	0 (0), 101
Ishwardi	ND	ND	ND	ND	3.5 (2), 57	0 (0), 49	1.8 (1), 55	1.7 (1), 60	5.3 (3), 57
Sirajganj	ND	ND	ND	ND	ND	1.8 (2), 111	0.8 (1), 122	1.0 (3), 300	1.7 (6), 344
Dinajpur	ND	ND	ND	ND	ND	ND	1.1 (3), 279	1.5 (6), 400	0.5 (2), 385
Jessore	ND	ND	ND	ND	ND	3.0 (3), 100	2.3 (3), 132	2.5 (5), 202	2.6 (5), 190
Sathkhira	ND	ND	ND	ND	ND	1.0 (2), 201	0.9 (2), 226	1.1 (3), 279	0 (0), 285
Srimongol	ND	ND	ND	ND	ND	ND	ND	1.5 (3), 200	2.5 (2), 79
Barisal	ND	ND	ND	ND	ND	0 (0), 202	0 (0), 234	0.4 (1), 275	0.7 (3), 404
Hili	ND	ND	ND	ND	ND	ND	ND	ND	2.2 (3), 138
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 96

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	2011 Round IX	
Heroin Smokers (Male):										
Dhaka	ND	ND	ND	3.4 (13), 388	2.6 (10), 391	3.0 (12), 399	3.0 (12), 401	4.2 (17), 402	3.4 (13), 388	
Combined people who inject drugs and Heroin Smokers (Male):										
Jaipurhat	ND	ND	ND	ND	ND	ND	ND	3.1 (2), 65	1.0 (1), 98	
Khulna	ND	ND	ND	ND	ND	ND	1.0 (4), 387	1.0 (4), 397	0.8 (3), 400	
Mongla	ND	ND	ND	ND	ND	ND	ND	1.5 (2), 130	1.1 (1), 93	
Bagerhat	ND	ND	ND	ND	ND	ND	ND	0 (0), 140	0 (0), 134	
Jhenaidah	ND	ND	ND	ND	ND	ND	ND	0.7 (1), 149	1.3 (1), 80	
Kushitia	ND	ND	ND	ND	ND	ND	ND	2.3 (3), 130	1.5 (2), 136	
Patuakhali	ND	ND	ND	ND	ND	ND	ND	0 (0), 100	0 (0), 105	
Combined people who inject drugs and Heroin Smokers (Female):										
Dhaka, Narayanganj and Tongi	ND	ND	ND	ND	ND	9.2 (11), 119	9.9 (12), 121	14.6 (15), 103	5.9 (15), 256	
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 98	
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	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	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	ND	
Narayanganj	28.7 (81), 282	ND	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	ND	
Faridpur	ND	ND	ND	ND	8.2 (31), 376	3.8 (14), 370	2.7 (10), 373	ND	ND	
Madaripur	ND	ND	ND	ND	12.2 (25), 205	8.4 (16), 190	6.3 (14), 222	ND	ND	
Fultola, Baniassanta, 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	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	ND	
Patuakhali	ND	ND	ND	ND	5.1 (3), 59	9.7 (6), 62	1.9 (1), 52	ND	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	4.6 (18), 394	
Tangail	ND	ND	ND	3.0 (6), 199	ND	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	10.3 (41), 400	
Khulna	ND	ND	ND	4.7 (15), 317	1.5 (6), 403	ND	ND	3.0 (8), 270	0.5 (2), 365	
Rangpur	ND	ND	ND	ND	ND	ND	ND	9.8 (24), 246	3.9 (8), 207	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	12.5 (4), 32	

