



INDIA HIV ESTIMATES 2020

Technical Brief



National AIDS Control Organisation
&
Indian Council of Medical Research – National Institute of Medical Statistics (ICMR-NIMS)
Ministry of Health & Family Welfare, Government of India

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**National AIDS Control Organisation
&
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Ministry of Health & Family Welfare, Government of India**



सत्यमेव जयते

आलोक सक्सेना
अपर सचिव एवं महानिदेशक

Alok Saxena

Additional Secretary & Director General



Foreword

Forty years ago, in the months of May–July 1981, the very first reporting of pneumocystis pneumonia (PCP) and Kaposi's sarcoma among gay men was done. These were rare diseases to be seen. It was not until 1983 when a virus was identified that was weakening the immune response of the infected individuals, leading to frequent occurrence of otherwise rare diseases. The virus, named as the Human Immunodeficiency Viruses (HIV) in 1986, led to one of the world's most devastating modern pandemics.

Since those early days, the global response to the AIDS epidemic has been concerted, evolving and phenomenal. India has been at the forefront of this global AIDS response implementing one of the world's largest, fully government funded and most comprehensive National AIDS Control Programme (NACP). Periodic HIV/AIDS burden estimations have been one of the driving forces behind this national AIDS response. Using the latest available science and understanding of the epidemic, the estimates not only provide the extent and spread of the HIV/AIDS epidemic and its impact informing the resource allocation, but also quantify the progress on the global goals.

Initiated in 1998, HIV Estimates 2020 is the 16th round of the HIV burden estimations under NACP. This technical brief presents the key findings from the 16th round of estimations. As evident, while the progress has been extremely significant on improving the survival of HIV infected people as reflected in AIDS-related mortality, there is scope of augmentation of prevention efforts.

HIV Estimates 2020 is of special significance given the context of the 2020 Fast-Track Targets and as the global AIDS response enters the fifth decade. I am confident that all stakeholders will use this technical brief to further augment the evidence-led national AIDS response towards attainment of the 2030 goal of ending the AIDS epidemic as a public health threat.

Alok Saxena

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अपनी एचआईवी अवस्था जानें, निकटतम सरकारी अस्पताल में मुफ्त सलाह व जाँच पाएँ
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सत्यमेव जयते

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निदेशक

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Director



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National AIDS Control Organisation
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Preface

United Nations defined 17 interlinked Sustainable Development Goals (SDGs) in 2015 to be achieved by 2030 towards ending all forms of poverty, fighting inequalities and tackling climate change, while ensuring that no one is left behind. The SDGs have been adopted by all United Nations Member States, India being one among them.

Ending the AIDS epidemic as a public health threat by 2030 is one of the defined targets under SDG 3 of good health and well-being. To guide global AIDS response towards the 2030 goal, Fast-Track Targets for the first five years (i.e., 2020) of SDGs were established. As 2020 Fast-Track Targets elapsed, an updated set of programmatic targets for 2025 has been recommended to keep the global AIDS response on track for 2030. The next phase of the National AIDS Control Programme (NACP) in India has adopted its goals and targets in line with the global context.

As the national and global AIDS response is transitioning to a new phase, HIV Estimations 2020 report is a timely publication providing the latest evidence on the magnitude and directions of the HIV/AIDS epidemic by States/UTs in India. The latest round of HIV Estimations not only describes the achievement against the 2020 Fast-Track Targets, but also defines the baseline for 2025 targets. HIV Estimations 2020 has employed the latest version of the 'Spectrum' model as in the past rounds. The report details the methodology and presents the findings on epidemiological indicators of prevalence–incidence–mortality–EMTCT need. For the first time, the report has provided evidence on the mother-to-child-transmission rate (including breastfeeding period), which is a critical to assess progress on eliminating new HIV infections among children and keeping their mothers alive. The report also briefly discusses the implications for the NACP.

HIV Surveillance and Epidemiology under NACP has a robust institutional arrangement for Surveillance and Epidemiology under NACP. The arrangement includes not only the most reputed public health institutes in India, but also engages multidisciplinary independent national and international technical experts. I am confident that the HIV Estimations 2020 report, which is an outcome of a very robust institutional arrangement, will be used by all stakeholders towards prioritization of locations and finetuning of their strategies towards achieving the 2030 goal of ending the AIDS epidemic as a public health threat.

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आईसीएमआर—राष्ट्रीय आयुर्विज्ञान सांख्यिकी संस्थान
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Director



Preface

We are pleased to present the 2020 HIV estimates at national and State/Union Territory levels via this technical brief.

The 2020 HIV estimates were developed under the guidance of the Technical Working Group on HIV Surveillance and Estimations (TWG). It was implemented jointly by the Indian Council of Medical Research-National Institute of Medical Statistics (ICMR-NIMS) – which is the apex technical body for HIV estimations in India – with the National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare. The Technical Resource Group on HIV Surveillance and Estimations (TRG), comprising of the highest-level technical experts, provided oversight to the entire HIV estimations work.

In terms of overview to the method and steps, the 2020 round of HIV estimates were generated using the latest scientific tool, which is the Spectrum 6.06 version recommended by UNAIDS globally. The starting point for the estimations work was referring to the 2019 State/Union Territory (UT) Spectrum files and updating them using version 6.06 with the latest programme, and epidemiological data available at NACO in the AIM module of Spectrum. Default parameters were restored to make these estimates consistent with updates made to the Spectrum model. Epidemiological data for the general population were updated with routine-HIV testing data from standalone integrated counselling centres for 2019 and 2020. HIV sentinel surveillance data for pregnant women for the period 1998–2019 and from two or more rounds of data from the community-based survey were used. As no new prevalence data for HRG was available after the year 2017, this information was used. Curve fitting using 'EPP Classic model' was done. The general population curve was calibrated using HIV prevalence (95% CI) from the National Family Health Survey-IV, 2015-16, while the HRG population was calibrated using HIV prevalence from Integrated Biological and Behavioural Surveillance Survey 2014-15. Results of the 2020 HIV estimates replace all estimates generated in the earlier rounds as they use the latest tools, methods and data inputs.

2020 HIV estimates were developed at an important juncture in the AIDS response as this year was a critical year for national planning, stock-taking and reporting purposes. Furthermore, the COVID-19 pandemic has also added a new dimension in terms of its potential impact on the AIDS response. Hence, the need was felt to gauge the status of the response by looking at the latest trend and level of key impact indicators in 2020, such as number of new HIV infections, number of people living with HIV, number of AIDS-related deaths, adult HIV prevalence, and the need for services to prevent mother-to-child transmission of HIV. The results from the 2020 HIV estimates are well presented in this document. I am sure these will be very informative for all programme planners, implementers and stakeholders and I recommend its wide referral. I congratulate the entire TWG members and ICMR-NIMS team, Dr. Damodar Sahu, PI & Focal Person of HIV Estimations, Dr. Anil Kumar, Scientist F, Dr. Saritha Nair, Scientist E, Dr. Jiten Kumar Singh, Scientist D and Dr. Varsha Ranjan, Research Officer, who were involved in the 2020 estimates exercise.

Dr. Vishnu Vardhana Rao
Director, ICMR-NIMS

Chair, National Working Group on HIV Estimations



Message

I congratulate the National AIDS Control Organisation, Ministry of Health and Family Welfare (NACO, MoHFW) for its exemplary leadership in building one of the world's largest and strongest HIV Strategic Information Structures to guide the National AIDS Control Programme (NACP). HIV Surveillance and Estimations (HSE) is the backbone of that structure enabling today a national, state and district evidence-informed programming.

Over the years, NACO's HSE activities have grown from strength to strength in terms of its scale and quality. This has enabled a more accurate drill down from National-State-District levels to understand the status of the AIDS epidemic and response across population groups at all geographic levels for the benefit of the NACP. It is remarkable to see that this work is done by national institutes at central, regional, and State levels, which form key parts of the HSE system in mutually supportive ways.

The 2020 HIV estimates, the latest in the HIV estimations rounds, have been generated by NACO, and the Indian Council of Medical Research-National Institute of Medical Statistics (ICMR-NIMS) under the guidance of the Technical Working Group on HIV Surveillance and Estimations (TWG) and oversight of the high-level Technical Resource Group on HIV Surveillance and Estimations (TRG). Generated using the latest Spectrum modelling tool recommended by UNAIDS, with adherence to robust methods and the input of updated data, these estimates provide critical information for stock-taking, programming and resource allocation as we enter a critical year in the AIDS response. 2020 marks the end-line of key fast-track targets and the start of a new phase in the NACP.

2020 HIV estimates clearly highlight the progress made in controlling the HIV epidemic. If we look at the last few years, it is estimated that adult HIV prevalence has declined by 33.3% from 2010 to 2020. Estimated annual AIDS-related deaths declined by 82.2% during the same period as an impact of the ART. Prevention has also had an impact, as HIV incidence per 1,000 uninfected population declined by 55.5% and annual new HIV infections declined by 47.8% from 2010 to 2020.

Despite this progress, there is more to be done to achieve some of the targets; and the many new initiatives being implemented by NACO, such as the 'multi-month dispensation of ART,' Dolutegravir regimen, revamping of TIs for better provision of HIV services among KPs, CSS, CLM, virtual space and community-based service delivery, and PrEP, will provide further impetus.

UNAIDS is pleased to have supported these efforts and remains committed to continue to do so. I once again congratulate NACO and ICMR-NIMS for generating the 2020 HIV estimates and recommend that all stakeholders use them for future planning and programming towards the 'END of AIDS' target of 2030.



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Acknowledgement

Biennial HIV Estimations is a key component of the spectrum of Surveillance and Epidemiology (S&E) activities under the National AIDS Control Programme. Being implemented since 1998, HIV Estimations 2020 is the latest in the series, updating the epidemiological evidence nationally and by States/UTs. India's topmost epidemiologists, demographers, biostatisticians, community representatives with the State and national programme managers have actively contributed to the successful completion of HIV Estimations 2020. We acknowledge the contributions made by all stakeholders engaged in the process.

The Technical Resource Group (TRG) for HIV Surveillance and Estimation, first under the chairpersonship of Smt. Arti Ahuja (former Additional Secretary & DG, NACO, MoHFW, GoI) and now under the chairpersonship of Shri Alok Saxena (Additional Secretary & DG, NACO, MoHFW, GoI) and co-chairpersonship of Dr. Sanjay Mehendale (Former Additional Director General, Indian Council of Medical Research, New Delhi) recommended the process, method and report for HIV Estimations 2020. We place on record our sincere thanks to the leadership for providing vision, insights and support towards HIV Estimations 2020.

Technical Working Group (TWG) (Surveillance & Epidemiology), under the Chairpersonship of Dr. Dandu Chandra Sekhar Reddy (Former HoD, Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India) was instrumental in reviewing and recommending the method and findings of the HIV Estimations 2020 for TRG perusal. Dr. M. Vishnu Vardhana Rao (Director ICMR-NIMS, New Delhi) led the implementation of HIV Estimations 2020 at the Indian Council of Medical Research-National Institute of Medical Statistics (ICMR-NIMS). Prof. Arvind Pandey, Dr. Shashi Kant, Dr. Bilali Camara (UNAIDS India), Mx. Abhina Aher, Dr. John Stover, Mr. Taoufik Bakkali (UNAIDS Asia Pacific), Dr. Vokaty Alexandra (WHO India), Dr. Rajatshruva Adhikary (WHO India), Dr. Shri Kant Singh (IIPS India), Dr. Shanta Dutta (ICMR-NICED, Kolkata), Dr. Sheela Godbole (ICMR-NARI, Pune), Dr. A. Elangovan (ICMR-NIE, Chennai), Dr. Sanjay Rai (AIIMS, New Delhi), Dr. P. V. M. Lakshmi (PGIMER, Chandigarh) and Dr. H. Sanyama Devi (RIMS, Imphal) strengthened the exercise with their expertise and provided critical technical guidance at all stages as TRG and TWG members/invitees.

Programmatic context for the exercise was provided by Dr. Naresh Goel (DDG, NACO), Dr. Anoop Kumar Puri (DDG, NACO), Dr. Chinmoyee Das (DD, NACO), Dr. Bhawani Singh Kushwaha (DD, NACO), Dr. Saiprasad Bhavsar (DD, NACO) and Dr. Bhawna Rao (DD, NACO). We place on record our sincere thanks to NACO's leadership and senior experts for providing vision, insights and support towards HIV Estimations 2020.

Dr. Pradeep Kumar (NACO) and Dr. Damodar Sahu (ICMR-NIMS) anchored the implementation of HIV Estimations 2020, which included the defining technical and operational framework and preparation of the Technical Brief. Dr. Arvind Kumar (NACO), Dr. Varsha Ranjan (ICMR-NIMS) and Ms. Nalini Chandra (UNAIDS India) actively supported the implementation of the models. Dr. Shreya Jha (AIIMS, New Delhi), Dr. Sayali Kalme (ICMR-NARI, Pune), Dr. Santha Kumar Aridoss (ICMR-NIE, Chennai), Dr. Subrata Biswas (ICMR-NICED, Kolkata), Ms. Chandrakanta (PGIMER, Chandigarh) and Dr. Manihar Singh (RIMS, Imphal) participated in the process. UNAIDS India supported the publication of the HIV Estimations 2020 report. We acknowledge the contribution of each of them towards the successful completion of HIV Estimations 2020.

