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National AIDS Control Organisation
India's response to HIV & Sexually Transmitted Infections
Ministry of Health & Family Welfare, Government of India
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Ministry of Health & Family Welfare
Government of India

Azadi Ka Amrit Mahotsav

CONSOLIDATING THE EVIDENCE, BUILDING THE FUTURE:

CONSULTATION MEETING ON INTEGRATED AND ENHANCED EPIDEMIOLOGY UNDER THE NATIONAL AIDS & STD CONTROL PROGRAMME IN INDIA

REPORT OF THE NATIONAL CONSULTATION MEETING (27-29 AUGUST 2021)

National AIDS Control Organisation
Ministry of Health and Family Welfare
Government of India

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सत्यमेव जयते
आलोक सक्सेना
अपर सचिव एवं महानिदेशक
Alok Saxena
Additional Secretary
& Director General

राष्ट्रीय एड्स नियंत्रण संगठन
स्वास्थ्य और परिवार कल्याण मंत्रालय
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FOREWORD

"The eye cannot see what the mind does not know"

In 1981, rare forms of pneumonia and cancer were reported in young, previously healthy gay men in the United States of America in weekly surveillance reports. Further research into these rare illnesses led to the discovery of a virus, later named Human Immunodeficiency Virus (HIV), which was causing acquired immunodeficiency among the infected. Soon, the scientists established that HIV originally came from a virus particular to chimpanzees in West Africa in the early 1900s, and spread silently to other parts of the world. But cases were not noted or reported anywhere else till the discovery of the disease in 1981.

Since then, the global and national AIDS response has travelled a long way. In India, the initial cases were detected through a sero-surveillance system in 1986. As more and more cases were detected and reported across the country, the Government launched the first phase of the National AIDS and STD Control Programme (NACP) in 1992 to respond to the HIV/AIDS epidemic in the country. Now, the Government has approved NACP Phase-V as a fully funded Central Sector Scheme for a period of five years (2021-22 to 2025-26). The NACP Phase-V aims to reduce annual new HIV infections and AIDS-related death by 80% since the baseline value of 2010. Given the ambitious agenda of the NACP Phase-V, complementary strategies of programme monitoring, surveillance & epidemiology, and research & evaluation continue to be the mainstay of the NACP not only to inform the evidence-based decision making but also to ensure that national AIDS response is always ahead of curve.

Robust surveillance and epidemiology systems of NACP, the Crown Jewel, have been the cornerstone of the national AIDS response since its inception. The system has evolved by design with periodic stock-taking and review in line with global and local programmatic and epidemiological context providing actionable evidence on HIV, Syphilis, Hepatitis B and Hepatitis C. As a natural evolution process of the robust strategic information systems, NACO has developed an ambitious framework for integrated and enhanced surveillance & epidemiology (IESE) of HIV, STIs and related co-morbidities to anchor and augment a data-driven holistic response through a consultative process. This included a global consultation titled "Consolidating the Evidence, Building the Future" convened on 27–29 August 2021. The current report presents the collective wisdom of global and national experts, programme managers and community representatives shared during the consultation.

I am confident that the rich discussions shared through this report would not only benefit the surveillance and epidemiology systems under the NACP of the Government of India but would also be a knowledge treasure for global communities and countries enhancing the scientific discussions and decisions.

Alok Saxena

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अपनी एचआईवी अवस्था जानें, निकटतम सरकारी अस्पताल में मुफ्त सलाह व जाँच पाएँ
Know you HIV status, go to the nearest Government Hospital for free Voluntary Counselling and Testing

सत्यमेव जयते
निधि केसरवानी, भा.प्र.से.
निदेशक
Nidhi Kesarwani, I.A.S.
Director

राष्ट्रीय एडस् नियंत्रण संगठन
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PREFACE

HIV Surveillance and Epidemiology is a vital component of evidence-based decision making under the National AIDS Control Programme. The system is crucial to measure the level, trends and determinants of HIV/ AIDS using the highest scientific rigour. HIV Sero-Surveillance in India was first done in 1985 which gradually evolved into one of the largest surveillance systems. This system is the bedrock of HIV epidemiology under NACP for updating the policymakers, programme managers, and all other related stakeholders on the level and trend of HIV epidemic, inclusive of related risk-behaviours and informing the potential drivers of the epidemic to tailor the responses.

The HIV surveillance and estimation system is outcome oriented. The evidence generated though the robust system is released in the form of the technical briefs. The national programme undertakes technical consultation periodically to review the existing HIV surveillance system to discus on alternate models and methods, and to develop future roadmaps of HIV epidemic monitoring in the country.

This report on the national consultation convened during 27-29th August 2021 presents the concept note of "Integrated and Enhanced Surveillance and Epidemiology for HIV, STIs and related co-morbidities," as recommended by NACO's TRG on Surveillance and Epidemiology. It covers the full ambit of expanded surveillance on HIV, Syphilis, Hepatitis, STI surveillance, Mortality surveillance, key population size estimates, behavioural survey, and disease burden estimation.

This consultation report will be useful to all technical experts to prepare and develop technical protocol and take the work forward. I also hope that this report will be referred to by those who are working in the area of HIV/AIDS epidemiology, to better understand the surveillance system.

Nidhi Kesarwani

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MESSAGE

Achieving the Sustainable Development Goal of 'ending the AIDS epidemic as a public health threat' by 2030 is possible when programme monitoring and planning — including target setting and resource allocation — is informed by latest data at national/State/district levels. This is even more critical as the AIDS response reaches its 'last mile'.

Less than ten-years remain to achieve the SDG targets and goals which countries have set for themselves. To build on progress made since 2010, interim milestones have also been set by the global community for 2025, and so that the 2030 goal can progressively be reached. To ensure that there is least an 83% decline in annual new HIV infections from 2010 to 2025, that at least 90% of the people living with HIV and key population groups receive comprehensive context specific integrated services; at least 95% of people living with HIV know their HIV status, are on treatment and virally suppressed; and to eliminate mother to child transmission of HIV by 2025 — more granular level of analysis of data for impact planning is needed.

The National AIDS Control Organisation (NACO) is undertaking substantial steps in this direction, for more disaggregated and location and population specific data to be made available to fulfil data needs. HIV surveillance and epidemiology (S&E) data is a critical source of information on the epidemic and behaviours for impact analysis, stock-taking, and planning. India has one of the world's largest and robust S&E systems, which, under the leadership of NACO, has progressively been refined ever since the first AIDS case was detected in 1986. Once again, in 2021, this exercise of reviewing methods, and considering newer ones has been undertaken — and a consultation was held from 27 to 29 August to review the proposal, design, and method for enhancing the S&E system.

We congratulate NACO, for this initiative to periodically revisit and refine the surveillance and epidemiology system in the country. UNAIDS is pleased to have partnered with NACO, ICMR Regional Institutes, and other national, regional, and international partners in this endeavour. On behalf of UNAIDS, I extend our appreciation to colleagues from partner organisations who contributed to the very rich discussions — which are also summarised in this report.

In the context of SDGs and keeping a holistic approach to health, the integration of surveillance of multiple diseases such as HIV, STIs and Hepatitis which is being considered by NACO — to support the multi-disease elimination agenda — is a step in the right direction. UNAIDS remains committed to ending AIDS in India.

David Bridger
UNAIDS Country Director for India

CONTENTS

I. LIST OF ABBREVIATIONS

AEM	AIDS Epidemic Model
AIDS	Acquired Immunodeficiency Syndrome
AIIMS	All India Institute of Medical Sciences
ANC	Antenatal Clinic
ART	Antiretroviral Therapy
ARV	Antiretroviral
CAB	Community Advisory Board
BBSS	Bio-Behavioural Surveillance Survey
CBSS	Community-Based Surveillance Survey
CDC	Centres for Disease Control and Prevention
COVID-19	Coronavirus Disease 2019
CRS	Civil Registration System
CST	Care Support & Treatment
CT	Chlamydia Trachomtis
DBS	Dried Blood Spot
DISHA	District Integrated Strategy for HIV/ AIDS
DSRC	Designated STI/RTI Centres
EC	Ethics Committee
EMTCT	Elimination of Mother-to-Child Transmission
FSW	Female Sex Workers
GoI	Government of India
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HRG	High-risk Group

HSS	HIV Sentinel Surveillance
HSV 2	Herpes Simplex Virus 2
IBBS	Integrated Bio-Behavioural Surveillance
ICMR	Indian Council for Medical Research
ICMR-NARI	Indian Council of Medical Research- National AIDS Research Institute
ICTC	Integrated Counselling and Testing Centres
IDU	Injecting Drug Users
IEC	Information, Education and Communication
IESE	Integrated and Enhanced Surveillance and Epidemiology
LAC	Link ART Centres
LDT	Long-distance Truckers
LFU	Lost-to-Follow-Up
MCCD	Medical Certification of Cause of Death
MoHFW	Ministry of Health & Family Welfare
MPSE	Mapping and Population Size Estimation
MSM	Men having Sex with Men
MTCT	Mother-to-Child Transmission
NAAT	Nucleic Acid Amplification Tests
NACO	National AIDS Control Organisation
NACP	National AIDS and STD Control Programme
NARI	National AIDS Research Institute
NCD	Noncommunicable Disease
NFHS	National Family Health Survey
NG	Neisseria Gonorrhoeae
NICED	National Institute of Cholera and Enteric Diseases
NIE	National Institute of Epidemiology
NIIHAR	Network of Indian Institutes on HIV/AIDS Research
OST	Opioid Substitution Therapy

PGIMER	Postgraduate Institute of Medical Education and Research
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
POC	Point-of-Care
RDS	Respondent-driven Sampling
RIMS	Regional Institute of Medical Sciences
RITA	Recent Infection Testing Algorithms
RPR	Rapid Plasma Reagin
RSTRRL	Regional STI Training, Research and Reference Laboratories
SACS	State AIDS Prevention and Control Societies
SDG	Sustainable Development Goals
S&E	Surveillance and Epidemiology
SGS	Second-Generation Surveillance
SIMS	Strategic Information Management System
SMM	Single Male Migrants
SOCH	Strengthening Overall Care for HIV Beneficiaries
SRS	Sample Registration System
STI	Sexually Transmitted Infections
TG	Transgender Persons
TI	Targeted Interventions
TPHA	Treponema Pallidum Haemagglutination
TPT	TB Preventive Therapy
TRG	Technical Resource Group on HIV Surveillance & Estimation
TWG	Technical Working Group on Surveillance and Epidemiology
USAID	U.S. Agency for International Development
VA	Verbal Autopsy
WHO	World Health Organisation

I. EXECUTIVE SUMMARY

Surveillance and Epidemiology (S&E) has been the cornerstone of evidence-based decision making under the National AIDS and STD Control Programme (NACP) since its inception. Fully funded by the Government of India (GoI) and implemented through a very robust, time-tested institutional mechanism, S&E has guided NACP to focus on locations and populations by providing actionable evidence for policy-making, resource allocation, planning, implementation, and impact assessments.

S&E has evolved by design with periodic stock-taking and review of the S&E activities undertaken to identify newer data needs and areas for improvement or inclusion under the S&E framework. As India advances towards the 'end of AIDS as a public health threat' goal by 2030, the National AIDS Control Organisation's (NACO) Integrated and Enhanced Surveillance and Epidemiology (IESE)plan for HIV, Syphilis, and related co-morbidities' under NACP V has been firmed up. To crystalize the framework, a National consultation with global experts, National experts, programme managers and implementers, and community representatives was convened on 27–29 August 2021 in a hybrid mode. The title of the National consultation was *"Consolidating the Evidence, Building the Future: Consultation Meeting on IESE Under the National AIDS and STD Control Programme in India."*

The National consultation included twelve technical sessions related to the topics of the IESE plan. The topics for the twelve technical sessions were as follows: overview to the current epidemiological evidence, IESE under NACP, HIV Sentinel Surveillance (HSS) plus under NACP, STI Surveillance under NACP, Integrated Bio-Behavioural Surveillance (IBBS)-Lite under NACP, size estimation high-risk population operating through virtual platforms, size estimation of bridge population at physical locations, programme-based epidemic Surveillance, research priority augmenting epidemic monitoring under NACP, Mortality Surveillance, disease burden estimation (HIV estimates), disease burden estimation (AIDS Epidemic Model (AEM) and Sexually Transmitted Infections (STI) estimates).

During the three-day's proceedings, there was broad consensus on the technical framework proposed during various technical sessions. For details on the technical frameworks proposed via the presentations, please refer to annexure 3. Below are some key take aways and areas for consideration suggested during the technical sessions.

Technical Session - 1

Current Epidemiological Evidence: HIV remains heterogeneous with evidence pointing to resurgent epidemics in a few areas, and newer population groups at risk. The granularity of the data highlights epidemic within an epidemic. For having ability to predict the epidemic in the future, an inequalities framework can be included in the S&E initiatives. Actions are needed to respond to the heterogeneity of the epidemic for jump starting again towards meeting 2030 Sustainable Development Goals (SDGs).

Technical Session - 2

Overview of the Integrated and Enhanced S&E Plan: The IESE plan is recognized as well-timed and comprehensive. It would support S&E activities under NACP more than ever. Areas for consideration include reaching the unreached populations through S&E activities. Further, each of the components needs to be supported with a well-framed implementation strategy and implementation structure. Community medicine department of medical colleges and community institutions can support the entire implementation. Once the data are made available, it would be critical to empower people at the periphery level to use the data. NACO IT-enabled Management Information Systems (MIS) Strengthening Overall Care for HIV Beneficiaries (SOCH), District Integrated Strategy for HIV/AIDS (DISHA), and *Sampoorna* Suraksha strategies are the key anchors of the National AIDS response.

Technical Session - 3

HIV Sentinel Surveillance Plus: HSS Plus would include biomarkers of HIV, Syphilis, Hepatitis B and Hepatitis C. Inclusion of treponemal and incidence

test and viral load may be considered as additional biomarkers. It was suggested that a preliminary study could be conducted to identify the correction markers for incidence testing. There is a need felt to review the definition of migrants and truckers. Methodology standardisation, lab infrastructure strengthening, capacity-building and quality assurance system would be essential for enabling successful implementation of the HSS Plus.

Technical Session - 4

STI Surveillance under NACP: It was suggested that a treponemal test may be conducted among Rapid Plasma Reagin (RPR) positive samples in Antenatal Clinic (ANC) Surveillance. Phase-wise expansion of STI Surveillance in other populations was recommended and could be initiated initially in places with proximity to Designated STI/RTI Centres (DSRC). Etiologic and syndromic Surveillance was recommended at DSRC and Bridge Population Targeted Intervention (TI) sites. It was recommended that serum/Dried Blood Spot (DBS) (if validated) should be the preferred sample for Syphilis testing, urine for Chlamydia Trachomatis and Neisseria Gonorrhoeae (CT/NG) to be collected in men and women and additional anal swabs for anal NG/CT among Men Having Sex with Men/Transgender Persons (MSM/TG). Among the High-risk Group (HRG) population, a collection of behavioural data on presumptive treatment was suggested. Among the People Living with HIV (PLHIV) population, Surveillance for Syphilis (Serum), CT/NG (urine) could be done. A suggestion was made to include the Herpes Genitalis or Herpes simplex virus type 2 (HSV-2) as another biomarker. Lab infrastructure strengthening, capacity-building and quality assurance system were suggested to be critical for ensuring successful implementation of STI Surveillance. There was a proposal made to implement a study on validation of syndromic diagnosis vis-à-vis etiologic diagnosis.

Technical Session - 5

Integrated Bio-Behavioural Surveillance Survey: Community-Based Surveillance Survey (CBSS) in the general population is planned for implementation in high prevalence north-eastern States (first in Mizoram). Biomarkers to include HIV, Syphilis, Hepatitis B, Hepatitis C, Viral load and CD4 count, and HIV incidence assay. Areas for consideration include relooking at the sample size for incidence, viral load suppressions; focusing on risk-behaviour network, the elaborate question on drug use parameters. Regarding the proposal on Integrated Bio-Behavioural Surveillance (IBBS) among HRG, a need was felt to relook at the representativeness of the population, the sample size, and the questionnaire length proposed. IBBS among PLHIV would include incidence assay, Syphilis, viral load, CD4, Hepatitis B and C, Non-communicable Diseases (NCD).

Technical Session - 6

Size Estimation of HRG population Operating through Virtual Platforms: It was felt that the definition of HRG needed to be broadened as mapping of 'at-risk' population at the virtual platform would not be confined to any typology. The method proposed under the framework was considered more suitable for MSM. A need was felt to adapt the method to the specific typology. The network operator model for Female Sex Workers (FSW) could be explored. Community consultation and engagement would be key.

Technical Session - 7

Size Estimation of Bridge Population at Physical Locations: Community consultations and community engagement would be critical for this initiative. Areas of consideration include relooking at the definition of migrants and truckers to include drivers and helpers also. There was an opportunity to understand migration patterns among HRGs via this exercise. Mapping of the place of work as well as mapping of the place of residence would be essential when mapping the physical locations of the bridge population so that services could accordingly be made available. Collaboration with sex workers would be key in this exercise of size estimation of bridge populations. Correction factors for adjusting for potential duplications would be needed, with a mechanism for revalidation of results.

Technical Session - 8

Programmatic Case-Based Surveillance: SOCH is a mammoth database that provides a wealth of information. Case-Based Surveillance is enabled via SOCH. The proposal is to use the SOCH database for conducting Case-Based Surveillance pertaining to epidemiology, programme and research. Case-Based Surveillance can help describe the HIV epidemic by location and population. It can provide early warning for outbreaks or clusters of infection. It can provide information on disease progression in identified HIV-positive people by mapping sentinel events right from the registration to the facility.

Technical Session - 9

Research Priorities: All the topics for research priorities presented were considered by the panellists as highly relevant. A suggestion was made for consideration of the following additional priority areas for research: long-term survival study; Coronavirus Disease 2019 (COVID-19) and HIV; HIV vaccine; adolescents HRGs; operations research on the impact of take-home dose of Antiretroviral Therapy (ART). There was scope to build the capacity of State AIDS Prevention and Control Societies (SACS) to implement/support local research studies. The Community Advisory Board (CAB) would be engaged in all the activities. Furthermore, NACO's EC has been constituted to include more community representation also.

Technical Session - 10

Mortality Surveillance: Areas for consideration include engaging representative ART centres in Verbal Autopsy (VA) through in-built institution systems, analysis of Medical Certification of Cause of Death (MCCD), engagement of existing Centres of Excellence in Mortality Surveillance. A suggestion was made to use the updated World Health Organisation (WHO) tool on Mortality Surveillance in a harmonized, standardised manner. Focus is needed on monitoring MCCD (issues were observed with completeness, case records and discharge reports during some studies). For VA, out-reach workers can support tracking the Lost to Follow Ups (LFUs) and early identification of deaths. A suggestion was made to include TB in the reporting format of Mortality Surveillance.

Technical Session - 11

HIV Burden Estimations: 2021 HIV estimates round would be implemented using the latest Spectrum tool to generate District, State, and National estimates. The need to make the following updates to the models was agreed upon:

- Update the demographic projections till 2031.
- Update the HRG population size estimates.
- Update the programme data and Surveillance data.

The findings from the ART Impact Evaluation Study can be used to inform the disease progression. The focus would be on ensuring the quality of inputs which would determine the quality of results. The aim would be to complete the 2021 round by February 2022. Under future rounds, there is a scope to localize the parameters even further: For this research, priorities were identified. Capacity-building will remain an integral component in the process of HIV estimations.

Technical Session - 12

AIDS Epidemic Model and STI Estimation: AEM was a data-intensive model providing lots of policy options and improved disease transmission insights. There were rich data available in the country to support the use of AEM from size estimations, prevalence data, behavioural data, programme coverage data with time trend, 2008-2009 HRG size estimates, ANC HSS, IBBS, National Family Health Survey (NFHS), IBBA, Bio-behavioral Survey (BSS), IBBS-Lite, and NFHS. The proposal would be to pilot AEM in phase I in the State of Mizoram. The first step under this pilot would be to conduct a data exploratory exercise and develop a matrix of data needs and data availability. Capacity-building would be needed.

STI Burden Estimation Using Spectrum: Lots of data will be needed for estimating the prevalence and incidence of Syphilis, Gonorrhoea and Chlamydia. Key data sets available will be used to pilot STI burden estimation using Spectrum software. The first step under this pilot would be to conduct a data exploratory exercise and develop a matrix of data needs and data availability. Capacity building would be needed on the tool.

Summing up, the NACO's 'IESE plan for NACP' would provide useful information to inform the programme for achieving the 'end of AIDS epidemic as a public health threat' by 2030. The next steps would broadly include the following:

The compendium of concept notes and technical framework for the implementation would be updated based on the National consultation proceedings. It would be presented to the Technical Working Group (TWG) on HIV Surveillance and estimations (TRG). Following this implementation of the S&E plan would be launched under the guidance of TWG / TRG / ethics approval. Working groups and other consultations would be convened as needed towards implementation by a specific area. A final step would be supporting quick dissemination of key evidence emerging from the implementation for the benefit of the programme towards the 'ENDGAME' goal by 2030.

REMARKS BY ADDITIONAL SECRETARY AND DIRECTOR GENERAL, NACO DURING THE OPENING SESSION

The NACO's S&E system has a robust design that has evolved under earlier phases of the NACP to meet programme needs. But there is a need to keep building on it as the epidemic, people's behaviours, programme response evolve — so that information is promptly made available for reducing new infections and deaths even further towards the AIDS endgame 2030 goal in the 'last mile'.

The National AIDS and STD Control Programme Phase V includes a focus on HIV and STI. In addition to HIV, there is a keenness to understand the magnitude of Hepatitis by location and population to inform needed support services by the Government. 'The IESE Framework', accordingly, is being tailored to cover the full ambit of expanded Surveillance on HIV, Syphilis, Hepatitis; STI Surveillance; Mortality Surveillance; key population size estimates; behavioural surveys; disease burden estimation — so that the needed data are made available to inform NACP-V and integrated action planning at the District-level under the flagship initiative of NACO DISHA.

Strong epidemiological evidence will form the corner stone of the DISHA initiative. Information from the programme field-level and from the communities have informed our intelligence that the high risk population size estimate as we understand and quantify them, may be an under-estimate. The programme (NACP) is working on updating the key population size estimates. Only when we have the updated data, we will be able to not overlook anyone — which is critical in this last mile when the 'high hanging fruits' need to be reached.

"What your mind doesn't know your eye will never see." Via the IESE activities to be implemented under NACP-V, the endeavour is to make all the policy-makers, programmers, and all the people who are involved in the programme aware of the reality of the epidemic, response status and needs as informed by the data and evidence base.

As an output from the three day's workshop, I expect that we will find a way forward for implementing the NACO IESE. And what better group than this! We have been able to bring the best minds across the world together today. With everyone's inputs and support, we will be able to jump start this.

Thank you.

II. INTRODUCTION

One of the key characteristics of the S&E system under NACP has been its capacity to evolve continuously to meet the contemporary programmatic and epidemiological needs. This evolution happens by design which onboards all related stakeholders in a participatory manner to firm up the technical frameworks and then is guided by the Technical Resource Group (TRG) on S&E before the implementation starts. To inform the evolution design, expert meetings on S&E were also convened in 2016 and 2018 bringing global experts, National experts together with programme managers, planners, community representatives and other stakeholders.

As NACP enters its next phase, the framework for IESE for HIV, Syphilis, and related co-morbidities to anchor the National AIDS response has been firmed up towards the 2030 goal of ending of AIDS epidemic as a public health threat.

NACO organized in collaboration with Regional Institutes, SACS, and partner organizations, a three-day-long consultation meeting in a hybrid mode (physical and virtual) during 27, 28 and 29 August 2021 with experts, community, developmental partners, and programme managers to crystallize the technical framework. The list of thematic areas in the technical framework is given below:

Technical Session 1: Current Epidemiological Evidence

Technical Session 2: Integrated and Enhanced Surveillance & Epidemiology under NACP

Technical Session 3: HSS Plus under NACP

Technical Session 4: STI Surveillance under NACP

Technical Session 5: Integrated Bio-Behavioural Surveillance (IBBS)-Lite under NACP

Technical Session 6: Size Estimation of High-risk Population Operating through Virtual Platforms

Technical Session 7: Size Estimation of Bridge Population at Physical Locations

Technical Session 8: Programme-based Epidemic Surveillance

Technical Session 9: Research Priority Augmenting Epidemic Monitoring under NACP

Technical Session 10: Mortality Surveillance

Technical Session 11: Disease Burden Estimation (HIV estimates)

Technical Session 12: Disease Burden Estimation (Contd. – AEM and STI Estimates using Spectrum Pilot Proposal)

Concluding Session: Consolidating the Evidence, Building the Future

The three day consultation meetings titled *"Consolidating the Evidence, Building the Future: Consultation Meeting on Integrated and Enhanced Epidemiology Under the National AIDS and STD Control Programme in India"* included 12 technical sessions with global experts participating (UNAIDS/WHO/ Centres for Disease Control and Prevention [CDC]/ U.S. Agency for International Development [USAID] /Independent), National experts participating, representatives from implementation partners, community experts, NACO and SACS representatives in attendance. The proceedings from the 12 technical sessions and concluding sessions are summarized in this report.

III. PROCEEDINGS OF THE 12 TECHNICAL SESSIONS

The National consultation *"Consolidating the Evidence, Building the Future: Consultation Meeting on Integrated and Enhanced Epidemiology Under the National AIDS & STD Control Programme in India"* included 12 technical sessions. The session topics were based on the "NACO IESE Plan". Each session was structured to include a technical presentation followed by a panel discussion. This chapter summarizes in bullet points, the key components of the technical presentation and areas of consideration emanating from the panel discussion in each of the 12 sessions.

SESSION - 1

CURRENT EPIDEMIOLOGICAL EVIDENCE

Chairs	Shri Alok Saxena, Additional Secretary & Director General, NACO Dr Sanjay Mehendale, Former Addl. Director General, Indian Council for Medical Research (ICMR) Dr DCS Reddy, Former HoD, Dept. of Community Medicine, Institute of Medical Sciences, BHU
Moderator	Dr Chinmoyee Das, DD NACO
Panelists	Mr Taoufik Bakkali, UNAIDS Regional Support Team for Asia and the Pacific; Dr Vishnu Vardhana Rao, ICMR-NIMS; Dr Sanjay Rai, AIIMS-New Delhi; Dr Subhasish K. Guha, STM-Kolkata; Dr Rajatashuvra Adhikary, WHO India; Dr Sangita Kaul, USAID India; Dr Melissa Nyendak, CDC India; Dr Samiran Panda, ICMR; and Dr Bilali Camara, UNAIDS India
Presenter	Dr Pradeep Kumar, Programme Officer, S&E, NACO

Session objectives:

1. To present the level and trends of the HIV epidemic in India as per the latest evidence and,
2. Discuss the programmatic implications thereof.

Key components of the presentation:

A presentation (Annexure 1) was made on the latest evidence on the HIV epidemic generated via key S&E activities carried out under NACP IV by NACO with National implementation partners (Box 1). The presentation highlighted a fully funded S&E system under NACP through the domestic budget.

Following are the highlights of the latest epidemiological evidence available under the NACP.

- India continues to be a low HIV-prevalence country but in terms of volume, it accounts for the second-highest number of PLHIV globally. Annual new HIV infections and AIDS-related deaths are estimated to be declining at the National-level.
- At the sub-national level, there is variation in level and trend. The 2019 and 2020 HIV estimates highlight the heterogeneous and dynamic nature of HIV with adult HIV prevalence, PLHIV, annual new HIV infections and AIDS-related deaths varying at the inter-state and inter-district level, and by population groups.

Box 1: Key Surveillance & Epidemiology (S&E) activities under NACP-IV

1. Two rounds of Global Consultations.
2. HSS
    a. Five rounds among pregnant women, two rounds among HRG and bridge population and two rounds among inmates in central prisons.
    b. Evolved into HSS Plus by 2021 round:
    8 population groups and almost 5,00,000 samples.
    c. Four biomarkers: Integration of Hepatitis B and Hepatitis C as additional biomarkers.
3. Integrated Bio-Behavioral Surveillance (IBBS) Survey: One round in 2014-15.
4. Behavioral Surveillance Survey-Lite (BSS-Lite): One round in 2019-20.
5. White Paper on Mapping and Population Size Estimation (MPSE): Roll out of programmatic-MPSE.
6. Increase use of programmatic data to explain the epidemic.
7. Four rounds of HIV burden estimations.
8. Piloting of District-level HIV estimations in 2017.
9. Implementation of District-level HIV estmates for all Districts in country for 2019 round.
10. Focus on publications in peer-reviewed journals.

- The epidemic size is increasing in all except four select States.
- The drivers of the HIV/AIDS epidemic vary by State and even within States. In the select north-eastern States, the epidemic appears to be sustained by behaviour in the general population.
- HRG size estimation based on analysis of IBBS 2014-15, and Targeted Intervention data indicate that perhaps there is a much higher universe of HRGs than the current coverage.

With better survival of PLHIV on treatment, it is estimated that almost two fifths of PLHIV would be 50 years or older.

- Evidence also indicates that the HIV epidemic is ageing. With better survival of PLHIV on treatment, it is estimated that almost two fifths of PLHIV would be 50 years or older. This population group would need specific attention on the HIV-health programme in future years.
- There is a continuous focus under NACP to generate quality evidence via S&E activities to inform the programme in the 'last mile' to achieve the 'End of AIDS' goal by 2030. Towards achieving this goal, NACO has developed an IESE framework' for anchoring the National AIDS response till 2025-2026.

Panellists' observations:

The panellists complemented NACO on its strong S&E system — probably the largest in the world — which has been strengthened over the years. The S&E activities have made robust information available

to inform the NACP but there are opportunities available under the programme to do more, as part of the constant focus of NACO to keep improving the quality and granularity of information available.

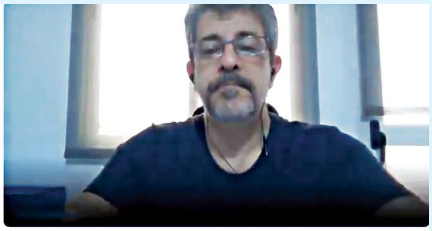
- Acknowledging that as India's HSS system is very robust there is potential to refine the HSS system in such a way that it helps generate an early warning on emerging epidemics. By building an inequalities framework into the HSS system, it can provide a much greater ability to predict the epidemic in the future.
- While the network of HSS sites has been expanded over the years, there is scope to increase the network covering newer areas and populations simultaneously also for greater comprehensiveness of the system. This is especially important regarding HSS among HRG which is conducted in institutional settings. There is potential to understand more about those population subgroups not covered under the programme and reach them via HRG HSS in institutional settings.
- NACO-led HIV estimates work in India with Indian Council of Medical Research-National Institute of Medical Statistics (ICMR-NIMS) was complimented as a global best practice. With the estimates available at the National/State/District-level, it can inform local level prioritization and planning to facilitate bottom-up response under NACP.
- India's HIV epidemic remains concentrated in nature in most of the States. Now, with HIV burden estimates available by Districts, it would be useful to investigate the behaviour and drivers in those areas for the presentation of a more comprehensive picture of the local situation.
- While some HRGs at higher risk continue to operate at traditional locations, many HRGs who identify themselves as HRG or otherwise, are operating/soliciting using virtual means of communication and there is a need to understand more about them, especially those hidden so that they can be linked with appropriate services.

Now, with HIV burden estimates available by Districts, it would be useful to investigate the behaviour and drivers in those areas for the presentation of a more comprehensive picture of the local situation.

