

INTEGRATED BEHAVIOURAL AND BIOLOGICAL ASSESSMENT

Repeated surveys to assess changes in behaviours
and prevalence of HIV/STIs in populations at risk of HIV

ROUND 1 (2005-2007)
National Interim Summary Report
INDIA

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Indian Council of Medical Research (ICMR)
Family Health International (FHI)



DISCLAIMER

- The data represents the figures pertaining to populations at increased risk of HIV infection in the survey districts.
- Estimating state or national HIV prevalence is not possible from this data alone.
- Support for this study was provided by the Bill & Melinda Gates Foundation through Avahan, it's India AIDS Initiative. The views expressed herein are those of the author(s) and do not necessarily reflect the official policy or position of the Bill & Melinda Gates Foundation and Avahan.

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This National Interim Summary Report of Integrated Behavioural and Biological Assessment (IBBA) is a collaborative effort of ICMR institutes, various Governmental and Non-governmental Organisations and technical partnership with Family Health International. We wish to take this opportunity to extend our appreciation to all those who have contributed towards the successful completion of this work.

We sincerely thank Prof. Nirmal Kumar Ganguly, Director General, Indian Council of Medical Research (DG, ICMR) for his constant guidance and support through out the phase of IBBA. We sincerely acknowledge the help provided by Ms. K. Sujatha Rao, Additional Secretary and Director General, National AIDS Control Organisation (NACO). We also thank Project Directors of State AIDS Control Societies (SACS) of Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, Manipur and Nagaland for their support.

The Community Advisory Board (CAB) and Community Monitoring Board (CMB) members need a special word of appreciation as without their constant support and help it would have been impractical to carry out the survey. We also take this opportunity to acknowledge the support provided by all the local authorities in IBBA districts including health officials and police departments.

We would like to place on record our appreciation for contributions by the Bill & Melinda Gates Foundation (BMGF) and their State Lead Partners.

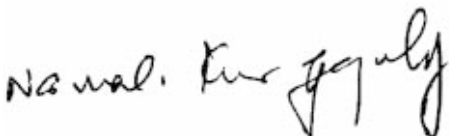
Last but not the least we thank all those 'participants' of the survey and for their cooperation without which completion of the IBBA would not have been possible.

MESSAGE

Three large surveys with different objectives, study population, and methodologies have recently been carried out in India; HIV Sentinel surveillance (HSS), National Family Health Survey – III (NFHS - III) and Integrated Behavioural and Biological Assessment (IBBA). IBBA carried out by the Institutes of Indian Council of Medical Research and Karnataka Health Promotion Trust with technical support from Family Health International is unique as it is the first large scale survey including biological and behavioral component among populations at high risk for HIV infection using probability based sampling approach. The survey is expected to provide baseline data for assessing the impact of intervention “Avahan: India AIDS Initiative” by Bill & Melinda Gates Foundation first through second and third round of the survey.

The survey was conducted in 29 districts from high prevalence states. The survey covered female sex workers, clients of the female sex workers, men having sex with men, injecting drug users and highway truckers. The survey had built in mechanisms for ensuring that the populations under study were protected from any adverse events. New methodologies such as respondent driven sampling were utilized to conduct survey among hard to reach populations. The survey has generated very valuable data on various aspects such as condom use, coverage by the intervention programmes, prevalence of HIV and STIs. It is commendable that the huge data generated in the survey has been compiled well and being released as a summary report.

I am sure that this will form an important resource for the data on behavioural and biological factors influencing the HIV epidemic in high prevalence states. All persons instrumental in conducting the survey and generating the data deserve appreciation for a commendable effort.



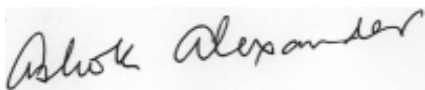
Prof. Nirmal Kumar Ganguly,
Director General,
Indian Council of Medical Research

MESSAGE

In 2005-07 the premier institutes of the Indian Council of Medical Research (ICMR), in partnership with Family Health International (FHI), implemented the Integrated Behavioural and Biological Assessment (IBBA), the first large-scale bio-behavioural survey conducted among high risk populations in India. This survey was conducted with the support of Avahan, the India AIDS Initiative of the Bill & Melinda Gates Foundation. Avahan is one of the largest focused HIV prevention programmes in the world and currently works with close to 300,000 female sex workers, injecting drug users and high-risk men who have sex with men and about 6 million men at risk. Avahan's goal is to reduce HIV prevalence in high risk groups and stabilize the epidemic in the general population of the six highest prevalence states of India. The results of this survey are an important component of the overall evaluation strategy for the Avahan HIV prevention program, and a long-term resource for planning and policy-making in India's national, regional, and local HIV/AIDS control programmes.

This report reflects the efforts of several years of careful planning and execution by many dedicated institutions, groups, and individuals, which resulted in many key learnings. The close collaboration between the Government of India, civil society, academic institutions, and other stakeholders was a model for coordination and results-driven execution in this sector. Early engagement by the survey designers with local communities ensured high quality survey monitoring and active participation by members of the target populations. Community participation and engagement at all levels were salient features of the IBBA. The sophisticated and thoughtful methods employed to identify, document, and enroll high risk populations will contribute immeasurably to the global evidence base for survey methods with marginalized and hard-to-reach communities in resource-limited for many years to come.

The scope and size of the IBBA is unprecedented in the area of HIV/AIDS programming and is a significant achievement in its own right. In sponsoring the IBBA Avahan is proud to have been a partner with the Government of India, the National AIDS Control Organization, and the State AIDS Control Societies, whose support has been vital to the success of HIV prevention programming in India. We are grateful to the premier agencies of ICMR and FHI, as well as to all of the Avahan state lead partners and implementing agencies. Finally, Avahan would like to recognize and thank the many individuals who participated in this significant survey. Their courage and collective support was vitally important.



Ashok Alexander

Director

Avahan -- India AIDS Initiative

Bill & Melinda Gates Foundation

PREFACE

The India AIDS Initiative, Avahan, of the Bill & Melinda Gates Foundation commenced in 2003 with the aim of slowing the HIV epidemic through focused, integrated, large-scale HIV prevention among the high-risk populations in 83 (out of 115) districts in six high prevalence states in India and along the national highways. Avahan supports these populations through a package of proven, high quality HIV prevention interventions including clinical services for sexually transmitted infections (STIs), prevention commodity provision and promotion (condoms and needles/syringes), behavior change communication, community mobilization, and structural interventions to create an enabling environment for HIV prevention. Avahan aims to reduce HIV incidence amongst high-risk populations and stabilize infection rates among the general population in the six high prevalence states.

The Integrated Behavioural and Biological Assessment (IBBA) is a critical component of the overall Avahan evaluation strategy with the goal of measuring and understanding the impact of the Avahan interventions among high-risk and bridge populations and to provide data for epidemic impact modeling. The data reported here are from the first round of the IBBA. This round of the IBBA was implemented in 29 districts in six states of India, and along four selected segments of the National Highway among female sex workers, high-risk men who have sex with men (including transgender), injecting drug users, clients of sex workers and truckers. The IBBA is the first independent large-scale study of high risk populations in India combining behavioural, STI, and HIV data collection, and will provide a wealth of data for India's national HIV prevention and control efforts.

The IBBA was implemented by premier institutes of the Indian Council of Medical Research (ICMR) including the National AIDS Research Institute (NARI), National Institute of Epidemiology (NIE), National Institute of Medical Statistics (NIMS), National Institute of Nutrition (NIN), and Regional Medical Research Centre (RMRC). Family Health International (FHI) team worked very closely in partnership with NARI and all other ICMR institutes from the inception of the assessment. The scale of the IBBA led to considerable logistical challenges in the field which were solved through the leadership of the ICMR institutes who supervised research agencies in the conduct of the field work.

FHI deeply values the partnership with ICMR, NARI, NIE, NIMS, NIN and RMRC in carrying out this important study. We appreciate the funding support from BMGF for the IBBA and the partnership and support of the Avahan team. The IBBA would not have been possible without the support of the National AIDS Control Organization (NACO), State AIDS Control Societies (SACS) and the valuable inputs from Avahan State Lead Partners and implementing partners. Finally, and especially, we wish to thank the thousands of individuals who gave their consent to participate in the IBBA.



Kathleen Kay,
Country Director, India
Family Health International

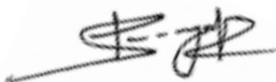
FOREWORD

HIV infection was first reported in India in Chennai in 1986 among female sex workers. HIV infection has spread to almost all states of the country. Estimated number of HIV infected persons was 5.2 million for the year 2005. However, the number was scaled down to 2.5 million in 2006 as a result of new data available from National Family Health Survey. Due to very high number of HIV infected persons, a number of intervention programmes were initiated by Government of India under National AIDS Control Programme II and number of intervention programmes are planned under National AIDS Control Programme III. Complementing the national efforts for control of HIV epidemic in the country, 'Avahan' initiative was launched by Bill & Melinda Gates Foundation among populations at high risk in six states with high prevalence of HIV infection and truckers along the National Highways.

Bill & Melinda Gates Foundation commissioned an Integrated Behavioural and Biological Assessment (IBBA) as a part of monitoring and evaluation of Avahan programme with objectives of studying impact of the Avahan intervention. The first round of the survey was implemented by Indian Council of Medical Research from November 2005 to August 2007. The survey involved collection behavioural response and biological samples approximately from 26,000 participants spanning across six states and national highways. The study was conducted ensuring that the respondents who belong to vulnerable and marginalized populations were not posed any physical or social risk. The survey posed enormous logistic challenges due to biological sample collection and transport at cold temperatures especially in the states from Northeast. The survey could be completed due to excellent coordination among a large number of partners including participating ICMR Institutes, research agencies and FHI. The support received from the National AIDS Control Organization, State AIDS Control Societies, Local administrations, Avahan partner NGOs was crucial for completion of the survey.

The survey highlighted many issues such as need for reliable method for size estimations of high-risk population, application of Respondent Driven Sampling in the hard to reach populations, inability to achieve high response rates among clients of the female sex workers. The survey also highlighted that the condom use and coverage for HIV testing leaves a lot to be desired. This was first round and hence will form the baseline for the Round two and three of the survey.

We are very happy to present the findings of the first round of the survey among female sex workers, men who have sex with men, injecting drug users and clients of the female sex workers. We hope this data will help in fine-tuning the intervention programmes for the benefit of the populations at risk. In the end, we would like to place on record the cooperation from the respondents in completion of the survey.



Dr. R. S. Paranjape,
Director,
National AIDS Research Institute

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
APSACS	Andhra Pradesh State AIDS Control Society
CBO	Community Based Organization
CRS	Chain Referral Sampling
CSPRO	Census and Survey Processing System
DMG	Data Management Group
EAG	Evaluation Advisory Group
ELISA	Enzyme Linked Immunosorbant Assay
FHI	Family Health International
FSW	Female Sex Worker
FSW-BB	Female Sex Worker – Brothel Based
FSW-HB	Female Sex Worker Home-Based
FSW-NBB	Female Sex Worker – Non Brothel Based
GUD	Genital Ulcer Disease
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HMSC	Health Ministry Screening Committee
HSV-2	Herpes Simplex Virus type 2
IBBA	Integrated Behavioural and Biological Assessment
ICMR	Indian Council of Medical Research
IDU	Injecting Drug User
IEC	Information Education Communication
KHPT	Karnataka Health Promotion Trust
KSACS	Karnataka State AIDS Control Society
MDACS	Maharashtra District AIDS Control Society
MSACS	Maharashtra State AIDS Control Society
MSM	Men who have Sex with Men
MSW	Male Sex Worker

NACO	National AIDS Control Organization
NACP	National AIDS Control Programme
NARI	National AIDS Research Institute
NGO	Non-Governmental Organization
NIE	National Institute of Epidemiology
NIMS	National Institute of Medical Statistics
NIN	National Institute of Nutrition
NSACS	Nagaland State AIDS Control Society
ORW	Out Reach Worker
PCR	Polymerase Chain Reaction
PSI	Population Services International
RIMS	Regional Institute of Medical Sciences
RMRC	Regional Medical Research Centre
SACS	State AIDS Control Society
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
TNSACS	Tamil Nadu State AIDS Control Society
VCT	Voluntary HIV Counseling and Testing (for HIV)

EXECUTIVE SUMMARY

The HIV/AIDS epidemic in India is a concentrated epidemic, indicating that transmission is highest in individuals with high-risk behaviours and those in their sexual and drug use networks. With the aim of slowing down HIV transmission in India, in the year 2003 the Bill & Melinda Gates Foundation (BMGF) initiated the Avahan program, focusing on populations with high-risk behaviours, i.e. male and female sex workers and injecting drug users. The program covers more than 70 districts in the six highest prevalence states, and offers comprehensive prevention services in line with the National AIDS Control Program (NACP). The Integrated Behavioural and Biological Assessment (IBBA) is a major component of the first independent evaluation of the Avahan intervention among these populations, and it is designed to measure the impact of the program on risk behaviours, STI prevalence, and HIV incidence and prevalence.

The first round of the IBBA was implemented in 29 districts in six states, i.e., Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Manipur and Nagaland. Family Health International (FHI) provided the requisite technical support. The National AIDS Research Institute (NARI), Pune, coordinated the survey that was implemented by five institutes of the Indian Council of Medical Research (ICMR) and Karnataka Health Promotion Trust (KHPT). Field work was carried out by selected professional research agencies, except in Karnataka, where KHPT conducted the fieldwork. Probability based sampling methods were used for all survey groups in all districts. Participation rates were generally satisfactory with a handful of exceptions in specific locations. Coordination and monitoring of the behavioural and biological components followed a detailed protocol. Data management, statistical analysis and reporting were carried out through a central facility established at the National Institute of Epidemiology (NIE), Chennai.

The IBBA was implemented amidst many logistical challenges, including setting up field sites for interviews and medical examinations in areas convenient to high-risk groups, collecting biological specimens in sometimes remote field locations, and transporting specimens to district and state laboratories under cold-chain conditions.

This report summarizes the major findings of the first round of the IBBA among FSWs, MSM, Clients and IDUs.

The majority of FSWs were illiterate in all districts. Consistent condom use with clients was generally high, but lower with regular commercial clients compared with occasional clients. In some districts (Chittoor, Prakasam) condom use was low with both types of clients. Except the brothel-based FSWs, many of the sex workers have regular non-commercial partners. Consistent condom use with them was low. The reported coverage of interventions by any agency was relatively lower in bigger cities like Chennai, Mumbai and Hyderabad compared to other districts, with the exception of Kolhapur, Karim Nagar and Shimoga. Forced sexual activity was reported by small proportion of sex workers. Syphilis was the predominant STI in most of the districts. HIV prevalence was also high in many districts, with Maharashtra having the highest prevalence rates. Among the IBBA districts in Tamil Nadu, Chennai had the lowest HIV prevalence.

The MSM group covered in the IBBA included male sex workers and hijra populations as well. There were variations in respondent characteristics from state to state. Most of the MSM were literate across all districts. Exposure to various intervention services provided by any agency was moderate. MSM reported low levels of condom use for anal sex with their regular sexual partner in all districts except Bangalore. Condom use (last time) with paying male partners was high (above 70%) in all districts. A considerable proportion of MSM from Andhra Pradesh and around 20% in the other states reported having paid female partners; condom use among them was low. Condom use with non-commercial partners was below 40%. HIV prevalence was above 20% in two districts of Andhra Pradesh (East Godavari and Hyderabad) and in Madurai district of Tamil Nadu.

Exposure of IDUs to the various intervention programs was around 50% in the four districts surveyed. A majority of the IDUs reported that their usual place of injecting was in their own home or at the home of their injecting partner. In Nagaland, drug use started at a younger age, but start of injecting drug was delayed in comparison to Manipur. Heroin was the most commonly injected drug in Manipur and spasmoproxixon was common among Nagaland IDUs. A large proportion of IDUs in Manipur reported using brand new needles and syringes the last time they injected. Only a very small proportion of IDUs reported having commercial sex partners in the past one year and condom use was relatively low. The STI prevalence was low in Manipur; however, the HIV prevalence was high. A reverse phenomenon was noted in the districts of Nagaland.

For clients of FSWs, probability sampling methods proved to be very challenging. Several pilot exercises were undertaken to arrive at the best feasible sampling strategy for this bridge population. Many of the clients reported low consistent condom use with sex workers. HIV prevalence above 5% was observed among clients of sex workers in East Godavari, Guntur, Vizag, and Warangal in Andhra Pradesh and in Parbhani, Pune, and Yavatmal of Maharashtra. In all the above districts, except Vizag, the prevalence of syphilis was also high.

Some of the general observations that have come out of the survey underscore the need for more concerted prevention efforts. Although consistent condom use among FSWs with occasional clients was high in many districts, the condom use with regular and nonpaying clients was low. The non-availability of condoms was as the primary reason reported by clients for non-use of condoms.

An exercise on this scale was possible only because of the concerted efforts of ICMR Institutes, KHPT, FHI, Research Agencies, and support from NGOs, National AIDS Control Organization (NACO) and State AIDS Control Societies (SACS) and most of all the cooperation of the respondent populations.

OPERATIONAL DEFINITIONS USED IN IBBA

FEMALE SEX WORKERS: Any female, 18 years or older, either brothel based (working/ living/operating in brothels in red light/brothel areas) or non-brothel based (soliciting male clients on the street or in other non-brothel settings), who sold sex in exchange for cash at least once in the last one month.

FEMALE SEX WORKERS - BROTHEL BASED (MUMBAI, THANE AND PUNE, MAHARASHTRA): Any female, 18 years or older, brothel based (working/living/operating in brothels in red light/ brothel areas) or soliciting within 100 meters of a brothel, who sold sex in exchange for cash at least once in the last one month.

FEMALE SEX WORKERS - STREET BASED (MUMBAI AND THANE, MAHARASHTRA): Any female, 18 years or older, non-brothel based (soliciting male clients on the street or in other non-brothel settings), who sold sex in exchange for cash at least once in the last one month.

MEN HAVING SEX WITH MEN/HIJRA (ANDHRA PRADESH): Any male or hijra, 18 years or older, who had any type of sex (oral, manual, or penetrative), paid or unpaid, with another male in the last one month.

MEN HAVING SEX WITH MEN/HIJRA (PUNE, MAHARASHTRA): Any male, identified at cruising points, 18 years or older, who had any type of sex (oral, manual, or penetrative) with another male in the last one month or any hijra, 18 years or older, identified at solicitation points who has sold sex in exchange for money in the last one month.

MEN HAVING SEX WITH MEN/MALE SEX WORKERS (TAMIL NADU): Any male, 18 years or older, who had anal sex with other males (in exchange for cash/kind) at least once in the last one month.

HIJRA/ARAVANI (TAMIL NADU): Any individual, 18–60 years, who self identifies as a Hijra and exchanged any type of sex for cash/kind in the last one month.

INJECTING DRUG USERS: Any man, 18 years or older, who has injected drugs for non-medical reasons at least once in the last six months.

CLIENTS OF FEMALE SEX WORKERS: Any man, 18–60 years, recruited from solicitation points of FSW, that have paid for sex from a female in the last one month.

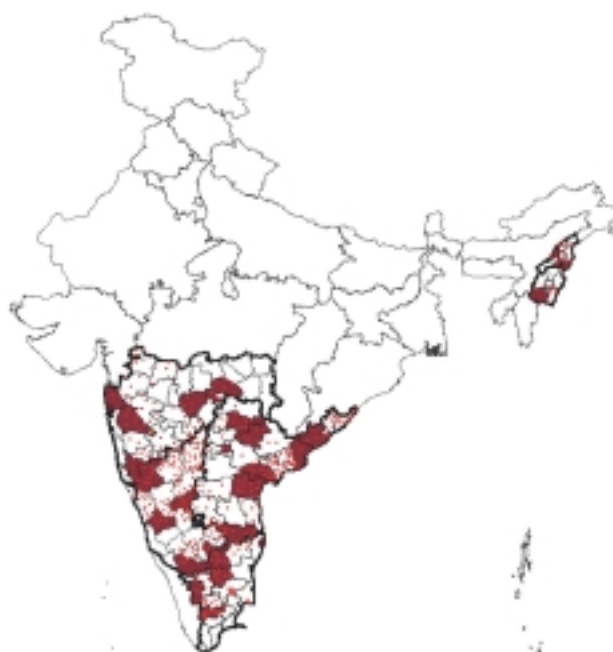
CHAPTER 1:

INTRODUCTION

1.1 Background: Since the first report of HIV infection in 1986, experts estimated number of HIV infected people in India as 2.0 million to 3.1 million by the end of year 2006 based on sentinel surveillance reports. HIV/AIDS in India is still concentrated amongst certain ‘high-risk’ populations such as FSWs and their clients, MSM, and IDUs. Controlling and managing HIV infection/AIDS amongst these high-risk populations is critical as they are the most affected. Effective prevention programs amongst the high-risk populations are vital to reduce the HIV burden in India. Targeted interventions among these high-risk populations have been one of the major components of India’s National AIDS Control Programme (NACP).

1.2 The India AIDS Initiative, Avahan: The India AIDS Initiative, Avahan, of BMGF started in 2003 with the aim of slowing down the HIV epidemic through focused, integrated, large-scale prevention programs complementing other HIV prevention service providers to achieve “saturated” (over 90%) coverage of high-risk populations (Box 1.1). The focus of Avahan is on FSWs and their clients, MSM, Hijras (transgendered persons), and IDUs in 83 districts in six high prevalence states in India (Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Nagaland and Manipur) and in 17 sites along the National Highways (NH 1–9). Avahan provides these populations with a core package of services very similar to the targeted intervention package of the NACP and quality clinical services for sexually transmitted infections, ensuring availability of prevention commodity (condom, needles/syringes), condom promotion, behaviour change communication, community mobilization and structural interventions to create

Box 1.1: IBBA districts and Avahan program coverage



The shaded areas represent IBBA districts and the red dots denote Avahan intervention sites in the high prevalence states.

an enabling environment for HIV prevention. Avahan aims to reduce HIV incidence amongst the high-risk populations and stabilize infection rates among the general population at large.

1.3 Monitoring and Evaluation of the Avahan Project: The IBBA, reported here, represents one large piece of the overall evaluation strategy to measure and understand the impact of the Avahan intervention on HIV transmission dynamics among the high-risk populations. The IBBA is the first independent large-scale systematic evaluation of the Avahan intervention among high-risk populations. In this assessment, behavioural risk information was collected along with biological specimens, which were tested for various STIs, including HIV. The IBBA is designed to measure the effect of a high coverage HIV prevention intervention, by monitoring changes in risk behaviours, prevalence of STIs and prevalence and incidence of HIV. Data from the evaluation will also be used to measure the cost-effectiveness of the intervention, to model the impact of the intervention on HIV transmission in India and contribute to a larger information base on which the program planners in India can design effective interventions to be used along with other data sources for projecting future epidemic trends. The information collected will strengthen the NACP in India, since the Avahan intervention is carried out in close collaboration with NACO and SACS.

1.4 IBBA: Objectives and Characteristics: The primary objective of the IBBA is to collect the necessary information for assessing the outcomes and impact of interventions in Avahan districts (Box 1.2). The first round of the IBBA was designed to be implemented in 29 districts in six states of India, and along four selected route categories of the National Highway. (Surveys among truckers groups are not covered in this report.) The IBBA is to be implemented thrice, at appropriate intervals between successive rounds. The total sample size for the first round of IBBA was 26,400. The first round covered high-risk populations (FSWs, MSM, Hijras and IDUs) and bridge populations (Clients of FSWs, and Truckers). Probability sampling approaches were used; and approaches differed (details given in chapter 2), depending on the characteristics of the high-risk population.

Box 1.2: IBBA objectives

- To measure the major outcomes and impacts of HIV interventions funded by Avahan under the India AIDS Initiative;
- To make data available for estimating sizes of populations targeted by the Avahan project; and
- To make information available to a partner organization under Avahan for modeling the impact of the intervention.

Geographical coverage of the IBBA in each district extended to the entire district, even though the Avahan intervention covered only a segment of the district (Tables 1.1 to 1.3).

The first round of IBBA is not a true baseline assessment for the Avahan since the program was already active in most of the districts before the assessment started. However, changes in key variables/indicators over the three rounds of the IBBA will be an important component in measuring the performance of the Avahan.

1.5 IBBA Partners: Premier institutes of ICMR including NARI, Pune; NIE, Chennai; National Institute of Nutrition (NIN), Hyderabad; Regional Medical Research Centre (RMRC), Dibrugarh; and National Institute of Medical Statistics (NIMS), New Delhi implemented the IBBA in Maharashtra, Tamil Nadu, Andhra Pradesh, Manipur and Nagaland and for the National Highways, respectively. The IBBA in Karnataka was implemented by KHPT in partnership with St. Johns Medical College and T.T. Krishnamachari Blood Bank, Bangalore. NARI coordinated the conduct of the IBBA survey at the national level. IBBA data was centrally managed and analyzed at the NIE, Chennai. FHI provided technical assistance for implementing the IBBA. Professional research agencies were hired by the ICMR Institutes to conduct the fieldwork. These included TNS India Private Ltd in Maharashtra and Tamil Nadu and ACNielsen ORG-MARG Private Ltd in Andhra Pradesh. The surveys in the Northeastern states were carried out by Kripa Foundation, Kohima and Regional Institute of Medical Sciences (RIMS), Imphal.

This IBBA National Interim Summary Report (2005-2007) summarizes the district-wise preliminary results of the first round of IBBA carried out among the high-risk populations (FSWs, MSM/Hijras, IDUs and clients of FSWs) in Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Nagaland and Manipur. The IBBA among truckers and a few specific groups in Maharashtra (i.e., FSWs in Mumbai: service bar, Hijras in Mumbai, Clients in Mumbai, and IDUs in Mumbai/Thane) is in progress/completed recently. Only those surveys that were completed and analyzed by July 2007 have been included in the report. A methodological overview of the IBBA survey is outlined in Chapter 2. Chapter 3 gives the size estimates obtained through IBBA for various high-risk populations. Salient findings by state and high-risk category are described in subsequent chapters. Chapter 8 gives HIV incidence estimates for the various groups of IBBA.

Table 1.1: Coverage of Avahan Interventions for Female Sex Workers by District

District	Agencies implementing programs	Month Avahan started	Intended Avahan coverage*	Month of IBB Asurvey
Andhra Pradesh				
Chittoor	APSACS, Avahan	May 2004	82%	Jun 2006
East Godavari	APSACS, Avahan	Apr 2005	14%	Mar 2006
Guntur	APSACS, Avahan	Aug 2004	68%	May 2006
Hyderabad	APSACS, Avahan	May 2004	17%	Feb 2006
Karim Nagar	Avahan	Dec 2004	100%	Nov 2005
Prakasam	APSACS, Avahan	Jan 2005	77%	Mar 2006
Visakhapatnam	APSACS, Avahan	Sep 2004	44%	May 2006
Warangal	APSACS, Avahan	May 2004	59%	Feb 2006
Karnataka				
Bangalore (Urban)	KSACS, Avahan	Jul 2005	59%	Jul 2006
Belgaum	KSACS, Avahan	Jul 2004	100%	Oct 2005
Bellary	Avahan	Jul 2004	100%	Nov 2005
Mysore	Avahan	Jan 2004	100%	Aug 2004
Shimoga	Avahan	Jul 2004	100%	Aug 2005
Maharashtra				
Kolhapur	MSACS, Avahan	Mar 2006	50%	Mar 2006
Mumbai BB	MSACS, MDACS, Avert, Avahan	Dec 2004	50%	Apr 2006
Mumbai SB	MSACS, MDACS, Avert, Avahan	Dec 2004	50%	Apr 2006
Parbhani	MSACS, Avahan	Feb 2005	72%	Nov 2006
Pune BB	MSACS, Avahan	Dec 2004	35%	Jun 2006
Pune NBB	MSACS, Avahan	Dec 2004	100%	Jun 2006
Thane BB	MSACS, MDACS, Avert, Avahan	Dec 2004	46%	May 2006
Thane SB	MSACS, MDACS, Avert, Avahan	Dec 2004	100%	Apr 2006
Yevatmal	MSACS, Avahan	Feb 2005	100%	May 2006

Tamil Nadu				
Chennai	TNSACS, APAC, Avahan	Oct 2004	21%	Jul 2006
Coimbatore	Avahan	Oct 2004	100%	Jun 2006
Dharmapuri	Avahan	Oct 2004	59%	Apr 2006
Madurai	TNSACS, APAC, Avahan	Oct 2004	40%	Mar 2006
Salem	Avahan	Oct 2004	100%	Mar 2006
Nagaland				
Dimapur	OXFAM, NSACS, Avahan	Oct 2004	100%	Feb 2006

* Intended coverage is calculated based on territory division with other HIV prevention providers in the district and the size estimates of the 'high-risk' populations in each territory within the district.

Table 1.2: Coverage of Avahan Intervention for Men having Sex with Men by District

District	Agencies implementing programs	Month Avahan started	Intended Avahan coverage*	Month of IBBA survey
Andhra Pradesh				
East Godavari	Avahan	Oct 2005	100%	Apr 2006
Guntur	Avahan	Mar 2006	21%	May 2006
Hyderabad	APSACS	---	0%	Jun 2006
Visakhapatnam	Avahan	Jan 2006	17%	May 2006
Karnataka				
Bangalore (Urban)	KSACS, Avahan	Jan 2006	90%	Jul 2006
Maharashtra				
Mumbai-Thane	MSACS, Avahan	Jan 2007	100%	Jan 2007
Pune	MSACS, Avahan	Jan 2007	100%	Oct 2006
Tamil Nadu				
Chennai	APAC, Avahan	Oct 2004	33%	Jul 2006
Coimbatore	Avahan	Oct 2004	100%	Jun 2006
Madurai	Avahan	Oct 2004	100%	Mar 2006
Salem	Avahan	Oct 2004	100%	Mar 2006

* Intended coverage is calculated based on territory division with other HIV prevention providers in the district and the size estimates of the 'high-risk' populations in each territory within the district.

Table 1.3: Coverage of Avahan Intervention for Injecting Drug Users by District

District	Agencies implementing programs	Month Avahan started	Intended Avahan coverage*	Month of IBBA survey
Manipur				
Bishnupur	CSD, SIDA, MSACS, Avahan	Oct 2004	100%	Jan 2006
Churachandpur	AusAID, MSACS, Avahan	Oct 2004	87%	Feb 2006
Nagaland				
Phek	NSACS, Avahan	Oct 2004	100%	Mar 2006
Wokha	NSACS, Avahan	Oct 2004	57%	Apr 2006

* Intended coverage is calculated based on territory division with other HIV prevention providers in the district and the size estimates of the 'high-risk' populations in each territory within the district.

CHAPTER 2:

METHODOLOGY

The salient features of the IBBA design and methodology are described in this chapter. A team consisting of members from ICMR, KHPT, FHI, and Avahan designed the protocol for implementation of the IBBA. The protocol was improved and refined as the assessment progressed. Hence, it is possible that some information on certain aspects of the assessment may not be available for some groups. Even though the formats for the assessment across the high-risk populations, districts, and states were similar, there were elements specific for given high-risk populations and geographical areas. Lessons learnt from the first round of the IBBA are expected to provide a standardized and improved methodology for the next rounds.

2.1 Approval Process: Prior to starting the IBBA, clearance for the assessment was obtained from the Health Ministry Screening Committee (HMSC), Government of India. The IBBA protocol was also approved by the Scientific Advisory Committees of the participating ICMR institutes. Ethics Committees of these institutions reviewed and approved the protocol, consent forms, study instruments, standard operating procedures and field manuals. The Karnataka IBBA protocol was approved by St. John's Medical College Hospital Institutional Ethics Review Board, Bangalore. The protocol was also approved by the Protection of Human Subjects Committee (PHSC) of FHI.

2.2 Coverage

2.2.1 IBBA Districts: Based on the recommendation of the Avahan WHO Evaluation Advisory Group (EAG) for the IBBA, and considering available resources, it was decided to implement the survey in 29 districts out of 83 where the Avahan was operating, and in four segments along the national highways. The districts were chosen purposively based on two key criteria: socio-cultural region and size of the high-risk population. In each state, the capital district for the state was also included.

2.2.2 Respondent Groups: The selection of high-risk populations to be covered in each district was based on the focus of the Avahan and the overall HIV transmission dynamics of the region (Box 2.1). Coverage of FSWs was a priority in the four Southern states (Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra); whereas, in the Northeastern states, priority was given to IDUs. Data were collected for the entire district regardless of the various funding agencies supporting HIV prevention interventions in the district. The high-risk populations

Box 2.1: IBBA districts

State and District	FSW	MSM	Hijra	IDU	Clients	Truckers
Andhra Pradesh (6800)						
Chittoor	✓					
East Godavari	✓	✓			✓	
Guntur	✓	✓			✓	
Hyderabad	✓	✓			✓	
Karim Nagar	✓					
Prakasam	✓					
Visakapatnam	✓	✓			✓	
Warangal	✓				✓	
Karnataka (2800)						
Bangalore	✓	✓				
Belgaum	✓					
Bellary	✓					
Mysore	✓					
Shimoga	✓					
Maharashtra (7200)						
Kolhapur	✓					
Mumbai	✓				✓	
Parbhani	✓				✓	
Pune	✓	✓			✓	
Thane	✓					
Yevatmal	✓				✓	
Mumbai-Thane		✓		✓		
Tamil Nadu (5200)						
Chennai	✓	✓			✓	
Coimbatore	✓	✓				
Dharmapuri	✓					
Madurai	✓	✓			✓	
Salem	✓	✓			✓	
All five districts			✓			
Nagaland (1200)						
Dimapur	✓					
Phek				✓		
Wokha				✓		

Manipur (800)						
Bishnupur				✓		
Churachandpur				✓		
Truckers (2000)						
North - South						✓
North - West						✓
South - East						✓
North - East						✓

Note: Mumbai FSWs consists of four groups, and Pune, Bangalore and Thane FSWs consists of two groups each.

covered include FSWs, MSM, Hijras, IDUs, clients of FSWs, and truckers. This interim report contains the results of the IBBA conducted for all groups with the exception of truck drivers and a few groups in Maharashtra for whom the data collection/analysis was not complete when the report was compiled.

2.3 Key Areas of Enquiry: Key risk behaviours and STIs related to the spread of HIV were assessed. For the behavioural assessment (Box 2.2), face-to-face interviews using structured questionnaires were used. Keeping in view the requirement for modeling the impact of Avahan intervention, different variables were selected. The questionnaire covered demographic variables, migration, sexual behaviour, condom use, types of partners, knowledge about HIV and exposure to interventions. For the biological assessment (Box 2.3), prevalence of STIs including HIV was estimated. In addition, prevalence of Hepatitis B and C were estimated in IDU group.

Box 2.2: Behavioural indicators

- Number and types of sexual partners
- Condom use with different types of partners
- Practices related to condom use and safe sex
- Knowledge of STIs and STI care-seeking behaviours
- Knowledge and attitudes toward HIV/AIDS
- Drug and substance use
- Mobility and migration patterns influencing risk
- Perception of HIV and STI risk
- Exposure to Avahan and other HIV interventions

Box 2.3: Biological indicators

All participants:

- Syphilis serology
- N. gonorrhoeae NAT
- C. trachomatis NAT
- Herpes simplex virus type 2 (HSV-2) serology (10% sample)
- HIV serology
- BED assay for early HIV infection

IDUs only:

- Hepatitis B virus (HBV) surface antigen
- Hepatitis C virus (HCV) antibody

2.4 Preparatory Activities

2.4.1 Pre-survey Assessment: State level consultative discussions were held with local stakeholders including State AIDS Control Society (SACS) and non-governmental organizations (NGOs) working with high-risk populations. In each state, a participatory workshop was conducted with NGOs, including outreach workers and peer educators. These meetings/workshops were designed to make use of their inputs on implementation issues, including characteristics of the population and to identify time and locations for data collection.

2.4.2 Research Instruments and Tools: NARI, KHPT and FHI developed the survey instruments including questionnaires and consent forms, field guidelines, and laboratory standard operating procedures (SOPs). Guidelines for handling adverse events, and ensuring safety and confidentiality of data were also developed. All the questionnaires and manuals were translated into local languages and back-translated. The questionnaires were pre-tested in each state, and reviewed by NARI, KHPT, FHI and Avahan before finalization.

2.4.3 Community Preparations: Community preparation was an integral part of the implementation of IBBA which was carried out with the intent of understanding and addressing the concerns of stakeholders, gatekeepers, and community members. The survey established a Community Advisory Board and a Community Monitoring Board which were independent of the survey teams and their main role was protecting the high-risk populations. One Community Advisory Board was established for each high-risk population in each district to help and guide the survey team, to suggest mechanisms for avoiding adverse events, and to help address problems as and when they arose in a community sensitive manner. The Community Monitoring Board was composed of members of the high-risk populations who visited the areas where the survey was implemented and reported any complaints, concerns, or problems to the Community Advisory Board.

2.5 Ethical Issues and Consent process

2.5.1 Informed consent: All respondents were informed of, and gave consent for each test that was to be performed on their blood and urine specimens. At the assessment sites, potential participants were selected as per the protocol and were informed about the purpose and procedures for the study and asked for consent. Participation was completely voluntary with the option to withdraw at any time.

2.5.2 Harm Minimization Measures: The high-risk populations involved in the IBBA are often marginalized and stigmatized. Protection of respondents in all phases of the assessment was given high priority. The ethical committees of the participating centres reviewed the

conduct of the assessment periodically (Box 2.4). The set guidelines were strictly followed to protect the rights of respondents including confidentiality of the data. Questionnaires and biological testing were linked anonymously, meaning that the results were linked to the questionnaire, but the results could not be traced back to the individual.

2.6 Sampling

2.6.1 Sample Size: The sample size of 400 per district was arrived at for each of the high-risk groups, except for truckers where the sample size was 500 per every highway segment. The sample sizes were calculated for tracking changes in key risk behaviours over time and for looking for district level impact. With the exception of truck drivers, by definition, all respondents engaged in behaviours that put them at risk for HIV infection, either commercial sex, sex with multiple partners or injecting drug use. The main protective behaviours of interest for Avahan included condom use and use of clean needles/ syringes and injecting equipment. The size of 400 allowed for detection of an absolute difference of 15% or more from the assumed value of 50% with 95% confidence (5% probability of type I error), and 90% power (10% probability of type II error), for indicators such as consistent condom use, last time condom use and use of clean needles. A design effect of 1.7 was assumed for cluster sampling and 1.5 for respondent driven sampling methods.

Behaviour of the HIV epidemic itself is not uniform or at the same stage in different districts or states. Thus, there are difficulties in merging data from different districts. Sub-group analysis of sub-populations within a district also becomes difficult on account of very small numbers. Districts for the IBBA within each state were not selected randomly. Rather, districts with the highest numbers of high-risk populations were selected within different socio-cultural regions, in recognition of the diversity that exists between these regions, and to facilitate the goal of modeling Avahan's impact in different types of settings. For this reason, aggregation of data across districts will represent only those districts, and generalization of the information for the overall state or even to all Avahan districts in the state may not be valid. It may be possible to identify districts with similar patterns in the context of HIV epidemic evolution. After careful considerations, data from similar districts could perhaps be pooled.

2.6.2 Sampling Approaches: A probability sampling method was used in all groups and all districts. The choice of method for individual high-risk populations was dependent on the population being assessed. Conventional cluster sampling was used for populations that

Box 2.4: Ethics committee meeting



were relatively stable (in terms of mobility) in that, they were attached (even if temporarily) to a particular establishment. This was most often the case for brothel-based, home-based and lodge-based FSWs. For populations that tended to be less stable, such as street-based FSWs, MSM, Hijras, and clients of FSWs, (because they were not associated with any particular site or establishment in a fixed manner or at fixed times), time-location cluster sampling was used.

Respondent driven sampling (RDS) was used for populations where a substantial proportion did not congregate in identifiable locations and would have been missed if a venue based sampling approach such as conventional cluster sampling or time-location cluster sampling was used.

A “take-all” approach was followed when the pre-survey assessment or sampling frame development suggested that there were fewer than 400 members of the high-risk population in that district.

2.6.3 Mapping and Sampling Frame: For surveys where cluster sampling was used, non-governmental organizations/individuals working with high-risk populations were involved in the mapping of potential sites where members of the group could be sampled. First, the existing mapping information available from the lead partners in each of the State agencies was obtained. Mapping information was updated by visiting each site. During this process, inactive sites were excluded and new sites were added. Information was gathered at each site about the presence of high-risk population members on different days and times, as well as approximate numbers and patterns of mobility. This information was then used to develop a list of primary sampling units to serve as either a conventional cluster sampling frame or a time-location sampling frame. The exercise was carried out in areas that were not covered by the Avahan as well (Appendix 1).

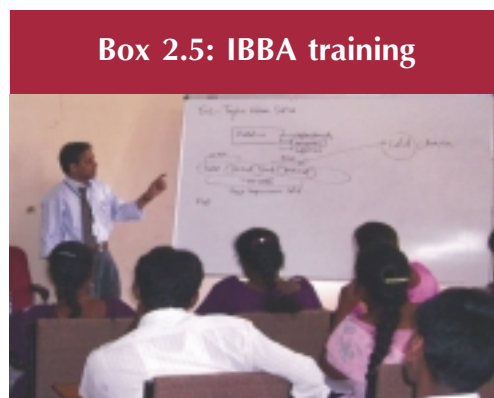
2.6.4 Cluster Sampling Procedures: Selection of respondents for conventional cluster sampling/time-location cluster sampling was done through a two-stage cluster sampling procedure. The primary sampling units (clusters) were selected by systematic random sampling (without replacement), by probability proportional to size. In the selected clusters, respondents were chosen through simple random sampling using their dress code as labels. The information needed to calculate selection probabilities and weights and non-response rates was recorded in the cluster information sheet.

2.6.5 Respondent Driven Sampling: Selection of respondents for RDS was done through a system of peer recruitment involving initial identification of six to eight diverse “seeds”, who were members of the high-risk population, purposively selected from among various networks to participate in the assessment. Each seed was issued three coupons to recruit members of

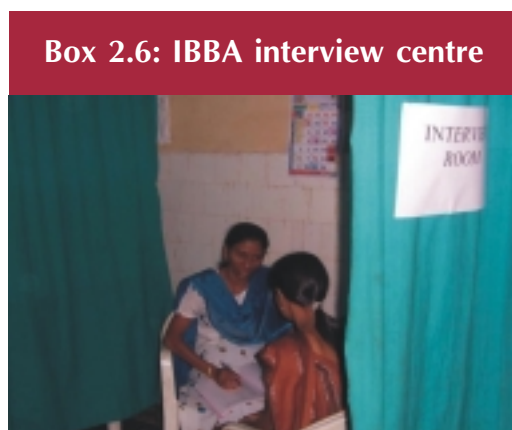
the population who met the eligibility criteria and who were “known” to them (i.e., not strangers). Additional seeds were selected during the conduct of the survey, if the earlier seeds did not succeed in developing active recruitment chains. RDS data was analyzed using the Respondent Driven Sampling Analysis Tool (RDSAT) program, with appropriate weighting and accounting for design effects. Validity of the estimates obtained through the RDS depends upon the extent of networking amongst the respondents. Inability to cover different categories of the hidden population is the potential risk in this approach. If some categories of respondents are not identified in the RDS process, they remain unrepresented in the survey.

2.7 Implementation of Survey

2.7.1 Training: Intensive training was imparted to all field personnel in view of the sensitive nature of the behavioural questions and the fact that biological specimens were collected. One five-day training workshop was held to orient the various field staff on their specific roles. The medical officers were trained on syndromic management of STIs. In addition, all individuals involved in the IBBA were trained in community sensitization, harm minimization, good laboratory practices (GLP), biohazard, and the basics about HIV, AIDS and STIs. A dry run of field activities was done to assess the skills of the team and to resolve problems before initiating field work (Box 2.5).



2.7.2 Fieldwork: Multiple field teams were formed in each district. The teams consisted of a supervisor, community liaison staff, laboratory technician, interviewers, and clinician. Data was collected through face-to-face interviews in a private location specifically set up for the interview and clinical examination in the vicinity of survey site (Box 2.6).



2.7.3 STI Referral and Communicating Results to Participants: One major benefit to the participants

of the IBBA was the access to medical examination and treatment by a doctor. Participants with symptoms consistent with STIs were treated syndromically for STIs at the time of the survey. They were provided with referral cards containing only the participant’s identification

number and directed to visit a designated clinic. At the clinic, syphilis test results and STI care were provided, if any respondent choose to do so.

2.7.4 Monitoring: There were several layers of monitoring to ensure that the IBBA was conducted in strict adherence to the approved protocol. Researchers from NARI, the state ICMR institutes, KHPT and FHI were present in the field during the preparatory work, training, mapping and conduct of the actual survey. Staff from the research agencies as well as NARI, ICMR, KHPT and FHI made frequent surprise visits to check quality and consistency of various aspects of fieldwork including sampling, selection of respondents, the consent process, clinical examinations by the doctors, biological sample collection by technicians, and storage/transport/processing of samples at the field laboratories. Quality of the data collected in the field was checked on the spot for completeness. Inconsistencies were checked and corrected at the site itself by the field team.

2.8 Biological Component of IBBA: IBBA is unique in that biological indicators for risk of HIV infection have been measured for the first time in such a large assessment. The biological indicators included in the assessment were presence of STIs as diagnosed by serology or nucleic acid amplification assay. Seroprevalence of HIV infection was determined by using two test algorithm and HIV incidence was estimated by BED-CEIA assay.