HIV Estimations 2020 is being published at a critical juncture, establishing the progress made so far and highlighting the priority areas towards achieving the 2030 goal of ending the AIDS epidemic as a public health threat. We are confident that all stakeholders will use the latest evidence presented here to fine-tune their responses to further benefit the national AIDS response in the country.

Dr. Shobini Rajan

Contents

Acronyms	xiii
Overview	1
Tools and Methodology	2
Key Results	4
I. Adult HIV Prevalence (15–49 Years)	4
II. People Living with HIV (PLHIV).....	5
III. HIV Incidence (per 1000 Uninfected Population)	7
IV. Annual New HIV Infections.....	8
V. AIDS-related Deaths	10
V. Estimated PMTCT Need for HIV.....	12
Conclusion	14
Annexure	16
Annexure 1: NACO’s Technical Working Group on HIV Surveillance and Epidemiology	16
Annexure 2: Institutional Arrangement for Surveillance and Epidemiology under NACP	18
Annexure 3: NACO’s Technical Resource Group on HIV Surveillance and Estimation	19
Annexure 4: National Summary of the HIV/AIDS Epidemic in 2020.....	21
Annexure 5: State and UT-wide Summary of HIV Epidemic in 2020, India HIV Estimates 2020	22
Annexure 6: State and UT-wide Adult HIV Prevalence (15–49 Years), 2015–2020, India HIV Estimates 2020	23
Annexure 7: State and UT-wide HIV Incidence (per 1,000 Uninfected Population), 2015–2020, India HIV Estimates 2020	24

Acronyms

AIDS	Acquired Immuno Deficiency Syndrome
AIIMS	All India Institute of Medical Sciences
AIM	AIDS Impact Module
A&N	Andaman & Nicobar
ANC	Antenatal Care
ANHI	Annual New HIV Infections
ARD	AIDS-related Deaths
ART	Antiretroviral Therapy
CST	Care, Support and Treatment
DemProj	Demographic Projection
EMTCT	Elimination of Mother-to-Child Transmission
DNH & DD	Dadra & Nagar Haveli and Daman & Diu
EPP	Estimation and Projection Package
HIV	Human Immunodeficiency Virus
HRG	High- Risk Group
IBBS	Integrated Biological and Behavioural Surveillance
ICMR	Indian Council of Medical Research
J&K	Jammu and Kashmir
LB	Lower Bound
MTCT	Mother to Child Transmission
NACO	National AIDS Control Organisation
NACP	National AIDS Control Programme
NFHS	National Family Health Survey
NIMS	National Institute of Medical Statistics
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
TRG	Technical Resource Group
TWG	Technical Working Group
UB	Upper Bound
UT	Union Territory
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

Overview

National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare, Government of India periodically undertakes the HIV estimation process to provide updated information on the status of the HIV epidemic in India. The first round of HIV estimation in India was undertaken in 1998, while the last round was completed in 2019. India HIV Estimates 2020, the latest round in this series, provides the current status of the HIV epidemic in the country and its States/Union Territories (UTs) on key parameters of HIV prevalence, new infections, AIDS-related mortality and prevention of mother-to-child transmission (PMTCT) need.

The 2020 round of HIV estimation was carried out jointly by NACO and Indian Council of Medical Research-National Institute of Medical Statistics (ICMR-NIMS), New Delhi under the guidance of NACO's Technical Working Group (TWG) on HIV Surveillance and Epidemiology. The members of TWG include experts in demography, epidemiology, statistics, etc. from national and regional institutes for HIV Surveillance and Epidemiology, and also independent technical experts (see Annexures 1 and 2). The findings have been reviewed and approved by the National Technical Resource Group (TRG) on HIV Surveillance and Estimation of NACO (see Annexure 3).

Tools and Methodology

The 2020 round of HIV Estimation of India employed globally recommended modelling technique, as in the past: namely the latest version of the Spectrum tool and the same TRG-approved method used in the earlier rounds was followed. For the HIV Estimation 2020, Spectrum 6.06 version was used, the details of which are available elsewhere.¹ State/UT-wide models for HIV Estimation 2019 were updated using Spectrum 6.06 version for the 2020 round.

A detailed report on HIV Estimations 2019 is available at the NACO website.² Specifically, India continues to use the DemProj (Demographic Projection) and AIM (AIDS Impact Module) modules of the Spectrum tool for 2020 round. The Estimation and Projection Package (EPP), integrated with the AIM module, has been used to generate the incidence curve from the time series surveillance data for further estimation process. The projection period for HIV Estimations 2020 is 1980 to 2026, as set in the earlier rounds.

The first step in the process was to review the demographic projections in each of the State/UT models using DemProj module of Spectrum, based on the latest fertility data (total fertility rate and age-specific distribution of fertility). No update was made in the demographics. In the next step, several programmatic and epidemiological parameters were updated in the AIM. These included data on programme coverage of adults and children on antiretroviral therapy (ART), coverage of PMTCT for the years 2019 and 2020, and projecting for future years using a similar approach as in the HIV Estimation 2019. Considering the impact of the COVID-19 pandemic, the current coverage was assumed to be flatlined for a year, following which the uptake in services was assumed to increase at average rates previously noted in the two-three years preceding the pandemic.

As part of the process, the data of natural progression of HIV [adult and paediatric transition parameters, HIV-related fertility reductions and mother-to-child transmission (MTCT) probabilities] were restored to the default. This was done to make the India HIV Estimation 2020 consistent with the updates made in Spectrum 6.06 version.³

The epidemiological configuration for each State/UT continues to be factored in the general population and high-risk groups (HRG). Epidemiological data for the general population were updated with routine HIV testing data from stand-alone integrated counselling for the two years (2019 and 2020). These epidemiological data for the general population also had inputs from HIV sentinel surveillance among pregnant women for the period 1998–2019, as well as from two or more rounds of data from community-based surveys involving States/UTs. As no new prevalence data for HRG was available after the year 2017, no updates were made for the HRG for the 2020 round of estimation.

¹ <https://www.avenirhealth.org/software-spectrum.php>

² <http://naco.gov.in/surveillance-epidemiology-0>

³ <https://avenirhealth.org/Download/Spectrum/Spectrum%20Update%20List.pdf>

After updating the demographic, programmatic and epidemiological inputs, HIV prevalence curves for 35 States/UTs (excluding Lakshadweep) were generated for various population sub-groups. As in the previous rounds, the HIV prevalence for the general population was calibrated using HIV prevalence (95% CI) from National Family Health Survey-IV (NFHS IV, 2015-16) while the same for HRG population was calibrated using HIV prevalence from Integrated Biological and Behavioural Surveillance Survey (IBBS, 2014-15).

The results from HIV Estimation 2020 reflecting levels and trends of prevalence, incidence, AIDS-related deaths (ARD) and PMTCT needs have been presented in this report. It is important to reiterate that these results – generated using the most updated Spectrum tool in which improvements are incorporated based on the latest available science and understanding of the epidemic, and having the most recent data inputs – replace the results from the previous rounds of estimates. Their importance is due to the use of Spectrum 6.06 version, which has critical updates on the natural history of HIV, specifically on rates of disease progression and mortality with untreated HIV from Population-based HIV Impact Assessment (PHIA) surveys, which has affected the HIV-related deaths and PMTCT needs. Updates to the Spectrum version 6.06 were done as advised by UNAIDS Reference Group on HIV Estimates, Modelling and Projections. In view of this, for all comparisons, the time trend data, as provided through HIV Estimation 2020, shall only be used until the data from the next round of estimation is made available. This is in accordance with the recommendations of UNAIDS, stating that the results from previous rounds cannot be compared with the results from the latest round.⁴

⁴ https://www.unaids.org/en/dataanalysis/knowyourresponse/HIVdata_estimates

Key Results

Key highlights from the HIV Estimation 2020 have been presented in the subsequent sections. National estimates are summarized in Annexure 4 with State/UT-wide details presented in Annexures 5–7.

I. Adult HIV Prevalence (15–49 Years)

National adult (15–49 years) HIV prevalence was estimated at 0.22% (0.17%–0.29%) in 2020; 0.23% (0.18%–0.31%) among males, and 0.20% (0.15%–0.26%) among females. The national adult prevalence continued to decline from an estimated peak level of 0.54% in 2000–2001 through 0.33% in 2010 to 0.22% in 2020 (see Figure 1). This corresponds to a 33.3% decline in the last ten years. Similar consistent declines were noted among both males and females at the national level.

Among the States/UTs, in 2020, Mizoram had the highest estimated adult HIV prevalence of 2.37%, followed by Nagaland (1.44%) and Manipur (1.15%), all of which were States in northeast India. Andhra Pradesh (0.66%), Meghalaya (0.53%), Telangana (0.48%) and Karnataka (0.45%) were the other States with adult prevalence higher than 0.40%. Besides these States, Delhi, Maharashtra, Puducherry, Punjab, Goa and Tamil Nadu had an estimated adult HIV prevalence greater than the national prevalence (0.22%), while Haryana and Chhattisgarh had an estimated adult HIV prevalence in the range of 0.20–0.21%. All other States/UTs in India had estimated adult HIV prevalence below 0.20% (see Figure 2).

Figure 1. Estimated Adult HIV Prevalence (%) in India, 1990–2020

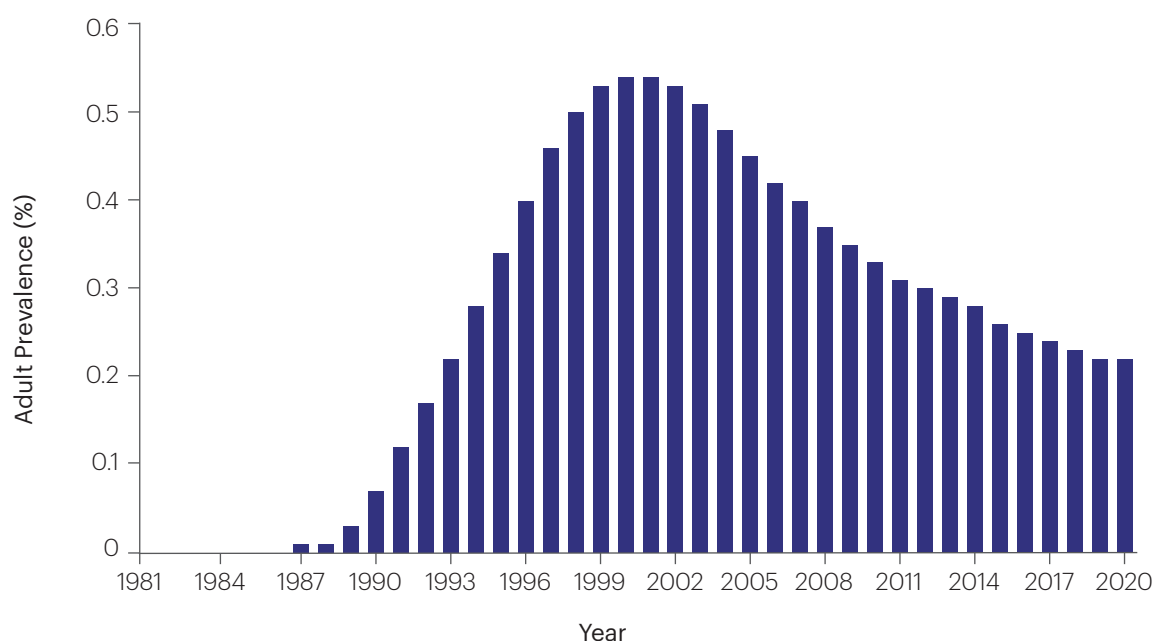
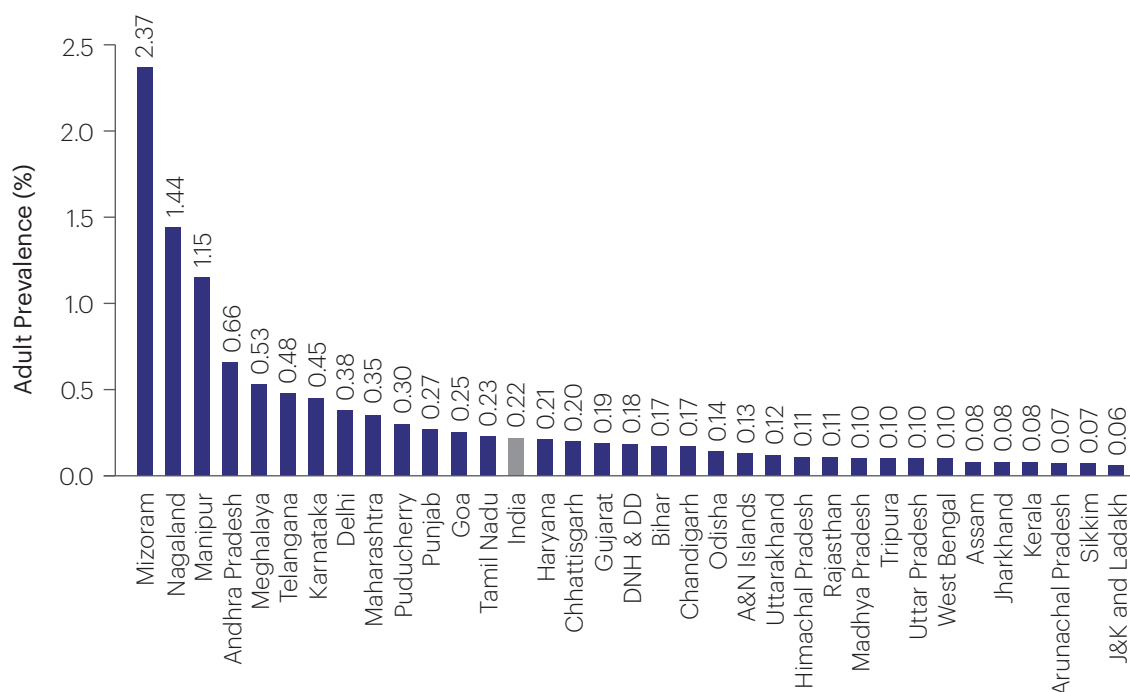