- There is a need to deliberate on the periodicity and magnitude of the Surveillance activities that are currently being undertaken including using Prevention of Mother-to-Child Transmission (PMTCT) data for Surveillance.
- The Mortality Surveillance is to be carefully assessed for how to account for pitfalls in mortality reporting including that for the cause of deaths.
- The programme evaluation components in NACP may be strengthened.
- Developing capacity at the State and District-levels to conduct surveys and Surveillance and then also size estimation is a critical priority.
- NACP is a success model. However, there is a need to further support research in the following areas:
  a. Diagnosis of early HIV infections.
  b. Effective elimination of HIV transmission in high-risk settings.
  c. Achieving cure.
- The evidence has indicated many LFU people. There is a need to better understand the root causes of the PLHIV being LFUs to respond to the issue.
- The ageing epidemic would lead to different clinical challenges. The Programme needs to prepare for the same.


Consolidating the Evidence, Building the Future:
Consultation Meeting on


Azadi Ka Amrit Mahotsav



SESSION - 2

INTEGRATED AND ENHANCED SURVEILLANCE & EPIDEMIOLOGY UNDER NACP

Chairs	Smt. Arti Ahuja, Addl. Secretary, MoHFW and Dr Mohammed Shaukat, Senior Public Health Expert
Moderator	Dr Chinmoyee Das, NACO and Dr Marjolein Jacobs, UNAIDS India
Panelists	Dr Tobi Saidel, WHO Consultant; Dr Wolfgang Hladik, CDC Atlanta; Dr Pretty Pathak, Uttar Pradesh SACS; Dr Bilali Camara, UNAIDS India; Dr DCS Reddy, Senior Public Health Specialist; Dr Shobini Rajan, NACO
Presenter	Dr Pradeep Kumar, NACO

Session objective:

To provide an overview of NACO's "IESE Plan Under NACP" and seek inputs from the panellists on the same.

Key components of the presentation:

A detailed presentation was made on NACO's framework for second-generation S&E activities outlined under the "IESE Plan Under NACP". The IESE plan was informed by global recommendations on HIV S&E an essential public health function and framed according to the National context and needs, recognizing the opportunities available in the NACP system. The endeavour thus was to make high-quality data on HIV, STI and related communicable diseases available for the benefit of the programme.

- The IESE plan was developed following a series of consultations with programme managers, National and Regional institutes of S&E, SACS, independent technical experts, and experts from the community in 2021. The framework has been recommended by the TWG and TRG and approved by NACO. This National plan would be fully funded by the GoI through domestic resources.
- The objective of the IESE plan was to measure the levels, trends and determinants of prevalence, incidence and mortality of HIV/AIDS, STIs and related co-morbidities using methods of highest scientific rigour towards generating high-quality actionable epidemiological evidence available. The framework would achieve the stated objective in a cost-efficient and cohesive manner maximizing the opportunities available in the existing NACP systems through complementary real-time and cross-sectional epidemiological evidence serving macro and micro needs.
- There were 10 key components of the integrated and enhanced S&E plan: (i) MPSE (ii) HSS plus, (iii) Integrated Biological and Behavioural Surveillance Surveys, (iv) STI Surveillance, (v) Mortality Surveillance, (vi) Incidence Surveillance, (vii) Programmatic Case-Based Surveillance, (viii) Disease burden estimation: National, State, District, (ix) AEM select States and (x) Epidemiological investigations. An overview of each of these components was presented.
- The framework included low-risk population (pregnant women, general population), bridge population, HRGs, HIV-negatives non-HRG but 'at-risk' population groups, and PLHIV — so that comprehensive epidemiological and behavioural information is made available under various activities.
- Engagement of NACO with all stakeholders including formal institutional arrangements was integral to the generation of high-quality robust actionable epidemiological evidence.

Through this institutionalized approach, it was possible to identify the gaps and be able to screen those populations who are missing and continue to get missed from coverage.

- The framework included adherence to the highest ethical standards, community-owned, data triangulation, programmatic synergy, institutional collaboration, and dissemination for action as six guiding principles of IESE.

Areas of consideration:

Panellists complimented NACO on the comprehensive and ambitious IESE plan presented. The plan was well-timed considering that the support for S&E activities under NACO is stronger than ever and the second-generation S&E activities proposed will help respond to the information gap needs. Following were the key points highlighted.

- Every process of S&E has a clear objective and purpose. Each activity is a means of making more information available and is not an end. Biological and behavioural Surveillance and estimation activities help generate critical evidence on the epidemic level and trends. The addition of STI and Hepatitis biomarkers, Mortality Surveillance, AEM, understanding HRG in the virtual world and other newer initiatives under the plan are welcome.
- It is critical to continue HSS activities and strengthen them as presented under the plan. HSS remains a key information source on the epidemic. Case-Based Surveillance enabled via SOCH can complement HSS activities to help understand the local epidemic context and people's needs, especially in areas where the epidemic is heterogeneous and where new infections are emerging.
- Surveillance activities to be scaled up further focusing on areas and populations not adequately covered, especially HRG, and where evidence indicates emerging epidemics such as few pockets in Bihar and UP, or where prevalence or burden of PLHIV is high.

Case-Based Surveillance enabled via SOCH can complement HSS activities and help in understanding the local epidemic context and people's needs, especially in areas where the epidemic is heterogeneous and where new infections are emerging.

- The existing NACO S&E institutional framework involving NACO in the lead with National and Regional institutes, SACS, independent technical experts are a good practice on which the second-generation S&E activities are being planned. Panellists suggested involving Community Medicine Departments of Medical colleges to expand the S&E network.
- The engagement of public health institutes under the HIV S&E framework is well established. Equally important will be the involvement and strengthening of the community institutions in the S&E framework of the NACP.
- Greater emphasis on data analysis and use up to the granular peripheral level.
- Behavioural and epidemiological data when used in conjunction with programme data are very useful.
- NACO IT-enabled MIS 'SOCH,' 'DISHA', and Sampoorna Suraksha strategy are new critical initiatives by NACO in this regard to anchor the National AIDS response.
- A policy is as good as the implementation. A good implementation plan must be worked out for each of the thematic areas to ensure that the impact of the IESE is fully realized.


Consolidating the Evidence, Building the Future:
Consultation Meeting on
Integrated and Enh ed Epidemiology
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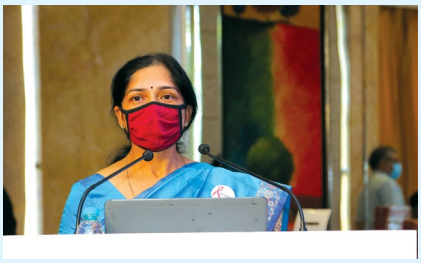

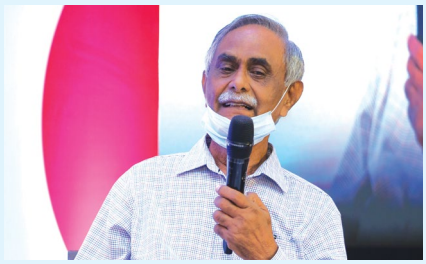


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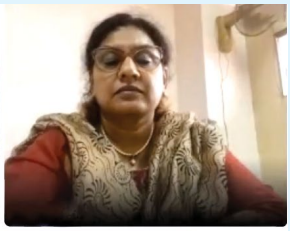
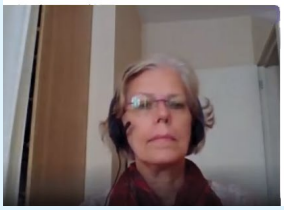
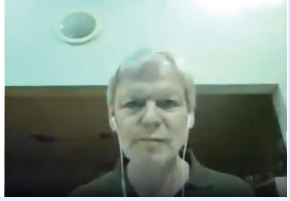






SESSION - 3

HIV SENTINEL SURVEILLANCE PLUS UNDER NACP

Chairs	Dr Bilali Camara, UNAIDS India and Dr Shobini Rajan, NACO
Moderator	Dr Sai Prasad Bhavsar, NACO and Ms Deepika Srivastava Joshi, CDC India
Panelists	Dr Rajatashuvra Adhikary, WHO India; Mr Taoufik Bakkali, UNAIDS Asia Pacific; Dr Thanh Duong, CDC; Dr Sumathi Muralidhar, VMCC, New Delhi; Dr Sandhya Kabra, NCDC; Dr Madhuri Thakar, ICMR-NARI; Dr Shanta Dutta, ICMR-NICED; Dr Chinmoyee Das, NACO
Presenter	Dr Sanjay Rai, AIIMS, New Delhi

Session objective:

To seek guidance on potential enhancements augmenting the methodological rigours of HSS Plus (2023 round).

Key components of the presentation:

A detailed presentation was made on the status of HSS Plus 2021 and proposed enhancements for HSS Plus 2023.

- Under the 17th round of HSS, there were a total of 1,449 sites included under HSS Plus with five lakh sample collection covering the eight population groups of ANC, FSW, MSM, TG persons, Injection Drug Users (IDU), migrants, truckers and prisoners. The blood specimen collected from the respondents was being tested for three to four biomarkers (HIV, Syphilis, Hepatitis B and Hepatitis C) depending upon the population group. Hepatitis B and C were included as additional biomarkers in the 2021 round for the first time. While there has been some logistics issues initially for the supply of test kits, the integration has been carried out successfully.
- Impact of COVID-19: Due to the COVID-19, the data collection period was extended beyond three months of the timeline (1st January to 31st March 2021) for all the typologies. Consultation meetings and most of the training were conducted virtually which was challenging given the limited internet connectivity at site level. Many SACS staff were deputed into COVID duty and many sentinel sites were converted into COVID hospitals. The inter-state movement was restricted due to COVID-imposed lockdowns and supervision was also impacted.
- HSS Plus 2023 among ANC: It was proposed to establish additional sub-district level composite sites (@ one per District) in the Districts with only one ANC site, introduce Treponema Pallidum Haemagglutination (TPHA) as an additional test for samples reactive on RPR and introduce incidence assay as an additional test.
- HSS Plus 2023 in central prisons: It was proposed to include District jails as composite sites to improve the representativeness of HSS among inmates; to introduce TPHA as an additional test for samples reactive on RPR and introduce incidence assay as an additional test.
- HSS Plus 2023 among HRG and bridge populations: The proposal was to increase the number of HSS sites among H/TG people, migrants and truckers, and the sample size to 400, and also to consider review of the definition of migrants' and truckers' population to align with the current programmatic contexts. The proposal also asked for a recording of the retrospective service uptake data to inform the programme. A recommendation was also made to establish HSS sites among female

migrant workers. The need to resume the Syphilis Surveillance with the introduction of Treponemal and Non-Treponemal Syphilis Point-of-Care (POC) tests was highlighted, along with the introduction of incidence assay as an additional test.

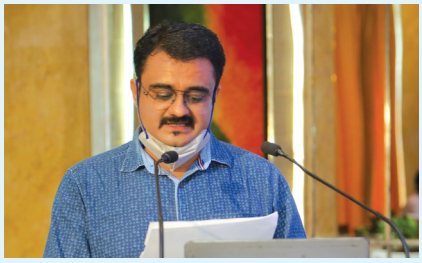
Areas of consideration:

Panellists complemented NI-AIIMS on the detailed presentations and the enhancements proposed under HSS Plus 2023. There was concurrence on the enhancements proposed with few points for consideration.

- **Methodology:** Regarding sampling of prisoners, there was a possibility to improve it even further and the proposals under HSS Plus 2023 were considered a good start. Regarding the sampling of migrants and truckers, the population was dynamic. It was noted that an expanded cost-effective sampling frame may need to be created and standardised. The definition of migrants and truckers could be reviewed. There was a suggestion to relook at the questionnaire and shorten it if possible.
- The testing methodology is to be standardised in view of the proposed enhancements for STI and incidence testing. Incidence assays were an ambitious plan. It was suggested that before implementation begins at the large scale HSS level, a pilot assessment for incidence assays in select States could be implemented as a first step and also work out the correction factors if any.
- Integration of Hepatitis B and Hepatitis C is an example of best practices between the National health programmes. The programmes shall continue to work together towards strengthening the system further.
- At the ground level, there was an observed decline in bacterial STIs and cases of viral STIs picking up. Hence, suggestion was to include markers for viral STI inaddition to Syphilis.

Greater emphasis on analysis of the full evidence generated by HSS Plus to understand groups of populations less likely to access the programme, understand those hard to reach, understand dual-transmission risks by location is needed.

- The IESE requires a very strong laboratory network. Lab infrastructure strengthening, capacity building and quality assurance system will be critical given the context of the framework.
- Regarding HSS in prisons, it was observed that there should be training organized for prison officers so that testing, diagnosis and treatment could be made available under one roof.
- One of the limitations of the HSS system was that it covered only those populations reached by the programme, especially in the context of HRG covered by TIs. It does not reach people not reached by the programme, and those operating in the virtual world. Ways to evolve HSS Plus even further to cover populations not covered by the programme, can be considered. Recency testing is an important consideration at the stage of the epidemic.
- Greater emphasis required on analysis of the full evidence generated by HSS Plus (demographic, behavioural, epidemiological) to understand groups of populations less likely to access the programme, understand those hard to reach, understand dual-transmission risks by location, etc. If needed, the findings and analysis from HSS Plus could inform a deep dive into population sub-groups to understand their vulnerabilities for risk and infection even more.




Consolidating the Evidence, Building the Future:
Consultation Meeting on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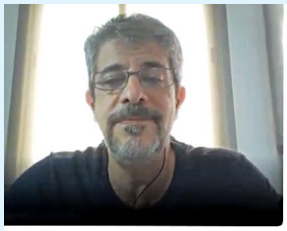


SESSION - 4

STI SURVEILLANCE UNDER NACP

Chairs	Dr DCS Reddy, Former HoD, Dept. of Community Medicine, Institute of Medical Sciences, BHU and Dr Sunil Gupta, Addl. DG, Dte. GHS, MoHFW
Moderator	Dr Bhawna Rao, NACO and Dr Upma Sharma, CDC
Panelists	Dr Tobi Saidel, WHO Consultant; Dr. Joyce Neal, CDC Atlanta; Dr Sumathi Muralidhar, VMCC, New Delhi; Dr Manju Bala, NCDC; Ms Abhina Aher, Tweet Foundation; Dr Chinmoyee Das, NACO
Presenter	Dr Sheela Godbole, ICMR NARI

Session objective:

To seek guidance on the proposed technical framework for STI Surveillance.

Key components of the presentation:

Following were key components of the presentation on STI Surveillance.

- **Rationale:** STI Surveillance was being introduced under NACP considering the epidemiologic synergy between HIV and STIs. Both were markers of unprotected high-risk sexual behaviours. STI Surveillance would provide the potential for early warning of the HIV / STI epidemic (incident STI). It could help assess the impact of behavioural interventions.
- **Expected output from the implementation of STI Surveillance:** It would help assess the magnitude of the STI burden at various geographic levels, help in identification of vulnerable population groups, provide data and evidence to inform resource allocation and prioritization of interventions as well as monitoring impact of these interventions.
- The core components of STI Surveillance include STI case reporting, prevalence assessment, etiological Surveillance of syndromes, and antimicrobial resistance monitoring. The current situation is:
  - **Case reporting:** Currently, STIs are not notifiable in India. There are consolidated syndromic and lab-based reporting from 1,252 designated programme-based DSRCs, 1,461 preferred providers catering to HRGs, and Syphilis reporting including congenital Syphilis in monthly consolidated reporting National Health Mission. In 2020-2021, 6.8 million STI/RTI were managed (NACO). Areas of consideration are ensuring consistency and completeness of reporting, private sector reporting, considering reporting in Health Management Information System (HMIS), the number of tests performed. Primarily syndromes are reported and understanding the proportion of syndromes tested is needed. Congenital syphilis is inadequately reported.
  - **STI prevalence assessment:** Currently, HSS includes RPR based sero-prevalence (>1:8) for syphilis among pregnant women and prison inmates. Areas of consideration are the inclusion of STI prevalence assessment among HRG and bridge population groups also in the next Surveillance round. It may be noted that TPHA alone would not give an indication of incident Syphilis. Hence, RPR reactive in any titre followed by TPHA testing will indicate syphilis burden. The addition of urine for Nucleic Acid Amplification Testing (NAAT)-based testing of CT/NG

would add one more STI indicator. Pooled centralized testing may help save costs.

- **Etiological Surveillance of syndromes:** Currently, it is reported monthly by apex, regional and State STI labs. It was planned for 2021 Surveillance among HRG and bridge populations. Areas of consideration are its incorporation in future rounds of HRG Surveillance and inclusion of syndrome validation at the National-level in HRG Surveillance.
- **Antimicrobial resistance monitoring:** Currently, Gonococcal antimicrobial resistance monitoring has been ongoing for over two decades. It is implemented through the apex centre for STIs at VMMC and Safdarjung Hospital with a pyramidal implementation structure with Regional STI Training, Research and Reference Laboratories (RSTRRL) and State Reference Laboratories established by NACO. The quality assurance process has been in place for a long time. Areas for consideration are ensuring that all laboratories are reporting adequately. Research is needed to focus on NAAT-based methods of identifying resistance. Programme need to take into account reported levels of resistance and changing treatment options for genital discharge syndromes.

- **Proposed newer initiatives in STI Surveillance:** The proposal was to include five population groups under the STI Surveillance: (i) general population, (ii) bridge & 'at risk' populations, (iii) HRGs, (iv) PLHIV and (v) children ≤ 2 years of age. The STI Surveillance will build upon existing Surveillance, laboratory, and programme delivery networks (DSRC).

  The Syphilis Surveillance among pregnant women, as a proxy of the general population, was proposed to be strengthened (i) with the addition of treponemal test on samples which are positive for RPR and (ii) phase-wise expansion of sites in sub-districts location in States where sites are located only in District hospitals.

The proposal was to include five population groups under the STI Surveillance which are general population, bridge & 'at risk' populations, HRGs, PLHIV and children ≤ 2 years of age.

- For the bridge / at-risk population, the proposal was to undertake both etiologic and syndromic Surveillance at two locations, i.e. among the DSRCs attendees and at Targeted Interventions (TI) sites for truckers and migrants. The sample size at the selected DSRC was proposed at 400 with consecutive sampling and bio-specimen collection of serum/DBS for Syphilis and urine for CT/NG. Among the truckers and migrants at TI sites, the existing Sentinel Surveillance System will be enhanced with Syndrome Surveillance, the addition of Syphilis as an additional biomarker on existing DBS spots and also the collection of urine as an additional sample for CT/NG.

  For the HRG (FSW, MSM, IDU and H/TG people), the STI Surveillance will dovetail the existing Surveillance system among the group. The proposal was to include Syphilis as an additional bio-marker on DBS samples being collected among the group. Besides, the proposal was also to include urine sample collection among the group for CT/NG and as well as the collection of STI treatment history among the group.

- Among the PLHIV, the proposal was to implement etiological Surveillance using the existing systems and resources at ART centres. This included a sampling of symptomatic and asymptomatic PLHIV and pooled testing for NG/CT.

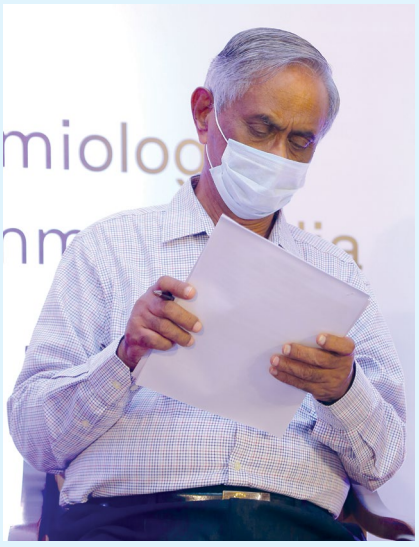
- Among the children, the proposal included the development of a Congenital Syphilis registry and improvement of Strategic Information Management System (SIMS) and HMIS reporting of exposed and treated infants and Congenital Syphilis. This was proposed in view of the impact indicator of 'case rate of Congenital Syphilis of 50 or fewer cases per 100,000 live births' from the Elimination of Mother-to-child Transmission (EMTCT) of HIV and Syphilis goals.

Testing methods standardization, capacity-building and quality assurance system need to be in place for strong STI Surveillance.

Areas for consideration:

Indian Council of Medical Research- National AIDS Research Institute (ICMR-NARI) was complemented for the comprehensive framework proposed. The presentation clearly highlighted the reason why STI Surveillance was needed and what would be the components of the STI Surveillance. The panellists recognized that there were many opportunities and strategies proposed in the presentation that the working team could delve deep into to further define the methodology and approach for each of the STI Surveillance components; however, the framework was broadly concurred with the following observations:

- While bacterial STIs Surveillance is the focus of the framework, the addition of HSV-2 bio-marker etc. may further augment the insights into the epidemic.
- The collection of urine samples for CT/NG to measure the STIs among MSM and H/TG people may be reviewed given the context of STIs affecting the rectum or anus. If the urine samples are not appropriate for the ano-rectal STIs, the biological sample collection through swabs may be considered in such cases. Use of the community in swab collection procedures may enhance the response rates.
- STI Surveillance may include young/ adolescent HRGs as one of the separate groups to understand the magnitude of the epidemic among these groups.
- STI Surveillance may require investments in laboratory infrastructures. Testing methods standardization, capacity-building and quality assurance system need to be in place for strong STI Surveillance. Sample transportation strategy of bio-specimen (urine or swab) also needs to be worked out and standardised.
- Undertake a study on validation of syndromic diagnosis vis-à-vis etiologic diagnosis. This will strengthen the Surveillance system strongly.
- Along with STI Surveillance, strengthened programme delivery for STI services (both etiologically and syndromic management) at DSRC and TIs and treatment for STI are critical. Simultaneous focus should be on service utilization and service access.



Consolidating the Evidence, Building the Future: Consultation meeting on Integrated and Enhanced Epidemiology Under the National AIDS & STD Control Programme in India

SESSION - 5

INTEGRATED BIO-BEHAVIOURAL SURVEILLANCE (IBBS)-LITE UNDER NACP

Chairs	Dr Shashi Kant, AIIMS-New Delhi and Dr Mohammed Shaukat, Senior Public Health Expert
Moderator	Dr Saiprasad Bhavsar, NACO and Dr Anwar Parvez, I-TECH India
Panelists	Dr Sunil Solomon, JHU; Mr Taoufik Bakkali, UNAIDS Asia Pacific; Dr H. Sanyama Devi, RIMS; Dr Madhuri Thakar, ICMR-NARI; Dr Rajatashuvra Adhikary, WHO India; Dr Atul Ambekar, AIIMS, New Delhi; Dr Chinmoyee Das, NACO
Presenter	Dr Richard, Mizoram SACS; Dr Shreya Jha, AIIMS, New Delhi; Dr Shanta Dutta, ICMR-NICED; Dr A. Elangovan, ICMR-NIE

Session objective:

To seek guidance on the proposed technical framework of (i) CBSS, (ii) IBBS-Lite among HRG and bridge population and (iii) IBBS-Lite among PLHIV under NACP.

Key components of the presentation:

The frameworks are presented in Annexure 3. Following are the central proposals included in the presentations.

- Community-Based Surveillance Survey (CBSS):
  - CBSS was proposed for implementation among the general population in the high prevalence north-eastern States. The proposal was to implement CBSS in Mizoram in the first phase.
  - The objective of CBSS would be to measure the level, trend and correlates of:
    - Prevalence and incidence of HIV/STIs/related co-morbidities in the general population.
    - CD4 counts and HIV viral load among HIV infected people.
    - HIV/AIDS-related stigma and discrimination in the general population.
  - The proposal was to measure the indicators at the State-level with a sample size of 4,000. The sampling strategy was a multi-stage sampling method. In the first stage, Districts selection for CBSS was proposed by constituting four regions in the State and then selecting one District randomly for each of the regions. In the selected District, the proposal was to select 60 clusters from 67 samples collected from each of the clusters in the second stage. In the third step, households are to be selected in the selected cluster through the random walk technique. In the final step, one male and one female eligible consenting participant were proposed for selection through the Kish grid for bio-behavioural data collection. For the biomarkers, venous blood would be collected for testing of bio-makers as per the objectives.
- IBBS-Lite among the HRG and Bridge population
  - The objective of IBBS-Lite would be two-fold. First, to analyse and understand HIV prevalence, incidence and HIV-related risk behaviours among HRG and bridge populations in different regions, by linking behaviours and biological findings. Second, to examine the change in HIV-related risk behaviours and HIV prevalence among HRGs in three different time points during 2022-2030.
  - Three rounds of IBBS-Lite are being planned from 2022-2030: Round one (2022-2024), round two (2025-2027) and round three (2028-2030). Each round will be implemented over a period of three years and will cover Six to Eight States per year under IBBS-Lite.

- The technical framework included six population groups representing the HRG and bridge population under IBBS-Lite. The population groups included FSW, MSM, IDU, H/TG persons, truckers and migrants' population. The presentation included the operational definitions of population groups.
- The proposal was to measure the indicators at the State-level. The sample size would be calculated for the State using the HIV prevalence as the indicator. The sampling strategy proposed was a multi-stage sampling method. Districts selection for IBBS-Lite was proposed by constituting four regions in the State (up to four) and then selecting one District with the highest size for the region. In the selected District, a sampling frame development exercise would be undertaken to develop conventional clusters/ time-location clusters and then the clusters would randomly be selected. At the selected clusters, respondents would be randomly selected for bio-behavioural data collection. The sampling strategy would be independently implemented for each of the Surveillance groups. The National-level estimates would be generated using the State-level estimates with appropriate weighting.

⏩ IBBS-Lite among PLHIV

- The objective would be to generate evidence on the HIV/AIDS-related behaviours, service uptakes and co-morbidities among PLHIV to support planning for integrated care and treatment to PLHIV. Specifically, IBBS among PLHIV sought to provide evidence on the level and trend of (i) HIV/AIDS-related behaviours, perceptions, and service uptake, (ii) lifestyle behaviours, (iii) CD4 level and viral load, and (iv) co-morbidities prevalence (TB, Syphilis, Hepatitis B, Hepatitis C, Non- Communicable Diseases [NCDs] etc.).
- The technical framework for IBBS-Lite among PLHIV was proposed as a repeated cross-sectional survey of PLHIV aged 18 year or more with each round of the activity to be implemented over three years period. In each year of a round, there would be annual rotating cycles where one State would be selected in each of the geographic regions of the country for a given year. Overall, three rounds of IBBS-Lite are to be implemented among PLHIV between 2022-2030.
- The proposal was to measure the indicators at the State-level and then aggregate the State-estimates to provide National estimates. Using Syphilis seroprevalence as the bio-markers for sample size calculation, the proposed sample to be achieved was worked out at 1,200 per State. The sampling strategy in the selected State was a multi-stage sampling design. In the first step, one State is to be selected in each of the six geographical regions of the country: North, Central, East, Northeast, West and South. Once a State is selected, its identified District would be grouped as per the established administrative/socio-cultural region with an upper limit of up to four groups per State. The grouping will also take into account the availability of ART centres. Next, one District with an ART centre would be randomly selected in each region. The target sample for each of the ART centre would be allotted based on the proportional contribution of the region in the total estimated PLHIV for the State. At each ART centre, respondents are to be selected following a consecutive sampling strategy.

Areas for consideration:

Presentations on CBBS and IBBS-Lite were well received by the panellists. Following were the suggestions made in the context of the proposed technical framework.

⏩ For the CBBS, it was suggested to call the activity as IBBS among the general population to make it consistent with the thematic areas and avoid the introduction of new acronyms. Further, it was observed that given the proposed sample size, around 80-100 people would be detected HIV positives. Given the potential numbers, the robustness of incidence and viral load estimates may be looked into.

⏩ For the CBBS, a robust mapping and listing in the selected clusters may be undertaken as a part of the exercise. Also, the feasibility of venous blood collection vis-à-vis DBS blood collection in the CBSS may be relooked from the implementation perspectives including logistics, acceptability perspectives, etc.

- For the CBSS, one of the objectives is to estimate the incidence in the general population. The sample size requirement in the context may need to looked into.
- Further, the CBSS may explore the potential for reaching to and interviewing the sexual/drug-injecting partners to help us understand the epidemic better.
- For the CBBS and IBBS-Lite among the general population and high-risk/bridge population group, the focus may be on understanding the epidemiology of HIV/AIDS. Accordingly, tools shall be comprehensive and formulated to focus on the epidemiological contexts better with questions focusing on the prevalence of risk behaviour including those on sexual and drug use networks. The tool may further be customized depending upon the epidemiological context of a State. Mizoram, which has been proposed for CBSS, has predominant injecting behaviour and the data collection tool may accordingly be worked out to meet the local epidemiological context.
- It was suggested that the sample size for each State shall also be calculated on the biological parameters and perhaps would be too high for State-level estimates for the migrants and truckers' population. In view of the required sample size, the inclusion of bridge and truckers' population in IBBS-Lite shall be further looked into.
- The triangulation of IBBS data vis-à-vis the existing individual tracking system under the programme would further help explain the epidemic better.
- The IBBS would be more useful if it represents all of the target population and not only the population which are covered under the programme. The IBBS design needs to ensure that IBBS is representative of all of its target population and that it goes beyond the population currently covered under the programme.
- Currently, the definition of hotspots is changing. The methodology may perhaps be tweaked in the evolving context of the hotspots.
- The DBS spot, as well as dried urine spots, may also be used for finding out the presence of psychoactive drugs through the latest technology. The proposal may consider the inclusion of the same to help confirm the prevalence of drug use in the target population.
- For IBBS-Lite among HRG, the suggestion was to include the presence of Lamivudine and viral load as additional tests that would help to the progress on the second and third of the 95-95-95 cascade objectively.
- The suggestion was also to reconsider HIV sub-typing. As ART is now known to be effective against all sub-types, doing the HIV sub-typing will just add to the work without any significant implications.
- For IBBS-Lite among PLHIV, it was mentioned that the proposed design is about IBBS among PLHIV in ART centres and that should be taken into consideration while interpreting the results. The prevalence of 6% of Syphilis among PLHIV seems to be very high. The same needs to be looked into.
- The additional advantages of implementing IBBS-Lite among PLHIV in the ART centre may be dovetailed in view of the availability of some of the proposed data to be collected which is already available in the current programme monitoring system under NACP. Further, the addition of Antiretroviral (ARV) drug resistance testing may be considered for IBBS among PLHIV.
- IBBS-Lite among PLHIV in ART centre may be very relevant to inform characterization of the heterosexual risk as the predominant route of transmission in the Indian context. This also gives the opportunity to track the change in risk behaviour among the PLHIV population after they become aware of their HIV status, which would have programmatic implications.
- IBBS-Lite among PLHIV is the need of the hour, especially in the context of the NCD, as the population is ageing. Hence the proposed Surveillance will inform the programme not only of the burden but also of the strategies.
- The laboratory preparation for CBBS and IBBS needs to be undertaken as a part of the integrated and enhanced Surveillance strategies. This would include reworking the volume of serum samples or the number of the DBS spots required, validation of the tests, training of the manpower etc. For the viral load and CD4 component of IBBS among PLHIV, the existing laboratory systems and data available at the ART centres may be used as in ANC settings.
- For incidence, there is a need to do adjustments for false recency before the implementation of any incidence assay. A validation exercise would be required to find the correction factors for false recency.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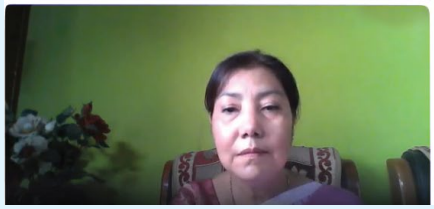

SESSION - 6

SIZE ESTIMATION OF HIGH-RISK POPULATION OPERATING THROUGH VIRTUAL PLATFORMS

Chairs	Dr Shobini Rajan, NACO and Dr Rajatashuvra Adhikary, WHO India
Moderator	Dr Bhawani Singh, NACO and Shri Aditya Singh, JHU India
Panelists	Ms Purvi Shah, UNAIDS and WHO; Mr Taoufik Bakkali, UNAIDS Asia Pacific; Dr Mukta Sharma, WHO-SEARO; Dr. Abu Abdul-Quader, CDC; Dr JK Mishra, Delhi SACS; Mr. Murugesan S, The Humsafar Trust; Dr Shajy Isac, IHAT; Ms Vinita Verma, NACO; Dr Chinmoyee Das, NACO
Presenter	Dr Pradeep Kumar, NACO

Session objective:

To seek guidance on the proposed technical framework for high-risk populations operating through virtual platforms.

