



A Report on
National Data Analysis Plan:
A Systematic
Approach Towards
Analysis of
National HIV/AIDS
Programme Data
2015



National AIDS Control Organisation

India's voice against AIDS
Ministry of Health & Family Welfare, Government of India

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Contents

List of Abbreviations	v
Acknowledgements	vii
Executive Summary	ix
1 Background	
Evolution of the HIV/AIDS Control Programme in India	1
Evolution of a Data Capturing System of the HIV/AIDS Control Programme in India	2
Context of National Data Analysis Plan	3
Objectives of National Data Analysis Plan	4
2 Process of National Data Analysis Plan	
Preparatory Activities	5
NDAP Launch Workshop	6
Establishment of a Coordination Mechanism	8
Review and Finalisation of Analysis Plan	8
CMIS Data Cleaning Workshop	9
Review, Discussion and Finalisation of Findings and Interpretations	9
Capacity Building	9
Development and Finalisation of Peer-reviewed Articles	10
3 Achievements of NDAP	
Collaboration among Institutions	11
Development of Clean Data Sets and Data Cleaning Guidelines	11
Capacity Building of Researchers	11
Peer-reviewed Articles	11
Reports on Programmatic Implications	12

4 Recommendations and Way Forward

Data Quality Management	39
Scientific Publications	39
Decentralisation of Capacity	39
Institutionalisation	39
Key Findings and Programme Implications	40
Challenges/Limitations	40

Annexures

Annexure 1: List of Analysts and Institutes	41
Annexure 2: List of Mentors and Institutes	42
Annexure 3: Memorandum of Understanding	43
Annexure 4: Data Confidentiality Undertaking (for Analysts)	47
Annexure 5: National Data Analysis Plan of NACP-IV: Terms of Reference for Data Analyst.....	48
Annexure 6: Project Team	50
Annexure 7: Broad Guidelines for Cleaning CMIS Data for Quality Issues	51
Annexure 8: National Data Analysis Plan: Milestones	52
Annexure 9: List of Peer-reviewed Articles and Publication Status	53
Annexure 10: Key Findings and Recommendations of Programme Gap Analysis	54
and Prioritisation of Districts in Twelve Indian States	

References	57
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List of Abbreviations

ANC	Antenatal Clinic
ART	Antiretroviral Therapy
BB	Blood Bank
BSD	Basic Services Division
BSS	Behavioural Surveillance Surveys
CDC	Centers for Disease Control and Prevention
CMIS	Computerised Management Information System
CPFMS	Computerized Project Financial Management System
C-SHaRP	Centre for Sexuality and Health Research Policy
CST	Care, Support and Treatment
DADU	Data Analysis and Dissemination Unit
DGHA	Division of Global HIV/AIDS
DLHS	District Level Health Survey
FFP	Fresh Frozen Plasma
FHI360	Formerly known as Family Health International
FSW	Female Sex Workers
HRG	High-Risk Group
HSS	HIV Sentinel Surveillance
IBBA	Integrated Biological and Behavioural Assessment
ICMR	Indian Council of Medical Research
ICTC	Integrated Counselling and Testing Centre
IDU	Injecting Drug User
IEC	Information, Education and Communication
IQR	Interquartile Range
M&E	Monitoring and Evaluation
MSM	Men who have Sex with Men
NACO	National AIDS Control Organisation

NACP	National AIDS Control Programme
NARI	National AIDS Research Institute
NDAP	National Data Analysis Plan
NFHS	National Family Health Survey
PLHA	People Living with HIV/AIDS
PPTCT/PMTCT	Prevention of Parent/Mother to Child Transmission
RTI	Reproductive Tract Infection
SACS	State AIDS Control Society
SI	Strategic Information
SIMS	Strategic Information Management System
SIMU	Strategic Information Management Unit
STI	Sexually Transmitted Infection
TI	Targeted Intervention
TTI	Transfusion Transmissible Infection
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

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NACO thanks all the programme divisions that were part of this initiative and contributed to its success. NACO would also like to congratulate and appreciate all the department heads in facilitating this process. The views, comments and feedback received from the programme divisions and department heads added immense value to this initiative.

NACO wishes to acknowledge the teams at the national and state level that have been maintaining HIV/AIDS programme data, including Computerised Management Information System (CMIS) data for various components, HIV Sentinel Surveillance (HSS), mapping, and estimation data, which have provided the opportunity for this initiative. Had all this programme data not been systematically collected and maintained to this extent, the data analysis plan would not have been possible.

NACO extends its wholehearted thanks and acknowledgement to the mentors of NDAP for their immeasurable contribution at various levels of development of the analyses. They enabled the analysts to think through the available data, helped conceptualise the ideas, provided mentorship during the development and finalisation of analysis plans, interpretation of the findings, and writing the peer-reviewed articles. Their mentorship not only helped the analysts to complete this analysis, it also helped to improve the thinking processes for conducting research in future.

NACO would like extend thanks and acknowledgment to its development partners, including the Centers for Diseases Control and Prevention (CDC), FHI 360, World Health Organization (WHO) India and Population Council for their strong support. NACO would like to appreciate the Data Analysis and Dissemination Unit team that worked as the NDAP secretariat, and were the focal point of the activity. The team facilitated communication and data access between NACO and the analysts and mentors, provided technical inputs at each stage of development, and motivated the analysts at regular intervals. Their contribution is immeasurable and has helped in the completion of this project.

Executive Summary

The National Data Analysis Plan (NDAP) is a first-of-its-kind activity for a public health programme, whereby data has been systematically analysed to address programmatic queries raised during the end phase of the National AIDS Control Programme Phase III (NACP-III). This project was initiated in 2013 with the approval of the Secretary, Department of AIDS Control (presently National AIDS Control Organisation) and progressed with the development of concept notes, orientation and mentoring of analysts, signing of a Memorandum of Understanding (MoU) and confidentiality document, formation of the NDAP secretariat, reviewing and finalising of protocols and analysis plan, capacity building at each stage through mentorship and workshops, development of articles and their dissemination through scientific journals, and finally, a dissemination workshop. The objectives of this national-level initiative were: (a) to identify the topics and thematic areas that can be studied by analysing available information (programme data); (b) to structure the analysis by identifying key questions and appropriate methodologies and tools for analysis; (c) to commission the analysis through a collaborative approach, involving institutes, programme units and senior experts as mentors, with agreed timelines; (d) to consolidate, discuss and disseminate the analytical outcomes for programmatic use; and (e) to promote scientific writing within the programme.

This was a retrospective analysis, with programme data including but not limited to Computerised Management Information System (CMIS), HIV Sentinel Surveillance (HSS), National Family Health Survey (NFHS), HIV Estimation, Integrated Biological and Behavioural Assessment (IBBA), Targeted Intervention data from Form C and Form E, and the database on People Living with HIV/AIDS (PLHA). Predominantly, these data have been collected during the third phase of NACP, i.e. during 2006–2012. Most of the analysis is descriptive due to the cumulative nature of the data, except in the PLHA dataset, which used survival analysis. All data sets were approved by the data sharing committee of NACO and all studies were reviewed

and approved by NACO. All researchers in this initiative entered a data confidentiality agreement with NACO. This initiative was supported by the Centers for Diseases Control and Prevention (CDC), World Health Organization, India (WHO-India), FHI-360, Population Council, and John Snow, Inc. (JSI).

This initiative has been able to engage with researchers across 28 institutions across all the regions of the country, ensuring the availability of research capacities for future region-specific activities. Another strength of the project is that it was able to engage senior public health experts as “mentors”, who formed the source of critical thinking, and helped maximise the benefits of the initiative. Their ongoing support to NACO, as well as to the individual researchers engaged in this initiative, was immeasurable. The topics of analysis of NDAP can be broadly categorised under the following heads: (1) TI; (2) Strategic Information Management Unit (SIMU); (3) Basic Services Division (BSD), including Integrated Counselling and Testing Centre (ICTC) and Prevention of Parent/Mother to Child Transmission (PPTCT); (4) Blood Safety; (5) Care, Support and Treatment (CST); and (6) Laboratory Support.

The whole project period may be divided into the preparatory phase, data standardisation and analysis plan development phase, conceptualisation, writing phase and dissemination phase. The preparatory phase included data extraction, concept note development, literature building, engagement of researchers and institutions. In the second phase, programme data was standardised to ensure quality and the analysis plan was finalised by conducting review meetings. The conceptualisation phase ensured critical thinking by researchers in order to answer some of the key questions of the programme with the available data, and the writing phase entailed developing both a technical document with programme implications as well as peer-reviewed articles. The dissemination phase ensured that the findings were shared broadly with those involved in the programme and scientific audiences, through dissemination workshops and submission to journals for peer-reviewed publication.

During each phase, the NDAP secretariat, consisting of officers from NACO, ensured appropriate support for the researchers. In addition, capacity-building sessions were conducted at regular intervals to facilitate the project and to ensure the availability of these capacities across all regions. The capacity-building sessions were oriented towards data management, conceptualisation with critical thinking, development of an analysis plan and scientific writing. The presence of mentors for the researchers throughout the project ensured scientific rigor and critical thinking.

The achievements of this exercise were three-fold—building the capacities of the researchers across the country; successful collaborative work at the national level; and the dissemination of the findings, intended for both programme implementers and scientific audiences.

The dissemination of NDAP took place through a one-day dissemination workshop, which was attended by both programme implementers and researchers. Apart from the dissemination workshop, the summary findings and peer-reviewed publications were achieved.

Sixty-six per cent (21/32) of the topics included key findings along with programmatic implications for NACO. Both have been presented in detail in this report.

Fifty per cent (16/32) have finalised peer-reviewed articles and submitted them to scientific journals, which are at different stages of publication. Details of these submissions are mentioned below:

- Published in the *World Journal of AIDS* (5)
- Accepted for publication in *WHO South-East Asia Journal of Public Health* (9) and *Journal of AIDS* (2)

NDAP's work has several lessons to offer, which could be adopted in future activities. Considering the potential of such programme data, periodical exercises of this nature are required at the state and regional levels. Hence it is suggested that the State AIDS Control Societies (SACS) and ICMR institutes take this forward. Instead of looking at this as a one-time activity, national programmes, including NACO and SACS, should consider including these as “terms of reference” for the staff working on this programme.

Major findings and programmatic recommendations

- The analysis of programme data for Punjab, Assam, Odisha and West Bengal indicates that there are certain pockets and districts in these states which are driving the HIV epidemic. Hence the programme needs to focus on these identified pockets.
- The analysis of high-risk groups (HRGs) registered in the TI programmes shows the changing profile of HRGs (female sex workers and men who have sex with men) over the years, and also highlights the importance of more detailed studies in states like Himachal Pradesh, which appear to have a higher volume of sex workers.
- The survival analysis among HIV-infected children and adults registered in antiretroviral therapy (ART) centres in Andhra Pradesh highlights the importance of early diagnosis and treatment initiation to promote quality of life among PLHIVs. Hence, it is suggested that the analysis be extended to other states to validate appropriate measures that could be considered by the programme.
- The analysis of TI data suggests that referrals and subsequent HIV testing among HRGs needs to be strengthened (current HIV testing among HRGs is <50 per cent). Efforts need to be intensified towards 100 per cent referrals and linkages between targeted interventions and counselling and testing programmes.
- The blood safety programme should encourage component usage across the country, and depending on the clinical observations and requirements in each region, the importance of component usage could be promoted. Considering the increase in component usage across the country, availability and accessibility, especially of platelets and packed cells, should be strengthened. In addition, the eastern and western regions of the country need focus due to the high positivity of Hepatitis B and C, in comparison to other regions.
- The importance of line-list data has been highlighted by analysing the line-list data on PPTCT from Maharashtra. Hence, based on the findings, line-listing could be strengthened across the country to garner an evidence-rich source of information and, ultimately, strengthen adherence to treatment.
- The PPTCT programme has been showing increasing service utilisation in the majority of districts of the 12 states in which PPTCT programme data has been analysed. There are districts in these states where very low (3 per cent in a district of Gujarat) HIV testing is reported, whereas a district in Rajasthan has reported 98 per cent HIV testing. Considering this wide gap, the PPTCT programme needs to focus on districts where there is low HIV testing.

Background

Evolution of the HIV/AIDS Control Programme in India

Globally, the HIV/AIDS epidemic is changing due to the growing response and more in-depth understanding of the virus, its epidemiology and its response to treatment. This change has come about because of the gradual strengthening of systems and the commitment by the global community towards fighting this virus. Within a year after diagnosing the first case of HIV in 1986 among sex workers in Chennai and Tamil Nadu, the National AIDS Control Programme (NACP) was launched to co-ordinate the national response to HIV/AIDS. Its activities covered surveillance, blood screening and health education. By the early 1990s, cases of HIV infection had been reported in every state of the country and it was clear that individual states had different prevalence rates. In 1998, 176 surveillance sites were established and nation-wide surveillance was initiated.

From the very beginning, India's response in terms of building epidemiological evidence to guide interventions has been important. This report is a continuation of that effort and it emphasises the need for such a national level effort, details the processes adopted to reach the proposed objectives, provides the achievements, so far, of this national initiative, includes a summary of the analysis undertaken, presents the lessons learnt from this initiative, and finally, suggests future directions.

India's HIV programme has been managed by NACO at the national level and by State AIDS Control Societies (SACS) in the states since 1992. In that year the National AIDS Control Programme (NACP)

was designed and implemented for controlling the spread of HIV and providing support and treatment. Also in 1992, the first phase of the National AIDS Control Programme, NACP-I (1992–1999), was launched with the objective to slow down and curb the spread of HIV through a major effort to prevent HIV transmission with a predominant focus on blood safety and raising awareness about the disease. The achievements of this first phase include: (i) creating the AIDS response structure at the national and state levels and providing critical financing; (ii) establishing a strong partnership with the World Health Organization (WHO) and other donors; (iii) establishing NACO and SACS; (iv) improving blood safety; (v) improving awareness about HIV, especially in urban areas; (vi) expanding sentinel surveillance; (vii) expanding sexually transmitted infection (STI) control and services; (viii) improving condom promotion activities and services; and (ix) the creation and dissemination of a national HIV testing policy (NACO, 2010).

NACP-II (1999–2006) was implemented with the objective to reduce HIV prevalence below 5 per cent among the adult population in high prevalence states (Andhra Pradesh, Karnataka, Madhya Pradesh, Manipur, Nagaland and Tamil Nadu), less than 3 per cent in states with moderate prevalence, and below 1 per cent in states in the nascent stages of the HIV epidemic. The major achievements of the second phase include: (i) increased number of Targeted Interventions (TIs) through Non-Governmental Organisations (NGOs), HIV testing facilities and STI treatment facilities at the district level; (ii) national and state level Behavioural Sur-

veillance Surveys (BSS); (iii) expansion of Prevention of Parent to Child Transmission (PPTCT) of HIV; (iv) development and implementation of a Computerised Management Information System (CMIS) and a Computerised Project Financial Management System (CPFMS); (v) strengthening of HIV prevention, care, support and treatment systems; and (vi) a substantial increase in support from bilateral, multilateral and other partners (NACO, 2010).

The rollout of free antiretroviral therapy (ART) in April 2004 gave new hope to thousands of people living with HIV for a chance to live a healthy life. With the success and confidence gained in NACP-II, Phase III was launched in July 2007 with the goal to “halt and reverse the epidemic”. This was to be achieved over a period of five years (2007–2012) by scaling up prevention efforts and integrating them with care, support and treatment (CST) services. Prevention and CST formed the two key pillars of all HIV/AIDS control efforts in India. NACP-III was implemented with the objective to reduce new HIV infections and prevent the spread of HIV from High Risk Groups (HRGs) to the general population (NACO, 2010). The key achievements of NACP-III include: (i) a substantial scaling up of the coverage of HRGs through TI; (ii) the establishment of a link worker scheme in 159 districts reaching the rural population; (iii) an increase in condom distribution from 160 crore to 300 crore; (iv) a rapid scale-up of HIV testing facilities, including standalone and facility-integrated facilities; (v) increased coverage of PPTCT and STI services; (vi) an increase in voluntary blood donation; and (vii) the extension and strengthening of CST services through ART centres, Link ART Centres and Community Care Centres (NACO, 2010).

Some of the other significant achievements of NACP-III include an overall reduction of 57 per cent in estimated annual new HIV infections (among the adult population), from 2.74 lakh in 2000 to 1.16 lakh in 2011, reflecting the impact of scaled-up prevention interventions. This has been noted as a great success story of India’s HIV/AIDS Control Programme. The estimated adult HIV prevalence has decreased from 0.41 per cent in 2001, through 0.35 per cent in 2006, to 0.27 per cent in 2011. Wider access to ART has led to a 29 per cent reduction in estimated annual AIDS-related deaths, from 2.07 lakh in 2007 to 1.48 lakh in 2011, highlighting the impact of the scale-up of free ART services in the country.

Presently, NACP is in the course of implementing its fourth phase, NACP-IV (2012–2017), with the objective to reduce new infections and provide comprehensive care and support to all PLHIV and treatment services for all those who require it. One of the key strategies of the present phase of NACP is “strengthening Strategic Information Management Systems” and one of the important guiding principles is “evidence based and result oriented programme implementation” (NACO, 2013).

Over the past two decades, the number of data sources has expanded and the geographic unit of data generation, analysis, and use for planning has shifted from the national to the state, district and now sub-district level. The data sources for the HIV/AIDS programme in the country include HIV Sentinel Surveillance (HSS), Computerised Management Information System (CMIS), National HIV Estimation, National Family Health Survey (NFHS) and Integrated Biological and Behavioural Assessment (IBBA). This evidence base enables India to focus on the right geographies, populations and to fine-tune its response over time. Given the proliferation of data sources and the emerging capacity within India to analyse and use data, it is imperative to identify opportunities to strengthen the national programme’s use of data for better evidence-driven programmes at the district, state and national levels.