Figure 2. State/UT-wide Adult HIV Prevalence (%), 2020



II. People Living with HIV (PLHIV)

The total number of people living with HIV (PLHIV) in India was estimated at 23.19 lakh (18.33 lakh–29.78 lakh) in 2020. Children (<15 years) accounted for 3.5%, and 44.3% of total infections were among females. Maharashtra had the highest estimated number of PLHIV (3.90 lakh), followed by Andhra Pradesh (3.03 lakh), Karnataka (2.55 lakh), Uttar Pradesh (1.61 lakh), Telangana and Tamil Nadu (1.58 lakh each). Bihar (1.30 lakh) and Gujarat (1.04 lakh) were the other States with an estimated PLHIV of more than one lakh (see Figure 3). West Bengal (0.78 lakh), Delhi (0.67 lakh), Punjab (0.65 lakh), Rajasthan (0.62 lakh), and Madhya Pradesh (0.60 lakh) were estimated to have PLHIV size of more than 50 thousand. Odisha (0.49 lakh), Haryana (0.45 lakh), Chhattisgarh (0.43 lakh), Manipur (0.28 lakh) and Kerala (0.25 lakh) were the other States with an estimated PLHIV size of around 25 thousand or more. Together, these 18 States/UTs had around 94% of the total estimated PLHIV in the country.

Overall, there was an estimate of 1,721 (1,361–2,210) PLHIV per million people in 2020 in India (see Figure 4). State/UT-wide, the number of PLHIV per million population was the highest in Mizoram (17,207), followed by Nagaland (10,421), Manipur (9,510), Andhra Pradesh (5,712) and Telangana (4,144). PLHIV per million population ranged from 3,065 to 3,850 in the States of Karnataka, Meghalaya, Maharashtra and Delhi. Puducherry, Goa, Punjab and Tamil Nadu were other States/UTs with PLHIV per million higher than the national average of 1,721.

Figure 3. State/UT-wide PLHIV (in Lakh), 2020

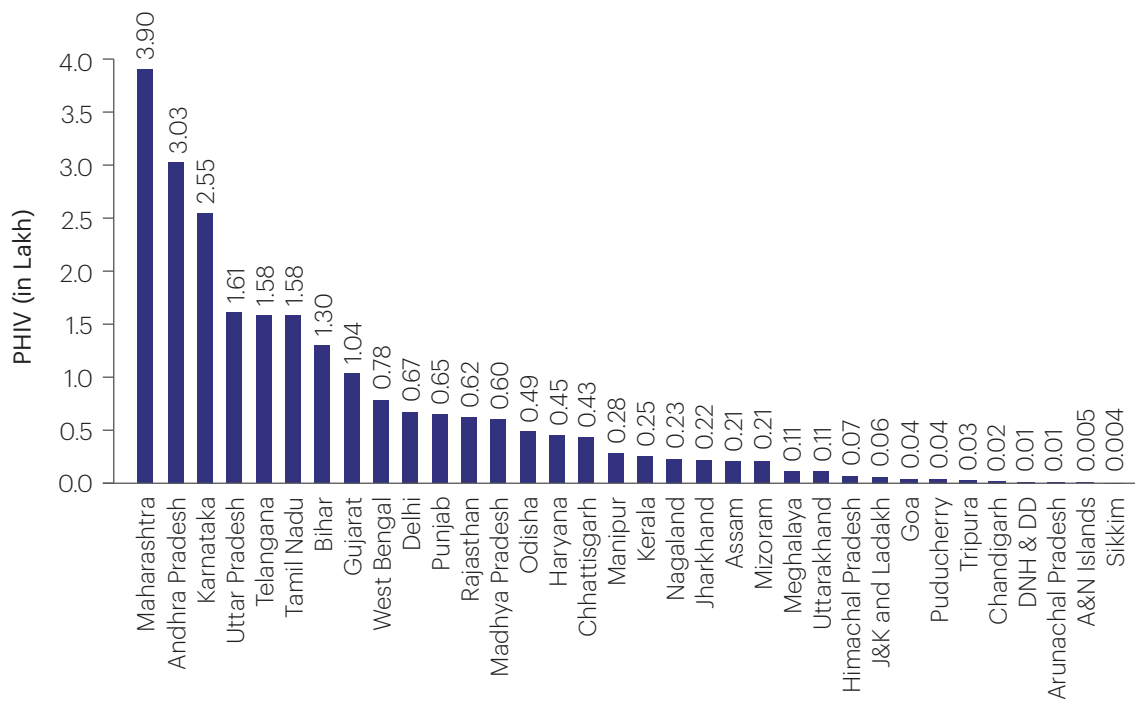
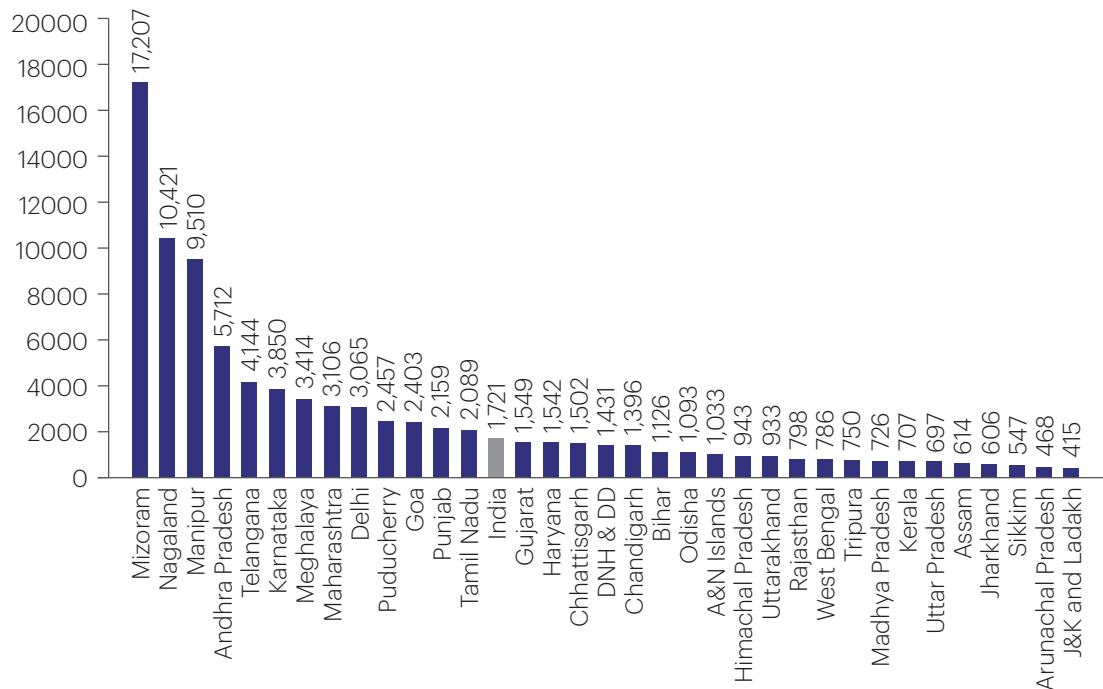


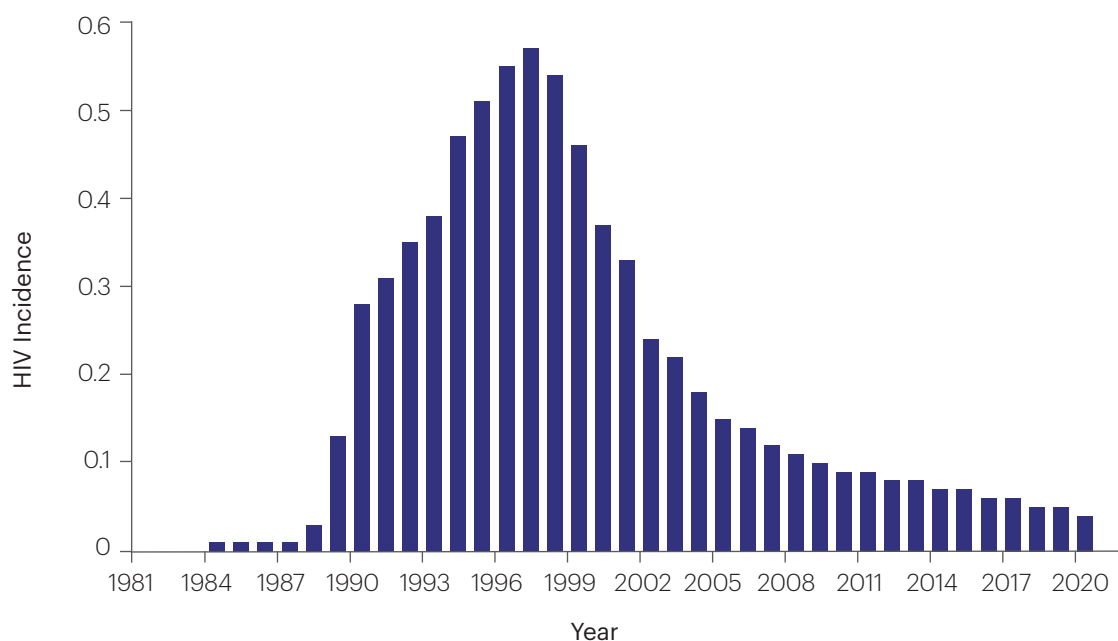
Figure 4. State/UT-wide Estimated PLHIV per Million Population, 2020



III.HIV Incidence (per 1,000 Uninfected Population)

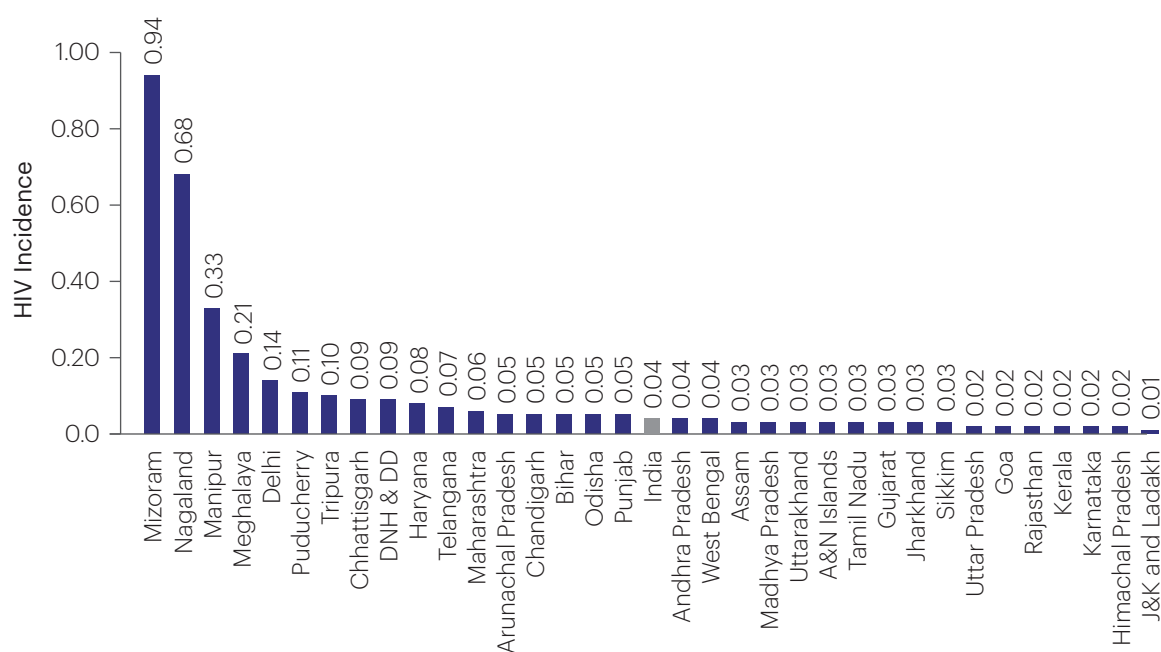
Nationally, HIV incidence was estimated at 0.04 (0.02–0.09) per 1,000 uninfected population in the calendar year 2020. It declined from 0.57 per 1,000 uninfected population in 1997 through 0.09–0.10 in 2009–10 to 0.04 in 2020, corresponding to a 56% decline in the last ten years (see Figure 5).