Key components of the presentation:

With the growth of internet access, especially in urban areas and with the changing pattern of HRG's soliciting partners and clients, there has, for long, been a need felt under the programme to undertake mapping and size estimation of high-risk population operating through the virtual platform — so that they may accordingly be linked with necessary services or information. Mapping and size estimation of high-risk populations operating through virtual platforms is an evolving area and there is no standard globally recommended methodology either.

Following are the components of the technical framework proposed for estimating the population size of high-risk populations operating in the virtual platforms.

- The objectives would be to (i) identify the mobile and internet-based apps used by HRGs to solicit sexual/injecting partners/ clients, (ii) estimate the total size of HRGs operating through mobile and internet-based apps, (iii) estimate the size of HRGs operating exclusively through mobile and internet-based apps, and (iv) provide the demographic and risk behaviours characteristics of high-risk population operating through virtual platforms.
- In terms of global experiences, there were three main studies which were reviewed: (i) Kenya Model which entailed mapping of mobile and internet-based apps and estimation of the MSM at these apps and conducting face-to-face interviews of randomly selected MSM from virtual platforms to characterize the respondents as well as to assess the level of duplications. (ii) Viet Nam Model wherein mobile and internet-based apps users were mapped, and the active users on these apps were counted as per the predefined schedule. An online survey was conducted using the Respondent-driven Sampling (RDS) approach to get the multiplier for the size estimation. (iii) Linkages Across the Continuum of HIV Services for Key Persons Affected by HIV (LINKAGES Project) in India created a gridwork of geocoordinates (separated by pre-defined distance) and mapped the active users on the 'Grindr' app setting the geo-coordinates of the mapper phone on the gridwork.
- Based on the above global experiences and considering a few National pilots, the following would be the proposed framework for mapping and size estimation of high-risk populations operating through virtual platforms.

- **Step 1:** Mapping of mobile and internet-based apps.
- **Step 2:** Size estimates of the active population on the mobile and internet-based apps: To estimate the size, the number of active online users on the predominant mobile applications in the given District would be mapped based on the predefined schedule of the suitable days and times for 15 days. Then, the hotspots which would at least be one kilometre from each other to be selected for this mapping. The number of active online users within a radius of 500 meters is to be counted. The mapping team would join the groups on various online platforms with the help of the community networks and count the number of active users at a predefined schedule.
- **Step 3:** Sample survey among the active population on the mobile and internet-based apps: Interviews would be conducted among the active online users on the predominant mobile applications at each of the mapping locations. It was proposed that the interview team would log in the applications at the randomly selected mapping locations, select the respondent randomly, introduce the mapping exercise, take the consent, and interview him/her if consented through a self-administered online survey tool. The online tool will collect information on socio-demographic profiles (age, education, marital status etc.), duplication of accounts, use of other applications, exposure to physical hotspots, and history of risk behaviour.

⏩ The proposal was to implement mapping and size estimation of high-risk populations operating through virtual platforms once the framework was finalized and approved by the TWG/ TRG and the EC.

REMARKS BY ADDITIONAL SECRETARY AND DIRECTOR GENERAL, NACO

The mantra for this consultation is "what the mind doesn't know, the eye doesn't see." We need the latest and updated information on the epidemic, the behaviours, the population groups at risk — to inform AIDS response, address gaps and focus programmatic action towards set goals. We need to understand who the population groups at risk are, where they are, and how services can reach them — so that the programme can accordingly link them with necessary services. Our aim is to prevent new infections and keep people healthy and alive on ART.

The programme refers to typologies of HRGs considered at greatest risk for infection – FSW/MSM/ TG people/people who inject drugs — among whom prevention efforts are prioritised. We need to assess if anyone is being missed. This is particularly critical in the context of virtual populations. Available evidence and information from communities have highlighted how HRGs are increasingly using virtual platforms for solicitation and networking — many no longer active at earlier known physical locations, while others are not exclusively active on virtual platforms.

Beyond the traditional higher risk group typologies, there is an urgent need to consider populations who do not identify themselves with a typology but may be at risk or negligible risk. There are young adults who may be engaging in unsafe sexual practices using online platforms or dating apps. This may not be an urban phenomenon only. It would be interesting to understand behaviours in peri-urban and rural areas also and how people engage with the apps on the internet and how does it lead to a physical meeting — because NACP's focus remains on programmatic goals.

As a first step, the programme would like to raise awareness on HIV and STI prevention and safer behaviours among the virtual populations once they are quantified and geo-tagged. It is critical that everyone knows how to protect themselves, what a condom is, what is pre-exposure prophylaxis (PrEP), where to get tested for HIV/STI— and in the second step, we would like to link them with key services if they are not covered currently by any of the targeted intervention programmes. Innovative ways for service delivery also need to be explored so that the services are also made mobile for those who do not wish to go to fixed physical centres.

Areas for consideration

NACO was congratulated for including mapping and size estimation of high-risk populations operating through virtual platforms as a critical component of the 'IESE plan.' The broad framework presented was well appreciated with the following points iterated.

- **Definition:** There was a need to go beyond traditional definitions and typologies of HRGs based on risk profile while undertaking the mapping and size estimation of those populations operating in virtual platforms. In an effort to achieve 'the end of AIDS epidemic as a public health threat' by 2030, the programme would aim to ensure that all who are 'at-risk' of acquiring HIV/AIDS, irrespective of the population identifying themselves as HRG or not, and even the youth / young adults — essentially anyone who would be operating using the virtual platform and who may be at risk for HIV/STI — would be reached with the necessary Information, Education and Communication (IEC) or linkage to services in a sensitive and ethical manner ensuring confidentiality so that no one was left behind. Given the context, a need was mentioned for having a wider population group to be covered with a focus on size estimation of the 'at-risk' population operating through virtual platforms. Separate community consultation regarding the definitions may be undertaken as a preparatory activity.
- Approaches have been evolving on size estimation of HRGs operating through virtual platforms. Some have worked and some have not. The proposed method shall be considered as starting point and recommendations was to have a flexible framework to evolve as evidence and contexts become clearer.
- **Duplication:** There was a recognized possibility of duplication and the challenge of overcoming it. An individual may have multiple accounts in different names, abandoned online profiles, and the individual may also be getting captured in the physical spaces. Correction factors are needed for adjusting for duplication.
- The proposed objective was to undertake size estimation of high-risk populations operating through virtual platforms. However, the proposed method was more suitable for MSM. This was also consistent with global contexts where most of the size estimation exercise at the virtual platforms have been done for the MSM population. However, literature on the size estimation exercise at the virtual platforms among FSW and IDU, etc. has been scarce. In Delhi in India, a network-operator-based approach has been used to estimate the size of FSWs operating through virtual platforms. The method for FSW and other population groups may need to be customized and refined as the socialization, networking and engagements patterns differ on the virtual platform differ for each population group.
- Community consultation as a part of the mapping and size estimation exercise would be critical. This will not only be helpful to understand the apps on which the virtual population engaged in 'risk-behaviour' is found but it also would help identify the physical locations where the people operating through virtual platforms may congregate to meet/socialize/solicit their partners and may be covered under the programme. Also, having the virtual population mappers from the community would be useful for enabling better access and better response during the exercise.
- While the mapping of the population available on various dating is relatively easy, there are cetain platforms where the population is hard to reach. Also, the terminology for the population at these platforms perhaps needs to be reworked as the population at these platforms may not necessarily want to identify themselves as a HRG.
- There are exclusive apps/sites for specific HRG populations and there are generic apps/sites where a diverse group of people engaged in risk-behaviour is found. At exclusive apps/sites, the feasibility of implementation of size estimation including interviewing the potential respondents is relatively high. On the generic apps/sites, there would be a need to profile the population better to understand their risk. Also, the aspects of localized vs. global applications need to be taken into the account. In the case of global applications, there are

pitfalls of overestimating as the method may count people who are outside of State/ Country etc.

- The exercise may also consider the inclusion of the Indian short video platforms as a part of the exercise.
- There is potential to work with the CSR wing of the app owners to inform the size estimates of the population active on these platforms. Engagement with app owners to provide the deidentified aggregated data at State/City or District-level would be a very source of additional data to inform the population size estimation.
- Interview of the HRGs operating at the virtual platform would be a key component of the proposed method. Around 400-450 interviews with a very focused concise tool with the target population may suffice for the States to profile and characterize the population. However, the response rate for the same may become an issue. A self-administered survey, which allows the respondents to remain anonymous, has been used in the past and may facilitate a better response rate. Good communication strategies to make these surveys appealing to the target population would be critical. Strategies like gamification, incentivization etc. may be worked out to improve the response rate of the survey in a setting where the target population is comfortable. The engagement of the community/network members during the interview process would be the most critical aspect to improve the response rate. Also, the interview through virtual method (video conferencing etc.) by peers may be considered while ensuring privacy and confidentiality.
- Size estimates on the people engaged in risky behaviour at the virtual platform shall not be considered independent of the rest of the work. There are opportunities available in routine HSS, periodic IBBS surveys etc. which would provide a significant clue to understand the virtual world including the insights into the overlap and risk probabilities.
- There are potentials of the impact of the COVID-19 pandemic on the size of the population engaged in risk-behaviour at virtual platforms and this may be taken into account while analysing the data.
- The virtual platforms under consideration may also be used by adolescents. Therefore, strategy development is required considering ethical issues, data confidentiality, security etc. while linking them to National helplines on a need basis may also be considered in the technical framework.
- In terms of geographic coverage, urban areas, peri-urban areas, and rural areas are to be included. Also, while mapping the population, the impact of the time factor may be taken into consideration as the number may vary between different days of the week, different times of the same day, festival time etc. The turnover and frequency also need to be accounted for while estimating the size of the population.
- Community consultations and community engagement: Local intelligence gathered through community engagement and consultations was key and a way to reach gate keepers, network members and access the underbelly of the internet. The development of peer-led models could give insider access to social media groups that may not be accessible otherwise.
- NACO may like to review learnings from other countries also to inform the method. For example, there are internet surveys among MSM in Europe and Asia-Pacific MSM etc. Having a wider method review would inform the development of the most robust method in India. Also, ethics needs to be considered. Ethics guidelines of the Association of Internet Researchers may be referred to. Issues like privacy, confidentiality, sensitivity, retrievability and sharing of the data etc. need to be appropriately articulated in the terms of the Survey.
- The universe of people engaged in risky behaviour at virtual platforms may be much higher than the population in physical space. It would be appropriate to focus more on estimating the size of people who are at substantial risk. This would be critical as the size estimates would not only be feeding into the denominator for the first 90 but would also set up the targets for programmatic coverage.


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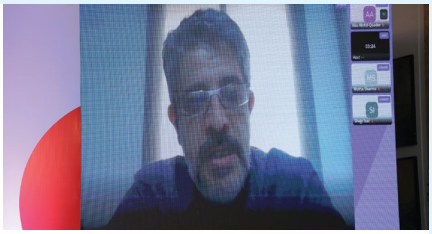


Consolidating the Evidence, Building the Future:
Consultation Meeting on

SESSION - 7

SIZE ESTIMATION OF BRIDGE POPULATION AT PHYSICAL LOCATIONS

Chairs	Dr Arvind Pandey, National Chair (Medical Statistics), ICMR, Dr Anoop Kumar Puri, NACO and Dr Shobini Rajan, NACO
Moderator	Dr Sai Prasad Bhavsar and Ms Sukhvinder Kaur, USAID India
Panelists	Dr Keith Sabin, UNAIDS, Geneva; Dr Abu Abdul-Quader, CDC; Dr S K Singh, IIPS, Mumbai; Ms Deepika Joshi, CDC India; Dr Damodar Sahu, ICMR-NIMS, New Delhi; Dr Chinmoyee Das, NACO
Presenter	Dr Pradeep Kumar, NACO

Session objective:

To seek guidance on the proposed technical framework for size estimation of bridge population at physical locations.

Key components of the presentation:

The technical framework for size estimation of bridge population at physical locations was presented to identify the physical locations where bridge populations were found and map and estimate the total size of the bridge population at these physical locations to inform the programme.

- **Migrants:** Migrants were considered to be at increased risk for HIV/STI than the general population and thus a priority population covered by TIs. The proposed method entailed:
  - **Step 1:** Mapping of the locations where migrants in the informal sector were available. For this, consultation would be held with different stakeholders (e.g., labour contractors, District labour offices, District industries centres, trade unions of informal labour) at District and block levels to identify the locations where migrants were available in high volume. The information would be gathered about the presence of major pockets of migrants in the District identified. Based on this, a comprehensive list of the migrant pockets in each District would be developed.
  - **Step 2:** Conducting rapid field assessment at the identified locations. Several visits would be made to the identified locations and key information interviews would be conducted to gather detailed information on characteristics of the identified site and estimate the size of the target group at these locations. The characterization of the site should have the potential to understand if there was any seasonal pattern at the sites.
  - **Step 3:** Conducting rapid profiling and risk assessment of migrants at the identified locations.
- **Truckers:** For NACP TIs, the halt points of truckers on National and State highways would be the key target population of the mapping and size estimation. For the size estimation, the trucker's definition would include both drivers as well as helpers. Like the method proposed for migrants, the method for truckers would include the similar three steps as mentioned above.
- The mapping and size estimation of bridge population would be piloted in select States once the framework was finalized and approved by the TWG/TRG and ethical approvals received.

REMARKS BY ADDITIONAL SECRETARY AND DIRECTOR GENERAL, NACO

While single male migrants (SMM) working in the informal sector and Long-Distance Truckers (LDT) are covered under the programme, we may need to go beyond this population group while planning intervention points for prevention and care efforts for specific populations.

There are male migrants who may be at some risk. In addition, there are women migrants also who are living away from their homes and are studying or working in metro cities, State capitals, tier one or two cities, etc. — and who may be engaging in risky behaviours.

We need to evolve our response according to the times and behaviours.

Areas for consideration

The panellists acknowledged the method proposed in view of the focus to estimate the size of the bridge population. Following were some of the points iterated by the panellists for consideration.

- Community consultations and local intelligence would be critical for ensuring successful implementation of bridge population mapping of locations, for conducting rapid field visits for site characterization and size estimations, and respondents' interviews to profile and risk assessment.
- The title of the sessions refers to the size estimation of the bridge population. In view of the intended objectives, the proposal may consider having a broader definition and perhaps may include clients of FSWs. While there have been challenges in the past to estimate the clients of female sex workers, there have been recent global experiences to estimate their size which may be looked into. Also, for the truckers, broadening the definition to transportation workers, including that of the local transport workers, may be considered. Besides, the engagement of FSWs in mapping and size estimation of migrants and truckers may further inform the programme.
- There are migrants among the HRG population also like those among FSWs, IDUs. It would be helpful to understand the migration pattern among these population groups also.
- For the implementation of the proposed method, three things need to be taken into consideration. The first thing would be the detailed planning for the implementation including that for intensive capacity building and supportive supervision as part of the quality assurance mechanism. The second point would be about the implementation mechanism: through the programmatic mechanisms or through an external survey agency and how the anticipated challenges and limitations of the selected arrangement are being addressed. The third point would be looking into post-survey activities including that for the revalidation and use of the data for the programme purposes.

Truckers and migrants are two of the most significant bridge population groups and accordingly the proposal to undertake the mapping and size estimations among the group is very relevant.

- Truckers and migrants are two of the most significant bridge population groups and accordingly the proposal to undertake the mapping and size estimations among the group is very relevant.
- There is a broader context of the strengthening of the overall data ecosystem in the context of the stated objectives of NACP. This would include having adequate technical rigours and institutional engagements to further improve the quality of the data to be used in planning and resource engagements.

Key informants' interviews with sex workers may help broaden the understanding of various subgroups which may fall within the umbrella of the bridge population.

- Migrant workers are mobbing by season, by shifting or emerging of industries etc. However, the location where this population engages with FSWs would generally be static in nature.
- The exercise may encompass the components of the hidden population. The method for the same may be separately discussed. If required, pilots may be undertaken and then scaled up based on the learnings gained.
- Correction factors for frequency, duplication and turnover, which are standard in any size estimation process, may be built into the proposed design to enhance the validity and reliability of the results.
- The bridge population group may include the personnel who are in the transportation industry railways/buses/airlines etc. Many of these population groups travel to places that are far away from their homes, stay at those places for a few nights and may have HIV-related risks.
- Source and destination characterization shall also be taken into account while undertaking the size estimation of the migrants population.
- For truckers, it may be useful to look into the data available with the National Highway Authority which might help in understanding the size of the truckers. Also, collaboration with trucking companies may further help to inform the size estimates of the truckers. Mapping of the pathways may also be considered an additional aspect of the exercise.
- Under the NACP, over the years, it has been noted that migrants, irrespective of their gender or staying status with family, are at risk of HIV infection. Given the context, both the male and female migrants may be included as a part of the size estimation exercise.
- Not every migrant may be at high risk of acquiring HIV. So, it would be important to identify the group of migrants who are at higher risk for acquiring the HIV infection and undertake the size estimation exercise among them. Studies have indicated that SMM who are staying away from the family are at higher risk of acquiring HIV infection.
- NACO is planning for IBBS-Lite among truckers and migrants. It would provide an opportunity to build size estimation components like service multiplier etc. to inform and triangulate the size estimation.
- There are complexities in defining the migrants from the National programme. Size estimation among the groups is being undertaken by using RDS in Venezuelan migrants in Colombian Peru.
- Migrants and truckers may be one of the subsets of the bridge population. And every State may have its own pattern of bridge population. Key informants' interviews with sex workers may help broaden the understanding of various subgroups which may fall within the umbrella of the bridge population. Piloting the method in some States will provide useful insights for the exercise.


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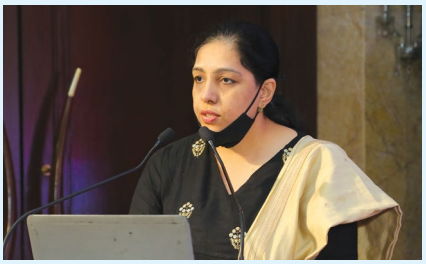


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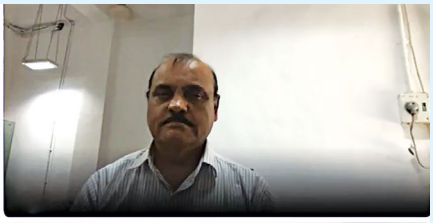


SESSION - 8

PROGRAMME-BASED EPIDEMIC SURVEILLANCE (CASE-BASED SURVEILLANCE)

Chairs	Dr DCS Reddy, Former HoD, Dept. of Community Medicine, BHU and Dr Naresh Goel, NACO
Moderator	Dr Bhawna Rao, NACO and Dr Asha Hegde, PATH
Panelists	Dr Tobi Saidel, WHO Consultant; Dr Daniel Rosen, CDC Atlanta; Dr Kimberly Green, PATH; Ms Deepika Srivastava Joshi, CDC India; Dr Rajesh Kumar, SHSRC, Punjab; Dr Chinmoyee Das, NACO
Presenter	Dr Pradeep Kumar, NACO

Session objective:

To seek guidance on the proposed technical framework for programme-based epidemic Surveillance (Case-Based Surveillance).

Key components of the presentation:

The presentation focused on the use of the IT-enabled integrated MIS 'SOCH' platform for epidemic Surveillance. Project SOCH had been successfully operationalised through which longitudinal information for each beneficiary would be available since their registration under NACP, across the service delivery points to a central database. SOCH was available for epidemiological analysis on key sentinel events since the first HIV test and engagement with HIV care.

- The objective of programmatic Case-Based Surveillance would be to utilize the SOCH platform to (i) describe the HIV epidemic in terms of people, place and time; (ii) estimate the HIV incidence in select population groups; (iii) detect outbreaks or clusters of infection; (iv) describe characteristics of people newly diagnosed with HIV; (v) people newly diagnosed with advanced HIV disease or AIDS, and people with HIV who have died; and (vi) inform the disease progression in identified HIV positive people.
- The populations of focus would be HRG and bridge populations, both HIV positive and HIV negative populations, pregnant women, HIV exposed babies, and at-risk HIV negative DSRC and Integrated Counselling and Testing Centre (ICTC) clients; and all HIV positives identified at ICTC centres.
- The service points for capturing sentinel events would be TI, DSRC, ICTC, Early Infant Diagnosis Centres (for children), ART centres, and viral-load laboratories.
- For de-duplication there would be the system generated unique ID; linking of mandatory mobile number with each ID at ART centre; and at the local level, facility search based on name, gender, age, fathers name would be enabled.
- For data security, adherence to the prescribed standards of data protection and security protocol of NACP would be critical. Only de-identified individual-level data without personal identifiers would be used for the analysis. In the factsheets/reports/technical briefs/scientific publications, only the de-identified aggregated analysis would be published.
- As next steps, once the detailed technical framework was approved by NACO's TRG and TWG, the protocol would be presented to the NACO's EC and Data Management

Committee for review of ethical considerations and data management protocol.

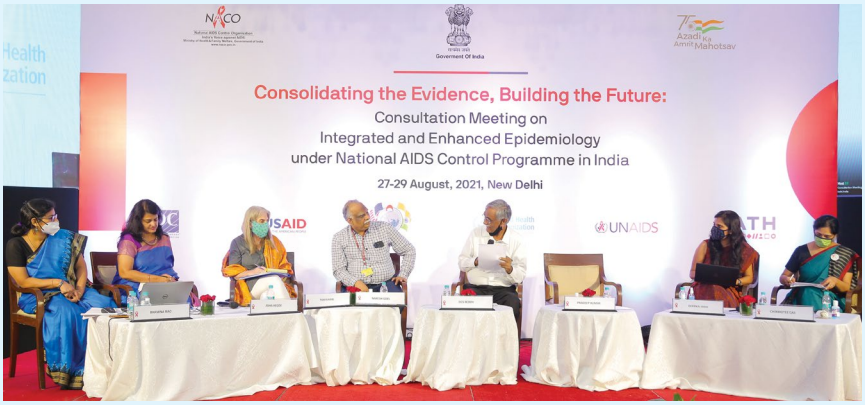
- Via the programmatic Case-Based Surveillance, the endeavour would be to develop quarterly factsheets and annual reports presenting the analysis of cumulative and new diagnosis of HIV infections by sub-groups; cumulative and new HIV infections and incidence rates by sub-groups; cumulative and new diagnosis by CD4 counts; viral load suppression among cumulative and new registrations; and cumulative and new mortality among HIV infected persons registered in care.

Areas for consideration:

NACO was congratulated for 'SOCH' and the proposal presented to implement programmatic Case-Based Surveillance using this massive database. The system provided a great opportunity not only in terms of monitoring of the cases for better client-centric services but also enables epidemiological Surveillance at a much granular level in real-time.

The proposal outlines the vision of NACO for comprehensive Case-Based Surveillance. The proposal has accounted for having the pilot test, and scaling it up based on learnings idea. The partners' network may also be included in Case-Based Surveillance pilots.

- The system details the involvement of beneficiaries-level data. The system is also equally important for the service provider not only from the perspective of quality care but also from the perspective of data transaction recordings.
- The unique ID would be extremely relevant for the implementation of Case-Based Surveillance.
- The proposal aims to include 'at-risk' HIV-negative as a part of the Case-Based Surveillance system. The number is expected to be huge which needs to be deliberated upon and the proposal may consider phasing-in.
- Programmatic Case-Based Surveillance is not only a tool for identifying the clusters in terms of transmission dynamics but also for focused micro-level elimination efforts.
- Case-Based Surveillance provides a significant opportunity to strengthen the insights into the model-based incidence estimates. Lab-based recency assay may further enhance the insights into the incidence.
- The system may further extend into the understanding of the co-morbidities which would be an additional advantage. Co-morbidities of TB, STIs, viral hepatitis and NCDs may be key considerations for a comprehensive understanding of the care and treatment needs of PLHIV.
- The frequency and speed of the data-capturing, analysis and use in Case-Based Surveillance would be a critical aspect of its successful implementation.
- The hardware elements, data security measures, and IT management team while facilitating the local level data use should also be focused to ensure smooth management of the system.
- The system may also make provisions of data capturing from the private sectors thus enhancing the completeness of the recording.
- The concept of biometric identifier may be considered to respond to the issues of de-duplication of the data. Iris scanner may be useful in this context. The same may be piloted in a few Districts.
- NACO may consider looking into the Botswana model of the 'Omang' card which is a gateway to avail services to further inform the proposal.
- The Case-Based Surveillance may consider using the terminology of 'follow-up' as part of the system.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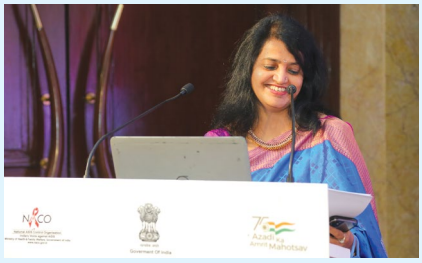


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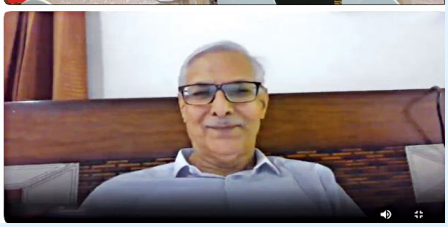

SESSION - 9

RESEARCH PRIORITIES AUGMENTING EPIDEMIC MONITORING UNDER NACP

Chairs	Dr Raman Gangakhedkar, Former HoD-ECD, ICMR and Dr. S Sundararaman, Public Health Strategist
Moderator	Dr Srinivas Murthy, NACO and Dr Marjolein Jacobs, UNAIDS India
Panelists	Dr Jeff Lane, University of Washington; Dr Sunil Solomon, JHU; Dr Shruta Rawat, The Humsafar Trust; Dr Venkatesan Chakrapani, C-SHaRP, Chennai; Dr Seema Sahay, ICMR-NARI, Pune; Dr Chinmoyee Das, NACO
Presenter	Ms Vinita Verma, NACO

Session objective:

To identify the research priorities for strengthening the S&E under NACP.

Key components of the presentation:

A detailed presentation was made on research priorities under NACP towards achieving the 2025 targets — of reducing annual new infections and deaths by 80% and promoting universal access to quality STI/RTI services to at-risk and vulnerable populations — and the 2030 goal of 'achieving the end of AIDS epidemic as a public health threat.'

- The starting point for identifying research priorities was reviewing the priority areas and strategies for NACP V 2021-2026. These are as follows.
  - Priority Area 1: Uninterrupted treatment and life-long free-of-cost ART to 2.1 million PLHIV. Strategies include the introduction of newer regimens that are cost-effective and are easy to use with fewer side effects, streamlining the second line, and economies of scale while considering costs.
  - Priority Area 2: Routine viral load monitoring with around 2.1 million testing per year by 2025-2026. Strategies include enabling multi-month dispensation and differentiated service delivery and optimal use of public sector viral load testing labs through strategic partnerships.
  - Priority Area 3: New infections prevention. Strategies include a targeted and people-centric approach, leveraging synergy with various Ministries, reaching hard-to-reach and virtual populations, and enhancing coordination with National Health Mission.
  - Priority Area 4: Resource optimization and IT. Strategies include leveraging IT, upskilling existing human resources, social media-driven low-cost IEC, maximizing the outputs of existing institutional mechanisms, private sector engagement, and creating platforms for integrated service delivery.
- The vision of research and evaluation under NACP V was to bring in global evidence on newer approaches and strategies in the prevention and control of HIV/AIDS; generate robust scientific evidence customized to local context and settings for feasibility and learnings before introduction and scale-up in the National programme.
- Following were the identified research areas for S&E:
  - Characterization of at-risk population groups.
  - HIV epidemic among adolescents and young.
  - Characterization of female to male transgender people.

- Prevalence of HIV, STIs and related co-morbidities among HRG operating through virtual platforms.
- To inform the HIV estimations process, a proposal was made to conduct research on fertility and breastfeeding patterns among HIV positive women.
  - MTCT of HIV probabilities.
  - HIV progression and mortality with and without ART.
  - Impact of aging HIV/AIDS epidemic.

- The priority area for research under NACP also included:
  - New prevention strategies and models.
  - Approaches to reach out to at-risk populations.
  - Approaches to identifying and estimating populations/networks operating on virtual platforms.
  - Understanding shifting identities - MSM population (Kothi) to transgender population.
  - Understanding vulnerabilities among female migrant populations.
  - Understanding mechanism to ensure care continuum among bridge populations while on move/ during mobility.
  - Strategies to improve and optimize Opioid Substitution Therapy (OST) adherence among IDUs.
  - Differentiated prevention and treatment models of service delivery.
  - Strategies to plug linkage loss from F-ICTC to ICTC to ART.
  - Early markers of NCDs among those who have started ART.
  - Mental health needs among PLHIV and their influence on treatment and adherence.
  - Approaches and strategies to address stigma and discrimination among HRG and PLHIV.
  - Impact of colliding epidemics — gaps with change in approaches, what needs to be done to maintain/augment HIV services and uptake among key populations and PLHIV.

- Regarding the implementation mechanism, it would include both central and State-levels. Collaboration with the Network of Indian Institutes on HIV/AIDS Research (NIIHAR) institutes and synergies with the nodal department within and outside Ministries would be fundamental while leveraging support from partners for innovations and pilots. Resource allocation for research activities would be covered under the domestic budget. There would also be due to compliance to set National approvals and review processes as instituted by NACO. For the implementation, institutes would be formally engaged.

Areas for consideration

The panellists complemented NACO for the comprehensive proposal and framework for research priorities under NACP. Following were a few points suggested.

- In recent years, there have been rapid changes in HIV policies across the globe like Test and Treat, Differentiated Delivery Model, Pre-Exposure Prophylaxis etc. These policy changes are usually grounded in strong clinical trial data. However, implementation science research and operational effectiveness evaluation to look into the impact of these policies in real-world settings are less common. Nevertheless, the real-world evaluation of the effectiveness and impact of these policies is critically important for epidemic control.
- The programme may initiate the research urgently among the adolescents, especially in Mizoram and other North-eastern States where HIV/AIDS epidemic is rapidly escalating. These populations are not covered in IBBS or in the regular programme; hence, it would be important to initiate research in these population groups to identify the risk factor and work with these adolescent populations keeping them HIV negative. Adolescents' key population may be studied as an exclusive group. A policy on the ethics of research among adolescents may be formulated to facilitate research among adolescents.