Laboratory Network: Biological assays were carried out through a network of laboratories at three levels,

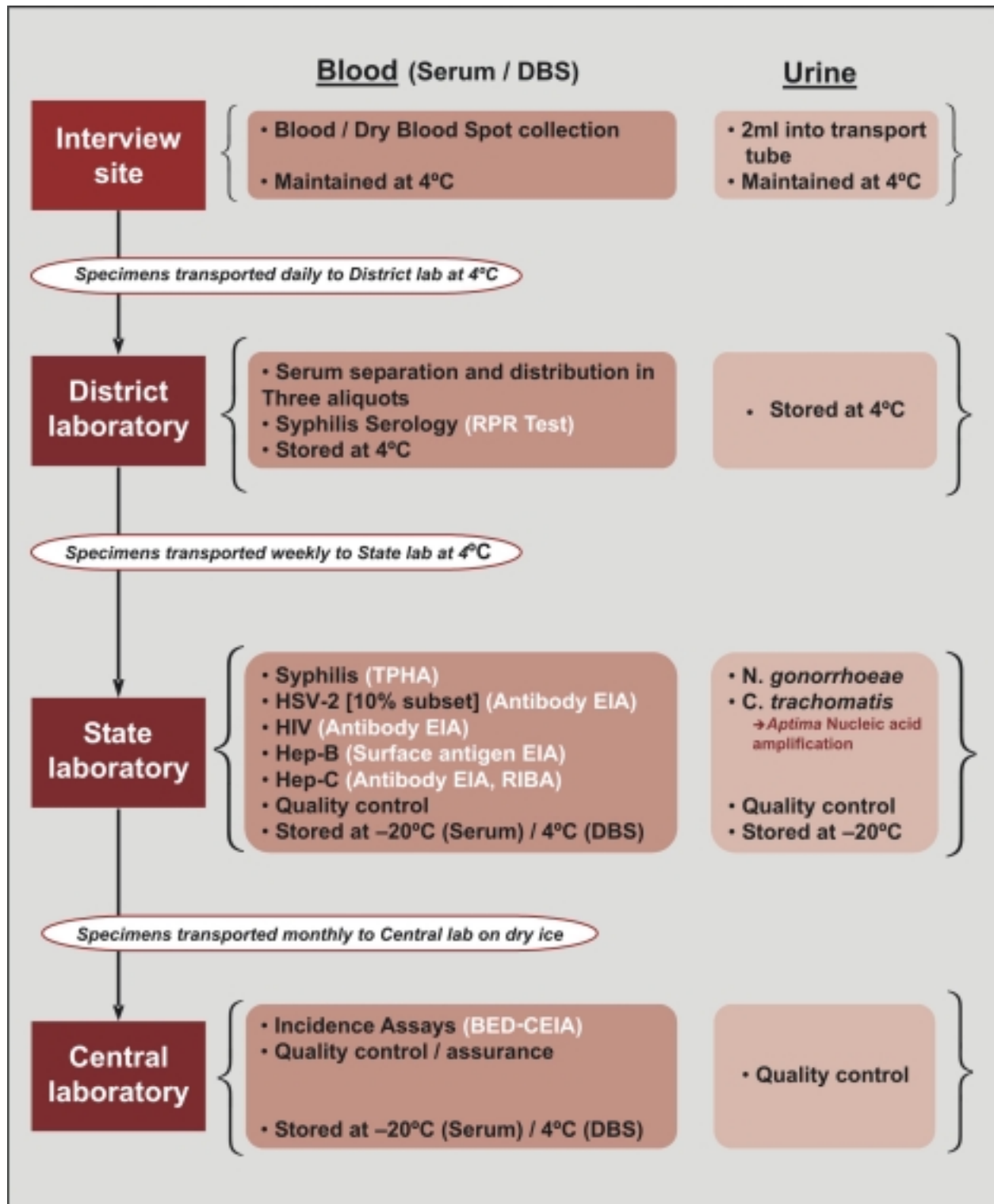
1. National level – National AIDS Research Institute, Pune (Box 2.7)
2. State level – at each state ICMR Institute
3. District level

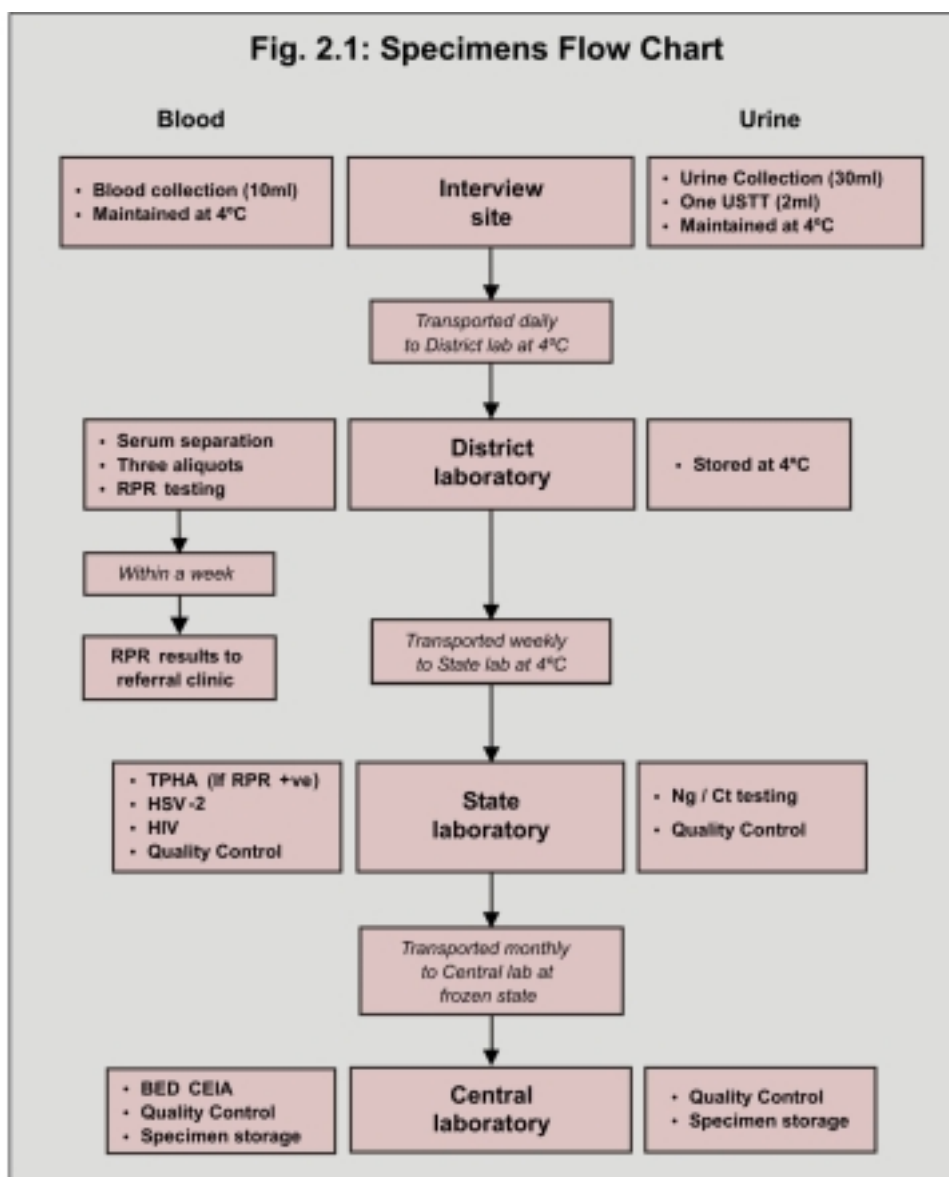
A small laboratory is established at field site during the survey period for collection of the samples.

Transportation: The biological samples were transported from site laboratory to the district lab and from district laboratory to the state laboratory maintaining cold chain (Box 2.8). In the state laboratory once the testing is over the samples were sent to NARI every month for quality control and archiving. The detailed logistics of transport and storage is illustrated in Fig. 2.1. Necessary monitoring and checks were instituted to ensure that samples were transported in appropriate conditions.

Box 2.7: IBBA central laboratory







2.9 Biological Assays (Table 2.1):

Syphilis Serology: Rapid Plasma Reagin (RPR) test for syphilis antibodies was carried out in the district laboratory. An indirect Hemagglutination test TPHA was used to confirm the results of RPR rapid test for all RPR positive sera. TPHA was carried out in the State laboratories. Since RPR and TPHA assays were not validated on dried blood spot, Trepanostika TP recombinant (BioMerieux), a solid phase enzyme-linked immunoassay, was used for testing anti-treponemal antibodies using dried blood spot (DBS) in the survey in the North-Eastern states of Nagaland and Manipur.

Table 2.1: Responsibilities and Tests Performed by Level of Laboratory

Laboratory level	Responsibility	Assays performed
Site laboratory	<ul style="list-style-type: none"> Collect, label, log and transport biological specimens (blood, and urine) to the district laboratory Aliquot 2 cc of urine into diagnostic test Urine Specimen Transport Tube (USTT) 	None
District laboratory	<ul style="list-style-type: none"> Aliquoting, labeling and logging of sera into three vials Store and transport of specimens in appropriate conditions Perform syphilis serologic screening test. Return syphilis results under study ID number to referral clinics 	<ul style="list-style-type: none"> Qualitative and quantitative RPR
State laboratory NARI, Pune NIN, Hyderabad NIE, Chennai RMRC, Dibrugarh	<ul style="list-style-type: none"> Store and transport of specimens in appropriate conditions Syphilis serologic screening and confirmatory testing HIV antibody testing HSV-2 serologic testing (10% random sample) Hepatitis B surface antigen and Hepatitis C antibody testing <i>N. gonorrhoeae</i> and <i>C. trachomatis</i> antigen testing (at NARI and NIN laboratories only) Complete laboratory data result forms per standard operating procedures 	<ul style="list-style-type: none"> TPHA (if RPR is positive). Trepanostika (dried blood spots only) HIV-1 ELISA (Screening) HIV-1 ELISA (Confirmation if screening test is positive) HSV-2 Hepatitis B Virus surface antigen EIA Anti-Hepatitis C Virus EIA Chiron RIBA, if anti-HCV EIA is positive <i>Aptima</i> nucleic acid amplification assay for <i>N. gonorrhoeae</i> and <i>C. trachomatis</i> (At NARI & NIN only)
Central laboratory NARI, Pune	<ul style="list-style-type: none"> HIV antibody testing to estimate new infection in the previous 6 months HIV-1 confirmatory test for discordant ELISA results Genital ulcer pathogen antigen detection from swabs Quality control for all assays Repository of samples Logistics and co-ordination 	<ul style="list-style-type: none"> HIV BED-CEIA HIV-1 Western Blot assay on discordant HIV results

HIV Seroprevalence: Seroprevalence of HIV infection was determined by using two test algorithms at the State laboratory. (Screening test- Microlisa – HIV by J. Mitra & Co. Pvt. Ltd.; Confirmatory test- Genedia HIV 1/2 ELISA 3.0 by Greencross life Sciences Corp). HIV serology was performed on the serum samples except for the states of Nagaland and Manipur where DBS were collected due to logistics necessity

HIV Seroincidence: BED-CEIA was applied for identifying early HIV infections among those found reactive for anti-HIV antibodies. The assay was validated for Indian subtype C infections prior to applying the assay for estimating HIV incidence in the survey populations.

HSV-2 Serology: HSV-2 ELISA was performed on 10% subset of all serum samples at State laboratory using HerpSelect 2 ELISA IgG kits (Focus Diagnostics)

Hepatitis B surface Ag (HBsAg) ELISA: HBsAg ELISA was carried out on all DBS samples at state laboratory using Murex HbsAg Version 3 kits (Abbott Diagnostics) for the detection of hepatitis B surface antigen in DBS sample. This test was carried out only among IDUs.

Hepatitis C antibody ELISA: DBS samples from IDUs were tested for the presence of antibodies against Hepatitis C by EIA (Murex anti-HCV version 4.0, Abbott Diagnostics).

Detection of *N. gonorrhoeae* and *C. trachomatis* in urine sample: Gen-Probe APTIMA Combo 2 for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*: The APTIMA Combo 2 (AC2) Assay, a target amplification nucleic acid probe test that utilizes target capture for the *in vitro* quantitative detection and differentiation of ribosomal RNA (rRNA) from *Chlamydia trachomatis* and/or *Neisseria gonorrhoeae* was applied for urine samples from participants. The assay combines the technologies of target capture, Transcription-Mediated Amplification (TMA), and Dual Kinetic Assay (DKA). The chemiluminescent detection reaction for *C. trachomatis* signal has very rapid kinetics and has the “flasher” kinetic type. The chemiluminescent detection reaction for *N. gonorrhoeae* signal is relatively slower and has the “glower” kinetic type. Assay results are determined by a cut-off based on the total RLU and the kinetic curve type. Assay results are automatically interpreted by the APTIMA Combo 2 Assay Software and presented as individual CT and GC test results. A test result may be a negative, equivocal, positive, or invalid. New laboratories were set up at the NARI, Pune and NIN, Hyderabad for this assay.

2.10 Quality Control and Quality Assurance in IBBA: Quality assurance for various laboratory tests comprised of training, site inspection, and documentation and proficiency testing (internal/external).

1. RPR tests done at the district laboratory were monitored by the state laboratory by retesting 10% of the serum samples tested at the district laboratories.

2. For the assays carried out in the State Laboratories (TPHA, HIV-J Mitra, HIV- Genedia, HSV-2 ELISA, Trepanostika, HbsAg, Anti-HCV ELISA) 10% randomly selected samples were retested on a separate aliquot at the central laboratory.
3. For Gen-Probe APTIMA Combo 2 assay, all positive samples and 5% of all negative urine samples were retested on a separate aliquot at NARI.

External quality control of the state laboratories was done by sending proficiency panels (blinded samples) for each assay at regular intervals. The state laboratories implement internal quality control by including known blinded positive and negative samples apart from the control specimens provided in the test kits.

2.11 Archives: All the serum samples after testing are stored at -20°C while the serum vials for QC are stored at -70°C at NARI. For storage of IBBA samples, a separate sample tracking system is developed and all the samples are stored group wise in a freezer room. All the hard copies of the test protocol are separated group wise. The soft copies of all lab results are entered in a computer as per the excel sheet developed by IBBA and all the data has been kept on CDs for back-up and long term storage.

2.12 Data Management and Analysis: In view of the large volume of data generated, a data management group (DMG) consisting of representatives from all partner organizations (ICMR, KHPT and FHI) was formed to steer the data management activities of the IBBA at NIE, Chennai. Double data entry was carried out using CSPro (version 3.1) software. In the case of IBBA carried out by the ICMR institutes, the first data entry was done by the research agency and the second independent data entry was done by the respective state ICMR institute. The double data entry for Karnataka IBBA data was carried out by KHPT. Accuracy was ensured by matching the two separately entered data files and correcting the mismatches. The data were subjected to routine quality control checks. Inconsistencies in the data were sorted out through discussions and cross verification with original documents. The cleaned data were used for statistical analysis. SPSS (version 14.0) and RDSAT (version 5.6.0) software were used for data analysis. The results were discussed amongst the IBBA team members and also with external experts. Based on these consultations, mid-course corrections in the analysis plans and newer strategies for revised data analysis were incorporated (Appendix 2).

CHAPTER 3:

SIZE ESTIMATES OF HIGH-RISK POPULATIONS

Introduction: One of the objectives of the IBBA was to estimate the sizes of high-risk populations (FSWs, MSM and IDUs) at the district level. Size estimation of high-risk population groups involved in covert, stigmatized and socially ostracized activities is a difficult exercise. Given the mobility and clandestine nature of these populations, it is not possible to enumerate them through mapping or counting of heads. In the absence of any gold standard, it is generally necessary to use several approaches to get a range of plausible values.

Standard methods for estimating population sizes for hidden populations that can be universally applied do not exist. However, the implementation of the IBBA, which included the development of comprehensive sampling frames, and a random sample of the survey population using probability methods, offered an excellent opportunity to use indirect methods to provide a range of population size estimates. In this chapter the Multiplier and Reverse Tracking Methods are described and size estimates generated by these methods are presented.

3.1 Multiplier Methods

The multiplier method uses information from two overlapping sources. In this application the IBBA served as one data source and Avahan NGO service delivery records were used to obtain a multiplier. An additional multiplier was also created by distributing unique objects to members of the population ahead of the survey.

3.1.1 NGO Multiplier: This method used NGO records, and estimated the overlap between population members participating in the Avahan program, and population members captured in the IBBA survey.

To use this method, several factors had to be assessed including:

- the overlap between the geographic coverage area of the IBBA district and the catchment area of the NGO;

- the correspondence between the information captured by the NGOs and information from captured in the IBBA questionnaire
 - a. time reference period
 - b. meaning of terms such as “registration”;
- the quality of NGO record-keeping; and
- the ability of NGOs to capture information on individuals (as opposed to contacts).

A range of multipliers with the closest correspondence between the IBBA questionnaire and the NGO records were attempted including:

- number registered with Avahan program within a specified time period;
- number contacted by an out-reach worker (last month);
- number who received a new health card (last three months); and
- number who visited the Avahan clinic (last three months).

3.1.2 Unique Object Multiplier – This method was implemented by distributing unique objects 1-2 weeks ahead of the survey such as key chains, stars, and bells. The objects were selected for each group in each district, based on their likelihood of being “easily remembered” by the population members. The objects were distributed to individuals whose profiles matched the eligibility criteria for the IBBA. Those who received the objects were treated as “labelled” individuals. During the IBBA, all respondents were asked whether they had received the object or not. The inverse of the proportion who reported having received the unique object, combined with the number of objects distributed, was used to estimate the size of the population.

To use this method, several factors had to be assessed including:

- the reliability of the information on the number of objects distributed;
- the reliability of information about to whom the objects had been distributed (eligibility criteria had to be the same as that of the IBBA survey); and
- overlap between the coverage area of the IBBA and the area where objects were distributed.

Because there was variability in the type of information recorded by NGOs and the method of recording it, ultimately the choice of which multiplier to use for each group in each district depended upon the quality of NGO record-keeping, and the level of correspondence between the NGO records and the IBBA questionnaire. In cases where none of the NGO multipliers worked well, the unique identifier was used as a multiplier.

3.2 Reverse Tracking Method (RTM)

The reverse tracking method took advantage of the sampling frame developed for the IBBA, which mapped the locations or venues where population members could be found, and also estimated the number of population members at the venues at different times of the day. This mapped information was used to create time-location and conventional cluster sampling frames from which a subset of clusters could be randomly selected for inclusion in the IBBA. At the time of data collection the actual number of population members found at the site at the time of the survey was recorded. The difference between this “actual” size and the size that had been estimated during mapping and sampling frame development was used to estimate the overall population size. This approach, referred to as “Reverse Tracking” was used to estimate the population size for those groups where conventional and TLC sampling was used. This method was not applicable for those groups where Respondent Driven Sampling was used because of the absence of a sampling frame. Results based on this method are given in tables 3.2, 3.3 and 3.4.

3.3 Limitations

3.3.1 Multiplier Method

- The IBBA was conducted with many groups in many districts. The NGO multipliers came from a variety of NGOs. It was not possible to customize the IBBA questionnaires in each district to ensure a one-to-one correspondence with the multiplier. So, for example, if the IBBA measured “exposure” or “contact” with a particular NGO, if the respondent did not remember, or was unclear about which NGO they had been in contact with, then the information from the IBBA may not have corresponded to the multiplier. Or, if the respondent was not clear about what it meant to be “registered” with an NGO, did not remember being registered, or there was no method of verifying registration with a specific NGO, then this multiplier would not correspond well with the IBBA. To the extent that the IBBA and whichever multiplier was being used did not correspond to each other, the size estimate could have been biased upward or downward.
- It is a challenge for NGOs to track individuals as opposed to contacts and also to ensure that community members are not double-counted. To the extent that there is double-counting of individuals by NGOs, this can also result in over-estimation of population sizes

3.3.2 Reverse Tracking Method

- The individuals may not be uniquely and exclusively attached to only one time location cluster or site. Therefore, double or multiple counting within a site is a distinct

possibility. Size estimates based on these TLCs can result in an over-estimate of the population size

- The estimated population size by RTM corresponds only to the area covered in the IBBA mapping (urban and semi urban areas of the IBBA district), where the high-risk population were known to be concentrated. This could have contributed to differences between the IBBA estimates and the NGO estimates.

The issue of size estimates of high risk populations is complex and may not have a single answer. Considerable variations are observed in the estimates of high risk groups from different sources. This issue needs review and wider consultation. We have tried to approach this issue through the methods described in this chapter, and are presenting the range of results in this context.

Table 3.1: Size Estimates of Female Sex Workers (FSWs)

State & District	Best available multiplier		Reverse tracking method (95% CI)
	Method	Estimate (95% CI)*	
Andhra Pradesh			
Chittoor	Unique object	871 (773 - 1004)	2436 (2416 - 2456)
East Godavari	Unique object	1462 (1147 - 1931)	4517 (4442 - 4592)
Guntur	Unique object	1176 (1006 - 1404)	3726 (3694 - 3758)
Hyderabad	—	—	3334 (3292 - 3377)
Karim Nagar	—	—	9749 (9620 - 9878)
Prakasam	Unique object	1055 (912 - 1247)	1757 (1745 - 1769)
Visakhapatnam	Unique object	1149 (963 - 1412)	2616 (2586 - 2646)
Warangal	—	—	1010 (1002 - 1019)

State & District	Best available multiplier		Reverse tracking method (95% CI)
	Method	Estimate (95% CI)*	
Maharashtra			
Kolhapur	Unique object	313 (183 - 617)	248 —
Mumbai (All)	Unique object	6250 (3030 - 16667)	—
Mumbai (BB)	Unique object	4152 (2585 - 6850)	7167 (7016 - 7318)
Mumbai (SB)	Unique object	3879 (2286 - 6737)	2622 (2466 - 2778)
Parbhani	Unique object	2795 (1758 - 4739)	—
Pune (BB)	Unique object	579 (266 - 1341)	1455 (1448 - 1462)
Pune (NBB)	Unique object	2263 (1745 - 2942)	343 —
Thane (BB)	Unique object	435 (371 - 516)	1244 (1242 - 1246)
Thane (SB)	Unique object	789 (625 - 1019)	945 (932 - 958)
Yevatmal	Unique object	192 (136 - 313)	275 —
Tamil Nadu			
Chennai	Registration	11809 (9104 - 15832)	10634 (10472 - 10797)
Coimbatore	Registration	3462 (3101 - 3942)	4221 (4174 - 4268)
Dharmapuri	Registration	8711 (8061 - 9501)	1841 (1752 - 1930)

State & District	Best available multiplier		Reverse tracking method (95% CI)
	Method	Estimate (95% CI)*	
Madurai	Registration	7668 (6907 - 8816)	6519 (6501 - 6537)
Salem	Registration	4750 (4312 - 5390)	2421 (2382 - 2460)
Nagaland Dimapur	Unique object	2683 (1833 - 3492)	—

Note: In the case of Hyderabad, Karim Nagar, and Warangal unique objects distribution was not carried out.

Take-all sampling (complete sampling) was adopted in case of Kolhapur, Pune (NBB) and Yevatmal.

Size estimation through reverse tracking method could not be done for Mumbai (All), Parbhani and Dimapur groups as RDS methodology was adopted.

* 95% confidence intervals (CI) of the sizes estimated through the multiplier method were worked out based on the 95% CIs of the multipliers.

Table 3.2: Size Estimates of Men having Sex with Men (MSM)

State & District	Best available multiplier		Reverse tracking method (95% CI)
	Method	Estimate (95% CI)	
Andhra Pradesh			
East Godavari	Unique object	1196 (862 - 1712)	1141 (1122 - 1159)
Guntur	Unique object	4167 (2049 - 8621)	685 (681 - 688)
Hyderabad	Unique object	4902 (2315 - 10870)	4076 (3954 - 4198)
Visakhapatnam	Unique object	746 (619 - 919)	950 (940 - 959)
Maharashtra			
Mumbai-Thane	Unique object	870 (610 - 1266)	1182 (1164 - 1200)
Pune	Unique object	334 (292 - 379)	316 ---
Tamil Nadu			
Chennai	Unique object	5517 (4040 - 7619)	4955 (4890 - 5021)
Coimbatore	Unique object	4673 (3546 - 6289)	2849 (2819 - 2878)
Madurai	Unique object	3676 (2747 - 5102)	937 (919 - 955)
Salem	Unique object	3401 (2445 - 4975)	1416 (1385 - 1447)

Note: Take-all sampling (complete sampling) was adopted in case of Pune.

Table 3.3: Size Estimates of Intravenous Drug Users (IDUs)

State & District	Best available multiplier	
	Method	Estimate (95% CI)
Manipur		
Bishnupur	---	---
Churachandpur	Unique object	1493 (1031 - 2083)
Nagaland		
Phek	Unique object	2439 (1754 - 3846)
Wokha	Unique object	2941 (1852 - 6250)

Note: In the case of Bishnupur, unique objects distribution was not carried out. Size estimation through Reverse tracking method could not be done for the above four IDU groups as RDS methodology was adopted.

CHAPTER 4:

FEMALE SEX WORKERS

4.1 Introduction: Female sex workers (FSWs) are one of the important high-risk populations affected by the HIV epidemic in India. Because of the large number of sexual partners they come in contact with, they are a key population targeted for prevention interventions. A number of targeted interventions have been undertaken with this community and they are one of the main focus populations for Avahan. The first round of the IBBA was conducted among FSWs in eight districts of Andhra Pradesh, four districts in Karnataka, six districts in Maharashtra, five districts in Tamil Nadu and in Dimapur district of Nagaland (IBBA carried out at Mysore in Karnataka did not follow the generic IBBA protocol and hence is reported as the last section in the chapter).

The IBBA among FSWs was carried out between November 2005 and July 2006 in Andhra Pradesh; August 2005 and August 2006 in Karnataka; March 2006 and March 2007 in Maharashtra; March and September 2006 in Tamil Nadu; and February and April 2006 in Dimapur.

4.2 Mapping: A two-stage cluster sampling design was adopted (fixed-location and time-location clusters were the primary sampling units) for all districts except Dimapur in Nagaland, Mumbai-All and Parbhani in Maharashtra, where RDS was used. Mapping was first conducted in each district for development of a sampling frame. A total of 4,086 brothel-based (fixed-location) and 45,419 non brothel-based (time-location) clusters were mapped across all the IBBA districts. Public places like parks, streets, cinema halls, bus stands, railway stations, etc. where FSWs solicit clients were considered as non-brothel based sites. In all, there were 18,484 FSWs meeting the protocol eligibility criteria and of them, 14,255 were approached for the IBBA survey.

4.3 Participation Rates: Overall, 79% of the eligible FSWs consented to participate in the survey, and completed the behavioural interview and gave both biological (both blood and urine) samples. The participation rates by district ranged from 63% to 82% in Andhra Pradesh; 81% to 90% in Karnataka and 61% to 79% in Tamil Nadu. In Maharashtra, Kolhapur had a participation rate of only 45%, and it was 50% in Pune (brothel-based). The remaining districts of Maharashtra had a participation rate ranging from 68% to 78% (Table 4.1).

Table 4.1: Participation Rates by District for Female Sex Workers

State & District	Respondents approached	Completed questionnaire and biological specimen collection	Participation rate (%)
Andhra Pradesh			
Chittoor	501	401	80
East Godavari	596	422	71
Guntur	526	405	77
Hyderabad	637	399	63
Karim Nagar	595	412	69
Prakasam	519	404	78
Visakhapatnam	511	411	80
Warangal	508	417	82
Karnataka			
Bangalore (BB)	376	334	89
Bangalore (SB)	415	335	81
Belgaum	426	360	85
Bellary	478	420	88
Shimoga	434	390	90
Maharashtra			
Kolhapur	256	115	45
Mumbai (All)	NA*	403	NA*
Mumbai (BB)	520	407	78
Mumbai (SB)	567	394	69
Parbhani	NA*	367	NA*
Pune (BB)	802	404	50
Pune (SB)	343	257	75
Thane (BB)	539	401	74
Thane (SB)	578	394	68
Yevatmal	220	153	70
Tamil Nadu			
Chennai	671	410	61
Coimbatore	643	410	64
Dharmapuri	655	408	62
Madurai	511	402	79
Salem	608	402	66
Nagaland			
Dimapur	NA*	426	NA*

* NA - Not applicable (Respondent driven sampling was adopted).

4.4 Extent of Avahan Coverage: The Avahan service coverage data, from the IBBA needs to be understood in the context of Avahan coverage in the district combined with start of the Avahan program and timing of the IBBA in the districts. Avahan is not the sole provider of services in these districts and the extent of coverage varied widely from district to district, except in Karim Nagar, Coimbatore, Dharmapuri and Salem where interventions by SACS and other agencies are being implemented. In Karnataka, Avahan is the sole provider of intervention for FSWs in all districts except in Bangalore (urban). Intended coverage of Avahan extends to 100% of FSWs in Karim Nagar, Thane (street-based FSW), Yevatmal, Coimbatore and Salem. In other districts, intended coverage of the program ranges from 14% to 82% in Andhra Pradesh, 50% in Maharashtra, 21% to 59% in Tamil Nadu, and 100% in Dimapur.

Services received from “any agency” were assessed based on four indicators, namely, ‘Contacted by Peer/Out reach worker (ORW) [in the last month]’, ‘visited the NGO clinic [in the last 3 months]’, ‘received condom from peer/ORW [in the last year]’, and ‘received information on STI [in the last year]’.

In Andhra Pradesh districts, the reported proportion of FSWs receiving any one of these services ranged from 45% to 95%. The corresponding proportions for Karnataka districts were 55% to 91%; Maharashtra districts were 17% to 86% and 30% to 79% for Tamil Nadu districts (Table 4.2; Summary data sheet F2).

Table 4.2: HIV Prevention Services Received from Any Agency by District

State & District	Intended Avahan Coverage	Number of Respondents	Contacted by a Peer/ORW in the last month (%)	Visited an NGO Clinic in the last 3 months (%)	Received condom from Peer/ORW in the last year (%)	Received information on STI from Peer/ORW in the last year (%)
Andhra Pradesh						
Chittoor	82%	401	90	83	90	89
East Godavari	14%	422	93	78	92	91
Guntur	68%	405	95	84	94	94
Hyderabad	17%	399	67	45	61	64
Karim Nagar	100%	412	ND	ND	62	57
Prakasam	77%	404	84	70	86	82
Visakhapatnam	44%	411	86	59	90	85
Warangal	59%	417	62	54	65	64

Karnataka						
Bangalore (BB)	59%	334	86	ND	76	87
Bangalore (SB)	59%	335	87	ND	79	88
Belgaum	100%	360	ND	ND	91	89
Bellary	100%	420	ND	ND	89	91
Shimoga	100%	390	ND	ND	55	68
Maharashtra						
Kolhapur	50%	115	24	17	24	25
Mumbai (All)	50%	403	34	26	34	31
Mumbai (BB)	50%	407	36	24	41	33
Mumbai (SB)	50%	394	28	22	30	25
Parbhani	72%	367	31	20	33	28
Pune (BB)	35%	404	65	35	71	67
Pune (NBB)	100%	257	40	30	44	40
Thane (BB)	46%	401	85	75	86	82
Thane (SB)	100%	394	31	27	31	30
Yevatmal	100%	153	83	63	86	56
Tamil Nadu						
Chennai	21%	410	30	30	30	30
Coimbatore	100%	410	56	55	56	57
Dharmapuri	59%	408	79	74	77	75
Madurai	40%	402	73	69	71	72
Salem	100%	402	71	69	65	70
Nagaland						
Dimapur	100%	426	ND	ND	23	22

ND - No data.

4.5 Demographic Profile: The key demographic information considered for this report included age, literacy, marital status, and current living status. The mean age of the FSWs was broadly similar across the various districts surveyed (27 years to 33 years) (Table 4.3; Summary data sheet F1). FSWs surveyed were younger in Dimapur and older in Tamil Nadu. The proportion of FSWs who could read and write varied markedly, from 14% in Hyderabad to 61% in Dimapur. More than 80% of the FSWs were ever married in Andhra Pradesh, 52% to 96% in Karnataka, 63% to 90% in Maharashtra, above 95% in Tamil Nadu and 65% in Dimapur. More than two-thirds of the FSWs reported that they were living with their regular sexual partners in Andhra Pradesh and Tamil Nadu. The mean age at which the FSWs started selling sex was higher in Tamil Nadu (25 years to 28 years). In Dimapur, the FSWs started selling sex at a younger age (21 years).

Table 4.3: Demographic Profile of Participating Female Sex Workers by District

State & District	Number of Respondents	Mean age (Years)	Mean age when started selling sex (Years)	Can read and write (%)	Ever married (%)	Living with sexual partner (%)
Andhra Pradesh						
Chittoor	401	30	25	36	95	80
East Godavari	422	31	23	33	88	69
Guntur	405	31	25	39	96	77
Hyderabad	399	30	25	14	96	76
Karim Nagar	412	29	23	22	89	73
Prakasam	404	29	24	32	96	79
Visakhapatnam	411	30	24	35	96	76
Warangal	417	29	21	21	81	74
Karnataka						
Bangalore (BB)	334	31	27	55	91	52
Bangalore (SB)	335	31	27	51	96	46
Belgaum	360	32	22	18	52	21
Bellary	420	31	22	38	56	31
Shimoga	390	32	26	42	93	49
Maharashtra						
Kolhapur	115	30	24	23	85	45
Mumbai (All)	403	29	24	26	88	47
Mumbai (BB)	407	30	22	15	80	33
Mumbai (SB)	394	31	24	28	90	46
Parbhani	367	32	25	14	88	43
Pune (BB)	404	29	22	23	63	24
Pune (NBB)	257	33	26	22	89	55
Thane (BB)	401	28	22	36	65	24
Thane (SB)	394	27	24	56	84	39
Yevatmal	153	28	24	22	86	34
Tamil Nadu						
Chennai	410	33	28	33	97	67
Coimbatore	410	33	28	59	96	79
Dharmapuri	408	31	25	29	98	69
Madurai	402	32	26	45	97	76
Salem	402	33	28	29	98	76
Nagaland						
Dimapur	426	26	21	61	65	41

4.6 Typology: FSWs were both brothel-based and non brothel-based in Andhra Pradesh and predominantly non brothel-based in Tamil Nadu; brothel-based in Belgaum, Bellary and Shimoga. However, in Bangalore, Mumbai, Pune and Thane, brothel and non-brothel based FSWs were considered as separate groups due to the larger size of the brothel-based and/or non brothel-based communities. In Kolhapur and Yevatmal, the take-all sample covered FSWs of mixed typology.

4.7 STI Knowledge: STI knowledge was assessed based on the ability of the FSW to correctly identify at least three of the six most common symptoms, viz., lower abdominal pain, foul smelling vaginal discharge, burning on micturition, genital ulcer/sore, swelling in the groin area, and genital itching.

More than three-fourths of the FSWs had heard of STIs in Andhra Pradesh (81% to 99%); Tamil Nadu (78% to 93%) and in Dimapur (73%). However, comparatively fewer FSWs reported so in Karnataka (64% to 88%) and Maharashtra (43% to 83%). In Andhra Pradesh, among the FSWs who had heard of STIs, more than 80% could correctly identify at least three of the most common STI symptoms in all districts, except in the district of Warangal (66%). This proportion ranged from 31% to 60% in Karnataka districts; 57% to 79% in Tamil Nadu districts and varied in Maharashtra districts (24% to 85%). It was very low in Kolhapur and Yevatmal (24% and 29%, respectively) (Summary data sheet F3).

4.8 HIV Awareness, Knowledge & Risk Perception: More than 80% of the FSWs reported that they had heard of HIV/AIDS. In Andhra Pradesh, Karnataka and Tamil Nadu districts, the knowledge that 'HIV can be prevented' was high among those who had ever heard of HIV/AIDS, whereas in Maharashtra, it was as low as 33%.

Knowledge on HIV spread was assessed based on the responses to a set of six questions. FSWs giving correct answers to all these questions were considered as having "correct knowledge". Only 2% of the FSWs had correct knowledge in Dimapur. In Andhra Pradesh districts, correct knowledge ranged from 7% to 32% and in Karnataka it ranged from 18% to 50%. Only 6%, 9% and 14% of the FSWs in Kolhapur, Yevatmal and Mumbai-All districts of Maharashtra had correct HIV knowledge. In other districts of Maharashtra the percentage ranged from 28% to 52%. In Tamil Nadu, Madurai reported the lowest (10%) and in other districts it ranged from 35% to 53%. Misconception was high in Andhra Pradesh districts and highest in Dimapur. The lowest reported (11%) misconception among the districts of Maharashtra was in Thane (street-based).

More than 35% felt that they were 'at-risk' for HIV infection among Andhra Pradesh districts and one fourth felt so in Karnataka. This risk perception was low in Tamil Nadu districts (12% to 40%) and ranged widely in Maharashtra (25% to 73%). Generally, across the districts, the

magnitude of the risk perception reflected the corresponding HIV prevalence (Summary data sheet F4).

4.9 Numbers of clients: The reported mean number of clients on the 'last day worked' was highest in Yevatmal (4) and between 2 and 3 in all other districts. Average number of clients during previous week was between 5 and 16 in Andhra Pradesh, Karnataka and Tamil Nadu districts and between 4 and 19 in Maharashtra districts (Summary data sheet F5).

4.10 Sex work at places traveled: Generally, more than 65% of FSWs from districts in Andhra Pradesh reported that they had sold sex at places traveled to, during the last year. This figure ranged between 1% and 7% in Maharashtra districts; and between 25% and 62% from the districts of Tamil Nadu, except in Chennai where only 8% reported selling sex while traveling during the past year (Summary data sheet F1).

4.11 Forced Sex: Forced sexual activity was reported by 10% to 25% of the FSWs in Andhra Pradesh districts and by 7% to 19% of the FSWs in Karnataka. The corresponding percentages ranged from 2% to 16% in Maharashtra districts, 6% to 19% in Tamil Nadu districts and 26% in Dimapur. FSWs predominantly reported that it was clients who forced them to have sexual activity, followed by police and pimps.

4.12 Partner Types and Condom Use: The IBBA defined "Occasional" clients as clients who visited the FSW only once or on a few occasions and are not well known to her. More than 90% of the FSWs reported having occasional clients in all districts in Andhra Pradesh, Karnataka and Maharashtra (except in Mumbai; 67%). The corresponding figure ranged between 78% and 96% in Tamil Nadu; and almost all reported having occasional clients in Dimapur. "Regular" clients were defined as those who visit the FSWs regularly/repeatedly and whom the FSW knows. The proportion of FSWs reporting regular clients was above 94% in Andhra Pradesh districts, except Hyderabad, where it was 81%; more than 85% of FSWs in Karnataka, Tamil Nadu and Dimapur and 65% to 97% in Maharashtra districts (Summary data sheet F5).

Husbands, boyfriends and live-in partners were the regular non-paying male sexual partners. The proportion of FSWs who reported having such partners was low in Maharashtra districts (24% to 55%) and highest in Andhra Pradesh (70% to 82%). The corresponding percentage ranged from 48% to 71% in Karnataka and 64% to 83% in Tamil Nadu. In Dimapur, 89% of the FSWs reported having non-paying regular male sexual partners (Summary data sheet F6).

4.12.1 Last time condom use: Condom use with occasional clients, regular clients and regular non-paying sexual partners of FSWs was assessed. Last time condom use was the reported use of a condom with any type of partner during the last sex act. Last time condom use with occasional clients was above 90% in Karnataka (except Shimoga - 76%), above 80%

in Andhra Pradesh and Tamil Nadu districts, and between 76% and 99% in Maharashtra. Only 36% of the respondents in Dimapur reported that they used condoms during their last sex act with occasional clients. Last time condom use with regular clients was highest in Maharashtra districts (81% to 99%); and it varied between 68% and 88% in Karnataka; between 64% and 94% in Andhra Pradesh; and between 85% and 97% in Tamil Nadu. The lowest was in Dimapur (26%) (Figs. 4.1 to 4.4; Summary data sheet F5)

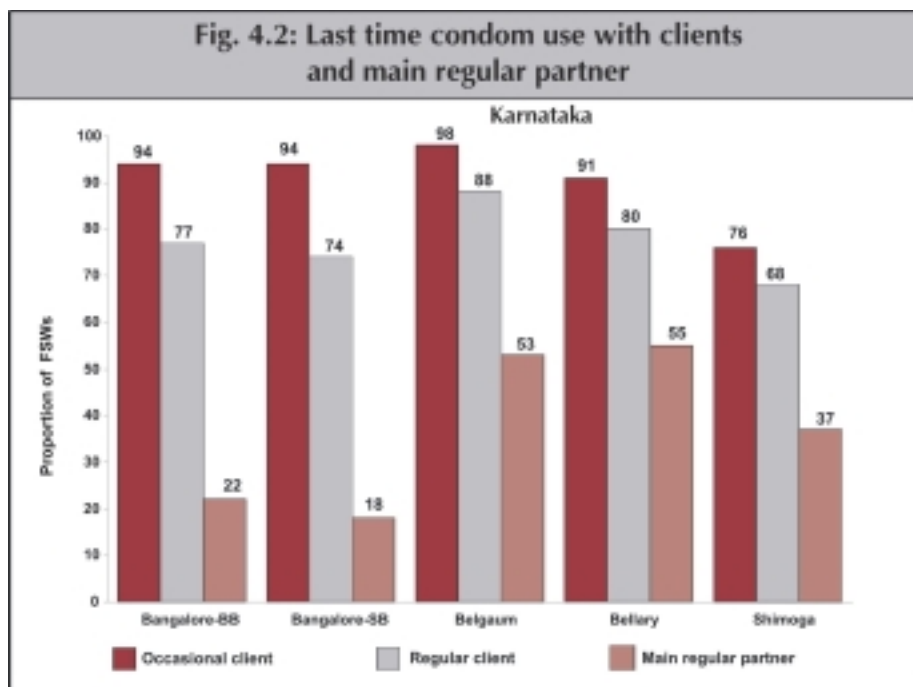
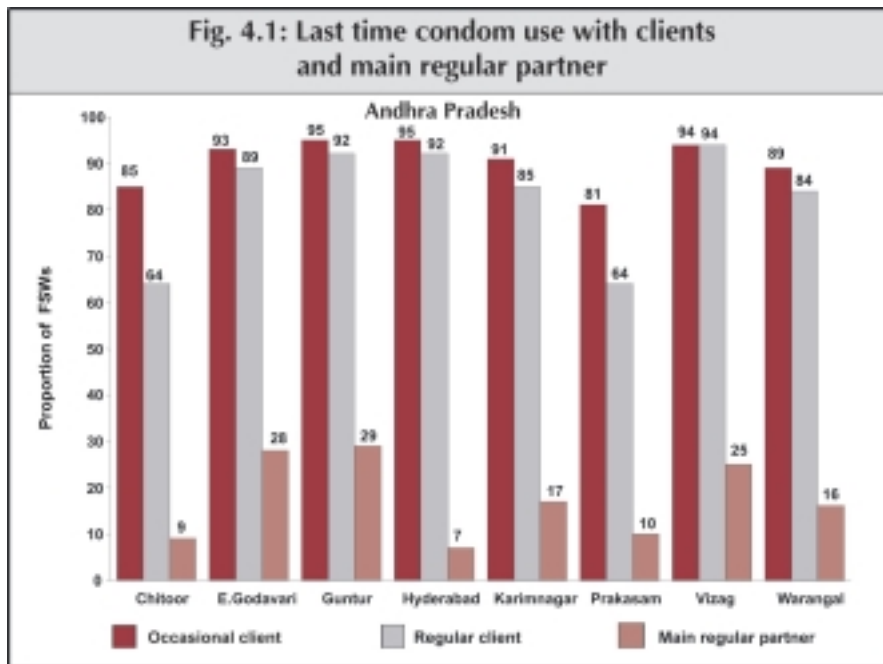


Fig. 4.3: Last time condom use with clients and main regular partner

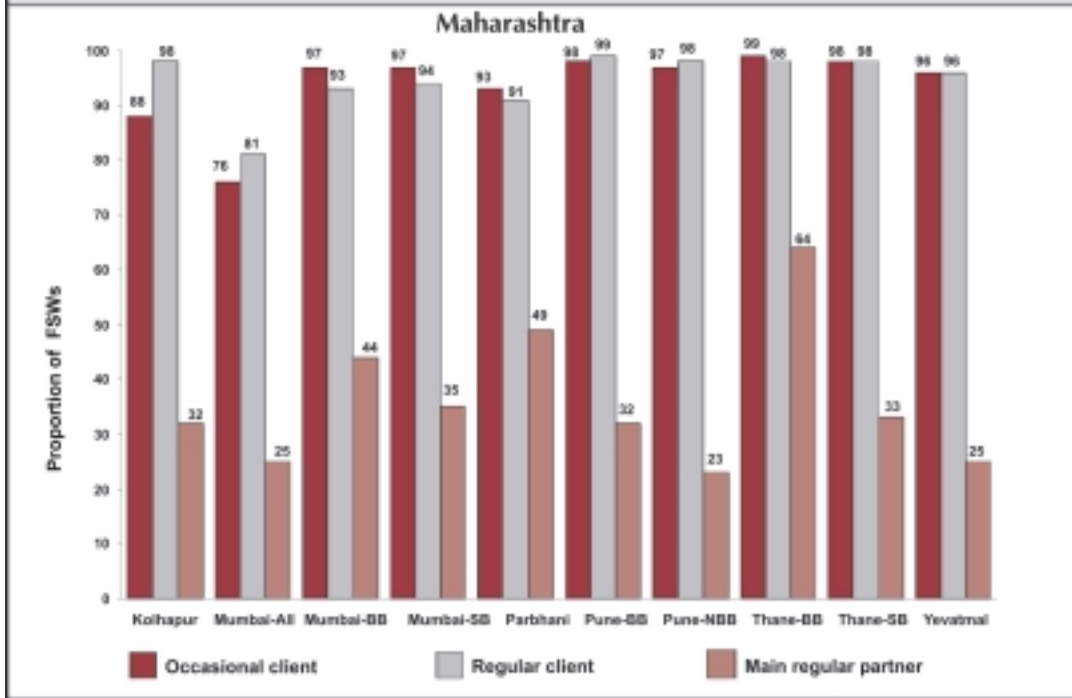
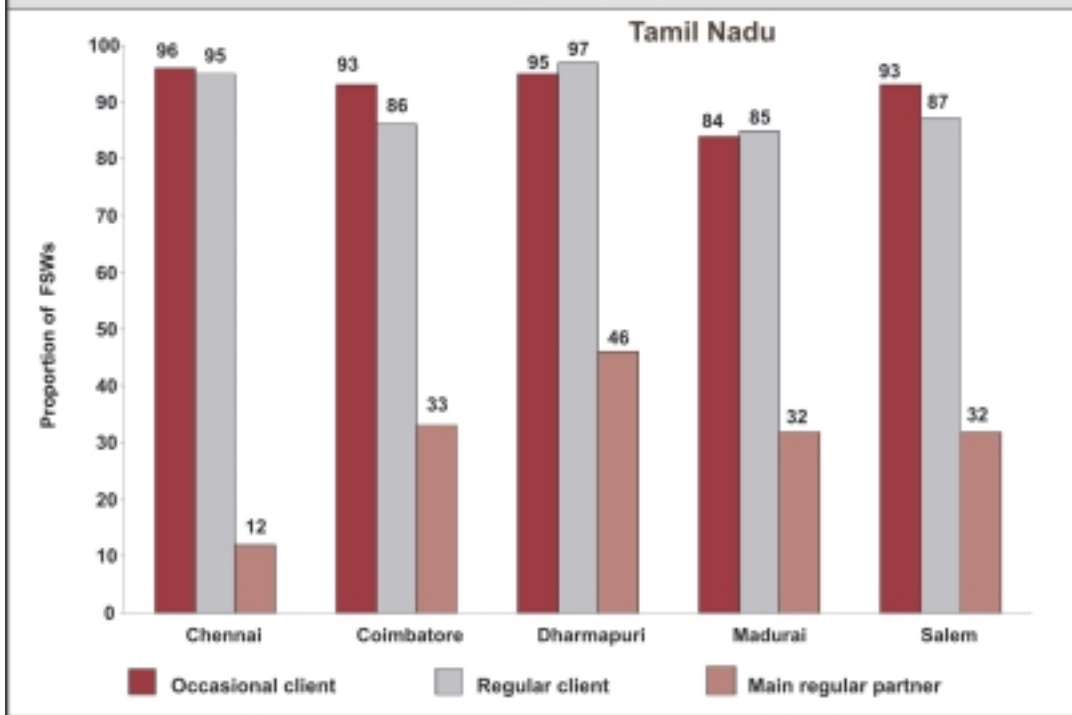


Fig. 4.4: Last time condom use with clients and main regular partner



4.12.2 Consistent Condom Use:

Consistent condom use was defined as use of a condom at each sex act (every time) with different type of partners. Consistent condom use varied very widely among the districts; it was only 11% with *occasional* clients and 5% with *regular* clients in Dimapur. In Andhra Pradesh, consistent condom use was low in Chittoor and Prakasam districts for both types of clients and non-paying partners. In other districts more than 55% of the FSWs reported

consistent condom use with clients. In Karnataka, more than 80% reported using condoms consistently with occasional clients except Shimoga (55%). Mumbai (street-based) FSWs reported low consistent condom use (56%) with regular clients among all districts of Maharashtra; most of the other districts reported more than 75% with both types of clients. FSWs from Coimbatore reported only 40% consistent condom use with clients. However, the corresponding proportion was above 60% in the other districts of Tamil Nadu (Figs. 4.5 to 4.9; Summary data sheet F5).