Figure 5. HIV Incidence per 1,000 Uninfected Population in India, 1990–2020



State/UT-wide, estimated incidence per 1,000 uninfected population continued to be the highest in the three northeastern States of Mizoram (0.94), Nagaland (0.68) and Manipur (0.33) in 2020 (see Figure 6). Other States estimated to have HIV incidence above the national average of 0.04 were Meghalaya (0.21), Delhi (0.14), Tripura (0.10), Chhattisgarh (0.09), Haryana (0.08), Telangana (0.07), Maharashtra (0.06), Punjab (0.05), Odisha (0.05), Bihar (0.05) and Arunachal Pradesh (0.05).

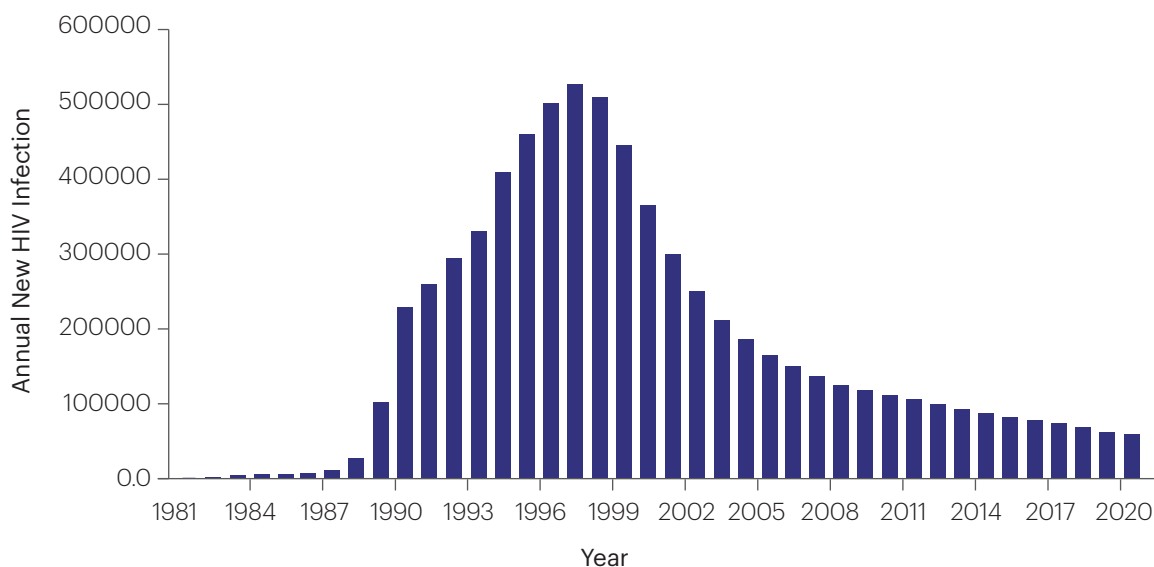
Figure 6. State/UT-wide HIV Incidence per 1,000 Uninfected Population, 2020



IV. Annual New HIV Infections

India was estimated to have around 57.55 thousand (28.51 thousand–113.70 thousand) new HIV infections in 2020, documenting 89% decline in new infections since attaining the peak in 1997. Nearly 48% decline from 2010 (the year set as baseline for the 2020 Fast-Track Targets) was noted (see Figure 7). Around 10% of the total new HIV infections in 2020 were estimated among children (aged <15 years), with an estimated 55% decline in annual new infections between 2010 and 2020.

Figure 7. Annual New HIV Infections in India, 1981–2020



Nineteen States/UTs with an estimated 1,000 or more people newly infected with HIV in 2020 (Maharashtra, Uttar Pradesh, Bihar, West Bengal, Delhi, Madhya Pradesh, Chhattisgarh, Telangana, Tamil Nadu, Haryana, Andhra Pradesh, Odisha, Gujarat, Rajasthan, Nagaland, Punjab, Karnataka, Assam and Mizoram) accounted for more than 90% of estimated annual new HIV infections (ANHI) in the country. Maharashtra had the highest number of new HIV infections in 2020 (around 7,800), followed by Uttar Pradesh and Bihar (around 5,600 each) (see Figure 8).

The decline in ANHI between 2010 and 2020 was noted in all States/UTs, except for four (see Figure 9). The highest decline was noted in Karnataka (82%), followed by Himachal Pradesh (78%), Gujarat (72%) and Andhra Pradesh (72%). No change in ANHI was noted in Chhattisgarh. In States/UTs of Tripura, Arunachal Pradesh, Dadra & Nagar Haveli and Daman & Diu (DNH & DD), there were more new HIV infections in 2020 as compared to 2010.

Figure 8. State/UT-wide Annual New HIV Infections (in thousand), 2020

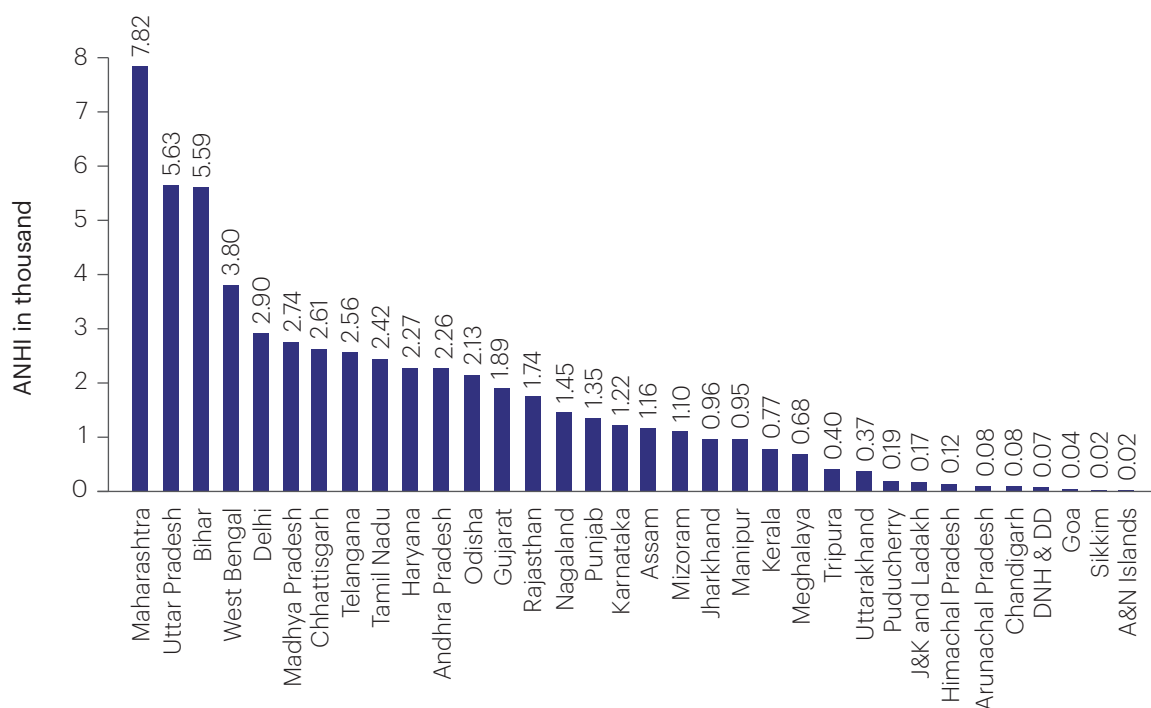
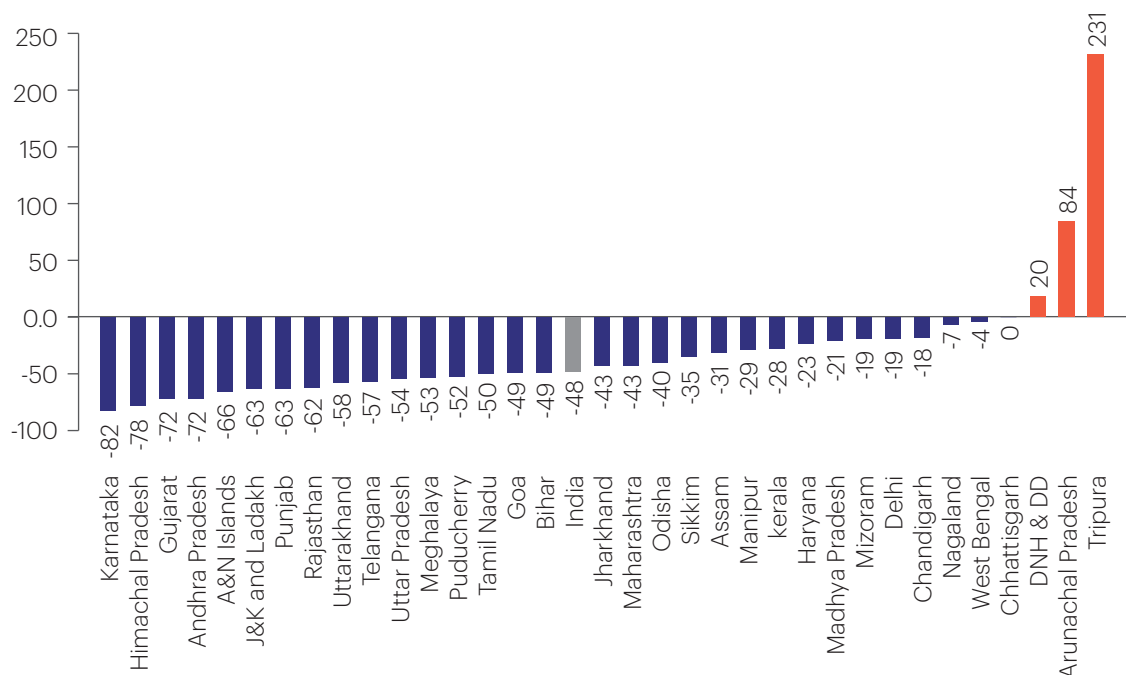


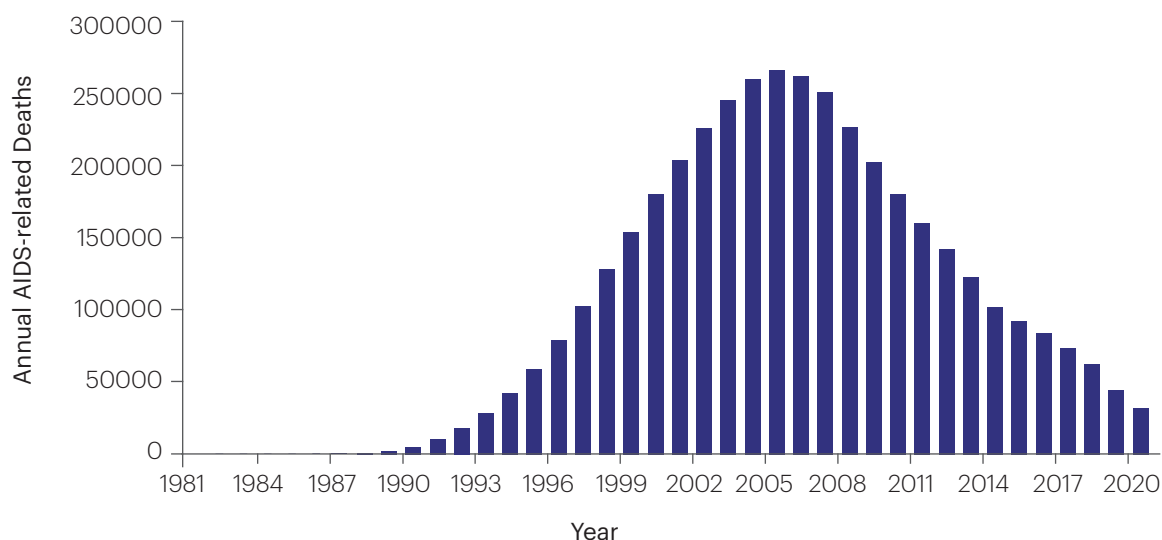
Figure 9. Percentage Change in Annual New HIV Infections by State/UT, 2010–2020



V. AIDS-related Deaths

There were approximately 51,000 (34,800–77,200) deaths among PLHIV in 2020, with almost 63% deaths being AIDS-related. Overall, annual AIDS-related mortality among PLHIV declined by 88% since attaining the peak in 2005 and by 82% since 2010 (see Figure 10). The estimated AIDS-related mortality per 100,000 population peaked at 24.34 in 2005 and declined through 15.13 in 2010 to 2.37 in 2020.

Figure 10. Annual AIDS-related Deaths in India, 1981–2020



State/UT-wide, Andhra Pradesh was estimated to have the highest number of AIDS deaths in 2020 (7.07 thousand), followed by Maharashtra (4.37 thousand), Karnataka (4.06 thousand), Uttar Pradesh (2.00 thousand), Bihar (1.77 thousand) and Telangana (1.52 thousand). In addition, Odisha, Tamil Nadu and Madhya Pradesh were other States with an estimated ARD higher than 1,000 in 2020 (see Figure 11).