- Ageing and HIV would be another critical research area for NACP. PLHIV are living longer with ART. Indians are predisposed to diabetes, cholesterol disorders etc. and interactions between HIV and these diseases are something that has not been studied yet. Establishing a longitudinal cohort across the different ART centres to look into non-communicable diseases, cancer, is a very critical research area going forward.
- NACO has started to work with the integrated model. An evaluation may be undertaken to see the previous and after impact for the integrated model.
- Monitoring of drug-resistant STIs is something that NACO may consider as one of the research priorities. There is a rapid rise in drug-resistant Gonorrhea, Chlamydia in other parts of the world which may affect the policies like PrEP etc. Given the context, monitoring of drug-resistant STIs shall be considered as a key priority area.
- COVID-19 and HIV are areas that would be of programmatic relevance in the coming years. Establishing cohorts to look into the risk of COVID-19 acquisition, progression, vaccination response, especially among PLHIV, would be extremely relevant for making an informed decision.
- Implementation research into the home-based ARV care may be another area of consideration for the programme. The model may not only facilitate the decentralization but also enhance convenience for the patients which may lead to better retention. With piloting of DBS, models may be tested for delivery of complete care package in household set-up.
- The future of treatment and prevention is of long-acting formulations. India may consider conducting studies proactively to assess the acceptability, feasibility, efficacy etc. of the long-acting formulations in a very timely manner.
- Looking into machine learning and predictive analysis is the future where the target audience may be characterized into different risk categories based on the patients' attributes. The programme may consider building machine learning, predictive analysis etc. as a crucial component of SOCH.
- Study on behaviour and socio-cultural factors that may affect HIV prevention, testing, care and treatment may be other areas that NACO may consider undertaking.
- Models on technological interventions to address the adherence issues and structural barriers may also be considered as a part of the research priority under NACP.
- There are high-risk population groups which are not necessarily well defined and acknowledged under the NACP. For example, male sex workers. Generating evidence on these population groups may help the programme to expand the services to the newer population group.
- While NACO offers free life-long ART services, there are out-of-pocket likely expenditures on availing of these services. Similarly, there are issues of violence, stigma, debt etc. Understanding these aspects will help the programme to design a holistic and integrated package of services.
- The inclusion of the female-to-male transgender population as one of the research priority groups is a very progressing concept. Qualitative formative research may be initiated in the group to inform the research hypothesis.
- A study among long-term ART survivors and positive prevention has not been explored much, including for HIV and malignancies. Studies may be undertaken on these topics as a part of NACO research priorities.
- There was an opportunity to build the capacity of SACS so that they could conduct/support local research studies.
- There are indications of rising epidemics in States like Bihar, Uttar Pradesh etc. Implementation research in this area may help NACO to formulate a suitable model to respond to the epidemic in these States.
- Take-home doses have been rolled out under NACP in the recent past. Evaluation studies of these initiatives may inform the programme about their effectiveness.

India has played a leadership role in making HIV medicines available across the world. HIV vaccine is another aspect where NACO may take a pioneering role.

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SESSION -10

MORTALITY SURVEILLANCE

Chairs	Dr Arvind Pandey, National Chair (Medical Statistics), ICMR and Dr R S Gupta, Sr Public Health Expert
Moderator	Dr Bhawani Singh, NACO and Dr Rajatashruva Adhikary, WHO India
Panelists	Dr Manish Bamrotiya, JHU India; Dr B Rewari, WHO-SEARO; Dr Monita Patel, CDC Atlanta; Dr Manoj Pardesi, NCPI Plus; Dr Chinmoyee Das, NACO
Presenter	Dr Kirtan Rana, PGIMER Chandigarh

Session objective:

To seek guidance on the proposed technical framework of Mortality Surveillance under NACP.

Key components of the presentation:

Mortality Surveillance was a critical component of the IESE under NACP. Mortality Surveillance would complement the existing modelled annual AIDS-related deaths estimates among PLHIV by providing population-level cause-of-death statistics and by triangulating the magnitude of the mortality estimates. Specifically, the Mortality Surveillance aims to provide the cause structure of mortality among PLHIV and estimate the magnitude of AIDS-related deaths.

- HIV mortality was being recorded by the ART centres. By March 2020, around 63% of the total estimated PLHIV were linked to ART implying that more than one third of estimated PLHIV were not linked anywhere. They may be at high risk of dying in absence of ART and this could contribute to HIV mortality to a large extent.
- Other sources of information would be Civil Registration System (CRS), MCCD, Sample Registration System (SRS), VA among relatives and family members of the deceased to complement medical certification of death. SOCH platform can generate valuable information about HIV patients which could help determine the cause of death.
- The Mortality Surveillance under the NACP was proposed to follow a two-pronged strategy. This would include (i) VA with family members and/or caregivers of the deceased PLHIV using a structured questionnaire to elicit signs and symptoms and other pertinent information to assign a probable underlying cause of death, and (ii) analysis of published MCCD to estimate the magnitude of the AIDS-related deaths.
- In terms of the method, it was proposed that the HIV Mortality Surveillance would be carried out by RIs in the States/ Union Territories under them. The sample size for each RI would be 1,100 AIDS-related deaths. The sample size would be selected in such a way that it represents the burden of AIDS-related deaths among PLHIV in States under that RI. The time duration for HIV Mortality Surveillance would be on annual basis. Consecutive sampling method to be adopted for completing the sample size.
- In terms of the implementation structure, HIV Mortality Surveillance would be implemented by all RIs through SACS. All ART centres under these RIs would be the data source point for deaths and LFU for this HIV Mortality Surveillance. Training would be imparted to the personnel for identifying appropriate respondents for the interview

Coordination with the existing mortality reporting system would facilitate a faster learning curve for the proposed system.

and for assigning the cause of death to VAs in the context of HIV-related deaths. Data would be collected by the ART care coordinator (interviewer) after taking written informed consent from the informant (next to kin) and explaining to them the objective of the Surveillance in the local language. The interviewer would ensure the informant's autonomy to freely choose his/her participation in the Surveillance.

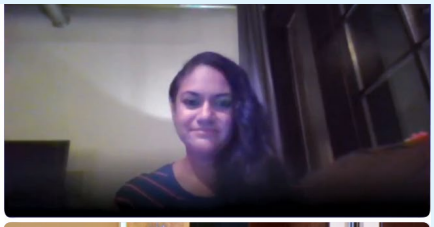
Areas for consideration

Mortality Surveillance was an important inclusion to the S&E plan under NACP to assess the impact of interventions under NACP and a step in the right direction. Following were key points suggested by the panellists.

- Analysis of death certificates is a key component of the proposed Mortality Surveillance system. However, most of the time, death certificates are not available. Sometimes, the death certificate is just the death registration as in the CRS and not MCCD. In some of the cases where MCCD is available, this would be mostly pertaining to the immediate cause of death, i.e cardio-pulmonary failures. In view of these potential limitations, analysis of indoor case sheets or the last discharge card would be more useful to inform the cause of death. Partnering with the Centre of Excellence under the ART programme may help the analysis of indoor case sheets or the last discharge card.
- Sample size may be calculated based on the caseload for a region. For example, the sample size for the States or regions like Maharashtra or Andhra Pradesh may be different from that of the whole of the northeast. The sample size and design may also consider providing the estimates/cause of deaths by sub-population groups. Also, the Link ART Centre may be included as a subset to understand the mortality patterns there.
- There are opportunities available in the SOCH platform to inform the Mortality Surveillance. The same may be fully explored and utilized.
- The framework may consider using of latest WHO 2020 tool for VA. The tool covers the COVID-19 also and hence would be more relevant in the current context.
- The VA tool needs to be complemented by an additional tool or linked with the 'White Card' to provide more insights into the issues that may have led to mortality among PLHIV like delayed diagnosis, baseline CD4, poor adherence, progress in terms of cascade when the death occurred, lifestyle behaviours etc. A pilot testing of tools may be undertaken. While analysing, the issues like poor adherence, need to be carefully dissected whether they were the cause or effect.
- Coordination with the existing mortality reporting system would facilitate a faster learning curve for the proposed system. For example, the Visceral Leishmaniasis programme, maternal health programme etc. also have established mechanisms for VA that may help the Mortality Surveillance system.
- The source of information for VA may also include peer educators or outreach workers as information gathering from friends or family may be challenging. As peer educators or outreach workers find out and report the deaths, some information may be collected at that stage by PE/ORW to inform the relevant circumstances around the death. Also, capacity-building of PE/ORW/care coordinator to implement the VA would be critical for quality data collection.

- Most of the time PLHIV White Card, Green Book, other case reports etc. are or are not available. Given the circumstances, a guidance note on document management of death cases may be helpful.
- Linking the indoor department with ART centres would also provide a very good handle for Mortality Surveillance. At least in cases where deaths are happening in indoor settings, this linking would be very useful.
- The technical framework may consider providing the cause of death by gender.
- There are sensitivities about HIV/AIDS in general. Deaths among PLHIV is a much more sensitive and confidentiality issue and sometimes the relatives do not want to identify themselves with such events. In such cases, perhaps an anonymised online survey may be considered as a part of the data collection for a high response rate.
- The framework appears to focus on mortality among PLHIV who were already on ART or initiated on ART. The framework may consider including the mortality among PLHIV who were already detected HIV positive but not initiated on ART.
- The technical framework may be piloted in select centres which may be scaled up gradually while accounting for learnings from the pilots.
- In some subsamples, the proposal may consider the comparison of the deaths recorded vis-à-vis VA findings. This will further help to strengthen both components as proposed in the technical framework in the long term.
- The proposal has asked for written informed consent from the relatives. The ethics and necessity for the same may be deliberated upon in view of the sensitivity and confidentiality associated with HIV and also in view of the consent given at the ART centre at the time of the registration.
- There are Medical Colleges with the Community Medicine Department. Each of the Community Medicine Departments usually has a field area. Many of these also participate in the HSS as State Surveillance Team. The technical framework may consider further utilizing these resources for further augmenting the quality of the Mortality Surveillance system. Health and demographic Surveillance systems already established in some of the institutes are other avenues of collaboration.
- As the age of the PLHIV would increase, the attribution of mortality may become weaker. The same needs to be taken into account in the proposed technical framework. Further, the findings need to be reviewed by the service providers at the ART centre concerned to inform and improve the service delivery aspects.

There are sensitivities about HIV/AIDS in general. Deaths among PLHIV is a much more sensitive and confidentiality issue and sometimes the relatives do not want to identify themselves with such events.



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SESSION - 11

DISEASE BURDEN ESTIMATION

Moderator	Dr Bhawna Rao, NACO and Nalini Chandra, UNAIDS India
Chairs	Dr S. Venkatesh, Dte. GHS and Dr Vishnu Vardhan Rao, Director ICMR-NIMS
Presenter	Dr Damodar Sahu, ICMR-NIMS; Dr Pradeep Kumar, NACO
Panelists	Dr Tobi Saidel, WHO Consultant; Dr. Joyce Neal, CDC Atlanta; Mr Taoufik Bakkali, UNAIDS Asia Pacific; Dr John Stover, Avenir Health; Dr Arvind Pandey, Senior Public Health Expert; Dr Chinmoyee Das, NACO

Session objective:

To seek guidance on proposed demographics and epidemic updates for HIV Estimates 2021.

Key components of the presentation:

HIV estimates are a critical component of the S&E initiatives under the NACP. Since 1998 when HIV estimates were first implemented under the NACP, it has remained a critical information source guiding decision-making regarding programme planning. Most recently, the 2019 round of HIV estimates and the 2020 HIV estimates round at the National/State/District-level had been implemented. The next upcoming round of HIV estimates would be the 2021 round. An in-depth presentation was made on the objective and method proposed for implementing the upcoming 2021 round of HIV estimations. Following central points were highlighted.

- The objective was to implement the 2021 round of HIV estimations using the most recent Spectrum software and generate the latest HIV estimates to understand the burden of the HIV epidemic across the country (at the National, State/UT, District-level) focusing on key indicators.
- The latest version of Spectrum software would be used for generating the 2021 round of HIV estimates. In the first step of the process, State and UTs specific models from the 2020 round would be updated and files aggregated for the National results. In the second step, and once State/UT and National estimates have been finalized, the District estimates would be generated. For this, the TRG-approved method would be adhered to which was District sub-epidemic creation in State specific models.
- The key technical considerations for 2021 estimates would be:
  - Updating the demographic projection. The significant update in the demographic projections was last done for the 2012 round of HIV burden estimations with projection extended till 2017 and in 2015 when projection was expended upto 2026. As AIDS response across the globe is being worked out in the context of the 2030 goal of ending AIDS as a public health threat (SDG 3.3), the consideration was to update the demographic projections till 2031 in the 2021 round of Estimation. The source would be the National Commission on Population (Ministry of Health and Family Welfare, MoHFW) population projections for India and major States for the period 2011-2036.
  - Programme data updates would include updating data on PMTCT and ART coverage. The information would be available for select indicators such as

NACO was undertaking a pan-India p-MPSE exercise to update the population size estimates under NACP. There was an opportunity to review and appropriately revise the size estimates under subsequent HIV Estimation rounds.

breastfeeding patterns among HIV positive mothers that could also be inputted to better inform the estimates for MTCT and children living with HIV.

- Regarding the HRG population size estimates, there was growing evidence around the size estimates of the HRG in India through multiple initiatives/studies. Further, NACO was undertaking a pan-India programmatic mapping and population size estimation (p-MPSE) exercise to update the population size estimates under NACP. There was an opportunity to review and appropriately revise the size estimates under subsequent HIV estimations rounds.
- Prevalence data input from HSS and ANC routine testing was critical to the estimations process. For the HIV Estimations 2021, it was anticipated that data from HRG HSS Plus 2021 would be available. The updated data would be critical to update the latest status of the HIV epidemic in the country, in addition to updating ANC routine testing data.
- There was an opportunity to validate the probability of HIV-related mortality among PLHIV on ART/not on ART in the Indian population based on NACO's ART Impact Evaluation Study findings.

- The aim would be to complete the 2021 round of HIV estimates by March 2022.

Areas for consideration

The panellists complemented the presenters for the comprehensive presentation and proposals and iterated a few points as summarised below.

- Complement the process for HIV estimations in India led by NACO and ICMR-NIMS with RI and SACS actively engaging. The collaboration at all levels, including at the District-level with key personnel going forward and in future rounds, is critical especially for validating data inputs, understanding the outputs and using the estimates to inform the programme.
- Capacity building/strengthening on HIV estimates has been a component of the HIV estimations process which needs to be retained and further build upon.
- The quality of data inputs is critical as that would determine the quality of outputs or results. Some mechanisms or initiatives for validating the data inputs could be undertaken.
- In terms of updates to be made in 2021 estimates, the proposal to update demographic inputs, programme data inputs, Surveillance data inputs, and HRG size estimates was acknowledged by all. In addition, the NACO and ICMR-NARI study on ART impact evaluation study could inform the 2021 estimates.
- Migration dynamics, especially considering COVID-19 may need to be looked at granularly and considered for inputting to the model. A new feature in Spectrum software allows users to input migration of PLHIV. It may be difficult to use this feature everywhere but can be considered for a few places.
- There is a provision in Spectrum software to input data on LFU based on a specific definition. The definition of LFU was discussed in the last 2020 round also, and from the programme side, the definition needs revision before considering its input to the model.
- Analysis and dissemination of estimates are critical for ensuring data use for decision-making.


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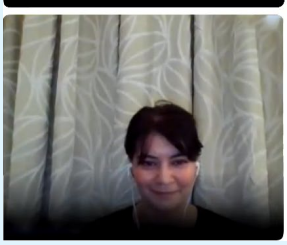

SESSION - 12

DISEASE BURDEN ESTIMATION (CONT.)

Moderator	Dr Srinivas Murthy, NACO and Nalini Chandra, UNAIDS India
Chairs	Dr Arvind Pandey, National Chair (Medical Statistics), ICMR and Dr Keith Sabin, UNAIDS, Geneva
Presenter	Mr Taoufik Bakkali, UNAIDS Asia Pacific; Dr Eline Korenromp, Avenir Health
Panelists	Dr John Stover, Avenir Health; Dr Yujwal Raj, Public Health Expert; Dr Damodar Sahu, ICMR-NIMS; Dr Pradeep Kumar, NACO

Session objective:

To seek guidance on the proposed technical framework for AEM and STI burden estimations.

Key components of the presentation:

Presentations were made on the overview of the AEM and the way forward for its applications in the context of three North-east States. and an overview of Spectrum-based STI burden estimates with deliberations on the way forward for STI burden estimates under NACP in India.

- AEM
  - Globally, AEM is being implemented in many countries in Asia and the Pacific region. AEM is a process model that is useful to inform planning purposes, especially for HRG. It focuses on HRG as critical groups in concentrated epidemics. AEM simulates HIV transmission based on behaviour of HRG. It produces a model tuned to the local situation both behaviourally and epidemiologically.
  - AEM enables the user to (i) estimate/ project incidence and prevalence by HRG and non-HRG men and women; (ii) estimate trends in the distribution of new infections among the various populations and (iii) conduct/use AEM analyses to recommend allocations of resources among HRG for an effective response towards set targets.
  - An overview was provided of how AEM works and all the outputs possible through the use of the model.
  - Strengths of AEM were highlighted as follows: That model was based on programme-relevant inputs usually available in areas with active programmes. AEM captures the time evolution of epidemic and relative contributions of key populations. Users define coverage and effectiveness of programmes based on local data and knowledge. The model would be used for scenario building. It allows modeling programmes and policies cost-benefit and cost-effectiveness. AEM links to Spectrum, allowing it to tie into National and global processes.
  - Weaknesses of the AEM were that the key input requirements were extensive, and trends must be provided over time. The process takes some time for initial data collation, analysis and extraction, especially for historical data. However, India has capacities and a wealth of data over time for most States, so that it could meet AEM's stringent data requirements.
  - Careful analysis would be needed during collation/use of data inputs, and they

AEM would be used for scenario building and it allows for modeling programmes and policies cost-benefit and cost-effectiveness. AEM links to Spectrum, allowing it to tie into National and global processes.

must be representative of the State being modeled, use realistic estimates of coverage and achievable behaviour change. It must be vetted with in-country and in-State experts to gain buy-in.

- Following would be the three broad steps for AEM implementation: (i) Review data needs, initiate data collection and analysis of data to extract trends. (ii) Construct an initial model for vetting by local experts. (iii) Generate policy scenarios, review options, optimize impact.

- STI estimates
  - Globally there are three models available for STI estimation: (i) STI-Spectrum module, (ii) WHO congenital Syphilis tool and (iii) SITE impact tool under development.
  - The STI-Spectrum tool is a statistical model that estimates prevalence and incidence trends in high-risk and lower-risk adults (15 to 49 years) and the National overall population for three infections: Syphilis, Gonorrhea, Chlamydia. The objectives of the tool are to interpret Surveillance data in a systematic, standardised manner, and evaluate historic progress in reducing the burden of STIs (2000-2020). Data requirements for each group estimated are data on STI prevalence from surveys, Surveillance or IBBS.
  - The Congenital Syphilis tool is an Excel spreadsheet that estimates annual Congenital Syphilis cases. The objective of the tool is to estimate Congenital Syphilis case incidence and reporting completeness, 2015-2020, and explore scenarios & coverage targets to eliminate Congenital Syphilis, 2021-2030. Data requirements are the prevalence of active Syphilis in pregnant women (Spectrum-STI trend estimate), the annual number of live births, service provision indicators: ANC-1 attendance, percent of ANC screened for Syphilis, percent of pregnant women found positive during ANC who get adequate treatment, average gestational age at first ANC visit. Global assumptions: Probabilities of developing Adverse Birth Outcomes associated with MTCT of Syphilis.
  - SITE is a dynamic model that simulates adult Syphilis transmission and impact of (prevention, screening and treatment) interventions. It is structured by risk groups/compartments, matching Surveillance data. It is like AEM and Spectrum-goals. Requirements include data on epidemiology, sexual behaviours, group sizes, programme service coverage: 1990-2020, and programme service/intervention coverage targets: 2021 to 2025, for example. The limitation of SITE is that it requires more advanced training and understanding of transmission modelling and Syphilis epidemiology. Moreover, it is in an early version, with no formal fitting process developed yet or automated uncertainty analysis. The user interface (R and R Studio software) is still in the early phase of development.

Areas for consideration

The panellists recognized the value added of AEM and STI-Spectrum modelling tools as presented by the experts. Following were the areas for consideration highlighted during the discussions:

SITE is a dynamic model structured by risk groups/ compartments, matching Surveillance data that simulates adult Syphilis transmission and impact of (prevention, screening and treatment) interventions.

- AEM should not be compared with Spectrum – both are separate tools for separate purposes. AEM can be linked with Spectrum and used instead of EPP as the incidence model.
- The data needs for AEM are large. However, there is rich data available under the programme which must be consolidated and validated before use (and ideally data should not be borrowed from other countries). Data triangulation is required as the data gathering process is undertaken to enable validation and quality assurance.
- TI data was also a good data source, to identify behavioural patterns to be integrated into AEM comparability.
- The latest population size of HRG should be utilized for both Spectrum and AEM.
- A need was highlighted to evolve a set of the validation processes, based on local understanding and other forms of data available.
- It was suggested to pilot AEM in select north-east States and then implement it in other States. A data exploratory exercise may be considered under the AEM implementation in phase I North-East States as a first step. Matrix of data needs and data availability is to be developed.
- AEM is an intensive model but provides lots of policy options and improved disease transmission insights. Thus, as AEM implementation is being planned, it would be good to derive the full benefit from it to estimate/project incidence and prevalence by HRG and non-HRG men and women; estimate trends in the distribution of new infections among the various populations and conduct analysis on intervention effectiveness and recommend allocations of resources among HRG for an effective response towards set targets. Dissemination and use of these data for decision-making at the State-level would be central.
- For STI modelling, STI-Spectrum tool may be piloted in phase I select States by building on the DemProj module, or at the National-level by creating a National model in Spectrum. Similar to the suggestion made for AEM, a data exploratory exercise and a matrix of data needs and data availability need to be developed for the STI-Spectrum tool.
- Capacity-building on the ground level is essential for both AEM and STI-Spectrum tools.


Consolidating the Evidence, Building the Future:
Consultation Meeting on
Integrated and Enhanced Epidemiology
under National AIDS Control Programme in India
27-29 August, 2021, New Delhi
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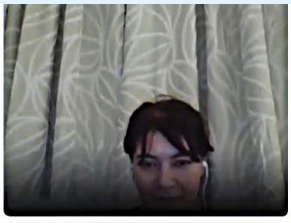
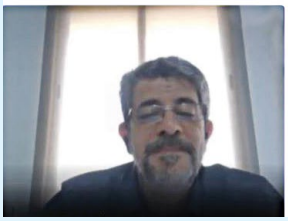
Consolidating the Evidence, Building the Future:
Consultation Meeting on
Integrated and Enhanced Epidemiology
under National AIDS Control Programme in India




Consolidating the Evidence, Building the Future:
Consultation Meeting on
Integrated and Enhanced Epidemiology



IV. PROCEEDINGS OF THE CONCLUDING SESSIONS

SESSION - 13

TO CONSOLIDATE THE PROCEEDINGS AND NEXT STEPS FROM THE WORKSHOP

Moderator	Dr Chinmoyee Das, NACO and Ms Deepika Srivastava Joshi, CDC India
Chair	Shri Alok Saxena, Additional Secretary & Director General (DG), NACO
Co-chair	Dr DCS Reddy, Chair, TWG (S&E)
Presenter	Dr Pradeep Kumar, NACO
Remarks	Dr Sangita Kaul, USAID; Dr Melissa Nyendak, CDC; Dr Rajatashuvra Adhikary, WHO India; Dr Bilali Camara, UNAIDS India; Ms Nidhi Kesarwani, NACO; Dr Shobini Rajan, NACO
Special remarks	Shri Alok Saxena, Additional Secretary & DG, NACO
Vote of thanks and conclusion	Dr Chinmoyee Das, NACO

Theme-wise summary of discussions:

Robust discussions were held during the 12 technical sessions of the three-day National consultation dedicated to specific topics of the NACO IESE plan under the NACP. Proposals were presented and guidance and feedback received for each topic. The following table summarizes in bullet points, the key areas for consideration.

Day – 1 **Technical Session 1:** Current Epidemiological Evidence

- Evidence points to the resurgent epidemic in a few areas, newer population groups at risk.
- Risk behaviour analysis in high priority Districts an identified need.
- For the ability to predict the epidemic in future: Inequalities framework to be included in the S&E initiatives.
- The granularity of the data is available which highlights an epidemic within an epidemic. Analysis of Programme, epidemiological, behavioural data by sub-districts is needed.
- Heterosexual risk behaviours are key to responding to the AIDS epidemic in the majority of places.
- Periodicity and magnitude of the Surveillance activities; cautious approach to the Mortality Surveillance.
- Actions needed to respond to the heterogeneity of the epidemic and jump-starting again towards 2030 SDGs.

Day – 1 **Technical Session 2:** Overview Integrated and Enhanced Surveillance & Epidemiology

- Well-timed framework, support for S&E activities under NACP stronger than ever.
- Empowering the people at the periphery to use the data is critical.
- STI Surveillance and Mortality Surveillance is a welcome step.
- Focus on implementation rigour. Engage Community Medicine Department of Medical Colleges and Community Institutions.
- Discussion on general population Surveillance vis-à-vis HRG Surveillance.
- NACO IT-enabled MIS, DISHA and Sampoorna Suraksha strategy to anchor the National AIDS response.
- Critical to include unreached populations in Surveillance.

Day – 1 **Technical Session 3:** HSS Plus

- HSS Plus to have HIV, Hepatitis B, Hepatitis C and Syphilis as biomarkers.
- Need for kit validation for Syphilis testing on DBS cards.
- Inclusion of treponemal and incidence test and viral load as additional biomarkers.
- The addition of the treponemal test strengthen the Syphilis Surveillance.
- Preliminary study to identify the corrections markers for incidence testing.
- Expansion of sites at sub-district facilities (ANC and prison).
- Data form to collect testing history from clients' registers, Syphilis as additional biomarkers (HRGs).
- Review of definition of migrants and truckers.
- Synergy/convergence between HSS Plus and IBBS-Lite.
- Methodology standardization, laboratory infrastructure strengthening, capacity- building and quality assurance system.
- Recency test as an alert. Piloting of laboratory-based incidence Surveillance in select States and subsequent scale up.
- Need for being strategic in addition of biomarkers on DBS samples.
- Behavioural practices and recency testing in the context of prisons.

Day – 1 **Technical Session 4:** Syphilis Surveillance

- ANC HSS: Addition of treponemal test in RPR positive samples and phase-wise expansion in Districts where sites are only in District headquarters.
- DSRC and Bridge Population TI Sites: Etiologic and Syndromic Surveillance; Serum/DBS (Syphilis), Urine for CT/NG.
- HRG: Etiologic; Serum/DBS (Syphilis), Urine for CT/NG; behavioural data on presumptive treatment
- PLHIV: Etiologic; Serum/DBS (Syphilis), Urine for CT/NG.
- Children: Case reporting for Congenital Syphilis.
- Sentinel sites with adequate representation (approach of being Strategic and starting fast).
- Herpes addition as another biomarker. Advantage of addition of TPHA as an additional test.
- Measuring STIs among MSM, H/TG people in case of urine sample collection; adolescents group added; validation of findings.
- Swab collection.
- Reporting of Congenital Syphilis in HMIS; Individual level data.
- Laboratory infrastructure strengthening, capacity building and quality assurance system.
- Study on validation of Syndromic Diagnosis vis-à-vis Etiologic Diagnosis.

Day – 2 **Technical Session 5:** Integrated Bio-Behavioural Surveillance Survey

- CBSS in general population to be implemented in high prevalence North-eastern States (first in Mizoram). Biomarkers to include HIV, Syphilis, Hepatitis B, Hepatitis C; viral load and CD4 counts; HIV incidence assay.
  - CBSS: To relook at sample size for incidence, viral load suppressions; focus on risk-behaviour network, the elaborate question on drug use parameters, representative design.
- IBBS in HRG: To be implemented in six States every year; 18 States in a cycle of three years. Biomarkers to include HIV, Syphilis, viral load, HIV sub-typing.
  - IBSS in HRG: relook at representativeness, sample size; detailed questionnaire; bridge population; Use of DBS to detect the presence of Lamivudine, drug use, reconsider HIV Sub-typing.
- IBBS among PLHIV: To include incidence assay, Syphilis, Viral Load, CD4; Hepatitis B, Hepatitis C, NCD
  - IBSS in PLHIV: To better define the objective and output, represents PLHIV in ART centre, sexual practices and networks.
- Logistics and capacity-building, kits validation; use of existing labs at ICTC/ART.

Day – 2	**Technical Session 6:** Size Estimation of population: Size estimation of high-risk population operating through virtual platforms

- Apps mapping and community consultations – counting of active online users at virtual hotspots.
- Self-administer respondents interview to profile and assess risk and adjust for duplication.
- Definition as key aspect; need to broaden the definition. Mapping of 'at-risk' population at the virtual platform not confined to any typology.
- The method proposed more suitable for MSM. Need to adapt the method to the specific typology. Network operator model for FSW.
- Use of existing HSS Plus and IBBS to characterize the people operating through virtual platforms.
- Four hundred samples may be distributed across the domains. Have brief questionnaire/tools.
- Community consultation for determining better response rate during the interviews.
- This exercise is not academic but programmatic to link populations with IEC and services.
- Not only urban areas but also the semi-urban areas and rural areas.
- Based on suggestions, firm up the method by the third quarter and pilot in the fourth quarter.

Day – 2	**Technical Session 7:** Size estimation of bridge population at physical locations

- Community consultations and community engagement critical.
- Definition of migrants to be relooked at. A subset may be clients of sex workers.
- Truckers' definition to also be relooked at and include both of the drivers as well as the helpers.
- Opportunity to understand migration patterns among HRGs via this exercise.
- Mapping of the place of work as well as mapping of the place of residence.
- Using of sex workers as key support in size estimation of bridge populations.
- Expansion of mapping among truckers to transportation workers.
- Correction factors for adjusting for duplications.
- The mechanism for revalidations needed.
- Inclusion of railway workers, bus drivers etc. in mapping source and destination Districts.
- Engagement with National Highway Authority for mapping of truckers through Pathway approach.

Day – 2 **Technical Session 8:** Programmatic Case-Based Surveillance

- Case-Based Surveillance is enabled using SOCH.
- Case-Based Surveillance can help describe the HIV epidemic in terms of people, place, and time. Estimate the HIV incidence in select population groups. Detect outbreaks or clusters of infection.
- It can help describe characteristics of people newly diagnosed with HIV, people newly diagnosed with advanced HIV disease or AIDS, and people with HIV who have died and can inform the disease progression in identified HIV positive people.
- Map sentinel events right from the registration to the facility.
- SOCH is a mammoth database that is extremely comprehensive. Its operationalization is the realization of a dream.
- Multi-pronged use of SOCH database for conducting Case-Based Surveillance pertaining to epidemiology, programme and research.
- Partners network to be included in Case-Based Surveillance.
- Exploring of biometric-based personal identifiers.

Day – 2 **Technical Session 9:** Research Priorities

- Topics for research priorities presented in the proposal are okay.
- Suggestion to consider following other priority areas: long term survival study; COVID-19 and HIV.
- HIV vaccine; adolescents KP; operations research on the impact of take-home dose of ART.
- Build capacity of SACS to implement/support local research studies.
- CAB are recommended for implementing research studies. CABs are already part of all activities and recently NACO's EC has been constituted to include more community representation also.

Day – 3 **Technical Session 10:** Mortality Surveillance

- Engage representative ART centres in VA through in-built institution systems.
- Analysis of MCCD.
- Engagement of existing CoE; include Link ART Centres (LAC) as a subset.
- Use updated WHO tool in a harmonized, standardised manner.
- Focus on monitoring MCCD (issue with completeness, case records and discharge reports).
- For VA: Use of ORWs to track the LFUs and early identification of deaths.
- Consent: Written Consent/Oral Consent.
- Data Triangulation: MCCD, SRS, CRS.
- Network of Community Medicine Department to implement the Mortality Surveillance.
- Include TB in the reporting format of Mortality Surveillance.
- Natural history of HIV.