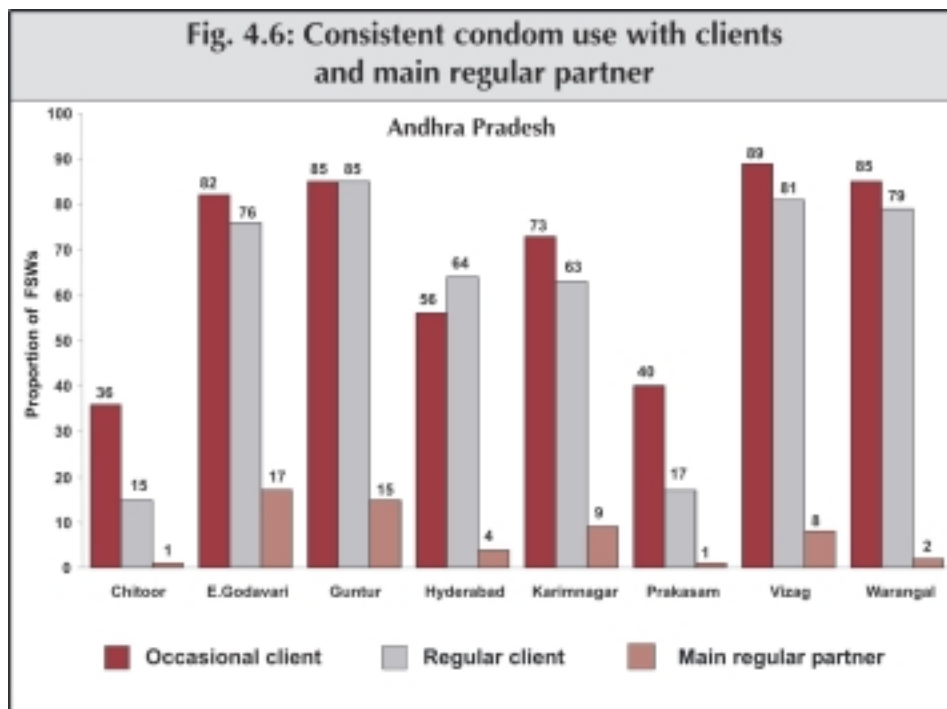
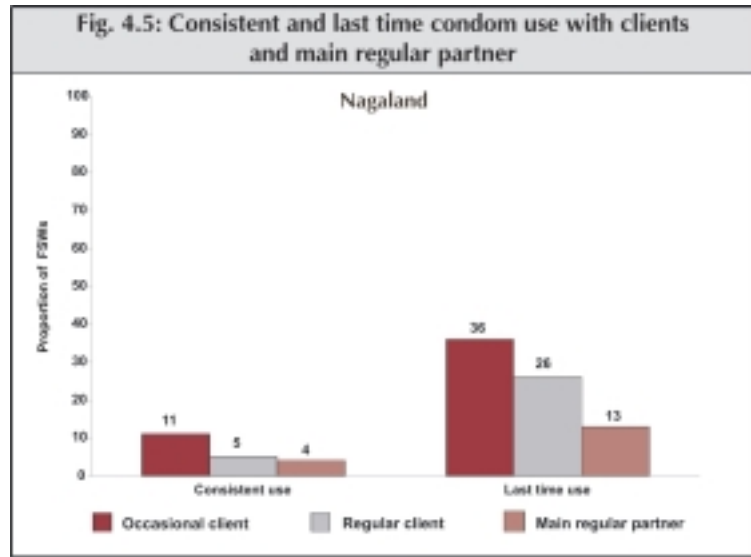


Fig. 4.7: Consistent condom use with clients and main regular partner

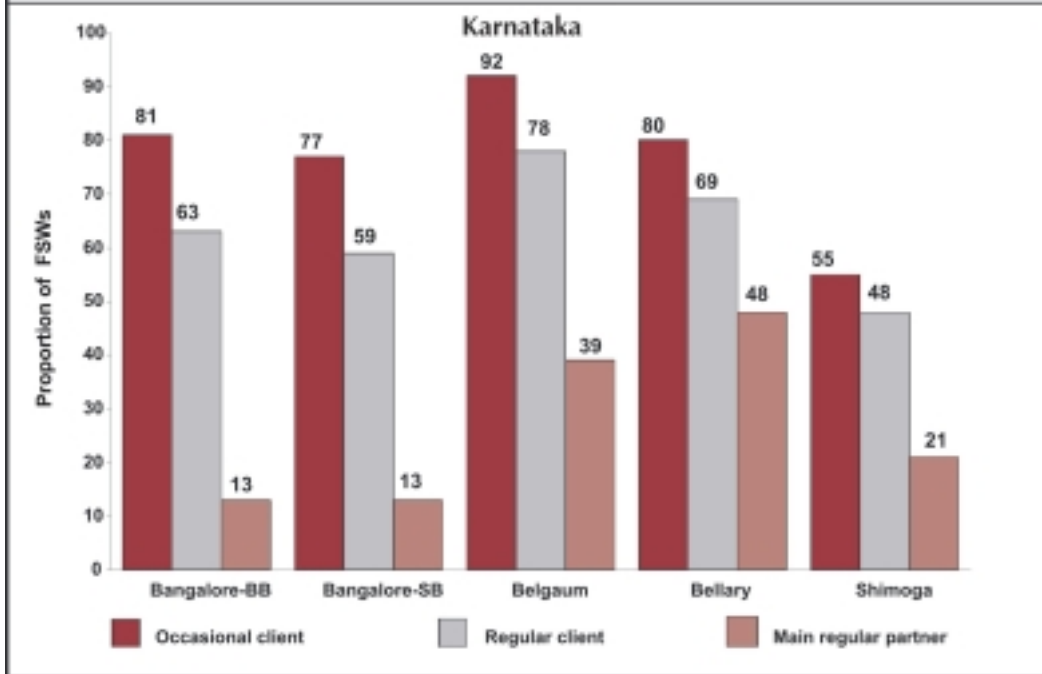
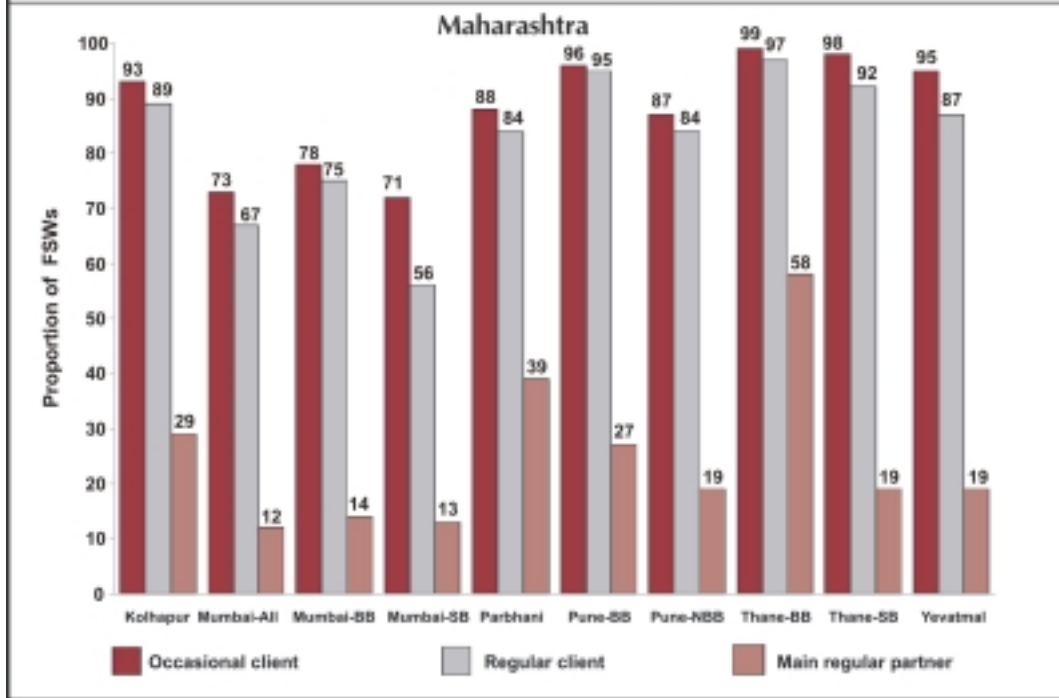
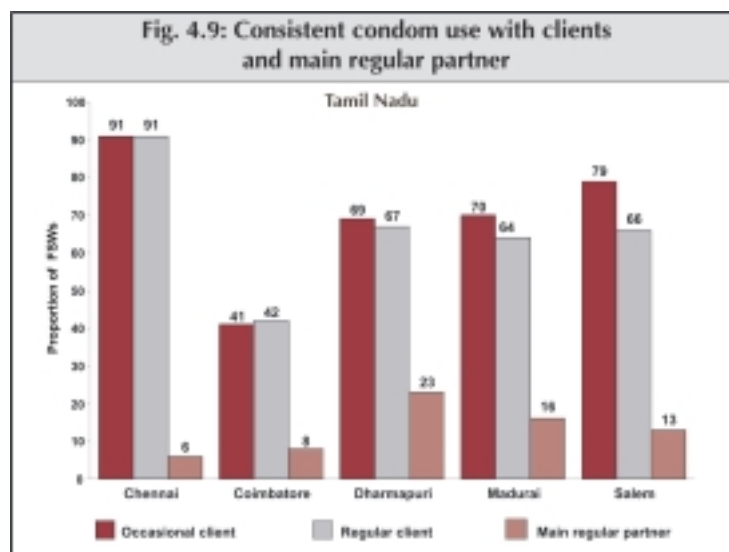


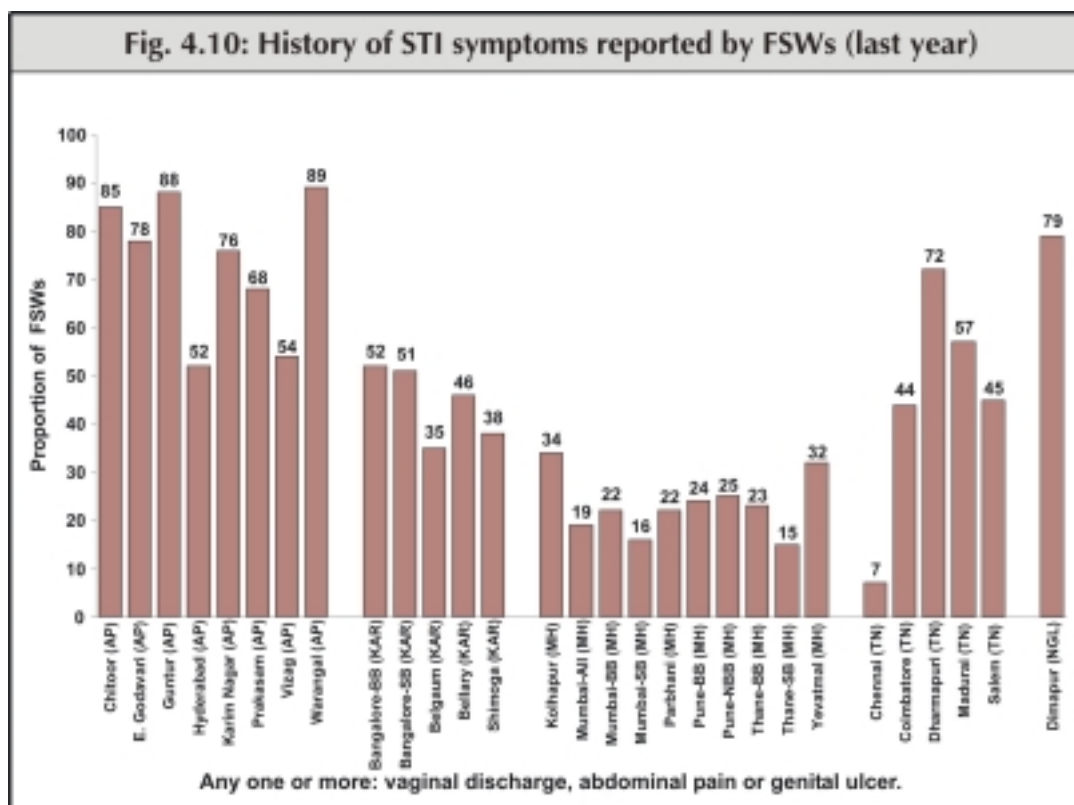
Fig. 4.8: Consistent condom use with clients and main regular partner



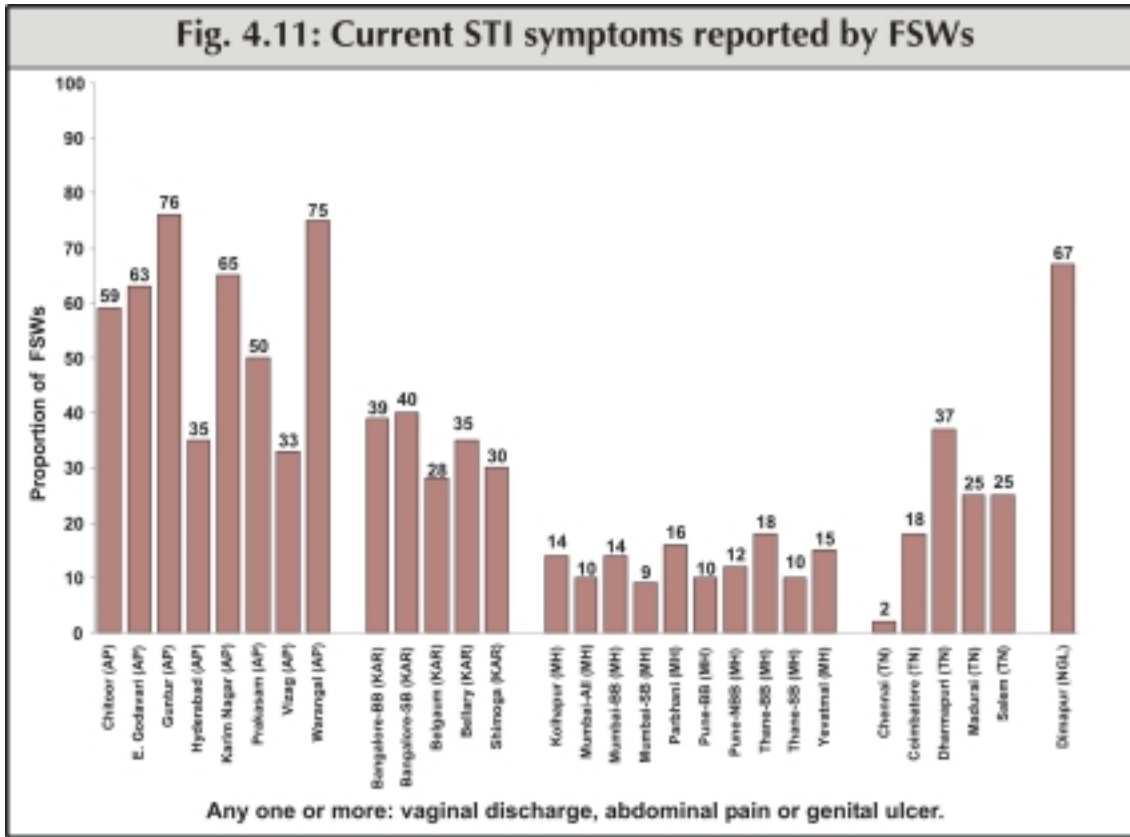


4.13 STIs/HIV

4.13.1 Proportion reporting STI symptoms: A high proportion of FSWs from Andhra Pradesh (52% to 89%) reported that they had at least one of the three STI symptoms at least once, viz., vaginal discharge, lower abdominal pain or ulcer during the last year. A significantly lower proportion of the FSWs in Maharashtra districts (15% to 34%) reported that they had any one of the above symptoms.

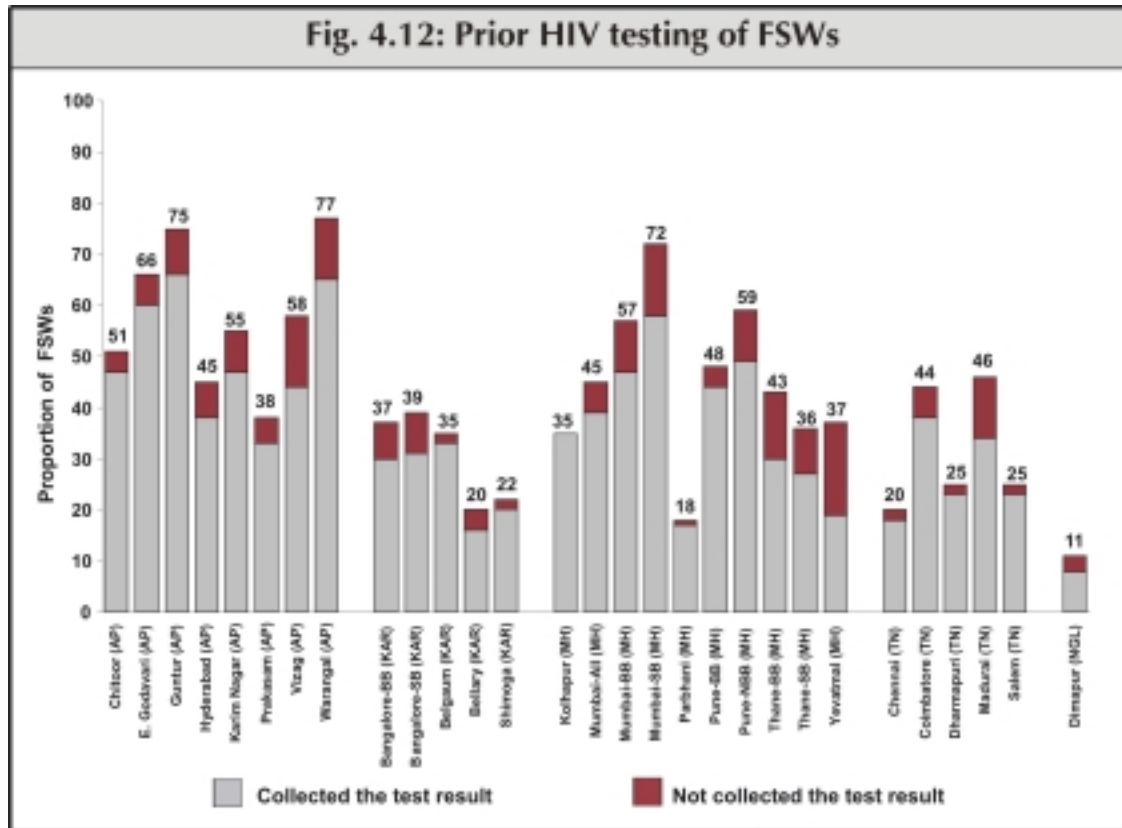


This proportion ranged between 35% to 52% in Karnataka districts (Figs. 4.10 and 4.11; Summary data sheet F3). Reported current genital ulcer/sore by the FSWs was 2% to 12% in Andhra Pradesh districts, 1% to 4% in Maharashtra districts, 0.4% to 4% in Tamil Nadu and 5% in Dimapur.



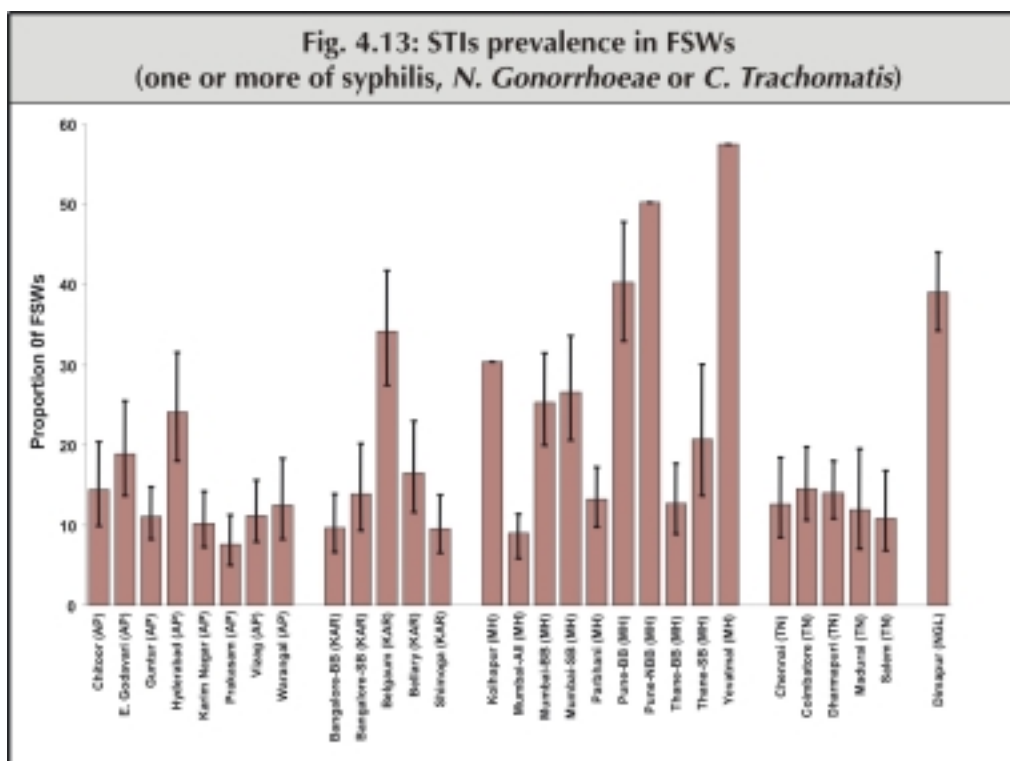
4.13.2 Treatment Seeking for Most Recent STI Symptom: Above 75% of the FSWs in all districts of Andhra Pradesh, Karnataka and Tamil Nadu opted for trained care (Avahan, other NGO, Government or private doctors/clinics) for the treatment of STIs except in Chennai (66%). However in Maharashtra it ranged between 54% (Thane-SB) and 89% (Mumbai-All) (Summary data sheet F3).

4.13.3 Proportion ever tested for HIV: More FSWs in Andhra Pradesh and Maharashtra districts, ranging from 18% to 77%, reported having ever undergone an HIV test. It ranged between 20% and 39% in Karnataka districts and 20% to 46% in Tamil Nadu. In Dimapur it was only 11% (Fig. 4.12; Summary data sheet F4).



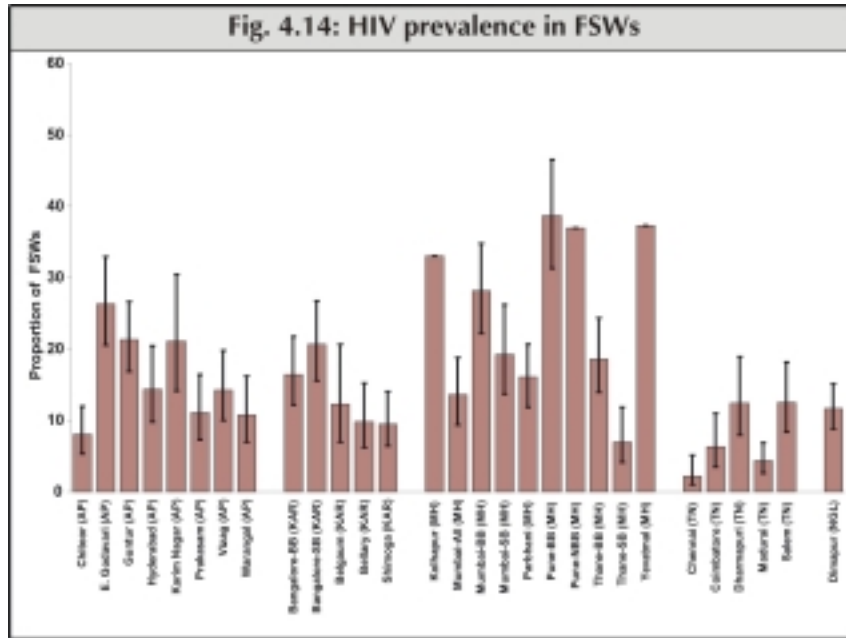
4.14 STIs/HIV Prevalence

4.14.1 Prevalence of STI: Having ‘any STI’ was defined as testing positive for any one or more of the following: reactive syphilis serology [rapid plasma reagin (RPR) positive (any titre) and *treponema pallidum hemagglutination assay* (TPHA) positive], positive *N. gonorrhoeae* or *C. trachomatis* NAT test. The STI prevalence among FSWs in Andhra Pradesh districts ranged from a low of 7.6% in Prakasam to a high of 24.1% in Hyderabad. The prevalence ranged from 9.5% to 20.6% in Karnataka. The prevalence of STIs in Maharashtra was the highest. Pune (brothel-based and non brothel-based) and Yavatmal had more than 40% STI prevalence. Thane (brothel-based) FSWs had the lowest prevalence of 12.7%. In Tamil Nadu districts, the prevalence was similar and ranged from 10.8% to 14.5%. The prevalence was 39.1% in Dimapur. Among the three types of STIs, syphilis was the predominant STI in all the districts except Shimoga and Thane (street-based) (Fig. 4.13). Positivity for *N. gonorrhoeae* or *C. trachomatis* NAT test was generally on the lower side ranging from 0.2% to 14.2% (Summary data sheet F7).



4.14.2 HSV-2 Antibody Prevalence: For each district, an HSV-2 antibody test was performed on a random sample of 10% of stored serum specimens. The prevalence of HSV-2 antibody ranged from 55.7% to 87.4% in Andhra Pradesh districts. In Maharashtra, it was 34% to 52% in the districts of Thane (brothel and street based), Parbhani and Mumbai-All. In other districts of Maharashtra it was more than 75%. In Tamil Nadu, the highest sero-prevalence was in Dharmapuri (72.1%) and in other districts it varied between 34.6% and 62.9%. In Karnataka districts, it varied between 58.4% and 80.5%. The HSV-2 sero-prevalence in Dimapur was 52.6% (Summary data sheet F7).

4.14.3 HIV Prevalence: In Andhra Pradesh, FSWs in Chittoor district had the lowest HIV prevalence (8.0%). Prevalence of HIV in FSWs in Warangal, Prakasam, Visakhapatnam, and Hyderabad was similar, ranging from 10.8% to 14.3%. FSWs in Karim Nagar and Guntur had a prevalence of more than 20.0%; and East Godavari had the highest prevalence of 26.3%. In Karnataka, prevalence of HIV was highest in Belgaum (34.2%). It ranged from 9.5% to 16.5% in the other districts of Karnataka. Majority of the districts in Maharashtra had high prevalence of HIV among FSWs. In Kolhapur, Pune (non brothel-based and brothel-based), and Yevatmal the HIV prevalence ranged from 33.0% to 38.7%. Thane (street-based) had the lowest prevalence of 7.0%. Among all the IBBA districts, Chennai (Tamil Nadu) had the lowest prevalence (2.2%). Other districts of Tamil Nadu had HIV prevalence ranging from 4.3% to 12.5% among the FSWs. HIV prevalence was 11.6% in Dimapur (Fig. 4.14; Summary data sheet F7).



4.15 IBBA Mysore: The IBBA among FSWs at Mysore in Karnataka was the first study before IBBA was implemented for the other districts of Karnataka. The survey was carried out during November 2005 to July 2006 in Mysore. Clusters were formed after estimating the number of FSWs and by applying capture and recapture method for selection of respondents. IBBA procedures and questionnaires were finalized after gaining experience in Mysore. For want of uniformity in the method, we have not included data from Mysore in various tables and figures. However, the data is important and is briefly reviewed below:

In all, 429 of the eligible FSWs consented to participate in the survey, and of them, 427 completed the behavioural interview and gave both blood and urine samples. The completion rate was 99.5%. The mean age of the FSWs was 30 years and only one fourth of the FSWs could read and write. Majority of the FSWs in Mysore (95%) were ever married. Mean age at started selling sex was 26 years. All the FSWs interviewed were street-based.

Reported mean number of clients on a typical day was 2.5 and this average was 8 during a typical week. In Mysore, 93% of the FSWs had occasional clients and 90% had regular clients. Usage of condom during the last sex act was 65% and 52%, respectively. One fifth of the FSWs were using condom consistently every time with both types of clients. More than two thirds of the FSWs (68%) had regular non-commercial sexual partners and the consistent condom usage among them was very low (1%).

Nearly one third of the FSWs reported that they were suffering from STI symptoms at the time of interview and only one-fifth of the FSWs had ever undergone HIV testing.

Proportion positive for Syphilis was 24.8% and 5.4% of the FSWs tested positive for *N. gonorrhoeae* and 10.8% for *C. trachomatis* test. Positives for any one or more of the STIs were 33.7%. Prevalence of HIV in FSWs of Mysore was 26% and 32.6% were HIV positive among “any STI” positive.

CHAPTER 5:

MEN WHO HAVE SEX WITH MEN (MSM) AND HIJRA (TRANSGENDER)

5.1 Introduction: Men who have sex with men (MSM) are yet another important ‘high-risk’ community critical to HIV prevention efforts covered under Avahan. The first round of the IBBA in MSM was undertaken in four districts each of Andhra Pradesh (East Godavari, Guntur, Hyderabad and Vizag) and Tamil Nadu (Chennai, Coimbatore, Madurai and Salem); Bangalore (urban) in Karnataka; Mumbai-Thane and Pune districts in Maharashtra.

The survey was carried out between April and June 2006 in Andhra Pradesh; July and August 2006 in Bangalore (Karnataka) October 2006 and April 2007 in Maharashtra; and March and September 2006 in Tamil Nadu. The survey covered MSM and Hijra communities as ‘combined’ groups in the districts of Andhra Pradesh, Karnataka and in Pune district of Maharashtra. The group covered at Mumbai-Thane (combined) was exclusively of MSM category. In Tamil Nadu, the groups surveyed comprised of both MSM and Male Sex Workers (MSWs). Hijras were covered as a separate group in Tamil Nadu and hence reported separately.

5.2 Mapping: Two-stage cluster sampling design was adopted for all districts. Fixed-location and time-location clusters were the primary sampling units in East Godavari district. In all other districts, only time-location clusters were considered. To develop the sampling frames, the existing mapping information available from different sources e.g. Avahan implementing partners and SACS was updated through a rapid field exercise. All the new clusters found out during the exercise were included in the sampling frames.

5.3 Participation Rates: A total of 2,421 respondents were approached in Andhra Pradesh; 554 in Bangalore (urban); 862 in Maharashtra and 2,206 in Tamil Nadu. Of them, 1,621 each from Andhra Pradesh and Tamil Nadu completed the survey (i.e., both behavioural questionnaire and biological samples); 303 from Bangalore (urban); and 653 from Maharashtra completed the survey. Recruitment of MSM for the survey was predominantly from public places (Fig. 5.1). The participation rate in Andhra Pradesh ranged from 53% to 78%. In Maharashtra it was 73% and 80% and 55% in Karnataka (Bangalore). The participation rates ranged from 64% to 91% in Tamil Nadu (Table 5.1).

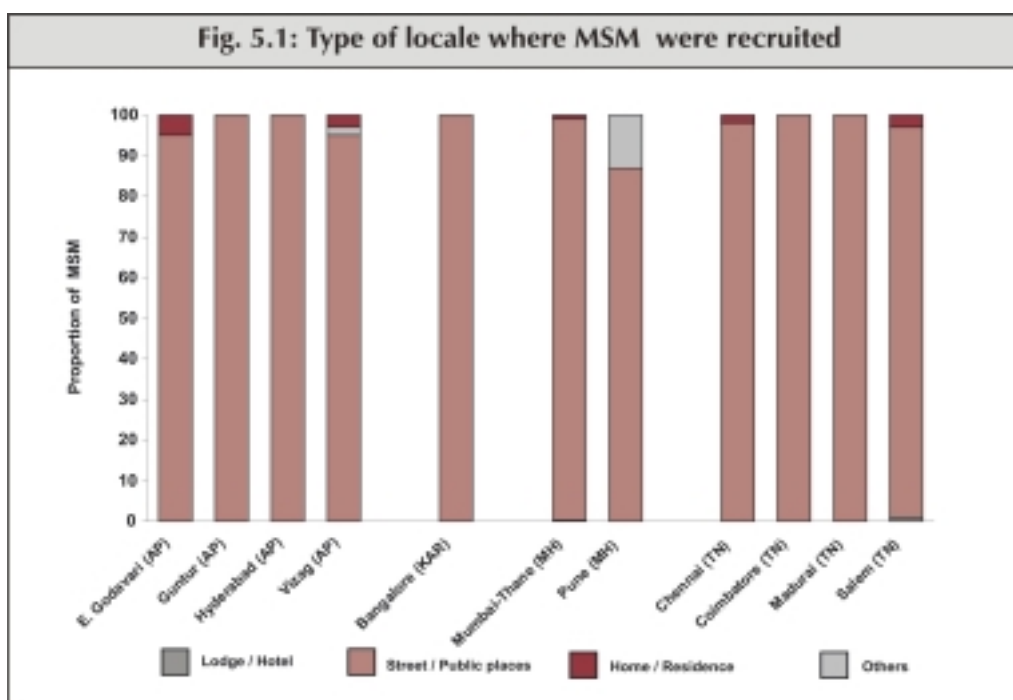


Table 5.1: Participation Rates by District of MSM

State & District	Number approached	Completed questionnaire and biological specimen collection	Participation Rate (%)
Andhra Pradesh			
East Godavari	560	405	72
Guntur	523	407	78
Hyderabad	767	403	53
Visakhapatnam	571	406	71
Karnataka			
Bangalore	554	303	55
Maharashtra			
Mumbai-Thane	546	400	73
Pune	316	253	80
Tamil Nadu			
Chennai	630	406	64
Coimbatore	599	410	68
Madurai	441	402	91
Salem	536	403	75

5.4 Extent of Avahan Coverage: Almost all the geographical areas and associated intended target populations of East Godavari and Coimbatore in Andhra Pradesh, and Madurai and Salem in Tamil Nadu were covered by Avahan interventions only and the program was under operation for more than one year.

Services received from “any agency” were assessed based on four indicators, namely, ‘Contacted by Peer/Out reach worker (ORW) [in the last month]’, ‘visited the NGO clinic [in the last 3 months]’, ‘received condom from peer/ORW [in the last year]’, and ‘received information on STI [last year]’. In Andhra Pradesh districts, the reported proportion of MSM receiving any one of these services ranged from 4% to 95% (Table 5.2). The corresponding proportion for Maharashtra was 6% to 60% and 55% to 78% for Tamil Nadu districts. The reported proportion receiving services ranged from 48% to 67% in Karnataka (Bangalore) (Summary data sheet M2).

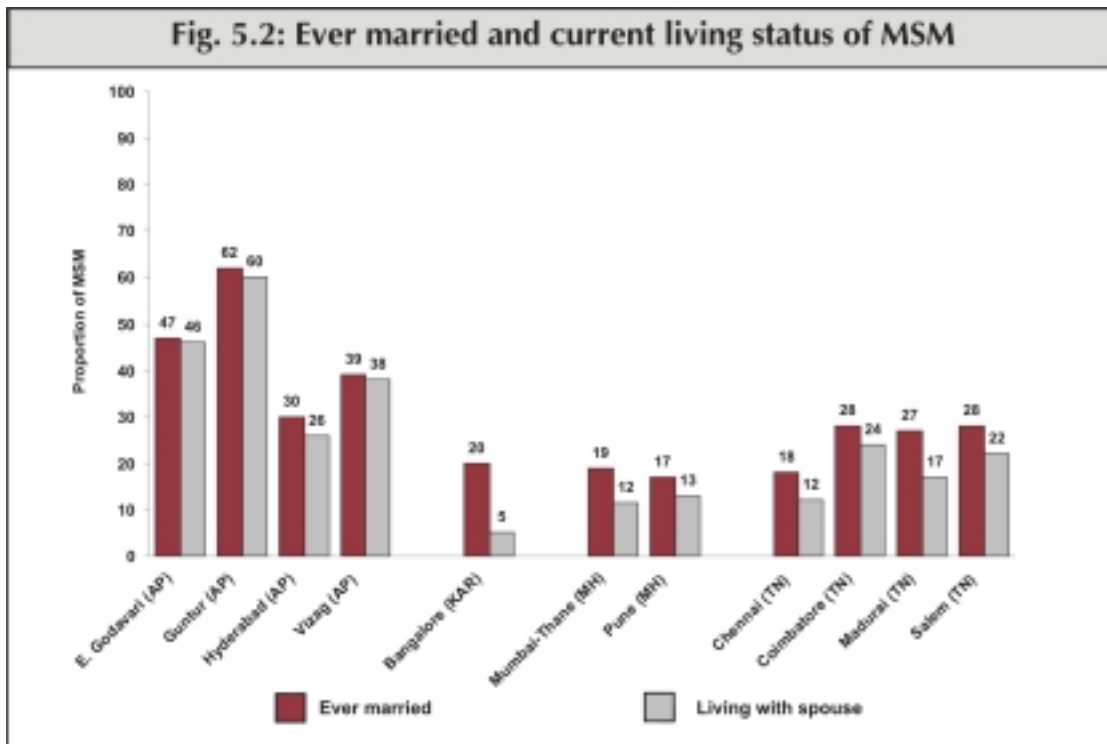
Table 5.2: Services Received by MSM from Any Agency

State & District	Intended Avahan Coverage	Number of respondents	Contacted by a Peer / ORW last month (%)	Visited an NGO Clinic last 3 month (%)	Received Condom from Peer / ORW (%)	Received information on STI from Peer/ ORW (%)
Andhra Pradesh						
East Godavari	100%	405	77	48	76	76
Guntur	21%	407	10	4	10	9
Hyderabad	0%	403	52	22	52	45
Visakhapatnam	17%	406	95	35	93	93
Karnataka						
Bangalore	90%	303	ND	ND	67	67
Maharashtra						
Mumbai-Thane	50%	400	57	22	67	59
Pune	100%	253	40	6	47	40
Tamil Nadu						
Chennai	33%	406	58	55	59	59
Coimbatore	100%	410	78	74	76	77
Madurai	100%	402	62	58	61	63
Salem	100%	403	60	61	63	64

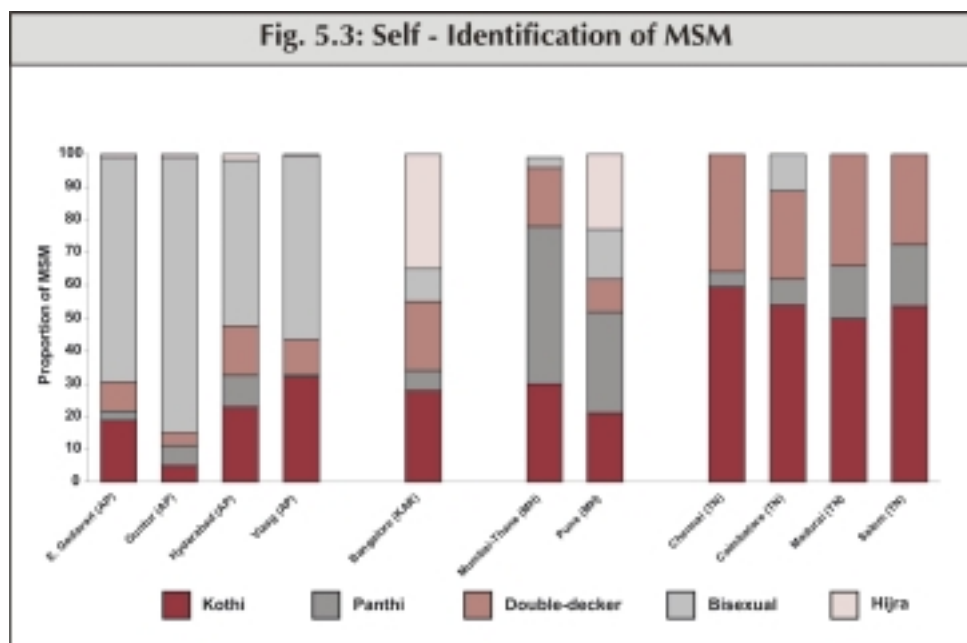
5.5 Demographic Profile: The key demographic information considered for this report included age, literacy, marital status, and current living status. The mean age of the respondents was broadly similar across all surveyed populations and ranged from 24 to 30 years (Table 5.3). The proportion of MSM who could read and write was high in all the IBBA districts (58% to 91%). The proportion reported as ever married in Andhra Pradesh varied from 30% to 62% (Fig. 5.2); the proportion in the two Maharashtra districts was 17% and 19% and 20% in Bangalore. In Tamil Nadu, the proportion varied from 18% to 28% (Table 5.3; Summary data sheet M1).