State/UT-wide, annual ARD were estimated to have declined from 2010 to 2020 in nearly all States/UTs, except Arunachal Pradesh, Meghalaya and Puducherry (see Figure 12). ARD declined by around 80% or more in the States/UTs of Punjab, Telangana, Tamil Nadu, West Bengal, Himachal Pradesh, Karnataka, Maharashtra, Andhra Pradesh, Goa and Mizoram.

Figure 11. State/UT-wide Estimated Annual AIDS-related Deaths (in thousand), 2020

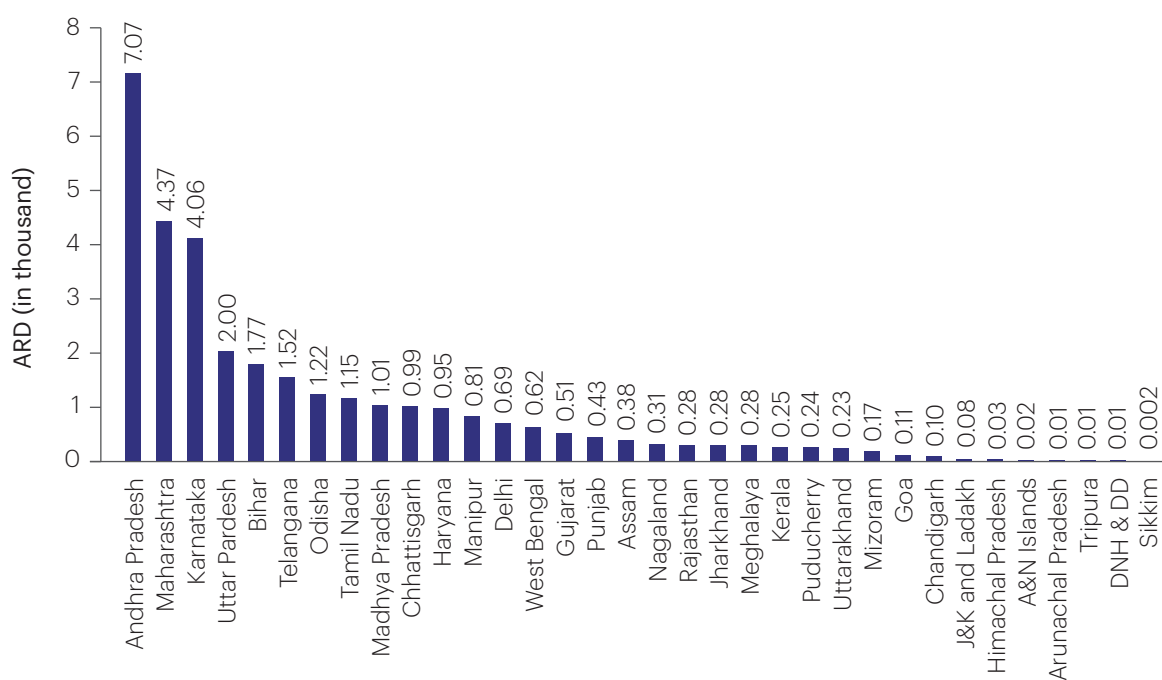
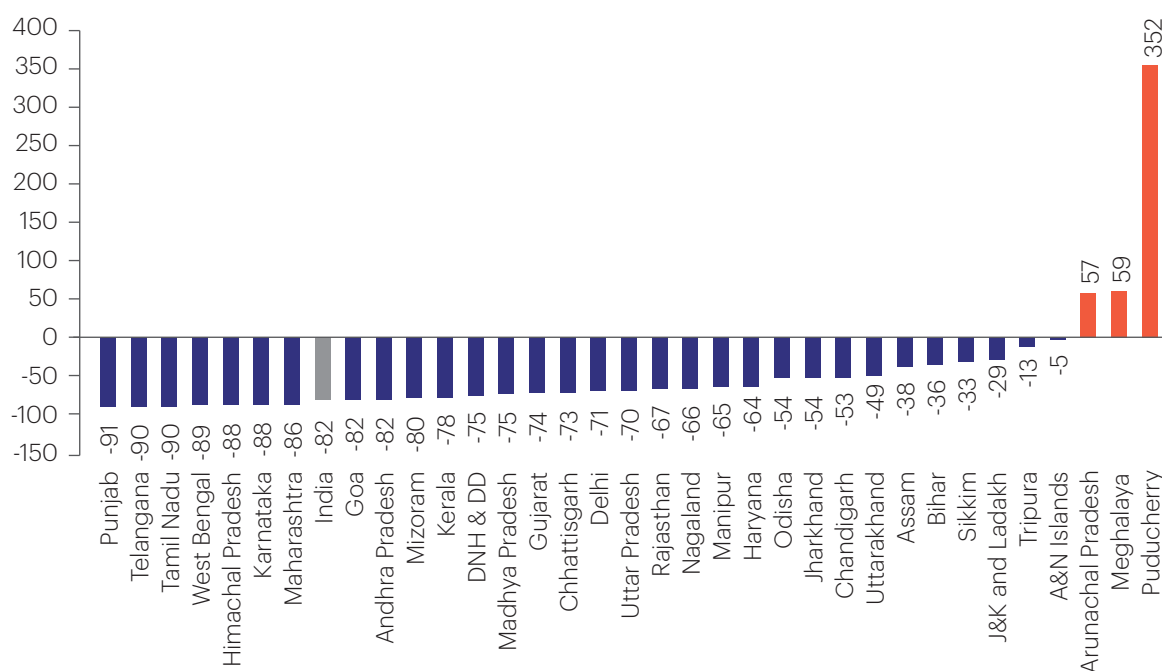


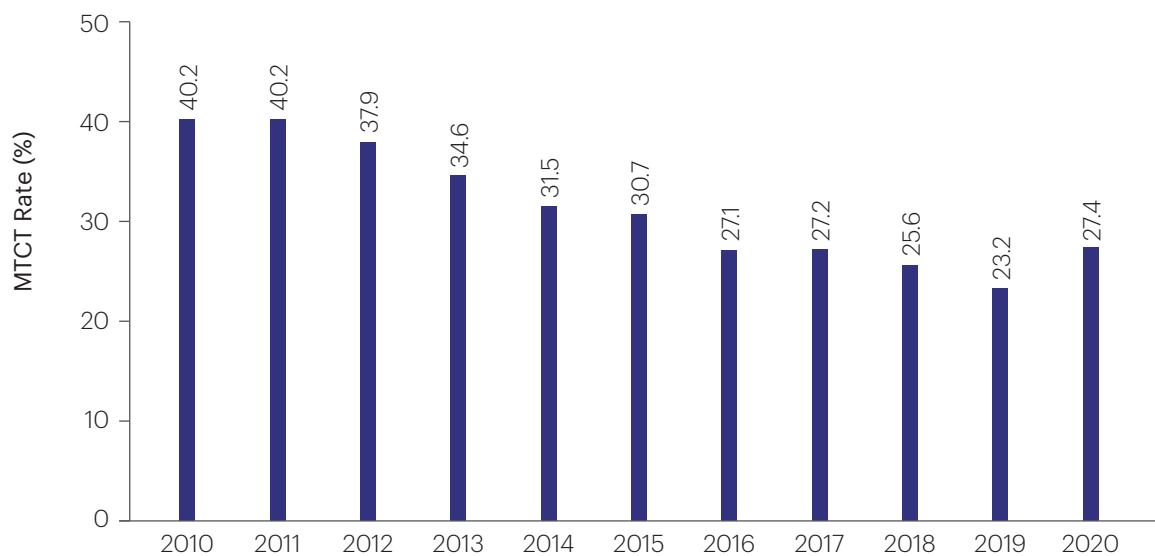
Figure 12. Percentage Change in Annual AIDS-related Deaths by State/UT, 2010–2020



V. Estimated PMTCT Need for HIV

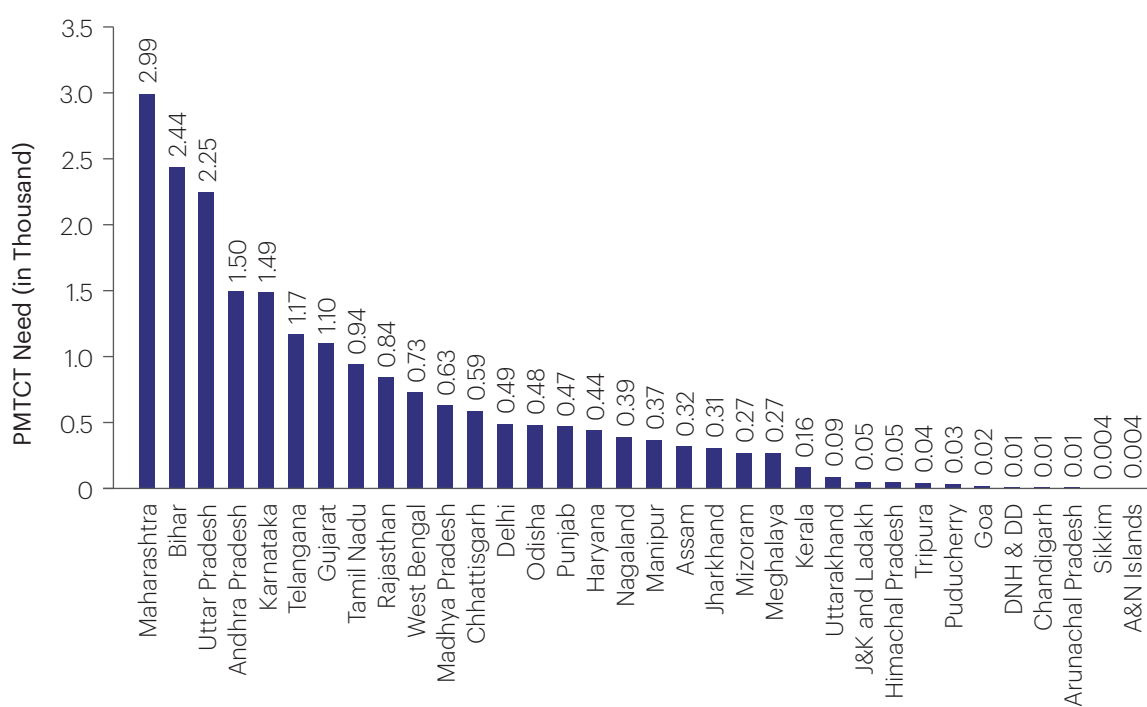
Nationally, there were an estimated 20.93 thousand (15.33 thousand–29.08 thousand) pregnant women in 2020 who were estimated to require ART to PMTCT of HIV. The final MTCT rate (including breastfeeding period) in 2020 was estimated at 27.4% (20.3%–33.5%), down from around 40.2% in 2010 (see Figure 13).

Figure 13. Final MTCT Rate in India, 2010–2020



Twenty States/UTs were estimated to have almost 95% of the total PMTCT need of the estimated total of 20.93 thousand in the country (see Figure 14). States accounting for the highest need were Maharashtra (2.99 thousand), Bihar (2.44 thousand), Uttar Pradesh (2.25 thousand), Andhra Pradesh (1.50 thousand), Karnataka (1.49 thousand), Telangana (1.17 thousand), Gujarat (1.10 thousand), Tamil Nadu (0.94 thousand), Rajasthan (0.84 thousand), West Bengal (0.73 thousand), Madhya Pradesh (0.63 thousand) and Chhattisgarh (0.59 thousand). States/UTs of Delhi, Odisha, Punjab and Haryana had PMTCT need of 0.44 thousand–0.49 thousand in 2020. The States of Nagaland, Manipur, Jharkhand, Assam, Meghalaya and Mizoram had PMTCT need between 0.27 thousand and 0.39 thousand.. The rest of the States/UTs had PMTCT need of around 0.16 thousand or lower.

Figure 14. State/UT-wide PMTCT Need (in thousand), 2020



Conclusion

The results from India HIV Estimation 2020 present evidence on the current status of the HIV/AIDS epidemic in the country. Evidently, India continues to have multiple HIV epidemics as the level and trend of key epidemiological indicators vary by States/UTs.

With an adult prevalence of around 0.22% in 2020, the overall HIV epidemic in India continues to be low. Globally, only 25 countries are estimated to have an adult prevalence of less than 0.20%.⁵ However, although overall HIV prevalence continues to be low in the country as a whole, the HIV epidemic continues to be high (more than 1%) in three northeastern States.

Even with low prevalence, India has the second highest HIV burden globally with an estimated 23.19 lakh PLHIV in 2020. In view of this burden, HIV/AIDS continues to be a public health challenge in India. As a signatory to the United Nations Declaration on Sustainable Development Goals (SDGs), India is committed to achieve the “End of AIDS” as a public health threat by 2030. In response, India has identified specific 2020 Fast-Track Targets for prevention of new HIV infections, scaling-up of testing and treatment, elimination of mother-to-child transmission (EMTCT) of HIV and elimination of HIV/AIDS-related stigma and discrimination, as adopted globally, to anchor the global AIDS response towards implementing strategies in pursuit of the “ENDGAME” by 2030.

