Ministry of Health & Family Welfare

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NITI Aayog

Healthy States, Progressive India

Report on the Ranks of States and Union Territories

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Foreword

NITI Aayog has been mandated with transforming India by exercising thought leadership and by invoking the instruments of co-operative and competitive federalism, focussing the attention of the State Governments and Union Ministries on achieving outcomes. As the nodal agency responsible for charting India's quest for attaining the commitments under the Sustainable Development Goals (SDGs), it was necessary to devise a mechanism for measuring outcomes particularly in the critical social sectors – such as Health and Education, where India's record has been less than stellar. This was intended to provide feedback to all stakeholders as to whether we are on course to what we have set out to achieve, and deviations, if any, to be pointed out in time to ensure necessary mid-course correction.

It is important to realize that implementation of social sector programs is squarely in the domain of the State Governments and India's achievement of SDGs is therefore critically dependent on the action in the States. Nudging States towards improving their social outcomes therefore requires developing indices that would capture annual increments in performance through an independent third party process and publish these. It is true that summarizing the complexities of a given sector and condensing it in an Index has its own limitations. However, in an environment where the focus is on budget spends and outputs with limited attention on outcomes, there is a need to increase competition among States to encourage them to strive evermore for increasing the pace of change.

The Health of its population is central to a nation's well-being and productivity. While India has made some significant gains in improving life expectancy and reducing infant and maternal mortality, our rates of improvement have been inadequate as a nation.

Further, there are large variations in health system performance and outcomes achieved across States. The "Performance in Health Outcomes" Index seeks to capture the annual progress of States and Union Territories (UTs) on a variety of indicators – Outcomes, Governance and Processes. While we have also reported the overall levels of performance of States, the focus of the NITI Index is to propel change, highlighting those States that have shown most improvement. The exercise has been spearheaded by NITI Aayog in collaboration with the Ministry of Health and Family Welfare, with technical assistance from the World Bank, the authors of this report on the ranks and their interpretation.

The exercise, which is the first of its kind attempted by the Union Government was conducted over a period of eighteen months. In addition to the technical expertise of the World Bank, experts in public health, economics, statistics and health systems were consulted in the development of the Index. It involved extensive engagement with the States for finalization of the indicators, sensitization workshops for sharing the methodology, process of data submission and addressing concerns; mentoring of States for the data submission process on an online portal and independent data validation.

The process of Index development and implementation highlighted the large gaps in data availability on health outcomes.The need for making outcome data available for smaller states, more frequent and updated outcomes for non-communicable diseases and financial protection, and the need for robust programmatic data that can be used for continuous monitoring, were important issues that despite our efforts, could not be addressed optimally in this first round. Despite these challenges and limitations, it was decided to launch the Index in the first year as a model to measuring performance and ranking States on change. We thereby hope to spur action on several fronts in bringing about national level transformation. We will strive to address the lessons learned in this first round and refine the Index in the successive years of its implementation. The linking of the Health Index with incentives under the National Health Mission by the Ministry of Health and Family Welfare underlines the importance of such an exercise. It re-emphasizes the move towards performance based financing for better outcomes.

I would like to acknowledge here the large number of individuals who contributed to the initiative being brought to completion of its first round. The Ministry of Health and Family Welfare under the guidance of Mr. C.K. Mishra, former Secretary, Department of Health & Family Welfare; Ms. Preeti Sudan, Secretary,

Department of Health & Family Welfare; Mr. Manoj Jhalani, Additional Secretary and Mission Director, National Health Mission, as well as the Joint Secretaries and their teams from the programme divisions provided their complete support to the initiative and worked in close co-ordination with NITI Aayog during its entire course.

Technical Assistance to NITI Aayog was provided through the entire duration by The World Bank, along with authorship of this report. We are grateful to Mr. Junaid Kamal Ahmad, Country Director and the technical team led by Ms. Sheena Chhabra, Senior Health Specialist along with Dr. Rattan Chand, Senior Consultant; Dr. Nikhil Utture, Consultant; and Dr. Iryna Postolovska, Young Professional with support from Ms. Manveen Kohli, Consultant. Peer review of the final report by Dr. Rekha Menon, Practice Manager; Dr. Ajay Tandon, Lead Economist; Dr. Mickey Chopra, Global Lead on Service Delivery; and Dr. Owen K. Smith, Senior Economist is gratefully acknowledged.

Inputs from statistical, economics and sector experts including Prof. Pulak Ghosh, IIM-Bangalore; Prof. Karthik Muralidharan, University of California, San Diego; Prof. Ladu Singh, International Institute of Population Sciences; Prof. Arvind Pandey, ICMR; Prof. Mudit Kapoor, Indian Statistical Institute; Dr. Shamika Ravi, Brookings India (and currently a Member of the Economic Advisory Council to the Prime Minister), were obtained at various stages of the project. Support provided by the Registrar General and Census Commissioner of India and the officials from the Office of Registrar General and Census Commissioner, India is gratefully acknowledged. Inputs received from Technical Organizations including UNICEF and DFID are also acknowledged.

NITI Aayog is most grateful to senior officials of the Health departments, nodal officers and their teams in all the States and UTs for their extensive co-operation throughout the project, including providing inputs and feedback during the development of the index, participation in regional sensitization workshops, submission of data on the online portal and provision of required supporting documentation/evidence for validation of data.

The mentor organizations, USAID (led by Mr. Xerxes Sidhwa and Mr. Gautam Chakraborty, and the team led by Ms. Alia Kauser and Dr. Rashmi Kukreja), Regional Resource Centre for the North Eastern States, branch of National Health Systems Resource Centre, MoHFW (led by Dr. Bamin Tada and Mr. Bhaswat Das), Centre for Innovations in Public Systems (led by Dr. Nivedita Haran) and TERI (led by Ms. Meena Sehgal) provided their valuable support to the States during the data submission phase of the project. Extended mentor support provided by Mr. Pankaj Gupta, USAID is also gratefully acknowledged. The data validation was conducted by the team at IPE Global led by Mr. Soumitro Ghosh and Ms. Daljeet Kaur. The online portal was developed by Silvertouch Technologies, led by Ms. Surbhi Singhal and Mr. Rushiraj Yadav.

The project was designed and executed under the guidance of the senior leadership of NITI Aayog, Dr. Arvind Panagariya, former Vice Chairman, NITI Aayog; Dr. Rajiv Kumar, Vice Chairman, NITI Aayog; Dr. Bibek Debroy, Member and Dr. Vinod Paul, Member, NITI Aayog. The Health Division team led by Mr. Alok Kumar, Adviser; Mr. Sumant Narain, former Director; Dr. Dinesh Arora, Director, and Dr. Kheya Furtado, Research Assistant, with support from Ms. Jyoti Khattar, Senior Research Officer planned, implemented and co-ordinated the entire project.

Amitabh Kant
Chief Executive Officer, NITI Aayog

Abbreviations

AHPI	Association of Healthcare Providers (India)
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ART	Antiretroviral Therapy
BCG	Bacillus Calmette–Guérin
BY	Base Year
CCU	Cardiac Care Unit
CHC	Community Health Centre
CIPS	Centre for Innovation in Public Systems
CMO	Chief Medical Officer
CRS	Civil Registration System
C-Section	Caesarean Section
DH	District Hospital
DPT	Diphtheria, Pertussis, and Tetanus
EAG	Empowered Action Group
ENT	Ear-Nose-Throat
GBD	Global Burden of Disease
FLV	First Level Verification
FRU	First Referral Unit
Hb	Hemoglobin
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HRMIS	Human Resources Management Information System
IDSP	Integrated Disease Surveillance Programme
IMR	Infant Mortality Rate
INR	Indian Rupees
IVA	Independent Validation Agency
ISO	International Organization for Standardization
IT	Information Technology
JSSK	Janani Shishu Suraksha Karyakram
JSY	Janani Suraksha Yojana
LBW	Low Birth Weight
L Form	IDSP Reporting Format for Laboratory Surveillance
MCTS	Mother and Child Tracking System
MCTFC	Mother and Child Tracking Facilitation Centre
MIS	Management Information System
MMR	Maternal Mortality Ratio
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
NA	Not Applicable
NABH	National Accreditation Board for Hospitals and Healthcare Providers
NACO	National AIDS Control Organization
NCDs	Non-communicable Diseases
NE	North-Eastern
NFHS	National Family Health Survey
NHM	National Health Mission
NHP	National Health Policy
NITI	National Institution for Transforming India

NMR	Neonatal Mortality Rate
NQAS	National Quality Assurance Standards
OPV	Oral Polio Vaccine
ORGI	Office of the Registrar General and Census Commissioner, India
OOP	Out-of-Pocket
PCPNDT	Pre-Conception and Pre-Natal Diagnostic Techniques
P Form	IDSP Reporting Format for Presumptive Surveillance
PHC	Primary Health Centre
PLHIV	People Living with HIV
RRC-NE	Regional Resource Centre for North Eastern States
RNTCP	Revised National Tuberculosis Control Programme
RU	Reporting Unit
RY	Reference Year
SBR	Still Birth Rate
SC	Sub-Centre
SDGs	Sustainable Development Goals
SDH	Sub-District Hospital
SLV	Second Level Verification
SRB	Sex Ratio at Birth
SRS	Sample Registration System
SN	Staff Nurse
SNO	State Nodal Officer
TA	Technical Assistance
TB	Tuberculosis
TERI	The Energy Research Institute
TFR	Total Fertility Rate
U5MR	Under-Five Mortality Rate
USAID	United States Agency for International Development
UTs	Union Territories

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Background and Methodology

1. ***The National Institution for Transforming India (NITI) Aayog is spearheading the Health Index initiative to bring about transformational change in achieving desirable health outcomes:*** India has achieved significant economic growth over the past decades, but the progress in health has not been commensurate. Despite notable gains in improving life expectancy, reducing fertility, maternal and child mortality, and addressing other health priorities, the rates of improvement have been insufficient, falling short on several national and global targets. Furthermore, there are wide variations across States in their health outcomes and systems performance. In order to bring about transformational change in population health through a spirit of co-operative and competitive federalism, NITI Aayog has spearheaded the Health Index initiative, to measure the annual performance of States and Union Territories (UTs), and rank States on the basis of incremental change, while also providing an overall status of States' performance and helping identify specific areas of improvement. It is envisaged that this tool will propel States towards undertaking multi-pronged interventions that will bring about the much-desired optimal population health outcomes.

2. ***Multiple stakeholders contributed to the Index development:*** The Index was developed by NITI Aayog with technical assistance from the World Bank through an iterative process in consultation with the Ministry of Health and Family Welfare (MoHFW), States and UTs, domestic and international sector experts and other development partners (Table 2.3 provides Health Index-indicator details and data sources).

3. ***States and UTs have been ranked on a composite Health Index in three categories (Larger States, Smaller States and UTs) to ensure comparison among similar entities:*** With a focus on outcomes, outputs and critical inputs, the main criteria for inclusion of indicators was the availability of reliable data for States and UTs, with at least an annual frequency. The Index is a weighted composite Index based on indicators in three domains: (a) Health Outcomes; (b) Governance and Information; and (c) Key Inputs/Processes, with each domain assigned a weight based on its importance. The indicator values are standardized (scaled 0 to 100) and used in generating composite Index scores and overall performance rankings for base year (2014-15) and reference year (2015-16). The annual incremental progress made by the States and UTs from base year to reference year is used to generate incremental ranks (Section 2 provides methodological details of constructing the Index). States and UTs have been ranked in three categories (Larger States, Smaller States and UTs) to ensure comparison among similar entities (Table 2.1 deals with categorization of States and UTs).