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	2011 Round IX	
Hotel Based Female Sex Workers:										
Dhaka	ND	ND	ND	4.9 (20), 405	4.5 (18), 400	ND	ND	3.0 (12), 399	2.2 (9), 401	
Chittagong	ND	ND	ND	ND	5.3 (7), 132	1.6 (2), 128	4.2 (5), 118	4.9 (6), 122	4.7 (8), 172	
Sylhet	ND	ND	ND	ND	5.4 (9), 166	6.1 (10), 165	8.3 (14), 169	8.3 (15), 180	9.3 (21), 225	
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 69	
Combined Residence and Hotel Based Female Sex Workers:										
Naryanganj	ND	ND	ND	ND	ND	ND	ND	3.6 (10), 277	ND	
Tangail	ND	ND	ND	ND	ND	ND	ND	1.4 (5), 352	ND	
Jamalpur	ND	ND	ND	ND	ND	ND	ND	2.3 (7), 300	3.2 (7), 218	
Netrokona	ND	ND	ND	ND	ND	ND	ND	1.7 (4), 241	1.2 (3), 245	
Jessore	ND	ND	ND	ND	ND	ND	ND	1.8 (7), 380	0.8 (2), 236	
Teknaf	ND	ND	ND	ND	ND	ND	ND	ND	1.7 (2), 119	
Residence Based Female Sex Workers:										
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	1.2 (3), 258	
Casual Female Sex Workers:										
Chandpur	ND	ND	ND	ND	ND	9.3 (9), 97	5.7 (5), 88	7.4 (9), 121	0 (0), 58	
Teknaf	ND	ND	ND	ND	ND	10.0 (15), 150	3.5 (7), 200	4.5 (11), 246	ND	
Hili	ND	ND	ND	ND	6.9 (7), 101	4.2 (5), 120	4.7 (6), 128	2.7 (4), 150	4.0 (5), 125	
Burimari	ND	ND	ND	ND	1.0 (4), 381	0.5 (1), 200	0.9 (2), 235	1.0 (3), 300	2.3 (1), 44	
Barisal	ND	ND	ND	ND	5.1 (10), 197	1.5 (6), 400	1.5 (6), 397	1.8 (7), 400	ND	
Male Sex Workers (MSW):										
Dhaka	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	4.2 (17), 402	
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	1.5 (6), 400	
MSM and MSW combined ⁴ :										
Dhaka	7.0 (28), 401	6.7 (26), 388	ND	ND	ND	ND	ND	ND	ND	
Mymensingh	ND	ND	ND	2.3 (9), 400	2.5 (10), 400	ND	ND	ND	ND	
Chittagong	ND	ND	ND	4.3 (17), 397	2.8 (11), 398	4.9 (14), 283	ND	4.1 (12), 290	4.5 (18), 399	
Sylhet	ND	ND	ND	3.0 (12), 402	3.3 (13), 400	5.6 (13), 231	ND	ND	ND	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	3.2 (5), 158	
Hijras:										
Dhaka	ND	ND	ND	10.4 (41), 393	ND	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	6.1 (25), 407	
Hili	ND	ND	ND	ND	ND	ND	ND	ND	3.2 (1), 31	

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	2011 Round IX
Partners of Hijra: Dhaka, Manikganj	ND	ND	ND	ND	2.3 (2), 88	ND	ND	ND	ND
Babus (Brothel): Tangail	ND	ND	ND	1.6 (4), 252	2.0 (5), 251	ND	ND	ND	ND
Doulatdia	ND	ND	ND	6.0 (12), 200	6.3 (11), 175	ND	ND	ND	ND
Jamalpur	ND	ND	ND	ND	5.4 (3), 56	ND	ND	ND	ND
STI Patients: Dhaka	11.0 (44), 399	5.2 (21), 404	ND	ND	ND	ND	ND	ND	ND
Chittagong	7.6 (31), 409	4.2 (17), 404	2.2 (9), 403	ND	ND	ND	ND	ND	ND
Rajshahi, Rangpur**	2.2 (9), 401	1.7 (7), 408	1.5 (6), 392	ND	ND	ND	ND	ND	ND
Sylhet	8.1 (32), 397	ND	5.1 (20), 389	0.9 (1), 106	ND	ND	ND	ND	ND
Truckers: Dhaka	2.0 (8), 403	ND	2.1 (9), 437	1.1 (4), 402	ND	ND	ND	ND	ND
Jessore	ND	ND	1.8 (7), 392	ND	ND	ND	ND	ND	ND
Benapole	ND	ND	ND	ND	ND	0 (0), 398	ND	ND	ND
Dockworkers: Chittagong	ND	ND	2.8 (11), 392	ND	ND	1.8 (7), 395	ND	ND	ND
Mongla	ND	ND	1.0 (4), 401	ND	ND	ND	ND	ND	ND
Rickshaw pullers: Dhaka	ND	ND	ND	ND	0.2 (1), 401	0 (0), 401	ND	ND	ND
Chittagong	ND	ND	1.0 (4), 400	ND	1.2 (5), 401	ND	ND	ND	ND
Jessore	ND	ND	1.0 (4), 401	ND	ND	ND	ND	ND	ND
Launch Workers: Dhaka	ND	ND	ND	1.5 (6), 402	ND	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	3.0 (388), 12894