HIV Estimation 2020 indicates that while India’s AIDS response continues to be successful, there is no place for complacency. Nationally, new HIV infections declined by 48% between 2010 and 2020 in comparison to the global average of 23% (between 2010 and 2019); yet this rate of decline is far from the envisaged target of 75%. The decline in new HIV infections was less than 50% in 17 States/UTs, while it actually increased in three States/UTs. Clearly, prevention of new HIV infections remains a critical challenge, requiring greater comprehensive prevention efforts to bring the epidemic to a lower trajectory at a faster rate. This is a necessary condition for India’s AIDS response to achieve 80% reductions by 2025.

Rapid scale-up of free, client-centric and high quality care, support and treatment (CST) services has been the hallmark of India’s national AIDS response since its launch in April 2004. HIV Estimation 2020 continues to reiterate the high impact of treatment services under the National AIDS Control Programme (NACP). Between 2010 and 2020, ARD declined nationally by almost 82% in comparison to the global average of 39% (between 2010 and 2019).⁶ While the goal of 75% decline in mortality was achieved nationally, the decline was less than 50% in seven States/UTs and actually increased in three States/UTs. Thus, there remain some gaps that are a source of concern and need to be addressed. Further saturation of CST services will cause greater impact and even further reduction in annual ARD towards attainment of ‘zero ARD’ in the future, and simultaneously augmentation of HIV prevention by fast-tracking progress on ‘Undetectable = Untransmittable’.

⁵ Source: UNAIDS 2020 estimates as downloaded from <https://www.unaids.org/en/resources/fact-sheet> on 10.05.2021

⁶ https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf

EMTCT of HIV is a key commitment under the NACP. However, HIV Estimation 2020 showed that the progress on EMTCT, though significant, is still far from the target. A significant achievement is evidenced by around 55% decline of annual new HIV infections among children between 2010 and 2020. Still, the MTCT rate stood at around 27.45% in 2020 against the target of 5%. The PMTCT response has been observed to be slower than the target set and is likely to be further affected during the ongoing COVID-19 pandemic due to disruption in service uptake.

HIV Estimation 2020 has provided critical epidemiological updates using the latest tool and data. The findings not only demonstrate the heterogeneity of the HIV/AIDS epidemic in India but also reflect the country's progress towards the 2030 SDG of ending AIDS as a public health threat. As the country plans the phase-V of the NACP, the findings of HIV Estimation 2020 will augment the national AIDS response by informing the policymakers, programme managers and all other related stakeholders on the most recent status of the epidemic.

Annexure 1

NACO's Technical Working Group on HIV Surveillance and Epidemiology

T-11020/11/2019/NACO-Surveillance
National AIDS Control Organization
Ministry of Health and Family Welfare
Government of India

6th and 9th Floor, Chanderlok Building,
36, Janpath, New Delhi, 110001
Dated 17 August 2020

Officer Order

Subject: Constitution and ToR of Technical Working Group (TWG) of Surveillance and Epidemiology under NACP

A TWG has been constituted under NACP to guide the implementation of the activities of Surveillance and Epidemiology under the National AIDS Control Programme in terms of design, implementation, and findings in line with evolving programme needs and global recommendations.

The constitution of the TWG is as below:

- I. Dr DCS Reddy (Former HoD, Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India): Chairperson
- II. Hod-surveillance, NACO: Ex-officio Co- chairperson
- III. Professor Arvind Pandey, Former Director, ICMR-NIMS: Member
- IV. Dr Shashi Kant, HoD, Centre of Community Medicine, AIIMS-New Delhi: Member
- V. Dr S K Singh, Professor, Dept of Department of Mathematical Demography & Statistics, IIPS, Mumbai: Member
- VI. All focal persons of national and regional institutes of Surveillance & Estimation: Ex-officio member
- VII. Community Representatives (up to 2): To be co-opted by chairperson and co-chairperson
- VIII. All Deputy Directors, NACO: Ex-officio member
- IX. SACS representative (2-4): To be co-opted by chairperson and co-chairperson on need basis
- X. Subject experts (up to 2): To be co-opted by chairperson and co-chairperson on need basis
- XI. Special Invitees: Multilateral and bilateral developmental agencies/partners/other stakeholders as and when deemed appropriate by chairperson and co-chairperson
- XII. Senior-most consultant in SI (Surveillance and Epidemiology) division: Ex-officio member secretary

2. The coordination and secretarial assistance towards convening of the meeting of the national working Group will be provided by the consultants of the SI-Surveillance & Epidemiology division.

3. The ToR of the technical working group is as below:
- a. Review and recommend the detailed design, operational manuals, tools, results, and policy implications of the activities of Surveillance and Epidemiology (including estimations) under the National AIDS Control Programme in view of the evolving programme needs and the global recommendations. This will include, but not limited to, following areas:
 - i. The existing activities of various bio-behavioural surveillance survey, epidemiological investigations into the level, trend and drivers of the HIV/AIDS epidemic and related risk behaviours, in-depth analysis of epidemiological data, HRG size estimations, epidemic profile, district prioritization/categorization etc
 - ii. HIV burden estimations (2020 and onward rounds)
 - iii. Newer activities of programme data-based surveillance, surveillance blood specimen repository, national/state/district level HIV burden estimations (programme-data based or any other suitable modelling techniques), stigma surveillance, mortality surveillance, incidence, and viral load surveillance etc.
 - b. Any other areas pertaining to the Surveillance & Epidemiology under NACP
 - c. Periodic review and recommendation on the action plans of national and regional institutes under SI-Surveillance & Epidemiology division of NACO including the project team structures, TA/DA norms, training norms, financial norms etc.
 - d. The working group will meet at least once in six months. The expenditure for the functioning of this Technical Working Group will be regulated in accordance with the instructions issued from time to time.
4. The recommendations of this working group will be presented/circulated to the TRG (Surveillance and Estimations) for their ratification/approval.
5. This issues with approval of the Addl. Secretary and DG (NACO, Dept of Health and Family Welfare Government of India)


Dr. Shobini Rajan
DDG (SI-Surveillance & Epidemiology)

To

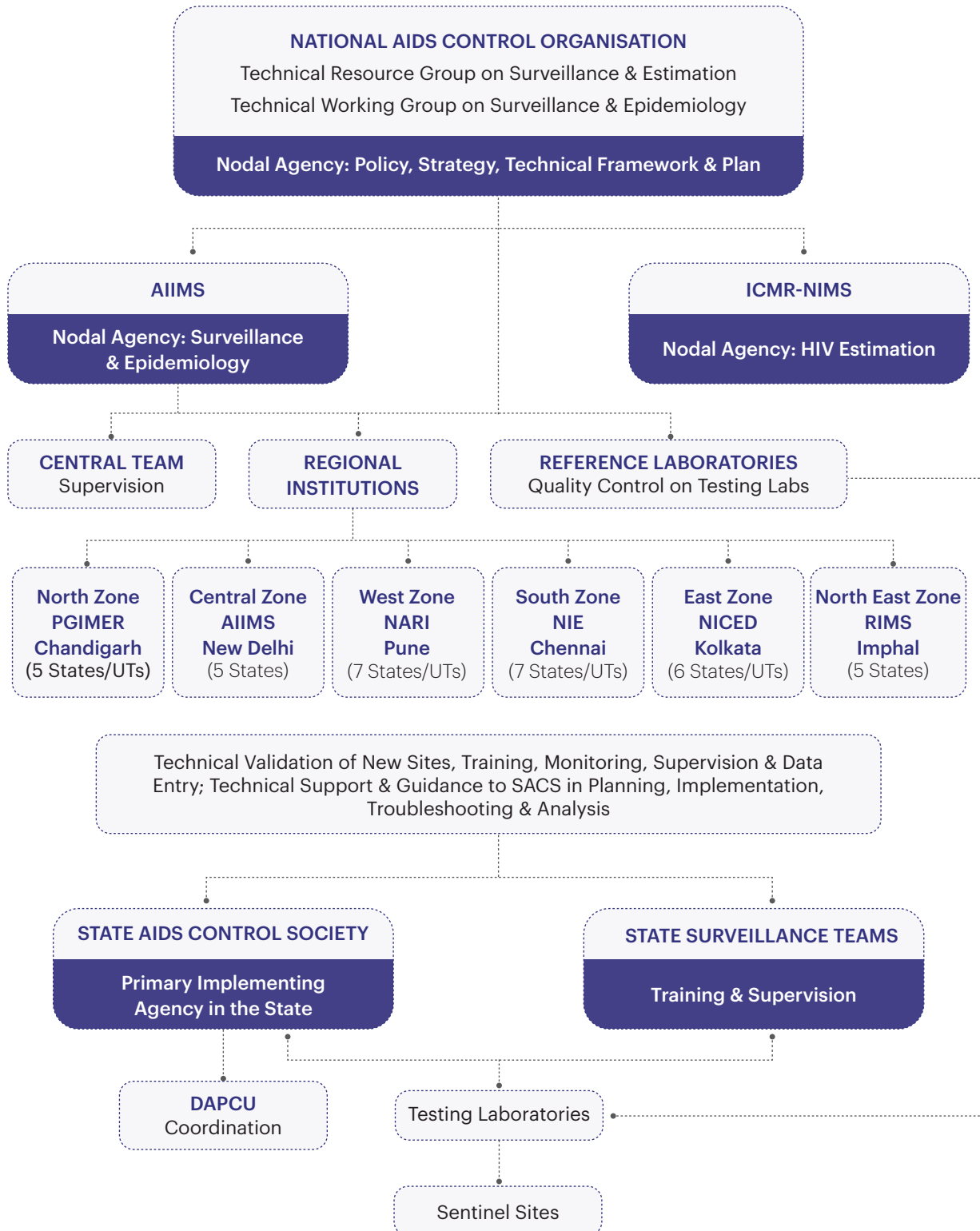
All the members of TWG as mentioned above

Copy to

1. Sr. PPS to AS & DG (NACO)
2. Dr. Sanjay Mehendale (Former Additional Director General, ICMR) and Co-Chair, TRG, Surveillance & Estimation
3. PS to JS (NACO)
4. All HoDs, NACO

Annexure 2

Institutional Arrangement for Surveillance and Epidemiology under NACP



Chair: Smt. Arti Ahuja, Former Additional Secretary and Director General, NACO / Shri Alok Saxena, Additional Secretary and Director General, NACO

Co-chair: Dr. Sanjay Mehendale, Additional Director General, ICMR

Member Secretary: Dr. Shobini Rajan, Chief Medical Officer (SAG), NACO

Members:

1. Dr. Henk Bekedam, Country Representative, WHO India
2. Dr. Bilali Camara, Country Director, UNAIDS India
3. Dr. N. S. Dharmshaktu, Principal Advisor to Ministry on Public Health, MoHFW, GOI
4. Dr. Peter Ghys, Director, Strategic Information and Evaluation, UNAIDS, Geneva
5. Dr. D. C. S. Reddy, Former Head of Department, Department of Community Medicine, Banaras Hindu University, Lucknow and Ex-NPO, WHO India
6. Prof. Arvind Pandey, Advisor, National Institute of Medical Statistics, New Delhi
7. Dr. Rajesh Kumar, Head, School of Public Health, PGIMER, Chandigarh
8. Dr. Samiran Panda, Director, National AIDS Research Institute, Pune
9. Dr. Manoj Vasant Murhekar, Director, National Institute of Epidemiology, Chennai
10. Dr. Shanta Dutta, Director, National Institute of Cholera and Enteric Diseases, Kolkata
11. Dr. Shashi Kant, Professor and Head, Centre for Community Medicine, All India Institute for Medical Sciences, New Delhi
12. Dr. S. Baby Vasumathi, Director, Institute of Obstetrics & Gynaecology, Madras Medical College, Chennai
13. Dr. Sanjay Dixit, Department of Community Medicine, MGM Medical College, Indore
14. Dr. D. K. Shukla, Former I/C Director, ICMR-NIMS, New Delhi
15. Dr. Laxmisha Chandrashekar, Head of Department, Department of Dermatology and STD, JIPMER, Puducherry
16. Mr. Taoufik Bakkali, UNAIDS Regional Support Team for Asia and the Pacific, Bangkok
17. Dr. Laishram Ladu Singh, Officiating Director, International Institute for Population Sciences, Mumbai

18. Dr. Jagdish Chandra, Former Director, Kalawati Saran Children's Hospital, New Delhi
19. Dr. Timothy Holtz, Director, DGHT, CDC India
20. Dr. John Stover, Vice President, Avenir Health and member UNAIDS HIV Estimation Reference Group
21. Mr. Ashok R. Kavi, Chairman, The Humsafar Trust
22. Mx. Abhina Aher, Associate Director, India HIV/AIDS Alliance
23. Dr. Naresh Goel, Deputy Director General, NACO
24. Dr. R. S. Gupta, Former Deputy Director General, NACO
25. Dr. Anoop Kumar Puri, Deputy Director General, NACO

Overall Coordination

1. Dr. Damodar Sahu, Scientist F & HIV Estimation Focal Person, ICMR-NIMS
2. Dr. Pradeep Kumar, Programme Officer, Surveillance & Epidemiology, NACO

