HIV

SENTINEL SURVEILLANCE (ANC)

Puducherry Report

2014-15

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INSTITUTE OF EPIDEMIOLOGY
Chennai

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AIDS CONTROL ORGANISATION
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For additional information and Correspondence

Focal Person - HIV Sentinel Surveillance
ICMR – NATIONAL INSTITUTE OF EPIDEMIOLOGY
Indian Council of Medical Research
Department of Health Research
Ministry of Health and Family Welfare
Government of India
127, Second Main Road
TNHB, Ayapakkam
Chennai-600077

Edited by

Elangovan A, Scientist F, ICMR - NIE
Ganesh B, Scientist D, ICMR - NIE

Contributed by

Santhakumar A, Scientist C (Surveillance), ICMR - NIE
Balamurugan T, Assistant Director - M&E, PACS

Technical Support by

Manikandan N, Scientist B (Surveillance), ICMR - NIE
Jothi Meenakshi SP, Scientist B (Surveillance), ICMR - NIE
Amirthammal G, Technical Officer (Surveillance), ICMR - NIE
Chandrasekar R, Ex. Technical Officer (Surveillance), ICMR - NIE

NATIONAL INSTITUTE OF EPIDEMIOLOGY
राष्ट्रीय जानपादिक रोग विज्ञान संस्थान

R-127, 3rd Avenue, Tamil Nadu Housing Board,
Ayapakkam, Chennai - 600 077, India
Phone: +91-44-26136204/26820517/26820469(D);
Fax: +91-44-26820464; Website: www.nie.gov.in
directorne@dataone.in, niedirector@icmr.org.in
mmurhekar@nieicmr.org.in

Indian Council of Medical Research,
Department of Health Research
MoH&FW, Govt of India

Dr. Manoj Murhekar, MD
Scientist G & Director-in-Charge

Foreword

HIV Sentinel surveillance among ANC attendees is one of the most important national level activities, as it helps the programme managers in framing health policies towards controlling HIV infection in the state and the country as well. The objectives of HIV sentinel surveillance are to understand the trends, assess spread and distribution of HIV infection among geographical areas across the state. In order to have uniform geographical coverage, the number of sentinel sites in the state has been increased over a period of years by keeping at least one site in each district.

The National Institute of Epidemiology, Chennai, one of the Regional Institutes for 8 southern states, is involved in the HIV surveillance activities since 2006. This report is prepared based on the data collected during the 14th round of surveillance, in conjunction with the post years data to analyze the trend and to have an insight of epidemiological factors. I hope this report will serve as a very useful tool for the policy makers, scholars, researchers and other stakeholders in formulating guidelines in controlling HIV and enhancing their knowledge of HIV in their state.

I take this opportunity to thank Dr. S. Venkatesh, Deputy Director General, NACO and Dr. Pradeep Kumar, Consultant (surveillance) & his team for entrusting this activity to NIE and also for providing technical support in implementing the surveillance. I also wish to thank the Project Director and nodal officer of State AIDS Control Society for their help in completing the surveillance activities in a timely manner. I express my gratitude to all the State Referral Laboratories, National Referral Laboratories, State Surveillance Team members, Sentinel sites personnel and other National and International partners who helped us in completing the surveillance successfully.

Dr. Manoj V Murhekar

WHO Collaborating Centre for Leprosy Research and Epidemiology

Dr.S.Jayanthi,

Project Director & Member Secretary,
Pondicherry AIDS Control Society,
Puducherry

Preface

The Union Territory of Puducherry comprises the former French establishments of Puducherry, Karaikal (in Tamil Nadu), Mahe (in Kerala) and Yanam (in Andhrapradesh), and it is considered as a HIV Low prevalence state in India. Pondicherry AIDS Control Society (PACS) has always worked towards providing best HIV quality services to each and every individual of the territory and has extended services to people of other states towards the goal of Zero prevalence. Besides providing quality services, PACS strives to foster an environment that respects human rights and combats stigma and discrimination. PACS is presently endeavoring to achieve the goal of "Getting to Zero: Zero new HIV infections, Zero stigma discrimination and Zero AIDS related deaths". One of the facts of this strategy is augmenting overall levels of awareness on HIV/AIDS as it is one of the key aspects in preventing new infections i.e. reaching zero new infections.

Since its inception, the HIV Sentinel Surveillance (HSS) has been periodically implemented properly as per the guidelines of NACO. The HSS survey has been conducted at two ANC Sites, one at Rajiv Gandhi Government Women and Children Hospital, Puducherry and another one at Government General Hospital, Karaikal.

Though this HSS survey impact of HIV infection, shows a remarkable decline in prevalence of HIV in Puducherry among Ante Natal Mothers (ANC) from 0.25% in 2004 to 0.13% in 2010 and 0% during the year 2012-13, in 2014-2015 the HIV prevalence is 0.13%. Pondicherry AIDS Control Society will strive hard to achieve zero prevalence and maintain it in the forthcoming years.

I am thankful to the staff of ANC Sites, SRL-JIPMER, SST Member, NIE and PACS staff for their co-operation and strenuous efforts.

(Dr. S. Jayanthi)

CONTENTS

CHAPTER 1

Introduction

Acquired immune deficiency syndrome or acquired immunodeficiency syndrome (AIDS) is a disease of the human immune system caused by the human immunodeficiency virus (HIV). This condition progressively reduces the effectiveness of the immune system and leaves individuals susceptible to opportunistic infections. The first HIV infection was reported in the year 1981 in the United States of America. Afterwards the epidemic spread rapidly throughout the globe.

In India it was in 1986, the first HIV infection reported from Chennai, Tamil Nadu. In the last two decades the awful disease spread throughout the country.

Surveillance is a vital component of any disease control programme. The purpose of surveillance is to actually look for evidence of disease risk, to predict the pattern and to plan appropriate action for control and prevention. Providing meaningful insights for action at policy, strategy, planning, or implementation levels at the appropriate time is the key objective of surveillance. The HIV epidemic in India is concentrated, with high prevalence among high-risk groups, moderate prevalence among bridge populations, and low prevalence among general population. Unprotected sex with female sex workers (FSW), injecting drug users (IDU), and unprotected anal sex between men are the three primary routes of HIV transmission in India. HIV sentinel surveillance measures the prevalence of HIV in a specific risk group in a specific region at a specific point of time. The HIV sentinel surveillance system in India is based on the HIV transmission dynamics mentioned above and monitors the HIV epidemic patterns among the following groups:

1. **High-risk groups**
   a. Female sex workers
   b. Men who have sex with men (MSM)
   c. Injecting drug users
   d. People who are TG (transgender)/eunuchs

2. **Bridge populations**
   a. Single male migrants
   b. Long-distance Truckers (LDTs)
   c. People attending STI or gynaecology clinics (currently discontinued)

3. General population

a. Pregnant women attending the ANC clinics in urban and rural areas, and the ANC clinic attendees were considered proxy for general population. STI patients were considered proxy for people with high-risk behaviour (high-risk and bridge populations and their partners).

1.1. Objectives and Application of HIV Sentinel Surveillance

The key objectives of HIV sentinel surveillance in India are to:

1. Monitor trends in HIV prevalence over time.
2. Monitor the distribution and spread of HIV in different subgroups and geographical areas.
3. Identify emerging pockets of HIV epidemic in the country.
4. Applications of HIV sentinel surveillance data.
5. Estimate and project burden of HIV at state and national levels.
6. Support programme prioritization and resource allocation.
7. Assist evaluation of programme impact.
8. Provide evidence to advocacy efforts.