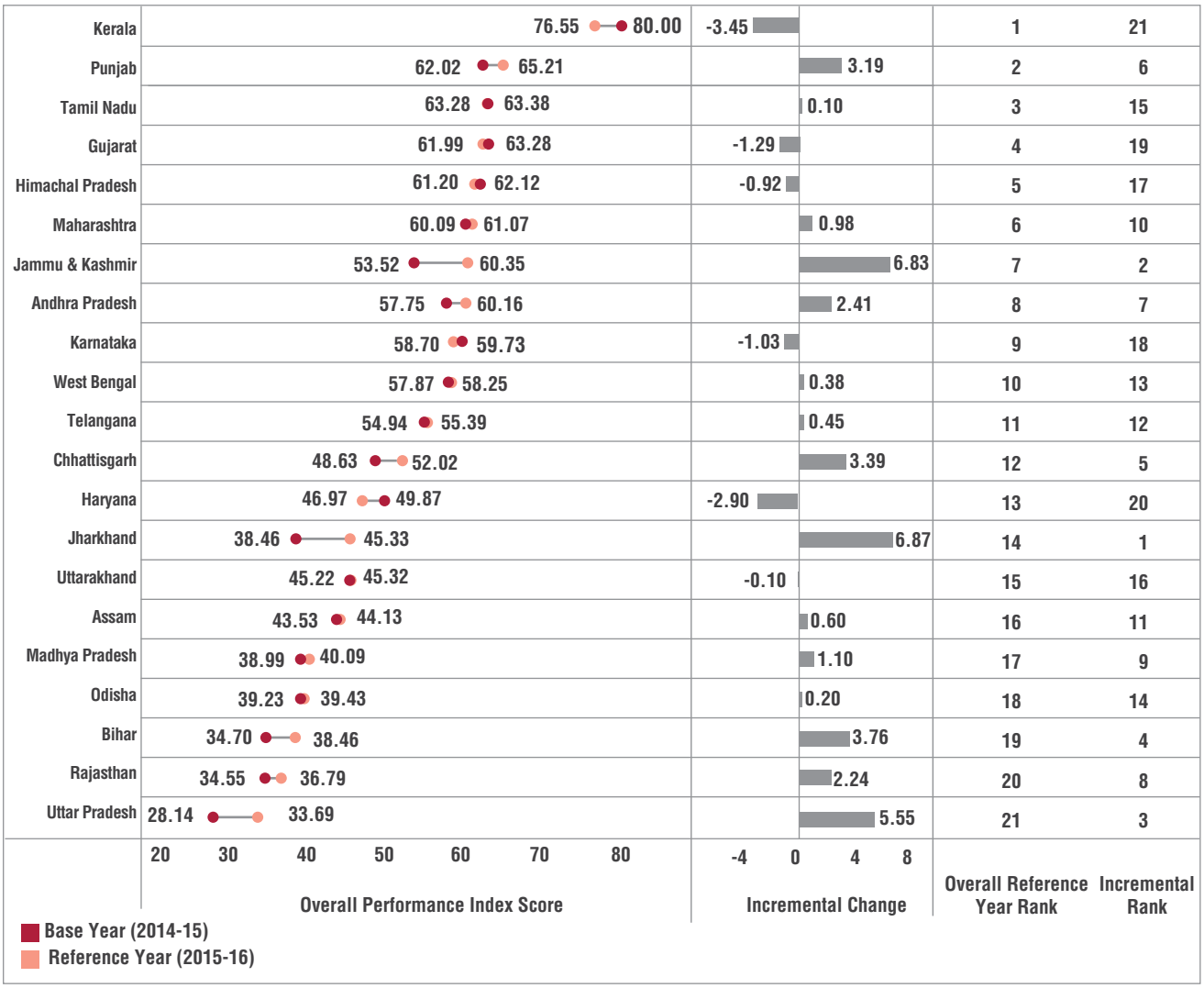
4. ***For generation of Index values and ranks, data was submitted online and validated by an Independent Validation Agency (IVA):*** The States were sensitized about the Health Index including indicator definitions, data sources and process for data submission through a series of regional workshops and mentor support was provided to most States (Table 3.4). Data was submitted by States on the online portal hosted by NITI Aayog and data from sources in the public domain was pre-entered. This data was then validated by an IVA and was used as an input into automated generation of Index values and ranks on the portal (Sections 3.2.4 and 3.2.5).

Key Results

5. ***There is a large gap in overall performance between the best and the least performing States and UTs; besides, all States and UTs have substantial scope for improvement:*** In the reference year (2015-16) among Larger States, the Index score for overall performance ranged widely between 33.69 in Uttar Pradesh to 76.55 in Kerala. Similarly, among Smaller States, the Index score for overall performance varied between 37.38 in Nagaland to 73.70 in Mizoram, and among UTs this varied between 34.64 in Dadra & Nagar Haveli to 65.79 in Lakshadweep. Among Larger States, the variation between the best and least performing States and UTs was the widest around 43 points as compared with 36 points in Smaller States and 31 points in UTs. However, based on the highest observed overall Index scores in each category of States and UTs, clearly there is room for improvement in all States and UTs.

6. ***The States and UTs rank differently on overall performance and annual incremental performance:*** States and UTs that start at lower levels of the Health Index (lower levels of development of their health systems) are generally at an advantage in notching up incremental progress over States with high Health Index score due to diminishing marginal returns in outcomes for similar effort levels. It is a challenge for States at high levels of the Index score even to maintain their performance levels. For example, Kerala ranks on top in terms of overall performance and at the bottom in terms of incremental progress mainly as it had already achieved a low level of Neonatal Mortality Rate (NMR) and Under-five Mortality Rate (U5MR) and replacement level fertility, leaving limited space for any further improvements.

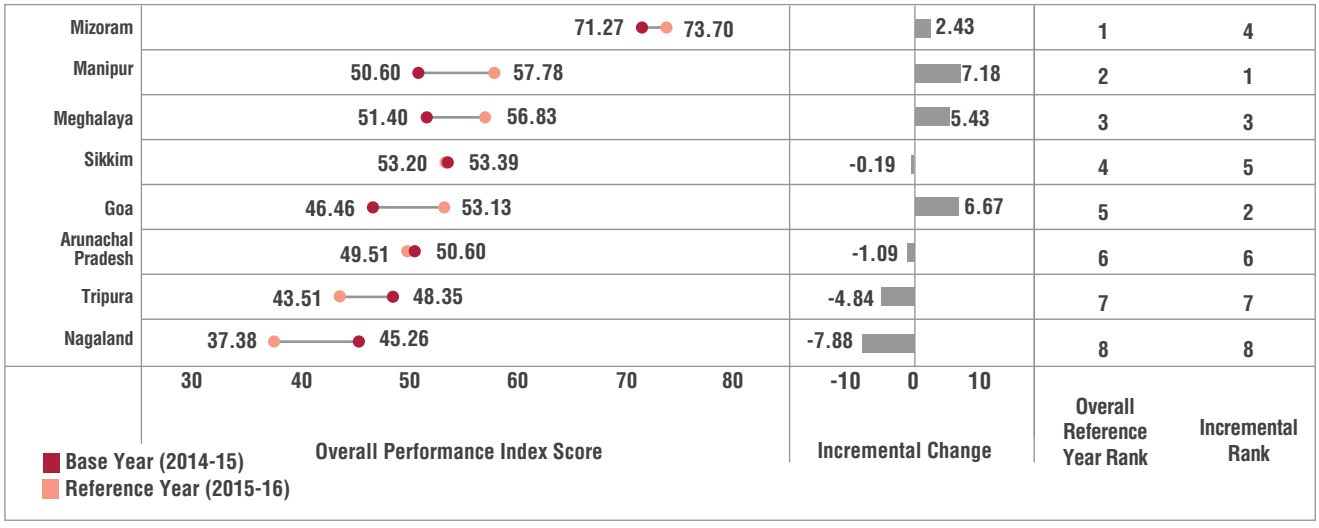
Figure E.1 - Larger States: Incremental scores and ranks, with overall performance from base year to reference year and ranks



7. ***Among the Larger States, Jharkhand, Jammu & Kashmir, and Uttar Pradesh are the top three ranking States in terms of annual incremental performance, while Kerala, Punjab, and Tamil Nadu ranked on top in terms of overall performance:*** In terms of annual incremental performance in Index scores from the base to the reference year, the top three ranked States in the group of Larger States are Jharkhand (up 6.87 points), Jammu & Kashmir (up 6.83 points) and Uttar Pradesh (up 5.55 points). However, in terms of overall levels of performance, these States are in the bottom two-third of the range of Index scores, with Kerala (76.55), Punjab (65.21) and Tamil Nadu (63.38) showing the highest scores. Jharkhand, Jammu & Kashmir, and Uttar Pradesh showed the maximum gains in improvement of health outcomes from base to reference year in indicators such as NMR, U5MR, full immunization coverage, institutional deliveries, and people living with HIV (PLHIV) on antiretroviral therapy (ART).

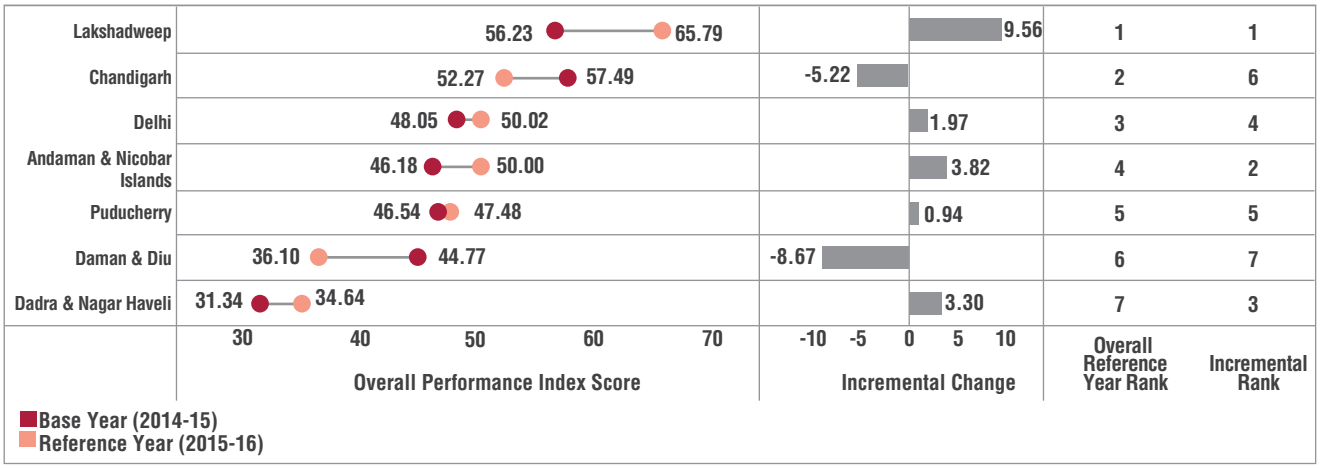
8. ***Among Smaller States, Manipur ranked first in terms of annual incremental performance and second in terms of overall performance, while Goa ranked second in terms of annual incremental performance:*** Among Smaller States, Mizoram (73.70) followed by Manipur (57.78) are the best overall performers. In annual incremental performance, Manipur (up 7.18 points) and Goa (up 6.67 points) ranked the highest. For Smaller States, among the top performers, the indicators that contributed to higher incremental performance varied. Manipur, ranked at the top and registered maximum incremental progress on indicators such as PLHIV on ART, first trimester antenatal care (ANC) registration, grading of Community Health Centres (CHCs) on quality parameters, average occupancy of three key State-level officers, and good reporting on the Integrated Disease Surveillance Programme (IDSP).

Figure E.2 - Smaller States: Incremental scores and ranks, with overall performance from base year to reference year and ranks



9. ***Among UTs, Lakshadweep showed both the highest annual incremental performance as well as the best overall performance:*** In annual incremental performance, Lakshadweep ranked at the top (up 9.56 points) followed by Andaman & Nicobar Islands (up 3.82 points). In terms of overall performance, Lakshadweep (65.79) ranked at the top, followed by Chandigarh (52.27). Lakshadweep showed the highest improvement in indicators such as institutional deliveries, tuberculosis (TB) treatment success rate and transfer of Central National Health Mission (NHM) funds from State Treasury to implementation agency.

Figure E.3 - Union Territories: Incremental scores and ranks, with overall performance from base year to reference year and ranks



10. ***The incremental measurement shows that about one-third of the States have registered a decline in their Health Indices in the reference year as compared to the base year:*** This is a matter of concern and should nudge the States into reviewing and revitalizing their programmatic efforts. Among the Larger States, six States, namely Uttarakhand, Himachal Pradesh, Karnataka, Gujarat, Haryana and Kerala have shown a decline in performance from base year to reference year, despite some of them being among the top ten in overall performance. Among the Smaller States, Sikkim, Arunachal Pradesh, Tripura and Nagaland have shown a decline; and among the UTs, Chandigarh and Daman & Diu have shown a decline. Tables E.1, E.2 and E.3 provide a categorization of States and UTs based on the level of annual incremental performance and the overall performance.