*ND = not done,

† 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

PREVALENCE OF HEPATITIS C OVER NINE ROUNDS OF SEROLOGICAL SURVEILLANCE

Study Populations, Geographical Location	HCV % 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	2011 Round IX
People who inject drugs (PWID) (Male):									
Detoxification Clinic:									
Dhaka	17.4 (70), 402	ND*	ND	ND	ND	ND	ND	ND	ND
Out of detoxification clinic:									
Dhaka†	ND	66.5 (278), 418	ND	62.3 (251), 403	59.2 (239), 404	ND	56.4 (604), 1071	54.0 (564), 1045	39.6 (492), 1243
Dhaka-A1	ND	ND	ND	ND	ND	ND	61.4 (413), 673	61.5 (397), 646	42.5 (355), 835
Dhaka-A2	ND	ND	ND	ND	ND	ND	48.0 (191), 398	41.9 (167), 399	33.6 (137), 408
Mymensingh	ND	ND	ND	ND	ND	4.1 (16), 395	5.3 (16), 301	6.2 (16), 260	15.7 (59), 375
Narayanganj	ND	ND	ND	ND	29.9 (32), 107	ND	29.5 (31), 105	31.5 (40), 127	21.1 (55), 261
Tongi	ND	ND	ND	ND	5.7 (7), 122	ND	7.5 (12), 160	5.9 (4), 68	24.2 (36), 149
Narsingdi	ND	ND	ND	ND	ND	ND	ND	15.6 (12), 77	5.9 (6), 101
Chandpur	ND	ND	ND	ND	52.3 (45), 86	ND	49.2 (87), 177	53.5 (85), 159	63.5 (73), 115
Teknaf	ND	ND	ND	ND	ND	37.4 (58), 155	36.7 (44), 120	29.6 (32), 108	22.9 (22), 96
Rajshahi	ND	59.6 (248), 416	ND	59.8 (242), 405	67.0 (264), 394	ND	65.9 (259), 393	56.8 (227), 400	69.6 (279), 401
Chapai Nawabganj	ND	ND	ND	79.5 (159), 200	77.0 (184), 239	ND	77.0 (154), 200	76.7 (161), 210	89.1 (196), 220
Kanshat	ND	ND	ND	ND	83.0 (39), 47	ND	73.9 (51), 69	84.3 (59), 70	95.7 (88), 92
Char Norendrapur	ND	ND	ND	ND	55.1 (43), 78	ND	ND	49.5 (50), 101	67.7 (84), 124
Rangpur	ND	ND	ND	ND	ND	ND	10.7 (20), 187	12.2 (20), 164	11.7 (12), 103
Naogaon	ND	ND	ND	ND	ND	57.5 (69), 120	49.2 (95), 193	62.6 (169), 270	66.8 (255), 382
Pabna	ND	ND	ND	ND	8.2 (7), 85	ND	10.1 (7), 69	7.8 (9), 116	6.9 (7), 101
Ishwardi	ND	ND	ND	ND	29.8 (17), 57	ND	20.0 (11), 55	15 (9), 60	12.3 (7), 57
Sirajganj	ND	ND	ND	ND	ND	50.5 (56), 111	51.6 (63), 122	24.7 (74), 300	44.5 (153), 344
Dinajpur	ND	ND	ND	ND	ND	ND	62.7 (175), 279	65.8 (263), 400	47.8 (184), 385
Jessore	ND	ND	ND	ND	ND	11.0 (11), 100	7.6 (10), 132	4.5 (9), 202	2.6 (5), 190
Sathkhira	ND	ND	ND	ND	ND	2.5 (5), 201	0.9 (2), 226	0.7 (2), 279	1.1 (3), 285
Srimongol	ND	ND	ND	ND	ND	ND	ND	0.5 (1), 200	2.5 (2), 79
Barisal	ND	ND	ND	ND	ND	5.9 (12), 202	15.4 (36), 234	11.3 (31), 275	9.7 (39), 404
Hili	ND	ND	ND	ND	ND	ND	ND	ND	32.6 (45), 138
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	1.0 (1), 96