Table 5.3: Demographic Profile of participating MSM by District

State & District	Number of Respondents	Mean Age (Years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Circumcised (%)	Practiced sex at places traveled (%)
Andhra Pradesh							
East Godavari	405	30	74	47	46	4	60
Guntur	407	27	58	62	62	20	70
Hyderabad	403	28	76	30	29	19	53
Visakhapatnam	406	26	82	39	38	1	90
Karnataka							
Bangalore	303	27	79	20	ND	11	17
Maharashtra							
Mumbai-Thane	400	24	89	19	18	33	24
Pune	253	25	91	17	15	21	21
Tamil Nadu							
Chennai	406	27	84	18	15	11	43
Coimbatore	410	29	86	28	26	7	42
Madurai	402	29	80	27	17	7	48
Salem	403	29	62	28	24	7	48

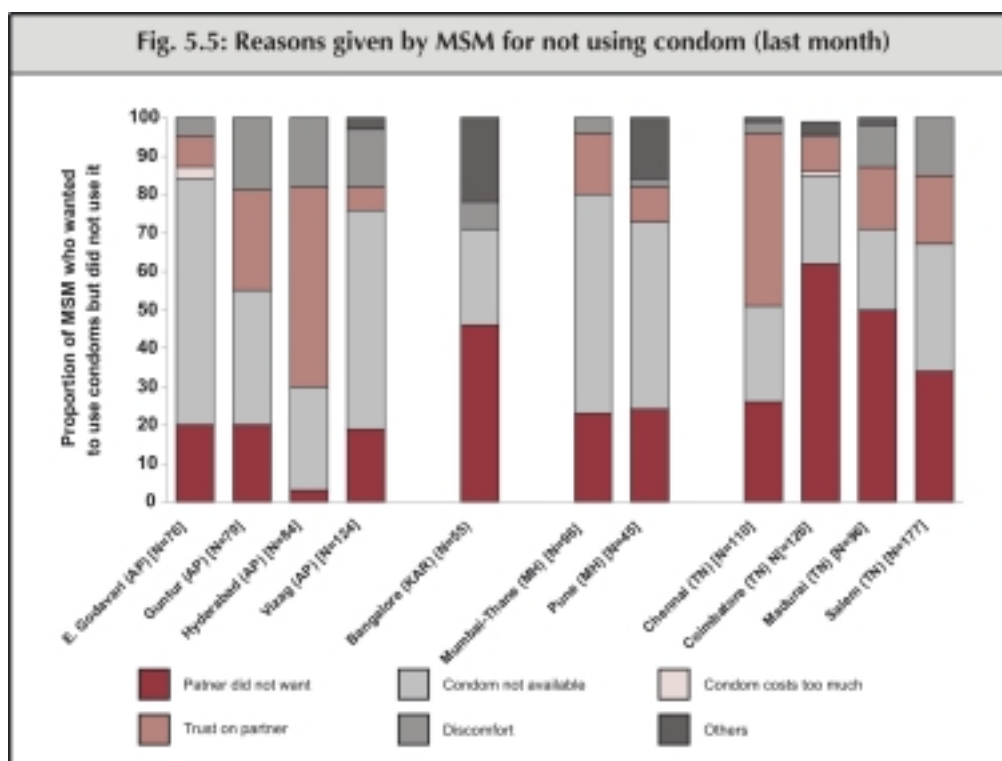
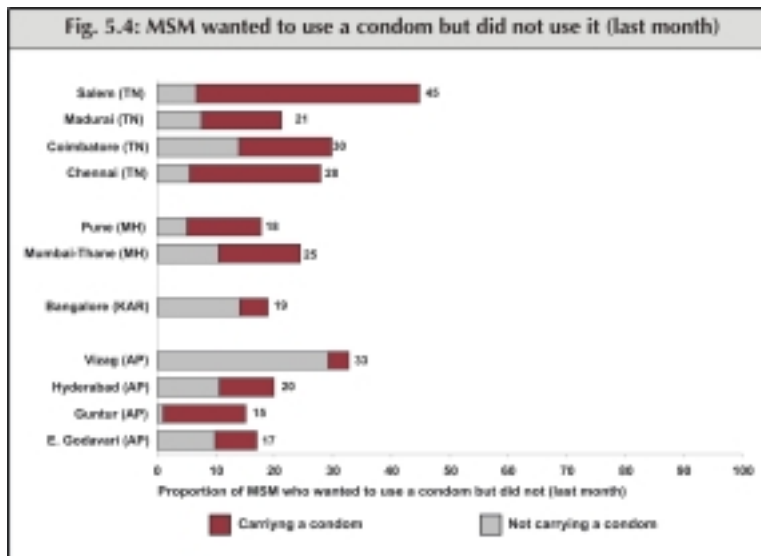


5.6 Self-Identification/Typology: Majority of the MSM surveyed identified themselves as bisexual in all districts of Andhra Pradesh and as Kothi in all districts of Tamil Nadu. The groups surveyed in Karnataka (Bangalore) and two districts of Maharashtra were of mixed category. Only 1% to 2% respondents were identified as Hijras across the four districts of Andhra Pradesh; 23% in Pune and 35% in Bangalore (Fig. 5.3).



5.7 Migration: A higher proportion of MSM (53% to 90%) of Andhra Pradesh had reported that they engaged in commercial or casual sex at places traveled during the past one year. This proportion ranged from 42% to 48% in Tamil Nadu; 21% and 24% in Maharashtra and 17% at Bangalore (Karnataka) (Table 5.3).

5.8 Condom use: In Andhra Pradesh, 15% to 33% of the respondents wanted to use a condom (last month) but did not use it. This percentage was 19 and 18 at Bangalore and Pune respectively. This percentage varied from 21% to 45% in Tamil Nadu. The reasons for not using a condom predominantly were condom not available in Andhra Pradesh and Maharashtra; partner did not want in case of Bangalore and either partner did not want or condom was not available in case of Tamil Nadu districts (Figs. 5.4 & 5.5).



5.9 STI Knowledge: STI knowledge was assessed based on the ability of the respondent to correctly identify at least three of the seven most common symptoms associated with STIs including: genital or anal ulcer/sore, discharge from rectum, pain during defecation, burning pain on urination, urethral discharge, swelling in groin area, and cannot retract foreskin.

More than 80% of the MSM had heard of STIs in Andhra Pradesh and Maharashtra; 47% in Bangalore and 74% to 92% in Tamil Nadu. In Andhra Pradesh districts, among the MSM who had heard of STIs, about 70% could correctly identify at least three most common STI symptoms in all districts, except in the district of Guntur (59%). This proportion varied from 49% to 81% in Tamil Nadu districts. It was low in Pune (38%) and Bangalore (30%) (Summary data sheet M3).

5.10 HIV/AIDS Awareness, Knowledge & Risk Perception: More than 90% of the respondents reported that they had heard of HIV/AIDS except in Bangalore (67%). Among those who had ever heard of HIV/AIDS, more than 85% had the knowledge that 'HIV can be prevented' in all districts except Mumbai-Thane (70%). Perception of being 'at-risk' ranged from 63% to 99% in Andhra Pradesh districts; 70% in Pune; 90% in Mumbai-Thane; and 80% to 95% in Tamil Nadu districts. It was very low in Bangalore (16%).

Knowledge on HIV spread was assessed based on the responses to a set of six questions. Respondents giving correct answers to all these questions were considered as having the correct knowledge. Only 1% to 4% had the correct knowledge in Andhra Pradesh districts; 12% in Bangalore; 18% in Pune; 16% in Mumbai-Thane; and from 4% to 20% in Tamil Nadu. Misconception about HIV/AIDS varied widely in Andhra Pradesh districts (23% to 54%); and Tamil Nadu (24% to 69%). It was 37% in Pune; 20% in Mumbai-Thane and only 11% in Bangalore (Summary data sheet M4).

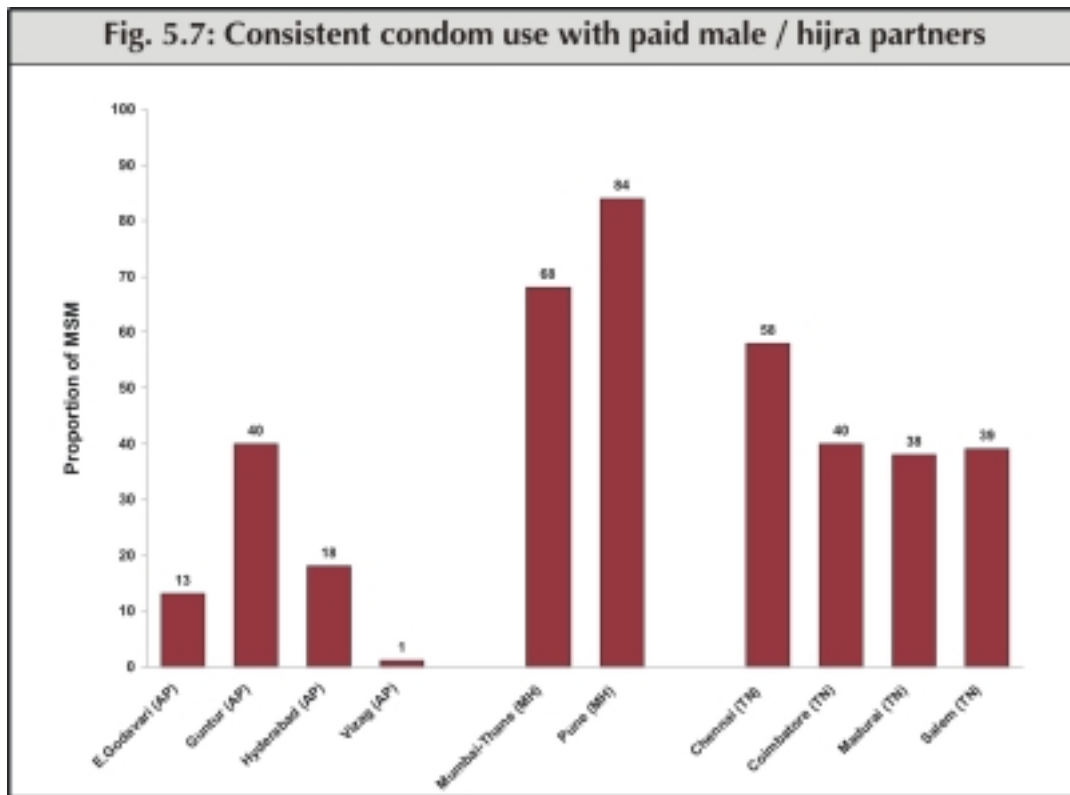
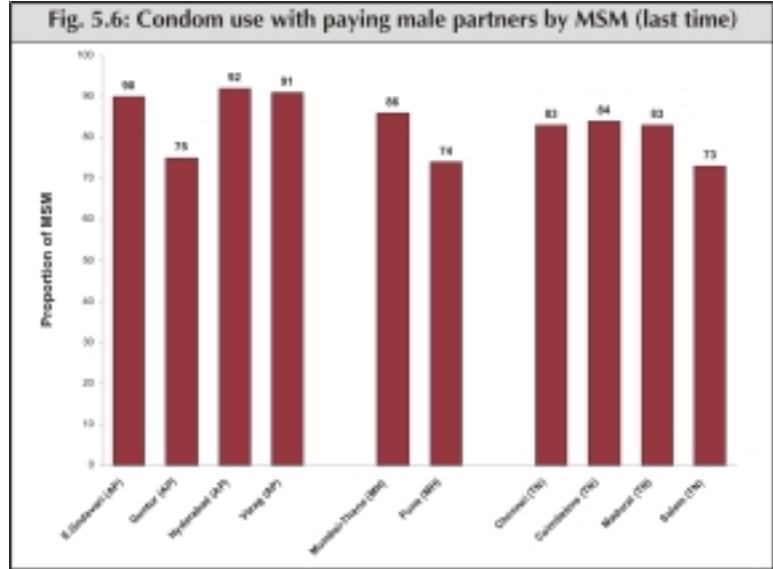
5.11 Regular Partners: Data on the gender of the main regular partner and condom use for anal sex were elicited. More than 65% and 74% of the MSM in the Andhra Pradesh and Tamil Nadu districts reported that they had main regular partner. For more than half of them in Andhra Pradesh, the regular partner was a male except in Guntur district (only 22%). In Tamil Nadu, more than 90% had a male as their regular partner. Every time condom use for anal sex varied between 2% to 22% in Andhra Pradesh; 41% in Pune; 49% in Mumbai-Thane; and 25% to 41% in Tamil Nadu (Summary data sheet M5).

5.12 Paying Male Partners: Male partners who paid the respondent to have sex with him were labeled as paying male partners. In Visakhapatnam, 90% of the respondents had paying male partners. Paying male partners ranged from 26% to 36% in the other districts of Andhra Pradesh; and around 60% in Pune; 26% in Mumbai-Thane; 49% to 62% in the districts of Tamil

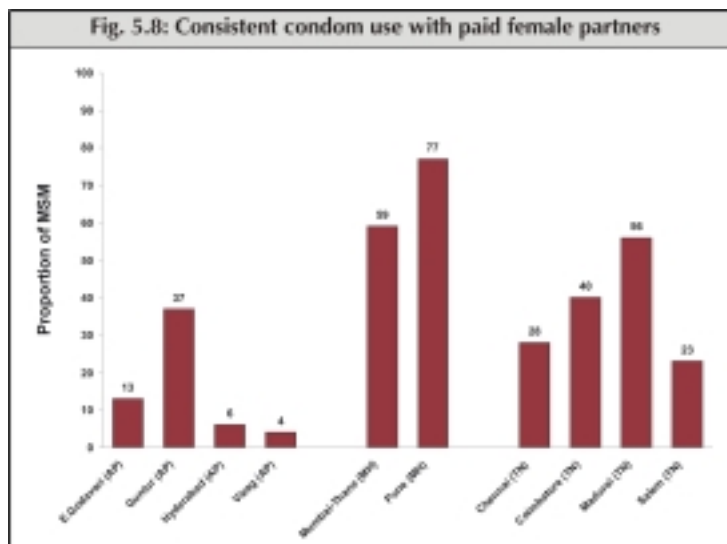
Nadu. Condom use (last time) was reported more than 70% among paying male partners in all the districts (Fig. 5.6; Summary data sheet M5).

5.13 Paid Male/Hijra Partners:

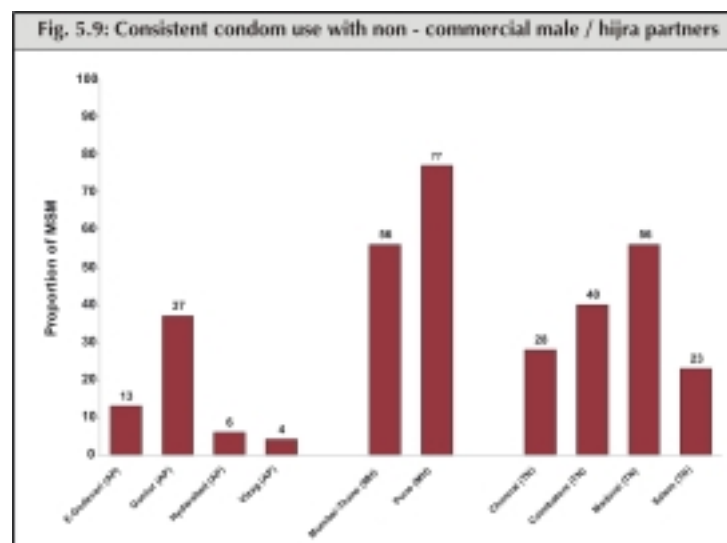
Male/Hijra sexual partners to whom the respondent paid to have sex were labeled as paid male/hijra partners. In Andhra Pradesh, 31% to 48% of the respondents had paid male/hijra partners. Reported every time condom use among them was 1% in Visakhapatnam and varied from 13% to 40% in other districts of Andhra Pradesh. 49% in Pune and 25% MSM/hijras in Mumbai-Thane had paid male/hijra partners and reported every time condom use among them was high in Pune (84%). A relatively smaller proportion (12% to 22%) of MSM reported to have paid male partners from all districts of Tamil Nadu (Fig. 5.7; Summary data sheet M6).



5.14 Paid Female Partners: Only 6% to 19% of the MSM in Tamil Nadu had paid female partners. Having paid female partners was higher in the districts of Andhra Pradesh (28% to 64%). In Pune, 24% of the respondents reported as having paid female partners. Among those with paid female partners, reported consistent condom use was highest in Pune (77%); 23% to 56% in Tamil Nadu; and 4% to 37% in Andhra Pradesh. (Fig. 5.8; Summary data sheet M6).

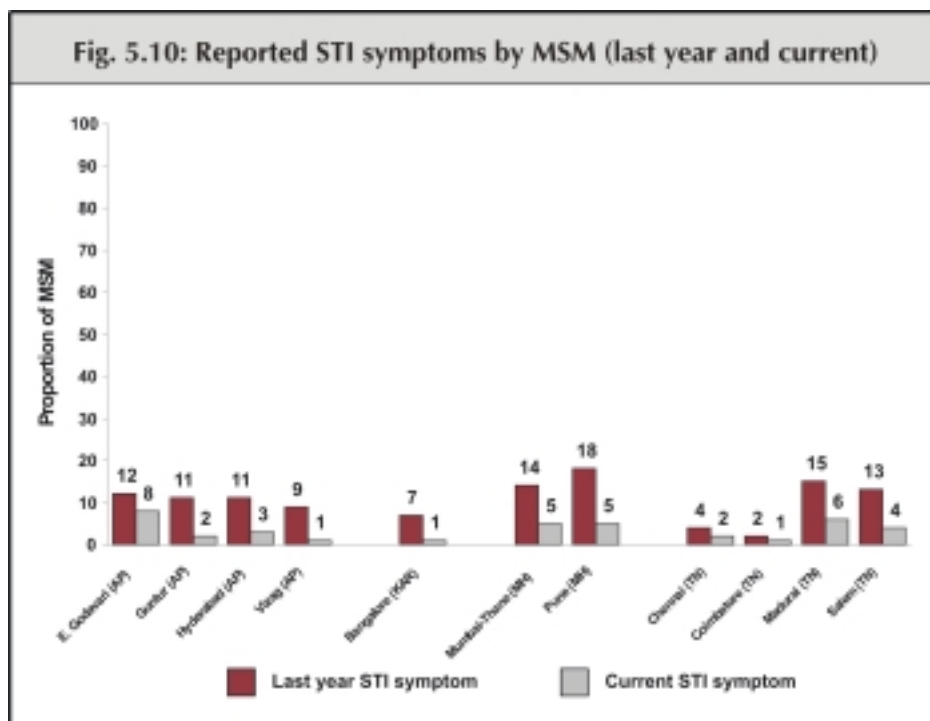


5.15 Non-commercial Male/Hijra Partners: About 90% of the MSM in Andhra Pradesh reported having non-commercial male/hijra partners. Reported every time condom use was 1% in Visakhapatnam and ranged from 7% to 32% in the other Andhra Pradesh districts. The proportion of MSM who reported having non-commercial male partners ranged from 34% to 70% in Tamil Nadu. Every time condom usage among them ranged from 22% to 40%. Reported every time condom use with non-commercial male/hijra partners was high in Pune (79%) (Fig. 5.9; Summary data sheet M7).



5.16 STIs/HIV

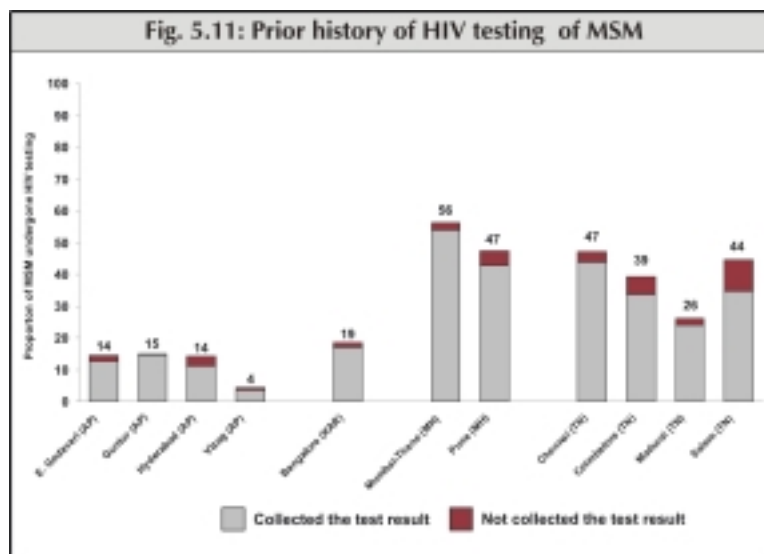
5.16.1 Proportion Reporting STI Symptoms: The proportion of MSM reporting any common STI symptom was low in all the districts. It ranged from 9% to 12% in Andhra Pradesh; 2% to 15% in Tamil Nadu; 7% in Bangalore and highest was in Pune (18%) (Summary data sheet M3) (Fig.5.10). Reported current genital ulcer/sore was 1% to 4% in Andhra Pradesh; 2% in Pune; 12% in Mumbai-Thane; and 0% to 2% in Tamil Nadu.



5.16.2 Treatment seeking for most recent symptom: Majority (65% to 100%) of the respondents in all districts opted for trained care (e.g., Avahan, other NGO, Government or private doctors/clinics) and/or preventive measures (e.g., use of condom, abstinence) in case of STIs (Summary data sheet M3).

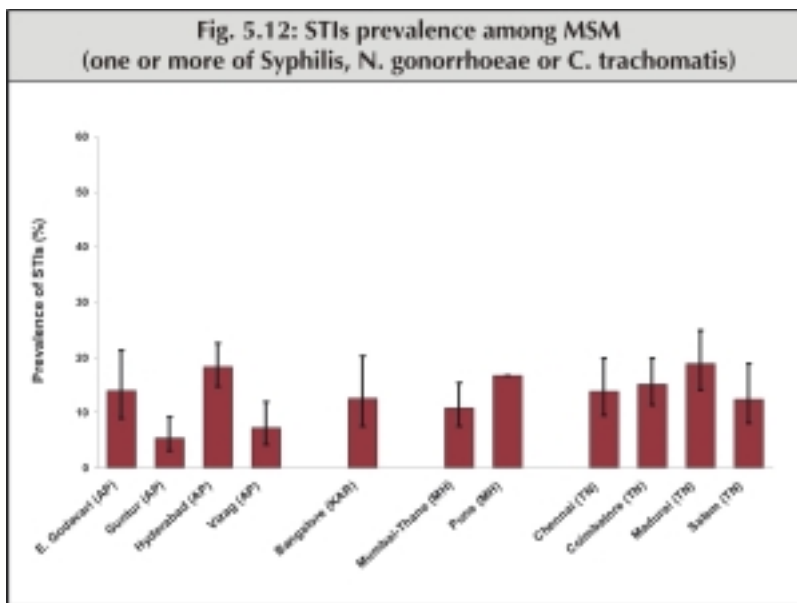
5.16.3 Proportion ever tested for HIV:

About 15% of the respondents reported ever undergoing an HIV test in East Godavari, Guntur and Hyderabad. Only 4% of respondents in Visakhapatnam reported so. In Bangalore and Pune, 28% and 48% of the respondents reported ever undergoing an HIV test. In Mumbai-Thane, this proportion was 57%. The percentage of respondents reporting so in Tamil Nadu districts varied from 27% to 47% (Fig. 5.11) (Summary data sheet M4).



5.17 STIs/HIV Prevalence

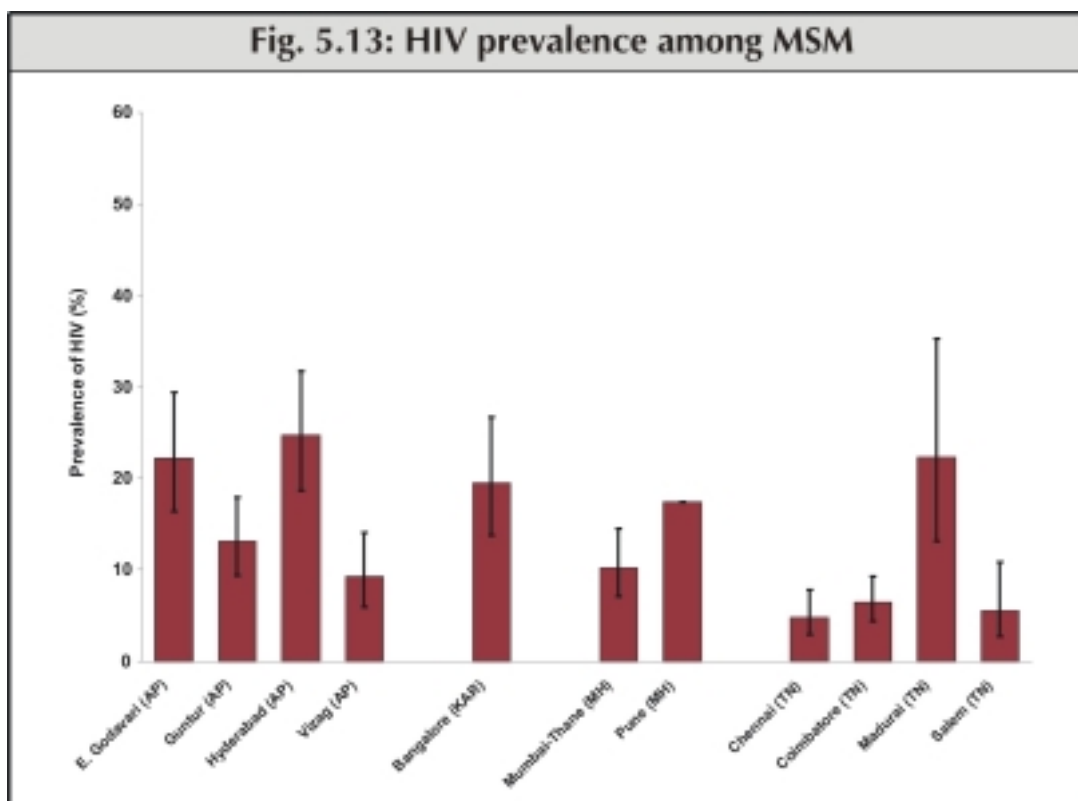
5.17.1 Prevalence of STIs: Having ‘any STI’ is defined as being positive in laboratory tests for any one or more of the following: reactive syphilis serology [RPR positive (any titre) and TPHA positive], positive *N. gonorrhoeae* or *C. trachomatis* test from urine specimens. The STI prevalence in Andhra Pradesh districts ranged from 5.3% (Guntur) to 18.3% (Hyderabad). The prevalence of any STI in Pune was 16.6% and 12.5% in Bangalore. It was 10.8% in Mumbai-Thane. In Tamil Nadu districts, the prevalence ranged from 12.4% to 18.8%. Among the three components of the STIs, reactive syphilis serology was the predominant one in all the districts (Fig. 5.12; Summary data sheet M8).



5.17.2 HSV-2 Antibody Prevalence: For each district, HSV-2 antibody was determined on a random sample of 10% of sera specimens. The prevalence of HSV-2 in participants ranged from 29.1% to 77.7% in Andhra Pradesh, between 14.7% and 40.3% in Tamil Nadu, and was 48.3% in participants from Pune; 43% in Mumbai-Thane; and 36.7% in Bangalore (Summary data sheet M8).

5.17.3 HIV Prevalence: In Andhra Pradesh, prevalence of HIV among participants was highest in Hyderabad (24.7%) followed by East Godavari (22.2%). Participants from Visakhapatnam had the lowest HIV prevalence (9.3%). In Tamil Nadu, participants from Madurai had the highest prevalence (22.3%); the prevalence was below 7% in the other districts. HIV prevalence among respondents in Maharashtra was 17.4% in Pune and 10.2% in Mumbai-Thane. The prevalence was 19.5% in Bangalore. A higher prevalence of HIV among those with STIs was observed in all the survey groups across states (Fig. 5.13; Summary data sheet M8).

5.18 Tamil Nadu: Aravani group (transgender): In Tamil Nadu, for the last few years, HIV prevention programs for this community are run by various organizations. Avahan has targeted this community with the objective of scaling up of HIV/AIDS prevention. About 400 Aravanis from five districts of Tamil Nadu viz., Chennai, Coimbatore, Dharmapuri, Madurai and Salem



were covered for the survey. The survey was carried out between September and October 2006.

A two-stage cluster sampling design was adopted. Fixed-location and time-location clusters were the primary sampling units. In all, there were 885 Aravanis met the eligibility criteria and all of them were approached for the interview. Only 46% among them completed the survey (i.e., both behavioural and biological components).

Mean age of the Aravanis in districts surveyed was 29 years. More than two-thirds (68%) of Aravanis could read and write. One-fourth of them were married. Only 18% were living with their sexual partners. Seventy four percent of Aravanis reported that they had sold sex. They started selling sex at the mean age of 18 years.

Sixty three percent of the respondents had identified themselves as Nirvana (undergone castration and are in women's attire). The others were Aqua (not undergone castration and who wears women's or men's attire).

Services received from "any agency" were assessed based on four indicators as in the case of MSM groups (section 4.4). The proportion received condom (during last year) was 74%. The same proportion had reported to have received information on STI from peers during last

year. Seventy three percent of Aravanis had visited NGO clinics and 74% were visited by the peers.

Almost all the Aravanis reported that they had heard of HIV/AIDS and 93% of them believed that HIV/AIDS could be prevented. Knowledge on HIV spread was assessed based on the responses to a set of six questions. Among those who ever heard of HIV/AIDS, only 18% had correct knowledge. The misconception about HIV/AIDS was high, about 70%. Fourteen percent of the Aravanis felt that they were at risk of being infected with HIV/AIDS.

The proportion of Aravanis having the regular partner was 69%. Nearly three-fourths of them had used condom with them in the last sex act but every time condom usage was 34%. Seventy four percent of Aravanis had paying male partners, and consistent condom usage with them was about 50%. Nearly one-third of the Aravanis had other non commercial male partners and 20% of them used condom for every act.

A high proportion (89%) of Aravanis reported that they ever heard of STI symptoms and 80% of them correctly identified at least three of the six most common symptoms. Proportion who reported as currently suffering form STI was about 2%. In all 45% of Aravanis reported that they had ever undergone an HIV test. Positivity of reactive syphilis serology among the Aravanis was 16.6%. None of the respondents tested positive for *N. gonorrhoeae* or *C. trachomatis*. Prevalence of HSV-2 (10% sample) antibody was 46.2%. Prevalence of HIV was 12% and HIV positive among those positive for syphilis was as 30.9%. Detailed results are given in summary data sheets (Tables H1 to H8).

CHAPTER 6:

INJECTING DRUG USERS

6.1 Introduction: The IBBA was conducted among Injecting Drug Users (IDUs) in four districts in the Northeast, Churachandpur and Bishnupur in Manipur and Phek and Wokha in Nagaland. The assessment was carried out between January and April 2006 in both the districts of Manipur and between March and May 2006 in Nagaland. The sample size for each district was approximately 400 and respondent driven sampling was the method used to sample eligible respondents. Number of seeds recruited at each site and the respondents per seed are shown in Table 6.1.

Table 6.1: Seeds and Recruitments for IDUs by District

State & District	Max number of seeds	Respondents per seed (Range)
Manipur		
Bishnupur	8	20 - 102
Churachandpur	6	50 - 111
Nagaland		
Phek	9	9 - 117
Wokha	9	8 - 105

6.2 HIV Prevention Services: Services received from “any agency” during the past six months were assessed based on five indicators, namely, ‘contacted by NGO/program worker’, ‘given information on STI/HIV/AIDS’, ‘visited the NGO clinic’, ‘received condoms’, and ‘received needles/syringes’ (Table 6.2). In Bishnupur, the reported proportion of IDUs receiving these services ranged from 41% to 56%. The corresponding proportions for Churachandpur varied between 37% and 88%. Nagaland reported lower levels of coverage by program in Wokha district, 22% to 32%, compared to 34% to 49% in the Phek district (Summary data sheet D16).

Table 6.2: Coverage of IDUs by HIV Prevention Services Received from any agency (last 6 months)

State & District	Intended Avahan coverage	Number of Respondents	Contacted by NGO / program worker (%)*	Given information on STI / HIV / AIDS (%)*	Visited the NGO clinic (%)*	Received condoms (%)*	Received needles / syringes (%)*
Manipur							
Bishnupur	100%	420	56	48	45	41	52
Churachandpur	87%	419	52	37	69	48	88
Nagaland							
Phek	100%	440	49	46	48	47	34
Wokha	57%	420	30	22	27	32	30

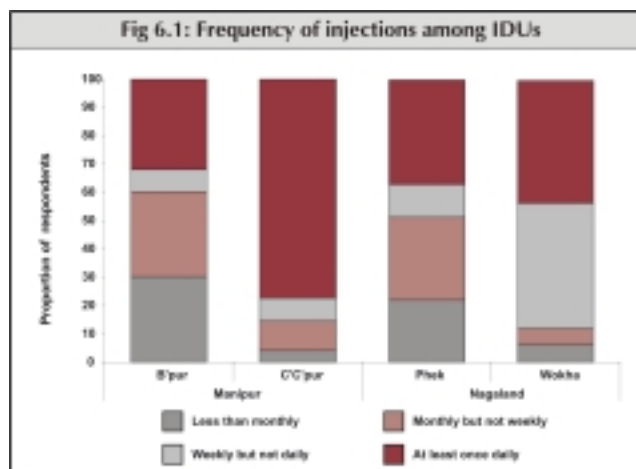
* Based on subset of respondents applicable for that analysis.

6.3 Demographic Profile: Most of the IDUs who participated in the study were between 20 and 30 years in age (Table 6.2). More than 90% of respondents in Manipur reported that they could read and write and close to 40% said they were unemployed. In Nagaland, 80% and 91% of respondents in Wokha and Phek reported that they could read and write and nearly 63% in Wokha and 48% in Phek reported being unemployed (Summary data sheet D1).

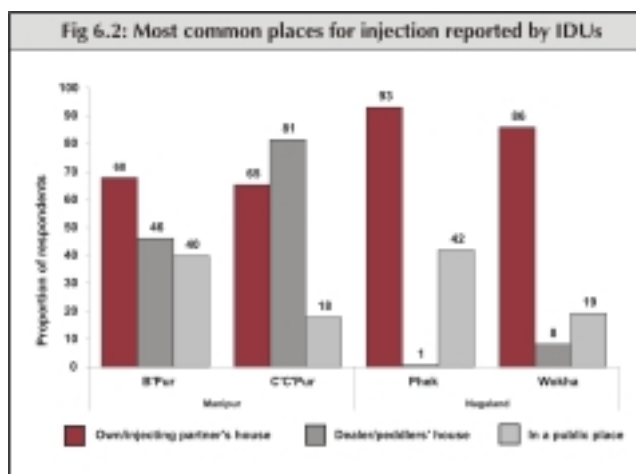
Table 6.3: Demographic Profile of Participating IDUs

State & District	Number of respondents	Current age distribution (Years) (%)					Can read and write (%)	Ever married (%)	Unemployed (%)
		18-20	21-25	26-30	31-35	36 or above			
Manipur									
Bishnupur	420	17	40	21	14	8	96	30	41
Churachandpur	419	11	37	32	14	6	92	31	38
Nagaland									
Phek	440	43	35	19	2	2	91	12	48
Wokha	420	23	35	29	9	4	80	26	63

6.4 Frequency of Injection: Only in Churachandpur, did the IBBA include a majority of respondents who were daily injectors, or in the case of Wokha, at least weekly injectors (Fig. 6.1). In Bishnupur and Phek, a large proportion of respondents injected infrequently (30% on a monthly basis, rather than a weekly or daily basis, and another 20%-30% on a less than monthly basis) (Summary data sheet D6).

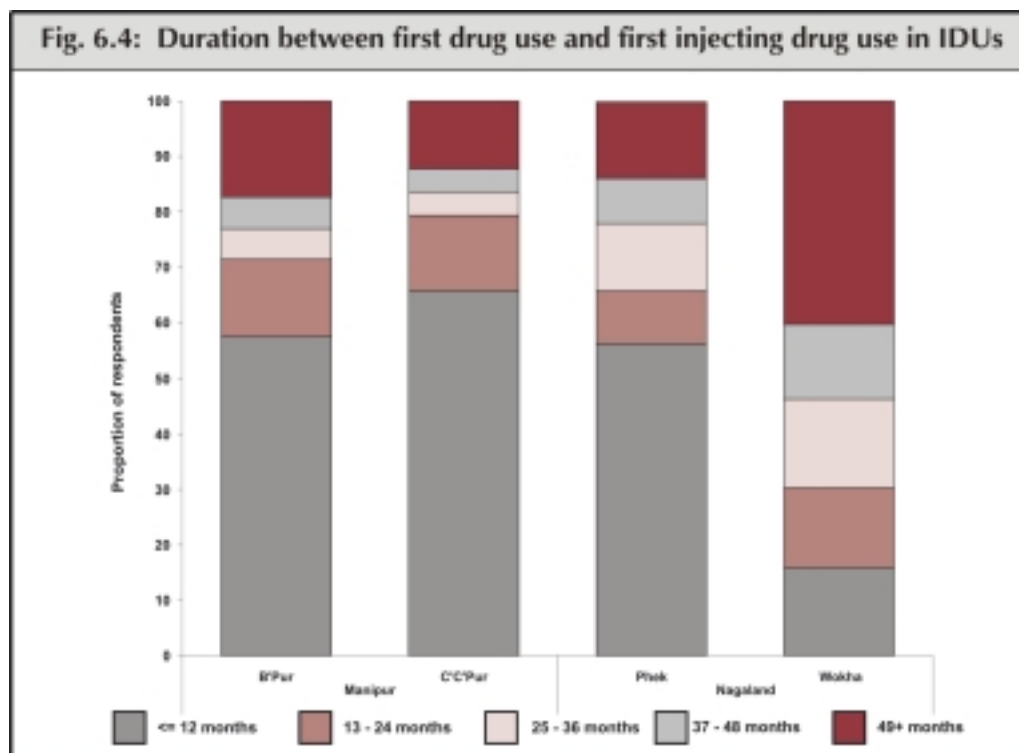
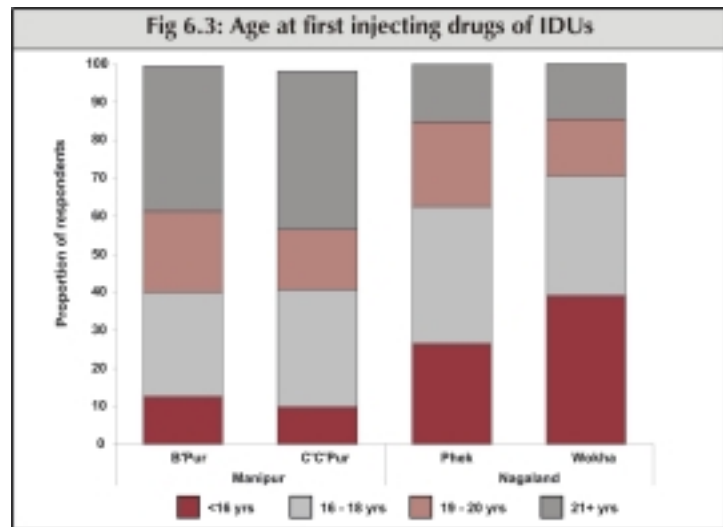


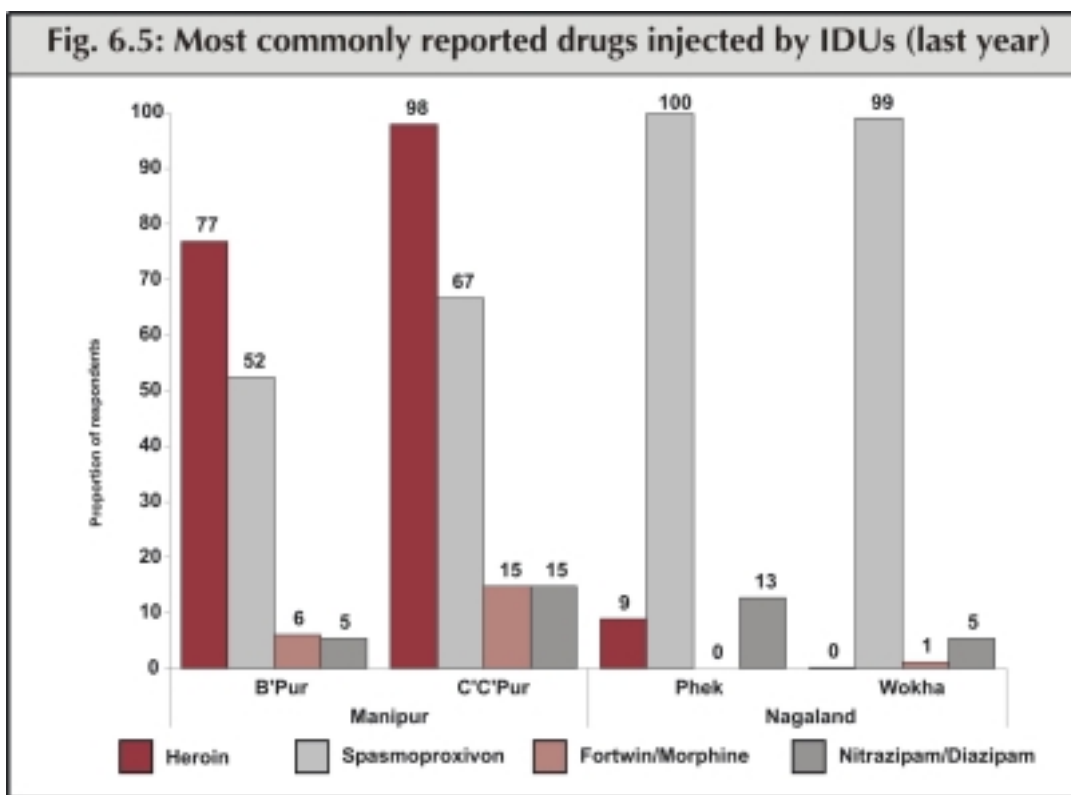
6.5 Place of Injection: Respondents were asked about the places where they injected most commonly. Majority in all the four districts mentioned that they injected in their own home or the home of their injecting partners (Fig. 6.2). In Manipur, many also reported injecting at their dealer's house. Fewer than half of the respondents mentioned injecting in public places including cinema halls, bus terminals,



public toilets, in the street or in a park, or in any other open space. This suggests that more than half of the respondents could have been missed if the sample had been drawn from public/street-based injecting sites. However, it also explains why the injectors captured in the IBBA were not limited to the daily or more frequent injectors who could have been preferentially captured at public/ street-based injecting venues (Summary data sheet D5).

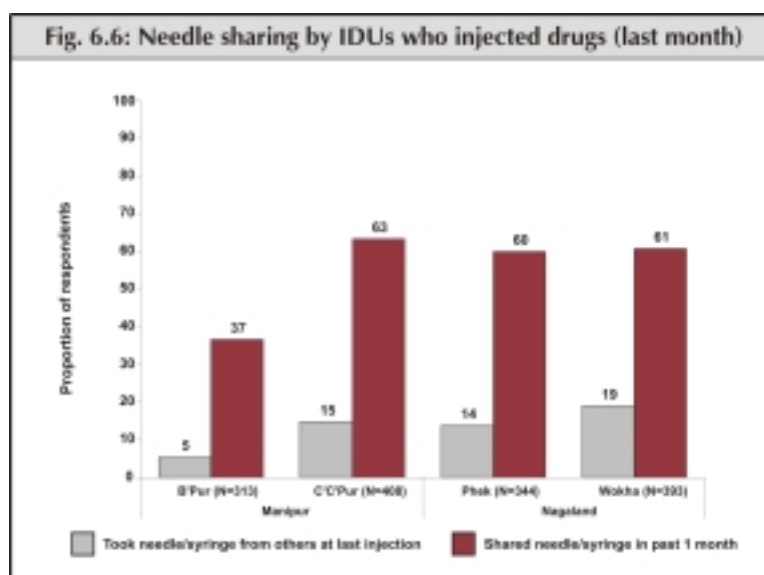
6.6 Age at First Using Drugs and First Injecting Drugs: Drug use starts at a slightly higher age in Manipur (i.e., above the age of 20 years), and injection practice usually begins within the first year of starting drug use (Figs. 6.3 & 6.4). The data suggest a somewhat different pattern in Nagaland, where drug use starts at a younger age (i.e., below the age of 20 years), but start of injecting drug use is delayed, particularly, in Wokha, with fewer than 20% of drug users reporting that they started injecting within the first year of drug use (Summary data sheets D2, D3 & D4).





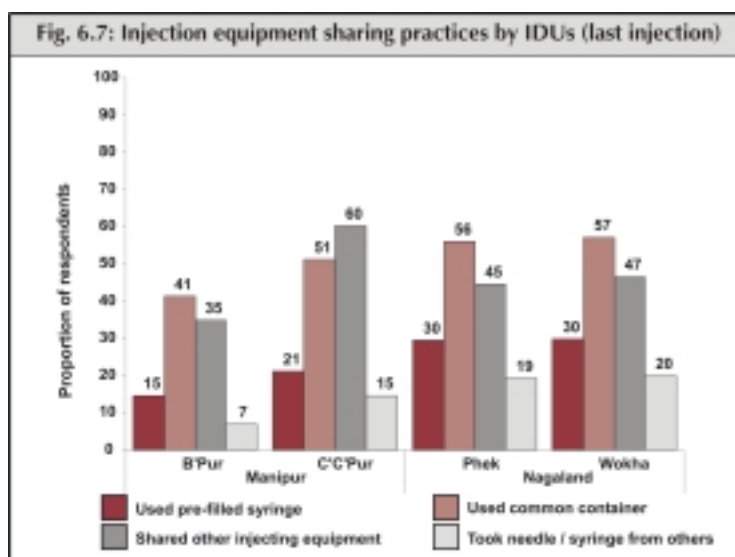
6.7 Types of Drugs Injected: Heroin was the most commonly reported drug injected in the year prior to the IBBA in Manipur; however, spasmoproxicon was also fairly common (Fig. 6.5). In Nagaland, spasmoproxicon was by far the most common drug used with very little heroin use reported in Phek and almost none in Wokha. Spasmoproxicon is reportedly used when heroin is either not available or too expensive. Only a small proportion of respondents mentioned injecting other drugs such as Fortwin, Nitrazipam or Diazepam (Summary data sheet D5).