Evolution of a Data Capturing System of the HIV/AIDS Control Programme in India

During the four phases of the national programme, NACO has been implementing several interventions, extending prevention and care, support and treatment across various most-at-risk populations, including female sex workers (FSW), men who have sex with men (MSM), male-to-female transgenders, injecting drug users (IDUs), bridge populations such as truckers, migrants, and the general population. The surveillance system has grown exponentially with the programme and has been monitoring the trend of HIV in the country. Another vital component that has grown over the four phases of NACP is the monitoring and evaluation system of NACO. Along with the HIV/AIDS programme, the data capturing system has also evolved from paper-based reporting during the earliest stage of NACP to

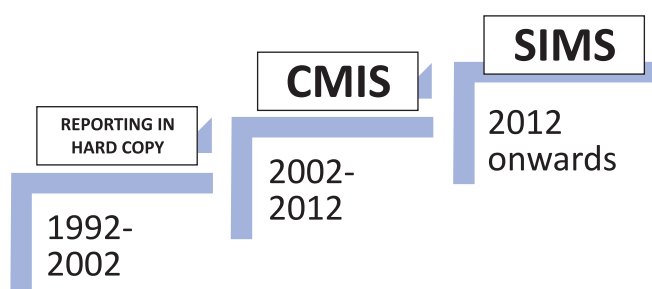


Fig.1.1: Evolving a Programme Data Capturing System in NACO

online reporting beginning from the second phase of NACP.

During NACP-II, CMIS was developed and implemented. Its purpose was to assist NACO in monitoring the programme as per the national goal and objectives. In addition, data collected through CMIS was used for developing annual reports, reporting to multilateral partners and reporting to the Health Ministry. Unfortunately, the data captured through CMIS was not systematically analysed due to many challenges, including quality of the data across various regions and resource limitations.

India is one of the developing countries that have shown a decline of HIV incidence at an early stage. This achievement has been globally appreciated by many multilateral partners and several initiatives, such as “south-to-south”, have been taken to share the experiences of India with other countries. These efforts of 25 years include establishing evidence, building manpower, leadership, commitment, designing and piloting interventions, providing space for innovations, establishing and strengthening health care facilities, development and adherence to guidelines, partnership at various levels with development partners, academic institutions, research institutions, NGOs, community-based organisations, business institutions, advocacy, sensitisation and cross-learning.

NACP-IV envisages an overarching Knowledge Management strategy that encompasses all the different programme areas. Apart from traditional Knowledge Management principles, the strategy emphasises Knowledge Translation as an important element of policy making and programme management at all levels. While Knowledge Management looks at systematic analysis, synthesis, development and dissemination of Knowledge products in various forms, the element of Knowledge Translation has been given highest priority to ensure a link

between knowledge and action. In its fourth phase, the national HIV programme takes tremendous advantage in capitalising on the knowledge generated and accumulated so far from more than a decade of implementation and experience—among the population, communities, programme managers and policy makers—and the information that is continuously being generated and updated thanks to programme monitoring, surveillance, and research.

Context of National Data Analysis Plan

During the formulation of NACP-IV one of the key challenges for the programme was the lack of data utilisation and dissemination under the programme. The capacity for proper presentation and analysis of data was found to be lacking amongst Monitoring and Evaluation (M&E) officers and programme managers. Within CMIS, the M&E team was being used for data entry. Analytical capacities at the state level were weak and, with a few exceptions, did not use the existing data for planning purposes. Even at the national level, planning, coordination, implementation, monitoring and troubleshooting of different Strategic Information (SI) activities across the country consumed most of the time of the staff at the Strategic Information Management Unit (SIMU) of NACO.

Efforts of the programme staff were directed towards administrative and financial processes and managerial requirements for undertaking planned activities. Due to frequent changes in M&E and programme personnel, there was often a gap observed in the utilisation of data for evidence-based planning. It was observed at service delivery levels that data were often used for reporting to higher levels and not for assessing performance. While the sub-components of programmes were being assessed from time to time, the need was felt for a concerted effort to conduct concurrent evaluations and plan for end-of-programme evaluations. There was scope to build in evaluation processes at the outset of the programme strategy so as to determine the extent to which the programme objectives were achieved. Therefore, considering the above, NACO initiated a process during NACP-IV to systematically analyse programme data and disseminate it for programme planning, reorientation of the programme strategy and future programme prioritisation.

Further, the Data Analysis and Dissemination Unit (DADU) of SIMU at NACO, in consensus with all the programme divisions, decided to analyse programme data to answer some of the key questions raised by the various programme divisions within NACO. The divisions including TIs, Basic Services Division (BSD), blood bank, laboratory, STI division, CST division and SI division will benefit from this concerted effort.

To this end, the “National Data Analysis Plan (NDAP)” project was developed by DADU. This project was initiated in the last quarter of 2013, with the support of Centers for Disease Control and Prevention (CDC), FHI-360, World Health Organization-India, and UNAIDS. Subsequently, during the writing stage, Population Council supported the initiative by building the capacity of analysts in scientific writing, reviewing and finalising the articles.

Objectives of National Data Analysis Plan

Following are the objectives of NDAP:

- (i) To identify the topics/thematic areas that can be studied by analysing available programme data;
- (ii) To structure the analysis by identifying key questions and appropriate methodologies/tools for analysis;
- (iii) To commission the analysis through a collaborative approach involving institutes, programme units and senior experts as mentors, with agreed timelines;
- (iv) To consolidate, discuss and disseminate the analytical outcomes for programmatic use; and
- (v) To promote scientific writing within the programme in the form of papers, articles, reports, and briefs.

Process of National Data Analysis Plan

This chapter describes the processes and activities that were organised to achieve the objectives of NDAP. These activities were well planned, discussed in detail at several meetings, and executed with a high level of commitment. Figure 2.1 shows the overall activities under NDAP.

Preparatory Activities

During October to December 2013, a series of preparatory activities for the launch of NDAP were carried out by NACO. These activities included: (1) development of concept notes; (2) extraction of HIV/AIDS programme

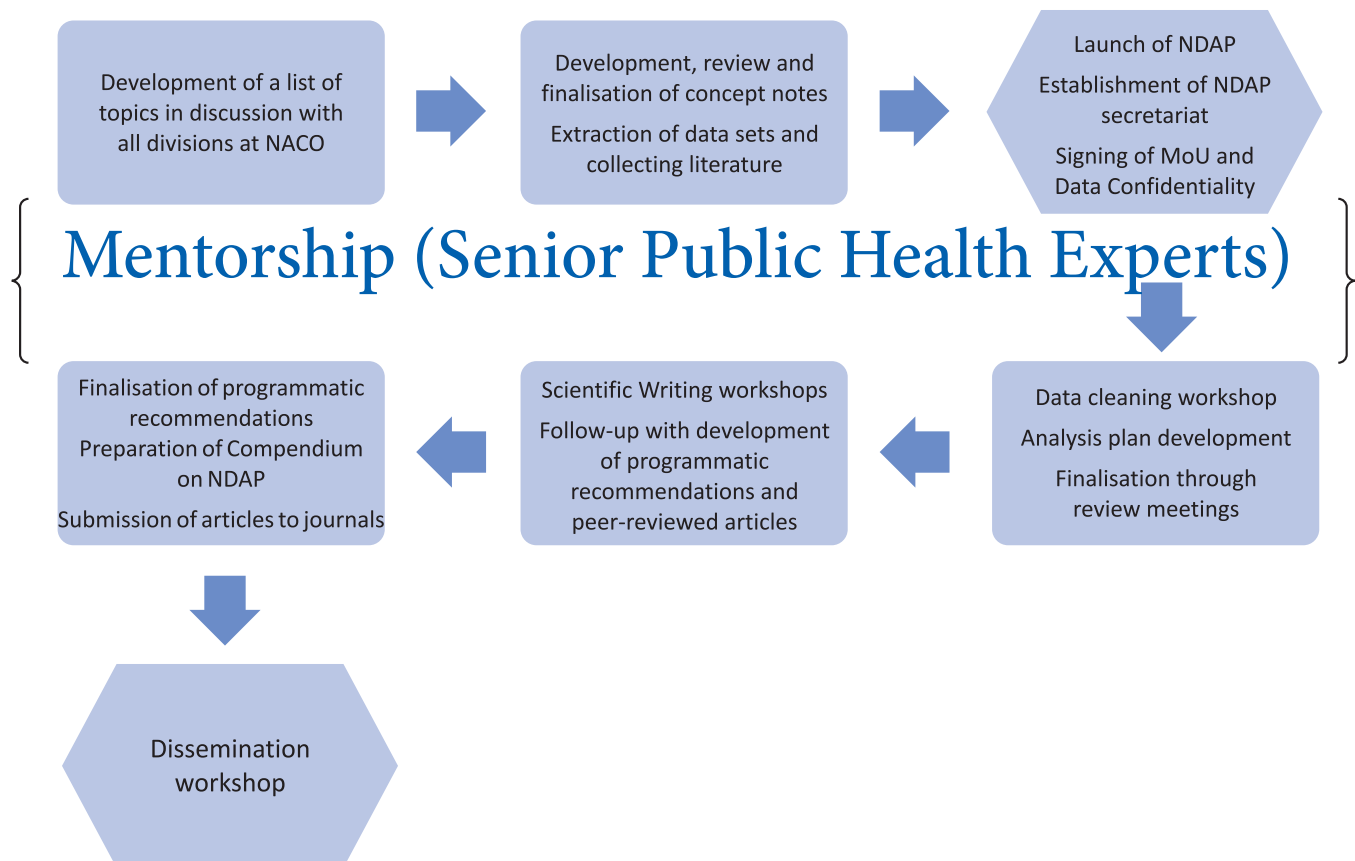


Figure 2.1: Process of National Data Analysis Plan: 2013–2015

data in the country, especially CMIS; (3) development of a library for reference materials; and (4) ensuring interest and availability of researchers from various institutions and organisations across the country.

Development of concept notes: Based on the proposed topics of analysis, brief one-page concept notes were developed by NACO for each topic with the context, broad objectives, possible methodology, data sources and expected outcomes. These concept notes were reviewed and finalised by NACO, with inputs from a team of experts from NACO partner agencies, including CDC, WHO-India, FHI360, and UNAIDS. These concept notes were shared with analysts for their respective topics to provide the basic background information on each of the topics.

Extraction of HIV/AIDS programme data in the country: The data sources that were considered for NDAP topics of analysis include CMIS, HSS, BSS, IBBA, District Level Health Survey (DLHS)-III, and Census 2001 from the Government of India.

Apart from CMIS, all other data sources were primarily collected as part of research and were subject to continuous data quality checks. CMIS data had to be cleaned for this exercise. Figure 2.2 presents the steps involved in the extraction, formatting, cleaning, and sharing of CMIS data for the topics of analysis in NDAP.

Development of a library with reference materials:

Literature on the topics of analysis in NDAP was collected as part of the preparatory activities. This included both published and unpublished HIV/AIDS programme reports and peer-reviewed articles published in national and international journals. Appropriate reference materials were shared with the analysts.

Ensuring the willingness and availability of analysts and mentors:

As part of the preparatory activities, a series of communications, both email and telephone, were made with analysts at different institutions and organisations. These analysts were contacted by NACO based on their prior experience in the HIV sector and their willingness to participate. In addition, senior public health experts in the country were contacted to enquire about their interest and availability for mentoring the analysts as part of NACO’s initiative. Based on their responses, invitations were sent for participation in the NDAP launch workshop. The details of analysts are in Annexure 1 and mentors in Annexure 2.

NDAP Launch Workshop

In January 2014, a three-day workshop was organised at the Jawaharlal Institute of Post Graduate Medical Education and Research (JIPMER), Puducherry, to launch the NDAP initiative. During the workshop, concept notes and data sets were shared with the

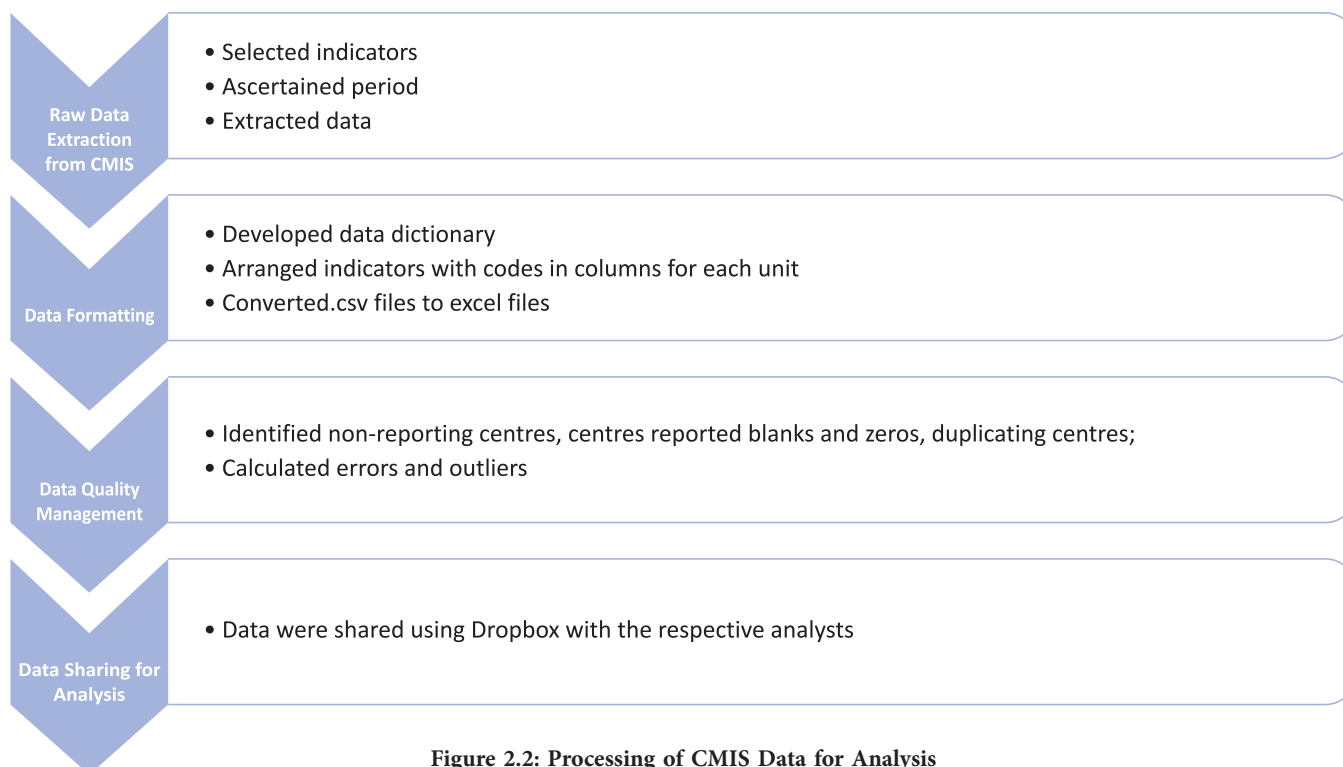


Figure 2.2: Processing of CMIS Data for Analysis



Chief Guests at the Launch Workshop of NDAP, JIPMER, Puducherry, January 2014



Participants (Analysts/Mentors) at the NDAP Inaugural Workshop, JIPMER, Puducherry, January 2014

analysts. These analysts were paired with mentors. The workshop was launched by Shri. Lov Verma, Secretary, Department of AIDS Control, Ministry of Health and Family Welfare, Government of India.

In all, 60 analysts and 30 public health experts participated in the workshop. Participants came from SACS, Indian Council of Medical Research (ICMR) institutes, medical colleges, research institutions, national and international development partner agencies and multilateral agencies. Analysts and experts included epidemiologists, statisticians, demographers, social and behavioural science researchers and community medicine professionals.

As part of the workshop, technical sessions were organised, which included: (1) systematic review and meta analyses, (2) introduction to scientific paper writing, (3) policy communication, (4) mentorship in research analysis, and (5) publication ethics. In



Panel Discussion on "Data Quality Issues", NDAP, JIPMER, Puducherry, January 2015

addition to the technical sessions, panel discussions were organised to discuss the methods of identifying and addressing data quality issues and different methods of analysis.



Participants at the NDAP Launch Workshop, JIPMER, Puducherry, January 2014



Panel Discussion on “Methods of Analysis”, NDAP, JIPMER, Puducherry, January 2015

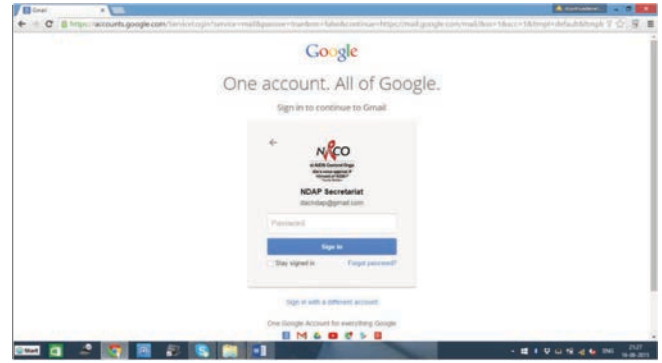


Session on “Importance of Mentorship”, NDAP, JIPMER, Puducherry, January 2014

During and immediately after the workshop, an MoU and Data Confidentiality documents were signed by the institutions/organisations engaged in the process of NDAP, with the head of the institution confirming the participation of its staff. A copy of these documents was provided to the respective institutions, after being signed by the Head of SIMU, NACO. In addition, each analyst signed a data confidentiality document, accepting that the programme data would not be shared with anyone and prior publication approval would have to be sought from DADU. Details of MoUs are available in Annexure 3, Data Confidentiality documents in Annexure 4 and Terms of Reference for analysts in Annexure 5.