Day – 3 **Technical Session 11:** HIV Burden Estimations

- 2021 HIV estimates round to use the latest Spectrum Tool to generate District, State and National estimates.
- Update the demographic projections till 2031.
- Update the HRG Population Size Estimates.
- Use of ART Impact Evaluation Study to inform the disease progression.
- Completion of 2021 by February 2022.
- Need to update the HRG size estimates given concentrated epidemics.
- Good communication needed to explain the updated HIV estimates and key findings.
- Full utilization of results available via Spectrum to better understand the epidemics.
- Scope to localize the parameters even further: For this research priorities identified.
- The quality of data inputs determine the quality of estimates.
- Local Intelligence is needed for data validation and triangulation of the data from multiple sources.
- Updates: COVID-19 related mortality, Mortality on ART for longer time survival, Incidence Rate Ratio validated through Survey Data, LFU drop out; Web-based version.
- Capacity building to remain an integral component in the process of HIV estimations.

Day – 3 **Technical Session 12:** AIDS Epidemic Model and STI Estimations

- AIDS Epidemic Model:
  - Data-intensive model but provides lots of policy options and improved disease transmission insights.
  - Data available from Size Estimations, Prevalence data, Behavioural Data, Programme coverage data with time trend, 2008-09 HRG size estimates, ANC HSS, NFHS, IBBA, BSS, IBBS, BSS-Lite, NFHS.
  - Consistency in HRG size estimates to be used in Spectrum and AEM.
  - Pilot AEM in phase I State of Mizoram. Develop a matrix of data needs and data availability
  - Capacity Building needed.
- STI Burden Estimation Using Spectrum:
  - Lots of data needed for estimating prevalence and incidence of Syphilis, Gonorrhea, Chlamydia
  - Data availability and contextualization need.
  - STI burden estimation using spectrum to be piloted first.
  - Matrix of data needs and data availability to be developed.
  - There may be a potential issue in understanding the results in initial rounds.
  - Capacity building on the tool.

Conclusion

The NACO integrated and enhanced S&E plan for NACP is very comprehensive. It will provide useful information to inform the programme for achieving the 'End of AIDS Epidemic as a Public Health Threat' by 2030. The next steps would broadly include the following.

- Compendium of concept notes and technical framework for implementation to be updated based on National consultation proceedings.
- Presentation to the TWG.
- Launch implementation of the integrated and enhanced S&E plan under NACP under the guidance of TWG / TRG / ethics approval.
- Convene working groups and other consultations as needed as part of the implementation by a specific area.
- Dissemination of key evidence emerging from the implementation.
- Develop technical reports and scientific papers on methods and findings.

REMARKS BY ADDITIONAL SECRETARY AND DIRECTOR GENERAL, NACO DURING THE CONCLUDING SESSION

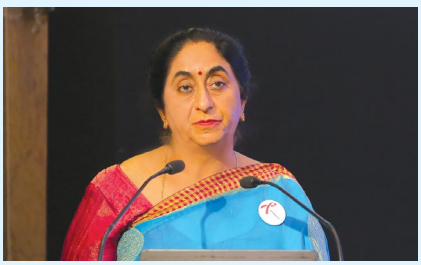
India has made notable progress in AIDS control since 1986 when the first case was detected. Through various evidence-informed initiatives, planned and scaled up under NACP I to NACP IV, we have succeeded in reducing new HIV infections and AIDS-related deaths over the years. But we are yet to achieve critical targets which we have set for ourselves towards 2025 and 2030 'end of AIDS epidemic as a public health threat.' We are at an influx point and there is no room for complacency, as we advance efforts under NACP V.

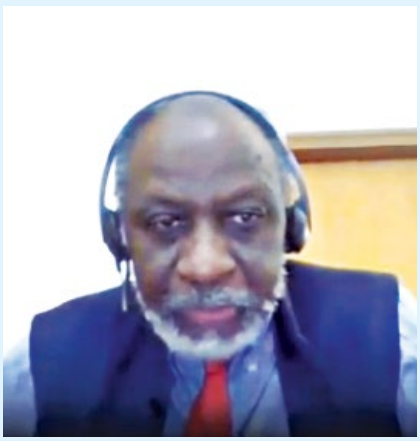
Evidence-informed programme planning has been the hallmark of the NACP. The breadth and depth of evidence made available by S&E under NACP I to IV have evolved by careful design. Considering where the epidemic and response were at the critical juncture of 2020, and what the data needs for the programme are for the next ten years to 2030, we are again at the juncture of refining the S&E framework even further.

The IESE framework under NACP V covers a range of topics that we believe are critical and will provide the needed evidence for programme planning in the 'last mile' towards the end of the AIDS epidemic. Preparing the framework took over two months of planning time, with multiple iterations. We tried to include everything that we need for the next 10 years or for achieving the 2030 target. During this three-day consultation, we have discussed the topics of IESE in-depth and received inputs and suggestions.

We will use this to prepare technical protocols and take the work forward under the guidance of the TWGs and TRGs. The evidence that will be made available under the IESE will serve programme information needs to advance towards global goals.


Consultation Meeting






PEPFAR


27-29 August,
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Consolidating the Evidence, Building the Future:
Consultation Meeting on
Integrated and Enhanced Epidemiology
under National AIDS Control Programme in India
27-29 August, 2021, New Delhi

I. ANNEXURES: AGENDA

Consolidating the Evidence, Building the Future: Consultation Meeting on Integrated and Enhanced Epidemiology under National AIDS and STD Control Programme in India

Venue: Ballroom, Hotel Shangri-La Eros, Ashoka Road, New Delhi-110001, India 27-29 August 2021

9:00 - 10:00	Registration	
Day 1: **Technical Session 1: Current Epidemiological Evidence** **Session Objectives: Level and Trends of HIV Epidemic in India and programmatic implications there of** **Session Chairs:** (i) Shri Alok Saxena, Additional Secretary & Director General, NACO; (ii) Dr Sanjay Mehendale, Former Addl. Director General, ICMR; (iii) Dr DCS Reddy, Former HoD, Dept. of Community Medicine, Institute of Medical Sciences, BHU **Moderator:** Dr Chinmoyee Das, NACO		
Time	Title	Presenter
10:00–10:10	Consultation Meeting: Welcome, rationale and expectations	Dr Chinmoyee Das, NACO
10:10–10:40	HIV Epidemiology in NACP-IV and the next phase: Providing evidence towards fast-tracking the responses to 2030 ENDGAME	Dr Pradeep Kumar, NACO
10:40–11:20	Take away for the next phase of the National AIDS and STD Control Programme	Mr Taoufik Bakkali, UNAIDS Asia Pacific Dr Vishnu Vardhan Rao, ICMR-NIMS Dr Sanjay Rai, AIIMS-New Delhi Dr Subhasish K. Guha, STM-Kolkata Dr Rajatashuvra Adhikary, WHO India Dr Sangita Kaul, USAID India Dr Melissa Nyendak, CDC India Dr Samiran Panda, ICMR Dr Bilali Camara, UNAIDS India
11:20–11:30	Summary of the discussions	Dr Chinmoyee Das
11:30–11:45	Guidance on the implications for next phase of NACP	Dr DCS Reddy Dr Sanjay Mehendale Shri Alok Saxena
11:45–12:15	Group photo followed by Tea	
Day 1: **Technical Session 2: Integrated and Enhanced Surveillance & Epidemiology Under NACP** **Session Objectives: To provide an overview of the Integrated and Enhanced Surveillance & Epidemiology Under NACP** **Session Chairs:** Smt. Arti Ahuja, Addl. Secretary, MoHFW and Dr Mohammed Shaukat, Senior Public Health Expert **Moderators:** Dr Chinmoyee Das, NACO and Dr Marjolein Jacobs, UNAIDS India		
Time	Title	Presenter
12:15–12:45	Integrated and Enhanced Surveillance & Epidemiology Under NACP: The overview	Dr Pradeep Kumar, NACO
12:45–13:15	Remarks from Experts	Dr Tobi Saidel, WHO Consultant Dr Wolfgang Hladik, CDC Atlanta Dr Pretty Pathak, Uttar Pradesh SACS Dr Bilali Camara, UNAIDS India Dr DCS Reddy, Senior Public Health Specialist Dr Shobini Rajan, NACO
13:15–13:30	Summary of discussions and key takeaway	Dr Mohammed Shaukat Smt. Arti Ahuja
13:30–14:30	Group photo followed by Lunch	

Day 1:

Technical Session 3: HSS Plus under NACP
Session Objectives: To seek guidance on potential enhancements augmenting the methodological rigours of HSS Plus
Session Chairs: Dr Bilali Camara, UNAIDS India and Dr Shobini Rajan, NACO
Moderators: Dr Sai Prasad Bhavsar, NACO and Ms Deepika Srivastava Joshi, CDC India

Time	Title	Presenter
14:30–14:45	HSS Plus: The current status and proposed enhancements	Dr Sanjay Rai, AIIMS, New Delhi
14:45–15:30	Discussions and suggestions on the proposal	Dr Rajatashuvra Adhikary, WHO India Mr Taoufik Bakkali, UNAIDS Asia Pacific Dr Thanh Duong, CDC Dr Sumathi Muralidhar, VMCC, New Delhi Dr Sandhya Kabra, NCDC Dr Madhuri Thakar, ICMR-NARI Dr Shanta Dutta, ICMR-NICED Dr Chinmoyee Das, NACO
15:30–15:45	Summary of discussions and key takeaway	Dr Shobini Rajan Dr Bilali Camara
15:45–16:00	Group photo followed by Tea	

Day 1:

Technical Session 4: STI Surveillance under NACP
Session Objectives: To seek guidance on proposed technical framework for STI Surveillance
Session Chairs: Dr DCS Reddy, Former HoD, Dept. of Community Medicine, Institute of Medical Sciences, BHU and Dr Sunil Gupta, Addl. DG, Dte. GHS, MoHFW
Moderator: Dr Bhawna Rao, NACO and Dr Upma Sharma, CDC

Time	Title	Presenter
16:00–16:30	STI Surveillance under NACP: The Technical Framework	Dr Sheela Godbole, ICMR-NARI
16:30–17:00	Discussions and suggestions on the proposal	Dr Tobi Saidel, WHO Consultant Dr Joyce Neal, CDC Atlanta Dr Sumathi Muralidhar, VMCC, New Delhi Dr Manju Bala, NCDC Ms Abhina Aher, Tweet Foundation Dr Chinmoyee Das, NACO
17:00–17:15	Summary of discussions and key takeaway	Dr Sunil Gupta Dr DCS Reddy
17:15–17:30	Summary, Group photo and closure of the day	Dr Pradeep Kumar
19:00–22:00	Reception Dinner	

Day 2:

Technical Session 5: Integrated Bio-Behavioural Surveillance (IBBS)-Lite under NACP
Session Objectives: To seek guidance on proposed technical framework of IBBS-Lite under NACP
Session Chairs: Dr Shashi Kant, AIIMS-New Delhi and Dr Mohammed Shaukat, Senior Public Health Expert
Moderators: Dr Saiprasad Bhavsar, NACO and Dr Anwar Parvez, I-TECH India

Time	Title	Presenter
09:15–09:35	Community-based Surveillance in Mizoram: The Technical Framework	Dr Richard, Mizoram SACS Dr Shreya Jha, AIIMS, New Delhi
09:35–09:55	IBBS-Lite among the HRG and Bridge population: The Technical Framework	Dr Shanta Dutta, ICMR-NICED
09:55–10:15	IBBS-Lite among the PLHIV: The Technical Framework	Dr A Elangovan, ICMR-NIE
10:15–10:45	Discussions and suggestions on proposals	Dr Sunil Solomon, JHU Mr Taoufik Bakkali, UNAIDS Asia Pacific Dr H. Sanyama Devi, RIMS Dr Madhuri Thakar, ICMR-NARI Dr Rajatashuvra Adhikary, WHO India Dr Atul Ambekar, AIIMS, New Delhi Dr Chinmoyee Das, NACO
10:45–11:00	Summary of discussions and key takeaway	Dr Mohammed Shaukat Dr Shashi Kant
11:00–11:30	Group photo followed by Tea	

Day 2:

Technical Session 6: Size estimation of high-risk population operating through virtual platforms
Session Objectives: To seek guidance on the proposed technical framework for high-risk populations operating through virtual platforms
Session Chairs: Dr Samiran Panda, ICMR and Dr Shobini Rajan, NACO
Moderators: Dr Bhawani Singh, NACO and Shri Aditya Singh, JHU India

Time	**Title**	**Presenter**
11:30–11:50	Size estimation of HRGs operating through virtual platforms	Dr Pradeep Kumar, NACO
11:50–12:30	Discussions and suggestions on the proposal	Ms Purvi Shah, UNAIDS and WHO Mr Taoufik Bakkali, UNAIDS Asia Pacific Dr Mukta Sharma, WHO-SEARO Dr Abu Abdul-Quader, CDC Dr JK Mishra, Delhi SACS Mr Murugesan S, The Humsafar Trust Dr Shajy Isac, IHAT Ms Vinita Verma, NACO Dr Chinmoyee Das, NACO
12:30–12:45	Summary of discussions and key takeaway	Dr Shobini Rajan Dr Samiran Panda
12:45–13:30	Group photo followed by Lunch	

Day 2:

Technical Session 7: Size estimation of bridge population at physical locations
Session Objectives: To seek guidance on the proposed technical framework for Size estimation of bridge population at physical locations
Session Chairs: Dr Arvind Pandey, National Chair (Medical Statistics), ICMR and Dr Anoop Kumar Puri, NACO
Moderators: Dr Sai Prasad Bhavsar and Ms Sukhvinder Kaur, USAID India

Time	Title	Presenter
13:30–13:50	Size estimation of bridge population at physical locations	Dr Pradeep Kumar, NACO
13:50–14:20	Discussions and suggestions on the proposal	Dr Keith Sabin, UNAIDS, Geneva Dr Abu Abdul-Quader, CDC Dr S K Singh, IIPS, Mumbai Ms Deepika Joshi, CDC India Dr Damodar Sahu, ICMR-NIMS, New Delhi Dr Chinmoyee Das, NACO
14:20–14:35	Summary of discussions and key takeaway	Dr Anoop Kumar Puri Dr Arvind Pandey
14:35–14:40	Session Break	

Day 2:

Technical Session 8: Programme-based epidemic Surveillance (Case-Based Surveillance)
Session Objectives: To seek guidance on the proposed technical framework for Programme-based epidemic Surveillance
Session Chairs: Dr DCS Reddy, Former HoD, Dept. of Community Medicine, BHU and Dr Naresh Goel, NACO
Moderators: Dr Bhawna Rao, NACO and Dr Asha Hegde, PATH

Time	Title	Presenter
14:40–15:00	Use of the IT-enabled integrated MIS for epidemic monitoring: The concept note	Dr Pradeep Kumar, NACO
15:00–15:30	Discussions and suggestions on proposals	Dr Tobi Saidel, WHO Consultant Dr Daniel Rosen, CDC Atlanta Dr Kimberly Green, PATH Ms Deepika Srivastava Joshi, CDC India Dr Rajesh Kumar, SHSRC, Punjab Dr Chinmoyee Das, NACO
15:30–15:40	Summary of discussions and key takeaway	Dr Naresh Goel Dr DCS Reddy
15:40–16:00	Group photo followed by Tea	

Day 2:

Technical Session 9: Research priorities augmenting epidemic monitoring under NACP
Session Objectives: To identify the research priorities strengthening the S&E under NACP
Session Chairs: Dr Raman Gangakhedkar, Former HoD-ECD, ICMR and Dr. S Sundararaman, Public Health Strategist
Moderators: Dr Srinivas Murthy, NACO and Dr Marjolein Jacobs, UNAIDS India

Time	Title	Presenter
16:00–16:20	Research priorities for HIV S&E under NACP: The need	Ms Vinita Verma, NACO
16:20–16:50	Epidemiological research priorities: Stakeholder's perspectives	Dr Jeff Lane, University of Washington Dr Sunil Solomon, JHU Dr Shruta Rawat, The Humsafar Trust Dr Venkatesan Chakrapani, C-SHaRP, Chennai Dr Seema Sahay, ICMR-NARI, Pune Dr Chinmoyee Das, NACO
16:50–17:05	Summary of discussions and key takeaway	Dr S Sundararaman Dr Raman Gangakhedkar
17:05–17:15	Summary of the day, and closure	Dr Pradeep Kumar, NACO

Day 3:

Technical Session 10: Mortality Surveillance
Session Objectives: To seek guidance on the proposed technical framework of Mortality Surveillance under NACP
Session Chairs: Dr Arvind Pandey, National Chair (Medical Statistics), ICMR and Dr R S Gupta, Sr Public Health Expert
Moderators: Dr Bhawani Singh, NACO and Dr Rajatashruva Adhikary, WHO India

Time	Title	Presenter
09:30–09:50	Mortality Surveillance under NACP: The Technical Framework	Dr PVM Lakshmi, PGIMER Chandigarh
09:50–10:20	Discussions and suggestions on the proposal	Dr Manish Bamrotiya, JHU India Dr B B Rewari, WHO-SEARO Dr Monita Patel, CDC Atlanta Dr Manoj Pardeshi, NCPI Plus Dr Chinmoyee Das, NACO
10:20–10:35	Summary of discussions and key takeaway	Dr R S Gupta Dr Arvind Pandey
10:35–11:00	Group photo followed by Tea	

Day 3:

Technical Session 11: Disease burden estimation
Session Objectives: To seek guidance on proposed demographics and epidemic updates for HIV Estimates 2021
Session Chairs: Dr S. Venkatesh, Dte.GHS and Dr Vishnu Vardhan Rao, Director ICMR-NIMS
Moderators: Dr Bhawna Rao, NACO and Nalini Chandra, UNAIDS India

Time	Title	Presenter
11:00–11:20	Demographics and Epidemiological updates proposed for HIV Estimations 2021	Dr Damodar Sahu, ICMR-NIMS Dr Pradeep Kumar, NACO
11:30–12:00	Discussions and suggestions on the proposal	Dr. Tobi Saidel, WHO Consultant Dr Joyce Neal, CDC Atlanta Mr Taoufik Bakkali, UNAIDS Asia Pacific Dr John Stover, Avenir Health Dr Arvind Pandey, Senior Public Health Expert Dr Chinmoyee Das, NACO
12:00–12:15	Summary of discussions and key takeaway	Dr Vishnu Vardhan Rao Dr S. Venkatesh

Day 3:

Technical Session 12: Disease burden estimation (Contd.)
Session Objectives: To seek guidance on the proposed technical framework for Asia Epidemic Model and STI burden estimations
Session Chairs: Dr Arvind Pandey, National Chair (Medical Statistics), ICMR and Dr Keith Sabin, UNAIDS, Geneva
Moderators: Dr Srinivas Murthy, NACO and Nalini Chandra, UNAIDS India

Time	Title	Presenter
13:30–14:00	Overview of AEM and way forward for its applications in the context of Mizoram	Mr Taoufik Bakkali, UNAIDS Asia Pacific
14:00–14:30	Overview of Spectrum-based STI burden estimates and way forward for STI burden estimates under NACP in India	Dr Eline Korenromp, Avenir Health
14:30–14:50	Discussions and suggestions on proposals	Dr John Stover, Avenir Health Dr Yujwal Raj, Public Health Expert Dr Damodar Sahu, ICMR-NIMS Dr Pradeep Kumar, NACO
14:50–15:05	Summary of discussions and key takeaway	Dr Keith Sabin Dr Arvind Pandey
15:05–15:30	Group photo followed by Tea	

Day 3:

Concluding Session: **IESE under NACP**
Session Objectives: **To consolidate the proceedings and next steps from the workshop**
Chair: Shri Alok Saxena, Additional Secretary & Director General, NACO
Co-Chair: Dr DCS Reddy, Chair, TWG (S&E)
Moderator: Dr Chinmoyee Das, NACO and Ms Deepika Srivastava Joshi, CDC India

Time	Title	Presenter
15:30–15:50	Theme-wise summary of the discussions	Dr Pradeep Kumar, NACO
15:50–16:10	Remarks	Dr Sangita Kaul, USAID Dr Melissa Nyendak, CDC Dr Rajatashuvra Adhikary, WHO India Dr Bilali Camara, UNAIDS India Ms Nidhi Kesarwani, NACO Dr Shobini Rajan, NACO
16:10-16:20	Guidance on the Technical Framework and Way Forward	Dr DCS Reddy
16:20–16:35	Special Remarks	Shri JVR Prasada Rao Former Union Secretary, MoHFW, GoI and Special Advisor to WHO, SEARO
16:35–16:55	Consolidating the Evidence, Building the Future: Strategic Directions	Shri Alok Saxena Additional Secretary & DG, NACO
16:55–17:05	Vote of Thanks and Concluding the Workshop	Dr Chinmoyee Das
17:05–17:30	Group photo followed by High Tea	

II. ANNEXURE: PARTICIPANTS LIST

Pre-TWG Meeting on Integrated and Enhanced Surveillance & Epidemiology

List of participants:

1. Sri Alok Saxena, Addl. Secy & DG, NACO
2. Smt Arti Ahuja, Addl. Secy (Health),MoHFW, GoI
3. Dr. DCS Reddy, Chair-TWG, Surveillance & Epidemiology, NACO
4. Dr. Shobini Rajan, Co-Chair, Surveillance & Epidemiology & CMO-SAG, NACO
5. Smt Nidhi Kesarwani, Director, NACO
6. Dr. Chinmoyee Das, HoD - Surveillance & Epidemiology, NACO
7. Mr. A. Majumdar, NICED
8. Mr. A. Verma, MoFFW
9. Dr. Aarti Mane, NARI-Pune
10. Dr. Aarti Tewari, NCDC-New Delhi
11. Ms. Abhina Aher, Tweet Foundation
12. Dr. Abu Abdul-Quader, CDC
13. Mr. Aditya Singh, JHU
14. Mr. Ajit Phalake, PATH
15. Ms. Akansha, PATH
16. Ms. Alka Ahuja, Director-Admin, NACO
17. Dr. Alpana Dange, Humsafar Trust
18. Ms. Amrita Khaitan, NI-AIIMS, DELHI
19. Ms. Anita Guliyani , SI, NACO
20. Dr. Anoop Kumar Puri, DDG, NACO
21. Mr. Anuj Kumar, IT-2,NACO
22. Dr. Anwar Parvez, I-Tech India
23. Mr. Archit Kumar Sinha, CST, NACO
24. Dr. Arvind Kumar, SI, NACO
25. Dr. Arvind Pandey, ICMR
26. Dr. Asha Hegde, PATH India
27. Mr. Ashish Dutt, IT-1,NACO
28. Dr. Atul Ambekar, AIIMS New Delhi
29. Dr. B B Rewari, WHO SEARO
30. Dr. Bilali Camara, Medical Epidemiologist, UNAIDS
31. Ms. Bitra George, FHI 360
32. Dr. Bhawani Singh Kushwaha, DD, NACO
33. Dr. Bhawna Rao, DD, NACO
34. Dr. Brogen Singh Akoijam, RIMS Imphal
35. Ms. Chaitanya Murugudu, PATH
36. Dr. Chandrakanta, PGIMER Chandigarh
37. Ms. Chandra Shekhar Tiwari, Chhattisgarh
38. Ms. Chinmay Laxmeshwar, PATH
39. Mr. Chiranjeev Bhattacharya, UNDP
40. Dr. Damodar Sahu, NIMS
41. Dr. Daniel Rosen, CDC
42. Ms. Davina Canagasabey, PATH
43. Dr. Elangovan. A, NIE-Chennai
44. Dr. Eline Korenromp, UNAIDS
45. Dr. Garima Meena, NARI Pune
46. Ms. Gitanjali Mohanty, MoHFW
47. Dr. Govind Bansal, PMR, NACO
48. Dr. G Suresh Reddy, AIIMS New Delhi
49. Dr. H Sanyama Devi, RIMS-Imphal
50. Mr. Haresh Patel, PATH
51. Mr. Harkesh Dabas, CHA
52. Mr. Ibou Thior, PATH
53. Mr. Intekhab Alam Sheikh, PATH
54. Mr. Janakiram Marimuthu, Tamil Nadu SACS
55. Mr. Jasbir, PATH
56. Mr. Jasvinder Singh, PATH
57. Mr. Jatan Shah, MoFFW
58. Mr. Javeed Lalband, PATH
59. Mr. Jeff Lane, I-Tech India
60. Mr. J.K.Mishra, Delhi JD SACS
61. Mr. Johannes Van Dam, PATH
62. Dr. John Stover, UNAIDS
63. Dr. Joyce Neal, CDC
64. Dr. JVDS OMC - Hyderabad
65. Mr. Kannan Mariyappan, PATH
66. Dr. Keith Sabin, UNAIDS
67. Dr. Kimberly Green, PATH
68. Ms. Kiran Kumar Pulavarthi, PATH
69. Dr. Kirtan Rana, PGIMER-Chandigarh
70. Mr. Karthikeyan M, TI-NACO
71. Mr. Kaushlendra Upadhyay, IT-3,NACO
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79. Mr. Mahesh D, SAATHI
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81. Dr. Maninder Kaur Manihani, CST, NACO
82. Dr. Manish Bamrotiya, JHU

83. Mr. Manish Kumar, Punjab
84. Dr. Manju Bala, NCDC
85. Dr. Manoj Pardeshi, NCPI Plus
86. Ms Mariyam Zainab, SI, NACO
87. Dr. Marjolein Jacobs, UNAIDS
88. Dr. Melissa Nyendak, CDC
89. Dr. Mohammed Shaukat, Senior Public Health Expert
90. Dr. Monita Patel, CDC
91. Dr. Mukta Sharma, WHO
92. Mr. Murugesan Sivasubramanian, Humsafar Trust
93. Ms. Nalini Chandra, UNAIDS
94. Dr. Nandini K Kumar, Bio-Ethics Expert
95. Dr. Nabeel Mangadan Konath, WHO
96. Dr. Naresh Goel, DDG, NACO
97. Mr. Neeraj Jain, PATH
98. Ms. Neha Kapoor, SI, NACO
99. Ms. Nidhi Rawat, IEC, NACO
100. Mr. Nikhil Patil, PATH
101. Dr. Nivedita, CoE/STM Kolkata
102. Mr. Pankaj Choudhary, NE Region
103. Mr. Pankaj Pajey, Madhya Pradesh
104. Ms. Partha Haldar, AIIMS New Delhi
105. Dr. Payden, WHO
106. Mr. Philips Loh, PATH
107. Dr. Pradeep Kumar, SI, NACO
108. Mr. Prakash Narwani, Rajasthan
109. Dr. Pramod Deoraj, Maharashtra
110. Dr. Praveen Kumar, Delhi APD
111. Mr. Preeti Kumar, PHFI
112. Dr. Preety Pathak, Uttar Pradesh, SACS
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122. Dr. Rani, Tamil Nadu
123. Ms. Raveena, SI, NACO
124. Dr. Richard CLR Hluna, Mizoram
125. Ms. Rochana Mitra, Alliance India
126. Dr. Roderico H Ofrin, WHO
127. Mr. Rohit Sarkar, TI-NACO
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133. Dr. Sanayaima Hanjabam, RIMS
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151. Mr. Sonu Singh, PATH
152. Dr. Srinivas Murthy, DD, NACO
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162. Dr. Sunil Gupta, Independent Expert
163. Dr. Sunil Solomon, JHU
164. Dr. Sunita Upadhyaya, CDC
165. Mr. Suresh Kunhi Mohammed, World Bank
166. Dr. SK Singh, IIPS
167. Mr. Taoufik Bakkali, UNAIDS
168. Dr. Thanh Duong, CDC
169. Dr. TLN Prasad, STI Specialist
170. Dr. Tobi Saidel, WHO
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175. Dr. Varsha Ranjan, NIMS
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178. Ms. Vinita Verma, SI, NACO
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181. Mr. Yashwinder Singh, HIS
182. Dr. Yujwal Raj, Independent Expert

III. ANNEXURE: CONCEPT NOTES

Concept Note on Epidemiological Evidences under the National AIDS and STD Control Programme (NACP) Phase-IV

Background

A robust S&E has been the foundation stone of government-led efficient and effective National AIDS response since its inception through the NACO in India[1]. During the period of 2012 to 2021 of phase-IV of NACP, a series of S&E activities have provided critical epidemiological evidence on the size of the HRGs, level and trend of the epidemic in different sub-population and disease burden estimates.

In NACP-IV, NACO has implemented five rounds of HSS among pregnant women and two rounds of HSS among HRGs. Inmates at central prison sites were included as a new population group and two rounds of HSS Plus have been implemented among this population group. The inclusion of biomarkers of Hepatitis B and Hepatitis C was done in the 2021 rounds of HSS Plus and is an excellent example of synergy between National public health programmes. NACO also implemented the world's largest community-based IBBS among HRGs in 2014-15. A BSS in 2020 further added to the basket of evidence among HRG under NACP. A white paper on MPSE under NACP provided a road map for size estimates under NACP[2]. Based on the recommendations, World's largest p-MPSE under NACP is under implementation to update the size of HRGs in India[3].

Nationally, the HIV response continues to be extremely successful The new HIV infections declined by 48% between 2010 and 2020 in comparison to the global average of 31%.

HIV estimations exercise crystallized the epidemiological evidence generated under the programme and four rounds of HIV Estimations exercise were implemented in NACP-IV. They included the piloting of the HIV burden estimates in five-States of India using HIV Estimates 2017 and finally scaling it up to 735 Districts of the country using HIV Estimates 2019.

The epidemiological evidence-base thus generated was shared with policymakers, programme managers, epidemiologists and researchers towards design and implementation of the holistic National AIDS response across prevention, testing and treatment spectrum across a range of location and population settings in the form of technical briefs, detailed report and peer-reviewed publications.

Key evidence highlights

1. **New infections and AIDS-related deaths are declining:** Nationally, the HIV response continues to be extremely successful. Nationally, new HIV infections declined by 48% between 2010 and 2020 in comparison to the global average of 31%[4]. Similarly, AIDS-related deaths declined by ARD declined Nationally by almost 82% in comparison to the global average of 42%. As a result, India continues to be a very low HIV prevalence country with an adult prevalence of 0.22%.
2. **The epidemic is highly heterogenic:** The HIV/AIDS epidemic in India continues to be extremely diversified by location and population. The adult prevalence is more than 1% in the three northeastern States. While the prevalence among FSW and MSM has been declining Nationally, the prevalence among IDUs is stable and at a very low level. The evidence indicates a very high level of HIV epidemic among in the Northern, Eastern and North-eastern parts of India with a rising trend in many States[5,6].

3. **Inmates in prison and other closed settings are at higher risk:** The prevalence among inmates in central prison is much higher than in the general population. The prevalence among inmates, especially in States with a high prevalence of HIV among IDU is very high indicating that IDU is perhaps over-represented among the prison population in these States[7].

4. **The drivers vary by States and perhaps by Districts:** Nationally, almost 86% of the epidemic is reported through sexual route followed by injection through infected needles/syringes and parent to child transmission. Less than 1% of total infections are reported to be through the transfusion of infected blood and blood products. However, there are States where 25% or more of the infections are reported to be acquired through sharing of infected needles/syringes[8].