1.2. Evolution of HIV Sentinel Surveillance in India

HIV surveillance in India began in 1985 when the Indian Council of Medical Research (ICMR) initiated a surveillance activity among blood donors and patients with STIs. After the National AIDS Control Organisation (NACO) was established in 1992, sentinel surveillance for HIV in India was initiated in 1993-94 with 52 sentinel sites in selected cities. In 1998, NACO formalized annual sentinel surveillance for HIV infection in the country with 180 sentinel sites, of which 176 were valid.

The first major expansion of the surveillance network was in 2003. More than 200 rural antenatal care (ANC) sentinel sites were established at the community health centre (CHC) level in most of the districts in high-prevalence states as well as some districts in low-prevalence states in North India. However, half of these ANC rural sites, especially those in low prevalence states of North India, were discontinued in the next round because they could not achieve the required target sample size due

to poor utilization rates. Another significant expansion in 2003 was the addition of 30 FSW sites. Overall, 354 districts had at least one HSS site in 2003. From 2003 and until 2005, the same sentinel sites continued with expansion to 83 FSW and 30 injecting drug user (IDU) sites.

The year 2006 could be considered the watershed year for HSS development in India. The goal was to have at least one sentinel site in every districts of India and new sentinel sites were added for all risk groups in that year. Key developments in 2006 included:

- Major expansion of STI and ANC urban sentinel sites in low-prevalence states of North India.
- Addition of rural ANC sites in high-prevalence states.
- Initiation of special ANC sites for 15-24-year-old pregnant women to monitor new infection.
- Expansion of sentinel sites among FSW, MSM and IDU.
- Initiation of sentinel sites among long-distance truckers (LDTs), single male migrants, and people who are transgenders (TG).
- Introduction of composite sites in HSS that facilitated establishment of sentinel sites in places where it had been difficult to do so, such as rural areas and places with fewer HRGs.

In year 2006, the scale of surveillance operations increased from 703 sites in high prevalence states in 2005 to 1,122 sites to cover the entire country. The surveillance was also expanded from being only clinic-based to also include Targeted Intervention (TIs)

Six leading regional public health institutions in the country were involved to expand and strengthen the surveillance network and implementation activities and follow up programmes. These regional institutes (RI) provided technical support, guidance, monitoring, and supervision for implementing HSS. Two more RIs were created in 2008. Supervisory structures were further strengthened with constitution of central and state surveillance teams, comprised of public health experts, epidemiologists, and microbiologists from several medical colleges and research institutions.

During the subsequent three rounds of HSS (2007, 2008-09, and 2010-11), the focus was on expansion of surveillance among high-risk and bridge populations.

Key strategic HSS implementation improvements in these rounds included:

1. Technical validation of new sentinel sites by regional institutes before inclusion in surveillance and dropping poorly performing sites.

2. Introduced the dried blood spot (DBS) method of sample collection from high-risk groups (HRGs) to overcome logistic problems at HRG sites.
3. Introduced informed consent at high-risk group sites to address ethical concerns.
4. Initiated random sampling methods of recruitment at HRG sites, taking advantage of the availability of updated line lists of HRGs at the TI projects.
5. Standardized training protocols across states with uniform session plans and materials, and adoption of a two-tier training plan with training-of-trainers (TOT) followed by training of site personnel.
6. Developed a four-tier supervisory structure: national-level central team; regional institutes; state surveillance teams; and State AIDS Control Society (SACS) teams.
7. Strengthened focus on supportive supervision and action-oriented monitoring.
8. Increased focus on quality of planning, training, implementation, supervision and feedback.
9. Decreased number of testing laboratories for ANC and STD samples, limiting them to high-performing laboratories with enzyme-linked immunosorbent assay (ELISA) facilities to ensure high-quality testing and close supervision.
10. Developed a new web-based data management system to enhance data quality and ensure real time monitoring of surveillance activities.
11. Initiated epidemiological investigation into unusual findings (sudden rise or decline in prevalence) to understand reasons and correct.
12. Conducted pre-surveillance sentinel site evaluation to assess preparedness of site for HSS and to obtain profile-related information.

Between 2008 and 2009, the annual frequency of HSS was shifted to biennial (once in two years). STI sites were gradually being discontinued in 2008-09 and 2010-11. The 13th round of HSS was implemented at 763 sentinel sites (750 ANC and 13 STI sites). Most of the STI sites from the 12th round of HSS were phased out during HSS 2014-15. For high-risk and bridge populations, National Integrated Biological and Behavioural Surveillance (IBBS) was conducted to strengthen surveillance among these groups so HSS 2014-15 did not include high-risk groups. Table 1 presents the scale up of sentinel sites in Puducherry since 2003.

Table 1: Scale up of No. of Sentinel Sites in Puducherry, 2003-2015

Site Type	2003	2004	2005	2006	2007	2008-09	2010-11	2012-13	2014-15
ANC	4	2	2	2	2	2	2	2	2
FSW					3	3	3		
MSM					2	2	2		
STD					3	3	3		

CHAPTER 2

Methodology and Implementation

This chapter describes HSS methodology and the implementation mechanisms adopted during HSS 2014-15.

2.1. Methodology of HIV Sentinel Surveillance at ANC Sentinel Sites

HIV sentinel surveillance is defined as a system of monitoring the HIV epidemic among the specified population groups by collecting information on HIV from designated sites (sentinel sites) over years, through a uniform and consistent methodology that allows comparison of findings across place and time, to guide programme response. A sentinel site is a designated service point/facility where blood specimens and relevant information are collected from a fixed number of eligible individuals from a specified population group over a fixed period of time, periodically, for the purpose of monitoring the HIV epidemic. Under HIV sentinel surveillance (HSS), recruitment of respondents is conducted for three months at selected ANC sentinel sites. Because of the low HIV prevalence in India, the classical survey method of sample size calculation that gives a large sample size cannot feasibly be collected through facility-based surveillance on an annual basis. Hence, a sample size of 400 for surveillance among ANC attendees was approved by a consensus of experts. Eligible respondents are enrolled until the sample size of 400 is reached or until the end of the surveillance period, whichever is earlier.

The eligibility criteria for recruiting respondents at an ANC sentinel sites were:

1. Age 15-49 years

2. Pregnant woman attending the antenatal clinic for the first time during the current round of surveillance period. “Sampling method” refers to the approach adopted at the sentinel sites for recruiting eligible individuals into HSS. Consecutive sampling method is adopted in HSS in India for ANC clinic attendees. After the start of surveillance, all individuals attending the ANC sentinel site facility who are eligible for inclusion are recruited in the order they attend the clinic. This sampling method removes all chances of selection or exclusion based on individual preferences or other reasons, and hence reduces the selection bias. It is convenient, feasible, and easy to follow.

”Testing strategy” refers to the approach adopted for collecting and testing blood specimens and handling the test results in HSS. In India, the unlinked anonymous testing strategy is used. Testing is conducted on a portion of blood specimen collected for routine diagnostic purposes (such as syphilis) after removing all personal identifiers. Neither the information collected in the data form nor the HIV test result from the blood specimen is ever linked to the individual from whom the information/ specimen is collected. Neither the personnel collecting the specimen nor the personnel testing the specimen are able to track the results back to the individual.