Establishment of a Coordination Mechanism

A key decision taken during the launch workshop was to have a dedicated system which could facilitate regular coordination between the researchers, mentors and NACO. Considering this decision, a secretariat was formed at NACO. The details of project team of NDAP are in Annexure 6. An email id was created, dacndap@gmail.com for the secretariat to communicate on all the activities related to NDAP.



NDAP Secretariat Sign-in Page, NACO, 2014

Review and Finalisation of Analysis Plan

Two review meetings, with batches of 20 participants each, were organised over three-month intervals. In addition, several one-to-one meetings were organised with the participating analysts. Through these meetings 40 topics were reviewed and finalised with analysis plans. This process ensured the engagement of the respective divisions of NACO in the process of the analysis.

First Interim Review Meeting: Initial Interim Review Meetings were organised in two batches, with the Northern Region meeting on 11–12 March 2014 at the Post Graduate Institute of Medical Education and Research (PGIMER), Dr RML Hospital, New Delhi, and the Southern Region meeting on 27–28 March 2014 at Government Hospital Thoracic Medicine (GHTM), Tambaram Sanatorium, Chennai.

Second Interim Review Meeting: To facilitate the analysis process and for more focused discussion and decisions, the second set of review meetings were conducted in small groups in the months of June–July 2014. The dates and venues of these meetings are mentioned below:

Date	Place
27 June 2014	Population Council, New Delhi
01 July 2014	National Institute of Epidemiology (NIE), Chennai
02 July 2014	All India Institute of Medical Sciences (AIIMS), New Delhi
09 July 2014	National AIDS Research Institute (NARI), Pune
18 July 2014	Vardhman Mahavir Medical College (VMMC), New Delhi

The NDAP secretariat followed up with the analysts to submit their findings after incorporating the comments of experts and mentors during the review meetings.

CMIS Data Cleaning Workshop

As part of this NDAP initiative, it was decided to use six years of CMIS programme data pertaining to 2007–2012, based on two criteria: (1) data collection formats of CMIS were consistent during this period, and (2) the reporting formats of programmes shifted completely to SIMS. To clean the CMIS data for the period 2007–2012 for TIs, STI/Reproductive Tract Infection (RTI), ART, Blood Bank and ICTC/PPTCT, a workshop was convened in New Delhi during 28–31 May 2014 involving selected analysts.



Inaugural Session of the CMIS Data Cleaning Workshop, New Delhi 2014

The identified analysts were grouped into teams based on data sets, to identify the missing data and outliers in the CMIS data as per the data cleaning guidelines. They presented their findings before senior experts and officers of their respective programme divisions, to address the issues identified and to obtain cleaned CMIS data sets for further analysis. As an end-product of the workshop, the CMIS data sets for the years 2007–2012 were cleaned, uploaded and shared with the respective analysts for analysis. As part of this workshop, a data cleaning guideline was developed (Annexure 7).

Review, Discussion and Finalisation of Findings and Interpretations

Following the finalisation of the analysis plan and data cleaning, all the analysts submitted their findings to



CMIS Data Cleaning Workshop, New Delhi 2014

the NDAP secretariat. These findings were reviewed and discussed within the NDAP team and discussed with the respective programme divisions. Feedback was provided to further strengthen the findings from the programme perspective.

Capacity Building

Through the NDAP initiative, capacity building activities were conducted at various points of time. These activities included a technical session and panel discussion during the launch workshop of NDAP, followed by data cleaning skills during the data cleaning workshop, and a session on identifying and addressing data quality issues using statistical packages.

Scientific Writing Workshops: NACO, with support from the Population Council, organised three four-day workshops on scientific writing for NDAP analysts. Two batches, each of around 20 participants, were trained. In addition to teaching the theory and principles of scientific writing, these workshops built



Scientific Writing Workshop, Ahmedabad, 2014

the skills of analysts in writing peer-reviewed articles for publication in journals. These workshops also supported the analysts in conceptualising a peer-reviewed article based on the available data. During the workshops, one-to-one mentorship support was provided to analysts for conceptualising the paper and data analysis. All the analysts were provided support for completing an abstract at the end of the workshop.

Mentorship by Senior Public Health Experts: The major capacity-building measure provided through the NDAP initiative was the mentoring support provided by senior public health experts. As part of this initiative, each public health expert was assigned two to three analysts to mentor until the submission of the final document. The analysts could access their respective experts at each stage. In addition, during the review meetings and the review process, feedback

was provided by these experts on the findings, interpretation and presentation of the analysis. Mentoring support by public health experts was a valuable capacity-building measure provided through this initiative.

Development and Finalisation of Peer-reviewed Articles

The conceptualisation of peer-reviewed articles was initiated during the scientific writing workshops. Based on this, analysts presented their findings in the form of tables, graphs and abstracts, which were then reviewed and finalised. Following the scientific writing workshop, articles were developed and submitted to NDAP for review and finalisation. The NDAP secretariat reviewed the articles, with support from the NDAP team, senior experts, programme divisions, and experts from Population Council.

Achievements of NDAP

This section briefly discusses the achievements of NDAP in terms of collaboration, development and strengthening of data resources, building the capacities of the researchers across the country and the publication of peer-reviewed articles for the first time, based on the systematic analysis of national HIV/AIDS programme data. The details of milestones achieved are in Annexure 8.

Collaboration among Institutions

A number of institutions collaborated with NACO in facilitating NDAP.

- 28 institutions (ICMR, medical colleges, development partners and multilateral agencies) apart from DAC and SACS;
- 68 analysts from various institutions, including SACS, ICMR, medical colleges and consultants were engaged;
- 30 mentors (senior researchers in HIV across the country) were engaged to mentor the analysts.

Development of Clean Data Sets and Data Cleaning Guidelines

NDAP's initiative helped clean and raise the quality of the programme data sets, which are now available for the programme divisions to use. The major achievement is the availability of clean CMIS data sets for all programme divisions, including TIs, ART, Integrated Counselling and Testing Centre (ICTC), PPTCT, blood safety and STI. In addition, a data cleaning guideline

for addressing the quality issues of CMIS programme data was developed.

Capacity Building of Researchers

NDAP's initiative helped develop skills for reviewing large programme data sets for quality issues, systematic analysis of data, conceptualisation of research questions, developing hypotheses, and scientific writing. There were around 40 analysts across all the regions of the country. These researchers, in turn, can help to build the capacity in their respective regions so that all the regions can have access to skilled human resources.

Peer-reviewed Articles

Out of 40 topics which have been finalised for the analysis plan, 32 topics could progress to the stage of scientific writing, i.e, 80 per cent (32/40) of the topics reached the stage of scientific articles. Of these, 16 topics (articles) reached the stage of submission to journals for publication, i.e, 50 per cent (16/32) of the articles were submitted for publication to peer-reviewed journals. Out of 16 articles, 5 articles have been accepted for publication in *World Journal of AIDS*, 9 articles have been principally accepted by WHO *South-East Asia Journal of Public Health* and two papers have been accepted by *Journal of AIDS*. There are 5 more articles in the final stage of completion, including one article on process documentation of NDAP. The details may be seen in Annexure 9.

Reports on Programmatic Implications

Out of 32 topics that reached the stage of scientific writing, reports on 21 topics on findings and programme implications have been submitted, i.e., reports on 66 per cent (21/32) of topics have been submitted with key findings along with programmatic implications by respective analysts. These topics are distributed across six broad themes (see Table below).

Thematic Areas	No. of Reports on Programmatic Implications Submitted
<i>Strategic Information Management Unit</i>	8
<i>Basic Services Division</i>	3
<i>Targeted Intervention</i>	4
<i>Blood Safety</i>	2
<i>Care, Support and Treatment</i>	3
<i>Laboratory Support</i>	1
<i>Total</i>	21

REPORTS ON PROGRAMMATIC IMPLICATIONS

Strategic Information Management Unit

This section is a summary of the analyses, which are primarily based on HIV sentinel surveillance, HIV estimation data using Spectrum and a combination of multiple data sources. These topics of analysis are focused on the changing face of the HIV epidemic in various regions, and the strengths and challenges of HIV sentinel surveillance and estimation.

1

Changing HIV epidemic in north-eastern India and its relationship with development and programmatic indicators

Analyst: Dr. Chiranjeev Bhattacharjya, Assam SACS

Mentor: Dr. Alok Kr. Deb, NICED

Objectives:

1. To study the level and trend of HIV prevalence in the districts and regions of Assam.
2. To study the relation between HIV prevalence with programme and developmental indicators.

Methods: This is a retrospective descriptive analysis of the data collected during 2007–2012. Correlation and Chi-square for trend tests has been used.

Data sources: HSS and CMIS-ICTC

Key findings:

- During 2007–2012, HIV positivity (per cent) increased relatively in North Assam (46.88 per cent), followed by South Assam (11.48 per cent) and East Assam (2.30 per cent), while there was a relative decline in West Assam (-51.5 per cent).
- Dima-Hasao (962.5 per cent), Karbi-Anglong (445.0 per cent), Darrang (226.3 per cent), Dhemaji (200.0 per cent) and Nagaon (107.8 per cent) districts of Assam showed significantly higher relative increase in HIV positivity (per cent) during 2007–2012.
- Analysis of the HSS and programme data shows higher HIV prevalence among IDUs and the antenatal clinic (ANC) population in Dima Hasao and Karbi Anglong districts. HSS data show a rising trend in HIV prevalence among FSWs in Darrang district. Further analysis of programme data has shown higher HIV prevalence among migrants in Nagaon district.
- Districts with higher HIV positivity (per cent) had higher female literacy (p value: 0.001) and/or higher usage of internet (p value: 0.006).
- Districts with higher ICTC HIV positivity (per cent) in 2011 had a higher proportion of women aged 15–44 years seeking treatment for any STI/RTI (p value: 0.04), higher proportion of brothel-based FSWs (p value: 0.02), lower proportion of FSWs having <5 clients/week (p value: 0.00) and higher proportion of annual condom utilisation in 2011 (p value: 0.003).

- Districts with a higher proportion of street-based FSWs had a higher proportion of annual condom utilisation in 2011 (p value: 0.025). A positive correlation with annual condom utilisation was also observed among brothel-based FSWs, while a negative correlation was noted among home and lodge/dhaba-based FSWs.

Recommendations for programmes:

- Detailed analysis of the programme data including individual ICTC/PPTCT client data and TI HRG data to understand the drivers/differentials of HIV prevalence in districts such as Dima Hasao, Karbi Anglong, Darrang, Dhemaji and Nagaon, which show a recent rise in HIV prevalence and have traditionally received less priority than other districts in the state.
- Strengthening of prevention services and availability of care, support and treatment services should be given priority in the above districts along with the existing high HIV-positivity districts.
- As a synergistic relation between HIV and STI/RTI has been observed in the analysis, strengthening of STI/RTI services in the key districts, particularly among the HRG and bridge populations, will be crucial.
- The implementation of the FSW TI intervention among brothel-based FSWs in Silchar town of Cachar should be initiated at the earliest, since Silchar has around 1,450 FSWs, currently covered by two FSW TIs. However, there are an additional 350–400 brothel-based FSWs in Silchar who are not being covered by any TI.
- Strategies should be made to strengthen condom utilisation among home-based and lodge/dhaba-based FSWs.

2

Urban and rural HIV estimates among the adult population (15–49 years) in selected states of India using Spectrum data

Analyst: Dr. J. Prabhakaran, Formerly with Tamil Nadu State AIDS Control Society (TANSACS) and Dr. Lincoln Priyadarshi Choudhury, Formerly with North East Regional Office, Guwahati

Mentor: Mr. Toufique Bakkali, UNAIDS

Objectives:

To estimate the HIV level and trend among the adult population in urban and rural areas of selected states in India.

Methods: Ten states were selected based on HIV levels: Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Manipur, and Nagaland, Mizoram, Punjab, Orissa and Jharkhand. Data files of Indian national estimation 2010–2011 were used, with appropriate alterations.

Data source: Spectrum, version 4.53 beta 19

Key findings:

- Our findings indicate lower levels of prevalence and incidence of HIV in the urban population (0.42; 0.16) as compared to the rural populations (0.49; 0.25) in Maharashtra and Tamil Nadu, respectively. In the remaining eight states, the prevalence and incidence of HIV are higher in urban areas than their rural counterparts.
- Prevalence of HIV among the urban population is lower than among the rural population in Tamil Nadu (0.17 per cent < 0.32) and Maharashtra (0.45 per cent < 0.51 per cent), while in Karnataka there are no differences in prevalence in both urban (0.51) and rural (0.51) populations. In the remaining seven states one finds more urban prevalence as compared to rural.

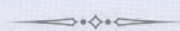
- In the states of Andhra Pradesh, Tamil Nadu, Maharashtra, Odisha and Punjab, the number of PLHIV, new infections and deaths are higher among the rural than the urban population.

States	PLHIV		New Infection		Death	
	Urban	Rural	Urban	Rural	Urban	Rural
Andhra Pradesh	1,28,242	2,47,509	7,273	14,036	8,641	16,679
Tamil Nadu	33,830	67,650	680	1,370	1,830	3,670
Karnataka	67,074	1,08,452	3,091	4,998	4,395	7,106
Maharashtra	1,32,336	1,80,124	6,004	8,335	7,736	10,738
Manipur	12,409	8,671	662	462	807	563
Nagaland	3,824	3,155	153	126	294	242
Mizoram	3,824	969	335	85	170	43
Odisha	13,974	53,343	1,086	4,146	976	3,727
Punjab	12,688	16,072	1,419	1,797	393	497
Jharkhand	15,801	15,441	3,025	2,956	530	518

- An early and lower peak in prevalence and incidence among the urban population was seen in Andhra Pradesh, Tamil Nadu, Karnataka and Nagaland, while in Maharashtra, the peak is earlier and higher in rural areas. Mizoram indicates an earlier and lower peak in the rural population and Manipur shows an earlier and higher urban peak. In Odisha the epidemic peaked earlier and was lower in the rural population.
- The urban population of Punjab was still peaking in prevalence while the incidence is early and lower among the rural population. In Jharkhand both urban and rural prevalence and incidence are still increasing. The incidence of HIV is higher in urban areas than in rural areas.

Recommendations for programmes:

- Future estimation of the HIV epidemic in India needs to undertake urban and rural differentiation, with inclusion of appropriate high-risk populations.



3

The evolving HIV epidemic in Odisha, India

Analyst: Mr. Pradeep Sangwan, FHI-360

Mentor: Dr Bitra George, FHI-360

Methods: Primarily HSS data were used to determine the levels and trends in the districts of Odisha, and these figures were further compared with state-level prevalence. The districts where HIV prevalence was greater than state prevalence were segregated and further analysis was done.

Data source: HSS 2004–2012, CMIS-ICTC 2006-2012, Fact Sheets and BSS-2006

Objectives:

- To understand the levels and trends of the evolving HIV epidemic in Odisha.
- To describe key vulnerabilities explaining the trend in identified districts of Odisha.
- To review the programmatic implications of these identified vulnerabilities.

Key findings:

- As per HSS-ANC, Odisha state shows an overall decreasing trend (0.55 per cent to 0.31 per cent; 2007 to 2013) in HIV prevalence with some fluctuations. The same scenario is observed in FSWs.
- According to the HSS-ANC 2012–13, the state prevalence was 0.31; there were seven districts which showed a higher prevalence than the state average. Of these seven districts, Anugul showed an overall decreasing trend (0.75–0.50), Bargarh and Puri reached a stable trend in 2010 and 2012–13, with 0.50 HIV positivity. The other districts, Balasore (0.50–1.50 per cent), Cuttack (1–1.75 per cent) and Raygada (0.25–1.50 per cent) showed an increasing trend while Ganjam showed a fluctuating trend with HIV positivity of 0.87 in 2012–13.
- As per HSS-ANC data 2012, the number of sites reporting HIV-positive cases has reduced in comparison to previous years (in 2008, 23 sites reported positive cases; in 2010, 22 sites reported positive cases, and in 2012–13, 15 sites reported positive cases).
- On comparing HSS site data with the same ICTCs where the HSS site was located (with ICTC data for the entire year) a correlation was observed in the positivity at these sites.
- The ICTC positivity in the following centres, including, DHH, Balasore ICTC (3.1 per cent), SCBMC-1 Cuttack (12 per cent), ASKA AREA hospital Ganjam (4 per cent) and DHQH, Raygada (1.1 per cent) was higher than the state positivity (0.80 per cent) in 2012 (Source: State Fact Sheet 2012).
- As per the State Fact Sheet, the number of condom outlets has decreased from 37,841 in 2012 to 1,551 in 2014, and the number of condoms sold has dipped from 80 lakh in 2012 to 21 lakh in 2014. It was observed that free condom distribution has also decreased from 63 lakh in 2012 to 50 lakh in 2014. There has been a decrease in the number of TIs (31 in 2012 to 22 in 2014) and accordingly, the coverage of HRGs has decreased from 16,464 in 2013 to 6,144 in 2014 (Source: State Fact Sheet).

Recommendations for programmes:

- Four districts (Balasore, Cuttack, Ganjam and Raygada) require more attention from Programme Managers in terms of HIV prevention, care and treatment.
- As there has been a dramatic (50 per cent) decrease in coverage, mapping and validation of the number of HRGs in the state should be done at regular intervals.
- Since some ICTCs are exhibiting high HIV positivity, HIV prevention programmes need to be scaled up in the catchment area within the block/area.