   In some of these States, the transmission is indent driven by a combination of high-risk behaviour in the general population as well as in HRGs and the epidemic would likely persist despite effective programmes for HRGs. In these States, at least 15% of men who had sexual intercourse in the past 12 months had sex with a partner who was neither a spouse nor who lived with the respondent[9].

5. **Low prevalence but high burden States:** There are States in central and eastern India that have low prevalence but have a high burden of PLHIV. Many of these States have an incidence-prevalence ratio of more than 3 and an incidence-mortality ratio of more than 1 indicating that the epidemic is expanding in these States. Effective AIDS response in these States would be vital not only to attain the SDGs but also to ensure the HIV/AIDS epidemic in the country remains under control[4].

6. **There are more HRGs than currently targeted under the programme:** Size estimates are fundamental to any S&E system. Mapping and size estimates under NACP were last done in select urban and peri-urban areas in 2008-2011 and now the p-MPSE is under implementation. However, an analysis of IBBS data has indicated that there are more HRGs than the current estimates of NACP. Using the service multiplier method, the analysis estimated size of FSWs, MSM and IDU are estimated to be as high as 18 lakh, 6 lakh and 4 lakh, respectively[10]. Another study of the magnitude of drug use in India estimated the number of IDUs around 7.5 lakh[11]. There appear to be more IDUs in India than are currently covered under the programme.

Effective AIDS response in these States would be vital not only to attain the SDGs but also to ensure the HIV/ AIDS epidemic in the country remains under control.

7. **The epidemic is ageing:** PLHIV is gradually getting older as a result of better survival with increased uptake of ARV treatment in India[12]. An analysis of 2017 rounds of HIV burden estimations under the NACP projected that the mean age of HIV-infected people will increase from 38.4 years in 2005 to 45.5 years in 2025 with the proportion of HIV-infected people aged 50 years or older increasing from 19% in 2005 to 37% in 2025. This ageing HIV epidemic is anticipated to lead to more non-AIDS morbidities, increased treatment complexity, and an inevitable need for multidisciplinary healthcare services to ensure continued high-quality survival.

8. **The agenda is still unfinished:** While the programme has been extremely successful Nationally, the agenda is still unfinished given the 2030 target of ending the AIDS epidemic as a public health threat. The decline in new HIV infections has been slower than expected with a 48% decline between 2010 and 2020 against the target of 75%. Out of every 100 only 78 know their status (2020 target:- 90%). Among those PLHIV who know their status, only 83% are on ART (2020 target: -90%). And among those who are on ART, only 85% are virally suppressed (2020 target: - 90%). Slightly more than half of the HIV-positive mothers were on ART (2020 target:- 95%). Clearly, despite being a very successful public health response, there is no place for complacency.

9. **The use of granular data will further augment effective and efficient AIDS response:** While the agenda is still unfinished, the locations which need to be focussed under the programme is well recognised. District-level HIV burden estimates have indicated that there are 299 moderate and high priority Districts in the country that comprise 84% of the PLHIV size, 76% of the new infections and 80% of the PMTCT need[13]. Saturating these Districts with a spectrum of HIV prevention-testing-treatment services will provide maximum returns on the investments.

Conclusion

The S&E have provided crucial pieces of evidence not only on the level and trends of the HIV/AIDS epidemic in the country but also on the locations and population groups that need to be focussed on for the effective and efficient AIDS response. The IESE of HIV, STIs and related comorbidities will take the mandate forward in the next phase of NACP anchoring the National AIDS response towards the attainment of 2030 SDG of ending AIDS as a public health threat.

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Concept Note on the Integrated and Enhanced Surveillance & Epidemiology Under National AIDS and STD Control Programme (NACP)

Background

Public health Surveillance is an essential public health function to inform disease prevention and control measures[1,2]. Defined as "ongoing systematic collection, analysis, interpretation and dissemination of health data for the planning, implementation and evaluation of public health action", public health Surveillance not only guides public health policy and strategies but also documents the impact of an intervention or progress towards specified public health targets/goals by providing in-depth insights into the epidemic[3].

In India, HIV Surveillance is one of the first interventions under the National AIDS response. Recognizing the HIV epidemic threat, the ICMR initiated Sero-Surveillance in search of the virus in 1985, detecting the first case of HIV in India in April 1986[4]. This Sero-Surveillance evolved into the HSS, which was first piloted in 1994 and then formalized into the annual Surveillance system in 1998 under the NACP[5].

The yearly HIV Surveillance system under NACP gradually evolved into biennial HSS plus. The 17th round, implemented in 2021, covered eight population groups [pregnant women, SMM, LDT, inmates at central prison sites, FSWs, MSM, H/TG people and IDU collecting bio-behavioural data from almost 5 lakh respondents. The blood specimen is being tested for four bio-markers, i.e. HIV, Syphilis, HBV and Hepatitis C Virus (HCV). The round also collected relevant data on the background characteristics, related knowledge, services uptake and risk behaviours through a focused tool.

HIV Surveillance & Epidemiology in the era of Sustainable Development Goals: The Global Context

The United Nations (UN) launched the SDGs in 2015, setting the global agenda for the next 15 years towards a better and more sustainable future for all[6]. Ending AIDS as a public health threat by 2030, interalia, is one of the targets under SDG 3 towards attaining good health and well being[7]. Epidemiological indicators of prevalence, incidence and mortality by location and population are fundamental to monitor the progress towards the 2030 endgame[8].

WHO's guidelines for second-generation HIV Surveillance provide a framework for the complete Surveillance system to provide high-quality epidemiological data for informed decision-making. This framework for Second-generation Surveillance (SGS) has five components including (i) mapping of HRGs, (ii) HSS, (iii) BSS/IBBS survey, (iv) STD Surveillance and (v) HIV case and mortality reporting.

Integrated and Enhanced Surveillance & Epidemiology under NACP: An Overview

Given the contour of SDGs, global recommendations for comprehensive Surveillance systems and S&E being core to the evidence-driven decision making under the NACP since its inception, NACO has approved a framework for an IESE of HIV, STIs and related comorbidities providing high-quality epidemiological data in a very cost-efficient and cohesive manner maximizing the opportunities available in the existing NACP systems.

The system aims to provide complementing real-time and cross-sectional epidemiological evidence serving macro and micro needs towards meeting SDG goals. Specifically, the system will measure the levels, trends and determinants of prevalence, incidence and mortality of HIV/AIDS, STIs and related co-morbidities using methods of the highest scientific rigor.

The core components of the system have been summarised below:

A. Guiding Principles

a. Adherence to the highest ethical standards.
b. Community owned.
c. Institutional collaboration.
d. Programmatic synergy.
e. Data triangulation.
f. Dissemination for action.

B. Population Group

a. Low-Risk Population: Pregnant Women, General Population.
b. Bridge Population: Truckers, Migrants.
c. HRGs: FSW, MSM, IDU, H/TG and Prisoners.
d. People Living with HIV.

C. Bio-markers

a. HIV: Prevalence, incidence, viral load and CD4.

b. STIs: Syphilis, Neisseria Gonorrhea, Chlaymydia Trachomatis.

c. Related Co-Morbidities: Hepatitis B, Hepatitis C, any other feasible biomarker as identified by the programme.

D. Behaviours

a. Socio-economic-demographic profile.

b. Risk behaviours: Knowledge and practices.

c. Interventions related knowledge and services uptake.

d. Stigma and discrimination.

e. Co-morbidities related risk behaviour.

E. Implementation Setting

a. Facility-based.

b. Community-based.

F. Sampling design

a. Random.

b. Consecutive.

G. Periodicity

a. Cross-sectional annual/bi-ennial Surveillance survey.

b. Ongoing programme based case Surveillance.

H. Implementation framework

a. NACO as the nodal agency for policymaking and technical designs under the guidance of Technical Resource Group-S&E and TWG-S&E.

b. National-level collaboration

i. National Viral Hepatitis Surveillance Programme.

ii. AIIMS, New Delhi: Nodal institute Surveillance & Epidemiology.

iii. ICMR-NIMS, New Delhi: Nodal institute HIV Burden Estimation.

iv. ICMR-NARI, Pune (Apex laboratory for Labs).

v. VMCC and Safdarjung Hospital: Nodal institute STIs Surveillance.

vi. Registrar General of India.

c. Regional Institutes

i. Ten National and Regional institutes of S&E.

ii. Regional STI Centres.

iii. National reference laboratories.

d. State

i. State AIDS Control Society.

ii. Technical Support Unit.

iii. State S&E team.

iv. State reference laboratories.

v. State reference centers.

I. Outcome: Reports and scientific publications on

a. levels, trends and determinants of prevalence, incidence and mortality of HIV/AIDS, STIs and related co-morbidities.

b. Burden indicators.

c. Impact indicators.

d. National core indicators.

e. National priority indicators.

Funding Support

The work will be completely supported by NACO through its approved budgetary framework. Need-based complementing funding to support the participation of outside members will be explored through the partner's funding as and when required.

[1] https://www.who.int/immunization/monitoring_Surveillance/burden/vpd/en/.
[2] Choi BC. The past, present, and future of public health Surveillance. Scientifica. 2012 Jan 1;2012.
[3] http://www.emro.who.int/health-topics/public-health-Surveillance/index.html http://www.emro.who.int/health-topics/public-health-Surveillance/index.html.
[4] Ramachandran P. Surveillance for the HIV infected. Health for the millions. 1991;17(4):15-9.
[5] Lal S. Surveillance of HIV/AIDS epidemic in India. Indian Journal of Community Medicine. 2003;28(1):3.
[6] Maurice J. UN set to change the world with new development goals. The Lancet. 2015 Sep 19;386(9999):1121-4.
[7] Sidibé M, Loures L, Samb B. The UNAIDS 90–90–90 target: a clear choice for ending AIDS and for sustainable health and development. Journal of the International AIDS Society. 2016;19(1).
[8] Ghys PD, Williams BG, Over M, Hallett TB, Godfrey-Faussett P. Epidemiological metrics and benchmarks for a transition in the HIV epidemic. Plos Medicine. 2018 Oct 25;15(10):e1002678.

Concept Note on Surveillance of Sexually Transmitted Infections (STIs) under NACP

Background

STIs are indicative of ongoing unprotected high-risk sexual intercourse. For areas where HIV infection is not well established, the high prevalence of STIs is an early warning of the epidemic potential of HIV from sexual transmission. Given the associations, a comprehensive package of prevention, testing and treatment services for HRGs and the at-risk population is integral to the AIDS response under the NACP. Besides, one of the STIs, i.e. Syphilis is of particular concern for maternal and child health given the commitment towards the elimination of congenital Syphilis. The World Health Organization (WHO) "Global guidance on criteria and processes for validation: EMTCT of HIV and Syphilis (2017)" identifies an impact indicator of 'case rate of congenital Syphilis of 50 or fewer cases per 100,000 live births'.

STD Surveillance is, accordingly, a key component of SGS[1]. Further, WHO in its global health sector strategy on STIs (2016–2021) has linked STI-Surveillance to report the progress on four SDGs pertaining to neonatal and under-5 mortality (SDG 3.2), ending of AIDS epidemic (SDG 3.3), universal access to sexual and reproductive health (SDG 3.7) and universal health coverage including vaccines for all (SDG 3.8)[2]. WHO's updated STI Surveillance guidelines (2012) have outlined four core components: case reporting, prevalence monitoring, etiological Surveillance (primarily Syphilis and Gonorrhea based on diagnostic feasibility), and gonococcal antimicrobial resistance (AMR) monitoring customized to the general, bridge and HRG population[3].

Objectives

Given the context, STI Surveillance has been included as one of the key components of the IESE under the NACP with an objective to monitor the level, trend, and differentials of STIs prevalence in select population groups. Specifically, the system aims to focus on the 'Syphilis' and 'Gonorrhoea' under etiologic Eurveillance and 'Urethral Discharge' and 'Genital Ulcer Disease' under syndromic Surveillance. Other related STIs may be included under the Surveillance depending upon the feasibility.

Method

The STI Surveillance under the IESE will piggy-back existing programme delivery, Surveillance and laboratory networks. The potential key component, as adapted from WHO 2012 guidelines for STI Surveillance, has been presented below:

S No	Population category	Population	Surveillance component	STI	Sample size	Recruitment sites	Recruitment strategy	Remarks
1	General population	Pregnant women	Etiological	Syphilis	400 per site as in HSS	ANC HSS Sites	Consecutive sampling as in HSS	Already in existence with Syphilis as a biomarker. Addition of treponemal test to be explored.
		Sexually active men and women	Etiological Syndromic	Syphilis, Gonorrhoea Chlamydia	400 per site as in HSS	DSRCs	Consecutive sampling as in HSS	To be aligned with routine HSS implementation.
2	Bridge population/' at-risk' population	Truckers, Migrants	Etiological	Syphilis, Gonorrhea Chlamydia	250 per site as in HSS	TI Clinics	Consecutive sampling as in HSS Random sampling as in HSS	Cross-Sectional Surveillance Survey already in existence with DBS data markers. Sampling strategy for STI biomarkers to be explored.
3	High-risk group	FSW, MSM, IDU and H/TG						
5	PLHIV	PLHIV	Etiological	Syphilis, Gonorrhoea Chlamydia	Same as in IBBS Lite	ART Clinics	Random sampling as in HSS	The proposed IBBS-Lite among PLHIV is to be piggybacked for STI Surveillance among PLHIV. STI biomarkers and sampling strategy to be worked-out.

Implementation Mechanism

NACO will implement the STI Surveillance through existing programme delivery, Surveillance, and laboratory networks. The technical rigour to the STI Surveillance will be provided through the NACO's TWG-S&E and National and Regional institutes for Surveillance & Epidemiology. The existing structures of Apex Laboratories, RSTRRL and State Reference Centres will be used for testing of the samples for STIs. The epidemiological rigours will be provided by S&E institutes including (i) All India Institute of Medical Sciences (AIIMS-Delhi), (ii) ICMR-National AIDS Research Institute (ICMR-NARI, Pune), (iii) ICMR-National Institute of Epidemiology (ICMR-NIE, Chennai), (iv) Post Graduate Institute of Medical Education and Research (PGIMER, Chandigarh), (v) ICMR-National Institute of Cholera and Enteric Diseases (ICMR-NICED, Kolkata) and (vi) Regional Institute of Medical Sciences (RIMS-Imphal). The process will engage members from multi-lateral partners, SACS and other related stakeholders engaged for S&E under the NACP.

The year 2021-2022 is planned for the preparation and getting necessary approval of the technical framework, operational manuals and ethical considerations.

Timelines

NACO has approved the work plan for STI Surveillance under NACP. Broadly, the year 2021-2022 is planned for the preparation and getting necessary approval of the technical framework, operational manuals and ethical considerations. The year 2021-2022 is planned for implementation. The broad timelines for the same are as below:

S No	Activity	Sub-activity	Timelines	Responsibility
1	Preparation of technical framework	Meeting with all members of the group to brief them about the ToRs and expectations	T_O + Week 3-4	SI-S&E (NACO)
		Preparation and submission of draft zero followed by peer-review	T_O + Week 4-5	SI-S&E (NACO) ICMR-NARI-Pune
		Peer-review	T_O + Week 6-7	VMCC-SH (apex STI Lab) All regional institutes NACO's STI and Lab programme division
		Revision of technical framework based on inputs from peer-review	T_O + Week 7-9	ICMR-NARI-Pune
		Global consultations on the draft framework	T_O + Week 10	SI-S&E (NACO)
		Revision of technical framework based on inputs from a global consultation	T_O + Week 10-12	ICMR-NARI-Pune
		Presentation of technical framework to NACO's TWG (S&E)	T_O + Week 13	SI-S&E (NACO) ICMR-NARI-Pune
		Revision of technical framework based on inputs from TWG	T_O + Week 13-15	ICMR-NARI-Pune
		Presentation of technical framework to NACO's TRG (S&E)	T_O + Week 16-20	SI-S&E (NACO) ICMR-NARI-Pune
2	Appraisal of ethical considerations by EC	Presentation to NACO's/AIIMS/ICMR-NARI EC	T_O + Week 16-30	SI-S&E (NACO) ICMR-NARI-Pune
3	Preparation of operational manual	Discussion with ICMR-NARI-Pune and VMCC-SH on operational manual	T_O + Week 16-30	S&E (NACO)
		Submission of draft zero and peer-review	T_O + Week 30	ICMR-NARI-Pune
		Firming-up and submission to NACO.	T_O + Week 34	ICMR-NARI-Pune
4	Implementation of STI Surveillance	Letter to SACS regarding preparatory activities	T_O + Week 15-30	Data collection timeline to be worked-out to align with 2022-23 round of Surveillance
		Technical on-boarding meeting with SACS	T_O + Week 34-40	SI-S&E (NACO) AIIMS-New Delhi ICMR-NARI-Pune All other regional institutes VMCC-SH (Apex STI Lab)
		Training of the Surveillance sites personnels	T_O + Week 40-52	Labs concerned under the guidance of SACS.
		Field data collection initiation.	T_O + Week 52-90	SI-S&E (NACO) All regional institutes.
		Monitoring of field work	T_O + Week 52-90	SI-S&E (NACO) ICMR-NARI-Pune VMCC-SH (Apex STI Lab)
		Testing of samples	T_O + Week 54-96	Labs concerned under the guidance of SACS
		Data management	T_O + Week 54-96	SI-S&E (NACO) All regional institutes.
5	Data analysis, reports, papers	Technical briefs, scientific papers	T_O + Week 90-104	SI-S&E (NACO) ICMR-NARI-Pune VMCC-SH (Apex STI Lab).

Funding Support

The activity will be completely implemented with NACO's domestic budget for Surveillance and Epidemiological activities. Budget norms for the same have been defined and will be included in the action plan of SACS in FY 2022-2023. National and Regional institutes of S&E will be providing the technical guidance to STI Surveillance as per their approved action plan in memorandum of understanding.

Outcome

- Estimates on the magnitude and directions of the STI epidemic in India by State/UT.

Products

- Technical Reports
- Scientific papers

[1] UNAIDS/WHO. Guidelines for second generation HIV Surveillance: an update: know your epidemic. Geneva, UNAIDS/ WHO, 2013.
[2] CWorld Health Organization. Global health sector strategy on sexually transmitted infections 2016–2021. Towards ending STIs. Report No. WHO/ RHR/16.09, (Geneva, 2016).
[3] WHO. Strategies and laboratory methods for strengthening Surveillance of sexually transmitted infection 2012.Geneva. World Health Organization 2012.

Concept Note on the Integrated Bio-Behavioural Surveillance Surveys among People Living With HIV/AIDS in India

Background

HIV/AIDS epidemic in India is concentrated in nature with an estimated adult prevalence of around 0.22% and an estimated 23.29 lakh PLHIV in 2019[1]. Most of the infections are acquired through the heterosexual route (84-86%) followed by infected syringes and needles (4-6%) and homosexual/bisexual route (2-3%)[2]. Around 90% of infections in the country are through the sexual routes.

As more and more PLHIV are being put on ARV drugs with the adoption of 'Test and Treat' policy and leading a longer life[3], UNAIDS 2025 targets mentioned that 90% of PLHIV shall have access to reproductive and sexual services, communicable diseases, NCD, mental health and other services needed for overall health and well-being[4]. Improved Surveillance among HIV-infected persons, including that for NCDs, has been recommended for integrated care and treatment to PLHIV[5].

The cross-sectional Surveillance system under the NACP in India covered eight population groups pregnant women, migrants, truckers, prisoners, FSW,MSM, H/TG people and IDU). Given the context of UNAIDS 2025 targets and the role-related risk-behaviours, service uptakes as well as co-morbidities among PLHIV, the IESE under NACP has included PLHIV as one of the Surveillance population groups.

Objectives

The goal of the IBBS among PLHIV is to generate evidence on the HIV/AIDS-related behaviours, service uptakes and co-morbidities among PLHIV to support planning for integrated care and treatment to PLHIV. Specifically, IBBS among PLHIV aims to provide evidence on the level and trend of

1. The HIV/AIDS-related behaviours, perceptions and service uptake.
2. Lifestyle behaviours.
3. CD4 level and viral load.
4. Co-morbidities prevalence (TB, Syphilis, Hepatitis B and Hepatitis C).

Method

The IBBS-Lite among PLHIV is proposed as a repeated cross-sectional survey of PLHIV aged 18 year or above. Each round of the activity will be implemented over three years period. For each round, there will be annual rotating cycles where one State will be selected in each of the geographic regions of the country for a given year. Overall, three rounds of IBBS-Lite will be implemented among PLHIV between 2022-2030.

In IBBS-Lite among PLHIV, the representative estimates will be provided at the State and the National-level. The indicator of Syphilis seroprevalence among PLHIV is proposed to be chosen for the sample size calculation. Assuming a Syphilis seroprevalence of 6%[6,7,8,] desired precision at +30% of the assumed prevalence, design effect of 1.7 (assuming multi-stage sampling), response rate at 95% and at 95% confidence interval, the proposed sample size of around 1,200 will be required to provide a robust estimate of Syphilis seroprevalence.

A multi-stage sampling design will be adopted to obtain probability-based estimates. In the first step, one State will be selected in each of the six geographical regions of the country: North, Central, East, North-East, West and South[9]. Once a State is selected, its District will be grouped as per the established administrative/socio-cultural region with an upper limit of up to four groups per State. The grouping will also take into account the availability of ART centres. After doing the regional grouping, one District with an ART centre will be randomly selected in each region. The target sample for each of the ART centres will be allotted based on the proportional contribution of the region in the total estimated PLHIV for the State. At each ART centre, respondents will be selected following a consecutive sampling strategy with up to a maximum of 10 interviews per day (5 interviews per interviewer per day) over a period of 2 months.

Once a respondent is selected, he/she will be administered written informed consent. Bio-behavioural data collection will be done from the consented respondent. The behavioural data collection will be done using a mobile application to ensure efficiency in data management. Whole blood specimens will be collected from the consenting

respondent. The collected specimen will be divided into three sub-specimen for different bio-markers: one whole blood sub-specimen for CD4, one DBS specimen for Syphilis, Hepatitis B and Hepatitis C and viral load. The CD4 testing will be done at the ART centre while DBS samples will be sent to identified SRL/NRL.

Implementation Mechanism and Funding

NACO will implement the activity in six States every year in collaboration with National and Regional institutes for HIV S&E through domestic resources. In each State, a dedicated team of eight research assistants will be placed for a year for implementing IBBS-Lite in various population groups. The team will be supported by four lab technicians for nine months. Two months of the time of the research assistants and lab technicians will be dedicated for IBBS-Lite. The technical and monitoring support will be provided by National and Regional institutes, SACS and Technical Support Units. The process will be implemented under the guidance of NACO's TWG (S&E) and engage bi-lateral/multi-lateral partners and other related stakeholders.

Timelines

NACO has approved the work plan for implementation of IBBS-Lite among PLHIV in India. The objective is to complete the activity in six States by end of FY 2022-2023. The broad timelines for the same are outlines below:

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of operational manual	Discussion with ICMR-NARI-Pune and VMCC-SH on operational manual	T_O + Week 16-30	S&E (NACO)
Preparation of the concept note	July 2021	S&E (NACO)	Care Support & Treatment (CST)-NACO, Lab-NACO
	Firming-up and submission to NACO	T_O + Week 34	ICMR-NARI-Pune
Preparation of the concept note to the National and International experts	August 2021	S&E (NACO)	CST-NACO, Lab-NACO, National and Regional institutes, States/ TSU concerned
Presentation of the technical framework to the NACO's TWG-S&E	September/October 2021	T_O + Week 34-40	SI-S&E (NACO) AIIMS-New Delhi ICMR-NARI-Pune All other regional institutes VMCC-SH (Apex STI Lab)
Presentation of the technical framework to the NACO's TRG-S&E	November 2021	S&E (NACO)	CST-NACO, Lab-NACO
Development of the operational framework	November'21 -January 2022	S&E (NACO)	SI-S&E (NACO) All regional institutes
National-level orientation	January 2022	S&E (NACO)	SI-S&E (NACO) ICMR-NARI-Pune VMCC-SH (Apex STI Lab)
State-level capacity-building	February-April 2022	S&E (NACO)	CST-NACO, Lab-NACO, National and Regional institutes, States/ TSU concerned
Database development	January -April 2022	ICMR-NIE, Chennai	S&E (NACO), CST-NACO, Lab-NACO
Implementation in selected States	May-September 2022	Field team under the guidance of SACS/TSU concerned	S&E (NACO), CST-NACO, Lab-NACO, National and Regional institutes, States/TSU concerned
Analysis of data, presentation to the TWG and TRG	September-March 2022	S&E (NACO)	CST-NACO, Lab-NACO, National and Regional institutes, States/ TSU concerned

Outcome

- Evidence on the HIV/AIDS-related behaviours, service uptakes and co-morbidities among PLHIV to support planning for integrated care and treatment to PLHIV.

Products

- Technical and operational manuals
- Scientific papers

[1] A National AIDS Control Organization & ICMR-National Institute of Medical Statistics (2020). India HIV Estimates 2019: Report. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
[2] National AIDS Control Organization (2020). Sankalak: Status of National AIDS Response (Second edition, 2020). New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
[3] Kumar P, Sahu D, Chandra N, Kumar A, Rajan S. Aging of HIV epidemic in India: Insights from HIV estimation modeling under the National AIDS and STD Control Programme. Indian journal of public health. 2020 Apr 1;64(5):76.
[4] https://www.unaids.org/sites/default/files/2025-AIDS-Targets_en.pdf
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[6] UKhan S, Menezes GA, Dhodapkar R, Harish BN. Seroprevalence of syphilis in patients attending a tertiary care hospital in Southern India. Asian Pacific Journal of Tropical Biomedicine. 2014 Dec 1;4(12):995-7.
[7] Rathod SP, Padhiar B, Shah B. Sexually transmitted infections and human immunodeficiency virus coinfection: Scenario in Western India. Indian Journal of Sexually Transmitted Diseases and AIDS. 2020 Jul;41(2):162.
[8] Sethi S, Mewara A, Hallur V, Prasad A, Sharma K, Raj A. Rising trends of syphilis in a tertiary care center in North India. Indian journal of sexually transmitted diseases and AIDS. 2015 Jul;36(2):140.
[9] National Family Health Survey (NFHS-4). 2015-16. Ministry of Health & Family Welfare and International Institute for Population Sciences.

Concept Note on Community-based Surveillance

Background

HIV Surveillance is one of the first interventions under the National AIDS response in India. Recognizing the HIV epidemic threat, the ICMR initiated the Sero-Surveillance in search of the HIV virus in 1985, detecting the first case of HIV in India in April 1986[1,2]. This Sero-Surveillance evolved into the HSS, which was first piloted in 1994 and then formalized into the annual facility-based HSS in 1998 under the NACP[3]. In 2021, the country is implementing the 17th round of facility-based Sero-Surveillance among eight population groups (pregnant women, SMM LDT inmates in central prisons, FWS, MSM, H/TG people and IDU. as HSS Plus.

CBSS have emerged as one of the key epidemiological tools to inform public health policy[4,5]. Being community-based, these systems can minimize the biases inherent in facility-based systems like those arising from health-seeking behaviours, referral or self-selection etc. The system also has the potential to capture asymptomatic infections. As evident, community-based HIV Surveillance may provide a more robust level and trend of the extent of infection in the Surveillance population. Population-based periodic representative cross-sectional surveys are being implemented in high-prevalence settings to characterise the HIV epidemic at the population level including measuring HIV incidence, HIV prevalence, and viral load suppression among PLHIV[6].

CBSS in high-prevalence States is a critical component of the IESE under the NACP. The high-prevalence States considered for CBSS under IESE are Mizoram, Manipur and Nagaland[7].

Objective

The main objective of the CBSS is to measure the magnitude, directions and determinants of prevalence, incidence, viral load suppression and related aspects for HIV, STIs and related comorbidities at the State level. Specifically, CBSS will:

1. Measure the level, trend and determinants of prevalence/ incidence of HIV/STIs-related co-morbidities incidence and HIV prevalence in the general population.
2. Measure the level, trend and determinants of CD4 counts and HIV viral load among HIV infected people.
3. Measure the level, trend and determinants of HIV/AIDS-related stigma and discrimination in the general population.

Method

The CBSS is proposed as a repeated cross-sectional survey of people aged 18 years or more. Assuming an HIV prevalence of 2%, desired precision at + 30% of the assumed prevalence, design effect of 1.7 (assuming multi-stage sampling), response rate at 90% and at 95% confidence interval, the proposed sample size of around 4,000 will be required to provide a robust estimate of HIV prevalence. Multi-stage sampling design may be adopted to obtain probability-based estimates. The sampling design shall take into account the operational feasibility. The participant shall be recruited only after they have given their consent for participation. Accordingly, CBSS technical protocol including the participant consent form, referral forms etc will be presented to the EC of the Institutes/NACO for perusal and guidance.

Implementation Mechanism

NACO will develop the technical protocol for CBSS along with the AIIMS-New Delhi and RIMS-Imphal. The process will engage members from SACS, multi-lateral partners, State AIDS Control Societies and other related stakeholders engaged for S&E under the NACP. CBSS will be first implemented in Mizoram as a priority State. A budget of Rs 25 lakh has been allotted to the approved annual action plan of Mizoram SACS in FY 2021-2022 for the purpose. The activity will be expanded into the States of Manipur and Nagaland in the next FY (FY2022-2023).

Timelines

NACO has approved the workplan for the development of the technical and operational framework of the activities under the integrated and enhanced plan. The objective is to get the implementation initiated in the last quarter of FY 2020-2021. The broad timelines for the same are as below:

S No	Activity	Sub-activity	Timeline	Responsibility
	Preparation of technical framework	Meeting with all members of the group to brief them about the ToRs and expectations	T_o + Week 3-4	SI-S&E (NACO)
		Preparation and submission of draft zero followed by peer-review	T_o + Week 4-7	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
		Revision of technical framework based on inputs from peer-review	T_o + Week 7-9	AIIMS-New Delhi RIMS-Imphal
		Global consultations on the draft framework	T_o + Week 10	SI-S&E (NACO)
		Revision of technical framework based on inputs from a global consultation	T_o + Week 10-12	AIIMS-New Delhi RIMS-Imphal
		Presentation of technical framework to NACO's TWG (S&E)	T_o + Week 13	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
		Revision of technical framework based on inputs from TWG	T_o + Week 13-15	AIIMS-New Delhi RIMS-Imphal
		Presentation of technical framework to NACO's TRG (S&E)	T_o + Week 16-20	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
3	Appraisal of ethical considerations by EC	Presentation to NACO's EC	T_o + Week 16-24	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
4	Preparation of operational manual	Discussion with AIIMS-New Delhi and RIMS-Imphal on operational manual	T_o + Week 16-20	S&E (NACO)
		Submission of draft zero and peer-review	T_o + Week 16-26	AIIMS-New Delhi RIMS-Imphal
		Firming-up and submission to NACO	T_o + Week 34	AIIMS-New Delhi RIMS-Imphal
5	Implementation of community-based Surveillance (GP)	Letter to SACS regarding preparatory activities	T_o + Week 15-20	
		Technical on-boarding meeting with SACS	T_o + Week 16-20	
		Training of the Field Investigators	T_o + Week 24-28	S&E (NACO)
		Field data collection initiation	T_o + Week 28-44	SACS
		Monitoring of field work	T_o + Week 30-44	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
		Testing of samples	T_o + Week 28-44	SACS
		Data Management	T_o + Week 24-44	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal
6	Data analysis, reports, papers	Technical Briefs, scientific papers	T_o + Week 44-60	SI-S&E (NACO) AIIMS-New Delhi RIMS-Imphal

Funding Support

The work will be completely supported within the already approved NACO's MoU with seven National and Regional institutes for the period 2021-2023. No additional funds will be required from NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partner's funding if required.