Hence, the personal identifiers such as name, address, outpatient registration number, etc. were not mentioned anywhere in the data form, blood specimen, or data form transportation or sample transportation sheets. Similarly, the HSS sample number or any mark indicating inclusion in HSS is not mentioned in the ANC register or patient/OPD card. The portion of the blood specimen with identifiers is used for reporting the results of the routine test for which it has been collected. The portion of the blood specimen without identifiers is sent for HIV testing under HSS.

“Testing protocol” refers to the number of HIV tests conducted on the blood specimen collected during HSS. A two-test protocol is adopted in HSS. The first test is of high sensitivity and second of high specificity and is confirmatory in nature. The second test is conducted only if the first is found to be positive. HIV testing under surveillance is for the purpose of ascertaining HIV levels and trends in a community and not for case diagnosis, which is why the two-test protocol is the global standard for surveillance.

The methodology of HSS at ANC sentinel sites is summarized in Table 2 below:

Table 2: Methodology of HIV Sentinel Surveillance at ANC Sentinel Sites	
Sentinel site	Antenatal clinic
Sample size	400
Duration	3 months
Frequency	Once in 2 years (biennial)
Sampling method	Consecutive sampling
Eligibility	Pregnant women ages 15-49 years attending ANC clinic for the first time during the current round
Testing strategy	Unlinked anonymous testing
Blood specimen	Serum collected through venous blood specimen
Testing protocol	Two-test

2.2. Information Collected under HSS at ANC Sentinel Sites

HSS provides information on two bio-markers- HIV and syphilis. All blood specimens collected under HSS are tested for these two infections. When recruiting an individual in HSS, information is collected on basic demographic parameters such as age, education, occupation, spouse's occupation, and order of pregnancy. Collected information is kept minimal and restricted to those who might be asked under routine clinic procedures. During the recent rounds, a few questions were added to identify potential biases in the sample (e.g., source of referral) or to further profile the respondents with respect to their vulnerability (migration status of spouse) so that HIV prevalence estimates can be better explained and interpreted. HSS 2014-15 collects information on the following nine key demographic variables from every respondent.

1. Age: The age of the respondent is recorded in number of completed years. Since age is a part of eligibility criteria, improper recording or non-recording of age makes a sample invalid. Information on age helps identify the age groups with high HIV prevalence. In the absence of data on HIV incidence, high prevalence among younger age groups is considered a proxy for recent infections.

2. Literacy status: The literacy status of an individual has a direct bearing on the awareness levels with respect to risks of acquiring HIV and means of protecting oneself. Knowing the literacy status of the pregnant woman, helps in understanding the differentials in HIV prevalence and informs demographics about the women who are accessing services at ANC clinics. This information may also be helpful to compare and standardize the demographic profiles of two independent samples under HSS, while investigating any unusual increase or decrease in trends. Under HSS 2014-15, the literacy status of respondents was classified into five categories as defined below.

(a). Illiterate: People with no formal or non-formal education. (b). Literate and till 5th standard: People with non-formal education or those who joined school but did not study beyond 5th standard. (c). 6th to 10th standard: Those who studied beyond 5th standard but not beyond 10th standard. (d). 11th to graduation: Those who studied beyond 10th standard but not beyond graduation. Includes those with technical education/diplomas,. (e). Post-graduation: Those who studied beyond graduation.

3. Order of current pregnancy: The order of pregnancy denotes the number of times a woman has been pregnant. It includes the number of live births, still births, and abortions. It is also referred to as gravidity. Women who are pregnant for the first time

are referred to as primi-gravida. In the context of HIV, order of pregnancy indicates the duration of exposure to sexual risks. Since primi-gravida are likely to be exposed to sexual risks only recently, HIV prevalence among them is considered a proxy for new HIV infections and helps in understanding the HIV incidence in that region. The order of pregnancy is recorded as first, second, third, fourth, or more.

4. Source of referral to the ANC clinic: Under HSS, ANC clinic attendees are asked who referred them to the clinic for antenatal check-up. This variable was added to the data collection form to understand the various sources of referral, especially to assess if there is any specific bias in the sample because of specific referrals of HIV-positive cases from any source. Published literature indicates that there is disproportionate referral of HIV-positive cases from private sector to government hospitals. Similarly, if there are higher numbers of referrals from ICTC/ ART centres in the sample, it may bias the HIV prevalence, as those respondents are likely to be people who have been exposed to HIV risk, to have HIV risk perception or who are known to be HIV-positive. This variable helps assess any such phenomenon. The response categories listed in the HSS data form include: (a). Self-referral (b). Family/ relatives/ neighbours/ friends (c). NGO (d). Private hospital (doctors/ nurses) (e). Government hospital (including ANM/ ASHA) (f). ICTC/ ART centre,

5. Current place of residence: HSS 2014-15 records the reported current residence of the respondent as 'Urban' or 'Rural'. If the current place of residence of the respondent i.e., the place she is living with her husband falls under Municipal Corporation, municipal council, or cantonment area, it is classified as 'urban'. Otherwise, it is recorded as 'rural'. Place of residence helps in studying the epidemic patterns in urban and rural areas separately and provides programmatic insight for implementing interventions. In the context of formerly high-prevalence states, urban rural differentials of HIV prevalence is important because HIV is known to have spread to rural areas, sometimes with higher prevalence in these states. In low-prevalence states with rising HIV trends, migration from rural areas to high prevalence destinations is likely to play a role. Therefore, studying rural epidemics is important to characterise the epidemic appropriately.

6. Duration of stay at current place of residence: All the respondents are asked about the duration of stay at the current place of residence (the place she is living with her husband) and the responses are recorded in years and months. If the duration is less than one year, '0' years and the number of months as reported by the respondent are recorded. If the duration is less than one month, the duration is recorded as '0' years,

‘1’ month. Duration of stay at current place of residence is asked to ascertain whether the pregnant woman belongs to the place where the ANC clinic is situated. Because many pregnant women in India go to their maternal home for delivery, it is likely that they attend ANC clinic at their mother’s place. If this is the case, her duration of stay will be only a few days or months. Although counsellors are instructed to ask where the respondent is living with her husband, this variable helps eliminate reporting errors. Also, it helps in understanding the duration of exposure to sexual risk. Similar to order of pregnancy, this variable also helps assess new HIV infections occurring in a region.

7. Current occupation of respondent: Certain occupations are associated with higher exposure and risk to HIV. It is important to understand the profile of respondents and differentials of HIV with respect to their occupation. For this purpose, HSS has categorized occupations into 13 categories ensuring that all the possible occupations are covered and the categories are relevant to the epidemiological analysis of HIV prevalence data. The occupation categories and their definitions were as follows: (a). Agricultural labourer (b). Non-agricultural labourer: includes workers at construction sites, quarries, stone crushers, road or canal works, brick-kilns. (c). Domestic servant (d). Skilled/semi-skilled worker: includes workers in small-scale or cottage industries; industrial/ factory workers; technicians such as electricians, masons, plumbers, carpenters, goldsmiths, iron-smiths, and those involved in automobile repair; artisans such as weavers, potters, painters, cobblers, shoe-makers, tailors. (e). Petty business/ small shop: includes vendors selling vegetables, fruits, milk, and newspapers; pan shop operators. (f). Large business/self-employed: includes professionals and business people. (g). Service (govt/pvt): those working on salary basis in government, private, or institutional sector; excludes drivers and hotel staff. (h). Student (i). Truck drivers/ helpers (j). Local transport workers (auto/ taxi drivers, handcart pullers, rickshaw pullers, etc.) (k). Hotel staff (l). Agricultural cultivators/ landholders (m). Housewife (in order to be consistent with the occupation codes for spouse of respondent, housewife is Code 14).