Study Populations, Geographical Location	HCV % 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	2011 Round IX	
Combined PWID and Heroin Smokers (Male): Jaipurhat	ND	ND	ND	ND	ND	ND	ND	40.0 (26), 65	19.4 (19), 98	
Khulna	ND	ND	ND	ND	ND	ND	0.5 (2), 387	1.0 (4), 397	0 (0), 400	
Mongla	ND	ND	ND	ND	ND	ND	ND	2.3 (3), 130	0 (0), 93	
Bagerhat	ND	ND	ND	ND	ND	ND	ND	0 (0), 140	0.7 (1), 134	
Jhenaidah	ND	ND	ND	ND	ND	ND	ND	2.0 (3), 149	0 (0), 80	
Kushia	ND	ND	ND	ND	ND	ND	ND	7.7 (10), 130	4.4 (6), 136	
Patuakhali	ND	ND	ND	ND	ND	ND	ND	0 (0), 100	1.0 (1), 105	
Combined PWID and Heroin Smokers (Female): Dhaka, Narayanganj and Tongi	ND	ND	ND	ND	ND	16.8 (20), 119	20.7 (25), 121	18.4 (19), 103	9.4 (24), 256	
Benapole	ND	ND	ND	ND	ND	ND	ND	ND	0 (0), 98	
Total	17.4 (70), 402	63.1 (526), 834	ND	64.7 (652), 1008	54.2 (877), 1619	17.6 (247), 1403	37.0 (1704), 4601	31.2 (1902), 6105	30.2 (2154), 7141	

*ND = not done

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

ANNEXE: 4

COLLABORATING ORGANIZATIONS

1. Alliance for Co-operation & Legal Aid Bangladesh (ACLAB)
2. Ashakta Punarbashan Shangstha (APOSH)
3. Badhan Hijra Sangha
4. Bangladesh AIDS Prevention Society (BAPS)
5. Bandhu Social Welfare Society (BSWS)
6. Bangladesh Womens Health Coalition (BWHC)
7. Bohumukhi Polly Unnayan Sangstha (BPUS)
8. CARE-Bangladesh
9. Community- health Rehabilitation Education and Awareness (CREA)
10. Durjoy Nari Shangha
11. Family Health International Bangladesh
12. Health and Education for the Less Privileged (HELP)
13. Khulna Mukti Seba Sangstha (KMSS)
14. Light House
15. Mukto Akash Bangladesh (MAB)
16. Organization of Development Program for the Underprivileged (ODPUP)
17. Padakhep Manobik Unnayan Kendra (PMUK)
18. Prochesta
19. PROUD
20. Proyas Manobik Unnayan Society
21. Peples Development Community (PDC)
22. Rural Poor Development Organization (RPDO)
23. Save the Children USA
24. Social Advancement Society (SAS)
25. Sustha Jibon
26. Sylhet Jubo Academy (SJA)
27. Trinamool Unnayan Sangstha (TUS)
28. Ulka Nari Sangha
29. Unnayan Sahayak Sanghtha (USS)
30. Young Power in Social Action (YPSA)