Table E.1 - Categorization of Larger States on incremental performance and overall performance

Incremental Performance	Overall Performance →		
	Aspirants	Achievers	Front-runners
Not Improved	Uttarakhand Haryana	Himachal Pradesh Karnataka Gujarat	Kerala
Least Improved	Madhya Pradesh Assam Odisha	Maharashtra Telangana West Bengal	Tamil Nadu
Moderately Improved	Bihar Rajasthan	Chhattisgarh Andhra Pradesh	Punjab
Most Improved	Jharkhand Uttar Pradesh	Jammu & Kashmir	

Note: Overall Performance: The States are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>62); Achievers: middle one-third (Index score between 48 and 62), Aspirants: lowest one-third (Index score<48).
Incremental Performance: The States are categorized on the basis of incremental Index score range: 'Not Improved' (incremental Index score<=0), 'Least Improved' (incremental Index score between 0.01 and 2), 'Moderately Improved' (incremental Index score between 2.01 and 4), 'Most Improved' (incremental Index score>4.0).

Table E.2 - Categorization of Smaller States on incremental performance and overall performance

Incremental Performance	Overall Performance →		
	Aspirants	Achievers	Front-runners
Not Improved	Tripura Nagaland	Sikkim Arunachal Pradesh	-
Least Improved	-	-	-
Moderately Improved	-	-	Mizoram
Most Improved	-	Manipur Meghalaya Goa	-

Note: Overall Performance: The States are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>61.60), Achievers: middle one-third (Index score between 49.49 and 61.60), Aspirants: lowest one-third (Index score <49.49).
Incremental Performance: The States are categorized on the basis of incremental Index score range: 'Not Improved' (incremental Index score<=0), 'Least Improved' (incremental Index score between 0.01 and 2), 'Moderately Improved' (incremental Index score between 2.01 and 4), 'Most Improved' (incremental Index score>4.0).

Table E.3 - Categorization of Union Territories based on incremental performance and overall performance

Incremental Performance	Overall Performance →		
	Aspirants	Achievers	Front-runners
Not Improved	Daman & Diu	Chandigarh	-
Least Improved	-	Delhi Puducherry	-
Moderately Improved	Dadra & Nagar Haveli	Andaman & Nicobar Islands	-
Most Improved	-		Lakshadweep

Note: Overall Performance: The UTs are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>55), Achievers: middle one-third (Index score between 45 and 55), Aspirants: lowest one-third (Index score<45).
For Incremental Performance: The UTs are categorized on the basis of incremental Index score range: 'Not Improved' (incremental Index score<=0), 'Least Improved' (incremental Index score between 0.01 and 2), 'Moderately Improved' (incremental Index score between 2.01 and 4), 'Most Improved' (incremental Index score>4.0).

In terms of numbers of indicators, Chhattisgarh, Goa and Delhi showed improvement in the highest number of parameters, within the three categories of States respectively (Figures 4.6, 4.12, 4.18). The specific indicators for which the States' performance has dipped or improved and actual values for these are provided in Annexure 4. The indicators where most States and UTs need to focus include addressing vacancies in key staff, establishment of functional district Cardiac Care Units (CCUs), quality accreditation of public health facilities, and institutionalization of Human Resources Management Information System (HRMIS). Additionally, almost all Larger States need to focus on improving the Sex Ratio at Birth (SRB).

11. ***The overall performance of States is not always consistent with the domain-specific performance:*** Some States fare significantly better in one domain than others, suggesting that there is scope to improve their performance in lagging domains with specific targeted interventions. For example, while most States showed a better performance in Health Outcomes, Tamil Nadu, West Bengal, Assam, Madhya Pradesh, Odisha, Rajasthan, Daman & Diu, and Dadra & Nagar Haveli performed better in terms of Key Inputs/Processes. Domain-wise incremental performance among the three categories of States showed the highest improvement in outcomes, respectively for Jammu & Kashmir, Uttar Pradesh and Jharkhand; Goa and Manipur; Andaman & Nicobar Islands and Lakshadweep.

Conclusions and Way Forward

12. ***The Health Index is a useful tool for systematic measurement of annual performance across States and UTs:*** Rich learnings have emerged that will guide improvement of both the methods and the data to make the Index better. The Health Index is an important aid in understanding the heterogeneity and complexity of the nation's performance in health. It is the first attempt at establishing an annual systematic tool for measurement of performance across States and UTs on a variety of health parameters within a composite measure. In its first year, it may not have achieved perfection; however, it does set the foundation for a systematic output and outcome based performance measurement. In linking this Index to incentives under the NHM, the MoHFW has underlined the importance of such an exercise. The results and analysis in this report provide an important insight into the areas in which States have improved, stagnated or declined and this will help in better targeting of interventions. Owing to the multiplicity of determinants that impact health outcomes, some of these actions may lie outside the ambit of health departments and, in fact, depend on the actions of the private sector and sectors other than health. The learnings that have emerged during the process of development of the Health Index, will guide in refining the Index for the coming year and also address some of the limitations. The exercise also calls for urgently improving the data systems in health, in terms of representativeness of the priority areas, periodic availability for all States and UTs, and completeness for private sector service delivery.

Background

Overview – evolution and rationale
About the Index – defining and measuring
Processes – from idea to practice

1. Overview – evolution and rationale

India has achieved significant economic growth over the past decades, but the progress in health has not been commensurate. The inability to rapidly improve the human capital also places a binding constraint on economic growth. Between 1991 and 2015, India made major improvements, for instance, life expectancy at birth increased by approximately 10 years; Infant Mortality Rate (IMR) more than halved; Total Fertility Rate (TFR) dropped to near replacement level; and Maternal Mortality Ratio (MMR) declined by more than 60 percent[1]. At the same time, non-communicable diseases (NCDs) have emerged as the leading cause of morbidity and death for adults, contributing to 55 percent of all disease burden and more than 62 percent of deaths in the country[2]. When compared with India's economic progress and achievements, the rates of improvement in health outcomes have remained slower than that of developing countries with comparable levels of spending on health[3]. Furthermore, there is large variation in terms of health outcomes and health systems across States.

The National Development Agenda unanimously agreed to by all State Chief Ministers and Lieutenant Governors of Union Territories in 2015 had inter alia identified education, health, nutrition, women and children as priority sectors. To fulfil the National Development Agenda, it is imperative to make rapid improvement in these sectors. While the responsibility in this regard is shared between the Center and the States, given that health is a State subject, implementation is largely done by the States. The Center's role is limited primarily to financing, setting policy principles and program guidelines.

India, along with other countries, has committed itself to adopting the Sustainable Development Goals (SDGs) to end poverty, protect the planet, and ensure prosperity for all as part of a new global sustainable development agenda to be fulfilled by 2030. There is renewed commitment in India to accelerate the pace of achievement of the SDGs, including Goal 3 related to ensuring healthy lives and promoting the well-being for all.

In order to bring about rapid transformative action in achieving the desired outcomes, a priority for NITI Aayog is to nudge the States towards improvement in outcomes in the coming years. The broader goal is to develop a spirit of co-operative and competitive federalism whereby the Center and States can jointly determine the route to progress and prosperity. It is in this context that NITI Aayog has spearheaded the Health Index initiative with the MoHFW, and has an explicit focus on the outcomes of health systems. Technical assistance for the Health Index initiative was provided by the World Bank. Various stakeholders, including the States, domestic and international sector experts and development partners, were consulted throughout the process and given the opportunity to provide feedback. An interactive web portal hosted by NITI Aayog, provided a pre-designed format for the States to submit data concerning identified indicators for the Health Index. The data was verified by IPE Global, an independent validation agency prior to computing the Index and ranks for all States and UTs.

The Health Index consists of 24 indicators grouped in the domains of Health Outcomes, Governance and Information, and Key Inputs/Processes. The States and UTs have been ranked in three categories to ensure comparison among similar entities - Larger States, Smaller States, and UTs. The Health Index will be calculated and disseminated annually, with a focus on measuring and highlighting annual incremental improvement in the States and UTs. The composite Health Index and ranking of States and UTs will assist in monitoring the States' performance, also serving as an input for performance-based incentives, leading ultimately to improvements in the state of health in each State.

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[1] World Bank. 2017. World Development Indicators 2017. Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/26447 License: CC BY 3.0 IGO.
[2] Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States — The India State-Level Disease Burden Initiative. New Delhi, India: ICMR, PHFI, and IHME; 2017.
[3] Paper no I/2015, Working Paper Series I, Health Division, NITI Aayog.

2. About the Index – defining and measuring

2.1 AIM

To promote a co-operative and competitive spirit amongst the States and UTs to rapidly bring about transformative action in achieving the desired health outcomes.

2.2 OBJECTIVES

1. To develop a composite Health Index based on key health outcomes and other health systems and service delivery indicators.

2. To ensure States' participation and ownership through Health Index data submission on a web-based portal with requested mentor support.

3. To build transparency through independent validation of data by an independent agency.

4. To generate Health Index scores and rankings for different categories of the States and UTs based on year-to-year progress (annual incremental performance) and overall performance.

2.3 SALIENT FEATURES

- The Health Index consists of a limited set of relevant indicators categorized in the domains of Health Outcomes, Governance and Information, and Key Inputs/Processes.

- Health Outcomes are assigned the highest weight, as these remain the focus of performance.

- Indicators have been selected on the basis of their importance and availability of reliable data at least annually from existing data sources such as the Sample Registration System (SRS), Civil Registration System (CRS) and Health Management Information Systems (HMIS).

- Data on indicators is included for Index calculations after validation by the IVA.

- A composite Index is calculated as a weighted average of various indicators, focused on measuring the state of health in each State and UT for a base year (BY) and a reference year (RY).

- The change in the Index score of each State from the base year to a reference year measures the annual incremental progress of each State.

- States and UTs have been grouped in three categories to ensure comparison among similar entities, namely 21 Larger States, 8 Smaller States, and 7 UTs.

2.4 METHODOLOGY

2.4.1 Computation of Index scores and ranks

After validation of data by the IVA, data submitted by the States and pre-entered from established sources was used for the Health Index score calculations. Each indicator value was scaled, based on the nature of the indicator. For positive indicators, where *higher the value, better the performance* (e.g. service coverage indicators), the scaled value (S_i) for the i^{th} indicator, with data value as X_i. was calculated as follows:

$$\text{Scaled value } (S_i) \text{ for positive indicator} = \frac{(X_i - \text{Minimum value}) \times 100}{(\text{Maximum value} - \text{Minimum value})}$$

Similarly, for negative indicators where *lower the value, better the performance* (e.g. NMR, U5MR, human resource vacancies), the scaled value was calculated as follows:

$$\text{Scaled value } (S_i) \text{ for negative indicator} = \frac{(\text{Maximum value} - X_i) \times 100}{(\text{Maximum value} - \text{Minimum value})}$$

The minimum and maximum values of each indicator were ascertained based on the values for that indicator across States within the grouping of States (Larger States, Smaller States, and UTs) for that year.

The scaled value for each indicator lies between the range of 0 to 100. Thus, for a positive indicator such as institutional deliveries, the State with the lowest institutional deliveries will get a scaled value of 0, while the State with the highest institutional deliveries will get a scaled value of 100. Similarly, for a negative indicator such as NMR, the State with the highest NMR will get a scaled value of 0, while the one with the lowest NMR will get a scaled value of 100. Accordingly, the scaled value of other States will lie between 0 and 100 in both cases.

Based on the above scaled values (S_i), a composite Index score was then calculated for the base year and reference year after application of the weights using the following formula:

$$\text{Composite Index} = \frac{(\sum W_i * S_i)}{(\sum W_i)}$$

where W_i is the weight for i^{th} indicator.

The composite Index score provides the overall performance and domain-wise performance for each State and UT, and has been used for generating overall performance ranks.

The difference between the composite Index score of reference and base years was used to compute the annual incremental performance. Ranks were also generated to ascertain the relative position of the States in terms of annual incremental performance.

The ranking is primarily based on the incremental progress made by the States and UTs from the base year to the reference year. However, rankings based on Index scores for the base year and the reference year performance have also been presented to provide the overall performance of the States and UTs. A comparison of the change in ranks between the base and reference years has also been undertaken.

2.4.2 Categorization of States for ranking

Based on the availability of data and the fact that similar States should be compared, it was decided to rank the States in three categories, namely Larger States, Smaller States and UTs (Table 2.1).