Annexure 4

National Summary of the HIV/ AIDS Epidemic in 2020

Adult (15–49 Years) Prevalence	Total	0.22% [0.17–0.29]
	Male	0.23% [0.18–0.31]
	Female	0.20% [0.15–0.26]
Number of People Living with HIV	Total	23,18,738 [18,33,277–29,77,830]
	Adults (15+ years)	22,37,308 [17,73,563–28,69,016]
	Women (15+ years)	9,88,279 [7,82,107–12,67,941]
	Children (<15 years)	81,430 [58,650–1,09,358]
PLHIV per Million Population	Total	1,721 [1,361–2,210]
HIV Incidence per 1,000 Uninfected Population	Total	0.04[0.02–0.09]
	Male	0.05[0.02–0.09]
	Female	0.04[0.02–0.08]
New HIV Infections	Total	57,549 [28,510–1,13,695]
	Adults (15+ years)	51,802 [25,154–1,04,339]
	Women (15+ years)	21,953 [10,595–45,101]
Change in New HIV Infections since 2010 (%)	Total	-47.89
	Adults (15+ years)	-46.96
	Male (15+ years)	-47.83
	Female (15+ years)	-45.72
	Children (<15 years)	-55.02
AIDS-related Mortality per 100,000 Population	Total	2.37 [1.52–3.88]
	Male	3.30 [2.13–5.26]
	Female	1.37 [0.77–2.43]
AIDS-related Deaths	Total	31,944 [20,467–52,007]
	Children (<15 years)	3,582 [1,549–6,510]
	Adults (15+ years)	28,361 [18,377–46,197]
	Women (15+ years)	7,201[4,046–12,837]
Change in AIDS-related Deaths since 2010 (%)	Total	-82.24
	Adults (15+ years)	-83.19
	Female (15+ years)	-89.17
Children (<15 years)	-68.09	
PMTCT Need	Total	20,926 [15,328–29,075]
Final MTCT Rate of HIV (%)	Total	27.45 [20.30–33.52]

Annexure 5: State and UT-wide Summary of HIV Epidemic in 2020, India HIV Estimates 2020

S.No.	State/UT	Percentage of Adult HIV Prevalence (15-49 years), 2020		Total Number of PLHIV, 2020 (in thousand)		HIV Incidence per 1,000 Uninfected Population, 2020		Total Number of Annual New HIV Infections, 2020 (in thousand)		Percentage Change in Annual New HIV Infections,		AIDS-related Mortality per 100,000 Population, 2020		Total Number of AIDS-related Deaths, 2020 (in thousand)		Percentage Change in Annual AIDS-related Deaths,		PMTCT Need (in thousand)						
		LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB			
1	A&N Islands	0.06	0.13	0.35	0.22	0.48	1.20	0.01	0.03	0.27	0.01	0.02	0.12	65.91	0.64	4.54	12.87	0.003	0.02	0.06	-4.55	0.002	0.004	0.01
2	Andhra Pradesh	0.54	0.66	0.84	253.52	302.71	373.05	0.01	0.04	0.13	0.75	2.26	6.78	-71.87	8.86	13.35	20.97	4.69	7.07	11.11	-82.33	1.10	1.50	2.25
3	Arunachal Pradesh	0.05	0.07	0.11	0.48	0.71	1.07	0.02	0.05	0.10	0.03	0.08	0.15	83.72	0.36	0.70	1.30	0.01	0.01	0.02	57.14	0.01	0.01	0.01
4	Assam	0.07	0.08	0.10	18.77	21.24	24.11	0.03	0.03	0.05	0.87	1.16	1.61	-31.28	0.84	1.10	1.44	0.29	0.38	0.50	-38.27	0.27	0.32	0.38
5	Bihar	0.11	0.17	0.24	83.50	129.80	178.40	0.02	0.05	0.09	2.02	5.59	10.50	-49.09	0.69	1.53	2.89	0.80	1.77	3.33	-35.56	1.61	2.44	3.46
6	Chandigarh	0.12	0.17	0.24	1.70	2.21	2.99	0.01	0.05	0.12	0.02	0.08	0.18	-17.71	4.37	6.23	8.45	0.07	0.10	0.13	-52.63	0.01	0.01	0.02
7	Chhattisgarh	0.15	0.20	0.27	32.54	42.85	56.40	0.05	0.09	0.15	1.32	2.61	4.11	-0.46	2.17	3.48	5.62	0.62	0.99	1.60	-73.37	0.40	0.59	0.85
8	DNH and DD	0.12	0.18	0.28	0.80	1.20	1.78	0.04	0.09	0.18	0.03	0.07	0.15	20.34	0.50	0.81	1.43	0.004	0.01	0.01	-75.00	0.01	0.01	0.02
9	Delhi	0.33	0.38	0.45	57.15	66.81	77.66	0.09	0.14	0.20	1.91	2.90	4.22	-18.61	2.33	3.18	4.66	0.51	0.69	1.02	-70.98	0.41	0.49	0.61
10	Goa	0.18	0.25	0.38	3.51	4.36	6.01	0.01	0.02	0.08	0.01	0.04	0.14	-49.41	3.81	5.80	10.06	0.07	0.11	0.18	-81.77	0.02	0.02	0.04
11	Gujarat	0.16	0.19	0.23	85.22	103.89	125.91	0.02	0.03	0.05	1.11	1.89	3.27	-72.29	0.49	0.76	1.11	0.33	0.51	0.74	-74.02	0.89	1.10	1.37
12	Haryana	0.18	0.21	0.24	37.94	44.65	52.78	0.05	0.08	0.11	1.56	2.27	3.21	-22.91	2.57	3.29	4.46	0.74	0.95	1.29	-64.30	0.36	0.44	0.54
13	Himachal Pradesh	0.08	0.11	0.14	5.12	6.97	8.87	0.01	0.02	0.02	0.08	0.12	0.18	-77.84	0.21	0.37	0.83	0.02	0.03	0.06	-88.26	0.03	0.05	0.07
14	J&K & Ladakh	0.03	0.06	0.10	3.22	5.72	9.39	0.005	0.01	0.05	0.07	0.17	0.70	-63.21	0.21	0.55	1.26	0.03	0.08	0.17	-28.97	0.03	0.05	0.09
15	Jharkhand	0.04	0.08	0.11	10.03	22.44	27.77	0.02	0.03	0.04	0.69	0.96	1.35	-42.78	0.11	0.75	1.26	0.04	0.28	0.47	-53.67	0.19	0.31	0.39
16	Karnataka	0.37	0.45	0.55	216.10	255.15	307.51	0.01	0.02	0.05	0.55	1.22	3.17	-81.87	4.08	6.13	9.50	2.71	4.06	6.30	-88.18	1.15	1.49	2.15
17	Kerala	0.07	0.08	0.10	2.12	24.87	30.99	0.01	0.02	0.04	0.49	0.77	1.29	-27.65	0.52	0.70	1.08	0.18	0.25	0.38	-78.35	0.13	0.16	0.22
18	Madhya Pradesh	0.08	0.10	0.13	49.19	60.08	78.61	0.02	0.03	0.06	1.46	2.74	4.51	-21.44	0.83	1.22	2.11	0.68	1.01	1.75	-74.65	0.47	0.63	0.86
19	Maharashtra	0.25	0.35	0.56	301.17	390.30	560.46	0.02	0.06	0.21	2.30	7.82	25.94	-42.71	2.16	3.48	6.66	2.71	4.37	8.37	-86.20	2.03	2.99	4.64
20	Manipur	0.93	1.15	1.41	23.35	28.38	34.41	0.15	0.33	0.56	0.43	0.95	1.63	-29.29	19.07	27.21	37.11	0.57	0.81	1.11	-65.09	0.26	0.37	0.50
21	Meghalaya	0.48	0.53	0.58	10.11	11.16	12.31	0.18	0.21	0.24	0.57	0.68	0.79	-52.81	6.69	8.40	10.41	0.22	0.28	0.34	58.96	0.23	0.27	0.31
22	Mizoram	1.90	2.37	2.86	16.81	20.73	25.18	0.51	0.94	1.47	0.60	1.10	1.72	-19.26	10.13	13.86	18.87	0.12	0.17	0.23	-79.51	0.21	0.27	0.34
23	Nagaland	1.15	1.44	1.78	18.34	22.77	28.19	0.45	0.68	0.94	0.97	1.45	2.01	-7.29	9.69	14.39	22.30	0.21	0.31	0.49	-66.31	0.30	0.39	0.51
24	Odisha	0.13	0.14	0.17	44.12	49.31	59.58	0.04	0.05	0.07	1.69	2.13	2.91	-39.53	1.94	2.71	4.20	0.88	1.22	1.89	-54.03	0.41	0.48	0.59
25	Puducherry	0.18	0.30	0.44	2.68	4.34	6.20	0.05	0.11	0.19	0.09	0.19	0.32	-52.16	5.79	13.79	23.28	0.10	0.24	0.41	351.85	0.02	0.03	0.04
26	Punjab	0.21	0.27	0.33	52.24	65.08	80.01	0.02	0.05	0.08	0.69	1.35	2.52	-63.08	1.07	1.42	1.94	0.32	0.43	0.58	-90.80	0.36	0.47	0.60
27	Rajasthan	0.08	0.11	0.13	46.47	62.10	77.52	0.01	0.02	0.04	0.78	1.74	2.89	-62.11	0.22	0.37	0.56	0.17	0.28	0.43	-66.78	0.60	0.84	1.07
28	Sikkim	0.03	0.07	0.12	0.19	0.37	0.65	0.01	0.03	0.09	0.01	0.02	0.06	-34.62	0.10	0.26	0.62	0.001	0.002	0.004	-33.33	0.002	0.004	0.01
29	Tamil Nadu	0.16	0.23	0.29	121.45	157.74	197.06	0.01	0.03	0.07	0.90	2.42	5.24	-50.26	0.97	1.52	2.30	0.73	1.15	1.74	-90.30	0.65	0.94	1.34
30	Telangana	0.37	0.48	0.63	126.56	158.42	202.68	0.03	0.07	0.14	1.02	2.56	5.45	-57.35	2.64	3.98	6.59	1.01	1.52	2.52	-90.39	0.88	1.17	1.65
31	Tripura	0.07	0.10	0.14	2.06	3.04	4.20	0.05	0.10	0.16	0.21	0.40	0.64	231.15	0.10	0.18	0.28	0.004	0.01	0.01	-12.50	0.03	0.04	0.05
32	Uttarakhand	0.10	0.12	0.16	8.52	10.57	13.74	0.02	0.03	0.06	0.22	0.37	0.63	-58.30	1.22	2.00	3.25	0.14	0.23	0.37	-49.44	0.07	0.09	0.12
33	Uttar Pradesh	0.07	0.10	0.13	120.43	160.64	206.50	0.01	0.02	0.04	3.15	5.63	8.89	-53.54	0.48	0.87	1.44	1.11	2.00	3.33	-69.81	1.71	2.25	2.91
34	West Bengal	0.07	0.10	0.14	58.69	77.67	104.65	0.02	0.04	0.07	1.94	3.80	6.44	-3.90	0.43	0.62	1.08	0.42	0.62	1.06	-89.01	0.52	0.73	1.07
	India	0.17	0.22	0.29	1833.28	2318.74	2977.83	0.02	0.04	0.09	28.51	57.55	113.70	-47.89	1.52	2.37	3.88	20.47	31.94	52.01	-82.24	15.33	20.93	29.08

LB = Lower Bound; UB = Upper Bound; A&N = Andaman & Nicobar; DNH & DD = Dadra & Nagar Haveli and Daman & Diu

Annexure 6: State and UT-wide Adult HIV Prevalence (15-49 Years), 2015-2020, India HIV Estimates 2020