8. Current occupation of spouse: Occupation of spouse is an important epidemiological variable that may help identify population groups that are at higher risk of acquiring HIV. HSS used the same occupational categories as those used for the respondent. The two differences are that the category ‘unemployed’ (Code13) is used in the place of ‘housewife’ and there is an additional category: ‘Not applicable (never married/ widow/divorced/separated)’ (Code 99).

9. Migration status of spouse: Analyses of drivers of the emerging epidemic in some low-prevalence states points to migration from these states to high-prevalence destinations (NACO Annual Report 2013-14, Chapter 2. Current Epidemiological Scenario of HIV/AIDS, pg.12). In order to assess the effects of migration status of spouse on HIV prevalence among ANC clinic attendees, respondents in HSS were asked whether spouse resides alone in another place/town away from wife for work for longer than 6 months. This question is not applicable to respondents who were never married/widowed/ divorced/separated.

2.3. Implementation Structure of HIV Sentinel Surveillance in India

HIV sentinel surveillance has a robust structure for planning, implementation, and review at national, regional, and state levels. The structure and key functions of involved agencies are shown in Figure 1.

National level: The National AIDS Control Organisation (NACO) is the nodal agency for strategy formulation and commissioning for each round of HSS. The Technical Resource Group on Surveillance and Estimation, comprised of experts from the fields of epidemiology, demography, surveillance, biostatistics, and laboratory services, advises NACO on the broad strategy and

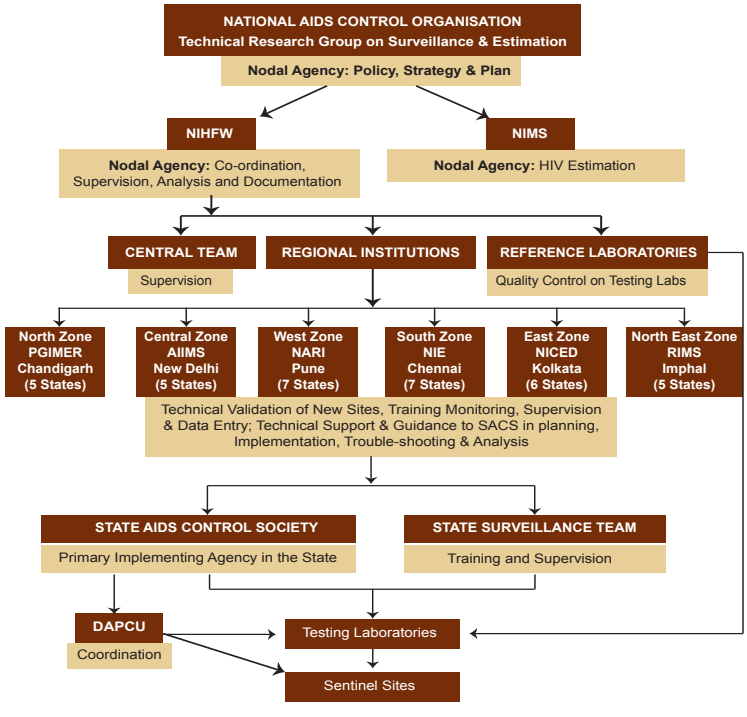


Figure 1: Implementing Structure of HIV Sentinel Surveillance in India

The main goal of implementing structure of HSS is for performing the assessment of the implementation plans of HSS and reviews the outcomes of each round. Two national institutes—National Institute of Health and Family Welfare (NIHFW) and ICMR-National Institute of Medical Statistics (ICMR-NIMS)—supports national level activity planning and coordination. In addition, the central team, which is coordinated by NIHFW, New Delhi and is comprised of experts from the Centres for Disease Control and Prevention (CDC), World Health Organisation (WHO),The Joint United Nations Programme on HIV and AIDS (UNAIDS), medical colleges, and other national and international agencies, provide support in training and supervision.

Regional level: Since 2006, NIE has been identified as regional institutes (RIs) for HSS to provide technical support to the State AIDS Control Societies (SACS) for all HSS activities in southern zone, starting with identification of new sites, training, monitoring and supervision, and improving quality of the data collection and their analysis. Data entry is another function performed by RIs. The team at each RI is comprised of two epidemiologists/public health experts and one micro-biologist, which are supported by one project coordinator, two research officers, one computer Assistant/data manager, and between four and ten data entry operators, depending on the volume of data entry. The names of the six regional institutes and the distribution of states among them are in Table 3.

State level: SACS is the primary agency responsible for implementation of HSS and NACO has appointed state epidemiologists at the SACS to support the activities and promote data analysis. In addition to these, every state has a surveillance team comprised of public health experts and microbiologists who support SACS in the training, supervision, and monitoring of the personnel involved in sentinel surveillance. State surveillance teams (SSTs) are formed by RIs in consultation with SACS. All activities are coordinated by RIs.

District level: In districts with functional district AIDS Prevention and Control Units (DAPCUs), the DAPCU staffs are involved in the coordination of HSS activities at the sentinel sites and the associated testing labs. Laboratory network Laboratory support is provided by a network of testing and reference labs. There are 117 state reference laboratories (SRLs) that conduct primary testing of blood specimens collected under HSS. Thirteen national reference laboratories (NRLs) provide external quality assurance to the SRLs through repeat testing of all HIV-positive blood specimens and 5 % of HIV negative specimens.

Table 3: Regional Institutes for HIV Sentinel Surveillance and their State Allocation	
Name of regional institution	Responsible states
Central Zone: All India Institute of Medical Science, New Delhi	Uttar Pradesh, Bihar, Jharkhand, Uttaranchal, and Delhi.
North Zone: Post-graduate Institute of Medical Education and Research, Chandigarh	Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, and Chandigarh.
West Zone: National AIDS Research Institute, Pune	Maharashtra, Gujarat, Goa, Madhya Pradesh, Rajasthan, Daman & Diu, and Dadra Nagar Haveli.
South Zone: National Institute of Epidemiology, ICMR, Chennai	Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, Odisha, Puducherry, and Lakshadweep and Telangana.
East Zone: National Institute of Cholera and Enteric Diseases, Kolkata	West Bengal, Chhattisgarh, Sikkim, Andaman & Nicobar Islands, Meghalaya, and Nagaland.
Northeast Zone: Regional Institute of Medical Sciences, Imphal	Manipur, Mizoram, Tripura, Assam, and Arunachal Pradesh.

2.4. Key Initiatives during HIV Sentinel Surveillance 2014-15:

In response to key issues identified in the implementation of HSS during the previous rounds and to improve the quality and timeliness of the surveillance process in the 14th round, several new initiatives were implemented as part of continuous quality improvement.

SACS checklist for preparatory activities: This was developed to monitor the planning process for HSS in each state (Annex 3). All the preparatory activities were broken into specific tasks with clear timelines and SACS were required to submit the completion status for each task. A team of officers from NACO coordinated with state nodal persons to ensure that preparatory activities in all states adhered to the timelines.

Pre-surveillance sentinel site evaluation (SSE): A pre-surveillance evaluation of ANC and STD sentinel sites was conducted to identify and correct human resources and infrastructure-related issues at the sentinel sites before initiation of surveillance. The evaluation also provided site information such as type of facility, average OPD attendance, availability of HIV and AIDS services, and distance of facilities from HSS labs (Annex 4), which may have implications on adherence to methodology.