4

HIV prevalence among ANC attendees by occupation in India: A descriptive analysis of HIV sentinel surveillance data, 2007–2013

Analyst: Dr. Mohan Bairwa, AIIMS

Mentor: Dr. Sanjay K. Rai, AIIMS

Objectives:

- To describe the prevalence of HIV among ANC attendees and their spouses by their occupation.
- To determine levels and trends of HIV prevalence among ANC attendees and their spouses in the following areas:
 - ◆ At the national level, and
 - ◆ In states grouped by HIV epidemic stage.

Methods: This study is a secondary data analysis of HSS-ANC data. States and Union Territories (UTs) were clubbed into low prevalence states (LPS), moderate prevalence states (MPS), and high prevalence states (HPS), based on the HIV epidemic stage they are in. Data were analysed using proportions with 95 per cent confidence interval.

Data source: HSS 2007–2012/13

Key findings:

- Our study has shown a significant decline in national HIV prevalence in ANC attendees, from 0.50 per cent in 2007 to 0.35 per cent in 2012–13.
- Relatively higher prevalence of HIV was found among hotel staff (1.08 per cent), agriculture/ cultivator/ non-agriculture labourers (0.59 per cent), skilled/semi-skilled labourers (0.66 per cent), domestic servants (0.56 per cent), and business (0.54 per cent).
- HIV prevalence declined among housewives from 0.47 per cent to 0.33 per cent, among students/ service/ unemployed individuals from 0.56 per cent to 0.20 per cent, and among agriculture/ cultivator/ unskilled workers, from 0.65 per cent to 0.45 per cent during the study, from 2007 to 2013.
- Spousal occupations of truck drivers/ helpers and hotel staff had higher HIV prevalence (0.89 per cent and 0.64 per cent, respectively).
- Among ANC attendees whose spouses were truck drivers and helpers, the prevalence of HIV declined in LPS (0.51 per cent to 0.44 per cent) and HPS (1.31 per cent to 1.15 per cent) but this decline was not statistically significant. The prevalence increased in MPS during the study period (0.43 per cent in 2007 to 3.15 per cent in 2012–13).

Recommendations for programmes:

- Spousal occupations, especially truck drivers/ helpers and hotel staff, display higher HIV prevalence, and therefore appear as priority area for action.
- The role of long-distance truck drivers and helpers remains important in the domain of research to explore and understand the penetration of HIV in the ANC attendees group.



5

Identification of proxy indicators for new HIV infection among antenatal clinic attendees in the state of Tamil Nadu, India

Analyst: Mr. V. Selvaraj, NIE

Mentor: Dr. Sanjay Mehandale, NIE

Objective:

To study the trend of HIV prevalence the 15–24 years age group as a proxy for new infection in the state of Tamil Nadu, India.

Methods: The direction and magnitude of the trend was studied using rolling regression. Another smoothing technique was also used to study the trend in HIV infection. This technique was adopted as there were only a few observed points (year-wise estimates).

Data source:

- ANC data for the years 2003–2010 (except for the year 2009).
- PPTCT data for the years 2008–2012 from TANSACS.

Key findings:

- The overall prevalence of HIV among ANC attendees (surveillance and PPTCT) is steadily declining, indicating a downward trend in new infections.
- A significant reduction in HIV prevalence in the age group 15–24 years was achieved in 2010 as compared to 2006 ($p < 0.001$).
- Over the years, the education level of ANC attendees (all ages) has been found to be associated with HIV reduction.

Recommendations for programmes:

- A similar exercise could be extended to other states of India, which would help to identify proxy indicators for the country.
- An increase in survey data would strengthen the findings and make them more robust.

6

Study on assessing random sampling approach in HIV sentinel surveillance in India for patterns and possible biases

Analyst: Dr. P.V.M. Lakshmi, Postgraduate Institute of Medical Education and Research (PGI), Chandigarh

Mentor: Dr. Rajesh Kumar, PGI Chandigarh

Objective:

To study the difference in HIV prevalence estimates by adjusting for demographic and behavioural changes.

Methods: We estimated the adjusted HIV prevalence of HRG HSS in Chandigarh (2004–2008), Punjab (2006–2008), Haryana (2006–2008), Andhra Pradesh (2004–2008), Karnataka (2004–2008) and Tamil Nadu (2004–2008) among different groups—IDU, FSW and MSM—after controlling for several potentially confounding factors (socio-demographic characteristics) with the help of a general linear regression model, using Poisson distribution link log function. The adjusted HIV prevalence during 2004–2008 was smoothed by calculating the two-year moving average. The adjusted prevalence was compared with the predicted prevalence. The difference between consecutive and random sampling methods was seen with the help of predicted limits.

Data source: HSS HRG 2001–2010

Key findings:

In this study three states/Union Territories from northern India, including Chandigarh, Punjab and Haryana, and three states from southern India, including Andhra Pradesh, Tamil Nadu and Karnataka, were considered.

Female sex workers

- In all states except Tamil Nadu, the education status of FSWs participating in the HSS varied during 2006–2010.
- Over the years, in all the states except Tamil Nadu, there was an increase in the number of urban-dwelling FSWs participating in the surveillance.

States	Adjusted Prevalence	Predicted Prevalence
Chandigarh	0.00 (0.40–0.53)	0.38 (0.33–0.42)
Punjab	0.74 (0.20–2.10)	0.62 (0.60–0.65)
Haryana	0.27 (0.01–1.41)	0.82 (0.51–1.13)
Andhra Pradesh	7.01 (5.40–8.98)	7.46 (4.49–10.43)
Karnataka	4.98 (2.87–8.02)	6.35 (1.22–11.49)
Tamil Nadu	2.94 (0.62–8.81)	5.73 (5.14–6.33)

Injecting drug users

- About 90 per cent of IDUs were in the <39 age group and this proportion remained almost constant over the years. A comparison of the distribution of age groups among IDUs from 2004 to 2008 in all the states shows significant change.
- A comparison by locality from 2004 to 2008 among IDUs shows a statistically significant difference in all the states except Andhra Pradesh.

States	Adjusted Prevalence	Predicted Prevalence
Chandigarh	7.01 (1.50–22.81)	7.01 (1.50–22.81)
Punjab	22.02 (13.51–34.15)	25.33 (21.86–28.79)
Haryana	0.92 (0.08–1.75)	–
Andhra Pradesh	3.56 (1.29–5.91)	–
Karnataka	0.00 (1.20–1.60)	0.87 (0.83–0.91)
Tamil Nadu	12.38 (6.98–21.48)	9.10 (4.76–13.44)

Men who have sex with men

- The change in the levels of education from 2004 to 2008 was statistically significant. In all states apart from Tamil Nadu, the education status of participating MSM in HSS varied during 2004–2008.
- The age distribution among MSM stayed even over the years, but the change in distribution in different age groups from 2004 to 2008 shows significant change in all states except in Punjab and Haryana.

States	Adjusted Prevalence	Predicted Prevalence
Chandigarh	0.35 (0.00–6.97)	5.44 (4.07–6.81)
Punjab	3.62 (0.69–13.17)	1.33 (0.94–1.71)
Haryana	2.52 (1.13–3.90)	-
Andhra Pradesh	9.39 (4.89–16.58)	17.28 (6.30–28.25)
Karnataka	4.77 (1.94–10.09)	19.19 (15.10–23.28)
Tamil Nadu	2.51 (1.17–4.82)	4.85 (4.64–5.06)

Recommendations for programmes:

- In the present study the difference between the consecutive and random sampling method is not significant in the case of FSWs and IDUs, but with MSM the difference is significant in some of the states.
- The sampling methods used to calculate the real estimates in HRGs need to be studied in detail.

District-wise epidemiological risk profiling of HIV infection in Punjab, India

Analyst: Dr. P.V.M. Lakshmi, PGI Chandigarh

Mentor: Dr. Rajesh Kumar, PGI Chandigarh

Objectives:

- To identify the districts with high prevalence or an impending risk of HIV.
- To understand the major drivers of epidemics in the districts identified.
- To find the gaps in programmatic coverage in these districts to facilitate better planning of interventions.

Methods: HIV prevalence from HSS, ICTC and blood banks; venereal disease research laboratory (VDRL) positivity rate from blood banks; sexually transmitted disease (STD) clinic attendees; pregnant women; and Hepatitis B and Hepatitis C positivity rates from blood banks in all the districts of Punjab were analysed to classify the districts into six groups: (i) confirmed epidemic with high prevalence of HIV, (ii) probable epidemic with high prevalence, (iii) probable epidemic with low prevalence, (iv) districts with high impending risk of epidemic, (v) districts with low impending risk of HIV, and (vi) districts with no epidemic.

Data source: HSS, 2006–2012; CMIS-ICTC, 2008–2012; CMIS-Blood Bank, 2007–2012; CMIS-STD, 2007–2012; Epidemiological Fact Sheets, 2010.

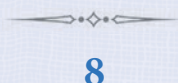
Key findings:

- Results from the 22 identified districts of Punjab were analysed. The data were insufficient to comment on Fazika and Pathankot districts.
- HIV prevalence among ANC attendees according to HSS 2003–2012 shows a sharp decline in India from 0.8 per cent (2003) to 0.35 per cent (2012). However, in Punjab there is an increasing trend, from 0.13 per cent (2003) to 0.37 per cent (2012).
- In 2006 only Hoshiarpur and Moga were above the state average of HIV-positivity, whereas in 2012, this extended to Hoshiarpur, Ludhiana, Moga, Sangrur, Nahanshar and Amritsar.
- In Punjab among MSM, the prevalence of HIV increased from 1.22 per cent in 2007 to 2.18 per cent in 2010. Though there are fewer sites to comment on that represent the whole state, a rising trend has been noted in both Bathinda and Rupnagar.
- Among FSWs in Punjab, the prevalence of HIV decreased from 1.36 per cent in 2006 to 0.79 per cent in 2010. In 2010, Mansa, Ludhiana and Patiala had positivity higher than the state level.
- Among IDUs in Punjab, the prevalence of HIV increased from 13.8 per cent in 2006 to 21.09 per cent in 2010. Among the districts, Rupnagar, Amritsar, Ludhiana, Jalandhar, Moga and Taran Taran have more than 5 per cent positivity. In these districts, there was a rising trend between 2007 and 2008 and a decreasing trend between 2008 and 2010. But overall, positivity was high in these districts.
- Overall, ICTC data positivity decreased from 5.05 per cent in 2008 to 2.24 per cent in 2012. In 2012, Amritsar, Jalandhar, Faridkot, Ludhiana, Moga, Patiala and Pathankot had positivity higher than the state average. Amritsar, Ludhiana, Jalandhar, Moga, Taran Taran and Gurdaspur had positivity levels higher than the state average for more than 50 per cent data points. All districts besides Moga had a high burden in the 15–24 years age group in ICTC data.

- Hepatitis B positivity decreased from 0.86 per cent in 2007 to 0.69 per cent in 2012. Barnala, Faridkot, Fatehgarh Sahib, Firozpur, Ludhiana, Mansa, Moga, Muktsar, Patiala, Sangrur and Taran Taran had positivity levels higher than the state average for more than 50 per cent data points.
- Hepatitis C positivity decreased from 1.4 per cent in 2007 to 1.07 per cent in 2012. Barnala, Bathinda, Faridkot, Firozpur, Ludhiana, Mansa, Moga, Muktsar, Sangrur and Taran Taran had positivity levels higher than the state average for more than 50 per cent data points.
- According to the summary data of 20 districts, a confirmed high epidemic was noted in eight districts, namely Rupnagar, Amritsar, Ludhiana, Jalandhar, Moga, Bathinda, Taran Taran and Gurdaspur. Patiala was identified as a probable high epidemic district and Kapurthala as probable low epidemic one.
- Routes of transmission were analysed for the years 2010, 2011 and 2012. In most sites, it was a heterosexual route. In Kapurthala, Moga, Nawanshahr, Rupnagar, the route of transmission through MSM was more than 5 per cent and in Amritsar, Faridkot, Firozpur, Gurdaspur, Hoshiarpur, Jalandhar, Ludhiana, Moga, Mohali, Muktsar, Nawanshar, Rupnagar and Taran Taran, the route of transmission through IDUs was more than 10 per cent.

Recommendations for programmes:

- Our analysis reveals that though injecting drug use is the major driver of the rising epidemic in the districts of Punjab, there is actually a mix of drivers. FSWs and MSM are also contributing to the rising burden. So a mixed approach needs to be identified to curb this increasing trend.
- Rupnagar, Bathinda, Mansa and Mohali have good programme coverage, but HIV prevalence is already high.
- Low programme coverage in the districts with no TI NGO among IDUs in Moga is contributing to the problem.
- Barnala, Bathinda, Faridkot, Firozpur, Ludhiana, Mansa, Moga, Muktsar, Sangrur and Taran Taran need to be approached programmatically, as these regions have higher Hepatitis C positivity than the state average.



8

The evolving HIV epidemic in West Bengal, India

Analyst: Mr. Soumya Mondal, WBSACS

Mentor: Dr. Samiran Panda, NICED

Methods: Consistent HIV testing sites (HSS sites) in the state of West Bengal that were in operation for three or more years during 2007–2013 have been identified. Six districts (Murshidabad, North 24 Parganas, Darjeeling, Bardhaman, Purba Medinipur and Kolkata) were selected based upon the criterion. In addition, among the HIV testing sites (ICTCs) that were in operation for three or more years during 2008–2012, spread all across the state, 195 consistent ICTC sites were included in this analysis. Self-initiated males and females attending ICTCs for HIV testing were considered for the HIV trend. The HIV infection trend was examined statistically (χ^2 for trend) for each of the consistent sites in West Bengal and with respect to specific groups. If the population group-specific HIV trend was observed to be uniform across multiple sites in one region, inferences were accordingly drawn about the region. The evolving nature of the HIV epidemic in West Bengal was thus examined through region and district specific analyses.

Data source: HSS (ANC, FSW, MSM and IDU), 2007–2013; ICTC, 2008–2012.

Objectives:

- Objective 1: To assess the feasibility of using district-specific data to characterise the HIV epidemic in different regions of West Bengal and to contrast it with the state scenario.
- Objective 2: To describe the situation of the HIV epidemic (2007–2012) based on an analysis of data generated from consistent HIV testing sites in various districts of West Bengal.

Key findings: HSS

- HSS data from Darjeeling show HIV sero-reactivity among FSWs (8 per cent to 0 per cent) and IDUs (8 per cent to 0 per cent) decreased significantly from 2007 to 2011. However, no such decreasing trend was observed in HIV prevalence among MSM (4.8 per cent to 2.5 per cent) in Darjeeling. Similarly, in ANC, it decreased from 2 per cent in 2007 to 0.3 per cent 2012–13.
- HSS data for the southern region show a statistically significant downward trend in HIV infection during 2007–2011 among FSWs, as detected in North 24 Parganas (4.8 per cent to 1.2 per cent) but not in Murshidabad (1.2 per cent to 0.4 per cent).
- A significant downward trend in HIV infection was observed among FSWs in Bardhaman (6 per cent to 1.2 per cent); however, no such downward trend was observed among FSWs in Purba Medinipur.
- No change was observed in the trends in HIV infection among FSWs, MSM and IDUs in Kolkata during 2007–2011.

ICTC

- HIV sero-reactivity had significantly decreased among direct walk-in males ($\chi^2 = 72.47$, $p < 0.001$) as well as females ($\chi^2 = 25.01$, $p < 0.001$) in the 45 consistent sites of ICTC in the northern region (Darjeeling (10), Jalpaiguri (9), Coochbehar (6), Uttar Dinajpur (7), Dakshin Dinajpur (4) and Maldah (9)).
- No decreasing trend in HIV prevalence among direct walk-in male attendees in any of the districts of the south-east region ($\chi^2=2.83$, $p=0.09$) was observed. However, a significantly declining trend was revealed among direct walk-in female attendees in this region ($\chi^2=27.60$, $p < 0.001$). The south-east region includes Hooghly (11), Howrah (12), Murshidabad (15), Nadia (12), North 24 Parganas (15) and South 24 Parganas (16).
- In the south-west region (Bankura (8), Bardhaman (12), Birbhum (6), Paschim Medinipur (11), Purba Medinipur (8), Purulia (13)), there was a significant downward trend in HIV infection among males ($\chi^2=5.60$, $p=0.02$) as well as females ($\chi^2=120.23$, $p < 0.001$).
- In the south-east region, decreasing ($\chi^2=106.90$, $p < 0.001$) HIV prevalence among direct walk-in females was observed in Kolkata.

Recommendations for programmes:

- West Bengal is witnessing a downward trend in HIV infection among the general population throughout the state. A similar downward trend is also being observed among population groups that are most at risk of HIV infection. However, localised pockets where intervention among most at risk populations groups should be strengthened have been identified through the aforementioned analysis. These pockets are:
 - FSWs (Murshidabad, Purba Medinipur and Kolkata)
 - MSM (Darjeeling and Kolkata); and
 - IDUs (Kolkata).

Basic Services Division

This section consists of topics that aim to identify the gaps in service provision, pertaining primarily to testing and strengthening of services. Basic Services Division includes Integrated Counselling and Testing Centres (ICTCs) and Prevention of Parent to Child Transmission (PPTCT).

9

Does the HIV sero-concordance status of couples increase the likelihood of transmission of HIV to children? Findings from a longitudinal cohort study from Maharashtra, India

Analysts: Dr. Asha Hegde, NACO, and Mr. Tejas, NACO

Mentor: Dr. D.C.S. Reddy, Retd. Professor of BHU and Presently Public Health Consultant

Objectives:

- To assess the role of HIV sero-concordance status of couples in HIV status of their child at 18 months of age testing.
- To study other socio-demographic factors among couples affecting the HIV status of the child at the age of 18 months.