S.No.	State/UT	2015		2016		2017		2018		2019		2020							
		LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB			
1	A&N Islands	0.06	0.15	0.30	0.06	0.15	0.31	0.06	0.15	0.32	0.06	0.14	0.33	0.06	0.14	0.34	0.06	0.13	0.35
2	Andhra Pradesh	0.79	0.94	1.16	0.73	0.87	1.08	0.68	0.81	1.01	0.63	0.76	0.95	0.58	0.70	0.89	0.54	0.66	0.84
3	Arunachal Pradesh	0.03	0.05	0.07	0.04	0.05	0.07	0.04	0.06	0.08	0.04	0.06	0.09	0.04	0.06	0.10	0.05	0.07	0.11
4	Assam	0.08	0.08	0.09	0.08	0.08	0.09	0.08	0.08	0.09	0.08	0.08	0.09	0.08	0.08	0.09	0.07	0.08	0.10
5	Bihar	0.11	0.17	0.22	0.11	0.17	0.23	0.11	0.17	0.23	0.11	0.17	0.24	0.11	0.17	0.24	0.11	0.17	0.24
6	Chhattisgarh	0.18	0.21	0.27	0.17	0.21	0.27	0.16	0.21	0.27	0.16	0.21	0.27	0.15	0.20	0.27	0.15	0.20	0.27
7	Chandigarh	0.19	0.22	0.26	0.17	0.21	0.26	0.16	0.20	0.25	0.15	0.19	0.25	0.13	0.18	0.25	0.12	0.17	0.24
8	DNH & DD	0.11	0.17	0.26	0.12	0.18	0.27	0.12	0.18	0.27	0.12	0.18	0.27	0.12	0.18	0.28	0.12	0.18	0.28
9	Delhi	0.36	0.41	0.46	0.36	0.40	0.46	0.35	0.40	0.45	0.34	0.39	0.45	0.33	0.39	0.45	0.33	0.38	0.45
10	Goa	0.30	0.38	0.51	0.27	0.35	0.48	0.25	0.32	0.45	0.22	0.30	0.42	0.20	0.27	0.41	0.18	0.25	0.38
11	Gujarat	0.18	0.21	0.25	0.18	0.21	0.25	0.17	0.21	0.25	0.17	0.20	0.24	0.16	0.20	0.24	0.16	0.19	0.23
12	Haryana	0.21	0.23	0.26	0.20	0.22	0.26	0.19	0.22	0.25	0.19	0.21	0.25	0.18	0.21	0.24	0.18	0.21	0.24
13	Himachal Pradesh	0.09	0.13	0.17	0.09	0.13	0.16	0.09	0.12	0.16	0.09	0.12	0.15	0.08	0.12	0.15	0.08	0.11	0.14
14	J&K & Ladakh	0.04	0.06	0.09	0.04	0.06	0.09	0.03	0.06	0.09	0.03	0.06	0.09	0.03	0.06	0.10	0.03	0.06	0.10
15	Jharkhand	0.03	0.09	0.11	0.03	0.09	0.11	0.03	0.09	0.11	0.03	0.09	0.11	0.04	0.08	0.11	0.04	0.08	0.11
16	Karnataka	0.53	0.65	0.78	0.49	0.60	0.72	0.46	0.55	0.67	0.42	0.51	0.63	0.39	0.48	0.59	0.37	0.45	0.55
17	Kerala	0.08	0.09	0.11	0.08	0.09	0.11	0.07	0.09	0.11	0.07	0.08	0.10	0.07	0.08	0.10	0.07	0.08	0.10
18	Madhya Pradesh	0.10	0.11	0.14	0.09	0.11	0.14	0.09	0.11	0.14	0.09	0.10	0.13	0.08	0.10	0.13	0.08	0.10	0.13
19	Maharashtra	0.35	0.46	0.63	0.33	0.43	0.61	0.31	0.41	0.60	0.29	0.39	0.58	0.27	0.37	0.57	0.25	0.35	0.56
20	Manipur	1.27	1.48	1.72	1.18	1.40	1.63	1.11	1.32	1.56	1.05	1.26	1.50	0.98	1.20	1.45	0.93	1.15	1.41
21	Meghalaya	0.49	0.53	0.58	0.50	0.54	0.59	0.50	0.54	0.59	0.49	0.54	0.59	0.49	0.53	0.58	0.48	0.53	0.58
22	Mizoram	1.88	2.19	2.52	1.92	2.24	2.60	1.94	2.29	2.68	1.95	2.34	2.75	1.94	2.36	2.81	1.90	2.37	2.86
23	Nagaland	1.16	1.42	1.73	1.16	1.42	1.73	1.16	1.42	1.74	1.15	1.43	1.75	1.15	1.43	1.76	1.15	1.44	1.78
24	Odisha	0.14	0.16	0.19	0.14	0.15	0.19	0.14	0.15	0.18	0.13	0.15	0.18	0.13	0.14	0.17	0.13	0.14	0.17
25	Puducherry	0.22	0.37	0.54	0.21	0.36	0.52	0.20	0.35	0.50	0.20	0.33	0.48	0.19	0.32	0.46	0.18	0.30	0.44
26	Punjab	0.26	0.31	0.36	0.25	0.30	0.35	0.24	0.29	0.34	0.23	0.28	0.34	0.22	0.27	0.33	0.21	0.27	0.33
27	Rajasthan	0.09	0.11	0.14	0.09	0.11	0.14	0.09	0.11	0.14	0.08	0.11	0.14	0.08	0.11	0.14	0.08	0.11	0.13
28	Sikkim	0.04	0.06	0.10	0.04	0.06	0.10	0.04	0.07	0.11	0.04	0.07	0.11	0.03	0.07	0.12	0.03	0.07	0.12
29	Tamil Nadu	0.21	0.29	0.36	0.20	0.27	0.34	0.19	0.26	0.33	0.18	0.25	0.32	0.17	0.24	0.31	0.16	0.23	0.29
30	Telangana	0.49	0.62	0.78	0.47	0.58	0.74	0.44	0.55	0.70	0.41	0.52	0.67	0.39	0.50	0.65	0.37	0.48	0.63
31	Tripura	0.04	0.05	0.07	0.05	0.06	0.08	0.05	0.07	0.09	0.06	0.08	0.11	0.06	0.09	0.12	0.07	0.10	0.14
32	Uttarakhand	0.11	0.14	0.18	0.11	0.14	0.18	0.11	0.14	0.17	0.11	0.13	0.17	0.10	0.13	0.17	0.10	0.12	0.16
33	Uttar Pradesh	0.08	0.11	0.14	0.08	0.11	0.14	0.08	0.10	0.13	0.07	0.10	0.13	0.07	0.10	0.13	0.07	0.10	0.13
34	West Bengal	0.08	0.10	0.13	0.08	0.10	0.13	0.08	0.10	0.13	0.07	0.10	0.13	0.07	0.10	0.13	0.07	0.10	0.14
	India	0.20	0.26	0.35	0.19	0.25	0.34	0.19	0.24	0.32	0.18	0.23	0.31	0.17	0.22	0.30	0.17	0.22	0.29

LB = Lower Bound; UB = Upper Bound; A&N = Andaman & Nicobar; DNH & DD = Dadra & Nagar Haveli and Daman & Diu

Annexure 7: State and UT-wide HIV Incidence (per 1,000 Uninfected Population), 2015-2020, India HIV Estimates 2020

S.No.	State/UT	2015		2016		2017		2018		2019		2020							
		LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB	LB	Estimates	UB			
1	A&N Islands	0.05	0.14	0.31	0.04	0.12	0.01	0.05	0.23	0.01	0.03	0.23	0.01	0.25	0.01	0.03	0.27		
2	Andhra Pradesh	0.03	0.08	0.18	0.03	0.07	0.17	0.02	0.16	0.02	0.05	0.14	0.02	0.14	0.01	0.04	0.13		
3	Arunachal Pradesh	0.03	0.04	0.07	0.03	0.05	0.07	0.03	0.08	0.03	0.05	0.09	0.02	0.09	0.02	0.05	0.10		
4	Assam	0.04	0.05	0.06	0.04	0.05	0.06	0.03	0.04	0.06	0.03	0.04	0.05	0.03	0.04	0.03	0.05		
5	Bihar	0.05	0.09	0.14	0.05	0.08	0.13	0.04	0.08	0.12	0.03	0.07	0.11	0.02	0.06	0.10	0.05	0.09	
6	Chandigarh	0.02	0.06	0.12	0.02	0.06	0.12	0.02	0.06	0.12	0.02	0.05	0.11	0.01	0.05	0.12	0.05	0.12	
7	Chhattisgarh	0.06	0.10	0.15	0.06	0.10	0.15	0.05	0.09	0.14	0.05	0.09	0.15	0.05	0.09	0.15	0.05	0.09	0.15
8	DNH and DD	0.05	0.11	0.22	0.05	0.11	0.23	0.04	0.10	0.20	0.04	0.09	0.19	0.04	0.09	0.19	0.04	0.09	0.18
9	Delhi	0.13	0.17	0.23	0.11	0.16	0.21	0.12	0.16	0.22	0.10	0.14	0.20	0.08	0.12	0.18	0.09	0.14	0.20
10	Goa	0.01	0.03	0.11	0.01	0.03	0.10	0.01	0.03	0.10	0.01	0.03	0.09	0.01	0.03	0.08	0.01	0.02	0.08
11	Gujarat	0.05	0.08	0.10	0.05	0.07	0.09	0.04	0.06	0.08	0.03	0.05	0.07	0.02	0.04	0.06	0.02	0.03	0.05
12	Haryana	0.07	0.09	0.12	0.07	0.09	0.12	0.07	0.09	0.12	0.07	0.09	0.12	0.06	0.09	0.12	0.05	0.08	0.11
13	Himachal Pradesh	0.02	0.03	0.05	0.01	0.02	0.03	0.01	0.02	0.03	0.01	0.02	0.03	0.01	0.02	0.03	0.01	0.02	0.02
14	J&K & Ladakh	0.01	0.03	0.06	0.01	0.03	0.06	0.01	0.02	0.06	0.01	0.02	0.06	0.01	0.02	0.05	0.005	0.01	0.05
15	Jharkhand	0.02	0.03	0.04	0.02	0.03	0.04	0.02	0.03	0.04	0.02	0.03	0.04	0.02	0.03	0.04	0.02	0.03	0.04
16	Karnataka	0.02	0.04	0.09	0.02	0.04	0.08	0.01	0.03	0.07	0.01	0.03	0.07	0.01	0.02	0.06	0.01	0.02	0.05
17	Kerala	0.02	0.03	0.04	0.02	0.02	0.04	0.02	0.02	0.04	0.02	0.02	0.04	0.01	0.02	0.04	0.01	0.02	0.04
18	Madhya Pradesh	0.03	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.06	0.02	0.03	0.05	0.02	0.03	0.06
19	Maharashtra	0.03	0.08	0.22	0.02	0.08	0.22	0.02	0.08	0.22	0.02	0.07	0.21	0.02	0.06	0.20	0.02	0.06	0.21
20	Manipur	0.24	0.41	0.61	0.22	0.39	0.59	0.20	0.38	0.59	0.18	0.35	0.57	0.16	0.34	0.57	0.15	0.33	0.56
21	Meghalaya	0.29	0.35	0.42	0.25	0.31	0.37	0.23	0.27	0.33	0.21	0.24	0.29	0.18	0.22	0.26	0.18	0.21	0.24
22	Mizoram	0.98	1.34	1.75	0.97	1.36	1.79	0.92	1.34	1.80	0.78	1.20	1.72	0.66	1.10	1.65	0.51	0.94	1.47
23	Nagaland	0.55	0.77	1.04	0.53	0.75	1.01	0.53	0.75	1.01	0.52	0.74	1.00	0.49	0.71	0.98	0.45	0.68	0.94
24	Odisha	0.05	0.06	0.07	0.04	0.05	0.07	0.04	0.05	0.07	0.04	0.05	0.07	0.04	0.05	0.07	0.04	0.05	0.07
25	Puducherry	0.05	0.12	0.19	0.05	0.12	0.20	0.05	0.12	0.19	0.05	0.11	0.20	0.05	0.11	0.19	0.05	0.11	0.19
26	Punjab	0.06	0.10	0.15	0.06	0.10	0.14	0.05	0.09	0.14	0.04	0.08	0.13	0.03	0.07	0.11	0.02	0.05	0.08
27	Rajasthan	0.03	0.05	0.07	0.03	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.05	0.01	0.03	0.04	0.01	0.02	0.04
28	Sikkim	0.02	0.04	0.08	0.01	0.04	0.08	0.01	0.04	0.09	0.01	0.04	0.09	0.01	0.03	0.10	0.01	0.03	0.09
29	Tamil Nadu	0.02	0.05	0.08	0.02	0.04	0.08	0.02	0.04	0.08	0.02	0.04	0.07	0.01	0.03	0.07	0.01	0.03	0.07
30	Telangana	0.06	0.11	0.20	0.05	0.10	0.19	0.05	0.10	0.18	0.04	0.09	0.17	0.03	0.07	0.15	0.03	0.07	0.14
31	Tripura	0.04	0.06	0.09	0.05	0.07	0.10	0.05	0.08	0.11	0.05	0.09	0.13	0.06	0.10	0.14	0.05	0.10	0.16
32	Uttarakhand	0.04	0.06	0.09	0.04	0.06	0.09	0.03	0.05	0.08	0.03	0.04	0.07	0.02	0.04	0.06	0.02	0.03	0.06
33	Uttar Pradesh	0.03	0.04	0.06	0.03	0.04	0.06	0.02	0.04	0.05	0.02	0.03	0.05	0.02	0.03	0.04	0.01	0.02	0.04
34	West Bengal	0.02	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.06	0.02	0.04	0.07	0.02	0.04	0.07
	India	0.03	0.07	0.13	0.03	0.06	0.12	0.03	0.06	0.11	0.03	0.05	0.10	0.02	0.05	0.09	0.02	0.04	0.09

LB = Lower Bound; UB = Upper Bound; A&N = Andaman & Nicobar; DNH & DD = Dadra & Nagar Haveli and Daman & Diu

Model-based biennial HIV estimations are undertaken under National AIDS Control Programme to provide an update on the current status of the HIV epidemic on key epidemiological parameters of prevalence, incidence, AIDS-related mortality and EMTCT need. HIV Estimations 2020 is the latest round in the series of HIV Estimations process. This report presents the method and State/UT-wide findings on key epidemiological parameters from HIV Estimations 2020.