Table 2.1 - Categorization of States and UTs

Category	Number of States and UTs	States and UTs
Larger States	21	Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu,Telangana, Uttar Pradesh, Uttarakhand, West Bengal
Smaller States	8	Arunachal Pradesh, Goa, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura
Union Territories	7	Andaman & Nicobar, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, Lakshadweep, Puducherry

This categorization was adopted due to the following reasons:

- The SRS data on health outcomes (NMR, U5MR, TFR and SRB) are not available for 8 Smaller States and 7 UTs, and though options were explored by the Office of the Registrar General and Census Commissioner of India (ORGI) to generate these estimates, no reliable option was available.

- Experts consulted[4] by NITI Aayog also reported that reliable estimates for these outcome indicators based on raw data obtained from SRS for the Smaller States and UTs could not be derived due to small sample size and insufficient number of events.

2.4.3 The Health Index - List of indicators and weightage

As the Index is a weighted composite Index based on indicators in three domains, each domain has been assigned weights based on its importance. Within a domain or sub–domain, the weight has been equally distributed among the indicators in that domain or sub-domain. Table 2.2 provides a snapshot of the number of indicators in each domain and sub-domain along with weights, while Table 2.3 provides the detailed Health Index with indicators, their definitions, data sources, and specifics of base and reference years.

Table 2.2 - Health Index: Summary

Domain	Sub-domain	Larger States		Smaller States		Union Territories	
		Number of Indicators	Weight	Number of Indicators	Weight	Number of Indicators	Weight
Health Outcomes	Key Outcomes	5	500	1	100	1	100
	Intermediate Outcomes	6*	300*	6*	300*	5*	250*
Governance and Information	Health Monitoring and Data Integrity	1	70	1	70	1	70
	Governance	2	60	2	60	2	60
Key Inputs/ Processes	Health Systems/Service Delivery	10	200	10	200	10	200
TOTAL		24	1130	20	730	19	680

* The data for indicator no. 1.2.6 related to out of pocket expenditure was available only for 2015-16 and hence was used to calculate independently the reference year Index and rank (as provided in Annexure 3). This was not included for analyzing improvements between the base and reference years/annual incremental performance as data between the two years needed to be comparable for that purpose.

[4] Experts included Pulak Ghosh, Professor, Indian Institute of Management, Bangalore; Arvind Pandey, Advisor, Indian Council for Medical Research/ National Institute of Medical Statistics (ICMR-NIMS); Laishram Ladusingh, Director, International Institute of Population Studies; Mudit Kapoor, Associate Professor of Economics, the Indian Statistical Institute (ISI).

Table 2.3 - Health Index: Indicators, definitions, data sources, base and reference years

S. No.	Indicator	Definition	Data Source	Base Year (BY) & Reference Year (RY)	Remarks
DOMAIN 1 – HEALTH OUTCOMES					
Sub-domain 1.1 - Key Outcomes (Weight: Larger States – 500, Smaller States & UTs – 100)					
1.1.1	Neonatal Mortality Rate (NMR)	Number of infant deaths of less than 29 days per thousand live births during a specific year.	SRS [pre-entered]	BY: 2014 RY: 2015	Indicators 1.1.1, 1.1.2, 1.1.3, and 1.1.5 are not applicable for category of Smaller States and UTs
1.1.2	Under-five Mortality Rate (U5MR)	Number of child deaths of less than 5 years per thousand live births during a specific year.	SRS [pre-entered]	BY: 2014 RY: 2015	
1.1.3	Total Fertility Rate (TFR)	Average number of children that would be born to a woman if she experiences the current fertility pattern throughout her reproductive span (15-49 years), during a specific year.	SRS [pre-entered]	BY: 2014 RY: 2015	
1.1.4	Proportion of Low Birth Weight (LBW) among newborns	Proportion of low birth weight (<=2.5 kg) newborns out of the total number of newborns weighed during a specific year born in a public health facility.	HMIS	BY: 2014-15 RY:2015-16	
1.1.5	Sex Ratio at Birth (SRB)	The number of girls born for every 1,000 boys born during a specific year.	SRS [pre-entered]	BY: 2012-14 RY: 2013-15	
Sub-domain 1.2 - Intermediate Outcomes (Weight: Larger & Smaller States – 300, UTs – 250)					
1.2.1	Full immunization coverage	Proportion of infants 9-11 months old who have received BCG, 3 doses of DPT, 3 doses of OPV and one dose of measles against estimated number of infants during a specific year.	HMIS	BY: 2014-15 RY: 2015-16	
1.2.2	Proportion of institutional deliveries	Proportion of deliveries conducted in public and private health facilities against the number of estimated deliveries during a specific year.	HMIS	BY: 2014-15 RY: 2015-16	
1.2.3	Total case notification rate of tuberculosis (TB)	Number of new and relapsed TB cases notified (public + private) per 100,000 population during a specific year.	Revised National Tuberculosis Control Programme (RNTCP) MIS, MoHFW [pre-entered]	BY: 2015 RY: 2016	
1.2.4	Treatment success rate of new microbiologically confirmed TB cases	Proportion of new cured and their treatment completed against the total number of new microbiologically confirmed TB cases registered during a specific year.	RNTCP MIS, MoHFW [pre-entered]	BY: 2014 RY: 2015	
1.2.5	Proportion of people living with HIV (PLHIV) on antiretroviral therapy (ART)	Proportion of PLHIVs receiving ART treatment against the number of estimated PLHIVs who needed ART treatment for the specific year.	Central MoHFW Data [pre-entered]	BY: 2014-15 RY:2015-16	Indicator not applicable for category of UTs.
1.2.6	Average out-of-pocket expenditure per delivery in public health facility (in INR)	Average out-of-pocket expenditure per delivery in public health facility (in INR).	National Family Health Survey (NFHS)-4 [pre-entered]	RY: 2015-16	Indicator applicable only for reference year ranking. Not considered for generating incremental performance scores/ranks or drawing comparison between base and reference years scores/ranks.

S. No.	Indicator	Definition	Data Source	Base Year (BY) & Reference Year (RY)	Remarks
DOMAIN 2 – GOVERNANCE AND INFORMATION					
Sub-domain 2.1 – Health Monitoring and Data Integrity (Weight: 70)					
2.1.1	Data Integrity Measure: a. Institutional deliveries b. ANC registered within first trimester	Percentage deviation of reported data from standard survey data to assess the quality/ integrity of reported data for a specific period.	HMIS and NFHS-4	BY & RY: 2015-16 (NFHS) BY & RY: 2011-12 to 2015-16 (HMIS)	The NFHS data was available only for reference year and the data for this was repeated for the base year and reference year.
Sub-domain 2.2 – Governance (Weight – 60)					
2.2.1	Average occupancy of an officer (in months), combined for following three posts at State level for last three years 1. Principal Secretary 2. Mission Director (NHM) 3. Director (Health Services)	Average occupancy of an officer (in months), combined for following posts in last three years: 1. Principal Secretary 2. Mission Director (NHM) 3. Director (Health Services)	State Report	BY: April 1, 2012-March 31, 2015 RY: April 1, 2013-March 31, 2016	
2.2.2	Average occupancy of a full-time officer (in months) for all the districts in last three years - District Chief Medical Officers (CMOs) or equivalent post (heading District Health Services)	Average occupancy of a CMO (in months) for all the districts in last three years.	State Report	BY: April 1, 2012- March 31, 2015 RY: April 1, 2013-March 31, 2016	
DOMAIN 3 – KEY INPUTS/PROCESSES					
Sub-domain 3.1 – Health Systems/Service Delivery (Weight – 200)					
3.1.1	Proportion of vacant healthcare provider positions (regular + contractual) in public health facilities	Vacant healthcare provider positions in public health facilities against total sanctioned healthcare provider positions for following cadres (separately for each cadre) during a specific year: a. Auxiliary Nurse Mid-wife (ANM) at sub-centers (SCs) b. Staff nurse (SN) at Primary Health Centers (PHCs) and Community Health Centers (CHCs) c. Medical officers (MOs) at PHCs d. Specialists at District Hospitals (Medicine, Surgery, Obstetrics and Gynaecology, Pediatrics, Anesthesia, Ophthalmology, Radiology, Pathology, Ear-Nose-Throat (ENT), Dental, Psychiatry)	State Report	BY: As on March 31, 2015 RY: As on March 31, 2016	
3.1.2	Proportion of total staff (regular + contractual) for whom an e-payslip can be generated in the IT-enabled Human Resources Management Information System (HRMIS).	Availability of a functional IT-enabled HRMIS measured by the proportion of staff (regular + contractual) for whom an e-payslip can be generated in the IT-enabled HRMIS against total number of staff (regular + contractual) during a specific year.	State Report	BY: As on March 31, 2015 RY: As on March 31, 2016	
3.1.3	a. Proportion of specified type of facilities functioning as First Referral Units (FRUs)	Proportion of public sector facilities conducting specified number of C-sections* per year (FRUs) against the norm of one FRU per 500,000 population during a specific year.	State Report on number of functional FRUs, MoHFW data on required number of (FRUs	BY: 2014-15 RY: 2015-16	Indicator definition modified
	b. Proportion of functional 24x7 PHCs	Proportion of PHCs providing all stipulated healthcare services** round the clock against the norm of one 24x7 PHC per 100,000 population during a specific year.	State Report on number of functional 24x7 PHCs, MoHFW data on required number of PHCs	BY: 2014-15 RY: 2015-16	

S. No.	Indicator	Definition	Data Source	Base Year (BY) & Reference Year (RY)	Remarks
3.1.4	Proportion of districts with functional Cardiac Care Units (CCUs)	Proportion of districts with functional CCUs [with desired equipment (ventilator, monitor, defibrillator, CCU beds, portable ECG machine, pulse oxymeter etc.), drugs, diagnostics and desired staff as per programme guidelines] against total number of districts.	State Report	BY: As on March 31, 2015 RY: As on March 31, 2016	
3.1.5	Proportion of ANC registered within first trimester against total registrations	Proportion of pregnant women registered for ANC within 12 weeks of pregnancy during a specific year.	HMIS	BY:2014-15 RY: 2015-16	
3.1.6	Level of registration of births	Proportion of births registered under Civil Registration System (CRS) against the estimated number of births during a specific year.	Civil Registration System (CRS) [pre-entered]	BY: 2013 RY: 2014	
3.1.7	Completeness of IDSP reporting of P and L forms	Proportion of Reporting Units (RUs) reporting in stipulated time period against total RUs, for P and L forms during a specific year.	Central IDSP, MoHFW Data [pre-entered]	BY: 2014 RY: 2015	
3.1.8	Proportion of CHCs with grading above 3 points	Proportion of CHCs that are graded above 3 points against total number of CHCs during a specific year.	HMIS	BY: 2014-15 RY: 2015-16	
3.1.9	Proportion of public health facilities with accreditation certificates by a standard quality assurance program (NQAS/NABH/ISO/AHPI)	Proportion of specified type of public health facilities with accreditation certificates by a standard quality assurance program against the total number of following specified type of facilities during a specific year. 1. District hospital (DH)/Sub-district hospital (SDH) 2. CHC/Block PHC	State Report	BY: As on March 31, 2015 RY: As on March 31, 2016	
3.1.10	Average number of days for transfer of Central NHM fund from State Treasury to implementation agency (Department/Society) based on all tranches of the last financial year	Average time taken (in number of days) by the State Treasury to transfer funds to implementation agencies during a specific year.	Centre NHM Finance Data# [pre-entered]	BY: 2014-15 RY: 2015-16	

*Criteria for fully operational FRUs: SDHs/CHCs - conducting minimum 60 C-sections per year (36 C-sections per year for Hilly and North-Eastern States except for Assam); DHs - conducting minimum 120 C-sections per year (72 C-sections per year for Hilly and North-Eastern States except Assam).
**Criteria for functional 24x7 PHCs: 10 deliveries per month (5 deliveries per month for Hilly and North-Eastern States except Assam)
#Centre NHM Finance data includes the RCH flexi-pool and NHM-Health System Strengthening flexi-pool data (representing a substantial portion of the NHM funds) for calculating delay in transfer of funds.