Standard operational manuals, wall charts, and bilingual data forms: These were developed to simplify the HSS methodology for site-level personnel and to ensure uniform implementation of the guidelines in all the sentinel sites. These were printed centrally and distributed across the country.

Training during HSS 2014-15:

Steps to improve quality of training:

1. A well-structured training programme was adopted to ensure that all the personnel involved in HSS at different levels were adequately and uniformly trained in the respective areas of responsibility.

2. The training agenda, curriculum, and planning and reporting formats were standardized and used in all the states. Standard slide sets and training manuals for training of sentinel site personnel were developed centrally to ensure uniformity.

3. Trainings included group work and a "know your sentinel site" exercise, which helped participants identify the routine practices that could affect the implementation of surveillance at their sites and recommended actions to address the same.

4. Pre and post-test assessments were given to each participant at the site-level trainings. Analysis of these scores helped state teams to identify the priority sites for supervisory visits.

5. Training reports for each batch were submitted in standard formats at the end of the each training.

Details of trainings:

1. Trainings started with two batches of national pre-surveillance meetings with about 90 personnel from regional institutes and SACS to discuss the critical aspects of planning for HSS 2014-15 and to clearly understand the system for supportive supervision through the online Strategic Information Management System (SIMS) application.

2. This was followed by 2-day regional TOTs organised by the RIs for SACS officers and state surveillance teams, comprised of public health experts and microbiologists, to create state-level master trainers and to plan for the site-level trainings.

3. Site-level trainings (2 days per batch @ 8-10 sites per batch) were conducted in all the states. Representatives from the regional institutes and NACO observed the

trainings to ensure that trainings were provided as per the protocol and that all the sessions were covered as per the session plan.

4. Separate trainings on surveillance testing protocols and lab reporting mechanisms through the SIMS application for HSS were organised for microbiologists and lab technicians from 117 ANC/STD testing labs and 13 NRLs.

5. Overall, 40 central team members; 30 officers from six RIs; 95 SACS officers including in-charge surveillance, Epidemiologists, and M&E officers; 280 state surveillance team members; 260 laboratory personnel including microbiologists and lab technicians from the designated testing labs; and more than 3,000 sentinel site personnel including medical officers, nurse/counsellors, and lab technicians were trained under HSS 2014-15.

Laboratory system: For HSS 2014-15, the laboratory system was strengthened by limiting the testing of specimens to designated SRLs. Real-time monitoring of the quality of blood specimens and laboratory processes was achieved through introduction of web based reporting through the SIMS application for HSS. Efforts were made to standardize quality assurance aspects of sample testing under HSS and to streamline responses in case of discordant test results between testing lab and reference lab through the SIMS application.

Supervisory mechanisms for HSS 2014-15: Supervision of all HSS activities was prioritized to ensure smooth implementation and high-quality data collection. Extensive mechanisms were developed to set up a comprehensive supervisory system for HSS and to ensure that 100 % of HSS sites were visited in the first 15 days of the start of sample collection. The principles adopted included action-oriented supervision, real-time monitoring and feedback, accountability for providing feedback and taking action, and an integrated web-based system to enhance the reach and effectiveness of supervision.

SIMS modules for web-based supervision: Specific modules were developed and made operational in the web-based SIMS for HSS to facilitate real-time monitoring of HSS 2014-15.

1. Field supervision was conducted by trained supervisors who visited the sentinel sites to monitor the quality of recruitment of respondents and other site-level procedures. Real-time reporting of field supervision used the SIMS supervisor module via the field supervisory quick feedback and action taken report sub-modules. The module was used extensively by all the supervisors and helped in quick identification and resolution of challenges in the field.

2. Data were supervised by data managers at RIs to monitor the quality of data collection and transportation using the SIMS module.

3. Laboratory supervision was conducted by SRLs and NRLs to monitor the quality of blood specimens, progress in laboratory processing, and external quality assurance, using the SIMS lab module.

Overall, 80 % of supervisors reported on the SIMS field supervisor quick feedback format, and 52 % of action taken report formats were submitted by HSS focal persons from SACS and RIs. Laboratory reporting through the lab module was completed by 87% of SRLs.

Integrated monitoring and supervision plan

1. An integrated supervision plan for each state was developed by RIs, SACS, and NIHFW to avoid duplication in monitoring coverage, thereby facilitating maximum coverage of surveillance sites.

2. The first round of visits was conducted by RI, SACS, and SST members. Central team members (CTM) visited the top priority sites identified in feedback from the first round of visits. Subsequent visits were based on priority with a goal of making at least three visits to each identified site which require supervision.

SMS-based daily reporting from sentinel sites: This was piloted in last round and implemented in this round as an approach of daily reporting of the number of samples collected at each sentinel site through a group SMS from a registered mobile number to a central server. The system automatically compiled and displayed site-wise data on an Excel format on a real-time basis. Access to this web-based application was given to SACS, RIs, and DAC and facilitated identification of sites with poor performance and enabled initiation of corrective action at sites that initiated HSS late; where sample collection was too slow or too fast; and where there were large gaps in sample collection.

CHAPTER 3.

Profile of Respondents

Review of the profile of the respondents showed that, three-fifths of respondents (53.3%) were in the age group of 15-24 years, with the median age of respondents being 23 years. Only 1.3% of respondents had limited or no literacy skills. More than two-fifth (43.1%) of respondents were literate with 6th to 10th standard education, followed by those who studied up to graduation (44.1%). Those with only primary education accounted for 2.5%. More than two-fifth of the ANC clinic attendees (50.3%, 37.8% respectively) were in their first and second pregnancy. Almost two-thirds of the respondents (72%) reported that they resided in rural areas. About 91.3% of ANC clinic attendees reported that they were housewives. Only 5.5% reported that they were in Service (Govt. Pvt.).

Non-agricultural labourers (28.0%); Service (Govt. Pvt.) (21.3%) and skilled/semi-skilled workers (17.5%) were the predominant occupations among the spouses of the respondents. Agricultural labour (9.4%); local transport worker (8.9 %); petty business (4.4%); truck driver/helper (3.1%); agricultural cultivator/landholder (2.8%); large business/self employed (2.5%) and hotel staff (2.0%) are other important occupation groups of spouses of respondents. Only less than five percent (3.3%) of ANC clinic attendees reported that their spouses reside in another place for work for less than six months.