Methods: This study uses data collected from 10,697 HIV-positive mothers recruited from various HIV testing centres of Maharashtra, India, during 2008–2013. Bivariate and multivariate logistic regression analyses were conducted to assess the role of the father's HIV status on the HIV status of the child at an 18-month follow-up, after adjusting for socio-demographic characteristics of the mother, single dose nevirapine given, breastfeeding status, and mode of delivery.

Data source: PPTCT line-list data of Maharashtra, 2008–2013

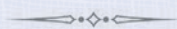
Key findings:

Out of the total sample, 7,123 children (66.6 per cent) were tested at 18 months, of which 682 (9.6 per cent) were found to be HIV-positive. Adjusted analysis showed:

- Children of sero-concordant couples were more likely to be HIV-positive than children of sero-discordant couples (10.1 per cent versus 7.9 per cent, AOR=1.34, 95 per cent CI: 1.08–1.67).
- Children whose mothers were not given a single dose of nevirapine at the time of delivery were 70 per cent more likely to be HIV-positive than those whose mothers were given nevirapine (AOR=1.69, 95 per cent CI: 1.16–2.47).
- Children delivered by vaginal delivery were twice as likely to be HIV-positive than those delivered by caesarean section (AOR=2.05, 95 per cent CI: 1.46–2.88).
- Children who were ever breastfed were 70 per cent more likely to be HIV-positive than those who were never breastfed (AOR=1.73, 95 per cent CI: 1.46–2.06).

Recommendations for programmes:

- Since this analysis is limited to mothers who are HIV-positive, as detected during pregnancy, the role of fathers' positivity in the HIV status of children could not be explored. Hence, it is recommended to explore the role played by the positivity status of fathers in the HIV status of children.
- To reduce HIV transmission during delivery, nevirapine should be ensured during delivery to both mother and baby.



10

Is mothers' lack of knowledge about the HIV status of their spouse a barrier to retention of HIV-positive mothers in care? A study from Maharashtra, India

Analysts: Mr. Tejas, NACO and Dr. Asha Hegde, NACO

Mentor: Dr. D.C.S. Reddy, Retd. Professor of BHU and Presently Public Health Consultant

Objectives:

- To study the various socio-demographic and clinical PPTCT indicators affecting retention in care among babies tested at 18 months.
- To examine the extent to which the HIV sero-discordance of couples influences the retention in care of their babies within the PPTCT programme; also, to identify the possible barriers to retention in care of HIV exposed babies.

Methods: Data pertaining to 10,697 HIV-positive mothers during 2008–2013, whose children were eligible for 18 month age testing, were studied. Retention in care at 18 months of age was measured by assessing whether the child was tested at 18 months, lost to follow up (LTFU), or died before 18 months. Bivariate and multivariate logistic regression analyses were performed to assess the association, adjusting for socio-demographic characteristics of the mother and father, mode of delivery, and gender of the child.

Data source: PPTCT line-list data of Maharashtra, 2008–2013

Key findings:

Out of 10,697, 66 per cent children were tested at 18 months, 23 per cent were LTFU and 11 per cent died before 18 months of age. After adjusting for the said variables:

- Children with HIV negative fathers were found to be 24 per cent more likely to be LTFU (AOR=1.24, 95 per cent CI: 1.1–1.4), whereas children whose father's HIV status was not known were 74 per cent more likely to be LTFU (AOR=1.74, 95 per cent CI: 1.49–2.03), compared to children of HIV-positive fathers.
- Children whose father's HIV status was not known were 40 per cent more likely to have died by 18 months, compared to children of HIV-positive fathers (AOR=1.39, 95 per cent CI: 1.12–1.72).
- Children with mothers of older age (>35 years) were 41 per cent more likely to be LTFU (AOR=1.41, 95 per cent CI: 1.02–1.94).
- Children with mothers having no formal education were 68 per cent more likely to be dead before the 18 month testing (AOR=1.68, 95 per cent CI: 1.45–1.95) and 20 per cent were more likely to be LTFU (AOR=1.20, 95 per cent CI: 1.07–1.35), as compared to babies of mothers having pursued at least some formal education.

Recommendations for programmes:

- Considering the large number of LTFU and deaths before 18 months among children whose father's HIV status is negative or not known, compared to those whose fathers are HIV-positive, there is a need to target HIV sero-discordant couples, and HIV testing of spouses of HIV-positive pregnant women needs to be strengthened by closely monitoring babies of sero-discordant couples to ensure higher rates of follow-up and retention in care of HIV exposed babies at 18 months.
- The programme needs to focus on strategies to address women who conceive at an older age (>35 years) and women with no formal education to reduce LTFU.



11

Programme gap analysis and prioritisation of districts in twelve Indian states

Analyst: Dr. Mariamma Thomas, formerly with NIMS

Mentor: Dr. Yujwal Raj, NACO

Data source: CMIS-PPTCT

Objectives:

- Describe the scaling-up at the district level of (a) service delivery response, and (b) service utilisation coverage.
- Quantify the programme gap with respect to service utilisation and coverage of (a) HIV testing, (b) case detection, and (c) prevention of parent to child transmission.
- Categorise the districts in terms of overall programme gap—very low, low, medium or high.
- Compare early infant diagnosis (EID) coverage with immunisation coverage among normal children.

Methods: The parameters used to describe each of the objectives specified above and the methods of assessment are illustrated below.

1. (a) The scaling-up of service delivery response was assessed in terms of PPTCT density—number of PPTCT per million population over time.
(b) The scaling-up of service utilisation coverage was assessed in terms of:
 - The number of pregnant women who received pre-test counselling and were tested for HIV over time in the district,
 - The number of pregnant women who received pre-test counselling and were tested for HIV per PPTCT over time,
 - The percentage of pregnant women who were tested, out of those who received pre-test counselling.
2. Programme gaps were quantified as the complement of the per cent coverage of each programme component (100 per cent covered).
 - (a) Coverage of HIV testing among pregnant women was estimated as the percentage of pregnant women tested for HIV out of those who availed antenatal care from government health facilities. In a few districts where HIV testing was greater than government ANC utilisation, any health facility was considered.
 - (b) Coverage of HIV case detection was estimated as the percentage of pregnant women who were detected as HIV-positive, out of an estimated number of HIV positive pregnant women.

- (c) Coverage of prevention of parent to child transmission was estimated as the percentage of mother–baby pairs who received nevirapine out of the estimated number of HIV positive pregnant women.
3. Categorisation of districts, based on programme gap, into very low, low, medium and high: Gaps above 50 per cent for an indicator were assigned scores on a 10-point scale. An indicator with less than a 50 per cent gap was assigned a zero score. The total score of a district was then classified into four categories: high (≥ 10), medium (5–9), low (1–4) and very low (0).
 4. The percentage of infants born to HIV-positive mothers who came for the first three EID follow-ups was compared with the percentage of infants born to HIV negative mothers who came for the first three scheduled vaccinations.

Key findings:

- Overall there has been an increasing service response in PPTCT and service utilisation in most of the districts across the 12 states.
- Among the 12 states, HIV testing at the district level ranges from 3 per cent in a district in Gujarat to a maximum of 98 per cent in a district of Rajasthan. Hence there are wide-ranging differences between districts, within states and between states.
- For measuring EID coverage, the data were not reliable in five states, while in the remaining states, as the period extends from six weeks to 12 months, EID coverage decreases.
- A detailed table has been provided in Annexure 10.

Recommendations for programmes:

- Overall, the programme needs to be strengthened in its coverage of PPTCT, ensuring increase in HIV testing and EID.

Targeted Interventions

This section on Targeted Interventions primarily profiles the type of population that has been recently accessing these services. The profiling is based on socio-demographic characteristics and sexual behaviour. This section also explores how these profiles have varied over the past two decades. In addition, it presents an analysis of the gaps in HIV testing and dual risk behaviour among various high-risk groups.

12

Characteristics and risk profile of female sex workers across six states of India

Analyst: Dr. Jessy Joseph, University College of Medical Sciences (UCMS), Delhi University and Dr. Susant Swain, Odisha SACS

Mentor: Dr. Arun Kumar Sharma, UCMS

Objectives:

- To describe the characteristics of FSWs accessing TIs in six states of India.
- To explore and study the risk profile of FSWs accessing TIs in six states of India.

Methods: A retrospective analysis of individual level data of FSWs registered under TI programmes during the year 2013–14 was conducted. Fifteen randomly selected TIs across the states of Andhra Pradesh, Karnataka, Maharashtra, Assam, Himachal Pradesh and Manipur were included in the analysis. Univariate and bivariate analysis was performed to examine associations between risk variables and demographic variables.

Data source: Form C and Form E of Targeted Intervention, 2013

Key findings:

- 1,6650 FSWs registered under the TI programme during the year 2012–2013 in the states of Karnataka, Maharashtra, Andhra Pradesh, Manipur, Assam and Himachal Pradesh were analysed.
- 48.2 per cent of FSWs were more than 30 years of age while 5.8 per cent were between 13 and 20 years of age.
- In all the states under study, except Manipur, a majority of FSWs were married.
- 57.9 per cent of FSWs had no other source of income apart from sex work.
- 60.6 per cent of FSWs were illiterate. This finding was consistent in all the states except Himachal Pradesh.
- Weekly alcohol consumption was reported by 51.2 per cent of FSWs. In Maharashtra, all FSWs consumed alcohol at least once a week.
- Absence of a regular partner was seen in 37 per cent of FSWs.
- The median age at initiation of sex work among FSWs was 26 years (interquartile range (IQR): 22, 30). In all six states, the majority of FSWs had initiated sex work between 20 and 30 years of age. Age at initiation less

than/ equal to 20 years was seen in 5.8 per cent of FSWs in Karnataka, to 36.9 per cent of FSWs in Maharashtra.

- A gradual increase in the mean age at initiation of sex work was seen among FSWs of synthetic cohorts created from 1975 to 2013.
- 49.4 per cent of FSWs had been engaged in sex work for three years or less. In all the states except Himachal Pradesh, FSWs covered by the study had been engaged in sex work for six years or less.
- The mean number of sexual acts reported per week by FSWs was 23.77 (95 per cent CI: 23.41–24.13). In the three high prevalence states of Andhra Pradesh, Karnataka and Maharashtra, the majority reported less than 15 sexual acts per week, while in the low prevalence states of Assam, Himachal Pradesh and Manipur, sexual acts per week were 15 or more.

Recommendations for programmes:

- Considering the common practice of alcohol consumption, it is suggested that future interventions address alcohol-related vulnerability.
- Considering the age at initiation into sex work is low, TIs could consider strategies for early enrolment of young FSWs to reduce their vulnerability.
- Considering that the number of sexual acts per week is similar in both low and high prevalence states, programmes should be cautious with the low prevalence states, including Assam, Himachal Pradesh and Manipur.



13

Demographic and sexual behaviour characteristics of men who have sex with men registered with the targeted intervention programme in India

Analyst: Dr. Harshal Salve, AIIMS

Mentor: Dr. Sanjay K. Rai, AIIMS

Objectives:

- To study the demographic profiles of MSM registered with the TI programme in India.
- To study the risk behaviour of MSM registered with the TI programme in India.
- To study the relationship between high risk behaviour and selected demographic factors.
- To study the pattern of vulnerability among MSM in the last two decades (1993–2013) through synthetic cohorts.

Methods: Age marital status, education, occupation, typology, alcohol use and sexual behaviour of MSM were studied from the TI data collected during 2013. A synthetic cohort was developed and analysed. Bivariate analysis was carried out to understand the demographic determinants of sexual behaviour.

Data source: Form C and Form E from 12 TIs of six different states.

Key findings:

- 52.1 per cent of MSM were in to the age group 20–30 years. The proportion of teenage MSM was very low (1.2 per cent).
- 57.6 per cent of MSM were married and 40.8 per cent had never been married.
- 23.1 per cent of MSM were illiterate.

- 21.1 per cent of MSM had never been employed.
- Double-decker (53.6 per cent) was the commonest typology of MSM registered in the TI programme, followed by *kothi* (36.7 per cent). Few (6.8 per cent) *panthis* were registered in the TI programme.
- The mean years of sexual work reported by MSM were 7.9 years (95 per cent CI: 7.8–8.0).
- The mean age of initiation of sex work was 22.9 years (95 per cent CI: 22.8–23.1).
- MSM reported 7.9 (95 per cent CI: 6.9–7.1) sexual acts per week.
- Of all the MSM covered in the study, 27.7 per cent reported having irregular partners and 45.6 per cent reported alcohol use.
- MSM registered in the TI programme in high prevalence states (HIV prevalence in MSM ≥ 10) reported higher risk behaviours, such as early age at initiation ($p < 0.001$), alcohol use ($p < 0.001$), more sexual acts per week ($p < 0.001$), as compared to those in low prevalence states. This association was statistically significant.
- There was no statistically significant difference in high risk behaviour by typology except for alcohol use ($p < 0.001$) and unemployed status ($p < 0.001$). *Kothis* had a higher proportion of unemployment (39.6 per cent) and *panthis* had a higher proportion of alcohol use (52.9 per cent).
- 293 (60.2 per cent) transgender/*hijras* were married.
- Information about irregular partners of MSM was inadequate to show any statistically significant association between MSM in high and low prevalence states.

Synthetic cohort analysis (1993–2013) findings:

- a. No clear demographic trends were observed over the years among MSM.
- b. Over the years, the age at initiation of sex work among MSM is increasing.
- c. The use of alcohol is decreasing among MSM registered in the TI programme over the years.
- d. Information about irregular partners is inadequate to comment on trends.

Recommendations for programmes:

- The following steps need to be taken to strengthen the TI programme data: Form C and E:
 1. Annual updation of master register data should be ensured and drop-outs identified in the master register.
 2. Information about typology should be collected as per current sexual preferences (annual updation can be considered).
 3. Information about the type of partner (regular/ irregular) needs to be collected in a more robust manner.
 4. Variables on the number of irregular partner need to be added in the master register of the TI programme. This will help create more effective high risk behaviour information on MSM.
 5. The head 'use of alcohol' needs to be further classified into frequency of use. As alcohol use is high risk, this will provide more in-depth information on alcohol use.
 6. Information about migration and condom use is very vital in assessing high risk behaviour among MSM. This was lacking in the master register of the TI programme. The inclusion of these two variables in the master register will make it more comprehensive.
- MSM from high prevalence states reported a greater degree of high risk behaviour. Hence, the TI programme needs to be strengthened in high prevalence states for it to have maximum impact.
- Cohort analysis revealed that the age at initiation of sex among MSM has increased over the years. This finding needs to be explored further with larger data.

Dual risk behaviour among high HIV risk groups in India: Exploratory study using Integrated Biological and Behavioural Assessment

Analyst: Ms. Lopamudra, Population Council

Mentor: Dr Avina Sarna, Population Council

Objectives:

- To explore the prevalence and pattern of dual risk behaviour among all the high risk groups (IDUs, MSM, FSWs and truck drivers) in India, and to see their geographical distribution.

Methods: For the MSM population, dual risk behaviours are defined by two types of behaviours, including unprotected sex with any female or male partners and injection drug use. In the case of FSWs, dual risk is defined by sex without condom and use of injection drugs, while for IDUs dual risk is defined as having sex with an FSW without a condom and unsafe injecting behaviour. Descriptive analysis of HIV prevalence and sexual behaviour and/or injecting behaviour is presented across the states.

Data source: IBBA Round 1 (2006) and 2 (2009)

Key findings:

Men who have sex with men

- Dual risk in terms of drug injection behaviour is almost nil across the states. The percentage of ever injecting drugs is highest among MSM at 1.4 per cent in Tamil Nadu.
- Condom usage is very high among all the male partners and paid female partners—every time condom use ranges from 72 per cent to 94 per cent.
- However, most of them do not use condoms with their regular female partners (80 per cent).
- Importantly, only a few of their regular female partners are aware of their MSM behaviour.
- Defining dual risk as unprotected sex with male or female partners, we observe a small proportion (ranging from 6 per cent to 13 per cent) to be exposed to such dual risk.

Female sex workers

- Condom usage is very high with regular paying or occasionally paying/non-paying male sexual partners. The percentage of FSWs using a condom every time with such partners is always more than 75 per cent.
- Condom use is low with regular non-paying partners. Though more than 28 per cent do not have such partners, about 60 per cent never use condoms while having sex with them.
- Less than 1 per cent have ever injected any drug.
- Naturally, the percentage of those with dual risk behaviour (i.e. having unprotected sex and injecting drugs) is extremely low.
- More than 8 per cent of FSWs in Andhra Pradesh and Tamil Nadu, and about 17 per cent in Maharashtra, reported that they suspect their clients to be IDUs.

Injecting drug users

- Needle/syringe or drug solution sharing behaviour is noticeably high in all the states—about 69 per cent in Nagaland, and more than 39 per cent each in Maharashtra and Manipur reported to have shared at least once during the past one year.
- There is variation in the percentage of IDUs having sex with FSWs across the states. This percentage is highest in Maharashtra (32 per cent) and lowest in Nagaland (6 per cent).

- Inconsistent condom usage has been observed across the states.
- Defining dual risk as injection sharing and having sex with FSWs, a state-specific variation has been observed. The percentage of IDUs exposed to both the risks is highest in Maharashtra (22 per cent).

Recommendations for programmes:

- Though there was no significant dual risk found among the high risk groups, a small proportion in some of the groups are still exposed to such risk.
- Programmes should continue focusing on TIs meant exclusively for different high risk groups.



15

Trends in HIV testing, referrals and uptake among most-at-risk populations in India: Retrospective analysis of national HIV programme monitoring data

Analyst: Mr. Padum Narayan, NIMS

Mentor: Dr. Reynold Washington, KHPT

Objectives:

- To examine the uptake of HIV testing among FSWs, MSM and IDUs who were reached through the NACO-supported HIV targeted interventions from 2009 to 2012.
- To examine whether the uptake of HIV testing has increased over time from 2009 to 2012, and whether there are any differences among subgroups in relation to the trend in uptake of HIV testing.