2.5 LIMITATIONS OF THE INDEX

- Some critical areas such as infectious diseases, NCDs, mental health, governance, and financial risk protection could not be fully captured in the Index due to non-availability of acceptable quality of data on an annual basis.
- For several indicators, the data was limited to service delivery in public facilities due to the paucity and uneven availability of private sector data on health services in the HMIS.
- As data was not available for various indicators at the time of Index development, analytical tools could not be used to derive indicator or domain-specific weights and expert opinion was thus used to assign weights. The data generated for this Index will be helpful in refining the Index and assigning weights in the future. This will also be helpful in fixing the minimum and maximum values of the scale for the next several years, instead of a year-to-year basis.
- For SRS related key outcome indicators, data was available only for Larger States. Hence, the Health Index scores and ranks for Smaller States and UTs were calculated excluding these indicators.

- Data for some indicators was available for formerly undivided States. In such instances, the decision was based on data triangulation. For example, data on the SRB was available only for the undivided State of Andhra Pradesh, and the same value was used for the States of Andhra Pradesh and Telangana as this was comparable with other data sources. However, in the case of MMR, it was observed that the estimates for separate States varied widely as compared with formerly undivided States and it was decided to drop the indicator from the Index.

- For several indicators, HMIS data and program data was used without any field verification by the IVA due to the lack of feasibility of conducting independent field surveys.

- Since the integrity of administrative data was to be measured in comparison with reliable independent data, National Family Health Survey (NFHS-4) was used, which overlapped the base and reference year period of the Index. Therefore, the same values of the indicator on data integrity measure were used for base and reference years.

- In some instances, such as the TB case notification rate, the programmatically accepted definition was used, which is based on the denominator per 100,000 population. The more refined indicator of TB cases notified per 100,000 estimated number of TB cases would have been used if data was available.

- In some cases, proxy indicators or proxy validation criteria were used. Thus, for the number of functional First Referral Units (FRUs) and 24x7 Primary Health Centers (PHCs), the annual number of C-sections and deliveries respectively were used as proxy criteria. The field validation of functionality based on available human resources and infrastructure was not viable.

- Due to unavailability of detailed records at the State level for a few indicators, such as vacancies of human resources and districts with functional CCUs, the validation agency had to rely on certified statements provided by the State.

- For a few indicators, such as vacancies of healthcare providers, the proportion of people living with HIV on ART and the average number of days for transfer of funds from the State Treasury; the State level and Central level program data was inconsistent. In such instances the data was reviewed and the most reliable source of data was considered by the IVA.

3. Processes – from idea to practice

3.1 KEY STAKEHOLDERS - ROLES AND RESPONSIBILITIES

Multiple stakeholders were involved in the entire exercise and their roles and responsibilities are summarized in Table 3.1.

Table 3.1 - Key stakeholders: Roles and responsibilities

NITI Aayog	States	Technical Assistance (TA) Agency (The World Bank)	Mentor Agencies[5]	Independent Validation Agency (IPE Global)
Development and dissemination of the Health Index along with necessary guidance in close partnership with MoHFW	Adopt and share Health Index with various departments	TA to NITI Aayog in developing the Health Index, protocols and guidelines	Assist States in understanding the Health Index, data being sought, and mechanism for providing the responses	Validation and acceptance of the data submitted by the States for various indicators including comparison with other data sources as needed
Facilitate interaction between States and TA, mentor and independent validation agencies	Input data on the indicators as per identified sources on web portal and submit data in a timely manner	Support to NITI Aayog to disseminate the Health Index in Regional/State-level workshops	Participate in Regional and State-level workshops organized by NITI Aayog	Review of supporting documents and participation in data validation workshops with States
Host a web portal for States to input data, its validation and dissemination of State-wise rankings	Co-ordination with different districts, mentor and independent validation agencies	Technical oversight to the mentor agencies, portal agency and the independent validation agency	Provide guidance to the States for submission of data by visiting State Health Departments/Directorates	Submission of final validation report with State details to NITI Aayog
Overall coordination and management		Provide technical support for generation of composite Index and report	Follow up with States for timely submission of data/ supporting documents on the web portal	Generation and validation of ranks and final certification of data on the portal

3.2 PROCESS FLOW

The process of development of the Health Index involved various steps (Table 3.2).

Table 3.2 - Timeline for development of Health Index

Sr No.	Step/Activity	2016	2017-18								
		Jun-Nov	Dec	Jan	Feb	Mar-Apr	May	Jun	Jul	Aug	Sep-Oct	Nov-Jan
1	Development of the Index											
2	Regional workshops with States											
3	Mentorship to States and submission of data on portal											
4	Validation of data and validation workshops with States											
5	Refinement of the Index											
6	Index and rank generation											
7	Report and dissemination of ranks											

[5] United States Agency for International Development (USAID), Regional Resource Centre for North Eastern States (RRC-NE), Centre for Innovation in Public Systems (CIPS), The Energy Research Institute (TERI).

3.2.1 Development of Index

The initial idea of a Health Index to benchmark improvements in the States' performance on key health outcomes originated in March 2016. Development of the Index commenced in June 2016. The selection of indicators and the methodology for the composite Index were among the most challenging tasks. For the selection of indicators, a thorough review of data sources, management information systems and similar global indices was conducted. After detailed deliberations, an initial draft with over 100 indicators was developed and shared with several stakeholders including the States, MoHFW, domestic and international experts, and development partners for review and feedback. A pre-test was conducted in two States to identify state-level issues regarding availability of data, sources for data collection and data validation. Through an iterative process, taking into account importance availability (at least annually) of reliable data, 28 indicators were included in the Health Index (Annexure 2). Once data collection and initial validation was completed, the availability and quality of data for all States was reviewed in a meeting chaired by Member, NITI Aayog. Based on the observations shared by MoHFW, the World Bank, and IVA, as well as inputs from States and experts, 23 indicators were retained and five indicators were dropped for calculating the annual incremental performance and the overall performance in the base and reference years. However, Index scores and ranks for the reference year were also calculated independently, based on 24 indicators including an additional indicator on out-of-pocket expenditure, as the data for this was available only for 2015-16 (Annexure 3).

3.2.2 Regional workshops with States

In order to guide the States on the Health Index and related processes, five regional workshops were held by a team comprising NITI Aayog, MoHFW, the World Bank, mentor agencies, and the portal agency covering all States and UTs (Table 3.3).

Table 3.3 - Health Index regional workshops

Region	Venue	Date	States/UTs
North	New Delhi	23.12.2016	Uttar Pradesh, Haryana, Punjab, Rajasthan, Uttarakhand, Jammu and Kashmir, Himachal Pradesh, Delhi, Chandigarh
West	Goa	13.01.2017	Gujarat, Maharashtra, Madhya Pradesh, Karnataka, Goa, Dadra & Nagar Haveli, Daman & Diu
East	New Delhi	27.01.2017	Bihar, Jharkhand, Odisha, Chhattisgarh, Andaman & Nicobar Islands
South	Vijayawada	03.02.2017	Andhra Pradesh, Telangana, Kerala, Tamil Nadu, Lakshadweep, Puducherry
North East	Shillong	10.02.2017	Meghalaya, Assam, Nagaland, Mizoram, Manipur, Arunachal Pradesh, Sikkim, Tripura, West Bengal

3.2.3 Submission of data on the portal

Mentors were assigned to most States to facilitate data collection and submission on the portal. The Empowered Action Group (EAG) States and North-Eastern States were provided dedicated mentor support which other States received on request. The mentor agencies assigned to various States are listed in Table 3.4.

Table 3.4 - List of mentor agencies

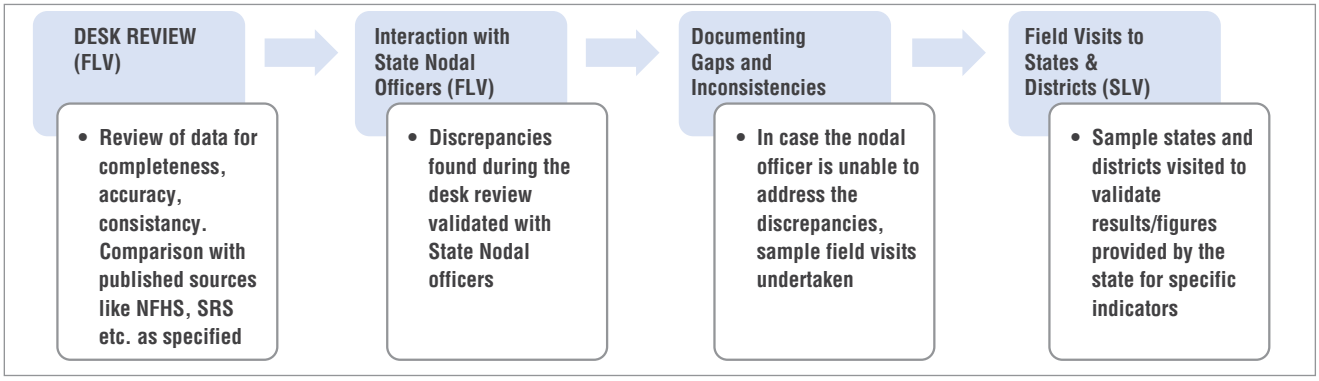
Agency	States
United States Agency for International Development (USAID)	Uttar Pradesh, Uttarakhand, Odisha, Chhattisgarh, Punjab, Himachal Pradesh, Bihar, Jharkhand, Rajasthan, Madhya Pradesh, Haryana, Chandigarh, West Bengal
Regional Resource Centre for North Eastern States (RRC-NE)	Assam, Meghalaya, Arunachal Pradesh, Mizoram, Manipur, Nagaland, Sikkim, Tripura
Centre for Innovation in Public Systems (CIPS)	Andhra Pradesh, Telangana
The Energy Research Institute (TERI)	Delhi

The dedicated interactive web portal, developed and hosted by NITI Aayog includes functions for submission of data and its validation and generates and displays state-wise Index scores and ranks. Data was entered in the portal by the States and UTs, except some designated indicators pre-entered on the basis of data source identified at the outset. For State-level data entry, options were provided to the States to either enter data at the State level or assign this to the districts. However, the final submissionof data on the portal was done by the designated State-level competent authority. The process of data entry and submission by the States began in February 2017 and ended in June 2017.

3.2.4 Independent validation of data

An Independent Validation Agency (IVA), namely, IPE Global, was hired by NITI Aayog through a competitive selection process to review and validate the Health Index data and the State rankings. The data submitted on the portal was validated by the IVA from May-October 2017 as summarized in Figure 3.1.

Figure 3.1 - Steps for validating data



FLV - First level verification, SLV - Second level verification

Field visits were conducted to carry physical validation of the data in Assam, Chhattisgarh, Rajasthan, Kerala, Himachal Pradesh, Bihar and Jharkhand[6]. A regional workshop was also held to cover the seven North-Eastern States. The detailed note on discrepancies in data submitted and their resolution is provided in Annexure 1.

3.2.5 Index and rank generation

The data validated and finalized by the IVA after resolving issues with the States was used in Index generation and rankings. Once the data was accepted by the IVA, the ranks were automatically generated by the portal hosted by the NITI Aayog. In addition, to ensure accuracy the indices and ranks were manually calculated and cross-checked with the results from the portal and the final values were certified by the IVA. The activity of Index and rank generation was undertaken in September and October 2017.

[6] Physical verification of the documents and meetings with State Nodal Officers were conducted by project offices of the IVA.

Results And Findings

Performance of Larger States
Performance of Smaller States
Performance of Union Territories
States and UTs: Performance on indicators

4. Unveiling performance – encouraging actions

This chapter presents the States' overall and incremental performance on the Health Index. The results are presented for each group of States separately: Larger States, Smaller States, and UTs. Overall performance is measured using the composite Index scores for base and reference years, and incremental performance is calculated as the change in composite Index scores from base to reference year.

4.1 PERFORMANCE OF LARGER STATES

4.1.1 Overall performance

In the base year (2014-15), the composite Health Index ranged from 28.14 in Uttar Pradesh to 80 in Kerala. On an average, modest improvement was observed between the base and reference year, with the difference between the worst and best performing States narrowing. In the reference year 2015-16, Uttar Pradesh at 33.69 remained the poorest performing State, and Kerala remained the best performing State despite a slight decline in the Health Index to 76.55.