Table 4: Profile of Respondents in Puducherry, HSS 2014-15

Background characteristics	Number	%
Age (N=800)		
15-24	426	53.3
25-34	367	45.9
35-44	7	0.9
45-49	0	0.0
Literacy status (N=800)		
Illiterate	10	1.3
Literate and till 5th standard	20	2.5
6th to 10th standard	345	43.1
11th to Graduation	353	44.1
Post Graduation	72	9.0
Order of current pregnancy (N=800)		
First	402	50.3
Second	302	37.8

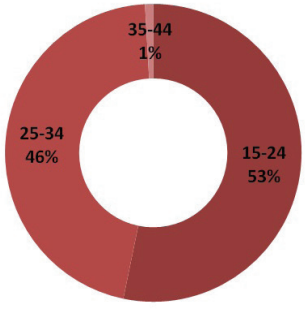
Third	76	9.5
Fourth or more	20	2.5
Source of referral pregnancy (N=800)		
Self referral	547	68.4
Family/Relatives/Neighbors/Friends	153	19.1
NGO	0	0.0
Private Hospital	18	2.3
Govt. Hospital	82	10.3
ICTC/ART Centre	0	0.0
Current place of residence (N=800)		
Urban	224	28.0
Rural	576	72.0
Current occupation of the respondent (N=800)		
Agricultural Labourer	3	0.4
Non-Agricultural labourer	10	1.3
Domestic servant	0	0.0
Skilled/Semiskilled worker	5	0.6
Petty business	0	0.0
Large business/self employed	0	0.0
Service (Govt./Pvt.)	44	5.5
Student	8	1.0
Truck driver/helper	0	0.0
Local transport worker	0	0.0
Hotel staff	0	0.0
Agricultural cultivator/landholder	0	0.0
Housewife	730	91.3
Current occupation of the spouse (N=800)		
Agricultural Labourer	75	9.4
Non-Agricultural labourer	224	28.0
Domestic servant	0	0.0
Skilled/Semiskilled worker	140	17.5
Petty business	35	4.4
Large business/self employed	20	2.5
Service (Govt./Pvt.)	170	21.3
Student	1	0.1
Truck driver/helper	25	3.1

Local transport worker	71	8.9
Hotel staff	16	2.0
Agricultural cultivator/landholder	22	2.8
Unemployed	1	0.1
Not Applicable	0	0.0
Spouse resides alone in another place/town from wife for work for longer than 6 months (N=800)		
Yes	26	3.3
No	774	96.8
99	0	0.0
HIV (N=800)		
Negative	799	99.9
Positive	1	0.1
Syphilis (N=800)		
Negative	800	100.0
Positive	0	0.0

3.1. Age

Age in completed years is recorded for every respondent at the time of recruitment into HSS. The majority (53.3 %) belonged to the age group of 15-24 years and a little more than (45.9 %) was in the age group of 25-34 years. Only one and half % of respondents belonged to the age group of 35-44 years and no one has registered in the 45- 49 year group (Figure 2).

Figure 2: Percent distribution of respondents by age group, HSS 2014-15, Puducherry



The proportion of respondents in the age group of 15-24 years varied from 49.3 % in Karaikal to 57.3 % in Puducheery. While the respondents in the age group of 35-44 years accounted only in the Pondicherry as 1.8%.

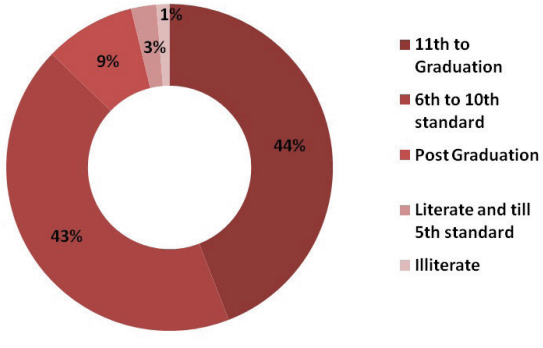
Table 5: Percent distribution of respondents by age group and district, HSS 2014-15					
	15-24	25-34	35-44	45-49	N
	%	%	%	%	
Karaikal	49.3	50.8	0.0	0.0	400
Pondicherry	57.3	41.0	1.8	0.0	400

3.2. Literacy Status

Under HSS 2014-15, respondent literacy status was classified into five categories:

1. Illiterate: people with no formal or non-formal education.
2. Literate and till 5 standard: people with non-formal education or those who joined school but had not studied beyond 5 standard.
3. 6 to 10th standard: people who studied beyond 5th standard but not beyond 10th standard.
4. 11 to graduation: people who studied beyond 10th standard but not beyond graduation. Includes those with technical education/diplomas.
5. Post-graduation: people who studied beyond graduation.

Figure 3: Percent distribution of respondents by education, HSS 2014-15, Puducherry



One percent of respondents in Puducherry had no formal education. Around 3% of respondents studied up to fifth standard and 43% were studied between sixth and tenth standards, 44% of the respondents reported to have studied beyond 10th standard and up to graduation, while another about 9% had studied post graduation (Figure 3).

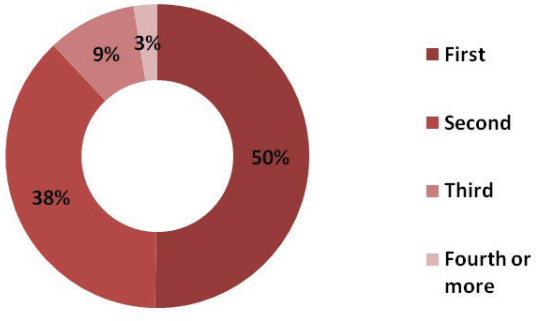
Table 6: Percent distribution of respondents by education and state, HSS 2014-15						
	Illiterate	Literate and till 5th standard	6th to 10th standard	11th to Graduation	Post Graduation	N
	%	%	%	%	%	
Karaikal	1.3	3.5	46.8	38.5	10.0	400
Pondicherry	1.3	1.5	39.5	49.8	8.0	400

The higher percent of (6-10TH) 46.8 reported in the Karaikal and eleventh to graduation was reported 49.8% in Puducherry district.

3.3. Order of Pregnancy

The order of pregnancy denotes the number of times a woman has become pregnant. It includes the number of live births, still births, and abortions. It is also referred to as 'gravidity'. As noted earlier, in the context of HIV, order of pregnancy indicates the duration of exposure to sexual risks, so HIV prevalence among primi-gravida is considered a proxy for new HIV infections and is an indicator of state HIV incidence.

Figure 4: Percent distribution of respondents by Order of Pregnancy, HSS 2014-15, Puducherry



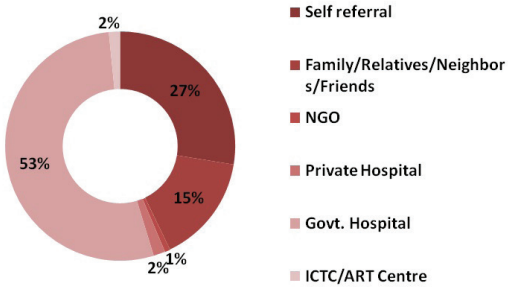
At the state level, a half (50%) of the respondents reported being pregnant for the first time, while 38% were pregnant for the second time and 9% of respondents reported that it was their third pregnancy. Only 3% of respondents were pregnant for the fourth or more time (Figure 4).

Table 7: Percent distribution of respondents by Order of Pregnancy and district, HSS 2014-15					
	First	Second	Third	Fourth or more	N
	%	%	%	%	
Karaikal	52.0	35.0	10.3	2.8	400
Pondicherry	48.5	40.5	8.8	2.3	400

3.4. Source of Referral to the ANC Clinic

This variable illuminates the various sources of referral, and helps identify if a specific bias is being introduced in the sample due to specific referrals of HIV-positive cases from any source. The response categories listed in the HSS data form include self-referral; family/relative/ neighbour/friend; NGO; private hospital (doctor/nurse); government hospital (including ANM/ASHA); and ICTC/ ART centre. Government health care providers include ANM, ASHA, doctors/nurses at PHC, and CHC.

Figure 5: Percent distribution of respondents by source of referral, HSS 2014-15, Puducherry



Self referral was identified as the major source of ANC clinics, accounting for 68.4 % of respondents, followed by family/relative/Neighbour/friend (19.15 %), and Government Hospitals (10.25 %). Only close to 2.25 % had been referred by private service providers at the state level. NGOs and ICTC/ART centres are zero percent (Figure 5).