Methods: We used service delivery data from NACO-supported TIs implemented between the period of 2009 and 2012. The proportions of people who were referred and tested for HIV were calculated from NACO's data retrieved from CMIS. Z tests were used to identify and calculate significant differences in the proportions of referrals and uptake of HIV testing.

Data source: CMIS-Targeted Intervention, 2009–2012; Mapping Data, 2009

Key findings:

- The registered number of FSWs, MSM and IDUs obtained from the annual reports of NACO and periodic performance reports on targeted HIV interventions prepared by the targeted interventions division of NACO validated the data available from NACO's CIMS, showing no major discrepancies.
- From 2009 to 2012, there was a steady increase in the number of targeted HIV interventions for FSWs (451 to 515), MSM (143 to 184) and IDUs (259 to 277).
- There was an increase in the percentage of referrals among all HRGs (FSWs: 31–68 per cent; MSM: 32–58 per cent; IDUs: 29–59 per cent).
- There was an increase in the percentage of people tested for HIV over the years (FSWs: 23–45 per cent; MSM: 25–41 per cent; IDUs: 17–43 per cent).
- The present level of HIV testing is less than optimal.

Recommendations for programmes:

- Efforts need to be intensified to improve the number of referrals made within the targeted HIV interventions.
- Programmes are recommended to identify strategies for improving the uptake of HIV testing among all most-at-risk populations.

Blood Safety

This section on Blood Safety discusses the patterns of transfusion transmissible infections (TTIs) in the country. It highlights the achievements of the Blood Safety division in increasing voluntary donation, in addition to mentioning the challenges within this division in providing quality infection-free blood and/or blood components. Further, it discusses the usage of blood and its components in different parts of the country.

16

Levels and trends of transfusion transmissible infections and inter-regional variations among donated blood units in India: Evidence from a national programme

Analyst: Dr. Saravanamurthy PS, NDAP Secretariat, NACO

Mentor: Dr. Arun Kumar Sharma, UCMS

Objective:

To study the levels, trends and regional variations of TTI among donated blood units in India.

Methods: Descriptive retrospective analysis of CMIS-Blood Bank data for the period 2008–2012 was carried out. This data set comprises data including the number of male and female donors, the number of voluntary and replacement donors, the number of blood units tested for five TTIs, including HIV, HBV, HCV, Syphilis and Malaria, and TTI positivity status. These numbers are reported in an aggregate manner for each month of a particular year, and the smallest unit of data available is at the blood bank level.

Data source: CMIS-Blood Bank, 2008–2012

Key findings:

- 495 blood banks are observed to be reporting consistently for 9 and >9 months for all the five years (2008–2012) and these blood banks are spread across 29 states of the country.
- Overall there is increase in voluntary donation from 50 per cent in 2008 to 75 per cent in 2012.
- Female donors are at a consistent level of 5 per cent over the five year period, and there is a decreasing trend in voluntary donors among females.
- The southern region has the lowest female donors (2 per cent), among all regions.
- HIV and syphilis are observed to be consistently declining among voluntary donors during the study period.
- Hepatitis infections (HBsAg (1 per cent) and HCV (0.45 per cent)) are observed to be following a similar trend over the study period and the levels are higher than HIV infection.
- HBsAg positivity is around 1 per cent in the East, West and North among voluntary donated units.

Recommendations for programmes:

- Blood donation among females has to be encouraged across the country, especially in the southern region.
- Studies on factors (apart from health factors) affecting female donors have to be implemented.
- Reasons for high levels of Hepatitis infection (B&C) among voluntary donors have to be explored and addressed, especially in the eastern and western regions of India.

17

Utilisation of blood and its components in India: Exploratory study using national programme database

Analyst: Dr. Ajay Rajan, Kerala SACS

Mentor: Dr. Prasanna Kumar, Consultant

Objective:

- To study the pattern of annual utilisation of blood and its components at the national and state levels in India from 2009 to 2012.
- To compare the annual utilisation of blood and its components at the national level among various subtypes, and unit location of blood banks in India between 2009 and 2012.

Methods: A secondary data analysis was done using NACP data for the period 2009–2012. Data from a total of 3,846 blood banks in 2009 and 3,922 blood banks in 2012, across 36 states, were analysed. The annual utilisation pattern of blood and its components was analysed across different states under the heads of unit types (government, private, voluntary) and location (medical college, district hospital, sub-district hospital). Proportions of blood collected for supply under different blood components (packed cell, platelet, fresh frozen plasma (FFP), cryoprecipitate) were calculated at the national and state levels and compared across different blood bank unit subtype, category and location.

Data source: CMIS-Blood Bank, 2009–2012

Key findings:

- The utilisation of whole blood decreased in 16 states and increased in 11 states between 2009 and 2012.
- Packed cell utilisation increased in 12 states, while 10 states saw a decrease during the study period.
- Annual utilisation of platelet concentrate either remained constant or increased in all the states.
- Annual utilisation of cryoprecipitate increased in eight states, while its utilisation decreased in five states.
- In 2012, whole blood and cryoprecipitate levels were highest in the model blood bank; those of packed cells were highest in NACO-supported blood banks; platelet and plasma levels were highest in Blood Storage Centres (BSC); Fresh Frozen Plasma (FFP) levels were highest in major blood banks.
- Among different categories of blood banks, in 2012, in the model blood bank and major blood bank, FFP was highest and in the NACO supported blood bank, Blood Component Separation Unit (BCSU), BSC, the highest utilisation was for packed cells.

Recommendations for programmes:

- The overall demand for component usage has increased, hence more components have to be made available, especially platelets and packed cells.
- The actual consumption status and utilisation status of each component can be used to develop a mathematical model to estimate the blood requirement.

Care, Support and Treatment

This section on HIV/AIDS Care, Support and Treatment discusses issues including loss-to-follow-up and death among adults and children registered with government ART centres. In addition, a systematic review of HIV/AIDS treatment provision in India has highlighted the challenges in the programme.

18

Survivality of children living with HIV who are on ART: A retrospective cohort study of Andhra Pradesh, India

Analyst: Mr. Ugra Mohan Jha, NACO

Mentors: Dr. L. Jeyaseelan, CMC-Vellore, Dr. Pauline Harvey, CDC-GCHA

Objectives:

To determine the survival probability among children living with HIV/AIDS and receiving ART.

Methods: Data from individual paediatric ART programmes registered since 2007–2013 were used to estimate survival, its covariates and validation of survival models. Data extracted from electronic CMIS software and analysed using SPSS 20.0, STATA, Kaplan Meier survival and Cox proportional hazard model, were used to measure survivality and to identify independent predictors of children's mortality.

Data source: PLHA line-listing data from Andhra Pradesh

Key findings:

- Among children living with HIV/AIDS and on ART, the overall estimated cumulative survival probability after 12 months was 0.95 (95 per cent) (95 per cent CI: 0.94–0.95) and, after 60 months, was 0.91 (91 per cent) (95 per cent CI: 0.89–0.92). In the younger (<5 years) age group, this figure after 12 months was 0.93 (93 per cent) (95 per cent CI: 0.91–0.94) and, after 60 months, was 0.90 (90 per cent) (95 per cent CI: 0.86–0.92). In the older age group (10 years and above), the figure after 12 months was 0.95 (95 per cent) (95 per cent CI: 0.93–0.95) and, after 60 months, was 0.89 (89 per cent) (95 per cent CI: 0.85–0.91).
- The median age at the beginning of ART was eight years (IQR: 5–11 years). An IQR of 5–11 years means that 50 per cent of the children were between 5 and 11 years old.
- The baseline median CD4 count at the start of ART was 244 (IQR: 153–398).
- The incidence of mortality rates among children on ART were highest in the < 5 years age group, with 39 per thousand persons per year, and the median CD4 count was 341 (IQR: 195–766).
- The incidence of mortality rates among children on ART in the 5–9 years age group was 25 per thousand persons per year, with a median CD4 count of 240 (IQR: 155–383).
- The incidence of mortality rates among children on ART in the 10–14 years age group was 32 per thousand persons per year, with a median CD4 count of 227 (IQR: 139–366).

- The overall mortality rates among children on ART in the <15 years age group was 30 per thousand persons per year, with a median CD4 count of 244 (IQR: 153–398).
- The mortality rate among children of age upto 1 year with HIV/AIDS and on ART was 86 per thousand.
- Overall, those with a CD4 count ≤ 200 were over six times more likely to die, with an Adjusted Hazard Risk Ratio of 6.27 (95 per cent CI: 3.46–11.36) and those with a CD4 count of 251–350 were over three times more likely to die, with an Adjusted Hazard Risk Ratio of 3.24 (95 per cent CI: 1.66–6.32), as compared to those with a higher CD4 count (≥ 350).
- Those at HIV clinical stage I and II were over three times more likely to die, with an Adjusted Hazard Risk Ratio of 3.19 (95 per cent CI: 1.92–5.28) and those in HIV clinical stage III were more than one time more likely to die with an AHR of 1.38 (95 per cent CI: 3.3–6.6) as compared to those in the HIV clinical stage IV.
- Under the CD4 count 251–250, children less than 5 years had more than two and a half times greater chances of death than those in the 10–14 years age group, with HR 3.40 (95 per cent CI: 1.49–7.73). Similarly, under CD4 count 251–350, children less than 5 years had more than two and half times more chances of death than those in the 10–14 years age group, with HR 1.73 (95 per cent CI: 0.83–3.62); and under CD4 count > 350 , children less than 5 years had over four and a half times more chances of death than those in the 10–14 years age group, with HR 4.40 (95 per cent CI: 1.45–13.38).
- The associated predictors for survivality that have been found include age, CD4 count and WHO clinical stage.

Recommendations for programmes:

- The overall estimated cumulative survival probability among children with HIV and on ART, below 15 years of age, was 95 per cent after one year and 91 per cent after five years. At the same time, in the younger (<5 years) age group, the survival probability was 93 per cent after one year and 90 per cent after five years. Accordingly, the mortality of those under 5 years needs to be tackled adequately through programme intervention.
- As per the SRS report 2013, the under-5 mortality in India is 49 per thousand. This study shows that the mortality rate among children with HIV/AIDS and on ART is 39 per thousand, which is, in fact, less than the SRS estimate. At the same time, as per the SRS report 2013, the infant mortality rate is 40 per thousand, but the mortality rate among children of age upto 1 year with HIV/AIDS and on ART is 86 per thousand—that means an infant upto one year has higher chances of death. This calls for urgent programmatic action targeting newborn children to control mortality among children with HIV infection.
- In the <15 years age group, the overall mortality rate among children on ART is 30 per thousand.
- The associated predictors for survivality have been found to be age, CD4 count and WHO clinical stage.

19

Survival on antiretroviral treatment and predictors of mortality among adult HIV-positive patients in Andhra Pradesh, India: A retrospective cohort study, 2007–2013

Analyst: Dr. Rambajpai, Army College of Medical Sciences, New Delhi

Mentor: Dr. L. Jeyaseelan, CMC-Vellore and Dr. Pauline Harvey, CDC-DCGH

Objective:

To explore the mortality rates and determinants among all known ART patients in one of the six high prevalence states, Andhra Pradesh, India

Methods: This retrospective cohort study included 139679 HIV-positive patients aged ≥ 15 years, who initiated ART between January 2007 to December 2013 in Andhra Pradesh state, India. Follow-up time was calculated from the date of ART initiation to date of death or censoring (loss to follow-up, transferred out, on medical advice or surviving on 31 December 2013). Mortality rates (per 1000 person-years) were calculated. Kaplan-Meier and Cox-regression models were used to estimate survival and explore determinants of mortality.

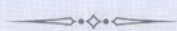
Data source: PLHA line-listing data from Andhra Pradesh

Key findings:

- The mean age of the patients at start of ART was 34.9 ± 9.2 years, among males 36.7 ± 9.1 years and among females 32.8 ± 8.8 years ($p < 0.001$).
- Male patients constitute 54.3 per cent of the total sample size.
- More than 50 per cent of HIV patients acquired the infection at and/or below the age of 45 years.
- Among the 139,679 adult HIV-positive patients, 18,394 (13.2 per cent) had died, 16,624 (11.9 per cent) were lost to follow-up, 14,237 (10.2 per cent) were transferred-out to another ART centre within or outside the state, 905 (0.6 per cent) were recorded as on medical advice and the remaining 89,519 (64.1 per cent) were still alive on 31 December 2013.
- This seven-year retrospective cohort study showed high mortality (56 per cent, 10305/18394) within three months of ART initiation among HIV-positive patients in Andhra Pradesh.
- The main independent predictors of mortality among adult HIV-positive patients on ART were higher age, male sex, low baseline bodyweight, poor baseline functional status, worse baseline WHO clinical stage, lower baseline CD4 count and poor ART adherence (< 95 per cent).
- The causes of death were not captured as part of the programme data.
- The survival probability of patients at three months, six months, one year, two years, and five years was 96.5 per cent, 94.8 per cent, 92.0 per cent, 88.9 per cent and 87.9 per cent, respectively.

Recommendations for programmes:

- Patients, mainly male, in the state should be encouraged to come forward for early HIV testing and counselling, and to initiate early treatment.
- Major efforts are required not only to trace LTFUs but to initiate a mechanism to trace those patients early when they have missed their monthly dose.
- It is recommended to capture the causes of death, which would be helpful for programmatic approaches.



20

A systematic review to explore the factors related to parent-to-child transmission of HIV, survival and treatment provision for children with HIV in India

Analyst: Dr. Arvind Kumar Singh, AIIMS

Mentor: Dr. Sanjay Kumar Rai, AIIMS

Objective:

To conduct a systematic review regarding parent to child transmission, survival and treatment of children living with HIV in India.

Methods: A systematic search was conducted in MEDLINE, IndMed, Web of Science, Google Scholar and major journals related to HIV/AIDS for studies published between 1992 and 2015 to identify all the relevant studies related to the transmission of HIV from parent to child, and survival of children living with HIV and ART.

Data source: Literature (peer-reviewed articles and reports available for public access)

Key findings:

- 33 peer-reviewed articles, selected based on certain eligibility criteria, were thematically classified under three categories, i.e., articles related to transmission, survival and treatment.
- Of the 33 articles included in the review, 19 articles were related to the transmission of HIV from parent to child and related factors, three articles were related to the survival of HIV infected children and its correlates, whereas the remaining 11 articles pertained to various aspects of treatment among children living with HIV.
- The relative risk of transmission in HIV uninfected children varied from 1.2 to three times in studies conducted in various parts of India.
- Programmatic factors associated with poor adherence include type of setting and late initiation of ART after diagnosis.
- Most of the studies included in the systematic review were small, unplanned studies, conducted as part of routine health care delivery related to HIV.

Recommendations for programmes:

- Early initiation of ART should be considered for strengthening adherence to ART.
- There is a need to conduct scientifically robust studies to facilitate programmatic recommendations.
- Operational research could throw light on the issues in each type of setting on adherence to ART.

Laboratory Support

This section discusses one specific issue—programmatic challenges—around 2-test and 3-test strategies.

21

Implications of using two versus three rapid tests for HIV diagnosis in India: Analysing public health programme data

Analyst: Dr. Archana Beri, CDC-India

Mentor: Dr. Arun Risbud, Ex-NARI

Objective:

- To analyse the implications of using two rapid tests versus the present practice of three tests for HIV diagnosis under NACP in India.
- To analyse the effect of a decreased number of tests across different types of peripheral testing sites, viz. PPTCT and ICTCs.

Methods: A total of 38,142 test results of individual serum specimens collected from ICTCs or PPTCTs associated with 117 state reference laboratories were analysed. The testing at the ICTCs/ PPTCTs was performed using a standard algorithm using 3 tests (Test-1, Test-2 and Test-3) in a sequence. The 3-test algorithm (henceforth referred to as 3TA) provided three outcomes/ results, viz. Positive, Negative and Indeterminate.

Data source: Test results of three rapid tests of all specimens which were reactive in the first screening test. Data were obtained from ICTCs/PPTCTs in 117 state reference laboratories. The period of obtained data was one year (2011–12).

Key findings:

A comparison of 3-test strategy (3-TS) with 2-test strategy (2-TS) indicates:

- 0.14–0.16 per cent of the first test reactive samples will be labelled positive with 2-TS, as against Indeterminate (I) with 3-TS, resulting in the labelling of these individuals as HIV-positive.
- 99.43 per cent of these samples are correctly labelled as positive across 2-TS and 3-TS.

Recommendations for programmes:

Considering the limitations of the data, the following recommendations are made:

- 2-TS may be analysed for its possible implications on the diagnosis of HIV in asymptomatic individuals considering the volume of testing (22 million tests conducted in 2013–14) under NACP.
- The study is a basic analysis of data available under the programme. A structured study to compare 2-TS and 3-TS strategies is required for a robust conclusion.
- The programme should routinely collect data on first test reactive samples and their outcomes. Similar monitoring of first test negative samples and their outcomes may be considered.

Recommendations and Way Forward

The National Data Analysis Plan is a first-of-its-kind project wherein a large amount of programme data has been methodically compiled and managed for systematic data analysis and publishing in scientific peer-reviewed journals. This project has been a great learning experience for NACO and some of these lessons could be considered by other national programmes in India and around the world. The following are the key takeaways from this exercise:

Data Quality Management

When the analysts of NDAP started using programme data, especially programme data from the national HIV information system (called the Computerised Management Information System or CMIS) and primary data capture registers from the targeted intervention programmes (Form C and Form E, available in soft copy), there were many quality issues and limitations on the availability and accessibility of data. It has been identified from the available data sets that around 40 per cent of the reporting units' data was not consistently reported for 12 months in any particular year and the units were not consistently available, or reported in the CMIS. Undertaking exercises such as these entails periodically examining consistency in reporting and validation of numbers, so that the data quality is addressed at regular intervals. By ensuring quality data, the reports generated can greatly enable the development of evidence-based programmes.