6.8 Injecting/ Sharing Practices: Among respondents who injected in the last one month, fewer than 20% reported using a needle that they took from someone else after that person injected with it the last time they injected (Fig. 6.6). However, nearly 60% of respondents

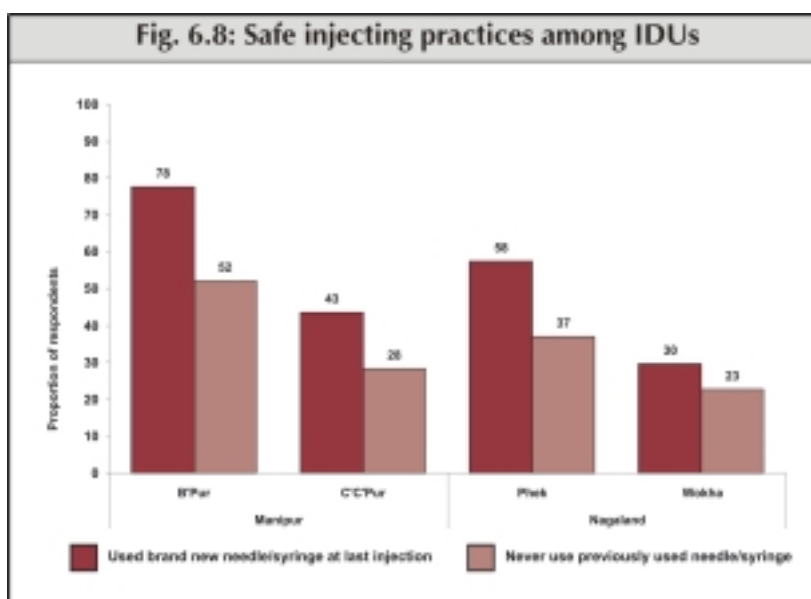


reported that they shared needles and syringes with one or more persons in the past one month, with the exception of Bishnupur, where the proportion (40%) was lower (Summary data sheet D7 & D8).

Although a small proportion (fewer than 20%) of respondents reported using a needle after someone else had used it, the last time they injected, the proportion who used a pre-filled syringe was larger (between 15% and 30%) and around 50% of respondents reported sharing other injecting equipment or using a common container the last time they injected (Fig. 6.7). It is worth noting that most respondents who reported using a pre-filled syringe the last time they injected, did not report that they had used a needle after someone else had used it last time they injected.



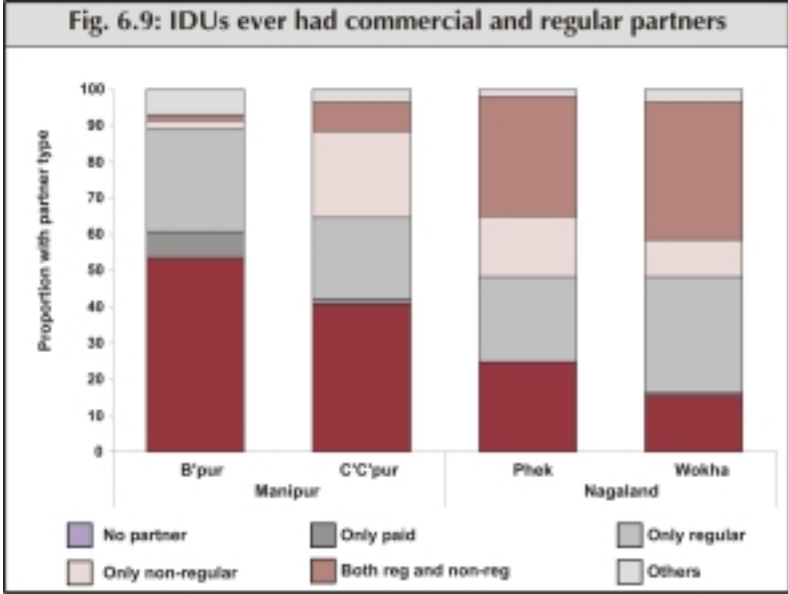
A large proportion of injectors in Bishnupur and Phek reported using a brand new needle and syringe the last time they injected and between 20% and 50% of injectors across the four districts reported that they never used needles and syringes that someone else has already used (Fig. 6.8).



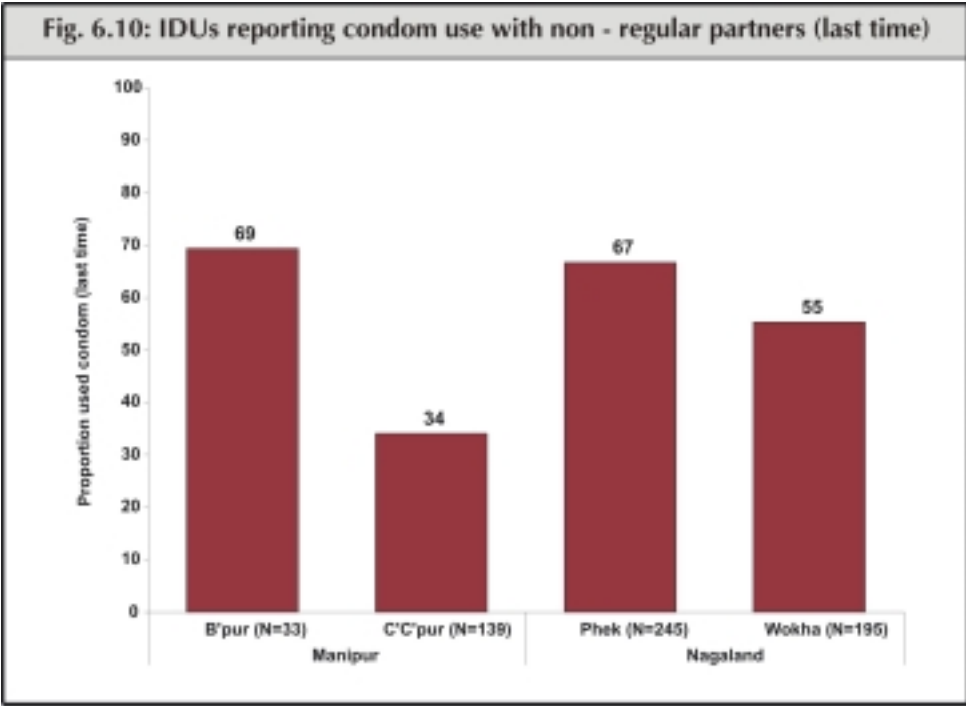
6.9 Sexual Risk: Only a small proportion of IDUs reported having commercial sex partners in the past one year (6% in Churachandpur,

14% in Bishnupur, 4% in Wokha and 2% in Phek) (Fig. 6.9). Many IDUs in Manipur reported never having been sexually active (40-50%), as compared to Nagaland where only 15-25%

reported not being sexually active. In Manipur, one-fourth of the respondents reported having a spouse/regular partner. Of particular note in Churachandpur was that one-third of the respondents also reported having other non-paid partners. In Nagaland, nearly half of the respondents reported non-paid partners and the majority of them (33% in Phek and 38% in Wokha) reported having both regular and non-regular unpaid sex partners. The relatively higher sexual risk behaviour in Nagaland, as well as in Churachandpur, signal the potential for sexual transmission of infectious diseases to non-injecting partners (Summary data sheet D10, D11 & D12).



Condom use at last sex is relatively low; the use with non-regular non-paid partners reported by 67% of respondents in Phek and 56% in Wokha. The proportion in Churachandpur was only 34% (Fig. 6.10).

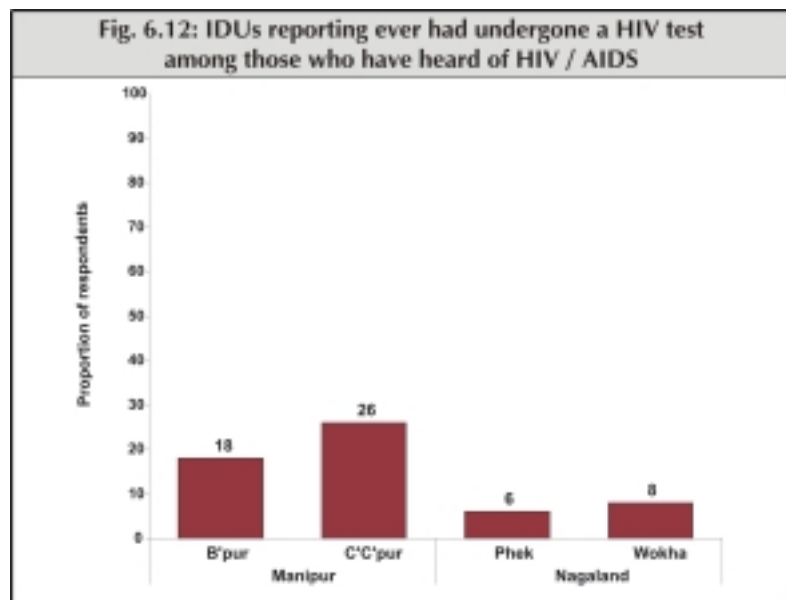
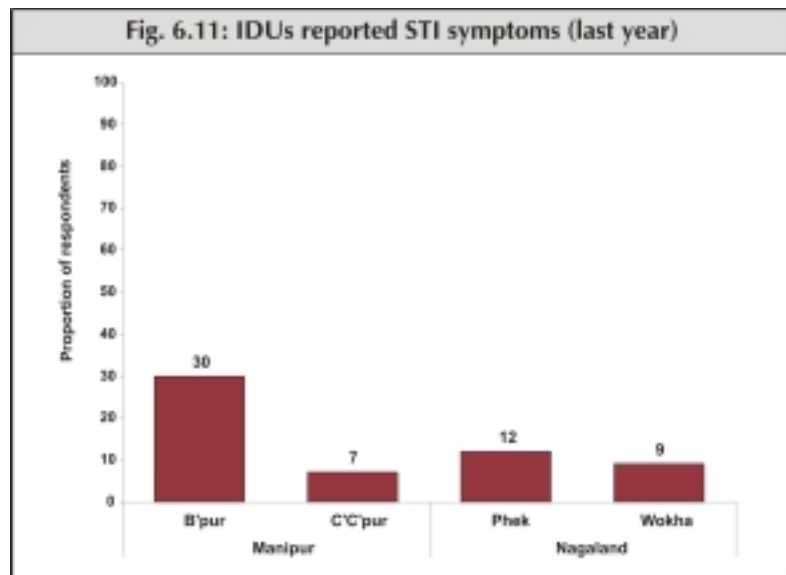


6.10 STI Knowledge: STI knowledge was assessed based on the ability of the IDUs to correctly identify at least three of the six most common STI symptoms, viz., urethral discharge, burning/pain on urination, genital ulcer/sore,, swelling in groin area, warts around genital area and cannot retract foreskin. More than three-fourths of the IDUs in Manipur had heard of STIs; among them, 11% in Bishnupur and 19% in Churachandpur could correctly identify at least three most common STI symptoms. In Nagaland, only less than 2% could correctly identify at least three symptoms (Summary data sheet D13).

6.11 Proportion Reporting STI Symptoms: In Bishnupur, 30% of the IDUs had at least one of the STI symptoms during the last year as compared to 7% in Churachandpur. This percentage was 12% and 9% in the Phek and Wokha districts (Fig. 6.11) (Summary data sheet D13).

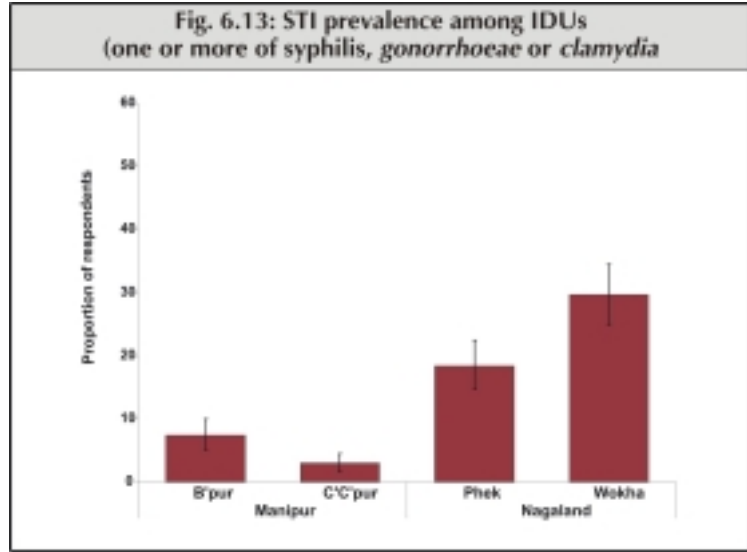
6.12 HIV/AIDS Awareness: All the IDUs surveyed in Manipur districts and more than 90% in the Nagaland reported that they had heard of HIV/AIDS. Misconception was above 90% in Manipur districts; 57% in Phek and 79% in Wokha (Summary data sheet D15).

6.13 Proportion ever Tested for HIV: Among those who had ever heard of HIV, 18% and 26% of the IDUs, respectively from the Bishnupur and Churachandpur had undergone HIV testing. The corresponding percentages for the two districts of Nagaland (Phek and Wokha) were 6% and 8%, respectively (Fig. 6.12) (Summary data sheet D15).

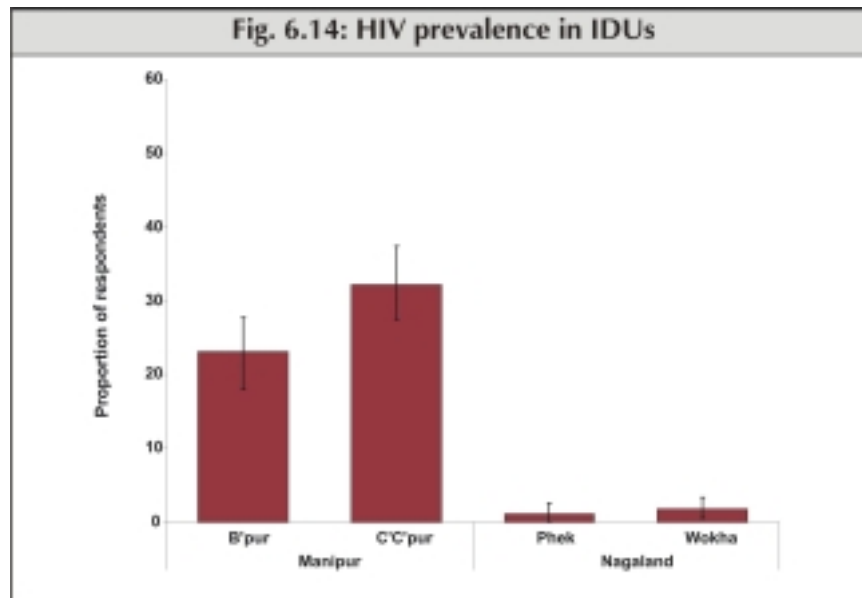


6.14 STIs/HIV Prevalence

6.14.1 Prevalence of STIs: Having 'any STI' is defined as being positive in laboratory tests for any one or more of the following: reactive syphilis serology [RPR positive (any titre) and TPHA positive], positive *N. gonorrhoeae* or positive *C. trachomatis* NAT test. The STI prevalence was low in Manipur (7.4% in Bishnupur and 3.0% in Churachandpur). In Nagaland, it was 18.4% in Phek and 29.7% in Wokha (Fig. 6.13). Among the three components of the "any STI", syphilis was the predominant one in all the districts (Summary data sheet D17).



6.14.2 HIV Prevalence: In Manipur, the HIV prevalence was high (23.1% in Bishnupur and 32.2% in Churachandpur). In contrast, the HIV prevalence was very low in Nagaland (1.1% in Phek and 1.8% in Wokha) (Fig. 6.14).



6.14.3 Hepatitis B and Hepatitis C: The prevalence of hepatitis B varied from 4.8% (in Phek) to 6.9% (Wokha) among all the four districts. The hepatitis C prevalence was high in Manipur (56% and 78%, in Bishnupur and Churachandpur districts respectively) and low in Nagaland (5.4% and 16.7% in Phek and Wokha, respectively) (Summary data sheet D17).

CHAPTER 7:

CLIENTS OF FEMALE SEX WORKERS

7.1 Introduction: Clients of FSWs are an important population to understand because they are instrumental in the spread of HIV from a limited number of FSWs to a much larger number of sexual partners including their spouses and other regular and casual sex partners, thus act as bridge population between high risk population and general population for spread of HIV infection. This chapter presents the highlights of data from the IBBA conducted among clients of female sex workers in five districts of Andhra Pradesh, three districts of Maharashtra and three districts of Tamil Nadu. The assessment was carried out between September and December 2006 in Andhra Pradesh, November 2006 and April 2007 in Maharashtra and October and December 2006 in Tamil Nadu.

The sampling universe for the client group can best be described as the subset of identifiable clients at FSWs' solicitation sites, with clients being identified by the interview team with the help of sex workers, community liaisons, pimps, and other key informants in the area. These identified eligible respondents were listed for each time-location cluster and subsets were then randomly selected for participation in the survey.

Many pilot exercises were undertaken to identify the appropriate sampling approach that would lead to the best participation rates. All of the methods tried resulted in high refusal rates. In the end, the IBBA team opted for a time-location cluster sampling approach at female sex workers solicitation sites, using the same sampling frames that had been used for the FSWs.

7.2 Participation Rates: The percentages of respondents who refused to participate in both the behavioural and the biological assessment were quite high for the client survey, ranging from 76% in Guntur to 47% in Yevatmal of (Table 7.1). Because of the high refusal rates, it is particularly important to characterize the population that was included. This was done by exploring various associated factors.

7.3 Exposure to Prevention Programs: Among the clients who participated in the survey, almost all (97%-100%) in Andhra Pradesh had heard/seen/read advertisement on condoms. The corresponding percentages for Maharashtra varied from 89% to 95% and 79% to 96% in Tamil Nadu. Comparatively lesser proportion of respondents had heard/ read advertisement about STIs (Table 7.2) (Summary data sheet C2).

Table 7.1: Participation Rates by District for Clients

State & District	Respondents approached	Completed questionnaire and biological specimen collection	Participation rate (%)
Andhra Pradesh			
East Godavari	1440	409	28
Guntur	1685	401	24
Hyderabad	1264	406	32
Visakhapatnam	1308	402	31
Warangal	1219	402	33
Maharashtra			
Parbhani	788	404	51
Pune	917	401	44
Yevatmal	757	399	53
Tamil Nadu			
Chennai	977	406	42
Madurai	1133	401	35
Salem	1092	396	36

Table 7.2: HIV Prevention Services Received from Any Agency by District

State & District	Number of respondents	Heard/seen / read advertisement on condoms (last 6 months) (%)	Heard/seen/ read advertisement on STI (last 6 months) (%)*	Heard/seen/ read advertisement on Key clinic (last 6 months) (%)	Ever visited key clinic for STI treatment (%)
Andhra Pradesh					
East Godavari	409	100	95	34	2
Guntur	401	100	98	75	2
Hyderabad	406	100	99	68	0.5
Visakhapatnam	402	96	93	83	7
Warangal	402	97	93	60	1
Maharashtra					
Parbhani	404	89	40	7	0
Pune	401	99	76	54	0.3
Yevatmal	399	95	57	21	0.3
Tamil Nadu					
Chennai	406	79	45	36	0.1
Madurai	401	96	86	84	1
Salem	396	92	51	37	0.1

7.4 Demographic Profile:

The mean age of the respondents was around 30 years in all districts and majority of them were able to read and write (Table 7.3). Respondents represented a variety of men in different occupations, which varied significantly from one district to another (Fig. 7.1). The districts in Tamil Nadu were dominated by non-agricultural laborers and businessmen. The districts in Andhra Pradesh and

in Maharashtra were a mix of agricultural and non-agricultural laborers, businessmen, truck drivers, and semi-skilled laborers. Predominantly, the respondents were married and living with their spouses (Fig. 7.2) (Summary data sheet C1).

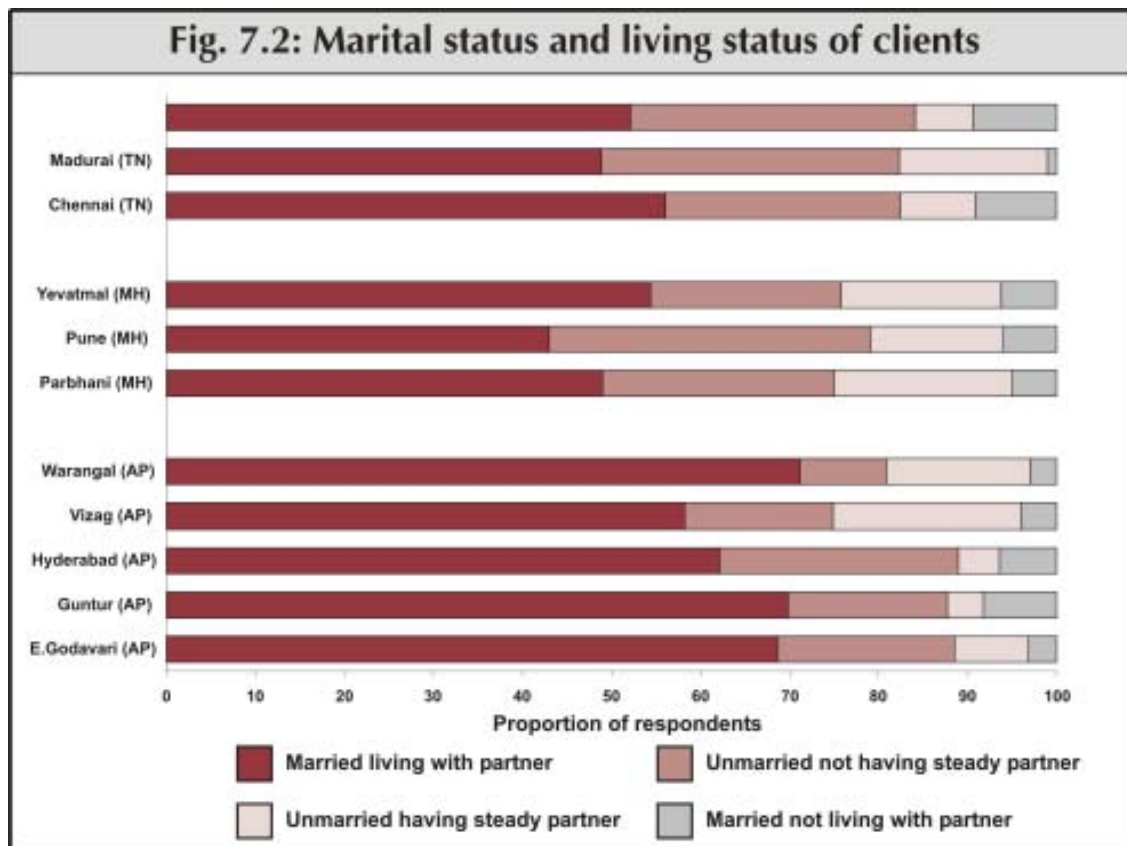
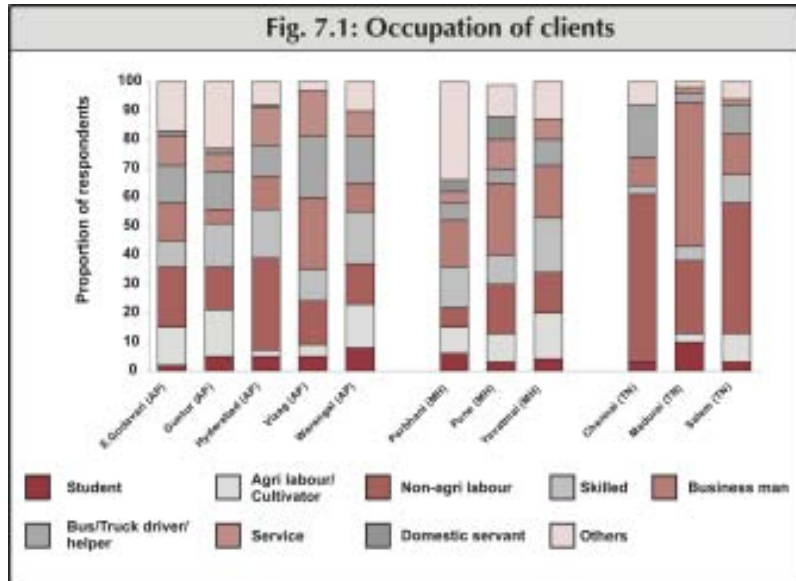
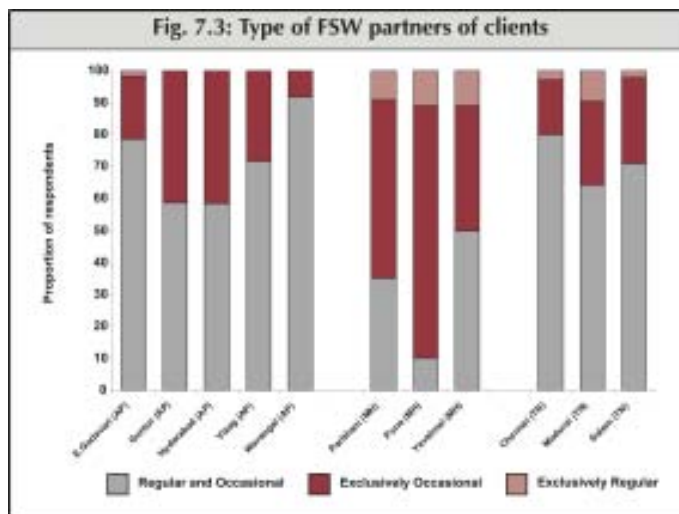


Table 7.3: Demographic Profile of Participating Clients by District

State & District	Number of respondents	Mean age (Years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Mean age when started having paid sex (Years)	Circumcised (%)	Bought sex from FSW at places traveled (%)
Andhra Pradesh								
East Godavari	409	30	58	72	96	20	5	54
Guntur	401	31	63	78	89	19	22	54
Hyderabad	406	31	80	68	91	20	11	52
Visakhapatnam	402	28	79	62	94	19	22	56
Warangal	402	30	88	74	96	19	16	58
Maharashtra								
Parbhani	404	27	69	54	92	20	21	43
Pune	401	28	87	49	89	22	9	17
Yevatmal	399	29	81	61	90	21	26	48
Tamil Nadu								
Chennai	406	32	64	65	86	22	4	26
Madurai	401	28.5	81	50	98	21	6	57
Salem	396	32	78	62	85	23	8	35

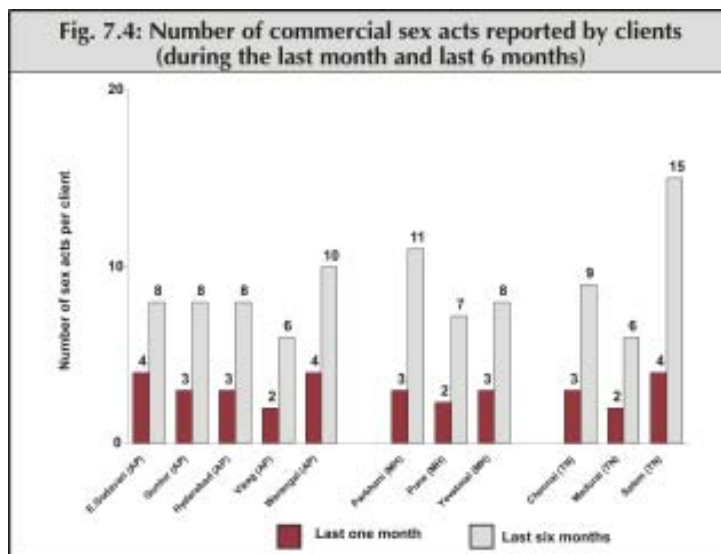
7.5 Regular or Occasional Clients:

Respondents were asked whether they frequented regular female sex workers (women who they bought sex from regularly and whom they recognized well), or occasional female sex workers (women who they bought sex from only once or twice and whom they would not know or recognize). The sample included a mix of clients visiting sex workers regularly and occasionally. Virtually, all respondents in all districts had visited some female sex worker on an occasional basis; however, the majority had female sex worker partners whom they visited regularly (Fig. 7.3) (Summary data sheet C5).



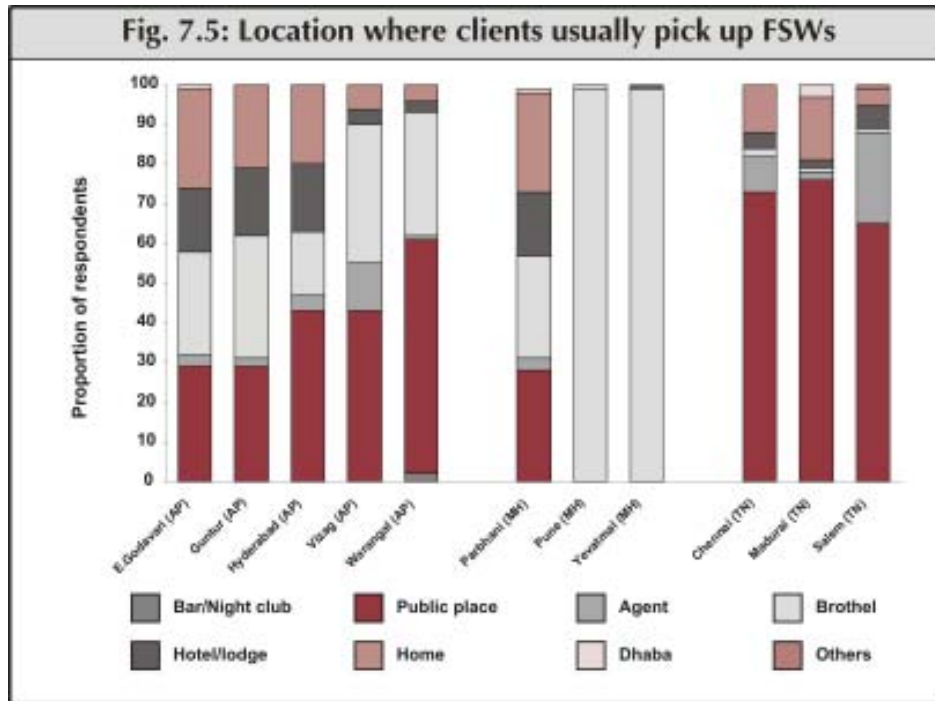
7.6 Frequency of Buying Sex:

The majority of respondents reported an average of between 3 and 5 commercial sex acts in the past month (Fig. 7.4). However, the corresponding figures for the past 6 month period suggested a lower monthly average since the average number of commercial sex acts over a six month period ranged somewhere between 7 and 14, except for Salem, where it was 18 (Summary data sheet C5).



7.7 Type of Sex Workers Normally Frequented:

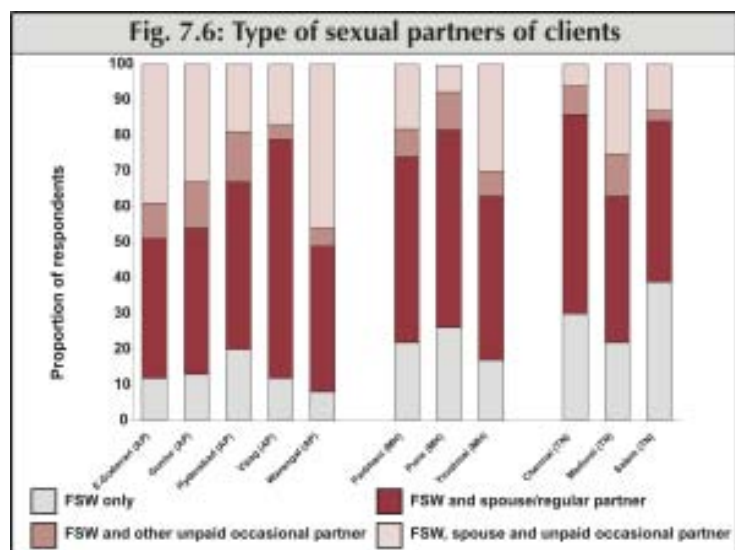
Clients captured in the IBBA were those who normally picked up sex workers on the street or in brothels. The Tamil Nadu respondents were dominated by clients of street-based sex workers. The respondents in Parbhani and Yevatmal in Maharashtra comprised almost exclusively of clients of brothel-based sex workers, while the districts of Andhra Pradesh had more of a mix of clients of brothel, home and street-based sex workers (Fig. 7.5). It is important to keep in mind that the distribution of clients in this study does not necessarily represent the mix of clients in the district. It was limited by the types of solicitation points in the sampling frame.



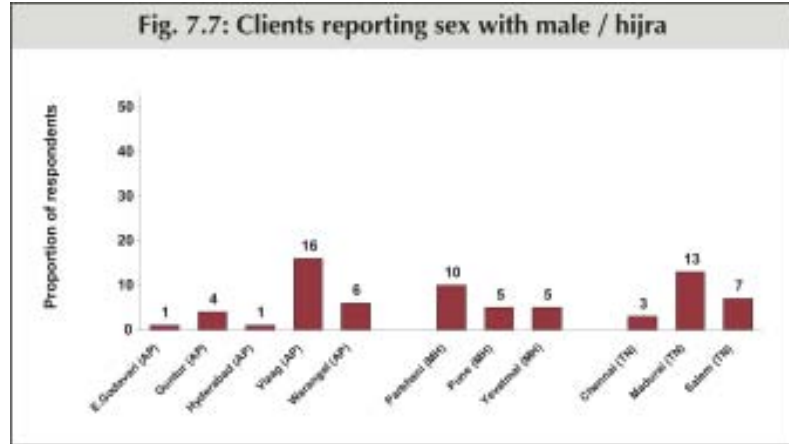
7.8 Clients as a Bridge Population

7.8.1 Bridging from Commercial to Non-commercial Partners: Transmission of HIV in the districts included in the IBBA is in large part determined by the behaviours of clients who are both exposed to FSWs, many of whom are infected with HIV, and who also have sexual relations with other women who are not commercial partners.

Most clients in the IBBA were not limited to commercial partners. Majority also had spouses and other regular partners, as well as other occasional partners. Majority of men had regular partners ranging from a low of 59% in Hyderabad to a high of 86% in Warangal. However, in addition to their FSW partners and their spouses/regular partners, many respondents also had other non-paid partners. This proportion ranged from a low of 14% in Chennai to a high of 51% in Warangal (Fig. 7.6) (Summary data sheet C5).

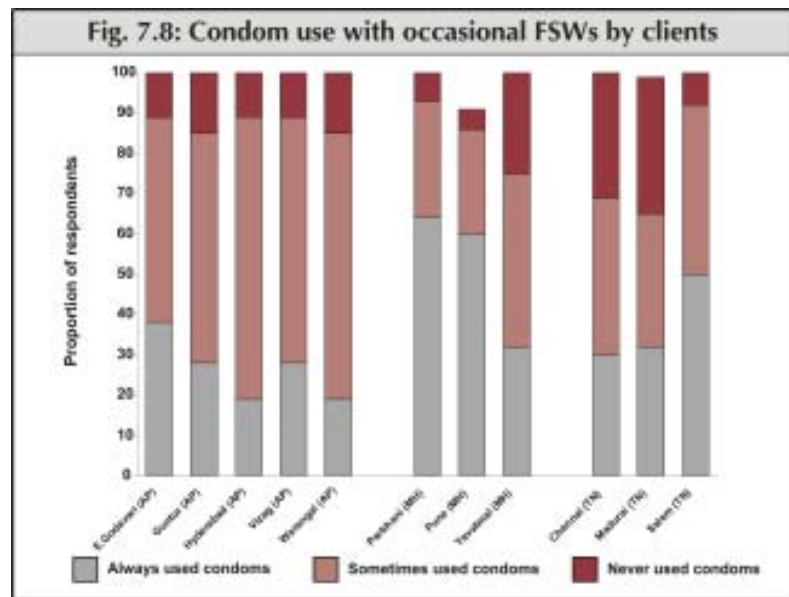


7.8.2 Bridging from Males to Males: A small but non-negligible proportion of clients reported also having sex with males/hijras in several districts. It was 13% in Madurai and 16% in Visakhapatnam (Fig. 7.7) (Summary data sheet C7).



7.9 Clients and Condom Use with Commercial Partners

7.9.1 Condom Use with Occasional Commercial Partners: Virtually all clients had visited sex workers whom they considered as “occasional” sex partners, meaning that they visited them only once or twice and they did not know them. Despite the high risk of this activity for the transmission of HIV only, the proportion of clients who reported consistently using condoms with these partners was not more than one-third, with the exception of Pune (60%); Madurai (50%); and East Godavari (38%) where the proportion was higher (Fig. 7.8) (Summary data sheet C6).



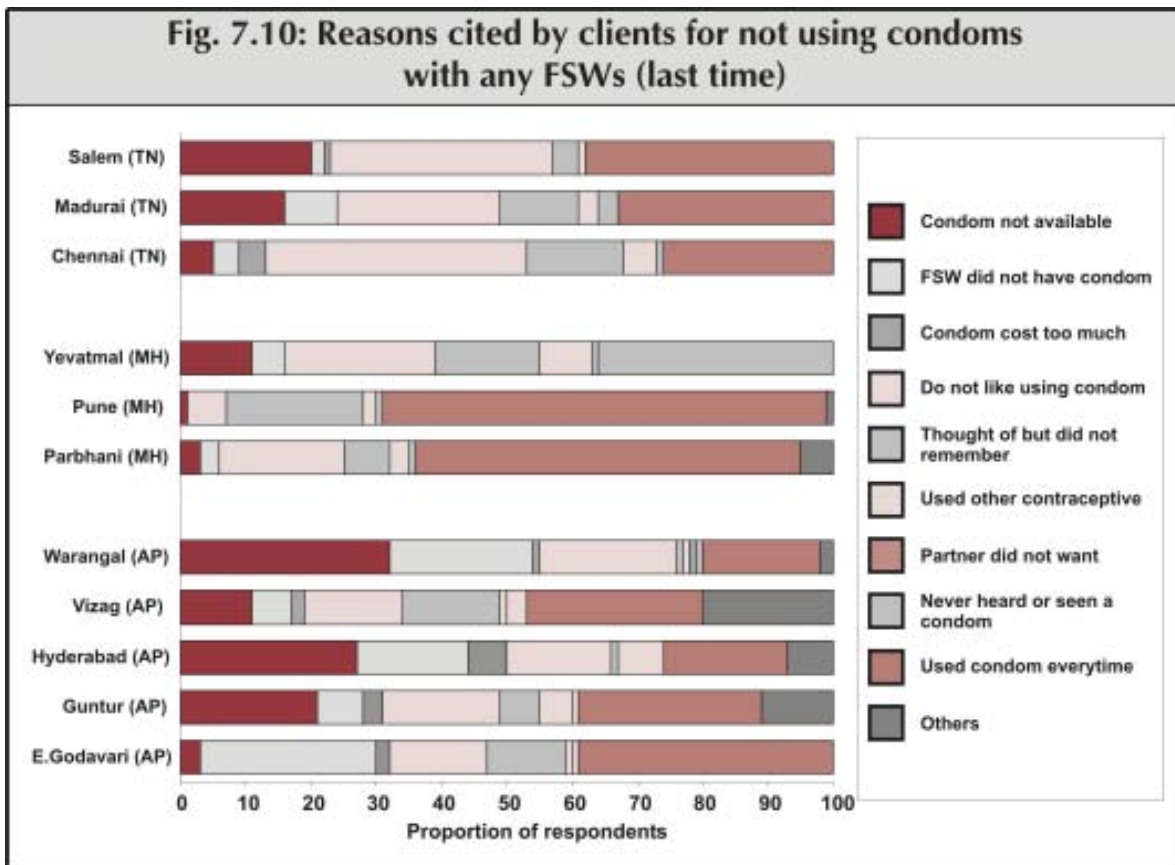
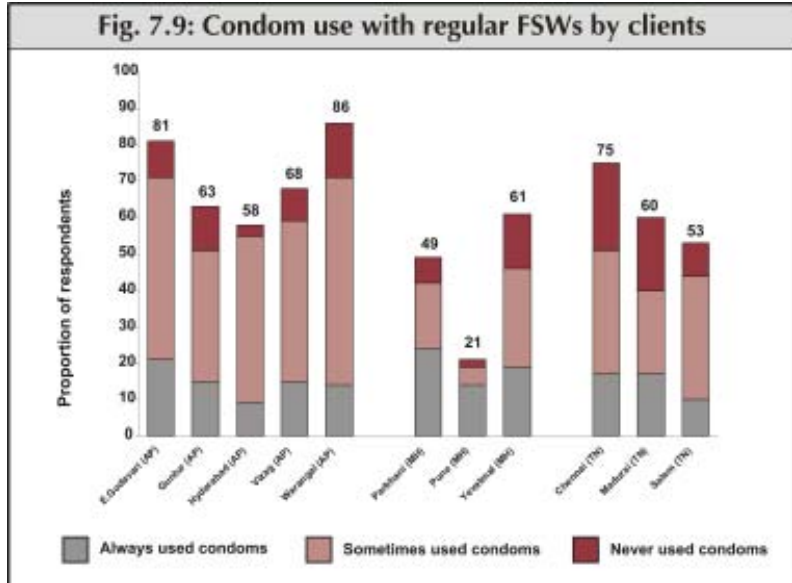
7.9.2 Condom Use with Regular Commercial Partners: The majority of clients (59%-86%) reported having sex with women whom they considered as “regular” commercial partners in the past year; meaning that they had sex with these women on multiple occasions and they felt that they knew them. With these women, consistent condom use was between 15% and 30%. It was 68% in Pune (Fig. 7.9) (Summary data sheet C6).

7.9.3 Reasons for Not Using Condoms: Men reported not using condoms for a variety of reasons (Fig. 7.10). However, the most common reasons were the non-availability of

condoms (reported by nearly 20% in several districts), combined with FSWs not having condoms (reported particularly in East Godavari and Warangal), and not liking to use condoms, reported by as many as 40% of clients in Chennai.

7.10 Self Reported STIs and Treatment Seeking Behaviour: About 30% of the clients from Andhra Pradesh reported that they ever had at least one of the five symptoms

viz., urethral discharges, genital ulcer/sore, swelling in the groin (scrotal) area, burning pain on urination or cannot retract foreskin, except in Hyderabad (12%). The proportion reported



in Yevatmal was a high of 51% and in Parbhani it was 36%. In Tamil Nadu, the reported proportion was low and it varied from 5% to 12% (Fig. 7.11) (Summary data sheet C3).

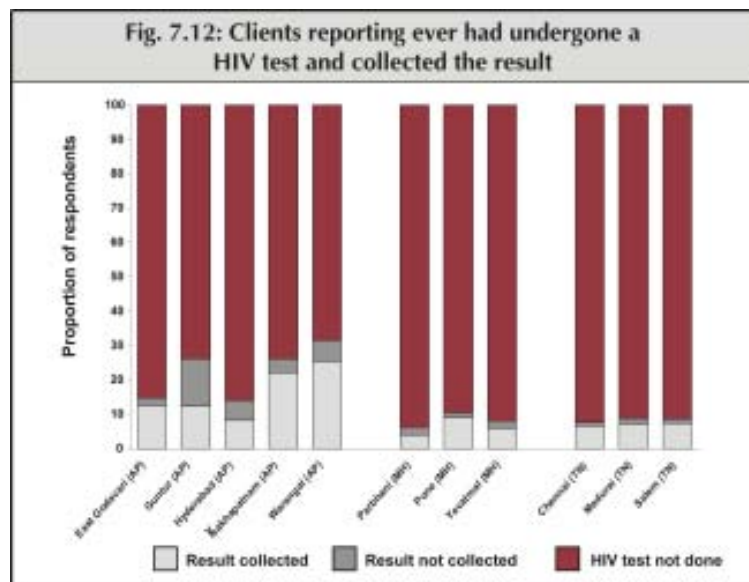
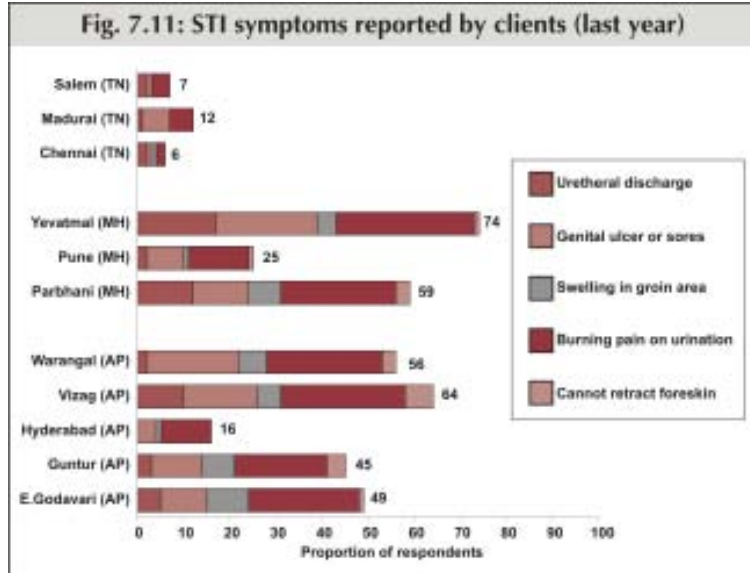
Among those who had STI symptoms, the treatment seeking behaviour of trained care (hospitals, clinic, private practitioners, etc.) was between 76% and 86% in the districts of Andhra Pradesh, except in Hyderabad (39%). It was generally low in Tamil Nadu, except Salem (90%). Approaching trained care for STI treatment was very low in Chennai (7%). It ranged from 40% to 55% in Maharashtra (Summary data sheet C3).