Outcome

- Technical and operational manual for community-based Surveillance under NACP.
- Estimates on the magnitude and directions and determinants of prevalence, incidence, viral load suppression and related aspects for HIV, STIs and related comorbidities in State.

Products

- Technical and operational manuals
- Scientific papers

[1] Ramachandran P. Surveillance for the HIV infected. Health for the millions. 1991;17(4):15-9.
[2] Ramachandran P. ICMR's tryst with HIV epidemic in India: 1986-1991. The Indian journal of medical research. 2012;136(1):13.
[3] Lal S. Surveillance of HIV/AIDS epidemic in India. Indian Journal of Community Medicine. 2003;28(1):3.
[4] Kumar, Muthusamy Santhosh, et al. "National Sero-Surveillance to monitor the trend of SARS-CoV-2 infection transmission in India: Protocol for community-based Surveillance." The Indian Journal of Medical Research 151.5 (2020): 419.
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[6] Farahani M, Radin E, Saito S, Sachathep KK, Hladik W, Voetsch D, Auld AF, Balachandra S, Barr BA, Low A, Smart TF. Population viral load, viremia, and recent HIV-1 infections: findings from population-based HIV impact assessments (PHIAs) in Zimbabwe, Malawi, and Zambia. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2021 Aug 1;87:S81-8.
[7] National AIDS Control Organization & ICMR-National Institute of Medical Statistics (2020). India HIV Estimates 2019: Report. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.

Concept Note on the programmatic mapping and population size estimation of HRGs operating through virtual platforms

Background

WHO and the UNAIDS have traditionally categorised HIV/AIDS epidemic into three groups: low-level, concentrated and generalised[1]. Epidemics are defined as "concentrated" if transmission occurs predominantly in clearly defined sub-population groups such as FSW, MSM, IDU and H/TG people. In such epidemics, the future course of the epidemic is determined by the size as well as frequency and links between the highly infected sub-population groups and the general population.

In a concentrated epidemic, knowing the size estimates of this subpopulation which is at more risk than the rest of the population is critical to inform not only the current estimates and future projections of level, trend and magnitude of the epidemic but also for planning and funding the interventions. Recognising the importance of the size estimates, the NACP in India, has undertaken periodic size estimates of FSW, MSM, IDU and H/TG people, collectively referred to as HRGs. The programme also prepared a white paper on MPSE of HRGs in India to provide a roadmap for a structured approach for institutionalised processes[2]. Currently, as per the recommendations of the White Paper, p-MPSE are underway focusing on the population operating at physical locations or through network operators[3].

In the past decade, India has experienced massive growth in internet access. There are over 280 million Facebook users and an estimated 2.7 billion WhatsApp users in India, making it the leading country in terms of Facebook and WhatsApp audience. India ranked second in the world with 88 million Instagram users[4]. The massive internet access in India has not left the key and vulnerable populations untouched. In India, as per the National IBBS 2014-2015, three fourths of FSWs reported using mobile phones to contact their clients[5]. A study in Delhi documented the shift of venue-based locations into the virtual network as a result of the entry of mobile phone-based communication into sex work[6]. Another study in select southern and western States concluded that FSWs, irrespective

Recognising the importance of the size estimates, the NACP in India, has undertaken periodic size estimates of FSW, MSM, IDU and H/TG people, collectively referred to as HRGs.

of their enrolment in targeted HIV prevention interventions (TIs), have already started using Internet-based mobile apps, dating sites, online classifieds to solicit, pick up clients and negotiate rates[7]. Increasingly gay persons, sex workers, as well as many young persons are using internet-based platforms and communication technologies to socialize, seek sexual and romantic partners, and find a sense of community[8,9,10].

Recognizing the evolving pattern, the White Paper recommended undertaking size estimation of the people who engage in high-risk behaviour exclusively on virtual platforms to have a more realistic estimate of HRG in the country. Given the recommendation, MPSE of HRGs operating through virtual platforms has been included as one of the key activities under the IESE under NACP.

Objectives

The broad objective of the activity is to provide size estimates of the HRGs operating through virtual platforms. The specific objectives are to

1) Identify the mobile and internet-based apps used by HRGs to solicit sexual/injecting partners/clients.

2) Estimate the total size of HRGs operating through mobile and internet-based apps.

3) Estimate the size of HRGs operating exclusively through mobile and internet-based apps.

4) Provide the demographic and risk behaviour characteristics of HRGs operating through virtual platforms.

Method

Efforts and literature have been growing on estimating the size estimates of HRGs operating through virtual platforms[2,11,12]. In Kenya, a study to develop the size estimates of MSM who use the internet to find sexual partners followed a three-step approach of mapping of mobile and internet-based apps, estimation of the MSM at these apps and then face-to-face interview of randomly selected MSM from virtual platforms to characterize the respondents as well as to assess the level of duplications[13]. Similar to the approach in Kenya, a study first mapped the mobile and internet-based apps in Viet Nam, counted the active users on these apps as per the predefined schedule and then conducted an online survey using the RDS approach to get the multiplier for the size estimation[14]. Under the 'LINKAGES' project of FHI360 in India, more than one method to estimate the size of HRG operating through a virtual platform was used. In Mumbai, they mapped the active users on the social media platforms by creating a gridwork of geocoordinates (separated by pre-defined distance), setting the geocoordinates of the mapper phone on the gridwork and then counting of active users of the app on the geocoordinates. The project also used the approach of census mapping of all virtual spots and their characterization, which includes estimating the size of the key population at each of the virtual hotspots for virtual peer outreach[2]. An under publication report of ICMR-NARI, funded by WHO, provides preliminary guidelines for mapping, size estimation & risk behaviour survey among HRGs in virtual space.

Given the global and National experiences and objectives of the size estimates of the HRGs operating through virtual platforms under IESE under NACP, the proposed steps have been described:

Step 1: Mapping of mobile and internet-based apps

In the 2021 round of HSS Plus, the data forms have included questions on the websites/mobile applications used by HRGs (FSW, MSM and H/TG people) and bridge population groups to meet their sexual partners (including commercial partners). Analysis of the data from HSS plus 2021 will lead to a comprehensive list of all virtual platforms used by HRGs in India by States/Districts. Community consultations will be done to discuss and detail the list with a specific focus on social media app groups and also to work out the suitable days and times to find active users online on a given app.

This step will result in the identification of the mobile and internet-based apps used by HRGs to solicit sexual/injecting partners/clients in a given District (Objective 1). This will help the programme in designing and implementing interventions for the virtual location.

Step 2: Size estimates of the active population on the mobile and internet-based apps

This will be done through a two-pronged strategy using established structures of community-led targetted Interventions (TI) programme under the NACP.

Under the revamped TI strategy of NACP, p-MPSE is being implemented to map all the physical locations where HRGs are found. The number of online users at these locations will be counted on the predominant mobile applications in the given District based on the predefined schedule of the suitable days and times for 15 days. To minimise the duplication, the hotspots which are at least at a distance of one kilometre from each other will be selected for this mapping. At each of the selected hotspots, the number of active online users within a radius of 500 meters will be counted. various online platform groups, the mapping team will join the groups with the help of the community networks and count the number of active users at a predefined schedule.

This step will result in the size of HRGs operating through mobile and internet-based apps identification of the mobile and internet-based apps used by HRGs to solicit sexual partners /clients in a given District (part Objective 2). However,

this number thus derived will potentially be an overestimate because of the issue of duplications.

Step 3: Sample Survey among the active population on the mobile and internet-based apps

In the third step, interviews will be conducted among the active online users on the predominant mobile applications at each of the mapping locations. For each District, the sample size for the survey is proposed to be around 45,013. The interview team will log in the applications at the randomly selected mapping locations, select the respondents randomly, introduce the mapping exercise, take the consent and interview him/her if consented through a self-administered online survey tool.

The online tool will collect information on socio-demographic profiles (age, education, marital status etc), duplication of accounts, use of other applications, exposure to physical hotspots as well as the history of risk behaviour.

The outcome of the survey will provide an estimate of the active online users who will fall within the programme definition of a HRG based on the history of risk behaviour. The data collected on duplication of accounts and the use of other applications will help to arrive at an adjustment factor to have a de-duplicated estimate (Objective 2). The data collected on exposure to physical locations will help to estimate the size of HRGs operating exclusively through mobile and internet-based apps (Objective 3). Data on socio-demographic profiles and risk behaviour will help to characterise the HRGs operating exclusively through mobile and internet-based apps (Objective 3).

Ethical Considerations

Ethical approval for p-MPSE of HRGs operating through virtual platforms will be obtained from NACO's EC. CABs in the Districts will be leveraged to account for the community perspectives and concerns. Informed consent will be mandatory for the sample survey component. Measures will be put in place to ensure the respondent and data confidentiality that would include no recording of respondent identity or personal identification information. Respondents will be compensated for their time and travel as per the guidance of the NACO's EC.

Community consultations will be done to discuss and detail the list with a specific focus on social media app groups and also to work out the suitable days and times to find active users online on a given app.

Implementation Mechanism

NACO will implement the p-MPSE of HRGs operating through virtual platforms using the existing institutional arrangements in a phase-wise manner. The technical framework will be first presented to the NACO's TWG on S&E and subsequently to the TRG-S&E for their perusal and recommendations. After the methodology is recommended, the activity will be implemented in select States with the probable high volume of HRGs in virtual space based on analysis of HRG HSS Plus 2021 data. The results, learnings and proposed methodological improvements will be presented to the TWG and TRGs and then scaled up in all of the relevant Districts based on analysis of HSS Plus 2021 data. For implementation, the budget available with TI for p-MPSE activities under the programme will be used.

Timelines

The objective is to implement the activity in the first phase States by end of March 2022 and complete the activity in all of the remaining Districts by March 2023. The broad timelines for the same are as below:

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of the concept note including group formation	July 2021	S&E (NACO)	TI-NACO
Presentation of the technical framework to the NACO's TWG-S&E	August 2021	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
Presentation of the technical framework to the NACO's TWG-S&E	September/October 2021	S&E (NACO)	TI-NACO
Presentation of the technical framework to the NACO's TRG-S&E	November 2021	S&E (NACO)	TI-NACO
Development of the operational framework	November 2021	S&E (NACO)	National and Regional institutes concerned
National level orientation	December 2021	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
State-level capacity-building	December/January 2021	TI-NACO, SACS/TSU concerned	S&E (NACO)
Database development	December/January 2021	ICMR-NIE, Chennai	S&E (NACO), TI-NACO,
Implementation in selected States	January-March, 2022	SACS/TSU concerned	S&E (NACO), TI-NACO, National and Regional institutes, States/TSU concerned
Analysis of data, presentation to the TWG and TRG	April-June 2022	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
Scale-up in rest of country as relevant	July 2022-March 2023	SACS/TSU concerned	S&E (NACO), TI-NACO, National and Regional institutes, States/TSU concerned

Outcome

- Size estimates and profile of HRGs operating through virtual platforms.

Products

- Technical and operational manuals
- Technical briefs
- Scientific papers

Concept Note on the programmatic mapping and population size estimation of high-risk migrants

Background

WHO and UNAIDS have traditionally categorised HIV/AIDS epidemic into three groups: low-level, concentrated and generalised[1]. Epidemics are defined as "concentrated" if transmission occurs predominantly in clearly defined sub-population groups such as FSW, MSM, IDUs, and H/TG People. In such epidemics, the future course of the epidemic is determined by the size as well as frequency and links between the highly infected sub-population groups and the general population.

In a concentrated epidemic, knowing the size estimates of this sub-population which is at more risk than the rest of the population is critical not only to inform the current estimates and future projections of level, trend and magnitude of the epidemic but also to plan and fund the interventions. Recognising the importance of the size estimates, the NACP in India, has undertaken periodic size estimates of FSW, MSM, IDU and H/TG people, collectively referred to as HRGs. The programme also prepared a white paper on MPSE of HRGs in India to provide a roadmap for a structured approach for institutionalised processes[2]. Currently, as per the recommendations of the White Paper, the p-MPSE are underway with a focus on the population operating at physical locations or through network operators[3].

In the past decade, India has experienced massive growth in internet access. There are over 280 million Facebook users and an estimated 2.7 billion WhatsApp users in India, making it the leading country in terms of various online platform audience. India ranked second in the world with, 88 million Instagram users[4]. The massive internet access in India has not left the key and vulnerable populations untouched. In India, as per the National IBBS 2014-2015, three fourths of FSWs reported using mobile phones to contact their clients[5]. A study in Delhi documented the shift of venue-based locations into the virtual network as a result of the entry of mobile phone-based communication into sex work[6]. Another study in select southern and western States concluded that FSWs, irrespective of their enrolment in targeted HIV prevention interventions have already started using Internet-based mobile apps, dating sites, online classifieds to solicit, pick up clients and negotiate rates[7].

As per the recommendations of the White Paper, the p-MPSE are underway with a focus on the population operating at physical locations or through network operators.

Gay persons, sex workers, as well as many young persons, are increasingly using different internet-based platforms and communication technologies to socialize, seek sexual and romantic partners, and find a sense of community[8,9,10].

Recognizing the evolving pattern, the White Paper recommended undertaking size estimation of the people who engage in high-risk behaviour exclusively on virtual platforms to have a more realistic estimate of HRG in the country. Given the recommendation, MPSE of HRGs operating through virtual platforms has been included as one of the key activities under the IESE under NACP.

Objectives

The broad objective of the activity is to provide size estimates of the HRGs operating through virtual platforms. The specific objectives are to

1) Identify the mobile and internet-based apps used by HRGs to solicit sexual/injecting partners/ clients.
2) Estimate the total size of HRGs operating through mobile and internet-based apps.
3) Estimate the size of HRGs operating exclusively through mobile and internet-based apps.
4) Provide the demographic and risk behaviours characteristics of HRGs operating through virtual platforms.

Method

Efforts and literature have been growing on estimating the size of HRGs operating through virtual platforms[2,11,12]. In Kenya, a study that aimed to develop the size estimates of MSM who used the internet to find sexual partners followed a three-step approach of mapping of mobile and internet-based apps, estimation of the MSM at these apps and then face-to-face interview of randomly selected MSM from virtual platforms to characterise the respondents as well as to assess the level of duplications[13]. Similar to the approach in Kenya, In Vietnam also, a study first mapped the mobile and internet-based apps, counted the active users on these apps as per the predefined schedule and then did an online survey using RDS approach to get the multiplier for the size estimation[14]. Under the 'LINKAGES' project of FHI360 in India, more than one methods to estimate the size of HRG operating through a virtual platform were used. In Mumbai, India, they mapped the active users on the 'Grindr' App by creating a gridwork of geocoordinates (separated by pre-defined distance), setting the geo-coordinates of the mapper phone on the gridwork and then counting of active users of the app on the geocoordinates. The project also used the approach of census mapping of all virtual spots and their characterization, which includes estimating the size of the key population at each of the virtual hotspots for virtual peer outreach[2]. An under publication report of the ICMR-NARI, funded by WHO, provides preliminary guidelines for mapping, size estimation & risk behaviour survey among key populations in virtual space.

Given the Global and National experiences gained and considering the objectives of the size estimates of the HRGs operating through virtual platforms under IESE under NACP, the proposed steps are described below:

Step 1: Mapping of mobile and internet-based apps.

In the 2021 round of HSS Plus, the data forms have included questions on the websites/mobile applications used by HRGs (FSW, MSM and H/TG people) and bridge population groups to meet their sexual partners (including commercial sex partners). Analysis of the data from HSS plus 2021 will lead to a comprehensive list of all virtual platforms used by HRGs in India by States/Districts. Community consultations will be done to discuss and detail the list with a specific focus on various online platform groups and also to work out the suitable days and times to find active users online on a given app.

Under the 'LINKAGES' project of FHI360 in India, more than one methods to estimate the size of HRG operating through a virtual platform were used.

This step will result in the identification of the mobile and internet-based apps used by HRGs to solicit sexual/injecting partners/clients in a given District (Objective 1). This will help the programme in designing and implementing interventions for the virtual location.

Step 2: Size estimates of the active population on the mobile and internet-based apps.

This will be done through a two-pronged strategy using established structures of community-led TI programme under the NACP.

Under the revamped TI strategy of NACP, p-MPSE is being implemented to map all the physical locations where HRGs are found. The number of online users at these locations will be counted on the predominant mobile applications in the given District based on the predefined schedule of the suitable days and times for 15 days. To minimise the duplication, the hotspots which are at least at a distance of one kilometre from each other will be selected for this mapping. At each of the selected hotspots, the number of active online users within a radius of 500 metres will be counted. various online platform groups, the mapping team will join the groups with the help of the community networks and count the number of active users at a predefined schedule.

This step will result in the size of HRGs operating through mobile and internet-based apps identification of the mobile and internet-based apps used by HRGs to solicit sexual partners /clients in a given District (part Objective 2). However, the number thus derived will potentially be an overestimate because of the issue of duplications.

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In the third step, interviews will be conducted among the active online users on the predominant mobile applications at each of the mapping locations. For each District, the sample size for the survey is proposed to be around 45,013. The interview team will log in the applications at the randomly selected mapping locations, select the respondent randomly, introduce the mapping exercise, take the consent and interview the respondents if consented through a self-administered online survey tool.

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Ethical Considerations

Ethical approval for p-MPSE of HRGs operating through virtual platforms will be obtained from NACO's EC. CABs in the Districts will be leveraged to account for the community perspectives and concerns. Obtaining prior informed consent will be mandatory for the sample survey component. Measures will be put in place to ensure the respondent and data confidentiality that would include no recording of respondent identity or personal identification information. The respondents will be compensated for their time and travel as per the guidance of theNACO's EC.

Implementation Mechanism

NACO will implement the p-MPSE of HRGs operating through virtual platforms using the existing institutional arrangements in a phase-wise manner. The technical framework will be first presented to the NACO's TWG on S&E (S&E) and subsequently to the TRG-S&E for their perusal and recommendations. After the methodology is recommended, the activity will be implemented in select States with the probable high volume of HRGs in virtual space based on analysis of HRG HSS Plus 2021 data. The results, learnings and proposed methodological improvements will be presented to the TWG and TRGs and then scaled up in all of the relevant Districts based on analysis of HSS Plus 2021 data. For implementation, the budget available with TI for p-MPSE activities under the programme will be used.

Timelines

The objective is to implement the activity in the first phase States by end of March 2022 and complete the activity in all of the remaining Districts by March 2023. The broad timelines for the same are as below:

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of the concept note including group formation	July 2021	S&E (NACO)	TI-NACO
Preparation of the concept note to the National and International experts	August 2021	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
Presentation of the technical framework to the NACO's TWG-S&E	September/October 2021	S&E (NACO)	TI-NACO

Presentation of the technical framework to the NACO's TRG-S&E	November 2021	S&E (NACO)	TI-NACO
Development of the operational framework	November 2021	S&E (NACO)	National and Regional institutes concerned
National level orientation	December 2021	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
State-level capacity building	December/January 2021	TI-NACO, SACS/TSU concerned	S&E (NACO)
Database development	December/January 2021	ICMR-NIE, Chennai	S&E (NACO), TI-NACO,
Implementation in selected States	January-March, 2022	SACS/TSU concerned	S&E (NACO), TI-NACO, National and Regional institutes, States/TSU concerned
Analysis of data, presentation to the TWG and TRG	April-June 2022	S&E (NACO)	TI-NACO, National and Regional institutes, States/ TSU concerned
Scale-up in rest of country as relevant	July 2022-March 2023	SACS/TSU concerned	S&E (NACO), TI-NACO, National and Regional institutes, States/TSU concerned

Outcome

- Size estimates and profile of HRGs operating through virtual platforms.

Products/ references

- Technical and operational manuals
- Technical briefs
- Scientific papers

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Concept Note on Programme-based epidemic Surveillance under the National AIDS and STD Control Programme (NACP) in India

Background

WHO defines HIV case Surveillance as reporting of an initial diagnosis of HIV infection and defined sentinel events from every person diagnosed with HIV to a public health agency responsible for the monitoring and controlling the epidemic[1]. As the service data become rigorous, individual-based and in the form of electronic health records, programmatic individual data-based case Surveillance is being advocated as a new and efficient method of epidemiological Surveillance complementing the cross-sectional facility or population based sentinel Surveillance surveys[2,3,4]. Specifically, programmatic individual data-based case Surveillance aims to track six sentinel events, namely HIV diagnosis, entry into care, first CD4 count, initiation of ART, viral suppression and death.

Beneficiary-centric IT-enabled MIS system under NACP

The availability of the individual-level data under NACP has improved tremendously with the investments in routine HMIS[5]. Under the project SOCH, following the principle of One Beneficiary One Database, longitudinal information for each beneficiary is now available, since their registration under NACP across the service delivery points to a central database and is available for epidemiological analysis on key sentinel events since the first HIV test and engagement with HIV care.

The objective of Project SOCH is to create a beneficiary-centric web and mobile-based system, to track and record, beneficiary service and inventory transactions in the National HIV programme to improve service delivery and beneficiary health outcome. The system will capture inventory and service delivery information pertaining to individual beneficiaries throughout the HIV continuum, and creating a centralized repository of EHR (Electronic-Health Record), and facilitate forecasting, inventory planning and clinical decision support. The proposed system will form part of the overall IT landscape of MoHFW, have API-based linkages with other independent MoHFW IT systems that intersect with the HIV continuum.

Given the roll out of beneficiary-centric, IT-enabled MIS system, the IESE of HIV, STIs and related co-morbidities under NACP has included Case-Based Surveillance as a complementing system to cross-sectional Bio-Behavioural Surveillance Surveys (BBSS). The objective of the programmatic Case-Based Surveillance is to augment the insights into the HIV/AIDS epidemic in India using the data generated under the SOCH system. Specifically, programmatic Case-Based Surveillance will:

1. Describe the HIV epidemic in terms of people, place and time.
2. Detect outbreaks or clusters of infection.
3. Describe characteristics of people newly diagnosed with HIV, people newly diagnosed with advanced HIV disease or AIDS, and people with HIV who have died.
4. Inform the disease progression in identified HIV positive people.
5. Inform mathematical model for disease burden estimation.

Key components of programmatic Case-Based Surveillance

A. Sentinel events

B. Population groups

a. HRG and bridge population
   i. HIV positive
   ii. HIV negative
b. Pregnant women
   i. HIV exposed babies
c. At-risk HIV negative clients
   i. DSRC
   ii. ICTC clients
d. All HIV positives identified at ICTC centers

C. Service points capturing sentinel events

a. Targetted Interventions
b. DSRC
c. ICTC
d. Early Infant Diagnosis Centers (for children)
e. ART centres
f. Viral-load laboratories

Events	Definition	Context
Date of Registration in TI/ICTC/DSRC/ EID	Date of first registration in SOCH system with a unique identifier at any of the system.	Describes entry into the NACP prevention and testing system.
First HIV testing	Date of first HIV testing and its result done in a NACO recognized facility.	Helps to identify the individuals with negative HIV test results. The results of follow-up HIV tests help to identify the incident cases.
First Positive HIV Diagnosis	Date of first confirmed positives as per the policy under NACP.	Contribute to the understanding of PLHIV (people who know their HIV) status. Also, as HIV negatives are being followed-up, their subsequent positive results may help in estimating HIV incidence.
Entry into care	Date of first registration in an ART centre by an HIV positive individual.	Describes entry into the CST system.
First CD4 test	Date and result of first CD4 test of an HIV positive individual registered in an ART centre.	Establishes the baseline CD4 value and thus helps understand the disease progression when coupled with follow-up CD4 counts.
Initiation on ART	Date and regimen of initiation of an HIV positive individual registered in an ART centre.	Provides information on ART initiation characteristics and also helps to understand the disease progression when coupled with follow-up ART uptake.
First viral load value	Date and result of first viral load test of an HIV positive individual after his/her initiation on ART.	Provides an indication of treatment success.
Follow-up viral load value	Date and result of follow-up viral load test of an HIV positive individual after his/her initiation on ART.	Provides information on disease progression.
Death	Date of death reported in any case of HIV, regardless of the cause of death.	Provides information on HIV-related mortality and outcomes.
Drop-outs	Reported date when a beneficiary drops out of NACP service delivery points.	Provides information to inform the denominators for calculation of indicators.

D. Data source

For each sentinel event, defined data variables will be collected from the SOCH system. As an electronic system, IT-enabled SOCH system captures and transmits case reports through web-based data collection portals or smartphone applications, etc. from TI, designated STI/RTI clinics, ICTCs, EIDs, ART and viral load testing centers. In SOCH, the data entered through the web-based portal or mobile application are electronically transferred to the National case-based database. The same is further shared with relevant facilities as per the referral system established.

E. De-duplication

a. System generated unique ID.

b. Mandatory mobile number with each ID at ART centre; optional mobile number at rest of centers.

c. At the local level, facility search based on name, gender, age, fathers name.

F. Sentinel events

Case-Based Surveillance harnesses this opportunity where longitudinal information for each beneficiary is reported from different service delivery points to a central database and is available for epidemiological analysis on key sentinel events since the first HIV test and engagement with HIV care[6]. The system has the potential to supplement cross-sectional point-in-time Surveillance surveys providing information on epidemiological indicators of prevalence, incidence, and mortality in a very cost-efficient manner.

HIV/AIDS epidemic in India is concentrated in nature with an estimated adult prevalence of around 0.22% in 2019[7]. While the overall HIV epidemic in India continues to be low, the prevalence continues to be high (>1%) in three northeastern States. Adult HIV prevalence in the State of Mizoram in 2019 is estimated to be at 2.32% which is almost 11 times the National average. Manipur and Nagaland are two other States that have an adult prevalence of

more than 1%. Given the context of prevalence and high-risk behaviour in the general population, epidemics in some of these States may be characterized as generalized epidemics[8,9,10].

While the magnitude of the HIV epidemic continues to be much higher than the National-level in the States of Mizoram, Manipur and Nagaland, even the trajectory of the epidemic is different in these States. In Mizoram, the trajectory of the epidemic is rising while in Nagaland, the epidemic has a stable trend but at a much higher level. In all of these States, the incidence per 1,000 infected population is also much higher than the National average[11].

Given the magnitude and trajectory of the HIV/AIDS epidemic in Mizoram, Manipur and Nagaland, there is an urgent need to improve the epidemic dynamics in these States. Accordingly, the IESE under NACP has included the implementation of the AEM in Mizoram, Manipur and Nagaland. AEM, earlier known as Asian Epidemic Model, has been used significantly in the concentrated epidemic and Asian settings to replicate the transmission dynamics of HIV by taking into account the level and trend of risk behaviours among important relevant sub-populations[12,13]. The model output not only predicts the future incidence and prevalence trends of the HIV/AIDS epidemic by population sub-group but also explores the effectiveness of different interventions and offers policy alternatives by varying input behaviours and model parameters to reflect programmatic/policy effects. The model is integral to the UNAIDS periodic disease burden exercise[14].

Objective

The aim of the implementation of AEM in the States of Mizoram, Manipur and Nagaland is to better characterise the level, trend and drivers of the HIV/AIDS epidemic in these States. Specifically, AEM will

1. Estimate and project the incidence and prevalence by subgroups including IDUs, FSWs and their clients, MSM, low-risk men and low-risk women.
2. Estimate the trend in the distribution of new HIV infections among various subgroups by routes of transmission.
3. Provide recommendations to policy makers on population group to be focussed for effective response.

Need-based comple-mentary funding to support the participation of outside members will be explored through the partner's funding if required.

Method

The activity will use the AEM developed by the East-West Center with support from UNAIDS, WHO, and World Bank. As a part of the modeling process, the population aged 15 years and older will be divided into several subgroups according to the availability of prevalence and risk-behaviour data and also as relevant to the local epidemic. Broadly, data on population size, sexual behaviors, injecting drug use and needle-sharing practices, the prevalence of HIV and STDs, and ART coverage will be inputted. The model will use these inputs to replicate the HIV transmission probabilities (through unprotected vaginal sex, unprotected anal sex, and use of infected needle/ syringe) fitting the observed epidemiological patterns of HSS data.

Implementation Mechanism

NACO will implement the AEM in the States of Mizoram, Manipur and Nagaland in collaboration with ICMR-NIMS-New Delhi, RIMS-Imphal and SACS concerned (Mizoram SACS, Manipur SACS and Nagaland SACS). Technical Support Units will be engaged in the implementation process. The process will be implemented under the guidance of NACO's TWG (Surveillance & Epidemiology) and engage bi-lateral/multi-lateral partners and other related stakeholders.

Timelines

NACO has approved the work plan for the implementation of the AEM under the IESE under NACP. The objective is to complete the activity by the last quarter of FY 2020-21. The broad timelines for the same are as following:

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of the concept note including group formation	T_O + Week 1-8	S&E (NACO)	-
Presentation to the NACO's TWG	T_O + Week 9	S&E (NACO)	SACS concerned National and Regional institutes concerned
Capacity building on AEM	T_O + Week 21-22	S&E (NACO)	UNAIDS India SACS concerned National and Regional institutes concerned
Data inputs, curve fitting and results generation	T_O + Week 22-29	S&E (NACO) SACS, RI & NI concerned	UNAIDS India
Presentation to the TWG	T_O + Week 29		
Revision in the State/UT models based on TWG inputs	T_O + Week 29-34		
Presentation to the TWG	T_O + Week 35		
Circulation and presentation to the TRG	T_O + Week 41-44		
Technical brief preparation and approval by competent authority	T_O + Week 45-60	S&E (NACO)	-
Submission in peer-reviewed journal/supplementary editions		S&E (NACO) SACS, RI & NI concerned	-

Funding Support

The work will be completely supported within the already approved NACO's MoU with seven National and Regional institutes for the period 2021-2023. No additional funds will be required from NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partner's funding if required.

Outcome

- Estimates on the level, trend and distribution of prevalence and incidence in the States by sub-groups.
- Recommendations on population group to be focussed for effective response.

Products

- Technical and operational manuals
- Scientific papers

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Concept Note on research priorities augmenting epidemic monitoring under National AIDS and STD Control Programme

Background

Robust strategic information has been the foundation stone of government-led efficient and effective National AIDS response since its inception through the NACO in India[1]. HIV S&E, one of the components of the strategic information under the NACP is among the first interventions under the National AIDS response in India[2,3]. Initiated as Sero-Surveillance in search of the virus in 1985, the system has evolved into one of the world's largest and most comprehensive Surveillance systems covering eight population groups and providing the HRG and PLHIV size estimates up to the District-level augmenting prioritization, resource allocation and outcome monitoring[4,5,6]. The outcome-oriented system has now evolved into an integrated and enhanced S&E of HIV, STIs and related co-morbidities anchoring the National AIDS response towards the attainment of interlinked SDGs.

Research & Evaluation (R&E) is a vital component of Strategic Information Management under NACP ensuring translation of research outputs into programmatic action and policy formulation[7]. R&E under NACP generates evidence on identified evidence gaps and research needs of the programme through scientific research following a systematic and institutionalised mechanism. Research is undertaken following a rigorous process which includes stringent multi-stakeholders review of proposals including that by TRG followed by review by NACO's EC. The projects are periodically monitored and outcomes are shared with programme for suitable actions and also disseminated through publications in peer-reviewed journals.

Surveillance and research inform and strengthen each other for an effective public health response[8]. Under NACP, complementary activities of Surveillance and research, along with programme monitoring, has built an evidence base for policymakers, programme managers, epidemiologists and researchers towards design and implementation of holistic National AIDS response across prevention, testing and treatment spectrum effective across a range of location and population settings[7,9,10,11]. The IESE under NACP have identified the research priorities towards further augmenting the characterization of epidemics including the size estimates of the high-risk group and PLHIV.