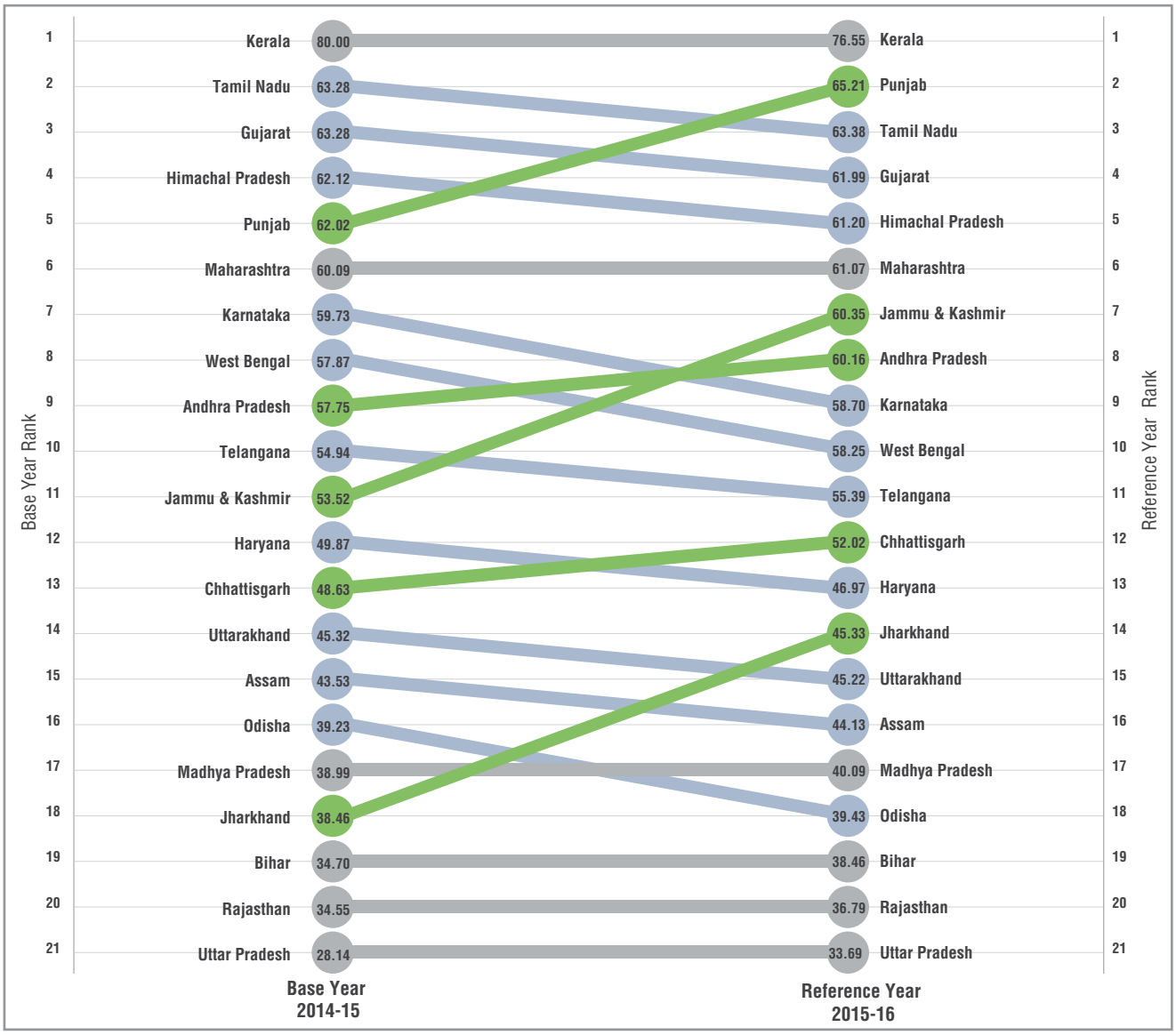
Figure 4.1 displays the composite Index scores for base and reference years for the Larger States and ranks the States based on their overall performance. The lines depict changes in the ranking: a blue line denotes a negative change in the State's ranking from base to reference year, a green line indicates a positive change, and a grey line indicates no change in ranking.

The top five performing States in the reference year based on the composite Index score are Kerala (76.55), Punjab (65.21), Tamil Nadu (63.38), Gujarat (61.99), and Himachal Pradesh (61.20). On the other end of the spectrum, Uttar Pradesh (33.69) scored the lowest and ranks at the bottom preceded by Rajasthan (36.79), Bihar (38.46), Odisha (39.43), and Madhya Pradesh (40.09). The EAG[7] States (except Chhattisgarh) and Assam lie at the tail end of the distribution, ranking between 14th and 21st positions.

Among the 21 Larger States, only five States improved their position from base to reference year. These States are Punjab, Andhra Pradesh, Jammu & Kashmir, Chhattisgarh and Jharkhand. The most significant progress was observed in Jharkhand and Jammu & Kashmir. Both States moved up by four positions in the ranking. Meanwhile, Punjab improved its performance in the ranking by three positions. Andhra Pradesh and Chhattisgarh have shown modest improvement – both up by one position. Despite increases in the composite Health Index scores, the rankings of Maharashtra, Madhya Pradesh, Bihar, Rajasthan, and Uttar Pradesh did not change between base and reference years. Kerala continued to be at the top position and the remaining States fell in ranking by 1-2 positions.

[7] Eight states namely Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand, and are referred to as the Empowered Action Group (EAG) States.

Figure 4.1 - Larger States: Overall performance - Composite Index score and rank, base and reference years



Note: Lines depict changes in composite Index score rank from base to reference year. The composite Index score is presented in the circle.

Based on the composite Index scores for the reference year (2015-16), the States are grouped into three categories: Aspirants, Achievers, and Front-runners (Table 4.1). Aspirants are the bottom one-third states with an Index score below 48. These States are largely the EAG States (except Chhattisgarh) and given the substantial scope for improvement, require concerted efforts. Achievers represent the middle one-third States with an Index score between 48 and 62. Overall, these States have made good progress and can move to the next group with sustained efforts. Front-runners, the top one-third States with an Index score above 62 are the best performing States. Despite relatively good performance, however, even the Front-runners could further benefit from improvements in certain indicators as the highest observed Index score of 76.55 is well below 100.

Table 4.1 - Larger States: Overall performance in reference year - Categorization

Aspirants	Achievers	Front-runners
Haryana	Gujarat	Kerala
Jharkhand	Himachal Pradesh	Punjab
Uttarakhand	Maharashtra	Tamil Nadu
Assam	Jammu & Kashmir	
Madhya Pradesh	Andhra Pradesh	
Odisha	Karnataka	
Bihar	West Bengal	
Rajasthan	Telangana	
Uttar Pradesh	Chhattisgarh	

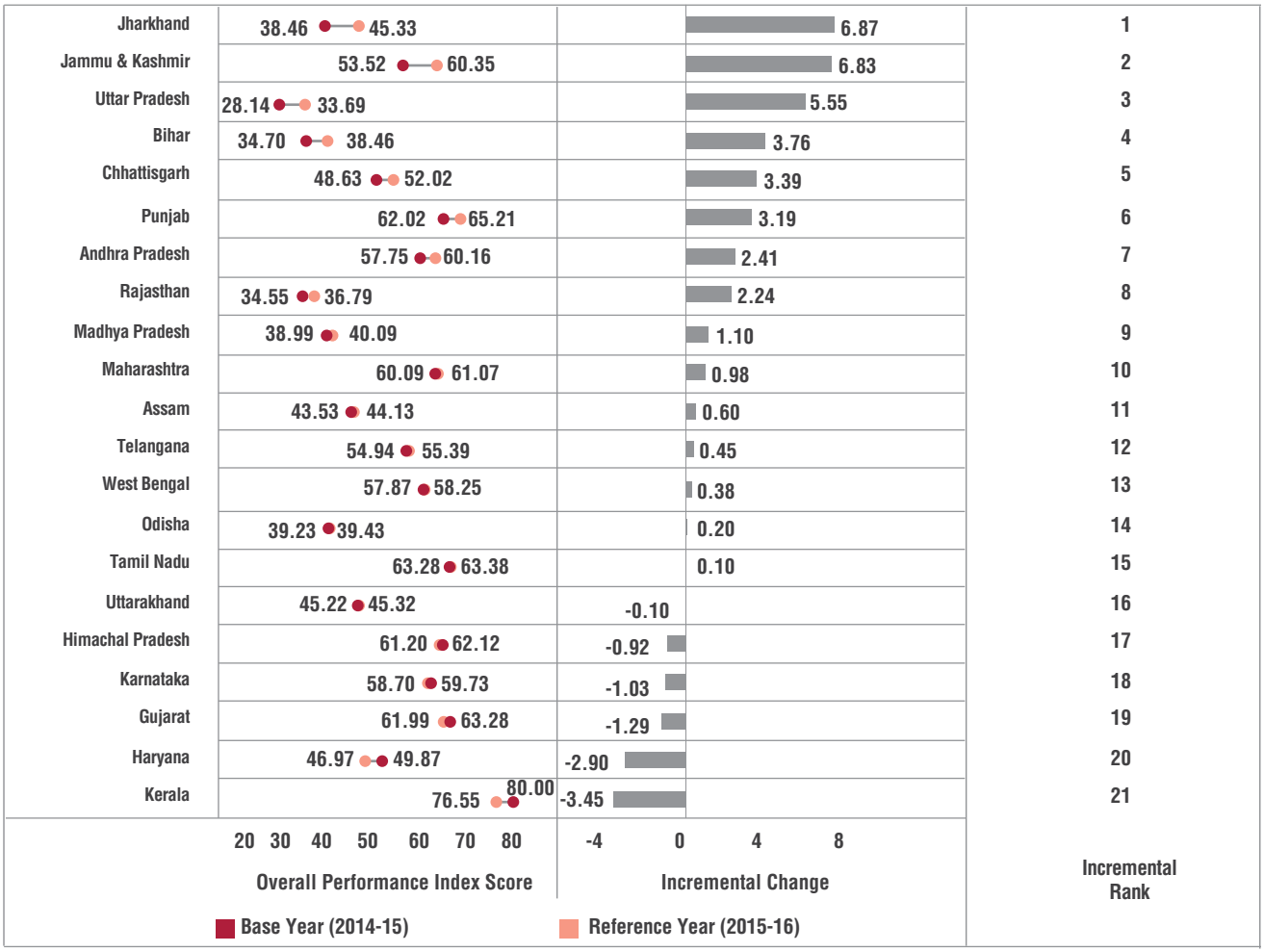
Note: The States are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>62), Achievers: middle one-third (Index score between 48 and 62), Aspirants: lowest one-third (Index score<48).

4.1.2 Incremental performance

Incremental performance measures the change in the Health Index score from base to reference year, which is masked by the year-specific rankings. It is important to identify the year-on-year pace of improvement made by States. States that start at lower levels of Health Index are generally at an advantage for higher incremental progress due to diminishing marginal returns for States that start at a high Index score. This measure is particularly important for identifying States with negative incremental progress.

In Figure 4.2, the left side, presents the State-wise movement in Health Index from base to reference year along with their relative position and on the right side, actual increments are presented. Overall, the incremental performance does not appear to be associated with the overall Index score. Importantly, some of the better-performing Larger States have made negative incremental progress. Three of the top five Larger States (Kerala, Gujarat, and Himachal Pradesh) recorded negative changes in the overall performance Index score between base and reference years.

Figure 4.2 - Larger States: Overall and incremental performance, base and reference years and incremental rank



Among the 21 Larger States, 15 States displayed a positive incremental change in the Index score. The remaining six States showed negative incremental change. Except for Uttarakhand that showed a slight negative incremental performance, the EAG States registered positive incremental progress. Jharkhand (ranked at top) followed by Jammu & Kashmir and Uttar Pradesh made significant incremental progress, with more than a five-point change in Index score from base to reference year. However, for Bihar, Chhattisgarh, Punjab, Andhra Pradesh and Rajasthan, the Index score increased by 2 to 4 points. Further, limited improvement was observed in Madhya Pradesh, Maharashtra, Assam, Telangana and West Bengal. Odisha, Tamil Nadu and Uttarakhand more or less maintained their respective Health

Index scores and made negligible incremental progress. Meanwhile, Himachal Pradesh, Karnataka, Gujarat, Haryana and Kerala showed declines in the reference year as compared to the base year, resulting in a negative incremental Index score.

Fifteen states observed positive incremental change in Index scores from base to reference year, whereas only five States (Punjab, Andhra Pradesh, Jammu & Kashmir, Chhattisgarh, and Jharkhand) increased in their overall performance ranks from base year to reference year. This depicts that only these five States made significant incremental progress leading to improvement in the overall performance position. The remaining States with modest or negative incremental progress have retained their earlier position or have moved down in the ranking.