Scientific Publications

In addition to generating periodic analytical reports, peer-reviewed articles based on these programme data would ensure that the knowledge and experience of Indian health programmes can be applied to a wider scientific audience who can access and learn from them.

Decentralisation of Capacity

The data analysis capacity that has been built through this initiative across the country will provide motivation to state and regional level institutes to continue to conduct such analyses based on their requirements. It is recommended that State AIDS Control Societies utilise this cadre of experienced and trained human resources, in the future, for undertaking further, more focused analyses for programme improvement.

Institutionalisation

Projects of this nature must be institutionalised, instead of remaining one-time activities. The "Terms of Reference" for data analysis should be considered for inclusion in the core roles and responsibilities of the staff in SACs and NACO. This could ensure a continuing focus on maintaining data quality, and a scientific approach towards data and publication in peer-reviewed journals.

Key Findings and Programme Implications

- The analysis of programme data from Punjab, Assam, Odisha and West Bengal indicates that there are certain pockets and districts in these states which are driving the HIV epidemic. Hence the programme needs to focus on these identified pockets.
- The analysis of high-risk groups (HRGs) registered in the TI programmes shows the changing profile of HRGs (female sex workers and men who have sex with men) over the years, and also highlights the importance of more detailed studies in states like Himachal Pradesh, which appear to have a higher volume of sex workers.
- The survival analysis among HIV-infected children and adults registered in antiretroviral therapy (ART) centres in Andhra Pradesh highlights the importance of early diagnosis and treatment initiation to promote quality of life among PLHIVs. Hence, it is suggested that the analysis be extended to other states to validate appropriate measures that could be considered by the programme.
- The analysis of TI data suggests that referrals and subsequent HIV testing among HRGs needs to be strengthened (current HIV testing among HRGs is <50 per cent). Efforts need to be intensified towards 100 per cent referrals and linkages between targeted interventions and counselling and testing programmes.
- The blood safety programme should encourage component usage across the country, and depending on the clinical observations and requirements in each region, the importance of component usage could be promoted. Considering the increase in component usage across the country, availability and accessibility, especially of platelets and packed cells, should be strengthened. In addition, the

eastern and western regions of the country need focus due to the high positivity of Hepatitis B and C, in comparison to other regions.

- The importance of line-list data has been highlighted by analysing the line-list data on PPTCT from Maharashtra. Hence, based on the findings, line-listing could be strengthened across the country to garner an evidence-rich source of information and, ultimately, strengthen adherence to treatment.
- The PPTCT programme has been showing increasing service utilisation in the majority of districts of the 12 states in which PPTCT programme data has been analysed. There are districts in these states where very low (3 per cent in a district of Gujarat) HIV testing is reported, whereas a district in Rajasthan has reported 98 per cent of HIV testing. Considering this wide gap, the PPTCT programme needs to focus on districts where there is low HIV testing.

Challenges/Limitations

- Standardisation of programme data and checking for quality issues was one of the challenges which consumed a considerable amount of time during this initiative.
- Sustaining the interest of all researchers at various institutes across the country, in the course of their several other primary responsibilities, was a challenge which could also explain why it took longer than expected to complete this initiative.
- The motivation for all the researchers to be part of this initiative was authorship of peer-reviewed articles, since otherwise, access to such important and sensitive data is not available, and all the researchers were pleased to enter a sustained relationship with NACO. Hence, other motivational factors could be considered for future activities, so that there is greater participation by researchers.

Annexure 1: List of Analysts and Institutes

Sl. No.	Name of analyst	Institute
1	Dr. Ram Bajpai	Army College of Medical Sciences, Delhi
2	Dr. Rahul Srivastava	All India Institute of Medical Sciences, Delhi
3	Dr. Mohan Bairwa	All India Institute of Medical Sciences, Delhi
4	Dr. Harshal Salve	All India Institute of Medical Sciences, Delhi
5	Dr. Vijay Silan	All India Institute of Medical Sciences, Delhi
6	Dr. Arvind Kumar Singh	All India Institute of Medical Sciences, Delhi
7	Dr. Archana Beri	Centre for Diseases Control and Prevention, Delhi
8	Ms. Deepika Joshi	Centre for Diseases Control and Prevention, Delhi
9	Dr. P.S. Saravanamurthy	Consultant
10	Dr. Mariamma Thomas	Consultant
11	Dr. Yujwal Raj	Consultant
11	Dr. Lincoln Choudhury	Consultant
12	Dr. Chinmoyee Das	National Centre for Diseases Control, Delhi
13	Mr. Ugra Mohan Jha	National AIDS Control Organisation, Delhi
14	Dr. Tejashri Kambli	National AIDS Control Organisation, Delhi
15	Ms. Gunjika Vishwanath Misra	National AIDS Control Organisation, Delhi
16	Ms. Vinita Verma	National AIDS Control Organisation, Delhi
17	Dr. Pradeep Kumar	National AIDS Control Organisation, Delhi
18	Mr. P.P. Gupta	National AIDS Control Organisation, Delhi
19	Dr. Asha Hegde	National AIDS Control Organisation, Delhi
20	Ms. Mariyam Zainab	National AIDS Control Organisation, Delhi
21	Mr. Tejas	National AIDS Control Organisation, Delhi
22	Dr. R. Mohan Kumar	Department of Public Health, Tamil Nadu
23	Dr. Anuj Tiwari	FHI-360, Delhi
24	Mr. Pardeep Sangwan	FHI-360, Delhi
25	Dr. Deepali Godha	Futures Group, Delhi
26	Ms. Madhumita Das	International Centre for Research on Women, Delhi
27	Dr. Priti Prabhugate	International Centre for Research on Women, Delhi
28	Dr. Gautam Roy	Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry
29	Dr. C. Palanivel	Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry
30	Dr. T. Mahalakshmi	Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry
31	Dr. D. Jayalakshmi	Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry
32	Dr. Sithansu Kar	Jawaharlal Institute of Post Graduate Medical Education and Research, Puducherry

Annexure 2: List of Mentors and Institutes

Sl. No.	Name of mentor	Institute
1	Dr. Sanjay K. Rai	All India Institute of Medical Sciences, Delhi
2	Dr. Shashi Kant	All India Institute of Medical Sciences, Haryana
3	Dr. Pauline Harvey	Centre for Disease Control and Prevention, Delhi
4	Dr. Daniel Rosen	Centre for Disease Control and Prevention, Delhi
5	Dr. K. Sudhakar	Centre for Disease Control and Prevention, Delhi
6	Dr. L. Jeyaseelan	Christian Medical College, Vellore
7	Dr. DCS Reddy	Consultant
8	Dr. Venkatesan Chakrapani	Centre for Sexuality and Health Research and Policy, Chennai
9	Dr. Prasanna Kumar	Consultant
10	Dr. Bitra George	FHI-360, Delhi
11	Dr. Ravi Verma	International Centre for Research on Women, Delhi
12	Dr. Reynold G. Washington	Karnataka Health Promotion Trust, Karnataka
13	Dr. Sheela Godbole	National AIDS Research Institute, Pune
14	Dr. Arun R. Risbud	National AIDS Research Institute, Pune
15	Dr. Ramesh S. Paranjape	National AIDS Research Institute, Pune (Retd.)
16	Dr. Raman Gangakhedkar	National AIDS Research Institute, Pune
17	Dr. Samiran Panda	National Institute of Cholera and Enteric Diseases, Kolkata
18	Dr. Alok Kumar Deb	National Institute of Cholera and Enteric Diseases, Kolkata
19	Dr. Sanjay Mehendale	National Institute of Epidemiology, Chennai
20	Dr. Arvind Pandey	National Institute of Medical Statistics, Delhi
21	Dr. Damodar Sahu	National Institute of Medical Statistics, Delhi
22	Dr. Soumya Swaminathan	Indian Council of Medical Research, Delhi
23	Dr. Rajesh Kumar	Post Graduate Institute of Medical Research, Chandigarh
24	Dr. Niranjana Saggurti	Bill and Melinda Gates Foundation, Delhi
25	Dr. Avina Sarna	Population Council, Delhi
26	Dr. Arun Kumar Sharma	University College of Medical Sciences, Delhi
27	Mr Taoufik Bakkali	Joint United Nations Programme for HIV/AIDS, Delhi

Annexure 3: Memorandum of Understanding

1. Memorandum of Understanding is executed on ‘ _____ ’ (Date) of ‘ _____ ’ (Month and year) between the ‘ _____ ’ (Institute’s name), at ‘ _____ ’, (Detailed postal address) represented by its ‘ _____ ’ (Designation of the Head of Institute), [hereinafter called ‘Institute undertaking data analysis’]

AND

the Department of AIDS Control (DAC), Ministry of Health and Family Welfare, Government of India, having its office at the 6th floor, Chandralok Building, 36 Janpath, New Delhi-110001, represented by its ‘ _____ ’ (Designation and name of the nodal person) [hereinafter called ‘Client’].

2. The term “Institute undertaking data analysis” and “Client” shall mean and include, its assign, successor-in-interest unless the text otherwise requires.

Whereas Institute undertaking data analysis is engaged in education, training, research and treatment in the field of medical and health sciences , and has been identified by the Client for undertaking analysis of existing data under programme in the field of HIV/AIDS.

AND Whereas the Client requested the Institute undertaking data analysis to undertake the study/analysis of the existing data under the National AIDS Control Programme (NACP) for ‘ _____ ’ (Title of Study) as per the Terms of References for Analyst enclosed as Annexure-A.

AND Whereas Institute undertaking data analysis has accepted the offer of the Client to undertake the study/analysis of the existing data under NACP, subject to the Terms and Conditions agreed as under.

TERMS AND CONDITIONS

(1) NOTICES:

Any Notice, request or consent required or permitted to be given in pursuant to the agreement shall be in writing and such notices etc. shall be deemed to have been given or made when delivered in person to an authorised representative of the parties or when sent by Registered Post or telegram or facsimile to such party at the following addresses:

Institute undertaking data analysis:

Client:

(2) RELATIONSHIP BETWEEN PARTIES:

This agreement between the parties shall not create or establish the relationship of master and servant. The relationship is only that of Institute undertaking data analysis and Client. The Institute undertaking data analysis shall complete its entire obligation for completing the work assigned to it.

(3) COMMENCEMENT, EXPIRY, MODIFICATION AND TERMINATION:

3.1 Commencement:

This Memorandum of Understanding shall become effective upon signature by both the parties.

3.2 Expiry:

It shall remain in full force and effect for a period of one year thereafter.

3.3 Modification:

Modification of this contract is not permitted unless it is agreed mutually between the parties that the modification necessary to carry out the obligation by both the parties and such modification is incidental and necessary for the effective performance of the contract concluded between the parties. In any event, modification of the contract will be permitted only if mutually agreed between the parties.

3.4 Renewal of Agreement

1. This Memorandum of Understanding is renewable at the option of Client.
2. One month prior to the expiry of the Memorandum of Understanding due to efflux of time, Client shall intimate Institute undertaking data analysis if it intends to renew or not to renew the Memorandum of Understanding.
3. In the event that Client decides not to renew the Memorandum of Understanding, Client shall give notice to the Institute undertaking data analysis regarding the same. In the event that Client decides to renew the Memorandum of Understanding, the terms and conditions of this Memorandum of Understanding, as may be amended, will apply de novo.

3.5 Termination:

No party is entitled to terminate the contract if the rights and obligations of the other party are affected by such termination. However, Client may terminate the contract after review of performance, provided the Client indemnifies Institute undertaking data analysis for all costs, charges and other dues that has been incurred by it in course of part performance of its obligation under the contract.

(4) OBLIGATION OF THE CLIENT:

Client shall

1. Provide overall guidance and support for undertaking analysis
2. Facilitate compilation of data available under programme
3. Provide technical advice on the analysis, through respective programme officers and the secretarial of National Data Analysis Plan under NACP-IV
4. Facilitate coordination and communication with analysts and mentors
5. Coordinate and conduct review meetings and workshops as per requirement, from time to time

(5) OBLIGATION OF INSTITUTE UNDERTAKING DATA ANALYSIS:

Institute undertaking data analysis shall

1. Ensure that analysis work is completed and stipulated deliverables are submitted within agreed timelines.
2. Assigning identified analyst to carry out the analysis work

Payment:

Financial support for participation of analyst in orientation workshops, review meetings, coordination with mentors and visits (with prior Client approval) to health care facilities for data collection (wherever applicable) shall be provided by the Client or through its partners. Besides this, there will not be any financial obligation on the part of the Client towards the Institute undertaking data analysis. Compensation to the analyst will be as per the Terms of Reference (Annexure A).

(7) FORCE MAJEURE:

Except as herein after provided no party hereto shall be liable for failure to perform any of its obligations under this agreement where such failure is due to reasons beyond such parties control such as Acts of God, order of court, statutory amendments which would impact the performance of this contract, acts of third parties, laws, regulations or other acts of civil or military authorities, fire, flood, epidemic restrictions, riots / any other circumstances of whatsoever nature, beyond the control of either party provided that the party claiming that the Force Majeure has affected its performance shall give notice to the other party immediately but not later than fifteen days after becoming aware of the first occurrence of the said Force Majeure condition giving full particulars of the case or events and the date of first occurrence thereof causing such Force Majeure condition.

(8) CONFIDENTIALITY:

Except with the prior written consent of the **Client**, the **Institute undertaking data analysis** shall not at any time communicate to any person or entity any confidential information acquired in the course of the assigned work, nor shall the Institute undertaking data analysis makes public the results discovered in the course of, or as a result of, the assigned work without informing and taking proper permission in writing of Client. The data/ information/ material to which the **Institute undertaking data analysis** is provided access to under the assignment, shall be used only for the purpose of the assignment as per this MoU. It shall not be used for any purpose beyond the scope of the assigned work. The data/ information/ material shall not be shared with any one, nor published without prior permission from the Client. The outcomes from the project under the contract, interim or final, in the form of technical analytic outputs, conclusions, scientific articles, papers, presentations, abstracts, or in any other form shall not be published/presented without prior permission from the Client, even after the termination of the MoU. All the data files, analysis papers, reports and any other technical output generated as a part of this project shall be submitted to the **Client** at the end of the period. To ensure confidentiality, the **Institute undertaking data analysis** and analyst will be required to sign an undertaking (**Annexure B**).

- 8.1 Conflict of Interests: The Institute undertaking data analysis shall hold the Client's interests paramount, without any consideration for future work, and strictly avoid conflict of interest with other assignments or their own corporate interests. If during the period of this MoU, a conflict of interest arises for any reasons, the Institute undertaking data analysis shall promptly disclose the same to the Client and seek its instructions.
- 8.2 Reporting Obligations: The Institute undertaking data analysis shall submit to the Client the reports and documents hereto, in the form, in the numbers and within the time periods set forth in the MoU. Final reports shall be delivered in CD ROM in addition to the hard copies.
- 8.3 Documents Prepared by the Institute undertaking data analysis to be the Property of the Client: All data, reports, other documents prepared by the Institute undertaking data analysis for the Client shall become and remain the property of the Client, and the Institute undertaking data analysis shall, not later than upon

termination or expiration, deliver all such documents to the Client. The Institute undertaking data analysis shall remain liable to produce completed deliverables till the satisfaction of Client.

(9) SETTLEMENT OF DISPUTES:

- 9.1 In the case of any Dispute between the parties, either party may issue a notice in writing to the other party to reconcile and sort out the differences. Both parties shall endeavour to resolve their disputes by mutual discussions which shall be held not later than 30 days of receipt of the notice of dispute. In spite of the discussions, if the disputes persist, either party shall have the right to nominate an arbitrator. The other party within fifteen days of receipt of such nomination shall nominate its arbitrator. Both arbitrators, within fifteen days after receipt of their nomination, shall nominate a person to act as the Chairman of the Arbitral Tribunal. The decision of the Arbitration Tribunal shall be final. The proceedings of the Arbitration Tribunal shall be governed by the provisions of Arbitration & Conciliation Act 1996. The language of the Arbitration shall be English. The place of arbitration shall be New Delhi.
- 9.2 Arbitration: In the case of dispute arising upon or in relation to or in connection with the contract between the Client and the Institute undertaking data analysis, which has not been settled amicably as mentioned in the clause 9.1, all such disputes shall be referred to Secretary of the Department of AIDS Control under Ministry of Health and Family Welfare, Government of India. The decision of the Secretary of the Department of AIDS Control will be considered as final. If the other party is not agreeable with the decision and requests for the arbitration, then the Secretary, Department of AIDS Control will have the authority to appoint a panel consisting of three arbitrators.
- 9.3 The place of such proceeding shall be at New Delhi, India and the language of the proceedings and that of all documents and communications between the parties shall be English.
- 9.4 The decision of the majority of arbitrators shall be final and binding upon both parties. The expenses of the arbitrators as determined by the arbitrators shall be shared equally by the Client and the Institute undertaking data analysis. However, the expenses incurred by each party in connection with the preparation, presentation shall be borne by the party itself. All arbitration awards shall be in writing and shall state the reasons for the award.

In witness whereas the parties to the Memorandum of Understanding have set their hands at
.....on the day, month and year above mentioned.

Authorized Representative

Authorized Representative

For and on behalf of **Client**

For and on behalf of **Institute undertaking data analysis**

Witnesses:

1.

2.