7.11 HIV/AIDS Awareness and Testing: Almost all of the clients (97% to 100%) reported that they heard of HIV/AIDS. More than 50% in Andhra Pradesh reported that they felt at the risk of being infected with HIV except in East Godavari (22%). In Maharashtra, it was 32% in

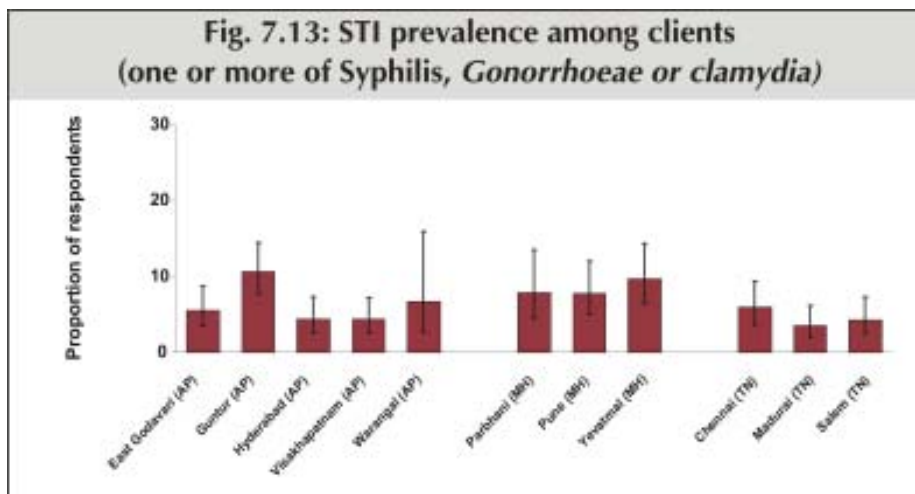
Pune; 40% in Yevatmal; and 64% in Parbhani and in Tamil Nadu, it was 46% in Madurai. In the other two districts of Tamil Nadu, it ranged from 7% to 14% (Fig. 7.12). Among those who have heard of HIV/AIDS, 14% to 32% in Andhra Pradesh, 8% in Maharashtra and an equal proportion in Tamil Nadu have undergone HIV testing (Summary data sheet C4).

7.12 STIs/HIV Prevalence

7.12.1 Prevalence of STIs: Having 'any STI' is defined as being positive in laboratory tests for any one or more of the following: reactive syphilis serology [RPR positive (any titre) and TPHA positive], positive *N. gonorrhoeae* or positive *C. trachomatis* NAT test. The STI prevalence

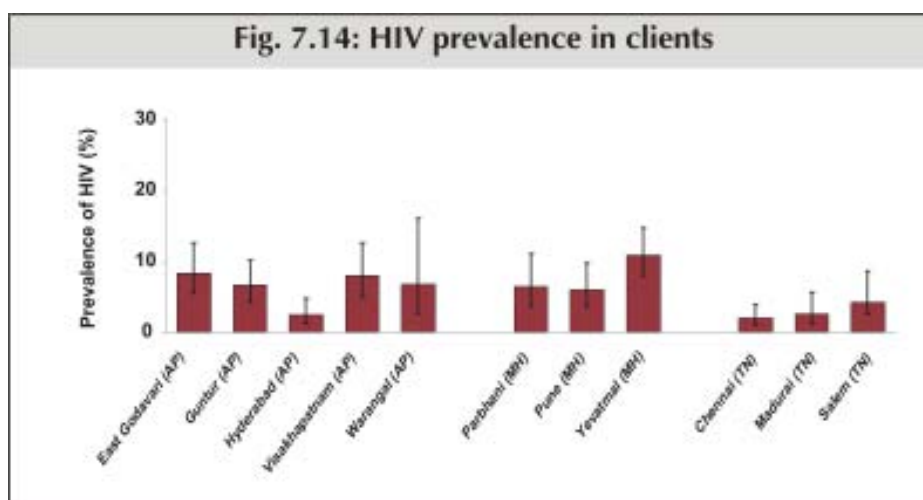


among clients was low in all the districts. It varied from 4.4% to 10.6% in Andhra Pradesh; 7.8% in Pune; 7.9% in Parbhani; 9.7% in Yevatmal; and below 6% in Tamil Nadu districts (Fig. 7.13). Among the three components of the STIs, syphilis was the predominant one in all the districts (Summary data sheet C8).



7.11.2 HSV-2 Prevalence: Prevalence of HSV-2 antibodies varied from 18.9% to 78.0% in the districts of Andhra Pradesh. In Tamil Nadu, it was between 10.2% and 22.3%. The HSV-2 prevalence was 13.7% to 21.1% in Maharashtra (Summary data sheet C8).

7.11.3 HIV Prevalence: In Andhra Pradesh, the prevalence of HIV among clients was lowest in Hyderabad (2.4%). It ranged from 6.6% to 8.3% in other districts. The HIV prevalence among clients was highest in Yevatmal (10.9%). It was very low in Tamil Nadu districts (2% to 4.2%) (Fig. 7.14). Higher prevalence of HIV among those with ‘any STIs’, observed in all the survey groups across states, was indicative of a positive HIV and STI relation (Summary data sheet C8).



CHAPTER 8:

HIV INCIDENCE AMONG HIGH-RISK GROUPS

8.1 Introduction: While prevalence provides the estimate of current disease burden, the incidence provides the information on how fast the epidemic is spreading and helps in making projections. Classical approach for incidence estimates requires prospective cohort studies that are very expensive and time consuming. Sensitive/less sensitive (S/LS) or “detuned” assays offer incidence estimates based on single-point testing in cross-sectional surveys by differentiating those HIV positive individuals who have been recently infected (usually less than 6 months post sero-conversion) from those with established infection. These assays provide a rapid estimate with cross sectional survey and are substantially economical. IBBA collected probability based samples from high-risk populations and provided opportunity to apply detuned assays for the incidence estimates on a large scale.

8.2 Methodology: Several serologic S/LS methods are available and can be divided into (1) ELISA methods for antibody titer; (2) ELISA methods that measure antibody avidity; (3) ELISA methods that measure antibody isotypes; (4) S/LS rapid tests; and (5) simple assays (e.g., Particle Agglutination Assay). Most of these assays are validated in the populations infected with HIV-1 subtype B. We had an opportunity to validate BED CEIA (Calypte HIV 1 BED Incidence EIA, Calypte Biomedical Corporation, Md, USA) in subtype C samples from India. The validation exercise done on serum samples collected sequentially from sero-converters provided an estimate of window period of 268 days. Correction factor was calculated using method described by Thomas Rehle et al (*S Afr Med J* 2007; 97: 194-199).

8.3 HIV Incidence: The required sample size for measuring incidence rates with reasonable statistical confidence is larger than what was feasible for the IBBA at

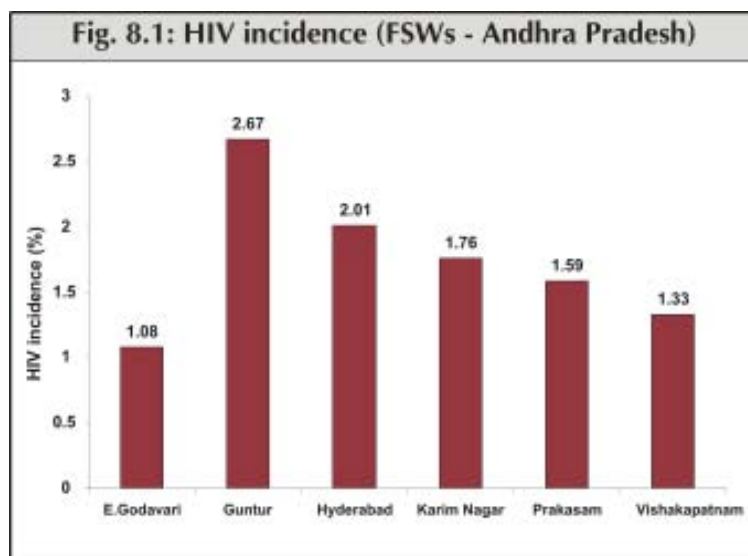


Fig. 8.2: HIV incidence (FSWs - Maharashtra)

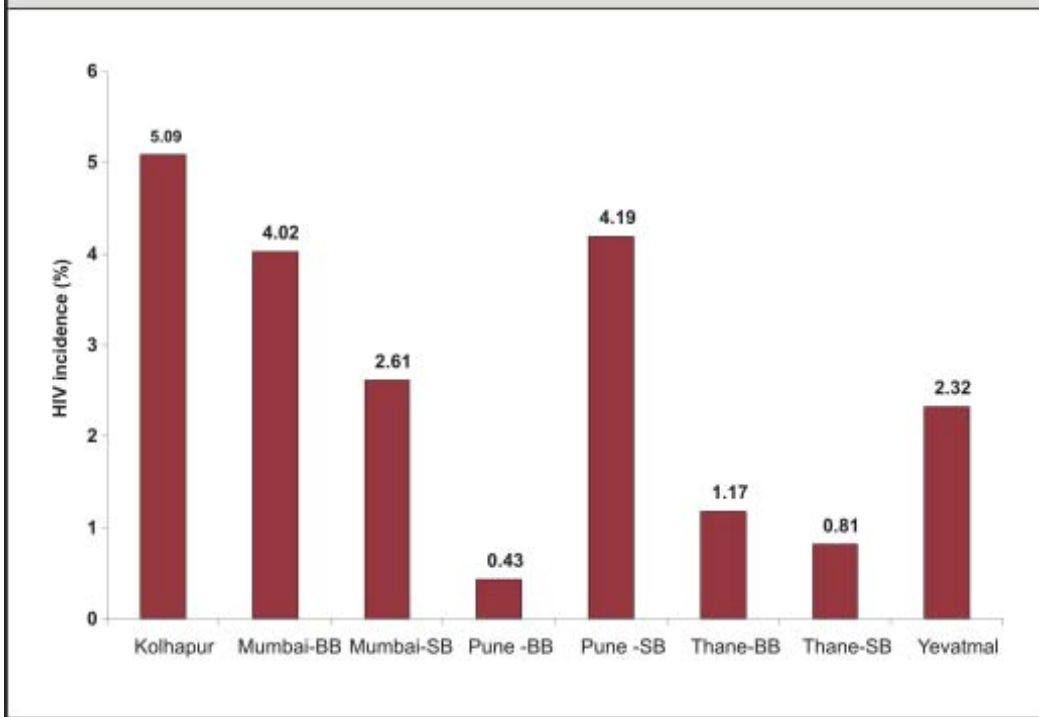
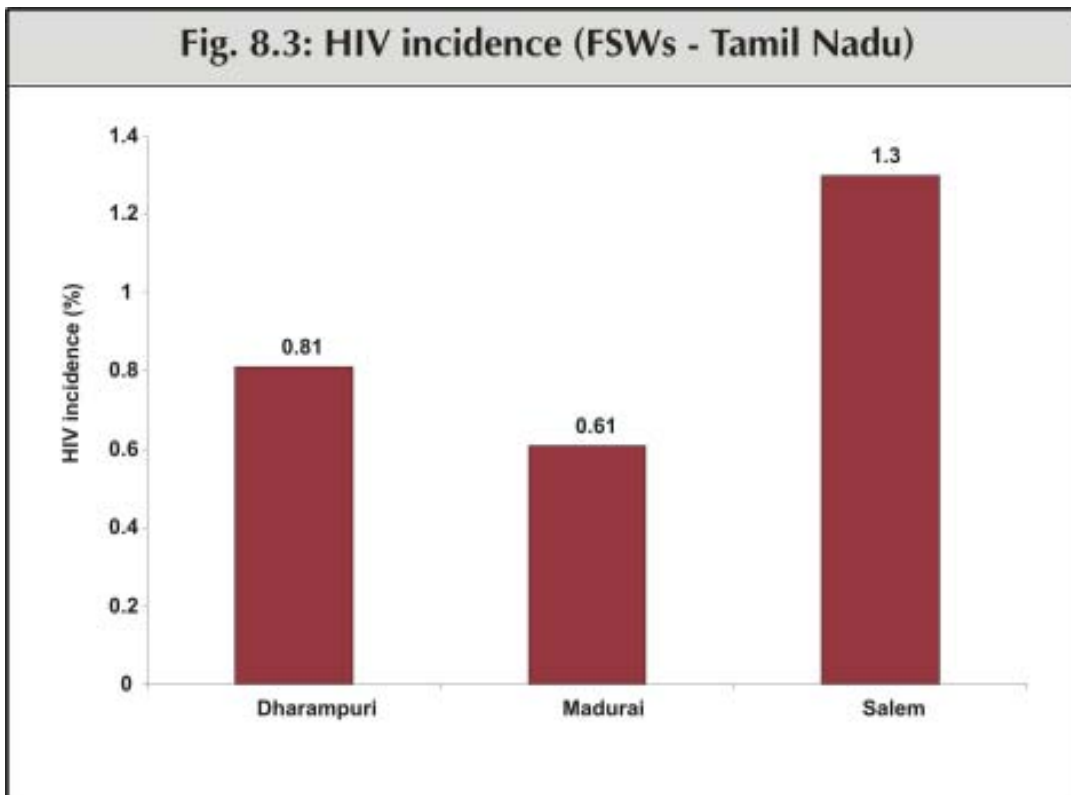
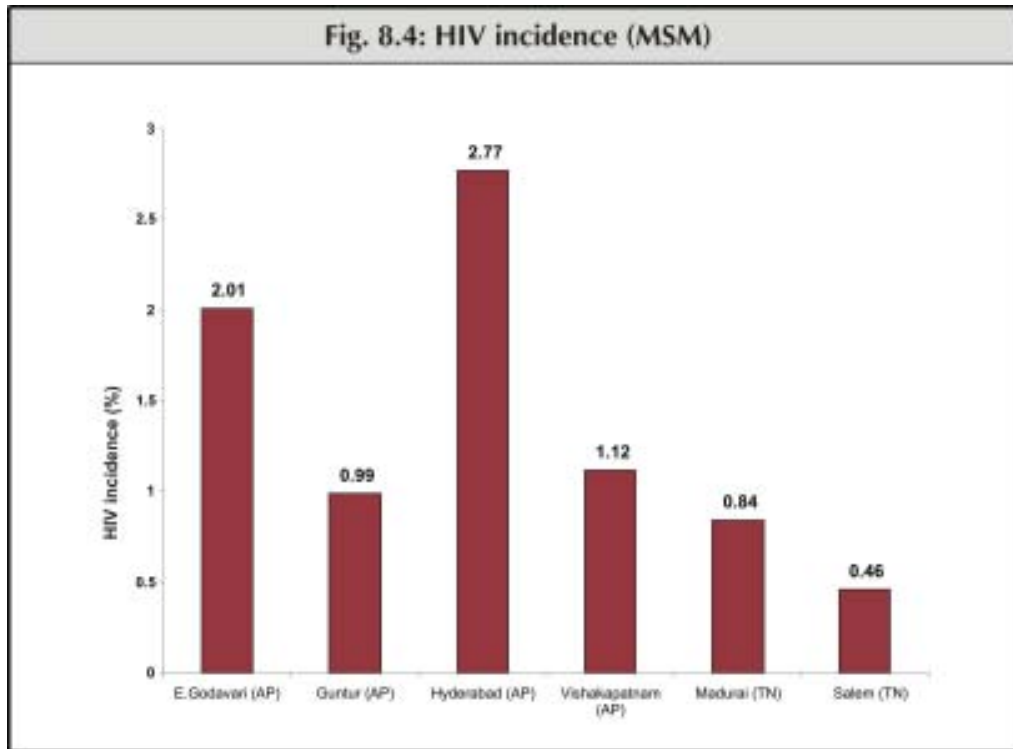


Fig. 8.3: HIV incidence (FSWs - Tamil Nadu)





the district level. The incidence rates presented here are therefore only indicative. HIV incidence for the various subgroups was calculated for 17 FSW groups and 7 MSM groups. Figs 8.1 to 8.4 show the incidence rates by districts and groups. The incidence rates indicate that HIV incidence is highest among FSW populations in Maharashtra with highest incidence reported in Kolhapur district. Incidence rates in Tamil Nadu ranged from 0.61% in Madurai FSWs to 1.3 in Salem FSWs. The rates among FSWs in Andhra Pradesh ranged from 1.08% in East Godavari district to 2.67% in Guntur district. The rates among MSM across the districts ranged from 0.46% in Salem to 2.77% in Hyderabad district. Overall the incidence rates were highest in Maharashtra districts followed by Andhra Pradesh districts and lowest in Tamil Nadu districts.

APPENDIX 1:

Formation of time location clusters in a given district

Each street based site is assumed to have four Time Location Clusters (TLCs) based on day and time of activity.

Peak Day + Peak Time - TLC-1

Peak Day + Lean Time - TLC-2

Lean Day + Peak Time - TLC-3

Lean Day + Lean Time - TLC-4

A Delphi like method was used to obtain minimum and maximum sizes of each TLC. Measure of size was arrived at for each TLC, based on this data.

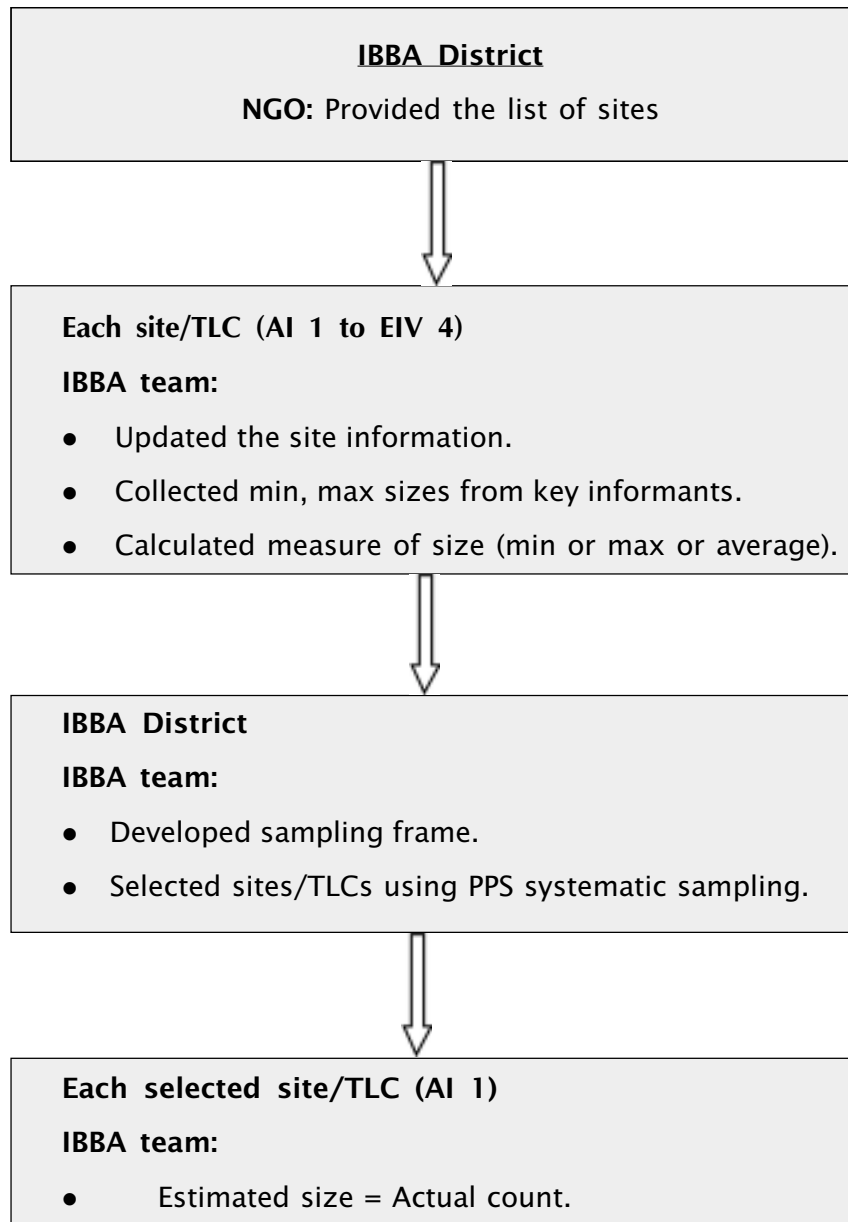
For example:

	A	B	C	D	E
I	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4
II	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4
III	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4
IV	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4	---- 1 ---- 2 ---- 3 ---- 4

A-I to E-IV are 20 street based sites in a district. Each site contributes four TLCs viz., AI-1, AI-2, AI-3, and AI-4; In all, there will be 80 TLCs.

Flowchart showing sampling frame development and cluster selection

Sampling frame development and cluster selection for IBBA survey in an IBBA district



APPENDIX 2:

IBBA DATA MANAGEMENT

The task of management and analysis of the IBBA data required well-delineated, clear and systematic procedures given the multi-center nature of the assessment, anonymity of data, multiple categories of sub-populations, large number of behavioural variables, evolving versions of questionnaires, biological data from various laboratories and appropriate analysis methods to suit different study designs and sampling procedures.

A team of Statisticians with extensive experience in handling large scale survey data was recruited for the central facility under the IBBA Data Management Group (DMG) at NIE, Chennai. This team coordinated multiple activities pertaining to management, analysis and reporting of the large volume of data generated by the IBBA.

Data entry programs were developed specific to different target groups across states and districts. To maintain accuracy of data, range checks, and logical and consistency checks were incorporated into the program. Double data entry was carried out using CSPRO (version 3.1) software. The first level data entry was done by the research agency and the second independent data entry of the same dataset was done by the respective state ICMR institute. Maximum accuracy was ensured by comparing, matching and accordingly correcting the two aforesaid data files. Corrected and cleaned raw data files were then transferred to the central data management facility at NIE, Chennai.

The multiplicity of tasks of the DMG included receiving datasets, data cleaning (second level), performing quality control checks, query processing, merging data files those were received in various formats, data preparation for statistical analysis, calculating standardized weights, recoding of variables, programming, analysis and report generation. Visiting various state ICMR Institutes by DMG personnel for on the spot clarification (if problem could not be sorted through communication) was also one of the tasks, which further facilitated the data management process. Safe custody and confidential storage of the datasets was the responsibility of the DMG. All these activities were carried out for 45 groups (22 FSWs, 10 MSM/Hijras, 4 IDUs, and 9 clients of female sex workers).

Calculating and assigning precise weights for each group was an important step in the analysis process. This required extensive review of sampling frames, cluster information sheets

and the instruments used for mapping exercise. Discrepancies in the sampling frame and cluster information sheet received from various centers were sorted out through communication. In some instances, site visits were made by the team to discuss with the research agencies/state ICMR key personnel to resolve the issues. Usage of different terminology was the major problem in understanding the sampling frame and cluster information sheets used for mapping by different research agencies. A manual documenting the weight calculation for each survey group has been prepared for standardized approach.

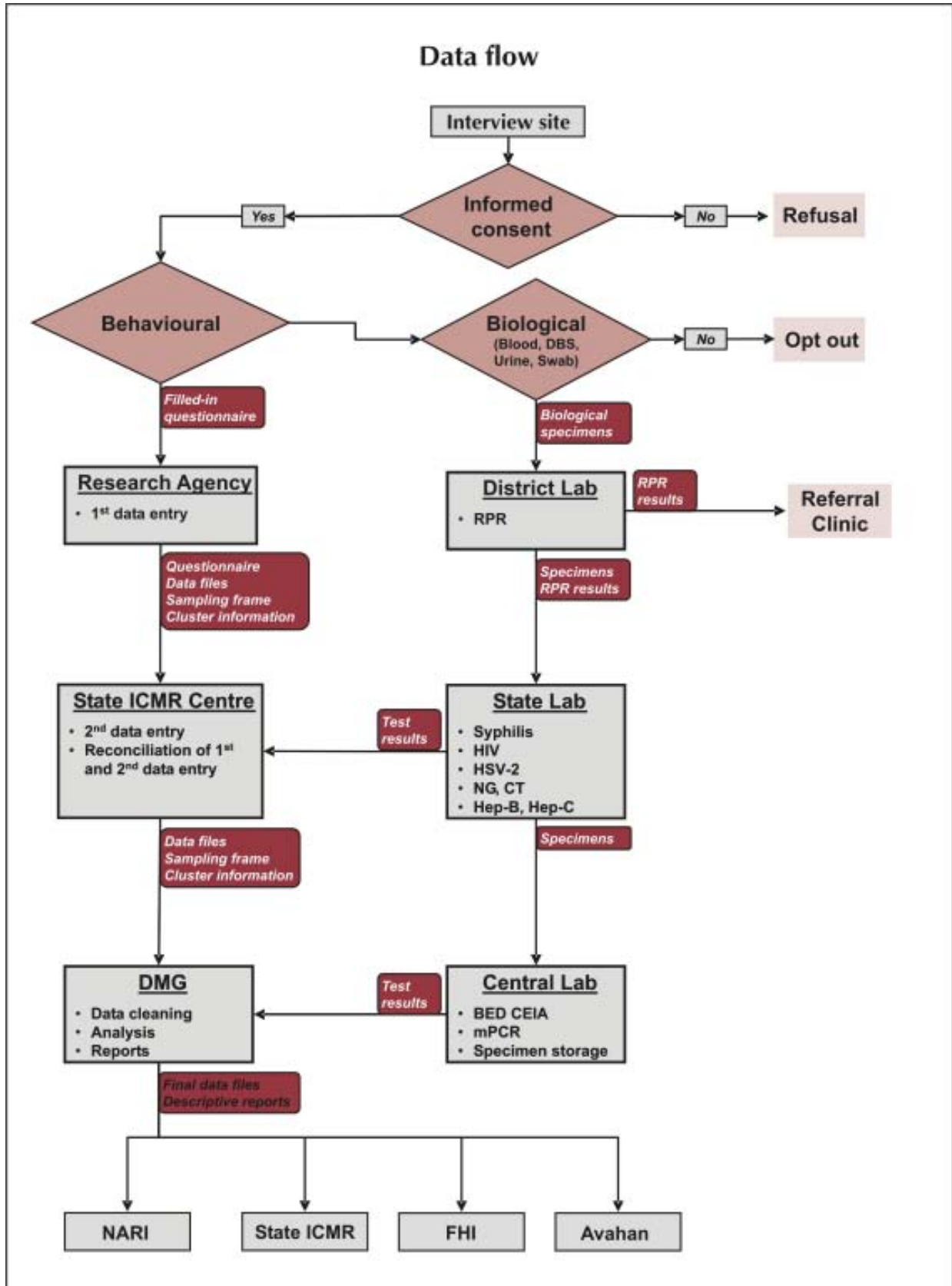
Behavioural questionnaires were lengthy and comprehensive. Frequency tables and cross-tables were generated extensively and reviewed to check for consistencies. Some of the issues were resolved by referring to the original filled-in forms stored at the respective state ICMR institutes. Discrepancies that could not be resolved were documented to facilitate possible explanations for unusual results, if any. During site visits to the states, laboratories were also visited to ensure compliance to the step-by-step procedures laid down for recording the coded results in the pre-specified formats.

Programs and SPSS syntax were developed to generate recoded data files so that response values were made uniform across various questionnaires. Detailed documentation of data dictionaries and data merging process were done. SPSS (version 14.0) and RDSAT (version 5.6.0) software were used for data analysis. Different versions of the questionnaire for a given group posed a major challenge in developing standardized program for generating reports and doing statistical analysis. Another challenge was to overcome the limitations of analyzing data in RDSAT. Complex sample analysis procedure of SPSS was used for estimates and their confidence intervals.

The DMG maintains and updates the IBBA database and necessary backups. Data is shared amongst partners as per a Data Management Policy.

Several alternatives for estimating size of the key population using data from IBBA and Avahan NGOs were examined. All these methods were highly assumptions dependent. A probability-based method (named as reverse tracking method for convenience) with minimal assumptions and using data available in the sampling frame and cluster information sheet was developed and used for size estimation.

The DMG was also responsible for preparation of the IBBA National Summary Report by coordinating with various agencies.



Female Sex Workers

TABLE F1: DEMOGRAPHIC PROFILE

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Mean age when started selling sex (years)	Typology street-based (%)	Practiced sex work at places traveled (last year) (%)	
Andhra Pradesh	Chittoor	30 (29.2-30.5)	36 (28.9-43.3)	95 (92.2-97.2)	80 (74.6-83.9)	25 (24.1-25.2)	31 (20.4-43.3)	67 (60.6-73.3)	
	East Godavari	31 (29.9-31.2)	33 (25.7-40.6)	88 (80.4-92.9)	69 (63.0-74.6)	23 (22.3-23.5)	36 (24.2-49.3)	75 (67.1-81.5)	
	Guntur	31 (30.0-31.5)	39 (30.8-47.0)	96 (92.6-97.2)	77 (70.8-82.4)	25 (24.0-25.2)	23 (13.9-36.2)	76 (70.6-80.4)	
	Hyderabad	30 (29.7-31.0)	14 (9.3-19.3)	96 (92.0-97.6)	76 (67.5-82.6)	25 (24.8-26.1)	82 (66.6-91.2)	ND	
	Karim Nagar	29 (28.5-29.6)	22 (15.2-31.1)	89 (82.5-93.3)	73 (66.8-79.1)	23 (22.5-23.5)	60 (46.9-70.9)	ND	
	Prakasam	29 (28.5-29.7)	32 (26.0-38.5)	96 (93.2-97.7)	79 (74.1-83.0)	24 (23.4-24.4)	32 (22.2-43.5)	71 (65.3-76.1)	
	Visakhapatnam	30 (29.2-30.6)	35 (29.2-41.9)	96 (92.8-97.7)	76 (70.3-80.6)	24 (23.0-24.0)	41 (30.1-53.1)	42 (37.3-47.4)	
	Warangal	29 (28.0-29.3)	21 (16.1-26.1)	81 (69.0-88.7)	74 (64.8-81.0)	21 (20.5-21.4)	49 (35.2-63.2)	ND	
	Karnataka	Bangalore (BB)	31 (30.0-31.6)	55 (47.4-61.4)	91 (87.2-94.4)	52 (45.9-57.7)	27 (26.3-27.7)	NA	11 (7.7-16.0)
		Bangalore (SB)	31 (29.9-31.4)	51 (44.4-58.0)	96 (93.0-97.6)	46 (38.6-54.5)	27 (26.0-27.4)	100 (99.0-100)	9 (6.3-12.9)
Belgaum		32 (30.7-32.3)	18 (13.3-23.6)	52 (43.1-61.4)	21 (15.4-26.9)	22 (21.0-22.3)	1 (0.5-3.0)	18 (12.2-25.2)	

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Mean age when started selling sex (years)	Typology street-based (%)	Practiced sex work at places traveled (last year) (%)
Bellary	420	31 (29.9-31.4)	38 (29.2-47.0)	56 (43.2-67.8)	31 (23.8-39.8)	22 (21.2-22.5)	2 (0.8-3.4)	15 (10.1-22.1)
Shimoga	390	32 (31.0-32.5)	42 (36.1-48.1)	93 (87.2-95.8)	49 (43.2-54.5)	26 (25.5-26.7)	1 (0.3-1.2)	13 (9.4-17.8)
Maharashtra								
Kolhapur*	115	30	23	85	45	24	68	0
Mumbai (All)	403	29 (28.4-29.9)	26 (21.0-31.4)	88 (83.6-92.2)	47 (39.6-52.4)	24 (23.8-25.2)	NA	2 (0.8-3.8)
Mumbai (BB)	407	30 (29.5-31.0)	15 (10.6-20.2)	80 (71.7-86.3)	33 (25.7-40.8)	22 (21.1-22.1)	NA	1 (0.3-2.8)
Mumbai (SB)	394	31 (30.6-32.1)	28 (21.5-34.4)	90 (84.6-93.1)	46 (38.6-53.2)	24 (23.4-24.8)	100 (99.2-100)	3 (1.6-6.4)
Parbhani	367	32 (30.9-32.6)	14 (10.9-18.3)	88 (83.4-92.7)	43 (37.0-49.6)	25 (24.2-25.4)	NA	7 (4.4-9.9)
Pune (BB)	404	29 (28.7-30.0)	23 (17.2-29.1)	63 (55.2-70.1)	24 (19.1-30.0)	22 (21.1-22.2)	NA	1 (0.5-3.3)
Pune (NBB)*	257	33	22	89	55	26	100	3
Thane (BB)	401	28 (27.1-28.3)	36 (30.4-41.5)	65 (58.7-70.3)	24 (19.8-30.0)	22 (21.5-22.5)	NA	3 (1.1-6.2)
Thane (SB)	394	27 (26.4-27.6)	56 (47.3-63.5)	84 (78.1-89.2)	39 (33.3-45.4)	24 (23.1-24.1)	100 (99.2-100)	0.5 (0.1-2.2)
Yevatmal*	153	28	22	86	34	24	3	7
Tamil Nadu								
Chennai	410	33 (32.4-33.7)	33 (26.8-40.1)	97 (94.4-98.4)	67 (60.1-72.9)	28 (27.7-28.8)	90 (82.5-94.5)	8 (4.5-12.7)

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Mean age when started selling sex (years)	Typology street-based (%)	Practiced sex work at places traveled (last year) (%)
Coimbatore	410	33 (32.0-33.3)	59 (53.4-64.8)	96 (92.5-98.3)	79 (72.6-84.0)	28 (27.2-28.4)	90 (78.7-95.6)	26 (21.6-31.3)
Dharmapuri	408	31 (30.6-31.8)	29 (24.0-34.8)	98 (95.5-98.8)	69 (61.0-76.1)	25 (24.8-25.8)	83 (66.3-92.7)	43 (37.3-49.8)
Madurai	402	32 (31.3-32.6)	45 (36.0-54.7)	97 (93.4-98.4)	76 (69.4-82.0)	26 (25.1-26.2)	90 (73.5-97.1)	62 (55.0-68.3)
Salem	402	33 (32.3-33.6)	29 (24.2-35.1)	98 (95.7-99.2)	76 (69.9-80.7)	28 (27.6-28.8)	85 (72.5-92.5)	25 (19.0-33.2)
Nagaland Dimapur	426	26 (25.0-26.3)	61 (55.0-67.0)	65 (59.4-71.9)	41 (36.7-46.4)	21 (20.1-21.0)	NA	53 (47.9-58.0)

Note: All types of female sex workers included unless otherwise indicated.

BB – Brothel-based (includes home-based and lodge-based); SB – Street-based (mobile or floating groups); NBB – Non-brothel based.

* 'Take-all' sampling. NA – Not applicable; ND – No data.

Female Sex Workers

TABLE F2: SERVICES RECEIVED FROM ANY AGENCY

State & District	No. of respondents	Contacted by a Peer/ORW (%)		Visited NGO Clinic (%)		Received condom from Peer/ORW (last year) (%)	Given information on STIs from Peer/ORW (last year) (%)
		Last year	Last month	Last year	Last 3 months		
Andhra Pradesh Chitoor	401	91 (86.0-93.8)	90 (85.8-93.6)	86 (80.6-89.5)	83 (78.1-87.5)	90 (85.4-93.4)	89 (83.8-92.4)
		94 (90.5-96.3)	93 (89.8-95.8)	83 (76.6-88.3)	78 (71.0-84.0)	92 (87.6-95.3)	91 (86.9-94.1)
Guntur	405	95 (92.4-97.0)	95 (92.1-96.7)	88 (83.1-90.9)	84 (79.5-88.3)	94 (91.3-96.5)	94 (91.5-96.3)
Hyderabad *	399	71 (62.8-78.0)	67 (58.6-73.9)	29 (22.1-36.3)	45 (37.4-52.0)	61 (52.3-68.7)	64 (56.1-70.6)
Karim Nagar *	412	53 (45.4-59.8)	ND	50 (41.2-58.4)	ND	62 (53.7-68.7)	57 (49.8-64.7)
Prakasam	404	87 (80.9-91.0)	84 (78.4-88.7)	74 (65.0-81.5)	70 (61.4-77.2)	86 (79.7-89.9)	82 (75.5-86.9)
Visakhapatnam	411	91 (87.5-94.0)	86 (81.6-89.5)	79 (72.6-84.1)	59 (52.1-64.9)	90 (85.8-92.7)	85 (79.3-88.8)
Warangal *	417	70 (63.4-76.6)	62 (54.3-68.4)	33 (25.8-41.0)	54 (45.5-61.9)	65 (57.5-71.3)	64 (57.2-70.7)
Karnataka*							
Bangalore (BB)	334	ND	86 (81.8-89.4)	65 (58.4-71.0)	ND	76 (69.9-80.9)	87 (83.0-90.4)
Bangalore (SB)	335	ND	87 (81.6-91.0)	70 (63.1-76.7)	ND	79 (72.8-83.8)	88 (82.6-92.1)

State & District	No. of respondents	Contacted by a Peer/ORW (%)		Visited NGO Clinic (%)		Received condom from Peer/ORW (last year) (%)	Given information on STIs from Peer/ORW (last year) (%)
		Last year	Last month	Last year	Last 3 months		
Belgaum	360	93 (87.8-96.6)	ND	84 (77.2-89.2)	ND	91 (85.9-94.5)	89 (84.0-93.0)
Bellary	420	92 (86.3-95.1)	ND	82 (73.4-88.5)	ND	89 (83.3-93.4)	91 (85.1-94.4)
Shimoga	390	68 (61.3-74.2)	ND	49 (41.7-55.5)	ND	55 (48.1-61.6)	68 (60.8-73.8)
Maharashtra							
Kolhapur	115	24	24	23	17	24	25
Mumbai (All)	403	34 (28.2-42.2)	34 (27.8-41.9)	31 (25.1-38.7)	26 (20.6-32.8)	34 (27.4-41.9)	31 (24.5-37.2)
Mumbai (BB)	407	30 (23.0-38.0)	36 (28.7-44.2)	35 (28.5-42.4)	24 (18.7-30.8)	41 (33.5-49.0)	33 (26.2-40.0)
Mumbai (SB)	394	26 (19.9-32.9)	28 (21.7-35.6)	29 (22.2-36.4)	22 (16.2-28.6)	30 (23.7-38.3)	25 (18.8-31.7)
Parbhani	367	32 (26.0-38.1)	31 (25.7-38.6)	26 (20.1-32.5)	20 (14.2-24.9)	33 (28.1-40.9)	28 (23.0-33.2)
Pune (BB)	404	70 (63.1-75.7)	65 (58.2-71.3)	51 (43.5-57.9)	35 (28.7-41.3)	71 (64.6-77.0)	67 (59.8-72.8)
Pune (NBB)	257	40	40	40	30	44	40
Thane (BB)	401	85 (80.7-89.1)	85 (80.6-89.0)	81 (76.2-85.0)	75 (69.4-79.4)	86 (82.1-90.0)	82 (77.4-86.4)
Thane (SB)	394	31 (23.0-40.4)	31 (22.9-40.8)	30 (22.4-39.9)	27 (20.5-34.9)	31 (22.9-40.8)	30 (22.5-38.0)
Yavatmal	153	83	83	69	63	86	56

State & District	No. of respondents	Contacted by a Peer/ORW (%)		Visited NGO Clinic (%)		Received condom from Peer/ORW (last year) (%)	Given information on STIs from Peer/ORW (last year) (%)
		Last year	Last month	Last year	Last 3 months		
Tamil Nadu Chennai	410	30 (22.6-39.4)	30 (22.5-39.2)	30 (22.6-39.4)	30 (22.1-38.7)	30 (22.6-39.3)	30 (22.8-39.5)
		58 (51.2-64.5)	56 (48.8-62.0)	58 (51.5-64.7)	55 (48.6-61.9)	56 (49.7-62.9)	57 (50.3-63.8)
Dharmapuri	408	78 (71.6-82.9)	79 (73.1-84.0)	76 (69.2-81.3)	74 (67.1-79.1)	77 (70.6-82.0)	75 (68.7-80.4)
		80 (73.1-85.4)	73 (65.0-79.1)	75 (67.2-81.1)	69 (60.8-76.5)	71 (62.0-78.1)	72 (64.7-78.7)
Salem	402	69 (60.2-76.5)	71 (62.1-77.9)	71 (63.0-78.3)	69 (60.0-76.0)	65 (56.5-73.2)	70 (61.8-77.3)
		26 (21.7-30.3)	ND	26 (21.7-30.3)	ND	23 (19.1-27.3)	22 (18.2-26.3)
Nagaland Dimapur	426						

* In the case of Hyderabad, Karim Nagar, Warangal and Karnataka, data given under 'last year' represent last 6 months only.

ND - No data.

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TABLE F3: STI KNOWLEDGE AND TREATMENT SEEKING BEHAVIOUR

State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3+ STI symptoms** (%)*	Vaginal discharge, abdominal pain or ulcer (last year) (%)	Action taken for the most recent symptom (%)*		Had any one of the three STI symptoms (last year) (current) (%)	
					From trained care	Took preventive measures		
Andhra Pradesh	Chittoor	401	96 (92.9-97.5)	97 (93.8-98.1)	85 (80.5-88.7)	89 (83.3-92.8)	62 (53.6-68.9)	59 (53.1-64.5)
	East Godavari	422	97 (94.0-98.1)	90 (84.7-93.2)	78 (70.1-84.2)	88 (79.2-92.8)	80 (72.3-86.1)	63 (54.9-69.9)
	Guntur	405	97 (94.8-98.5)	83 (78.0-87.1)	88 (84.2-91.3)	92 (88.3-95.1)	79 (73.0-83.8)	76 (70.1-81.1)
	Hyderabad	399	88 (82.7-91.3)	80 (73.6-85.6)	52 (43.9-59.0)	80 (69.9-87.4)	52 (42.9-61.9)	35 (28.5-41.2)
	Karim Nagar	412	81 (75.5-85.2)	81 (74.5-86.8)	76 (69.6-81.9)	78 (66.2-86.2)	45 (35.5-55.0)	65 (57.0-72.1)
	Prakasam	404	96 (93.2-97.9)	91 (87.1-94.2)	68 (62.9-73.5)	95 (90.2-97.2)	65 (57.8-70.9)	50 (44.0-55.7)
	Visakhapatnam	411	99 (97.4-99.6)	93 (88.8-96.1)	54 (47.0-59.9)	95 (90.8-97.1)	74 (65.8-80.7)	33 (26.8-39.6)
	Warangal	417	91 (86.1-94.5)	66 (58.2-73.3)	89 (84.4-92.7)	88 (82.4-92.0)	60 (50.7-68.6)	75 (67.8-81.0)
Karnataka	Bangalore (BB)	334	81 (75.9-85.4)	44 (38.4-49.8)	52 (46.5-58.1)	96 (91.2-98.3)	78 (71.0-83.8)	39 (33.5-44.8)
	Bangalore (SB)	335	85 (79.7-89.2)	42 (35.8-48.2)	51 (42.3-59.2)	94 (88.8-96.5)	76 (68.3-81.8)	40 (32.7-47.8)

State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3+ STI symptoms** (%)*	Vaginal discharge, abdominal pain or ulcer (last year) (%)	Action taken for the most recent symptom (%)*		Had any one of the three STI symptoms (last year) (current) (%)
					From trained care	Took preventive measures	
Belgaum	360	88 (82.8-91.3)	35 (26.6-45.6)	35 (26.9-43.1)	93 (79.1-97.8)	76 (62.1-85.6)	28 (21.0-35.6)
Bellary	420	78 (69.0-84.3)	31 (24.1-39.3)	46 (38.1-53.2)	81 (69.0-89.6)	61 (48.0-73.1)	35 (27.6-42.3)
Shimoga	390	64 (58.4-69.9)	60 (54.6-65.9)	38 (32.2-45.1)	75 (66.8-82.2)	63 (52.2-72.3)	30 (24.6-36.8)
Maharashtra							
Kolhapur	115	51	24	34	80	67	14
Mumbai (All)	403	58 (51.5-63.1)	52 (39.3-66.8)	19 (14.5-23.2)	89 (82.7-100)	29 (0.0-37.2)	10 (6.6-13.6)
Mumbai (BB)	407	67 (58.9-73.8)	56 (45.1-66.0)	22 (16.3-27.7)	67 (52.1-79.0)	48 (33.7-62.9)	14 (9.7-18.8)
Mumbai (SB)	394	55 (46.3-63.1)	85 (78.6-89.7)	16 (12.7-21.1)	63 (45.9-77.5)	70 (53.6-82.1)	9 (5.8-12.8)
Parbhani	367	83 (77.0-87.2)	34 (28.8-40.8)	22 (18.2-27.2)	63 (44.7-78.4)	48 (29.2-85.1)	16 (12.0-20.1)
Pune (BB)	404	70 (61.6-76.9)	49 (41.4-56.1)	24 (18.2-30.0)	69 (55.2-79.7)	88 (76.3-94.0)	10 (6.5-14.5)
Pune (NBB)	257	65	63	25	70	70	12
Thane (BB)	401	78 (72.4-82.0)	80 (74.3-84.9)	23 (18.4-28.9)	59 (46.9-70.0)	46 (33.8-58.3)	18 (13.9-23.5)
Thane (SB)	394	71 (62.6-77.9)	84 (78.2-88.3)	15 (10.3-20.5)	54 (41.7-65.9)	36 (26.2-46.9)	10 (6.3-14.8)
Yavatmal	153	43	29	32	76	69	15

State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3+ STI symptoms** (%)*	Vaginal discharge, abdominal pain or ulcer (last year) (%)	Action taken for the most recent symptom (%)*		Had any one of the three STI symptoms (last year) (current) (%)
					From trained care	Took preventive measures	
Tamil Nadu Chennai	410	78 (70.6-84.6)	76 (70.2-81.6)	7 (4.3-10.8)	66 (48.6-80.1)	68 (49.9-82.2)	2 (1.1-3.7)
Dharmapuri	408	90 (86.3-93.3)	57 (49.6-64.5)	72 (65.9-77.6)	95 (90.7-97.2)	89 (79.2-94.4)	37 (30.5-45.1)
Madurai	402	93 (90.5-95.4)	58 (49.1-66.1)	57 (50.3-64.2)	88 (82.3-92.4)	79 (72.1-85.1)	25 (19.1-31.4)
Salem	402	84 (78.6-89.0)	64 (56.0-72.0)	45 (37.1-53.3)	94 (87.3-97.1)	80 (72.1-86.4)	25 (19.1-32.1)
Nagaland Dimapur	426	73 (68.1-78.2)	37 (30.6-42.8)	79 (73.9-83.1)	64 (57.5-69.1)	82 (76.4-85.4)	67 (61.7-72.5)

* Based on subset of respondents applicable for that analysis.