Based on their incremental performance, States are categorized into four groups: 'not improved' (<= 0 incremental change), 'least improved' (0.01 to 2 point increase), 'moderately improved' (2.01 to 4 point increase), and 'most improved' (>4 point increase) (Table 4.2).

Table 4.2 - Larger States: Incremental performance from base to reference year - Categorization

Not improved	Least improved	Moderately improved	Most improved
Uttarakhand Himachal Pradesh Karnataka Gujarat Haryana Kerala	Madhya Pradesh Maharashtra Assam Telangana West Bengal Odisha Tamil Nadu	Bihar Chhattisgarh Punjab Andhra Pradesh Rajasthan	Jharkhand Jammu & Kashmir Uttar Pradesh

Note: The States are categorized on the basis of incremental Index score range into categories: 'not improved' (incremental Index score<=0), 'least improved' (incremental Index score between 0.01 and 2), 'moderately improved' (incremental Index score between 2.01 and 4), 'most improved' (incremental Index score>4.0).

Among the most improved States in terms of incremental progress, Jharkhand is the top most improved State and has showed maximum gains in improvement of health outcomes from base to reference year in indicators such as U5MR (44 to 39 per 1000 live births), TFR (2.8 to 2.7), full immunization (81 to 88 percent) and institutional deliveries (61 to 67 percent). Jammu & Kashmir, ranked at second, has shown good incremental progress on health outcomes of NMR (26 to 20 per 1000 live births), U5MR (35 to 28 per 1000 live births), full immunization coverage (90 to 100 percent) and PLHIV on ART (89 to 96 percent). Similarly, Uttar Pradesh, ranked third has attained significant incremental improvement on the parameters of U5MR (57 to 51 per 1000 live births), low birth weight (11.74 to 9.60 percent), institutional deliveries (44 to 52 percent), and PLHIV on ART (51 to 58 percent).

Among the States which could not register positive incremental performance, Kerala is ranked at the bottom mainly as it had already achieved low level of NMR and U5MR and replacement level fertility, leaving very limited space for any further improvements. Additionally, Kerala also registered a decline in sex ratio at birth from base to reference year (974 to 967 females per 1000 males). Haryana with a negative incremental score performed poorly due to increase in U5MR (40 to 43 per 1000 live births) and decline in the Sex Ratio at Birth (866 to 831 females per 1000 males) from base to reference year. Gujarat registered a significant decline in sex ratio at birth (907 to 854 females per 1000 males) that dragged down its incremental progress.

The indicators where most Larger States need to focus on include addressing the issue of sex ratio at birth, establishment of functional district Cardiac Care Units, ensuring quality accreditation of public health facilities, and institutionalization of Human Resources Management Information System.

4.1.3 Domain-specific performance

Overall performance is an aggregate measure of a State's performance and does not reveal specific areas requiring further attention. To identify such areas, the Index is disaggregated into the domains of Health Outcomes, Governance and Information, and Key Inputs/Processes. The domain of Governance and Information is not presented in this section as it has a limited number of indicators (three) due to data limitations and thus might not be fully representative of the domain.

The overall performance of the States is not always consistent with the domain-specific performance (Figure 4.3). Some top performing States fare significantly better in one domain suggesting that there is scope to improve their performance in the lagging domain with specific targeted interventions. Most States showed a better performance on health outcomes; however, Tamil Nadu, West Bengal, Assam, Madhya Pradesh, Odisha and Rajasthan performed better in terms of Key Inputs/Processes.

Figure 4.3 - Larger States: Overall and domain-specific performance, reference year

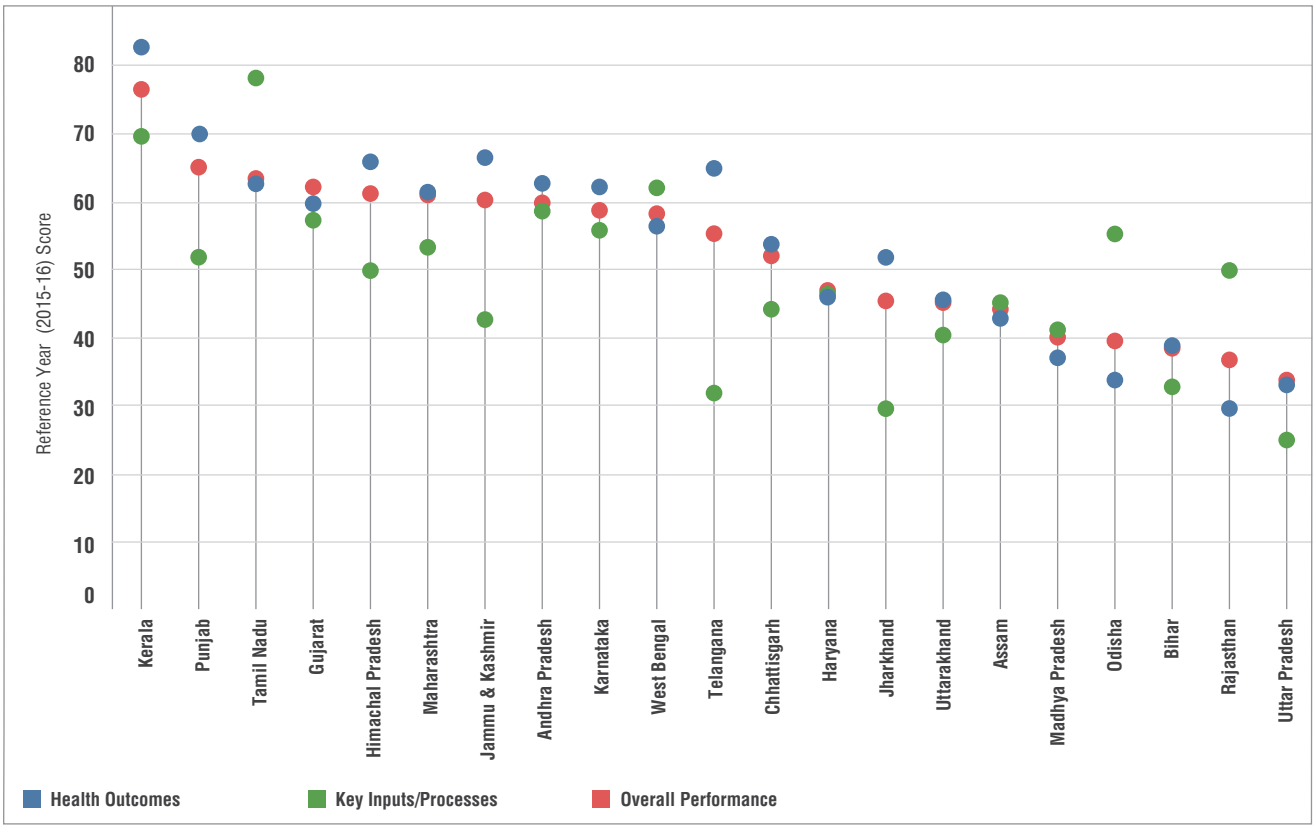
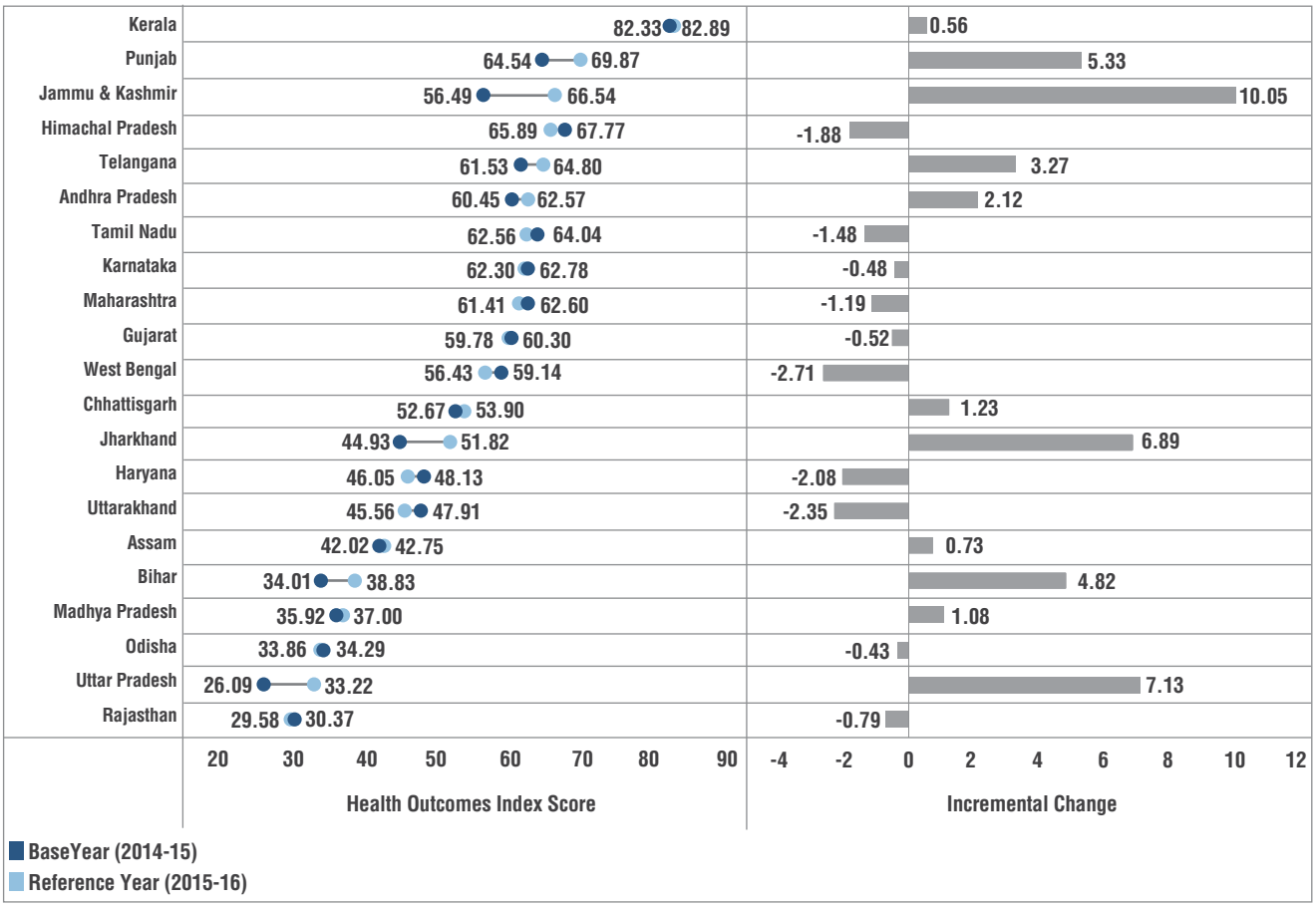


Figure 4.4 and Figure 4.5 present the overall performance of Larger States in the domains of Health Outcomes and Key Inputs/Processes for base and reference year. In these figures, from top to bottom, States are presented in descending order of Health Index scores for the reference year. For the Health Outcomes domain, Kerala is ranked at the top and Rajasthan is at the bottom, while for Key Inputs/Processes, Tamil Nadu earned the top position and Uttar Pradesh received the lowest ranking.

In the domain of Health Outcomes, 11 States (Kerala, Punjab, Jammu & Kashmir, Telangana, Andhra Pradesh, Chhattisgarh, Jharkhand, Assam, Bihar, Madhya Pradesh, and Uttar Pradesh) have improved their Index score from base to reference year. The Index score has declined from base to reference year for the other States. Jammu & Kashmir saw the largest positive incremental change (10.05) followed by Uttar Pradesh (7.13) and Jharkhand (6.89), while negative changes of more than 2 points were observed in West Bengal, Haryana, and Uttarakhand.