Annexure 4: Data Confidentiality Undertaking (for Analysts)

I/We,

.....
(Name), working as.....(Designation) in

.....(Complete Name and Address of Institution/

Organisation), am/are involved in the study/analysis titled

“.....

.....” fromto

.....(time period).

I hereby declare that the data that I am provided access to, under the above-mentioned study/ analysis will be used only for the purpose of the work mentioned hereinabove and only in the manner that Department of AIDS Control (DAC) authorizes and permits. I expressly acknowledge and agree that without prejudice to all the available legal remedies, I am also liable to administrative action in case the data is used for any purpose beyond the scope of this study. I will not share the data with any one, or publish the research data without prior written consent/permission from DAC and shall maintain the confidentiality of all Confidential Information. I shall submit a copy of all the data files, analysis papers and reports generated as a part of this analysis work to DAC at the end of the study/analysis. I will acknowledge Department of AIDS Control in all the publications that come out of this analysis/study.

.....
(Signature)

Date:..... Place: **Contact Details:**.....

Mobile & Telephone:..... Email:.....

.....
(Signature of the Head of Institution/Organisation)

..... Official Seal:

Name of the Head of Institution/Organisation:

Date:..... Place:

Annexure 5: National Data Analysis Plan of NACP-IV

TERMS OF REFERENCE FOR DATA ANALYST

I. Background:

India's success in tackling its HIV/AIDS epidemic partly lies in how India has developed and used its evidence base to make critical policy and programmatic decisions. Over the past decades, the number of data sources has expanded and the geographic unit of data generation, analysis and data use for planning has shifted from the national level to the state, district and now sub-district levels. This has enabled India to focus on the right geographies, populations and to fine tune its response over time. Given the proliferation of data sources and the emerging capacity within India to analyse and use data, it is imperative to identify these opportunities to strengthen the national programme's use of data for better programme decision-making at the district, state and national levels.

The Data Analysis and Dissemination Unit of the Department of AIDS Control (DAC), National AIDS Control Organisation, MoHFW, with the support of the US Centers for Disease Control and Prevention (CDC), Division of Global HIV/AIDS and Tuberculosis, India and FHI360, is undertaking the National Data Analysis Plan (NDAP) under the National AIDS Control Programme (NACP) - Phase IV, to address the programme needs with respect to evidence and research, and to make the best use of available data. A detailed exercise was conducted involving programme managers and key stakeholders at National and State levels and also with development partners, to assess the existing information gaps in the programme, and to prioritise areas for Analysis and Research.

NDAP is an effort to analyse the huge amount of data generated under the programme, to develop analytic documents, scientific papers, journal articles, etc., for publication and wider dissemination, and for evidence based planning and programme management. A panel of Epidemiologists, Biostatisticians, Monitoring and Evaluation officers, Modelling and Public Health Experts has been identified to carry out data analysis, with the guidance and mentorship of Senior Experts and support of Programme Officers. The Data Analysis and Dissemination Unit, DAC will coordinate this whole activity with the support of development partners and identified mentors.

II. Objectives of the National Data Analysis Plan:

The objectives of the National Data Analysis Plan under NACP-IV are as follows:

- A. To identify the topics/thematic areas that can be studied by analysing available information
- B. To structure the analysis by identifying key questions and appropriate methodology/tools for analysis
- C. To commission the analysis through a collaborative approach involving institutes, programme units and senior experts as mentors, with agreed timelines
- D. To consolidate, discuss & disseminate the analytical outcomes for programmatic use from time to time
- E. To promote scientific writing within the programme in the form of papers/ articles/ reports/ briefs etc.

III. Responsibilities of Analyst:

Following are the key responsibilities of the data analyst:

1. Coordinate with DAC and Mentors to structure the analysis for the identified topic/area
2. Sign an undertaking for ensuring Data Confidentiality
3. Coordinate with SACS/other sources to obtain the required data
4. Systematically organise data used for analysis
5. Undertake analysis using tools and methods agreed with DAC and Mentors
6. Fulfil the requirements for an Interim Review as decided from time to time
7. Complete analysis within stipulated timelines

8. Prepare the key deliverables identified (Report, Power point presentation, at least one Scientific paper published in a peer reviewed journal, NACO Research compendium, Abstract/Summary, etc.)
9. Sharing analytical outcomes with identified stakeholders

IV. Deliverables:

Following are the key deliverables of data analyst:

1. Organised Data Set
2. Analysis Report/ Policy brief
3. Power Point Presentation
4. Abstract/Summary
5. Publication of at least one scientific paper in a peer reviewed journal

V. Timelines:

S. No.	Activity	Duration
1.	Structuring Analysis, Compilation of Data & Commissioning Analysis	3 m
2.	Data quality checks, validation and finalising the data set for analysis	6 m
3.	Analysis	
4.	Oversight and periodic review from NACO	
5.	Results	

VI. Compensation:

Co-authorship for the analyst in publications.

Annexure 6: Project Team

NACO

Dr. Neeraj Dhingra, DDG (M&E)

Mr. Ugra Mohan Jha – Programme Officer (Statistics)

Former officers

Dr. S. Venkatesh, DDG (M&E)

Dr. Yujwal Raj – National Programme Officer (SI)

Dr. Chinmoyee Das – Epidemiologist

Consultants Supported by Partner Agencies

Dr. Saravanamurthy PS – WHO-India/ FHI360 / JSI

Mr. Manu S. Rawat – FHI360

Partner Organisations

US Centers for Disease Control and Prevention (US CDC, Division of Global HIV/AIDS and Tuberculosis, India)

WHO-India

FHI360

Population Council

Annexure 7: Broad Guidelines for Cleaning CMIS Data for Quality Issues

Standard Guidelines for CMIS Data Cleaning			
1. Duplicate RUs should be deleted and should be noted down separately.			
2. For addressing duplication of district name across the states			
District name	State name with codes	Change to	
Aurangabad	Maharashtra (MH)	Aurangabad_MH	
	Bihar (BH)	Aurangabad_BH	
Raigarh	Maharashtra (MH)	Raigarh_MH	
	Chhattisgarh (CG)	Raigarh_CG	
Mumbai	Maharashtra (MH)	Mumbai_MH	
Bilaspur	Himachal Pradesh (HP)	Bilaspur_HP	
	Chhattisgarh (CG)	Bilaspur_CG	
Hamirpur	Himachal Pradesh (HP)	Hamirpur_HP	
	Uttar Pradesh (UP)	Hamirpur_UP	
East	Delhi (DL)	East_DL	
	Sikkim (SK)	East_SK	
West	Delhi (DL)	West_DL	
	Sikkim (SK)	West_SK	
South	Delhi (DL)	South_DL	
	Sikkim (SK)	South_SK	
North	Delhi (DL)	North_DL	
	Sikkim (SK)	North_SK	
3. To be flagged with comments		Reporting Codes	
Create new variable (RU REP)		Remarks	
Reporting: Even a variable reported in that month	RUs reporting 1–3 months	1	Remarks should be provided
	RUs reporting 4–6 months	2	Remarks should be provided
	RUs reporting 7–11 months	3	Remarks should be provided
	RUs reporting all 12 months	4	Remarks should be provided
	RUs with all blank cells for all 12 months	5	Remarks should be provided
	RUs with all cells zero for all 12 months	6	Remarks should be provided
For identifying the error, please code as given here	RUs with reporting codes 1–4 : Label	1 (Active)	
	RUs with reporting codes 5 & 6	0 (In-active)	
	Error/Outlier in data		Check down to the RU level and discuss with programme people and write down in remarks column, issue, and suggestion/ comments

Annexure 8: National Data Analysis Plan: Milestones

Period	Activities
October–December 2013	Development and finalisation of concept notes for the proposed topics
	Extraction of data from CMIS 2007–2012
	Development of library with literature related to topics of analysis of NDAP
	Ensuring willingness and availability of analysts and mentors
January 2014	Inauguration at JIPMER Puducherry; NDAP secretariat established to coordinate and facilitate the activity
February–April 2014	MoU signed by heads of institutions of all analysts; data confidentiality agreements signed by all analysts
	<ul style="list-style-type: none"> • 28 institutions (ICMR and medical colleges) apart from DAC and SACS • 68 analysts engaged from various institutions, including SACS, ICMR, medical colleges and consultants • 30 mentors (senior researchers in the HIV sector across the country) engaged to mentor analysts
March 2014	CMIS data cleaning workshop organised; data cleaning guidelines developed
April–August 2014	Two review meetings and several one-to-one meetings organised
	40 topics reviewed and finalised for analysis plans
	Representative from NACO programme divisions also involved in the review
	51 topics initiated during NDAP inauguration
	<ul style="list-style-type: none"> • 2 topics dropped due to non-feasibility • 9 topics not initiated • 8 topics – slow progress • 32 topics at stage of analysis, writing and review
September–October 2014	Finalisation of analysis plans
	Addressing data quality issues
	Coordination with TIs for individual level data
November 2014–January 2015	Scientific Writing workshops
	Planning and implementation of one-to-one support for analysis and writing
February–September 2015	Development of report on preliminary findings with programmatic implications
	Sharing with Divisions for comments and approval
	Review and finalisation of peer-reviewed papers
	Submission to peer-reviewed journals
	Follow-up with submission and facilitating revision for Editor's comments
	Development of NDAP Compendium
	Dissemination workshop

Annexure 9: List of peer-reviewed articles and publication status

I. World Journal of AIDS (Accepted for publication)

Arvind K. Singh et al., A systematic review to explore the factors related to parent to child transmission of HIV, survival and treatment provision of children with HIV in India

Chiranjeev et al., Changing HIV epidemic in north-eastern India and its relationship with development and programmatic indicators

Harshal et al., Demographic and sexual behavior characteristics of men who have sex with men (MSM) registered in a targeted intervention (TI) program in India

Lincoln Priyadarshi Choudhury and J. Prabakaran. Urban and rural HIV estimates among adult population (15-49 years) in selected states of India using Spectrum data

Saravanamurthy et al., Levels, trends and inter-regional variations in transfusion transmissible infection positivity among blood donors in India: Evidence from India's national HIV program

II. WHO South-East Asia Journal of Public Health (Principally Accepted for Publication)

Mohan Bairwa et al., The role of occupation in HIV prevalence among antenatal clinic attendees in India: A descriptive analysis of HIV sentinel surveillance data, 2007-2013

Padum Narayan et al., Trends in HIV testing referrals and uptake among most-at-risk populations in India: Retrospective analysis of national HIV program monitoring data

Ram Bajpai et al., Survival on antiretroviral treatment and predictors of mortality among adult HIV-positive patients in Andhra Pradesh, India: A retrospective cohort study, 2007-2013

Ugra Mohan Jha et al., Survivability of children living with HIV who are on ART: A retrospective cohort study, Andhra Pradesh, India

Pardeep Kumar Sangwan et al., Factors and vulnerabilities of evolving HIV epidemic in Odisha

Archana Beri et al., Implication of using two versus three rapid tests for HIV diagnosis in India: Analysing public health program data

Mariamamma Thomas et al., Program gap analysis and prioritization of districts in twelve states of India

National Data Analysis Plan – A systematic approach towards the data of a national program: Experience of Data analysis and Dissemination Unit, National AIDS Control Organisation, India (A **Process documentation paper on NDAP by SIMU**)

Chavan et al., Comparison of rural-urban HIV epidemic in India and its correlates

III. Journal of AIDS(Accepted for publication)

Asha Hegde et al., Factors associated with HIV transmission from mother to child until 18 months of age: Findings from a longitudinal cohort study during 2008-13, Maharashtra, India

Tejas et al., Factors associated with retention in care of HIV exposed babies at 18 months of age: A longitudinal cohort study, Maharashtra, India

Annexure10: Key Findings and Recommendations of Programme Gap Analysis and Prioritisation of Districts in Twelve Indian States

State	Service Response (PPTCT density)	Service Utilisation	Programme Gap		EID Coverage
			HIV testing	Detection Prevention	
Andhra Pradesh	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	<50% in all districts	State: 68% case detection 62% prevention 40–82% in districts	75% at 6 weeks 30% at 6 months 27% at 12 months against 75–95% in normal children
Bihar	Increasing in most of the districts over time at very low rate	Increasing at district level and per PPTCT	71% in state; varied from 14–92% in districts	State: 95% case detection 96% prevention 76–100% in districts	While EID coverage was zero in many of the districts, data in other districts was not reliable
Gujarat	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	55% in state; 3–67% in districts	State: 84% case detection 86% prevention 9–90% in districts	63% at 6 weeks 18% at 6 months 5.3% at 12 months against 60–80% among normal children
Jharkhand	Increasing in all districts over time	Increasing at district level and per PPTCT	63% in state; varied from 14–92% in districts	State: 96% case detection 98% prevention 67–100% in districts	EID coverage was either zero or data was invalid in all districts
Karnataka	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	29% in state; varied from 1.5–91.6% in districts	State: 68% case detection 66% prevention 0–100% in districts	64.5% at 6 weeks 33.5% at 6 months 16.3% at 12 months against 84–97% in normal children
Maharashtra	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	23% in state; varied from 4.7–70.3% in districts	State: 73% case detection 69% prevention 42–90% in districts	Data was not reliable
Odisha	Increasing in most of the districts at very low rate	Increasing at district level and per PPTCT	52% in state; varied from 1.6–93% in districts	State: 89% case detection 92% prevention 53–100% in districts	Zero or unreliable data in many of the districts
Rajasthan	Increasing in most of the districts at very low rate	Increasing at district level and per PPTCT	78% in state; varied from 45–95% in districts	State: 92% case detection 93% prevention 50–100% in districts	Zero or unreliable data in many of the districts

Tamil Nadu	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	26% in state; varied from 7–54% in districts	State: 75% case detection 66% prevention 10–97% in districts	9.4% at 6 weeks Unreliable data at 6 months 7.4% at 12 months against 82-89% in normal children
Telangana	Increasing in all districts over time	Increasing at district level; declining per PPTCT*	41% in state; varied from 14–70% in districts	State: 70% case detection 75% prevention 51–87% in districts	Unreliable data at 6 weeks 50.7% at 6 months 37.6% at 12 months against 64–83% in normal children
Uttar Pradesh	Increasing in most of the districts at very low rate	Increasing at district level and per PPTCT	79% in state; varied from 1.5–98% in districts	State: 93% case detection 94% prevention 26–100% in districts	Unreliable data
West Bengal	Increasing in most of the districts at very low rate	Increasing at district level; declining per PPTCT*	85% in state; varied from 27–92% in districts	State: 90% case detection 95% prevention 56–100% in districts	Unreliable data

*As the no. of PPTCT/million population increases, service utilisation per PPTCT decreases.

Summary of District Categories and Recommendations for Programmes

States	Districts with High/Medium Level Programme Gap	Epidemiological Categories of High/Medium Programme Gap Districts	Programme Components Needing Attention
Andhra Pradesh	8 districts are in medium level programme gap	All except Srikakulam are in 'A' category epidemiologically	Coverage of case detection and prevention programme to be increased
Bihar	Excluding 6 districts with '0' HIV positivity, all 32 districts are in high/medium level programme gap	18 districts are in 'A' or 'B' category epidemiologically	Coverage of all three programme components, testing, case detection and prevention to be increased
Gujarat	All districts except 2, Tapi and Vadodara, are in high (5) or medium (19) level programme gap	Epidemiologically, 4 districts are in 'A' and 10 in 'B' category	Coverage of case detection and prevention programme to be increased
Jharkhand	All districts except Chatra are in high/medium level programme gap	Epidemiologically, 1 district, Ranchi, is in 'A' category and 5 districts, Godda, Hazaribagh, Koderma, Lohardaga and Purbi Singhbhum are in 'B' category	More aggressive HIV testing is required. Case detection and prevention programme requires focused planning and strengthening

States	Districts with High/Medium Level Programme Gap	Epidemiological Categories of High/Medium Programme Gap Districts	Programme Components Needing Attention
Karnataka	3 districts, Chikkaballapur, Ramnagar and Yadgir are in high level programme gap 12 districts are in medium level programme gap	All 15 districts are epidemiologically in 'A' or 'B' category	3 high level districts require focused planning and strengthening of all three programme components and 12 medium level districts need it for case detection and prevention
Maharashtra	24 districts are in medium level programme gap	4 out of 24 districts are in 'A' and 11 in 'B' categories epidemiologically	Case detection and prevention programme requires focused planning and strengthening
Odisha	All districts except Bhadrak are in high (23) or medium (6) level programme gap	Epidemiologically, 1 district, Cuttack, out of 23 high level districts comes under the 'A' category and 13 are in 'B' Out of 6 medium level gap districts, 3 are in 'B'	Focused planning and strengthening of all three programme components is required
Rajasthan	30 out of 33 districts are in high level programme gap	Epidemiologically, 4 districts are in 'A' and 10 in 'B' category	Focused planning and strengthening of all three programme components is required
Tamil Nadu	13 districts are in high (2) or medium (11) level programme gap	2 high level districts are epidemiologically in 'B' category Out of 11 medium level districts, 3 are in 'A' and 5 are in 'B'	Focused planning and strengthening of case detection and prevention is required for all high and medium level districts
Telangana	8 out of 11 districts are in medium level programme gap	All districts are in 'A' category, epidemiologically	Focused planning and strengthening of case detection and prevention is required for all 11 districts
Uttar Pradesh	68 out of 70 districts are in high (61) or medium (7) level programme gap	2 out of 61 high level districts are epidemiologically in 'A', and 31 in 'B' 2 out of 7 medium level districts are in 'B'	Focused planning and strengthening of all 3 components for all high categories, and of case detection and prevention for medium category is required
West Bengal	18 out of 19 districts are in high level programme gap	9 are in 'B' category epidemiologically	Focused planning and strengthening of all 3 components is required for all districts

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