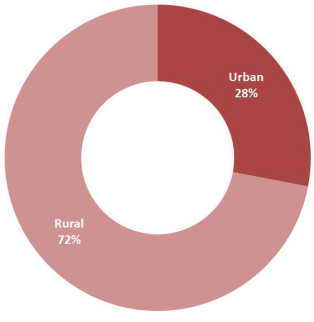
Table 8: Percent distribution of respondents by source of referral and district, HSS 2014-15

	Self referral	Family/Relatives/ Neighbors/Friends	NGO	Private Hospital	Govt. Hospital	ICTC/ART Centre	
District	%	%	%	%	%	%	N
Karaikal	100.0	0.0	0.0	0.0	0.0	0.0	400
Pondicherry	36.8	38.3	0.0	4.5	20.5	0.0	400

3.5. Current Place of Residence

2014-15 records the reported current residence of the respondent as urban or rural. If the current place of residence of the respondent was Municipal Corporation, municipal council, or cantonment area, it was classified as urban. Otherwise, it was recorded as rural.

Figure 6: Percent distribution of respondents by Current Place of residence, HSS 2014-15, Puducherry



At the state level, 72% of respondents reported to be currently residing in rural areas and the rest (28%) reported to be currently residing in urban areas (Figure 6).

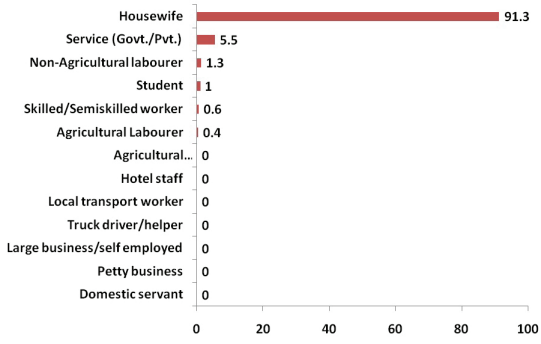
Table 9: Percent distribution of respondents by Current Place of residence and district, HSS 2014-15

District	Urban	Rural	N
Karaikal	28.0	72.0	400
Pondicherry	28.0	72.0	400

3.6. Current Occupation of the Respondent

Certain occupations are associated with higher exposure and risk to HIV. It is important to understand the profile of respondents with respect to their occupation. For this purpose, HSS has categorized 13 occupations, as detailed in an earlier chapter.

Figure 7: Percent distribution of respondents by Occupation, HSS 2014-15, Puducherry



The majority of the respondents (91.3 %) were housewives, and 5.5% of respondents reported to have working in Service (Govt./Pvt.), followed by were accounted for 5.55 % of respondents, followed by non-agricultural labourers (1.3 %), and those in Skilled/ Semiskilled work was 0.07% (Figure 7).

Table 10: Percent distribution of respondents by Occupation and district, HSS 2014-15

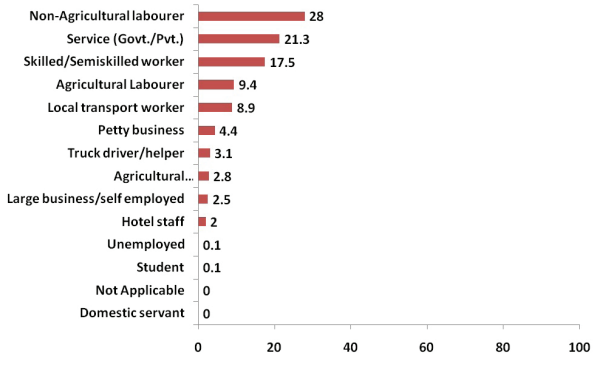
	Agricultural Labourer	Non-Agricultural labourer	Domestic servant	Skilled/Semiskilled worker	Petty bussiness	Large business/self employed	Service (Govt./Pvt.)	Student	Truck driver/helper	Local transport worker	Hotel staff	Agricultural cultivator/landholder	Housewife	
	%	%	%	%	%	%	%	%	%	%	%	%	%	N
Karaikal	0.5	0.3	0.0	0.8	0.0	0.0	4.8	1.3	0.0	0.0	0.0	0.0	92.5	400
Pondicherry	0.3	2.3	0.0	0.5	0.0	0.0	6.3	0.8	0.0	0.0	0.0	0.0	90.0	400

3.7. Current Occupation of the Spouse

The majority of the respondents (28%) were Non-agricaltural labourer and 21.3% of respondents reported to have working in Govt. / Pvt. Service, followed by Skilled / Semiskilled worker (17.5%), Agricultural Labourer (9.4%), Local transport worker (8.9%), Petty business (4.4%), Truck driver/ helper (3.1%), Agricultural cultivator / landholder (2.8%), Large business/ self non-non-agricultural labourer (1.3%), Student (1%), skilled/semi skilled worker (0.6%) and agricultural labourer (0.4%). Remaining

occupations, Agricultural cultivator / landholder, hotel staff, Local transport worker, truck driver / helper, large business / self employed, petty business and domestic servant were zero percent (Figure 8).

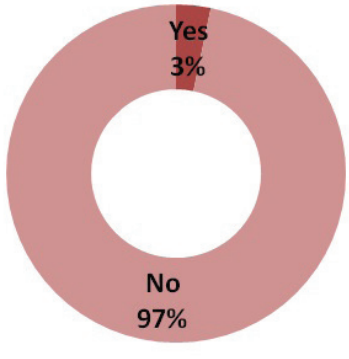
Figure 8: Percent distribution of respondents by spouse occupation, HSS 2014-15, Puducherry



3.8. Migration Status of Spouse

In order to assess the relationship between spousal migration status and HIV prevalence among ANC clinic attendees, respondents in HSS were asked whether spouse resides in another place/town away from wife for work for longer than 6 months. This question was not applicable to those respondents who were never married/ widowed/ divorced/ separated.

Figure 9: Percent distribution of respondents by spouse migration status, HSS 2014-15, Puducherry



At the state level, around 3.3 % of respondents reported that their spouses were migrants, though there were significant inter-district variations (Figure 9).

Table 11: Percentage of respondents with Migrant spouse by district, HSS 2014-15

District	% respondents with migrant spouse	N
Karaikal	4.8	400
Pondicherry	1.8	400

CHAPTER 4

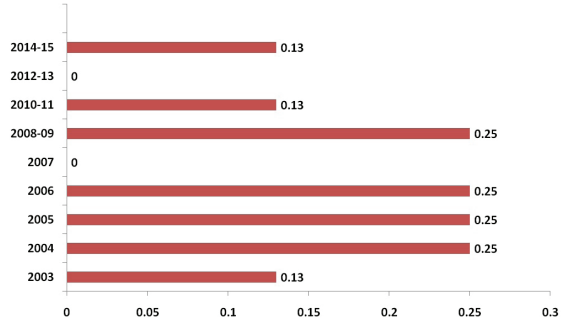
Levels of HIV Prevalence among ANC Clinic Attendees

4.1. HIV Prevalence in Puducherry

HIV prevalence is the proportion of respondents who are found HIV positive at a given point of time in a specified geographic area. It indicates the burden of the epidemic in different population groups.

HIV prevalence among ANC clinic attendees is considered as proxy for HIV burden in general population. HIV prevalence of 1% or more among ANC clinic attendees is considered as high level, 0.5-0.99% is considered as moderate level and less than 0.5% is considered as low HIV prevalence for the analysis purpose in this report. This chapter describes the levels of HIV prevalence among ANC clinic attendees at state and district level.