** Of the 6 symptoms, viz., lower abdominal pain, lower abdominal pain, foul-smelling vaginal discharge, burning on urination, genital ulcer / sore, swelling in groin area, and itching in genital area.

Female Sex Workers

TABLE F4: HIV/AIDS AWARENESS AND KNOWLEDGE

State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Believe HIV/AIDS can be prevented (%)*	Feel at risk of being infected with HIV/AIDS (%)*	Correct knowledge on HIV/AIDS (%)*	Misconception about HIV/AIDS (%)*	Ever undergone HIV test (%)*
Andhra Pradesh							
Chittoor	401	98 (95.1-98.9)	97 (94.3-98.4)	63 (55.6-69.1)	12 (8.6-17.4)	59 (51.1-67.0)	51 (44.7-57.9)
East Godavari	422	100 (98.6-100)	94 (91.3-96.4)	56 (46.1-65.6)	22 (15.5-31.5)	43 (35.7-51.5)	66 (55.4-74.7)
Guntur	405	100 (98.5-100)	93 (89.7-95.8)	47 (41.5-53.2)	14 (10.0-19.7)	55 (49.1-60.7)	75 (68.1-80.1)
Hyderabad	399	93 (87.8-96.3)	83 (76.1-88.2)	38 (30.3-46.1)	23 (15.2-32.7)	45 (36.8-53.1)	45 (35.6-55.0)
Karim Nagar	412	96 (92.7-97.4)	87 (82.4-90.7)	41 (33.0-50.2)	12 (8.0-16.2)	45 (37.2-53.0)	55 (45.1-64.2)
Prakasam	404	98 (95.9-99.1)	100 (99.1-100)	66 (58.9-72.1)	7 (4.2-10.5)	62 (56.1-67.9)	38 (32.5-43.2)
Visakhapatnam	411	100 (99.0-100)	98 (97.1-99.2)	70 (63.8-74.6)	32 (26.0-38.3)	58 (51.2-65.1)	58 (52.0-63.1)
Warangal	417	97 (89.8-99.0)	91 (86.2-93.8)	58 (48.9-67.0)	16 (11.4-21.3)	38 (30.5-45.7)	77 (68.5-83.3)
Karnataka							
Bangalore (BB)	334	98 (96.3-99.5)	93 (88.5-95.4)	27 (21.8-33.1)	50 (44.6-55.6)	30 (25.3-35.7)	37 (31.0-44.1)
Bangalore (SB)	335	97 (94.9-98.6)	92 (87.8-95.4)	30 (24.2-35.9)	47 (40.0-54.8)	29 (23.6-34.5)	39 (31.2-48.1)
Belgaum	360	97 (93.1-98.8)	88 (82.8-91.7)	27 (21.9-33.4)	18 (12.2-26.3)	55 (46.9-62.1)	35 (28.3-44.1)
Bellary	420	96 (92.3-98.0)	83 (76.2-88.1)	25 (19.9-30.2)	23 (15.3-34.1)	49 (40.4-57.6)	20 (14.7-26.9)
Shimoga	390	92 (87.6-94.3)	75 (68.7-79.7)	22 (17.2-27.1)	29 (21.5-37.1)	30 (25.4-35.2)	22 (18.0-26.8)

State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Believe HIV/AIDS can be prevented (%)*	Feel at risk of being infected with HIV/AIDS (%)*	Correct knowledge on HIV/AIDS (%)*	Misconception about HIV/AIDS (%)*	Ever undergone HIV test (%)*
Maharashtra							
Kolhapur	115	83	57	72	6	65	35
Mumbai (All)	403	94 (89.9-95.9)	62 (55.9-69.7)	33 (22.6-40.7)	14 (9.1-21.5)	16 (11.5-19.7)	45 (38.6-57.2)
Mumbai (BB)	407	86 (75.5-91.9)	40 (32.7-47.5)	52 (39.1-64.6)	45 (33.3-56.4)	34 (26.6-41.1)	57 (44.3-68.9)
Mumbai (SB)	394	86 (79.5-90.5)	33 (26.5-40.3)	73 (58.6-83.4)	30 (20.8-40.8)	40 (31.8-48.5)	72 (62.0-80.4)
Parbhani	367	96 (93.4-97.5)	64 (56.9-70.8)	67 (59.9-74.1)	41 (30.7-44.9)	37 (32.0-42.3)	18 (12.6-24.0)
Pune (BB)	404	96 (92.4-97.4)	65 (57.9-70.7)	65 (53.0-74.7)	36 (28.0-45.6)	28 (20.1-36.7)	48 (38.3-58.6)
Pune (NBB)	257	92	40	73	28	43	59
Thane (BB)	401	98 (95.1-98.9)	61 (55.3-67.0)	39 (32.0-47.2)	43 (35.9-50.2)	19 (14.8-24.3)	43 (36.1-50.1)
Thane (SB)	394	98 (94.4-99.0)	84 (79.3-87.6)	25 (18.8-33.2)	52 (45.5-59.0)	11 (7.6-16.2)	36 (28.5-43.3)
Yavatmal	153	82	43	52	9	31	37
Tamil Nadu							
Chennai	410	97 (93.4-98.5)	97 (95.1-98.5)	12 (8.4-16.9)	53 (47.1-59.3)	25 (19.2-31.3)	20 (15.1-26.2)
Coimbatore	410	93 (89.6-95.7)	94 (90.1-96.3)	20 (15.7-24.9)	35 (28.7-42.4)	28 (22.3-35.1)	44 (38.0-49.5)
Dharmapuri	408	93 (89.6-94.9)	91 (87.2-93.9)	12 (8.6-17.3)	37 (29.4-45.6)	35 (29.5-41.2)	25 (19.3-32.6)
Madurai	402	97 (94.5-98.5)	91 (86.5-94.0)	40 (31.0-50.1)	10 (6.4-16.4)	59 (50.2-67.9)	46 (39.1-52.5)
Salem	402	92 (86.7-95.3)	95 (90.4-97.1)	34 (27.5-41.5)	50 (41.3-59.1)	46 (38.9-54.0)	25 (18.7-33.5)
Nagaland							
Dimapur	426	87 (83.3-91.3)	71 (65.3-76.5)	80 (74.3-84.2)	2 (0.5-3.6)	72 (65.8-76.4)	11 (7.7-14.8)

* Based on subset of respondents applicable for that analysis.

Female Sex Workers

TABLE F5: SEXUAL HISTORY, CONDOM USE WITH OCCASIONAL AND REGULAR MALE CLIENTS

State & District	No. of respondents	Mean number of clients			Occasional clients (%)			Regular clients (%)		
		Last day	Last week	Had occasional clients	Condom use*		Had regular clients	Condom use*		
					Last time	Consistent		Last time	Consistent	
Andhra Pradesh	Chittoor	2.5 (2.4-2.6)	10.1 (9.6-10.6)	99 (97.2-99.4)	85 (79.8-88.6)	36 (30.4-42.2)	100 (98.2-100)	64 (56.8-71.1)	15 (11.5-19.1)	
	East Godavari	2.9 (2.7-3.0)	10.9 (10.2-11.7)	93 (85.9-96.9)	93 (88.3-95.8)	82 (75.4-87.1)	94 (89.2-96.5)	89 (84.1-92.8)	76 (69.4-81.6)	
	Guntur	2.9 (2.8-3.1)	11.4 (10.8-12.0)	98 (95.0-98.8)	95 (91.8-97.4)	85 (79.6-89.1)	100 (98.7-100)	92 (88.5-94.9)	85 (79.5-89.1)	
	Hyderabad	1.7 (1.6-1.8)	5.4 (5.1-5.7)	93 (89.3-95.6)	95 (90.8-97.1)	56 (47.1-63.8)	81 (71.1-88.5)	92 (87.2-94.8)	64 (54.6-72.8)	
	Karim Nagar	2.1 (2.0-2.2)	5.9 (5.5-6.3)	88 (83.4-92.2)	91 (86.6-94.1)	73 (65.9-79.2)	100 (98.9-100)	85 (79.0-88.9)	63 (56.7-68.4)	
	Prakasam	2.6 (2.6-2.8)	12.1 (11.5-12.8)	100 (98.8-100)	81 (76.7-85.1)	40 (35.1-44.9)	97 (93.3-98.5)	64 (56.1-71.4)	17 (13.2-22.1)	
	Visakhapatnam	3.0 (2.9-3.1)	11.3 (10.7-12.0)	99 (97.6-99.6)	94 (90.4-96.0)	89 (84.6-92.3)	97 (94.5-98.3)	94 (89.7-96.3)	81 (76.1-85.0)	
	Warangal	2.2 (2.1-2.4)	7.0 (6.6-7.4)	100 (99.2-100)	89 (83.7-93.2)	85 (78.3-89.8)	100 (98.8-100)	84 (78.1-89.3)	79 (71.4-85.0)	
	Karnataka	Bangalore (BB)	1.9 (1.8-2.1)	9.2 (8.5-9.9)	97 (93.4-98.3)	94 (90.3-96.1)	81 (76.4-85.5)	89 (84.0-92.7)	77 (71.7-81.8)	63 (57.1-68.3)
		Bangalore (SB)	2.1 (1.9-2.2)	10.1 (9.3-11.0)	99 (94.7-99.6)	94 (90.3-95.8)	77 (70.6-82.3)	87 (82.1-91.1)	74 (67.9-78.7)	59 (52.2-65.6)
Belgaum		2.6 (2.4-2.8)	15.6 (14.0-17.3)	99 (97.7-99.8)	98 (95.4-99.2)	92 (85.6-95.6)	97 (92.7-98.8)	88 (82.8-91.8)	78 (71.1-83.0)	
Bellary		2.2 (2.0-2.4)	12.6 (11.1-14.2)	88 (78.9-93.9)	91 (84.5-95.0)	80 (73.6-85.4)	97 (92.5-98.7)	80 (73.6-85.4)	69 (61.3-75.4)	
Shimoga		1.7 (1.6-1.8)	5.2 (4.8-5.7)	96 (92.3-97.7)	76 (69.4-81.2)	55 (47.7-62.2)	98 (94.5-99.3)	68 (60.8-73.9)	48 (40.7-54.6)	

State & District	No. of respondents	Mean number of clients		Occasional clients (%)			Regular clients (%)			
		Last day	Last week	Had occasional clients	Condom use*		Had regular clients	Condom use*		
					Last time	Consistent		Last time	Consistent	
Maharashtra Kolhapur Mumbai (All) Mumbai (BB) Mumbai (SB) Parbhani Pune (BB) Pune (NBB) Thane (BB) Thane (SB) Yavatmal	115	3.6	12.1	95	88	93	77	98	89	
	403	1.7 (1.6-1.8)	4.1 (3.7-4.6)	67 (60.6-72.1)	76 (68.5-85.4)	73 (60.4-79.3)	83 (77.6-86.8)	81 (75.9-88.3)	67 (60.9-76.0)	
	407	3.0 (2.8-3.2)	12.8 (11.7-13.9)	91 (83.2-95.5)	97 (93.8-98.4)	78 (70.8-84.5)	76 (68.1-83.1)	93 (83.2-97.1)	75 (66.3-81.7)	
	394	2.2 (2.1-2.3)	8.6 (8.0-9.2)	90 (85.1-93.7)	97 (94.5-98.8)	72 (62.8-79.2)	69 (61.3-75.4)	94 (87.3-97.2)	56 (45.0-66.2)	
	367	2.0 (2.1-2.4)	9.0 (8.0-9.6)	93 (89.9-96.4)	93 (90.2-96.4)	88 (83.9-92.8)	70 (64.7-74.0)	91 (85.5-96.5)	84 (75.7-90.5)	
	404	2.8 (2.6-2.9)	12.0 (11.3-12.8)	99 (98.1-99.7)	98 (96.1-99.2)	96 (93.2-98.0)	76 (67.7-83.2)	99 (97.9-99.9)	95 (91.4-97.5)	
	257	2.2	9.2	98	97	87	75	98	84	
	401	2.7	9.4	98	99	99	97	98	97	
	394	2.0 (1.9-2.1)	7.4 (7.0-7.8)	96 (93.3-98.2)	98 (93.7-99.1)	98 (93.5-99.1)	87 (81.2-90.9)	98 (96.1-99.3)	92 (86.3-95.1)	
	153	4.4	18.7	99	96	95	65	96	87	
	Tamil Nadu Chennai Coimbatore Dharmapuri Madurai Salem	410	1.8 (1.8-1.9)	5.6 (5.3-5.9)	85 (78.6-89.5)	96 (91.6-97.6)	91 (85.9-94.5)	92 (87.2-94.5)	95 (91.3-97.1)	91 (86.3-93.9)
		410	2.0 (1.9-2.1)	6.1 (5.7-6.4)	80 (74.3-84.7)	93 (89.2-95.9)	41 (35.2-46.9)	98 (96.3-99.4)	86 (82.5-89.7)	42 (35.9-48.8)
		408	2.7 (2.6-2.9)	10.4 (9.6-11.2)	96 (93.3-97.4)	95 (91.2-97.0)	69 (63.1-73.9)	100 (98.8-100)	97 (95.1-98.7)	67 (60.5-73.0)
402		2.0 (1.9-2.1)	5.6 (5.2-6.0)	80 (73.1-86.1)	84 (78.4-89.2)	70 (63.9-76.4)	96 (92.4-98.0)	85 (77.9-90.0)	64 (56.3-71.1)	
402		2.2 (2.1-2.3)	7.5 (7.1-8.0)	78 (69.9-84.1)	93 (87.0-96.4)	79 (72.1-84.2)	94 (89.6-96.9)	87 (80.9-91.1)	66 (58.3-73.3)	
426		1.9 (1.8-2.0)	6.2 (5.8-6.7)	100 (99.0-100)	36 (31.2-41.5)	11 (8.4-15.1)	99 (97.6-99.6)	26 (21.7-30.9)	5 (3.6-7.3)	

Occasional clients – Clients who visited the respondent only once or a few times and the respondent do not remember them.

Regular clients – Clients who visited the respondent regularly/repeatedly and respondent knows them.

* Based on subset of respondents applicable for that analysis.

Female Sex Workers

TABLE F6: CONDOM USE WITH NON-PAYING SEXUAL PARTNERS

State & District	No. of respondents	Regular non-paying partner (%)			Other non-paying partner (%)	
		Had regular non-paying partner	Condom use*		Had other non-paying partners	Condom use (last time)*
			Last time	Consistent		
Andhra Pradesh						
Chitoor	401	80 (75.3-84.4)	9 (6.2-14.0)	1 (0.1-5.7)	14 (10.9-18.9)	44 (29.2-61.0)
East Godavari	422	70 (63.5-75.0)	28 (17.3-40.7)	17 (11.0-25.9)	15 (9.5-22.1)	84 (69.9-92.3)
Guntur	405	78 (71.5-82.9)	29 (21.4-38.8)	15 (10.7-20.7)	16 (12.6-21.3)	86 (74.9-92.6)
Hyderabad	399	78 (70.4-83.6)	7 (4.4-12.3)	4 (2.3-7.7)	10 (7.0-14.8)	52 (32.5-71.5)
Karim Nagar	412	82 (76.4-87.2)	17 (12.3-23.0)	9 (5.5-14.9)	38 (29.8-48.0)	46 (30.4-63.3)
Prakasam	404	80 (74.8-84.0)	10 (6.7-14.1)	1 (0.1-4.0)	18 (14.5-23.2)	30 (19.7-43.1)
Visakhapatnam	411	74 (67.4-78.8)	25 (19.2-31.8)	8 (4.9-13.4)	17 (12.3-22.3)	64 (44.2-80.3)
Warangal	417	76 (67.3-83.2)	16 (11.0-22.7)	2 (0.9-4.3)	36 (28.2-45.4)	57 (44.9-68.6)
Karnataka						
Bangalore (BB)	334	68 (58.6-75.4)	22 (16.3-27.9)	13 (9.0-18.7)	12 (8.2-17.5)	42 (25.5-60.3)
Bangalore (SB)	335	69 (60.6-75.9)	18 (12.1-26.3)	13 (8.4-20.8)	12 (7.7-17.9)	41 (23.8-61.4)
Belgaum	360	48 (40.4-56.3)	53 (43.5-63.1)	39 (28.5-50.6)	8 (4.5-12.7)	59 (41.1-74.5)
Bellary	420	68 (59.9-74.4)	55 (44.8-64.7)	48 (35.6-58.1)	18 (12.6-25.5)	78 (64.0-87.3)
Shimoga	390	71 (65.5-76.6)	37 (29.8-44.6)	21 (16.3-26.8)	21 (16.5-26.1)	51 (36.5-66.0)
Maharashtra						
Kolhapur	115	55	32	29	4	20
Mumbai (All)	403	53 (46.7-59.4)	25 (16.1-37.9)	12 (5.1-23.8)	5 (2.6-6.7)	62 (42.1-79.4)
Mumbai (BB)	407	24 (18.3-30.7)	44 (31.5-56.6)	14 (7.4-25.1)	1 (0.5-4.3)	76 (28.7-96.1)

State & District	No. of respondents	Regular non-paying partner (%)			Other non-paying partner (%)	
		Had regular non-paying partner	Condom use*		Had other non-paying partners	Condom use (last time)*
			Last time	Consistent		
Mumbai (SB)	394	38 (30.3-45.3)	35 (25.1-45.9)	13 (7.5-20.2)	1 (0.4-4.3)	56 (9.8-94.0)
Parbhani	367	46 (40.2-53.1)	49 (40.2-57.9)	39 (27.9-48.1)	4 (2.1-6.2)	-
Pune (BB)	404	33 (27.2-39.7)	32 (23.5-42.4)	27 (19.0-37.4)	0 (0.0-0.8)	NA
Pune (NBB)	257	44	23	19	0	NA
Thane (BB)	401	36 (30.4-41.7)	64 (55.3-72.6)	58 (48.2-66.6)	1 (0.3-3.7)	100 (34.1-100)
Thane (SB)	394	42 (36.0-49.0)	33 (25.1-41.8)	19 (12.2-29.1)	0.5 (0.1-1.5)	100 (34.1-100)
Yevatmal	153	39	25	19	3	25
Tamil Nadu						
Chennai	410	64 (57.1-70.1)	12 (8.2-17.3)	6 (3.4-10.0)	5 (3.1-9.0)	48 (22.0-75.4)
Coimbatore	410	83 (78.2-86.8)	33 (27.3-39.8)	8 (5.1-12.0)	8 (5.2-11.9)	61 (42.0-76.7)
Dharmapuri	408	78 (72.8-82.0)	46 (37.9-53.6)	23 (16.3-31.2)	13 (9.0-17.5)	84 (69.9-92.0)
Madurai	402	77 (70.0-82.7)	32 (23.7-41.5)	16 (9.6-25.8)	20 (13.9-28.5)	80 (64.8-89.8)
Salem	402	78 (70.6-83.8)	32 (24.9-40.9)	13 (8.0-21.3)	19 (13.4-25.4)	68 (53.4-80.2)
Nagaland						
Dimapur	426	89 (85.6-91.6)	13 (9.9-16.5)	4 (2.5-6.4)	37 (31.8-42.2)	33 (22.4-45.0)

Regular non-paying male partner - Husband, boyfriend or live-in partner.

** Based on subset of respondents applicable for that analysis. NA - Not applicable.*

Female Sex Workers

TABLE F7: PREVALENCE OF HIV/STIS

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology** (%)	<i>N. gonorrhoeae</i> (%)	<i>C. trachomatis</i> (%)	Any STI** (%)	HIV among "any STI" positive (%)	HIV among "any STI" negative (%)
Andhra Pradesh	Chittoor	8.0 (5.3-12.0)	80.8 (63.5-91.0)	10.3 (6.5-16.1)	2.5 (1.2-5.1)	3.1 (1.4-6.8)	14.4 (9.9-20.4)	12.2 (5.7-24.3)	7.3 (4.4-12.0)
	East Godavari	26.3 (20.5-32.9)	87.4 (73.6-94.5)	15.0 (10.4-21.0)	1.2 (0.5-2.8)	3.2 (1.7-6.1)	18.9 (13.7-25.5)	34.9 (23.1-49.0)	24.2 (17.9-31.9)
	Guntur	21.3 (16.8-26.6)	85.4 (71.8-93.1)	8.6 (5.9-12.3)	1.3 (0.5-3.0)	1.7 (0.8-3.5)	11.1 (8.2-14.8)	30.6 (17.8-47.3)	20.1 (15.3-26.1)
	Hyderabad	14.3 (9.8-20.4)	79.8 (56.4-92.3)	17.4 (11.9-24.7)	6.4 (3.9-10.3)	6.5 (4.0-10.6)	24.1 (18.0-31.6)	21.4 (12.5-34.1)	12.1 (7.4-19.0)
	Karim Nagar	21.1 (14.1-30.4)	74.2 (49.7-89.3)	6.4 (4.0-9.9)	1.6 (0.7-3.5)	3.0 (1.8-5.1)	10.2 (7.3-14.2)	38.0 (24.0-54.3)	19.2 (11.9-29.5)
	Prakasam	11.1 (7.3-16.4)	64.6 (46.6-79.3)	5.2 (2.9-8.9)	0.2 (0.0-1.2)	3.4 (1.8-6.5)	7.6 (5.0-11.3)	14.1 (5.8-30.6)	10.8 (7.0-16.3)
	Visakhapatnam	14.2 (10.0-19.8)	58.6 (40.3-74.8)	7.0 (4.8-10.3)	1.4 (0.5-3.5)	3.6 (2.0-6.5)	11.2 (7.9-15.6)	27.2 (14.7-44.6)	12.6 (8.1-18.9)
	Warangal	10.8 (7.0-16.2)	55.7 (38.0-72.1)	10.2 (6.4-15.8)	1.9 (0.9-4.1)	2.9 (1.6-5.4)	12.5 (8.3-18.3)	38.4 (23.4-55.9)	6.9 (4.0-11.6)
Karnataka	Bangalore (BB)	9.7 (6.6-13.9)	62.5 (56.2-68.5)	9.7 (6.8-13.6)	3.4 (1.7-6.9)	6.1 (3.5-10.3)	16.4 (12.2-21.7)	20.7 (11.5-34.5)	7.5 (4.8-11.6)
	Bangalore (SB)	13.9 (9.3-20.2)	70.7 (63.3-77.2)	13.8 (9.5-19.6)	3.7 (1.5-8.6)	6.6 (4.0-10.7)	20.6 (15.5-26.7)	17.6 (6.2-40.9)	12.9 (7.8-20.7)
	Belgaum	34.2 (27.4-41.8)	80.5 (72.6-86.6)	7.5 (3.1-17.1)	2.7 (0.9-7.9)	5.5 (3.0-10.0)	12.3 (7.0-20.7)	59.0 (42.2-73.8)	30.8 (24.0-38.5)
	Bellary	16.5 (11.6-23.0)	72.1 (63.3-79.5)	4.6 (2.1-9.8)	1.6 (0.6-4.2)	4.3 (2.0-9.1)	9.8 (6.2-15.2)	36.8 (15.4-65.1)	14.3 (9.4-21.1)
	Shimoga	9.5 (6.5-13.8)	58.4 (51.8-64.6)	3.1 (1.4-6.7)	1.7 (0.8-3.8)	4.9 (3.1-7.6)	9.5 (6.4-14.0)	22.5 (8.7-47.0)	8.2 (5.5-11.9)

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology** (%)	N . gonorrhoeae (%)	C. trachomatis (%)	Any STI*** (%)	HIV among "any STI" positive (%)	HIV among "any STI" negative (%)
Maharashtra									
Kolhapur	115	33.0	83.3	27.0	4.3	5.2	30.4	40.0	30.0
Mumbai (All)	403	13.6 (9.4-18.8)	45.1 (31.1-59.7)	3.6 (1.7-4.8)	2.5 (1.1-4.3)	3.9 (2.4-5.6)	9.0 (5.9-11.4)	38.1 (23.5-54.5)	13.0 (9.7-17.0)
Mumbai (BB)	407	28.1 (22.2-34.8)	92.0 (79.1-97.2)	13.0 (9.3-17.9)	9.3 (6.5-13.2)	8.5 (5.6-12.5)	25.3 (20.0-31.5)	40.5 (29.9-52.1)	23.9 (17.9-31.0)
Mumbai (SB)	394	19.2 (13.7-26.2)	75.6 (57.4-87.7)	14.6 (10.6-19.7)	8.0 (4.8-13.0)	8.2 (5.4-12.2)	26.6 (20.6-33.6)	33.4 (22.6-46.3)	14.0 (9.4-20.5)
Parbhani	367	16.1 (11.9-20.6)	52.2 (50.0-100)	11.5 (8.4-15.2)	1.9 (0.2-1.9)	2.0 (0.9-3.0)	13.2 (9.8-17.3)	33.9 (22.6-46.3)	12.1
Pune (BB)	404	38.7 (31.3-46.5)	81.3 (63.4-91.6)	32.8 (25.6-40.9)	5.2 (3.2-8.5)	5.8 (3.8-9.0)	40.2 (33.0-47.9)	47.0 (33.7-60.7)	33.1 (25.8-41.3)
Pune (NBB)	257	37.0	96.2	39.7	7.8	8.6	50.2	42.6	31.3
Thane (BB)	401	18.6 (13.9-24.4)	34.0 (18.6-53.7)	9.1 (5.9-13.8)	0.9 (0.2-3.7)	3.6 (1.9-6.8)	12.7 (8.9-17.7)	57.7 (39.3-74.2)	12.9 (8.8-18.5)
Thane (SB)	394	7.0 (4.1-11.9)	52.6 (37.1-67.6)	4.7 (2.4-9.0)	4.9 (2.3-10.4)	14.2 (8.4-23.1)	20.7 (13.7-30.1)	17.5 (8.2-33.3)	4.3 (2.0-9.2)
Yavatmal	153	37.3	100	51.0	4.6	8.5	57.5	45.5	26.2
Tamil Nadu									
Chennai	410	2.2 (1.0-5.1)	34.6 (14.5-62.2)	11.3 (7.2-17.2)	0.3 (0.1-1.3)	1.8 (0.7-4.5)	12.6 (8.5-18.4)	3.1 (1.0-9.3)	2.1 (0.8-5.1)
Coimbatore	410	6.3 (3.5-11.0)	58.9 (40.7-74.9)	11.9 (8.5-16.6)	2.2 (0.8-5.6)	2.4 (1.1-5.1)	14.5 (10.6-19.7)	13.9 (5.5-31.0)	5.0 (2.8-8.9)
Dharmapuri	408	12.4 (7.9-18.9)	72.1 (51.5-86.3)	10.7 (7.9-14.3)	0.5 (0.1-1.6)	4.3 (2.3-7.8)	14.0 (10.8-18.0)	14.5 (6.9-28.0)	12.1 (7.2-19.4)
Madurai	402	4.3 (2.6-6.9)	52.2 (36.7-67.4)	11.1 (6.3-18.8)	0.0 (0.0-0.8)	0.9 (0.4-2.4)	11.9 (7.1-19.5)	5.0 (1.5-15.6)	4.2 (2.5-7.0)
Salem	402	12.5 (8.4-18.2)	62.9 (34.1-84.7)	7.5 (4.4-12.5)	1.7 (0.3-9.2)	3.7 (1.5-8.7)	10.8 (6.8-16.8)	26.6 (9.9-54.3)	10.8 (7.0-16.3)
Nagaland									
Dimapur	426	11.6 (8.8-15.1)	52.6 (46.0-59.2)	22.1 (18.1-26.3)	4.6 (2.7-6.7)	22.6 (18.3-27.1)	39.1 (34.3-44.1)	20.6	8.6

* Based on a random sample of 10% of sera specimens selected for HSV-2 testing.

** RPR positive (any titre) and TPHA positive.

*** Positive for reactive syphilis serology, N. gonorrhoeae or C. trachomatis (one or more).

Men who have Sex with Men (MSM)

TABLE M1: DEMOGRAPHIC PROFILE

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Circumcised (%)	Engaged in commercial/casual sex at places traveled (last year) (%)
Andhra Pradesh							
East Godavari	405	30 (28.7-30.5)	74 (66.4-80.5)	47 (40.5-54.1)	46 (39.3-52.9)	4 (2.5-7.6)	60 (49.5-69.3)
Guntur	407	27 (26.6-28.0)	58 (50.2-65.5)	62 (55.1-68.1)	62 (55.6-67.8)	20 (14.9-26.4)	70 (63.3-76.0)
Hyderabad	403	28 (27.0-28.5)	76 (71.3-81.0)	30 (23.8-36.2)	29 (23.4-36.1)	19 (14.1-24.4)	53 (46.8-58.6)
Visakhapatnam	406	26 (24.8-26.2)	82 (75.5-86.7)	39 (31.5-46.7)	38 (31.2-46.1)	1 (0.5-2.9)	90 (85.5-93.1)
Karnataka							
Bangalore	303	27 (26.6-28.4)	79 (70.5-85.5)	20 (14.6-27.0)	<i>ND</i>	11 (6.5-16.9)	17 (11.1-25.0)
Maharashtra							
Mumbai-Thane	400	24 (23.4-24.3)	89 (84.1-92.2)	19 (13.8-24.9)	18 (13.2-23.9)	33 (26.2-40.2)	24 (19.3-29.6)
Pune*	253	25	91	17	15	21	21
Tamil Nadu							
Chennai	406	27 (26.2-27.4)	84 (78.3-87.7)	18 (13.3-24.7)	15 (10.9-20.3)	11 (6.1-18.6)	43 (35.4-50.7)
Coimbatore	410	29 (28.5-30.0)	86 (81.1-89.9)	28 (23.4-33.2)	26 (21.9-30.9)	7 (4.3-10.5)	42 (36.4-48.4)
Madurai	402	29 (28.7-30.3)	80 (73.8-85.6)	27 (19.1-35.8)	17 (11.1-26.2)	7 (4.6-10.9)	48 (38.5-57.5)
Salem	403	29 (27.6-29.4)	62 (52.1-71.4)	28 (20.0-37.2)	24 (16.3-33.2)	7 (4.0-10.6)	48 (40.5-56.1)

* 'Take all' sampling. ND - Not data.

Men who have Sex with Men (MSM)

TABLE M2: SERVICES RECEIVED FROM ANY AGENCY

State & District	No. of respondents	Contacted by a Peer/ORW (%)		Visited a NGO Clinic (%)		Received condom from Peer/ORW (last year) (%)	Received information on STIs from Peer/ORW (last year) (%)
		Last year	Last month	Last year	Last month		
Andhra Pradesh							
East Godavari	405	79 (71.8-84.2)	77 (69.4-82.7)	55 (48.6-61.4)	48 (42.9-54.2)	76 (70.0-81.7)	76 (70.0-81.4)
Guntur	407	10 (5.9-16.0)	10 (5.7-15.7)	5 (2.6-9.1)	4 (1.7-7.6)	10 (5.8-16.1)	9 (5.3-14.6)
Hyderabad	403	52 (41.8-62.6)	52 (41.6-61.8)	28 (19.2-39.7)	22 (15.0-32.3)	52 (41.1-61.7)	45 (35.0-55.4)
Visakhapatnam	406	95 (90.8-96.8)	95 (90.8-96.8)	42 (35.2-49.6)	35 (28.7-42.0)	93 (89.0-95.3)	93 (89.5-95.5)
Karnataka							
Bangalore	303	ND	69 (61.7-75.4)	48 (38.1-57.4)	ND	67 (59.7-73.3)	67 (62.5-76.4)
Maharashtra							
Mumbai-Thane	400	60 (53.4-67.0)	57 (51.0-62.3)	39 (31.9-46.8)	22 (17.3-28.4)	67 (60.7-73.5)	59 (51.8-66.3)
Pune	253	46	40	8	6	47	40
Tamil Nadu							
Chennai	406	59 (52.7-65.7)	58 (51.8-64.5)	60 (53.5-66.4)	55 (48.9-61.5)	59 (52.2-65.7)	59 (52.3-64.9)
Coimbatore	410	78 (71.9-82.9)	78 (72.1-83.0)	78 (72.1-83.0)	74 (68.5-79.6)	76 (69.9-81.7)	77 (70.6-81.7)
Madurai	402	64 (53.4-73.5)	62 (51.9-72.1)	66 (55.3-75.4)	58 (47.5-67.7)	61 (51.2-70.5)	63 (52.0-72.2)
Salem	403	64 (52.0-74.0)	60 (48.4-69.7)	64 (51.9-74.0)	61 (49.3-71.0)	63 (51.6-73.8)	64 (51.9-74.0)

ND - Not data.

Men who have Sex with Men (MSM)

TABLE M3: STI KNOWLEDGE AND TREATMENT SEEKING BEHAVIOUR

State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3+ STI symptoms** (%)*	Had anyone of the STI symptoms** (last year) (%)	Action taken for the most recent symptom (%)*		Had anyone of the STI symptoms** (current) (%)
					From trained care	Took preventive measures	
Andhra Pradesh							
East Godavari	405	94 (90.4-96.3)	68 (62.1-74.3)	12 (7.3-18.9)	81 (64.1-90.9)	85 (68.9-93.8)	8 (4.4-15.3)
Guntur	407	82 (78.2-86.1)	59 (53.0-65.5)	11 (7.6-16.1)	77 (59.7-87.8)	55 (41.2-68.8)	2 (1.1-4.1)
Hyderabad	403	85 (80.1-89.4)	69 (59.6-76.4)	11 (7.4-16.7)	73 (56.4-85.4)	62 (48.0-74.3)	3 (1.9-6.2)
Visakhapatnam	406	99 (97.8-99.7)	70 (62.7-76.4)	9 (6.2-12.4)	100 (99.2-100)	94 (76.8-98.7)	1 (0.2-3.2)
Karnataka							
Bangalore	303	47 (36.6-58.0)	30 (14.8-50.3)	7 (4.0-11.1)	95 (80.8-99.0)	56 (32.2-77.6)	1 (0.6-3.1)
Maharashtra							
Mumbai-Thane	400	89 (84.6-92.3)	53 (45.4-59.6)	14 (10.1-19.2)	75 (56.6-87.5)	68 (51.7-81.0)	5 (2.7-8.5)
Pune	253	81	38	18	65	78	5
Tamil Nadu							
Chennai	406	91 (86.6-94.5)	74 (66.9-79.3)	4 (2.2-6.5)	77 (53.5-90.4)	66 (43.6-83.4)	2 (0.9-4.4)
Coimbatore	410	91 (86.8-94.1)	81 (73.4-86.3)	2 (1.1-3.8)	83 (49.7-96.0)	26 (8.1-59.3)	1 (0.4-2.3)
Madurai	402	74 (61.0-83.6)	49 (40.1-57.9)	15 (10.6-20.3)	93 (81.0-97.8)	60 (39.2-77.7)	6 (3.8-8.6)
Salem	403	92 (84.1-96.2)	61 (54.3-68.0)	13 (8.4-20.9)	88 (71.7-95.1)	93 (78.4-97.9)	4 (1.9-6.83)

* Based on subset of respondents applicable for that analysis.

** Of the 7 symptoms, viz., Genital / anal ulcer / sore, discharge from rectum, pain during defecation, burning / pain on urination, urethral discharge, swelling in groin area, and cannot retract foreskin.

Men who have Sex with Men (MSM)

TABLE M4: HIV/AIDS AWARENESS AND KNOWLEDGE

State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Believe HIV/AIDS can be prevented (%)*	Feel at risk of being infected with HIV/AIDS (%)*	Correct knowledge on HIV/AIDS (%)*	Misconception about HIV/AIDS (%)*	Ever undergone HIV test (%)*
Andhra Pradesh							
East Godavari	405	99 (98.1-99.8)	95 (91.2-97.2)	90 (84.7-93.5)	4 (2.2-6.9)	42 (36.5-48.3)	15 (10.7-19.5)
Guntur	407	100 (98.8-100)	86 (82.4-89.4)	63 (55.7-69.2)	3 (1.7-6.3)	54 (47.4-60.8)	15 (10.5-21.1)
Hyderabad	403	100 (99.2-100)	87 (80.1-92.0)	70 (60.5-78.0)	2 (1.1-5.8)	49 (43.3-54.6)	14 (10.3-19.4)
Visakhapatnam	406	99 (95.1-99.6)	96 (92.6-98.1)	99 (96.4-99.6)	1.2 (0.4-3.3)	23 (19.0-28.2)	4 (2.4-8.0)
Karnataka							
Bangalore	303	67 (57.8-75.7)	79 (68.1-86.7)	16 (5.9-35.3)	12 (6.9-21.0)	11 (4.3-24.0)	28 (16.2-42.8)
Maharashtra							
Mumbai-Thane	400	99 (96.4-99.6)	70 (63.6-76.6)	90 (84.3-93.5)	16 (10.3-23.4)	20 (15.2-25.9)	57 (48.6-64.5)
Pune	253	99	86	70	18	37	48
Tamil Nadu							
Chennai	406	99 (97.9-99.8)	100 (98.5-100)	88 (82.6-91.2)	20 (15.3-26.2)	24 (18.5-30.5)	47 (39.6-55.0)
Coimbatore	410	99 (97.3-99.5)	95 (90.2-97.1)	83 (77.5-87.5)	14 (10.0-19.4)	40 (34.3-45.4)	40 (34.0-45.5)
Madurai	402	90 (73.1-96.5)	88 (71.3-95.3)	95 (92.4-97.1)	4 (2.3-5.9)	69 (61.3-76.0)	27 (21.0-35.0)
Salem	403	97 (88.4-99.3)	99 (96.6-99.8)	80 (70.5-87.1)	20 (13.4-28.4)	59 (47.7-69.9)	46 (37.4-54.5)

* Based on subset of respondents applicable for that analysis.

Men who have Sex with Men (MSM)

TABLE M5: SEXUAL HISTORY, CONDOM USE WITH MAIN REGULAR AND PAYING MALE PARTNERS

State & District	No. of respondents	Had main regular partner	Main regular sexual partner (%)						Paying male partners (%)	
			Gender of main regular partner*		Condom usage* (anal sex)		Had paying male partners	Condom usage* (last time)		
			Male	Female	Hijra	Last time			Every time	
Andhra Pradesh										
East Godavari	405	89 (84.3-91.8)	58 (51.8-64.5)	42 (35.4-48.0)	0 (0.0-1.3)	79 (70.5-84.9)	9 (5.4-13.7)	35 (26.9-44.3)	90 (78.8-95.2)	
Guntur	407	81 (76.1-85.7)	22 (16.0-28.4)	78 (70.7-83.5)	1 (0.2-2.3)	59 (48.5-68.3)	22 (15.3-30.5)	26 (20.9-31.8)	75 (64.2-82.8)	
Hyderabad	403	66 (59.0-72.0)	51 (42.4-59.3)	49 (40.7-57.6)	0 (0.0-0.8)	67 (56.1-77.0)	12 (6.4-21.1)	36 (28.8-44.5)	92 (82.2-96.5)	
Visakhapatnam	406	100 (98.4-100)	78 (68.9-85.3)	22 (14.7-31.1)	0 (0.0-0.9)	86 (79.8-90.6)	2 (1.1-4.4)	90 (85.7-92.5)	91 (86.1-94.7)	
Karnataka										
Bangalore	303	41 (31.8-50.1)	ND	ND	ND	80 (67.7-88.1)	73 (60.5-82.8)	ND	ND	
Maharashtra										
Mumbai-Thane	400	64 (58.6-69.6)	79 (70.1-85.7)	21 (14.0-29.6)	0 (0.1-1.4)	68 (60.5-74.5)	49 (41.9-55.9)	26 (19.5-33.1)	86 (77.1-91.1)	
Pune	253	70	66	32	2	47	41	60	74	
Tamil Nadu										
Chennai	406	74 (67.0-79.9)	97 (92.5-98.5)	3 (1.4-7.4)	0 (0.0-0.9)	75 (66.3-81.9)	38 (29.9-47.6)	62 (55.3-67.3)	83 (74.1-89.6)	
Coimbatore	410	85 (79.6-89.7)	98 (95.2-98.7)	2 (1.1-4.3)	0 (0.0-2.5)	78 (73.1-82.9)	25 (19.8-30.1)	49 (43.2-54.8)	84 (77.2-89.0)	
Madurai	402	80 (73.7-85.5)	93 (87.6-95.8)	7 (4.2-12.4)	0 (0.0-0.8)	68 (55.4-78.6)	41 (30.4-52.1)	62 (52.3-70.8)	83 (76.0-88.6)	
Salem	403	84 (76.8-89.7)	95 (81.6-98.7)	1 (0.2-2.1)	4 (0.9-19.7)	63 (55.4-69.4)	28 (21.0-36.5)	57 (40.7-72.0)	73 (62.3-81.8)	

Main regular sexual partner – Spouse/lover/boyfriend/hijra.

Paying male partners – Commercial male partners who paid respondent to have sex with him.

* Based on subset of respondents applicable for that analysis. ND – No data.

Men who have Sex with Men (MSM)

TABLE M6: CONDOM USE WITH PAID MALE/HIJRA AND FEMALE SEXUAL PARTNERS

State & District	No. of respondents	Paid male/hijra partners (%)			Paid female partners (%)	
		Had paid male/hijra partners	Condom usage*		Had paid female partners	Condom usage* Every time
			Last time	Every time		
Andhra Pradesh						
East Godavari	405	48 (39.7-56.4)	83 (71.8-90.3)	13 (7.4-21.9)	40 (34.1-45.6)	13 (6.7-23.1)
Guntur	407	46 (39.7-52.7)	70 (60.1-79.0)	40 (33.6-46.8)	64 (56.6-70.0)	37 (29.5-45.3)
Hyderabad	403	46 (35.8-56.9)	50 (36.9-63.9)	18 (10.1-28.8)	32 (24.9-39.5)	6 (3.4-9.6)
Visakhapatnam	406	31 (25.4-38.0)	93 (87.5-95.8)	1 (0.3-5.3)	28 (21.9-34.0)	4 (1.7-11.3)
Karnataka						
Bangalore	253	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>
Maharashtra						
Mumbai-Thane	400	25 (18.6-32.2)	82 (66.8-91.6)	68 (52.1-80.6)	20 (14.4-27.0)	59 (40.0-75.6)
Pune	253	49	87	84	24	77
Tamil Nadu						
Chennai	406	19 (13.7-24.7)	81 (57.0-93.1)	58 (38.1-74.8)	19 (13.0-26.2)	28 (14.9-45.2)
Coimbatore	410	12 (8.3-16.5)	75 (53.1-88.6)	40 (21.1-62.3)	7 (4.5-10.9)	40 (18.2-65.7)
Madurai	402	22 (14.7-32.3)	63 (39.4-81.7)	38 (22.4-56.8)	6 (3.6-8.5)	56 (33.0-76.2)
Salem	403	16 (10.2-23.9)	59 (41.3-74.0)	39 (22.4-58.6)	17 (10.6-26.3)	23 (12.4-37.6)

Paid male/ hijra partners - Male/hijras to whom the respondent had paid to have anal intercourse with them.

Paid female partners - Respondent paid to females to have sex.

** Based on subset of respondents applicable for that analysis. ND - No data.*

Men who have Sex with Men (MSM)

TABLE M7: CONDOM USE WITH NON-COMMERCIAL MALE/HIJRA AND FEMALE SEXUAL PARTNERS

State & District	No. of respondents	Non-commercial male/hijra partners (%)			Main regular female partner (%)			
		Had non-commercial male/hijra partners	Condom usage*		Had main regular female partner	Living with her*	Condom usage*	
			Last time	Every time			Last time	Every time
Andhra Pradesh East Godavari Guntur Hyderabad Visakhapatnam	405	89 (83.4-92.3)	76 (68.3-83.2)	7 (3.5-11.9)	53 (45.1-60.0)	82 (73.7-88.7)	19 (13.3-26.3)	4 (1.8-8.6)
	407	88 (83.4-90.8)	69 (61.6-75.4)	32 (25.5-39.4)	66 (59.2-71.7)	89 (81.3-93.3)	7 (3.8-11.1)	3 (1.3-5.1)
	403	89 (85.2-91.7)	78 (71.7-83.6)	15 (8.0-25.3)	34 (28.2-40.5)	80 (70.6-87.6)	7 (3.8-13.8)	1 (0.2-3.8)
	406	95 (91.6-97.5)	88 (82.4-92.3)	1 (0.2-2.1)	51 (43.9-57.9)	76 (65.6-83.8)	24 (16.2-34.6)	0 (0.0-1.3)
Karnataka Bangalore	303	ND	ND	ND	10 (6.0-16.3)	ND	21 (10.5-38.2)	16 (6.8-32.0)
Maharashtra Mumbai-Thane Pune	400	58 (51.4-64.8)	80 (72.9-86.0)	56 (48.3-63.1)	33 (26.7-40.0)	40 (29.3-51.2)	42 (30.4-55.3)	31 (21.2-42.9)
	253	34	91	79	30	43	49	41
Tamil Nadu Chennai Coimbatore Madurai Salem	406	34 (27.8-40.3)	72 (59.0-81.7)	25 (16.7-36.6)	12 (8.1-18.1)	28 (15.0-46.8)	52 (29.8-73.4)	21 (6.4-51.8)
	410	67 (59.1-74.5)	84 (77.5-89.0)	22 (16.9-28.1)	26 (21.4-30.6)	69 (59.8-76.9)	23 (14.9-34.0)	7.0 (2.9-16.3)
	402	70 (63.4-76.1)	68 (54.3-79.5)	40 (28.9-51.5)	8 (5.1-11.9)	52 (34.0-68.8)	23 (12.3-37.8)	6 (2.3-15.7)
	403	63 (51.8-73.3)	70 (55.8-81.8)	23 (14.0-35.2)	21 (14.4-30.2)	50 (23.4-77.1)	45 (19.9-72.7)	16 (4.1-46.2)

Non-commercial male/hijra partners - Other than the regular non-paying partners.