Session objectives

The session aims to identify the research priorities strengthening the S&E under NACP. Specifically, the session objectives are to:

I. Present and take inputs from stakeholders on identified research priorities informing and strengthening the integrated and enhanced S&E under NACP.

II. Take inputs from stakeholders on other research priorities areas informing and strengthening the S&E under NACP.

Potential research priorities

A. Characterisation of 'at-risk' population groups: The IESE framework under NACP aims to cover nine population groups, including specific population groups across high-risk FSW, MSM, IDUs, and H/TG people, bridge (migrants, truckers and prisoners) and low-risk population groups (pregnant women/general population) as defined in AEM and other global documents and also PLHIV[12]. However, there are at-risk population who do not fall in the traditional Surveillance groups but almost 90% of new case detections are happening in these groups[13]. The characterization of non-HRG non-bridge but at-risk HIV population in terms of who, where and what will not only help the programme to have focus interventions among the group but also help expand the Surveillance in newer population group augmenting the and inform the disease burden estimations.

B. Characterisation of female-to-male transgender people: There is a growing body of evidence regarding the size and prevalence of HIV among male-to-female transgender people[14,15,16]. The 2021 round of HSS is expected to provide information on Hepatitis B, Hepatitis C and Syphilis among the group. However, evidence on female-to-male transgender people in the context of the HIV/AIDS epidemic is limited.

Characterisation of female-to-male transgender people in terms of size, risk behaviours and HIV prevalence will help customization of services to the group and also inform the Surveillance strategies.

C. **Prevalence of HIV, STIs and related co-morbidities among high-risk group (HRG) operating through virtual platforms:** NACP acknowledges that there is a significant size of MSM and FSW who seeks sexual partners/ clients through virtual platforms[17,18,19,20]. Given the growing evidence, methods for estimating the size of the HRG population operating on the virtual platform are being worked out. Representative probability-based estimates of HIV, STIs and related co-morbidities among HRG operating through virtual platforms will not only characterise the HIV epidemic in the group improving the disease burden estimations but also help to devise suitable Surveillance methods among the group.

D. **Fertility and breast-feeding patterns among HIV-positive women:** Elimination of vertical transmission of HIV is one of the stated goals under the global and National AIDS response[13,21]. Spectrum-based estimates play a critical role in measuring the progress on the EMTCT of HIV[22]. Evidence on fertility and breast-feeding patterns among HIV-positive women play a critical role to estimate the EMCTC related indicators. Given the context, there is a need to generate India-specific evidence on fertility and breastfeeding patterns among HIV-positive women to inform the HIV burden estimations in the context of EMTCT progress.

E. **MTCT transmission probabilities:** Peri-partum and breastfeeding transmission rates by treatment regimen is another critical area in the context of EMTCT on which scarce-to-none data are available in the Indian context and research in the given area will inform the MTCT rate estimates which is one of the two impact indicators to measure the progress on EMTCT.

F. **HIV progression and mortality without ART:** Data on the distribution of new infections by CD4 count, the annual rate of progression to next lower CD4 category and annual probability of HIV-related mortality when not on ART are most critical assumptions in the disease-burden model where estimated new infections are tracked over time by their CD4 count, mortality and ART status. However, population-based data on the same in the Indian setting are scarce to none. Representatives' population-based data on the natural history of HIV will inform the disease burden estimations under NACP.

G. **HIV progression and mortality with ART:** Annual probability of HIV-related mortality on ART by CD4 count at treatment initiation is another critical component of adult PLHIV transition parameters in Spectrum-based estimations. The data for the same are sourced from International epidemiology Databases to Evaluate AIDS (IeDEA) consortium which has only two sites in India[23]. Given the context of the adoption of policy like 'Test and Treat', 'Viral-load monitoring' and 'newer regimen with lesser side effects and better adherence', having local representatives population-based evidence on the HIV progression and mortality with ART will not only help us to directly measure the impact of the ART programme but also inform the disease burden estimations under NACP.

H. **HIV epidemic among adolescents and young:** Under NACP, empirical evidence on HIV prevalence, knowledge, sexual behaviour, and update of HIV/AIDS-related services among adolescents (aged 10–19 years) are limited. Though data on the burden of disease and prevalence in adolescents may be estimated through Spectrum-model, data from the representative community-based surveys will enhance the insights into the epidemiology of HIV and AIDS among adolescents and inform the programme to design and implement age-appropriate HIV-related interventions in the group.

I. **Impact of ageing HIV/AIDS epidemic:** The HIV/ AIDS epidemic in India is ageing with around 40% of the PLHIV estimated to be 50 years or older by 2025[24]. With increasing age, it is anticipated that PLHIV will have an increasing burden of ageing-related conditions and complications; however, the exact profile for the same is not established yet in Indian settings. More evidence on the impact of ageing among HIV-infected persons is necessary to inform designing of care, and treatment services to promote healthy aging of PLHIV and contribute towards the attainment of SDG 3 of "Good Health and Well-being".

Implementation Mechanism

Evidence generation on research priorities augmenting epidemic monitoring will follow the established mechanism of R&E under NACP. This will include a multi-stakeholder review of proposals including that by Technical Resource Group followed by a review by NACO's EC. The projects will be periodically monitored and outcomes will be shared with policy- makers, programme managers, epidemiologists and researchers augmenting the design and implementation of holistic National AIDS response and also disseminated through publications in peer-reviewed journals.

Funding Support

Under NACP, a specific budget is available to undertake research activities. The research priorities augmenting epidemic monitoring will be supported under NACP following the due procedures and approvals of NACO's R&E.

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Concept Note on Mortality Surveillance (2021-2022)

Background

Reducing AIDS-related mortality is integral to the global AIDS response. The UNAIDS Fast-Track strategy aimed to reduce the annual new HIV infections by 75 per cent (compared with 2010) and annual AIDS-related deaths by fewer than 500,000 by 2020. For the 2030 SDG of ending AIDS as a public health threat, the target is to reduce annual new infections by 90 per cent (compared with 2010) and annual AIDS-related deaths to fewer than 200,000[1].

Globally modelled estimates, considering the number of HIV-infected people on antiretroviral therapy (ART) and their survival rates, are the primary mechanisms to measure the magnitude and directions of the annual AIDS-related deaths. The need for the modelled estimates is necessitated in view of the lack of standardised/sub-optimum availability of direct HIV/AIDS mortality data[2]. Also, it is critical to complement the magnitude and directions of AIDS-related deaths with population-level estimates of cause-of-death for the policy and planning. Given the context and the need, WHO's 2013 Guidelines on SGS recommended improving the availability and quality of HIV/AIDS-related mortality data[3].

It is critical to complement the magnitude and directions of AIDS-related deaths with population-level estimates of cause-of-death for the policy and planning.

Objective

Mortality Surveillance is a critical component of the IESE under the NACP. Broadly, the Mortality Surveillance would complement the existing modelled estimates by providing population-level cause-of-death statistics and by triangulating the magnitude of the mortality estimates. Specifically, the Mortality Surveillance aims to provide:

1. The cause structure of mortality among PLHIV.
2. Estimate the magnitude of AIDS-related deaths.

Method

The Mortality Surveillance under the NACP is proposed to follow a two-pronged strategy. This will include (i) VA with family members and/or caregivers of the deceased PLHIV using a structured questionnaire to elicit signs and symptoms and other pertinent information to assign a probable underlying cause of death and (ii) analysis of published MCCD to estimate the magnitude of the AIDS-related deaths.

Implementation Mechanism

NACO will develop the technical protocol for Mortality Surveillance along with the RI PGIMER-Chandigarh and with the support of the National and Regional institutes concerned and under the guidance of the NACO's TWG, TWG-S&E. The other institutes include (i) AIIMS- New Delhi, (ii) ICMR-NARI, Pune, (iii) ICMR-NIE, Chennai, (iv) ICMR-National Institute of Medical Statistics-New Delhi, (v) ICMR-NICED, Kolkata and (vi) RIMS-Imphal. The process will engage members from multi-lateral partners, SACS and other related stakeholders who are engaged for S&E under the NACP.

The methods and results generated will be first reviewed by NACO's TWG-S&E. Once recommended by the TWG-S&E, the same will be reviewed by the TRG. The implementation will be undertaken after the approval of the Technical Protocol by TRG.

Timelines

NACO has approved the work plan for the development of the technical and operational framework of the activities under the IESE. The objective is to get the method and findings approved by TRG by end of March 2021. The broad timelines for the same are as below:

Sub-activity	Timelines	Responsibility	Stakeholders	
Preparation of technical framework	Meeting with all members of the group to brief them about the ToRs and expectations	T_o + Week 3-4	SI-S&E (NACO)	
	Preparation and submission of draft zero followed by peer-review	T_o + Week 4-7	Respective groups	
	Revision of technical framework based on inputs from peer-review	T_o + Week 7-9	Respective groups	
	Global consultations on the draft framework	T_o + Week 10	SI-S&E (NACO)	Respective defined groups, National and international bi-lateral, multi-lateral and independent experts, National and Regional institutes, SACS, Community experts.
	Revision of technical framework based on inputs from a global consultation	T_o + Week 10-12	Respective groups	
	Presentation of technical framework to NACO's TWG (S&E)	T_o + Week 13	SI-S&E (NACO) Respective groups	
	Revision of technical framework based on inputs from TWG	T_o + Week 13-15	Respective groups	
	Presentation of technical framework to NACO's TRG (S&E)	T_o + Week 16-20	S&E (NACO) Respective groups	
Appraisal of ethical considerations by the EC	Presentation to NACO's EC	T_o + Week 16-40	S&E (NACO) All National and Regional institutes	EC
Method manuscripts preparation and submission for scientific publications	Draft preparations	T_o + Week 16-40	Respective groups	
	Peer-review	T_o + Week 16-40	Respective groups	
	Revision and sharing with NACO	T_o + Week 16-40	Respective groups	
	Approval by a competent authority	T_o + Week 16-40	S&E (NACO)	
	Submission in peer-reviewed journal/supplementary editions	T_o + Week 16-40	S&E (NACO)	
Preparation of operational manual	Identification of regional institutes, based on group composition, for operational manuals preparation	T_o + Week 16/17	S&E (NACO) Respective groups	Respective defined groups. National and Regional institutes.
	Submission of draft zero and peer-review	T_o + Week 26	Regional and National institutes	Respective defined groups.
	Firming-up and submission to NACO	T_o + Week 34	Regional and National institutes	Respective defined groups.
	Approval of operational manuals and subsequent printing & publications	T_o + Week 34-44	S&E (NACO)	

Funding Support

The work will be completely supported within the already approved NACO's MoU with seven National and Regional institutes for the period 2021-2023. No additional funds will be required from NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partners' funding if required.

Outcome

- Technical and operational manual for Mortality Surveillance under NACP.

Products

- Technical and operational manuals
- Scientific papers

[1] Stover J, Bollinger L, Izazola J A, Loures L, DeLay P. others. 2016. "What Is Required to End the AIDS Epidemic as a Public Health Threat by 2030? The Cost and Impact of the Fast-Track Approach." PLoS One 11 (5): e0154893
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Concept Note on HIV Estimations 2021 (State/UT and National)

Background

NACO, MoHFW and GoI periodically undertakes HIV estimation process to provide updated information on the status of the HIV epidemic in India. The first HIV estimation in India was done in 1998 while the 2020 round is the latest round in the series. India HIV Estimates 2021, the planned round in the series will update the latest status of the HIV epidemic in the country, States and District on key parameters of HIV prevalence, new infections, AIDS-related mortality and PMTCT need. At first, the State/UT-wise model will be created and then aggregated into the National estimates. Once the State/UT-wise model is approved, the same will be disaggregated by the District through TRG approved method.

Implementation Mechanism

ICMR-NIMS-New Delhi and NACO will jointly implement the HIV Estimations 2021 under the guidance of the NACO's TWG, TWG-S&E. The process will engage members from multi-lateral partners, SACS and other National and Regional institutes engaged for S&E under the NACP. The institutes include (i) AIIMS-New Delhi, (ii) ICMR-NARI, Pune, (iii) ICMR-NIE, Chennai, (iv) PGIMER, Chandigarh, (v) ICMR-NICED, Kolkata and (vi) RIMS-Imphal.

The methods and results generated will first be reviewed by NACO's TWG-S&E. Once recommended by TWG-S&E, the same will be reviewed by TRG on "Surveillance and Estimation".

Key Technical Considerations under HIV Estimations 2021

Demographics, programme coverage, sub-population size and HIV prevalence are the key inputs under the NACO. For the 2020 rounds of estimations, data have been updated for the year 2019 for ART and PMTCT coverage and also for the routine ANC testing. However, the rest of the data has not been updated yet. Given the context, the key considerations for the HIV Estimations 2021 have been described below:

1. **Demographics:** The significant update in the demographic projections was last done for the 2012 round of HIV burden estimations. This was done in view of the differences between the projection generated by the DemProj in HIV estimations 2011 and Census 2011 for the year 2011. As a part of the process, the population projection was done till the year 2017[1]. Then in view of the programmatic needs to be able to estimate quantify the impact of the epidemic as per the duration of the National Strategic Plan (2017-24), the demographic projections were extended till 2026.

In the meantime, the National Commission on Population, MoHFW, GoI, has provided population projections for India and States for the period 2011-2036[2]. Also, AIDS response across the globe is being worked out in the context of the 2030 goal of ending AIDS as a public health threat (SDG 3.3).

2. **Programmatic coverage:** The PMTCT and ART coverage are the two fundamental inputs in HIV Estimations. While PMTCT coverage by ARV regimen has been updated till 2020, there are potentials to update the input values for select indicators like in (i) retention on ART at the time of delivery and (ii) breastfeeding pattern among HIV positive mothers. As these would have an impact on the transmission rate from the EMTCT perspective, an update of these indicators is one of the key considerations for HIV Estimations 2021.

3. **Sub-population size estimates:** State/UT model under India HIV Estimations follow concentrated epidemic model configuration. As a result, size estimates of the HRG are a critical input under HIV estimates.

In recent times, the evidence around size estimates of the key population has been growing. As per the recently released report titled "Magnitude of Substance Use in India" of the Ministry of Social Justice and Empowerment, there is almost 8.5 lakh IDUs in India[3]. Another study, which applied programme multiplier method to estimate the size of HRG, estimated 18 lakh FSW, 5.70 lakh MSM and 3.91 lakh IDUs[4]. While the science of HRG size estimates is still not perfect, both studies have indicated that the universe of HRG in India is much

larger than the current programmatic targets of 8.68 lakh FSW, 3.57 lakh MSM and 1.77 lakh IDUs. Also, NACO is undertaking a pan-India p-MPSE exercise to update the population size estimates under NACP.

Given the growing evidence around the size estimates of the HRG in India and its criticality in the HIV Estimation process, there is a need to review and appropriately revise the size estimates under the HIV Estimations 2021.

4. **Prevalence update:** In HIV Estimations 2020, the census level ANC-RT data was updated for the year 2020. However, there was no update on ANC HSS data (which was updated till the year 2019 during HIV Estimations 2019) and HRG HSS data (which was updated till the year 2017 during HIV Estimations 2017). For the HIV Estimations 2021, it is anticipated that data from HRG HSS Plus 2021 will be available. The updated data will be critical to update the latest status of the HIV epidemic in the country.

State/UT-wise data on people who know their HIV status have been used in District-level HIV burden estimates (2020) to inform the general population curve fitting. The second edition of 'Sankalak: Status of the National AIDS Response' has presented the data on the first 90 by States/UTs. This piece of evidence presents an opportunity to inform the conditions as lower bound of the epidemic which may be considered in the 2021 round of the epidemic.

5. **Advanced parameters:** Besides the items mentioned above, there are advanced parameters like sex-ratio, incidence rate ratio, adult transitions parameters etc. which need to be reviewed and considered for the update using local evidence. The same may be considered for an update in the HIV Estimations 2021 if enough data exists.

Timelines

NACO has approved the work plan for HIV Estimations 2021. The objective is to get the method and findings approved by TRG by end of march 2021. The broad timelines for the same are as below:

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of the concept note	T_o + Week 2-4	T_o + Week 3-4	SI-S&E (NACO)
Preparation of the concept note	T_o + Week 2-4	S&E (NACO)	ICMR-NIMS
Preparation of demographics	T_o + Week 2-12	ICMR-NIMS	S&E (NACO)
Review of available HRG Size estimates and preparation of State/UT-wise tables	T_o + Week 4-12	ICMR-NIMS	S&E (NACO)
Presentation to the NACO's TWG	T_o + Week 9-12	S&E (NACO)	ICMR-NIMS
Review of the available programme and epidemic data and their update	T_o + Week 12-32	S&E (NACO) ICMR-NIMS	NACO's programme division
Curve-fitting, draft results preparation	T_o + Week 32-34	ICMR-NIMS	S&E (NACO)
Presentation to the TWG	T_o + Week 35	ICMR-NIMS	S&E (NACO)
Revision in the State/UT models based on TWG inputs	T_o + Week 35-39	ICMR-NIMS	S&E (NACO)
Presentation to the TWG	T_o + Week 40	ICMR-NIMS	S&E (NACO)
Circulation and presentation to the TRG	T_o + Week 41-44	S&E (NACO) ICMR-NIMS	NACO's programme division
Finalization of report and printing	T_o + Week 35-48	S&E (NACO) ICMR-NIMS	-
Release of HIV Estimations 2021 Report	T_o + Week 48-52	S&E (NACO)	All stakeholders

Data Need

The HIV Estimations 2021 will build upon the State models prepared for the 2020 round. The demographic, programmatic and epidemiological data will be updated in the State model as a part of the process and based on the technical considerations detailed above. Programmatic data on PMTCT coverage, Adult ART coverage and child treatment will be updated in each State model for the year 2021. Epidemiological data, site-wise tested and positivity, from Surveillance will be also updated from HSS 2021 in State/UT model. Data available on the first 90 as well as any other appropriate data will be also used as a part of the process subject to the recommendations of the TWG and TRG.

The State model thus developed will be disaggregated into Districts estimates using a sub-epidemic model. The routine testing data from PMTCT programme from confirmatory centres and PLHIV in the District based on the master line list of the ART centre will be used as additional data to inform the level and trend of HIV burden at the District-level.

Funding Support

The work will be completely supported within the already approved NACO's MoU with ICMR-NIMS for the period 2021-23. No additional funds will be required from NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partners' funding if required.

Outcome

- Updated estimates on the magnitude and directions of the HIV epidemic in India by State/UT.

Products

- Technical Reports
- Scientific papers

[1] http://naco.gov.in/sites/default/files/Technical%20Report%20%20India%20HIV%20Estimates%202012%281%29.pdf
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Concept Note on the AIDS Epidemic Model for select high-prevalence north-eastern States in India

Background

HIV/AIDS epidemic in India is concentrated in nature with an estimated adult prevalence of around 0.22% in 2019[1]. While the overall HIV epidemic in India continues to be low, the prevalence continues to be high (>1%) in three northeastern States. Adult HIV prevalence in the State of Mizoram in 2019 is estimated to be at 2.32% which is almost 11 times the National average. Manipur and Nagaland are two other States with an adult prevalence of >1%. Given the context of prevalence and high-risk behaviour in the general population, epidemics in some of these States may be characterised as generalised epidemics[2,3,4].

While the magnitude of the HIV epidemic continues to be much higher in the States of Mizoram, Manipur and Nagaland, than that of the National-level even the trajectory of the epidemic is different in these States. In Mizoram, the trajectory of the epidemic is rising while in Nagaland, the epidemic has a stable trend but at a much higher level. In all of these States, the incidence per 1,000 infected population is also much higher than the National average[1].

Given the magnitude and trajectory of the HIV/AIDS epidemic in Mizoram, Manipur and Nagaland, there is an urgent need to improve the epidemic dynamics in these States. Accordingly, the IESE under NACP has included the implementation of the AEM in Mizoram, Manipur and Nagaland. AEM, earlier known as Asian Epidemic Model[5], has been used significantly in the concentrated epidemic and Asian settings to replicate the transmission dynamics of HIV by taking into account the level and trend of risk behaviours among important relevant sub-populations[6,7]. The model output not only predicts the future incidence and prevalence trends of the HIV/AIDS epidemic by population sub-group but also explores the effectiveness of different interventions and offers policy alternatives by varying input behaviours and model parameters to reflect programmatic/policy effects. The model is integral to the UNAIDS periodic disease burden exercise[8].

Objective

The aim of the implementation of AEM in the States of Mizoram, Manipur and Nagaland is to better characterise the level, trend and drivers of the HIV/AIDS epidemic in these States. Specifically, AEM will

1. Estimate and project the incidence and prevalence by subgroups including IDUs, FSWs and their clients, MSM, low-risk men and low-risk women.
2. Estimate the trend in the distribution of new HIV infections among various subgroups by routes of transmission.
3. Provide recommendations to policymakers on population group to be focussed for effective response.

Method

The activity will use the AEM developed by the East-West Center, USA with support from UNAIDS, WHO, and World Bank. As a part of the modelling process, the population aged 15 years and older will be divided into several subgroups according to the availability of prevalence and risk-behaviour data and also as relevant to the local epidemic. Broadly, data on population size, sexual behaviors, injecting drug use and needle-sharing practices, the prevalence of HIV and STDs, and ART coverage will be inputted. The model will use these inputs to replicate the HIV transmission probabilities (through unprotected vaginal sex, unprotected anal sex, and use of infected needle/ syringe) fitting the observed epidemiological patterns of HIV Sentinel Surveillance data.

Implementation Mechanism

NACO will implement the AEM in the States of Mizoram, Manipur and Nagaland in collaboration with ICMR-NIMS-New Delhi, RIMS-Imphal and SACS concerned (Mizoram SACS, Manipur SACS and Nagaland SACS). Technical Support Units will be engaged in the implementation process. The process will be implemented under the guidance

of NACO's TWG S&E and engage bi-lateral/multi-lateral partners and other related stakeholders.

Timelines

NACO has approved the work plan for the implementation of the AEM under the IESE under NACP. The objective is to complete the activity by the last quarter of FY 2020-2021. The broad timelines for the same are as below:

Funding Support

The work will be completely supported within the already approved NACO's MoU with seven National and Regional institutes for the period 2021-2023. No additional funds will be required from the NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partner's funding if required.

Sub-activity	Timelines	Responsibility	Stakeholders
Preparation of the concept note including group formation	T_O + Week 1-8	S&E (NACO)	-
Presentation to the NACO's TWG	T_O + Week 9	S&E (NACO)	SACS concerned National and Regional institutes concerned
Capacity building on AEM	T_O + Week 21-22	S&E (NACO)	UNAIDS India SACS concerned National and Regional institutes concerned
Data inputs, curve fitting and results generation	T_O + Week 22-29	S&E (NACO) SACS, RI & NI concerned	UNAIDS India
Presentation to the TWG	T_O + Week 29		
Revision in the State/UT models based on TWG inputs	T_O + Week 29-34		
Presentation to the TWG	T_O + Week 35		
Circulation and presentation to the TRG	T_O + Week 41-44		
Technical brief preparation and approval by competent authority	T_O + Week 45-60	S&E (NACO)	-
Submission in peer-reviewed journal/ supplementary editions		S&E (NACO) SACS, RI & NI concerned	-

Outcome

- Estimates on the level, trend and distribution of prevalence and incidence in the States by sub-groups.
- Recommendations on population group to be focussed for effective response.

Products

- Technical and operational manuals
- Scientific papers

[1] National AIDS Control Organization & ICMR-National Institute of Medical Statistics (2020). India HIV Estimates 2019: Report. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India
[2] National AIDS Control Organization (2020). Sankalak: Status of National AIDS Response (Second edition, 2020). New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
[3] AIIPS ICF. National Family Halth Survey 4 (NFHS4) 2015–16. Mumbai: International Institute for Population Sciences; 2017.
[4] Brown T, Peerapatanapokin W. Evolving HIV epidemics: the urgent need to refocus on populations with risk. Current Opinion in HIV and AIDS. 2019 Sep;14(5):337.
[5] Mahy M, Marsh K, Sabin K, Wanyeki I, Daher J, Ghys PD. HIV estimates through 2018: data for decision-making. AIDS (London, England). 2019 Dec 15;33(Suppl 3):S203.)
[6] Brown T, Peerapatanapokin W. The Asian Epidemic Model: a process model for exploring HIV policy and programme alternatives in Asia. Sexually transmitted infections. 2004 Aug 1;80(suppl 1):i19-24.
[7] Cambodia Working Group on HIV/AIDS Projection. Projections for HIV/AIDS in Cambodia: 2000–2010. Phnom Penh: Family Health International Cambodia, 2002.
[8] Mahy M, Marsh K, Sabin K, Wanyeki I, Daher J, Ghys PD. HIV estimates through 2018: data for decision-making. AIDS (London, England). 2019 Dec 15;33(Suppl 3):S203.

Concept Note on Sexually Transmitted Infections (STIs) Burden Estimations 2021

Background

STIs are key public health issues in view of their association with reproductive health, child health, sexual health and through their role in facilitating sexual transmission of HIV [National Strategic Plan (NSP) for HIV/AIDS and STI, 2017-2024]. Given the associations, a comprehensive package of prevention, testing and treatment services for high-risk groups and the at-risk population is integral to the national AIDS response. Besides, one of the STIs, i.e. Syphilis is of particular concern for maternal and child health given the commitment toward the elimination of congenital Syphilis. WHO "Global guidance on criteria and processes for validation: EMTCT of HIV and Syphilis (2017)" identifies impact indicator of 'case rate of congenital syphilis of 50 or fewer cases per 100,000 live births'. Further, WHO in its global health sector strategy on STIs (2016–2021) has four STIs targets that are related to the SDGs pertaining to neonatal and under-5 mortality (SDG 3.2), ending of AIDS epidemic (SDG 3.3), universal access to sexual and reproductive health (SDG 3.7) and universal health coverage including vaccines for all (SDG 3.8)[1].

Given the context, STI burden estimates are a critical requirement not only to inform the progress towards the national and global goals but also for target-setting, programme planning, and costing. However, data are scarce on STI/RTI burden in India[2].

HIV Burden estimates are institutionalized under the NACP since 1998[3]. It was initiated in 1998 and the latest update on the level and trend of the HIV epidemic was provided through the 2020 round of estimates. It is done through a robust structure under the guidance of the TRG and TWG on HIV S&E using 'Spectrum model'. The model is recommended by the UNAIDS reference group on Estimates, Modelling and Projections[4]. In the year 2016, the Spectrum suite included the STI model (Spectrum-STI) as a tool that can be used for estimation of burden and trends in STI[5]. There is a growing use of the Spectrum tool to produce STI estimates including by WHO[6,7].

Universal access to quality STI/RTI services to at-risk and vulnerable populations is one of the key goals under the NACP Phase-V. Given the relations of STIs with HIV and the focus in NACP Phase-V, STI Burden estimation has been included as one of the areas under the mandate for IESE of HIV, STI and related co-morbidities under the NACP. In view of this, a concept paper is being prepared to provide the broad contour of the STIs Burden Estimations (2021) under the NACP.

Objectives of the STIs burden estimations

The broad objective of the STI Burden Estimations is to estimate the magnitude and directions of the STIs by States/UTs in India. Specifically, the exercise would focus on Syphilis burden estimates including those of maternal syphilis. Depending upon the data availability, the exercise would also provide estimates on Gonorrhoea and Chlamydia.

Method

The STI burden estimates would be done using the Spectrum-STI tool. The process will review and use the data available in the programme to inform the modelling process. This will include data in the ANC and HRG Surveillance as well as routine testing data of Designated STI/RTI Clinics. The model will also use the published study/survey data to inform the burden estimation process. Depending upon the need, the input data for a State/UT may be supplemented by data from neighbouring States/countries.

Implementation Mechanism

NACO will implement the STIs Burden Estimations 2021 along with the support of the National and Regional institutes concerned and under the guidance of the NACO's TWG, TWG-S&E. The institutes include (i) AIIMS-Delhi, (ii) ICMR-NARI, Pune, (iii) ICMR-NIE, Chennai, (iv) PGIMER, Chandigarh, (v) ICMR-NICED, Kolkata and (vi) RIMS-Imphal. The process will engage members from multi-lateral partners, SACS and other related stakeholders engaged for S&E under the NACP.

The methods and results generated will first be reviewed by NACO's TWG-S&E. Once recommended by TWG-S&E, the same will be reviewed by TRG on "Surveillance and Estimation".

Timelines

NACO has approved the work plan for STI Estimations 2021. The objective is to get the method and findings approved by TRG by end of March 2021. The broad timelines for the same are as below:

Capacity-building	T_o + Week 16-20	S&E-NACO with support from UN partners	All other National and Regional institutes, BSD, and Lab division, NACO, Apex Laboratory-VMMC & SH, New Delhi
Preparation of the data inputs	T_o + Week 20-24	ICMR-NIMS-New Delhi	S&E (NACO), BSD and Lab division, NACO, Apex Laboratory-VMMC & SH, New Delhi
Presentation to all institutes and other stakeholders	T_o + Week 24-30	S&E (NACO) ICMR-NIMS-New Delhi	All other National and Regional institutes, BSD, and Lab division, NACO, Apex Laboratory-VMMC & SH, New Delhi
Revisions based on the inputs from stakeholders	T_o + Week 30-34	ICMR-NIMS ICMR-NARI-Pune	
Presentation to the TWG	T_o + Week 35	S&E (NACO) ICMR-NIMS-New Delhi	
Revision in the State/UT models	T_o + Week 35-39	ICMR-NIMS ICMR-NARI-Pune	
Presentation to the TWG	T_o + Week 40	S&E (NACO) ICMR-NIMS-New Delhi	
Circulation and presentation to the	T_o + Week 41-44		
Finalization of report and printing	T_o + Week 35-48		
Release of STI Estimations 2021 Report	T_o + Week 48-52	S&E (NACO)	All stakeholders

Funding Support

The work will be completely supported within the already approved NACO's MoU with seven National and Regional institutes for the period 2021-23. No additional funds will be required from NACO to implement the project. Need-based complementary funding to support the participation of outside members will be explored through the partners' funding if required.

Outcome

- Estimates on the magnitude and directions of the STI epidemic in India by State/UT.

Products

- Technical Reports
- Scientific papers

[1] World Health Organization. Global health sector strategy on sexually transmitted infections 2016–2021. Towards ending STIs. Report No. WHO/RHR/16.09, (Geneva, 2016).
[2] National AIDS Control Organisation. National Strategic Plan for HIV/AIDS and STI, 2017 – 2024. National AIDS Control Organization, Ministry of Health & Family Welfare, Government of India. 2017
[3] National AIDS Control Organization & ICMR-National Institute of Medical Statistics (2020). India HIV Estimates 2019: Report. New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
[4] https://www.epidem.org/Sep;14(5):337.
[5] https://www.avenirhealth.org/software-spectrum.php
[6] Korenromp EL, Mahiané SG, Nagelkerke N, Taylor MM, Williams R, Chico RM, Pretorius C, Abu-Raddad LJ, Rowley J. Syphilis prevalence trends in adult women in 132 countries–estimations using the Spectrum Sexually Transmitted Infections model. Scientific reports. 2018 Jul 31;8(1):1-0.
[7] World Health Organization. Report on global sexually transmitted infection Surveillance. (Geneva, 2018).

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NACO has developed framework for integrated and enhanced surveillance & epidemiology of HIV, STIs and related co-morbidities to anchor and augment a data-driven holistic response through a consultative process. This included a global consultation titled "Consolidating the Evidence, Building the Future" convened on 27–29 August 2021. The current report presents the collective wisdom of global and national experts, programme managers and community representatives shared during the consultation.