Figure 10 HIV Prevalence in Puducherry



4.2. HIV Prevalence at District Level

Table 12: HIV Prevalence among ANC Clinic Attendees by district, HSS 2014-15

District	HIV Prevalence (%)
Puducherry	0.00
Karaikal	0.25

4.3. Variations of HIV-Prevalence in Puducherry over time

There were no sites recorded more than 1% of HIV prevalence in the U.T of Puducherry since 2003.

CHAPTER 5

HIV Profile of the respondents, HSS, 2014-15, Puducherry

The national, state and district response to the HIV epidemic is guided by data obtained through HIV Sentinel Surveillance (HSS). The HIV epidemic in India continues to be concentrated among HRG with low level and declining prevalence among general population.

This chapter gives details about HIV/AIDS prevalence as observed against the key nine demographic and socio-economic variables which were recorded for each respondent. Fully acknowledging that several factors work in tandem or individually to either cause or prevent HIV, hence we do not suggest any evident causation by projecting the key variables vis a vis the HIV prevalence, as risk factors for acquiring HIV. However, this sort of detailed analysis will help the programme and policy makers to understand the risk factors associated with transmission of HIV/AIDS with particular demographic characteristics. This chapter presents cross tabulations of demographic variables with HIV/AIDS positivity among the ANC clinic attendees. A detailed state-wise analysis will be needed to understand region wise variations, applying local knowledge about vulnerabilities and risk factors.

The following sections present the findings for each of these background characteristics.

1. Age
2. Literacy status
3. Order of current pregnancy
4. Source of referral to the ANC clinic
5. Current place of residence
6. Duration of stay at current place of residence
7. Current occupation of respondent
8. Current occupation of spouse
9. Migration status of spouse

Table 13: HIV Profile of Respondents in Puducherry, HSS 2014-15			
Background characteristics	Tested	Positive	Prevalence
Age (N=800)			
15-24	426	1	0.23
25-34	367		
35-44	7		
45-49	0		
Literacy status (N=800)			
Illiterate	10		
Literate and till 5th standard	20	1	5
6th to 10th standard	345		
11th to Graduation	353		
Post Graduation	72		
Order of current pregnancy (N=800)			
First	402	1	0.25
Second	302		
Third	76		
Fourth or more	20		
Source of referral pregnancy (N=800)			
Self referral	547	1	0.18
Family/Relatives/Neighbors/Friends	153		
NGO	0		
Private Hospital	18		
Govt. Hospital	82		
ICTC/ART Centre	0		
Current place of residence (N=800)			
Urban	224		
Rural	576	1	0.17
Current occupation of the respondent (N=800)			
Agricultural Labourer	3		
Non-Agricultural labourer	10		
Domestic servant	0		
Skilled/Semiskilled worker	5		
Petty business	0		
Large business/self employed	0		

Service (Govt./Pvt.)	44		
Student	8		
Truck driver/helper	0		
Local transport worker	0		
Hotel staff	0		
Agricultural cultivator/landholder	0		
Housewife	730	1	0.14
Current occupation of the spouse (N=800)			
Agricultural Labourer	75		
Non-Agricultural labourer	224	1	0.45
Domestic servant	0		
Skilled/Semiskilled worker	140		
Petty business	35		
Large business/self employed	20		
Service (Govt./Pvt.)	170		
Student	1		
Truck driver/helper	25		
Local transport worker	71		
Hotel staff	16		
Agricultural cultivator/landholder	22		
Unemployed	1		
Not Applicable	0		
Spouse resides alone in another place/ town from wife for work for longer than 6 months (N=800)			
Yes	26		
No	774	1	0.13
99	0		

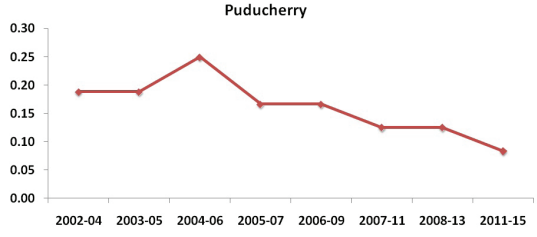
CHAPTER 6

HIV Prevalence trend among ANC clinic attendees

6.1 HIV Prevalence trend in Puducherry

Though there was a clear declining trend seen in Puducherry, within Puducherry, there are variations in HIV prevalence among the districts. District level information on HIV is essential for planning district strategies in HIV prevention and control. District wise trend analysis was performed on surveillance data collected during the year 2002-2015 using moving average technique. The district level analysis showed a clear declining or stable epidemic trend.

Figure 11 Puducherry



6.2 HIV Prevalence trend at district level

Figure 12 Karaikal District

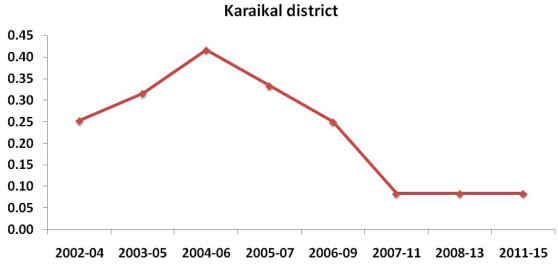
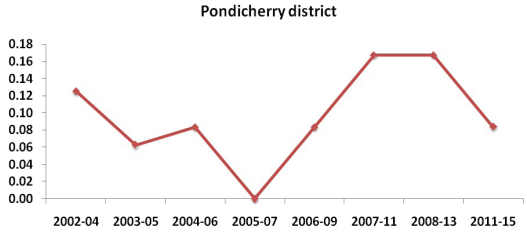


Figure 13 Pondicherry District



CHAPTER 7

Summary

- The total samples of ANC analyzed were 800 numbers across 2 districts in Puducherry. The median age of respondents was 23 years in Puducherry. The majority of the respondents were reported in the age group 15-24 (53.3%).
- In Puducherry, HIV Prevalence among the ANC was 0.13%.
- The proportion of illiterate ANC was 1.3% in Puducherry.
- The proportions of illiterates were similar in the districts of Karaikal (1.3%) and Pondicherry (1.3%). The high proportion of literacy was seen in the category of 11th to graduation (44.1%).
- In Puducherry, 50.3% of the respondents reported being pregnant for the first time.
- At the district level, the primi-gravida varied between 48.5% in Pondicherry to 52% in Karaikal.
- Self referral was identified as the major source of referral to ANC clinics, which accounted for 68.4% of respondents.
- Self referrals were higher in the districts of Karaikal (100 %), and family/ relatives/ neighbours/ friends (38.3 %) in Pondicherry district.
- Highest HIV prevalence (0.9%) was seen in people referred by NGO.
- In Puducherry, 72 % of respondents reported to be currently residing in rural areas.
- In Puducherry, the majority of the respondents (91.3 %) were housewives.
- In Puducherry, accounting for less than one-third (28.0 %) were non-agricultural labourer.
- In Puducherry, 0.1% of respondents reported that their spouses were migrants. The highest proportion of migrant spouses observed in Karaikal (4.8 %).

ICMR-NATIONAL
INSTITUTE OF EPIDEMIOLOGY
Chennai

NATIONAL
AIDS CONTROL ORGANISATION
New Delhi

PONDICHERRY
AIDS CONTROL SOCIETY
Puducherry