Main regular female partner - Regular female partners.

* Based on subset of respondents applicable for that analysis. ND - No data.

Men who have Sex with Men (MSM)

TABLE M8: PREVALENCE OF HIV/STIs

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology** (%)	<i>N. gonorrhoeae</i> (%)	<i>C. trachomatis</i> (%)	Any STI*** (%)	HIV among "any STI" positive (%)	HIV among "any STI" negative (%)
Andhra Pradesh	East Godavari	22.2 (16.4-29.4)	77.7 (59.4-89.2)	13.0 (8.0-20.2)	0.0 (0.0-0.8)	1.0 (0.3-3.1)	13.9 (8.9-21.2)	44.3 (32.2-57.2)	18.6 (12.7-26.5)
	Guntur	13.1 (9.4-18.0)	29.1 (14.8-49.4)	3.5 (1.9-6.4)	0.4 (0.1-1.9)	1.4 (0.5-4.0)	5.3 (3.0-9.2)	37.1 (19.2-59.5)	11.8 (8.3-16.4)
	Hyderabad	24.7 (18.7-31.7)	69.0 (53.4-81.2)	15.7 (11.6-20.9)	0.9 (0.3-2.7)	2.0 (0.8-4.6)	18.3 (14.6-22.6)	43.7 (30.8-57.6)	20.4 (15.6-26.2)
	Visakhapatnam	9.3 (6.0-14.1)	37.0 (19.8-58.4)	5.6 (2.9-10.3)	0.5 (0.1-2.1)	1.2 (0.5-2.8)	7.2 (4.2-11.9)	52.6 (32.4-71.9)	5.9 (3.6-9.7)
Karnataka	Bangalore	19.5 (13.8-26.7)	36.7 (30.3-43.6)	12.0 (6.8-20.1)	0.6 (0.1-2.4)	1.5 (0.5-4.7)	12.5 (7.4-20.2)	41.4 (21.4-64.7)	16.3 (10.3-24.9)
	Maharashtra								
Maharashtra	Mumbai-Thane	10.2 (7.1-14.5)	43.1 (25.0-63.2)	6.5 (4.0-10.4)	0.3 (0.1-1.3)	4.4 (2.2-8.5)	10.8 (7.4-15.4)	16.8 (6.5-36.9)	9.5 (6.4-13.8)
	Pune	17.4	48.3	14.6	0.4	2.0	16.6	52.4	10.4
Tamil Nadu	Chennai	4.8 (2.9-7.8)	31.9 (26.6-37.8)	12.9 (8.6-18.7)	0.3 (0.0-2.1)	0.7 (0.1-4.9)	13.8 (9.5-19.8)	18.6 (10.8-30.2)	2.5 (1.3-5.1)
	Coimbatore	6.5 (4.4-9.3)	27.3 (23.1-31.8)	14.5 (11.0-18.8)	0.0 (0.0-0.8)	0.8 (0.2-3.1)	15.1 (11.3-19.8)	16.3 (9.1-27.5)	4.7 (2.9-7.6)
	Madurai	22.3 (13.1-35.3)	40.3 (24.7-58.0)	17.8 (13.0-23.9)	0.0 (0.0-0.8)	1.1 (0.4-2.9)	18.8 (14.0-24.8)	39.5 (26.5-54.2)	18.3 (8.2-36.1)
	Salem	5.5 (2.7-10.8)	14.7 (5.8-32.6)	12.2 (7.8-18.6)	0.0 (0.0-0.8)	0.3 (0.1-1.0)	12.4 (8.0-18.8)	14.9 (5.9-32.8)	4.1 (2.1-7.9)

* Based on a random sample of 10% of sera specimens selected for HSV-2 testing.

** RPR positive (any titre) and TPHA positive.

*** Positive for reactive syphilis serology, *N. gonorrhoeae* or *C. trachomatis* (one or more).

Aravanis/Hijras (Transgenders)

TBLE H1: DEMOGRAPHIC PROFILE

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)
Tamil Nadu All five districts*	404	29 (27.9-29.7)	68 (60.8-74.2)	25 (19.3-31.4)	18 (13.4-24.8)

* Chennai, Coimbatore, Dharmapuri, Madurai, and Salem.

Aravanis/Hijras (Transgenders)

TABLE H2: GENERAL SEXUAL BEHAVIOUR

State & District	No. of respondents	Identification (nirvana Aravani) (%)	Mean age when started selling sex (years)*	Typology - street based (%)	Practiced sex work at places traveled (last year) (%)	Circumcised (%)	Tattooed (%)
Tamil Nadu All five districts	404	63 (54.9-69.6)	18 (17.5-18.3)	52 (40.8-63.9)	39 (31.2-48.1)	5 (2.8-8.8)	58 (51.4-64.9)

* Based on subset of respondents applicable for that analysis.

Aravanis/Hijras (Transgenders)

TABLE H3: SERVICES RECEIVED FROM ANY AGENCY

State & District	No. of respondents	Contacted by a Peer/ORW (%)		Visited a NGO Clinic (%)		Received Condom from Peer/ORW (last year)	Received information on STI from Peer/ORW
		Last year	Last month	Last year (%)	Last month (%)		
Tamil Nadu All five districts	404	74 (68.5-79.6)	74 (68.1-79.1)	75 (68.9-80.3)	73 (66.6-77.9)	74 (68.2-79.3)	74 (68.3-79.4)

Aravanis/Hijras (Transgenders)

TABLE H4: STI KNOWLEDGE AND TREATMENT SEEKING BEHAVIOUR							
State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3+ STI symptoms** (%)*	Had anyone of the STI symptoms** (last year) (%)	Action taken for the most recent symptom (%)*		Had anyone of the STI symptoms** (current) (%)
					From trained care	Took preventive measures	
Tamil Nadu All five districts	404	89 (83.6-93.2)	80 (72.3-86.4)	2 (1.1-5.5)	68 (19.8-95.0)	41 (17.0-70.9)	2 (0.5-4.9)

* Based on subset of respondents applicable for that analysis.

** Of the 7 symptoms, viz., genital/anal ulcer/sore, discharge from rectum, pain during defecation, burning/pain on urination, urethral discharge, swelling in the groin area, and cannot retract foreskin.

Aravanis/Hijras (Transgenders)

TABLE H5: HIV/AIDS AWARENESS AND KNOWLEDGE							
State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Believe HIV/AIDS can be prevented (%)*	Feel at risk of being infected with HIV/AIDS (%)*	Correct knowledge on HIV/AIDS (%)*	Misconception about HIV/AIDS (%)*	Ever undergone HIV test (%)*
Tamil Nadu All five districts	404	99 (97.2-99.5)	93 (85.6-96.4)	14 (9.2-20.8)	18 (13.3-24.7)	70 (60.1-77.5)	45 (38.4-52.2)

* Based on subset of respondents applicable for that analysis.

Aravanis/Hijras (Transgenders)

TABLE H6: SEXUAL HISTORY, CONDOM USE WITH MAIN REGULAR AND PAYING MALE PARTNERS

State & District	No. of respondents	Main regular sexual partner (%)				Paying male partners (%)			
		Had main regular partner	Living with that partner*	Condom usage (anal sex)*		Had paying male partners	Condom usage (anal sex)*		
				Last time	Every time		Last time	Every time	
Tamil Nadu All five districts	404	69 (62.2-74.8)	22 (15.9-30.3)	73 (64.9-80.5)	34 (25.4-44.6)	74 (66.2-80.8)	93 (87.1-96.4)	50 (41.8-57.6)	

Main regular sexual partner - Spouse/lover/boyfriend/hijra.

Paying male partners - Commercial male partners who paid to the respondent to have sex with him.

** Based on subset of respondents applicable for that analysis.*

Aravanis/Hijras (Transgenders)

TABLE H7: CONDOM USE WITH PAID AND OTHER NON-COMMERCIAL MALE/HIJRA PARTNERS

State & District	No. of respondents	Paid male/hijra partners (%)				Other non-commercial male/hijra partners (%)			
		Had paid male/hijra partners	Condom usage (anal sex)*	Condom usage (anal sex)*		Had paid non-commercial partners	Condom usage (anal sex)*		
				Last time	Every time		Last time	Every time	
Tamil Nadu All five districts	404	2 (1.0-4.3)	85 (50.4-97.1)	6 (0.7-34.8)	33 (25.9-40.5)	81 (66.4-89.8)	20 (9.0-37.8)		

Paid male/hijra partners- Male/hijras to whom the respondent paid to have anal intercourse with them.

** Based on subset of respondents applicable for that analysis.*

Aravanis/Hijras (Transgenders)

TABLE H8: PREVALENCE OF HIV/STIs

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology** (%)	<i>N. gonorrhoeae</i> (%)	<i>C. trachomatis</i> (%)	Any STI*** (%)	HIV among "any STI" positive (%)	HIV among "any STI" negative (%)
Tamil Nadu All five districts	404	12.0 (7.8-18.0)	46.2 (38.4-54.2)	16.6 (11.5-23.4)	0.0 (0.0-0.8)	0.0 (0.0-0.8)	16.6 (11.5-23.4)	30.9 (14.7-53.6)	8.3 (5.1-13.0)

* Based on a random sample of 10% of sera specimens selected for HSV-2 testing.

** RPR positive (any titre) and TPHA positive.

*** Positive for reactive syphilis serology, *N. gonorrhoeae* or *C. trachomatis* (one or more).

Injecting Drug Users

TABLE D1: DEMOGRAPHIC PROFILE

State & District	No. of respondents	Age (years) (%)		Can read and write (%)	Ever married (%)	Unemployed
		<20	20 - 30			
Manipur Bishnupur	420	9 (5.6-12.2)	68 (62.8-73.2)	23 (18.3-28.3)	30 (24.9-35.2)	41 (36.1-46.3)
	419	5 (2.9-7.1)	75 (70.2-78.8)	20 (16.5-24.5)	31 (26.2-36.1)	38 (33.8-44.4)
Nagaland Phek	440	26 (21.2-31.5)	70 (64.9-75.2)	3 (1.8-5.7)	12 (8.5-15.3)	48 (42.8-52.4)
	420	13 (8.7-17.3)	74 (69.3-79.3)	13 (9.3-16.5)	26 (21.5-30.4)	63 (60.9-70.5)

Injecting Drug Users

TABLE D2: AGE AT STARTING FIRST DRUG USE

State & District	No. of respondents	Age at starting first drug use (years) (%)				
		20 or below	21 - 25	26 - 30	31 - 35	36 or above
Manipur						
Bishnupur	420	62 (57.2-66.8)	23 (19.3-27.0)	10 (7.5-13.1)	3 (1.1-5.3)	1 (0.5-2.4)
Churachandpur	419	57 (51.1-62.6)	32 (27.1-37.9)	9 (5.6-11.7)	2 (0.6-3.7)	-
Nagaland						
Phek	440	85 (80.5-87.7)	10 (8.0-13.6)	3 (1.4-5.5)	0.2 (0.0-0.6)	1 (0.4-2.9)
Wokha	420	86 (81.7-88.4)	13 (10.2-16.7)	1 (0.4-1.9)	0.1 (0.1-0.4)	-

Injecting Drug Users

TABLE D3: AGE AT STARTING FIRST INJECTION USE

State & District	No. of respondents	Age at starting first injection (years) (%)				
		16 or below	17-18	19-21	22-25	26 or above
Manipur						
Bishnupur	420	6 (3.8-9.3)	16 (11.8-19.6)	30 (26.0-35.0)	23 (19.2-27.4)	25 (19.9-29.3)
Churachandpur	419	9 (6.5-12.1)	18 (13.8-1.2)	29 (23.9-33.9)	27 (22.5-32.8)	17 (13.3-21.1)
Nagaland						
Phek	440	15 (12.0-18.8)	33 (27.6-37.0)	33 (28.5-38.1)	11 (8.3-13.9)	8 (5.3-11.5)
Wokha	420	8 (5.6-10.9)	22 (17.3-26.9)	29 (24.1-32.8)	28 (23.8-32.8)	13 (10.2-16.5)

Injecting Drug Users

TABLE D4: DURATION BETWEEN FIRST DRUG USE AND FIRST INJECTING DRUG USE

State & District	No. of respondents	Duration (months) (%)				
		12 or below	13-24	25-36	37-48	49 or above
Manipur						
Bishnupur	420	58 (52.7-62.7)	14 (10.1-17.5)	6 (3.8-7.8)	6 (3.4-8.3)	17 (13.6-21.2)
Churachandpur	419	66 (60.5-70.3)	14 (10.3-17.0)	4 (2.8-5.4)	4 (2.5-6.4)	12 (8.6-16.4)
Nagaland						
Phek	440	56 (50.7-62.2)	10 (6.9-12.5)	12 (9.4-15.5)	8 (5.8-10.9)	14 (10.5-16.9)
Wokha	420	16 (12.5-19.4)	14 (11.2-18.0)	16 (12.4-20.1)	13 (9.9-17.0)	40 (35.0-45.3)

Injecting Drug Users

TABLE D5: MOST COMMONLY INJECTED DRUGS AND PLACE OF INJECTION

State & District	No. of respondents	Most common injecting drugs (%)					Most common place of injection (%)			
		Heroin	Spasmo- proxivon	Nitrazipum/ Diazepam	Fortwin & Morphine	Respondent's house	Injecting partner's house	Dealers' house	Open space	
Manipur Bishnupur	420	75 (69.5-81.4)	54 (46.7-60.0)	5 (2.9-6.8)	6 (4.2-8.8)	48 (42.3-53.0)	23 (19.0-28.2)	44 (39.6-50.9)	31 (25.0-35.9)	
	419	98 (96.5-99.4)	66 (60.8-71.4)	14 (10.6-18.1)	14 (10.8-17.2)	60 (54.7-65.4)	8 (5.4-10.9)	80 (74.3-85.2)	4 (2.1-6.2)	
Nagaland Phek	440	9 (6.7-11.5)	100 (99.5-100.0)	13 (9.8-16.1)	3 (1.2-3.2)	76 (72.0-80.7)	34 (28.8-38.6)	1 (0.0-1.3)	24 (18.8-27.2)	
	420	1 (0.2-2.2)	99 (98.1-99.9)	6 (3.5-7.8)	1 (0.3-2.8)	82 (78.5-86.3)	48 (42.6-52.2)	8 (5.7-10.9)	6 (4.1-9.3)	

Injecting Drug Users

TABLE D6: FREQUENCY OF INJECTING DRUGS

State & District	No. of respondents	Frequency of injections (%)				Injected drugs inprison (%)
		Less than once a month	At least Once monthly	At least once weekly	At least once daily	
Manipur Bishnupur	420	31 (25.9-36.1)	31 (26.2-35.9)	7 (5.0-9.4)	31 (25.8-36.4)	1 (0.5-2.2)
	419	6 (2.5-9.7)	10 (7.0-13.7)	8 (5.0-11.6)	76 (70.5-80.8)	2 (0.9-3.1)
Nagaland Phek	440	22 (17.9-26.6)	29 (23.5-32.7)	12 (8.6-14.7)	37 (31.1-44.7)	1 (0.1-1.3)
	420	6 (4.2-8.7)	6 (4.1-8.3)	45 (39.4-49.8)	43 (37.8-47.7)	2 (0.9-3.0)

Injecting Drug Users

TABLE D7: INJECTION PRACTICES AT LAST INJECTING INCIDENT

State & District	No. of respondents	Injection practice									
		Used pre-filled syringe (%)	Used a common container (%)	Passed needle/syringe to others after injection (%)	Injected with needle/syringe after others injected with it (%)	Injected with needle/syringe (exclusively used by respondent) (%)	Injected with fresh brand new needle (%)	Shared from a common container or any other injecting equipments (%)	Shared other injecting equipments (%)		
Manipur Bishnupur	420	14 (11.2-17.6)	41 (36.5-46.7)	13 (9.8-15.8)	7 (4.7-9.3)	16 (12.8-19.2)	78 (73.8-81.2)	47 (42.2-51.9)	35 (30.3-39.1)		
	419	21 (16.4-26.2)	51 (45.9-56.5)	15 (12.1-19.1)	15 (11.1-18.3)	60 (55.2-65.6)	43 (38.4-49.5)	68 (62.4-72.9)	60 (55.1-66.0)		
Nagaland Phek	440	30 (25.0-34.2)	56 (50.8-61.5)	28 (23.7-32.6)	19 (15.1-23.3)	28 (23.3-32.3)	58 (51.6-63.2)	60 (54.2-64.8)	45 (39.6-49.6)		
	420	30 (25.2-34.5)	57 (51.5-63.1)	40 (34.8-44.6)	20 (15.5-24.6)	54 (47.7-60.3)	30 (24.8-35.2)	61 (55.7-66.3)	47 (41.2-51.6)		

Injecting Drug Users

TABLE D8: GENERAL INJECTING PRACTICES					
State & District	No. of respondents	Never use a pre-filled syringe (%)	Never use a common container (%)	Never pass a needle/syringe to others (%)	Never inject with a needle/syringe after others injected with it (%)
Manipur					
Bishnupur	420	32 (27.1-37.7)	26 (21.8-30.5)	44 (38.9-50.1)	43 (37.5-48.7)
Churachandpur	419	39 (34.0-45.0)	5 (2.7-9.3)	20 (15.3-25.3)	22 (16.7-26.6)
Nagaland					
Phek	440	24 (19.2-27.7)	9 (6.3-12.2)	26 (20.9-29.8)	37 (31.3-41.8)
Wokha	420	17 (13.0-20.9)	7 (4.6-10.0)	13 (9.7-16.4)	20 (16.5-25.0)

Injecting Drug Users

TABLE D9: TREATMENT SEEKING BEHAVIOUR (LAST YEAR)							
State & District	No. of respondents	Treatment					
		Treatment taken for drug use (%)	For abscess (%)	For overdose (%)	Drug substitution (%)	Counseling (%)	Detox (%)
Manipur							
Bishnupur	420	15 (10.9-17.7)	4 (2.1-5.9)	1 (0.1-1.2)	8 (5.3-10.3)	7 (4.6-9.1)	6 (3.8-8.6)
Churachandpur	419	25 (20.8-30.1)	4 (1.8-6.0)	4 (1.7-5.7)	9 (5.9-12.2)	19 (14.5-22.5)	22 (17.6-26.6)
Nagaland							
Phek	440	4 (2.2-5.4)	0.2 (0.0-0.2)	2 (1.1-3.1)	0 (0.0-0.8)	1 (0.0-1.1)	0.4 (0.0-1.0)
Wokha	420	8 (5.7-10.0)	4 (2.2-5.2)	2 (1.2-3.6)	2 (1.2-3.8)	3 (1.8-4.3)	3 (2.0-5.1)

Injecting Drug Users

TABLE D10: SEXUAL PRACTICES WITH FEMALE SEX WORKERS

State & District	No. of respondents	Ever had sex with a female (%)	Had sex with a female (last year) (%)	Ever had sex with a FSW (%)	Had sex with a FSW (last year) (%)	Had sex with FSW only (%)	Condom used with FSW* (%)
Manipur							
Bishnupur	420	65 (58.7-70.3)	46 (40.9-52.3)	30 (26.0-35.2)	14 (10.9-17.3)	9 (5.6-11.6)	82 (73.0-100)
Churachandpur	419	75 (69.6-80.3)	59 (53.8-64.8)	8 (4.8-11.7)	6 (2.5-8.9)	1 (0.1-0.6)	-
Nagaland							
Phek	440	78 (72.4-82.7)	73 (66.6-77.4)	3 (1.8-4.3)	2 (0.8-2.9)	-	-
Wokha	420	89 (85.5-92.8)	86 (82.1-90.0)	5 (3.5-7.0)	4 (2.2-5.3)	-	-

* Based on subset of respondents applicable for that analysis.

- Estimate could not be calculated by RDSAT due to the absence of initial recruits for the variable concerned.

Injecting Drug Users

TABLE D11: SEXUAL PRACTICES WITH REGULAR FEMALE PARTNERS

State & District	No. of respondents	Had non-paid main female partner (%)	Condom used with non-paid female partner (last time) (%)*	Had sex with other non-paid female partner (%)	Condom used with other non-paid female partner (last time) (%)*
Manipur					
Bishnupur	420	35 (29.4-40.1)	36 (22.4-48.1)	6 (3.8-8.5)	70 (64.3-92.3)
Churachandpur	419	32 (27.3-37.3)	36 (29.4-46.3)	34 (29.3-38.8)	34 (15.7-47.2)
Nagaland					
Phek	440	57 (50.8-62.8)	55 (49.9-62.1)	51 (45.8-56.7)	67 (60.0-76.3)
Wokha	420	73 (67.4-77.4)	52 (45.3-57.7)	50 (44.0-55.7)	56 (45.4-67.4)

* Based on subset of respondents applicable for that analysis.

Injecting Drug Users

TABLE D12: SEXUAL PRACTICES WITH MALE PARTNERS			
State & District	No. of respondents	Ever had sex with a male (%)	Ever had sold sex for money or drugs to male partner (%)
Manipur			
Bishnupur	420	9 (6.4-11.6)	0.3 (0.0-0.7)
Churachandpur	419	1 (0.0-1.7)	0 (0.0-0.8)
Nagaland			
Phek	440	0 (0.0-0.8)	0 (0.0-0.8)
Wokha	420	0.2 (0.0-0.7)	0 (0.0-0.8)

Injecting Drug Users

TABLE D13: STI KNOWLEDGE			
State & District	No. of respondents	Ever heard of any STIs (%)	Knowledge of 3 or more STI symptoms** (%)
Manipur			
Bishnupur	420	88 (84.6-91.2)	11 (7.3-13.6)
Churachandpur	419	75 (69.7-79.2)	19 (12.7-24.1)
Nagaland			
Phek	440	78 (73.0-82.1)	0.7 (0.6-3.7)
Wokha	420	45 (39.6-50.2)	2 (0.0-3.9)

**** Urethral discharge, burning pain on urination, genital ulcers/sores, swellings in groin area, warts around genital area and cannot retract foreskin.**

Injecting Drug Users

TABLE D14: TREATMENT SEEKING BEHAVIOUR FOR MOST RECENT STI

State & District	No. of respondents	Urethral discharge, ulcer, swelling, burning pain or cannot retract foreskin (last year) (%)	Action taken for the most recent symptom (%)*	
			From trained care	Took preventive measures
Manipur				
Bishnupur	420	30 (25.9-34.3)	32 (17.9-47.2)	37 (22.3-48.8)
Churachandpur	419	7 (3.9-10.8)	50 (0.0-87.5)	-
Nagaland				
Phek	440	12 (8.5-14.7)	30 (16.2-47.1)	57 (34.2-71.4)
Wokha	420	9 (6.8-12.3)	41 (0.0-86.1)	12 (5.3-28.7)

* Based on subset of respondents applicable for that analysis.

- Estimate could not be calculated by RDSAT due to the absence of initial recruits for the variable concerned.

Injecting Drug Users

TABLE D15: HIV AWARENESS AND KNOWLEDGE

State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Feel at risk of being infected with HIV/AIDS (%)*	Misconception about HIV/AIDS (%)*	Ever undergone HIV test (%)*
Manipur					
Bishnupur	420	100 (98.9-100)	41 (35.7-45.9)	90 (87.7-93.4)	18 (13.8-22.1)
Churachandpur	419	100 (99.2-100)	40 (35.3-46.2)	92 (88.1-96.6)	26 (21.1-30.5)
Nagaland					
Phek	440	96 (93.5-98.7)	23 (18.0-26.5)	57 (52.3-62.9)	6 (3.5-8.1)
Wokha	420	89 (84.7-92.5)	20 (16.6-24.6)	79 (72.7-82.9)	8 (5.4-10.8)

* Based on subset of respondents applicable for that analysis.

Injecting Drug Users

TABLE D16: SERVICES RECEIVED FROM ANY AGENCY®

State & District	No. of respondents	Contacted by Peer/ORW (%)*	Given information on STI/HIV/AIDS (%)*	Visited the NGO clinic (%)*	Received condoms (%)*	Received needles/syringes (%)*
Manipur Bishnupur	420	56 (51.6-63.3)	48 (43.1-54.2)	45 (38.8-52.3)	41 (33.5-45.3)	52 (44.5-58.7)
	419	52 (45.7-56.9)	37 (29.6-42.2)	69 (62.6-74.4)	48 (42.4-54.5)	88 (83.4-93.1)
Nagaland Phek	440	49 (39.9-56.6)	46 (40.8-55.9)	48 (37.4-52.8)	47 (36.9-54.0)	34 (24.5-39.2)
	420	30 (23.9-34.3)	22 (17.1-27.0)	27 (21.5-32.3)	32 (25.4-35.6)	30 (24.4-34.9)

@ For Manipur it was during the last 6 months and for Nagaland during the last one year.

* Based on subset of respondents applicable for that analysis.

Injecting Drug Users

TABLE D17: PREVALENCE OF HIV/STIS

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology**	N. gonorrhoeae (%)	C. trachomatis (%)	Hepatitis B (%)	Hepatitis C (%)	Any STI*** (%)
Manipur Bishnupur	420	23.1 (18.0-27.8)	0.8 (0.0-1.5)	5.7 (3.5-8.0)	0.3 (0.0-0.5)	1.7 (0.9-2.8)	6.3 (4.5-8.4)	55.9 (50.2-61.8)	7.4 (5.1-10.0)
	419	32.2 (27.4-37.4)	-	0.9 (0.3-1.5)	0 (0.0-0.8)	2.1 (0.9-3.4)	5.8 (2.8-9.2)	77.6 (73.7-83.0)	3.0 (1.6-4.5)
Nagaland Phek	440	1.1 (0.0-2.6)	-	7.4 (5.4-9.9)	0.6 (0.0-0.8)	11.4 (8.2-14.9)	4.8 (2.9-6.9)	5.4 (3.0-7.4)	18.4 (14.7-22.5)
	420	1.8 (0.6-3.4)	-	19.5 (15.4-23.6)	1.6 (0.3-3.0)	11.0 (7.6-13.5)	6.9 (4.9-9.2)	16.7 (12.6-20.8)	29.7 (24.9-34.2)

* Based on a random sample of 10% of blood specimens selected for HSV-2 testing.

** RPR positive (any titre) and TPHA positive.

*** Positive for reactive syphilis serology, N. gonorrhoeae or C. trachomatis (one or more).

- Estimate could not be calculated by RDSAT.

Clients of female sex workers

TABLE C1: DEMOGRAPHIC PROFILE

State & District	No. of respondents	Mean age (years)	Can read and write (%)	Ever married (%)	Living with sex partner (%)	Mean age when started having paid sex (years)	Circumcised (%)	Bought sex from FSW at places traveled (last year) (%)
Andhra Pradesh East Godavari Guntur Hyderabad Visakhapatnam Warangal	409	30 (29.2-30.8)	58 (50.6-65.7)	72 (63.2-79.4)	96 (91.9-97.6)	20 (20.0-20.6)	5 (2.6-8.5)	54 (45.4-62.1)
	401	31 (30.4-32.1)	63 (56.4-69.5)	78 (72.2-83.1)	89 (82.4-93.7)	19 (19.0-20.1)	22 (17.1-28.5)	54 (47.4-61.0)
	406	31 (29.7-31.3)	80 (70.4-87.3)	68 (59.5-76.4)	91 (83.1-95.2)	20 (19.7-20.1)	11 (6.7-18.6)	52 (43.0-61.7)
	402	28 (27.4-28.6)	79 (72.9-83.5)	62 (53.8-69.7)	94 (88.6-96.7)	19 (19.2-19.7)	22 (17.8-27.1)	56 (50.7-61.3)
	402	30 (28.8-30.5)	88 (81.8-92.8)	74 (61.9-83.5)	96 (88.6-98.8)	19 (19.2-19.7)	16 (10.0-24.6)	58 (46.4-68.8)
Maharashtra Parbhani Pune Yevatmal	404	27 (26.4-27.8)	69 (63.0-74.2)	54 (47.1-60.7)	92 (86.1-94.9)	20 (19.7-20.4)	21 (15.9-27.0)	43 (36.2-50.5)
	401	28 (27.2-28.8)	87 (82.0-91.2)	49 (42.6-55.3)	89 (82.3-92.9)	22 (21.2-22.1)	9 (5.5-13.3)	18 (13.0-23.1)
	399	29 (28.4-29.9)	81 (75.4-85.7)	61 (54.1-67.0)	90 (84.1-93.4)	21 (21.0-21.8)	26 (21.0-32.7)	48 (41.7-55.0)
Tamil Nadu Chennai Madurai Salem	406	32 (31.6-33.3)	64 (57.2-70.7)	65 (58.8-71.2)	86 (80.6-90.2)	22 (21.6-22.5)	4 (2.0-6.7)	26 (20.7-31.0)
	401	28 (27.7-29.4)	81 (75.2-85.4)	50 (43.3-56.5)	98 (94.7-99.2)	21 (21.0-21.7)	6 (4.0-8.7)	57 (50.9-63.7)
	396	32 (31.4-32.9)	78 (72.0-82.7)	62 (54.0-68.5)	85 (78.5-89.8)	23 (22.4-23.3)	8 (5.2-11.9)	35 (28.5-41.8)

Clients of female sex workers

TABLE C2: EXPOSURE TO PROGRAMMES BY ANY AGENCY

State & District	No. of respondents	Heard/seen/read advertisement on condoms (last 6 months) (%)	Heard/seen/read advertisement on STI (last 6 months) (%)	Heard/seen/read advertisement on Key Clinic** (last 6 months) (%)	Ever visited Key Clinic for STI treatment (%)
Andhra Pradesh					
East Godavari	409	100 (98.9-100)	95 (91.9-97.4)	34 (25.7-42.9)	2 (0.5-4.5)
Guntur	401	100 (98.4-100)	98 (94.6-98.9)	75 (69.1-80.3)	2 (0.9-4.6)
Hyderabad	406	100 (98.8-100)	99 (96.8-99.4)	68 (59.6-74.9)	0.5 (0.2-1.8)
Visakhapatnam	402	96 (92.1-97.4)	93 (89.6-95.0)	83 (77.6-87.9)	7 (3.8-11.6)
Warangal	402	97 (86.4-99.3)	93 (85.5-97.0)	60 (50.7-69.0)	1 (0.2-2.5)
Maharashtra					
Parbhani	404	89 (84.4-92.0)	40 (33.9-46.7)	7 (4.3-10.8)	0 (0.0-0.8)
Pune	401	99 (86.7-99.6)	76 (69.9-80.9)	54 (46.7-60.5)	0.3 (0.0-2.1)
Yevatmal	399	95 (91.2-97.7)	57 (49.9-63.0)	21 (16.4-27.0)	0.3 (0.0-1.8)
Tamil Nadu					
Chennai	406	79 (74.1-83.3)	45 (39.5-51.2)	36 (30.0-41.9)	0.1 (0.0-1.0)
Madurai	401	96 (93.1-97.9)	86 (81.6-89.3)	84 (77.6-88.5)	1 (0.3-2.5)
Salem	396	92 (87.5-94.3)	51 (43.7-58.6)	37 (32.1-42.3)	0.1 (0.0-0.7)

** Key Clinics - Avahan supported STI franchise.

Clients of female sex workers

TABLE C3: TREATMENT SEEKING BEHAVIOUR FOR MOST RECENT STI

State & District	No. of respondents	Urethral discharge, ulcer, swelling, burning pain or cannot retract fore skin (last year) (%)	Action taken for the most recent symptom (%)*	
			From trained care	Took preventive measures
Andhra Pradesh				
East Godavari	409	29 (23.1-35.7)	86 (75.4-92.7)	89 (78.3-94.5)
Guntur	401	28 (21.9-34.7)	76 (67.4-83.6)	70 (58.9-79.2)
Hyderabad	406	12 (8.1-17.5)	39 (23.5-57.4)	37 (21.7-55.0)
Visakhapatnam	402	31 (25.3-37.0)	76 (62.4-85.1)	57 (44.1-68.6)
Warangal	402	32 (23.6-41.1)	86 (78.2-91.9)	68 (56.8-78.0)
Maharashtra				
Parbhani	404	36 (30.2-42.8)	55 (44.6-64.7)	66 (56.0-75.4)
Pune	401	21 (16.5-26.4)	40 (29.7-51.7)	77 (64.2-86.7)
Yevatmal	399	51 (45.4-57.3)	54 (46.5-61.8)	48 (40.9-55.9)
Tamil Nadu				
Chennai	406	5 (3.0-9.1)	7 (1.3-29.4)	8 (1.6-30.5)
Madurai	401	12 (8.7-16.0)	53 (34.6-71.2)	52 (36.2-67.2)
Salem	396	5 (3.2-7.6)	90 (67.1-97.4)	68 (37.4-88.3)

* Based on subset of respondents applicable for that analysis.

Clients of female sex workers

TABLE C4: HIV/AIDS AWARENESS AND KNOWLEDGE

State & District	No. of respondents	Ever heard of HIV/AIDS (%)	Feel at risk of being infected with HIV/AIDS (%)*	Ever undergone HIV test (%)*
Andhra Pradesh				
East Godavari	409	100 (99.2-100)	22 (14.7-32.8)	15 (9.8-21.4)
Guntur	401	100 (99.2-100)	56 (49.2-61.8)	26 (21.6-31.3)
Hyderabad	406	100 (99.2-100)	60 (49.1-69.3)	14 (9.9-19.3)
Visakhapatnam	402	99 (97.5-99.7)	55 (48.3-61.3)	26 (20.6-33.3)
Warangal	402	98 (93.8-99.7)	57 (43.5-69.6)	32 (26.2-38.3)
Maharashtra				
Parbhani	404	81 (74.6-85.7)	64 (56.5-70.6)	8 (4.9-12.1)
Pune	401	99 (96.7-99.4)	32 (27.3-36.4)	11 (7.6-14.9)
Yevatmal	399	98 (94.7-99.0)	40 (34.0-46.7)	8 (5.7-12.0)
Tamil Nadu				
Chennai	406	97 (95.1-98.4)	7 (5.1-10.6)	8 (5.1-11.9)
Madurai	401	99 (96.0-99.5)	46 (40.0-51.1)	9 (6.1-12.9)
Salem	396	98 (96.4-99.3)	14 (8.2-22.8)	9 (5.7-12.8)

* Based on subset of respondents applicable for that analysis.

Clients of female sex workers

TABLE C5: SEXUAL HISTORY, CONDOM USE WITH OCCASIONAL AND REGULAR FSWs

State & District	No. of respondents	Mean number of FSWs (last 6 months)		Occasional FSW (%)				Regular FSW (%)			
		Occasional	Regular	Had occasional FSWs	Condom use*		Had regular FSWs	Condom use*			
					Last time	Consistent		Last time	Consistent		
Andhra Pradesh	East Godavari	3.2 (2.9-3.4)	1.6 (1.5-1.8)	98 (95.1-99.5)	74 (66.3-80.7)	38 (29.6-46.3)	80 (73.5-85.8)	73 (63.6-80.2)	26 (18.4-35.8)		
	Guntur	5.8 (5.4-6.3)	1.7 (1.5-1.9)	100 (99.2-100)	72 (65.5-77.2)	28 (23.1-34.0)	63 (56.9-67.9)	66 (59.2-72.6)	24 (18.3-30.8)		
	Hyderabad	6.0 (5.5-6.6)	1.6 (1.3-1.9)	100 (99.2-100)	83 (73.6-89.3)	19 (13.6-25.6)	59 (48.6-68.0)	90 (81.5-94.3)	16 (10.9-22.9)		
	Visakhapatnam	3.7 (3.5-3.9)	1.3 (1.2-1.5)	100 (99.2-100)	73 (66.9-77.9)	27 (22.0-33.4)	69 (63.6-74.2)	69 (62.1-75.2)	23 (16.7-31.1)		
	Warangal	7.4 (6.6-8.2)	4.3 (3.3-5.3)	100 (99.2-100)	72 (65.5-77.6)	19 (12.5-27.0)	86 (76.3-92.1)	72 (57.4-83.1)	16 (10.5-24.9)		
Maharashtra	Parbhani	4.8 (4.2-5.3)	1.2 (0.9-1.5)	91 (87.0-93.9)	83 (76.8-87.1)	64 (57.3-70.5)	49 (41.7-55.9)	72 (62.3-79.8)	50 (38.6-60.8)		
	Pune	5.1 (4.5-5.7)	0.3 (0.3-0.4)	90 (86.0-92.2)	77 (72.5-81.5)	60 (54.4-65.0)	20 (16.5-24.6)	81 (66.9-90.2)	68 (52.4-80.6)		
	Yavatmal	3.6 (3.2-3.9)	1.2 (1.0-1.3)	89 (83.5-92.9)	60 (54.0-65.7)	32 (26.3-38.5)	61 (54.4-67.0)	54 (46.1-62.5)	30 (23.6-38.4)		
Tamil Nadu	Chennai	3.8 (3.4-4.2)	2.6 (2.3-2.8)	97 (93.2-98.9)	60 (53.9-66.2)	30 (24.8-36.2)	76 (70.1-81.8)	53 (45.8-59.8)	23 (17.3-29.3)		
	Madurai	2.4 (2.2-2.7)	1.7 (1.5-1.9)	90 (87.0-93.1)	54 (48.2-59.6)	32 (26.0-38.7)	66 (60.3-70.4)	48 (40.3-56.8)	26 (19.3-34.3)		
	Salem	7.0 (6.6-7.5)	3.1 (2.8-3.4)	98 (95.7-99.0)	77 (71.3-82.6)	50 (42.8-56.5)	70 (60.3-78.6)	54 (44.3-62.6)	15 (10.0-21.0)		

Occasional FSW - Clients who visited the FSW only once or a few times and did not remember their faces.

Regular FSW - Client who visit the FSW regularly/repeatedly and know them.

* Based on subset of respondents applicable for that analysis.

Clients of female sex workers

TABLE C6: CONDOM USE WITH NON-PAID SEXUAL PARTNERS

State & District	No. of respondents	Main/steady female partner (%)		Other non-paid female partners (%)	
		Had main/steady partner	Condom use* (Consistent)	Had sex with other non-paid partners	Condom use* (last time)*
Andhra Pradesh					
East Godavari	409	78 (68.6-84.8)	1 (0.4-3.4)	49 (41.3-57.3)	51 (43.1-59.7)
Guntur	401	74 (65.9-80.3)	0 (0.0-0.8)	45 (40.0-50.9)	44 (34.4-53.3)
Hyderabad	406	66 (58.9-72.8)	0 (0.0-0.8)	34 (25.4-43.0)	28 (15.7-44.5)
Visakhapatnam	402	83 (77.3-86.9)	4 (1.7-9.9)	21 (16.4-27.3)	49 (37.0-60.4)
Warangal	402	86 (80.1-91.0)	1 (0.4-3.4)	51 (38.4-63.6)	59 (49.8-68.3)
Maharashtra					
Parbhani	404	70 (63.2-76.3)	13 (8.6-18.5)	26 (20.2-32.8)	31 (19.2-45.9)
Pune	401	63 (57.7-67.8)	5 (2.8-9.0)	18 (14.1-23.4)	59 (47.3-70.4)
Yevatmal	399	76 (70.2-80.8)	7 (4.1-12.5)	36 (30.9-41.8)	27 (19.3-36.0)
Tamil Nadu					
Chennai	406	62 (55.4-67.8)	2 (0.9-6.5)	14 (9.5-21.5)	55 (42.3-67.2)
Madurai	401	66 (59.6-71.7)	14 (9.4-19.9)	37 (30.5-43.0)	42 (32.9-51.4)
Salem	396	58 (50.7-65.5)	8 (4.5-12.5)	17 (12.8-21.4)	71 (57.9-81.6)

* Based on subset of respondents applicable for that analysis.

Main/steady female partner - The partner like spouse/girlfriend for whom the respondent do not pay to have sex.

Other non-paid female partners - Female partners other than main/steady partner and female sex workers with whom casually had sex with and did not pay.

Clients of female sex workers

TABLE C7: CONDOM USE WITH MALE/HIJRA SEXUAL PARTNERS

State & District	No. of respondents	Male/Hijra sexual partner (%)		
		Had anal sex with male/hijra partner	Condom use	
			Last time*	Consistent*
Andhra Pradesh				
East Godavari	409	1 (0.5-3.7)	100 (66.5-100)	28 (8.8-60.7)
Guntur	401	4 (2.5-7.1)	81 (55.9-93.1)	19 (4.1-55.5)
Hyderabad	406	1 (0.3-2.9)	56 (9.6-94.0)	56 (9.6-94.0)
Visakhapatnam	402	16 (11.6-21.7)	50 (32.8-68.0)	19 (7.0-41.0)
Warangal	402	6 (1.9-16.0)	29 (4.7-76.7)	1 (0.1-9.7)
Maharashtra				
Parbhani	404	10 (7.0-14.4)	23 (11.5-40.2)	13 (5.2-29.1)
Pune	401	5 (3.2-7.8)	82 (57.7-93.6)	88 (67.9-96.4)
Yevatmal	399	5 (2.8-8.2)	6 (1.3-22.0)	6 (1.3-22.0)
Tamil Nadu				
Chennai	406	3 (1.7-5.8)	30 (11.1-59.4)	25 (7.5-58.0)
Madurai	401	13 (9.7-17.6)	39 (25.3-54.1)	15 (6.8-28.8)
Salem	396	7 (3.5-13.5)	85 (57.9-95.8)	51 (36.4-65.4)

* Based on subset of respondents applicable for that analysis.

Clients of female sex workers

TABLE C8: PREVALENCE OF HIV/STIs

State & District	No. of respondents	HIV (%)	HSV-2 antibody* (%)	Reactive syphilis serology** (%)	<i>N. gonorrhoeae</i> (%)	<i>C. trachomatis</i> (%)	Any STI*** (%)	HIV among "any STI" positive (%)	HIV among "any STI" negative (%)
Andhra Pradesh	East Godavari	8.3 (5.4-12.6)	44.8 (26.1-65.1)	4.8 (2.9-7.9)	0.0 (0.0-0.8)	0.9 (0.3-2.6)	5.5 (3.5-8.7)	20.9 (9.5-39.9)	7.6 (4.6-12.2)
	Guntur	6.6 (4.2-10.2)	69.2 (49.7-83.6)	10.1 (7.2-14.0)	0.0 (0.0-0.8)	0.8 (0.2-3.8)	10.6 (7.6-14.4)	5.9 (1.7-18.8)	6.7 (4.3-10.3)
	Hyderabad	2.4 (1.2-4.8)	27.4 (13.8-47.2)	3.1 (1.8-5.3)	0.0 (0.0-0.8)	2.1 (0.7-6.1)	4.4 (2.6-7.3)	26.2 (9.5-54.7)	1.3 (0.5-3.1)
	Visakhapatnam	8.0 (5.0-12.6)	78.0 (57.0-90.5)	3.4 (1.9-5.9)	1.3 (0.5-3.5)	0.4 (0.1-2.7)	4.4 (2.6-7.2)	28.2 (12.1-52.8)	7.1 (4.1-11.9)
	Warangal	6.7 (2.7-16.1)	18.9 (8.2-37.5)	5.5 (1.8-15.6)	1.6 (0.4-6.8)	0.4 (0.1-1.2)	6.7 (2.7-15.9)	83.6 (53.9-95.7)	1.2 (0.5-2.7)
Maharashtra	Parbhani	6.4 (3.6-11.1)	13.7 (5.1-31.7)	4.0 (1.6-9.7)	0.7 (0.2-3.4)	3.6 (1.7-7.6)	7.9 (4.5-13.5)	8.2 (1.7-31.5)	6.3 (3.4-11.2)
	Pune	6.0 (3.7-9.7)	19.0 (8.7-36.6)	6.0 (3.6-9.8)	0.1 (0.0-0.4)	3.0 (1.3-6.4)	7.8 (5.0-12.0)	15.4 (6.4-32.8)	5.2 (2.9-9.0)
	Yevatmal	10.9 (8.0-14.7)	21.1 (11.6-35.3)	7.8 (4.9-12.0)	0.9 (0.3-2.6)	1.6 (0.6-4.5)	9.7 (6.5-14.3)	32.9 (17.4-53.3)	8.5 (5.9-12.2)
Tamil Nadu	Chennai	2.0 (1.0-3.9)	19.6 (9.7-35.5)	4.7 (2.8-7.7)	0.0 (0.0-0.8)	1.2 (0.4-3.6)	5.9 (3.6-9.3)	10.1 (2.6-32.0)	1.5 (0.7-3.2)
	Madurai	2.5 (1.1-5.7)	10.2 (3.7-25.4)	3.5 (1.9-6.2)	0.0 (0.0-0.8)	0.0 (0.0-0.8)	3.5 (1.9-6.2)	10.6 (1.4-49.5)	2.2 (0.9-5.5)
	Salem	4.2 (2.0-8.6)	22.3 (11.2-39.5)	3.5 (1.9-6.4)	0.0 (0.0-0.8)	1.0 (0.4-2.5)	4.3 (2.5-7.3)	18.9 (7.7-39.6)	3.5 (1.5-7.9)

* Based on a random sample of 10% of sera specimens selected for HSV-2 testing.

** RPR positive (any titre) and TPHA positive.

*** Positive for reactive syphilis serology, *N. gonorrhoeae* or *C. trachomatis* (one or more).

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