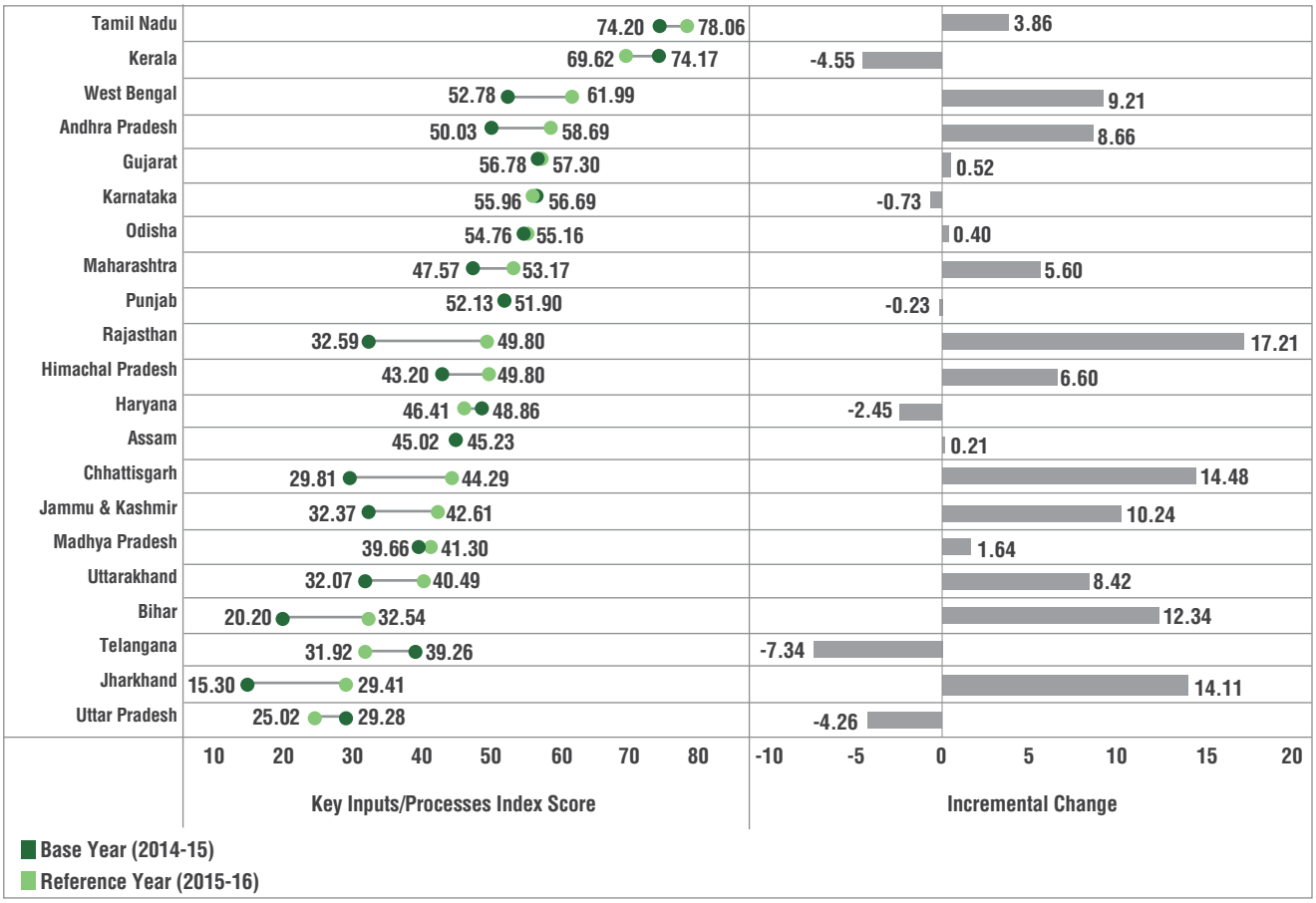
Figure 4.4 - Larger States: Performance in the Health Outcomes domain, base and reference years



Note: States ranked based on their reference year score in the Health Outcomes domain.

In the Key Inputs/Processes domain, the Index score has improved from base to reference year in 15 of the 21 States. The Key Inputs/Processes score declined in Kerala, Karnataka, Punjab, Haryana, Telangana and Uttar Pradesh. Large incremental increases of more than 10 points were observed in Rajasthan, Chhattisgarh, Jammu & Kashmir, Bihar, and Jharkhand. Negative incremental change of more than 2 points was observed in Kerala, Haryana, Telangana and UP.

Figure 4.5 - Larger States: Performance in the Key Inputs/Processes domain, base and reference years

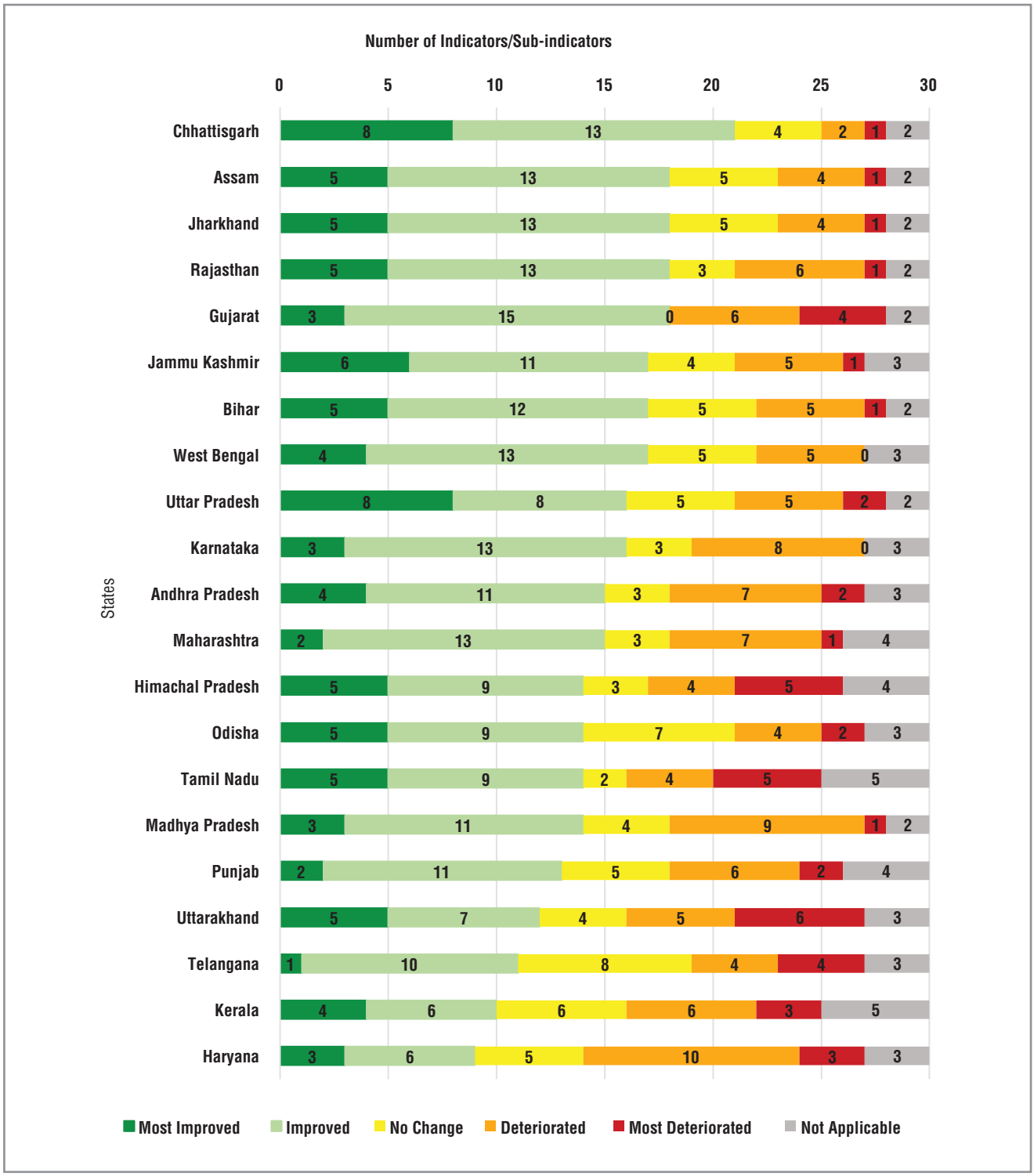


Note: States ranked based on their reference year score in the Key Inputs/Processes domain.

4.1.4 Incremental performance on indicators

Figure 4.6 captures the incremental performance on indicators and sub-indicators and provides the number of indicators and sub-indicators in each category, i.e, 'most improved', 'improved', 'no change','deteriorated' and 'most detriorated'. Chattisgarh has the highest proportion of indicators among Larger States (70 percent), which fall in the category of 'most improved' and 'improved'. On the other hand, Haryana has the highest proportion (43 percent) of indicators which fall in the category of 'deteriorated' and 'most deteriorated'. Detailed indicator-specific performance snapshot of States is presented in Annexure 4, which provides the direction as well as the magnitude of the incremental change of indicators from base year to reference year.

Figure 4.6 - Larger States: Number of indicators/sub-indicators, by category of incremental performance



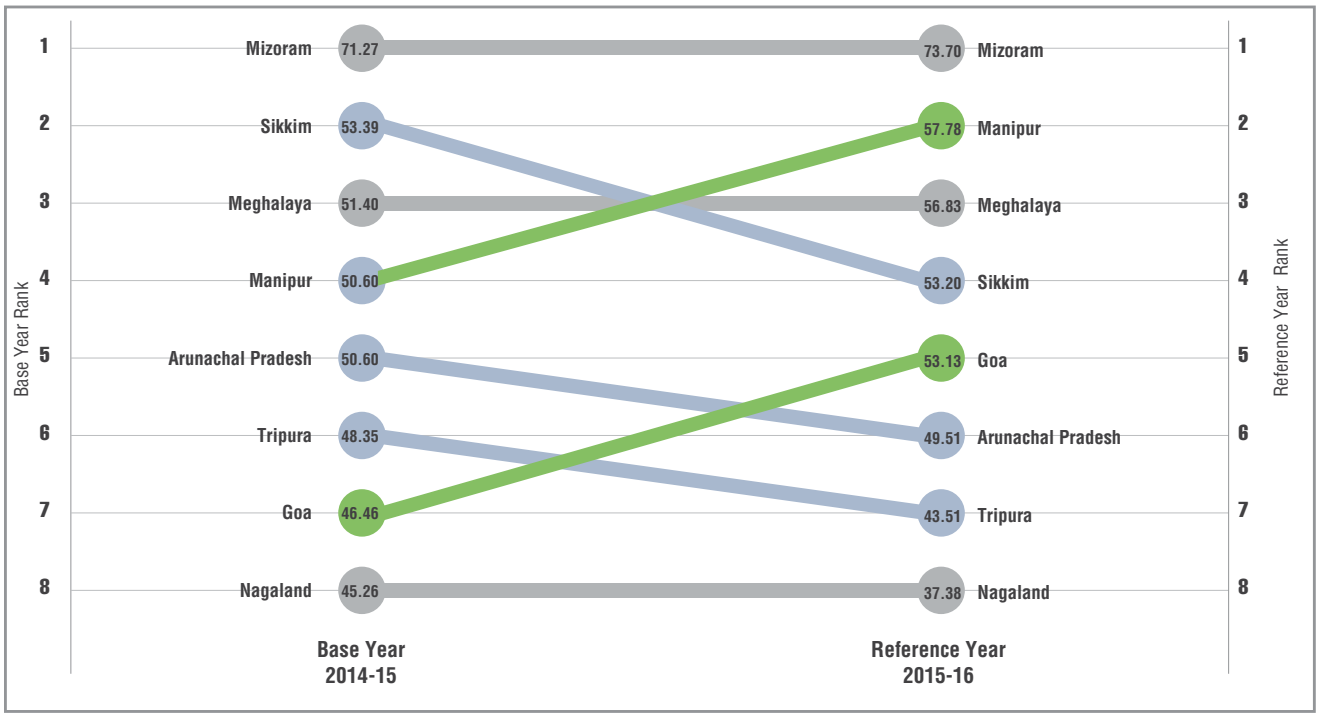
Note: For a State, the incremental performance on an indicator is classified as not applicable (NA) in instances such as: (i) If State has achieved TFR <= 2.1 in both base and reference years; (ii) Data Integrity Measure indicator wherein the same data has been used for base year and reference year due to overlapping periods of NFHS-4; (iii) Service coverage indicators with 100 percent values in both base and reference years; (iv) The data value for a particular indicator is NA in base year or reference year or both.

4.2 PERFORMANCE OF SMALLER STATES

4.2.1 Overall performance

In the base year (2014-15), the overall performance among the Smaller States ranged from 45.26 in Nagaland to 71.27 in Mizoram (Figure 4.7). Both states retained their respective rankings in the reference year. Mizoram exhibited a small improvement since base year, with the Health Index score rising to 73.70 in the reference year (2015-16). Meanwhile, Nagaland's performance worsened substantially - the State's Health Index fell from 45.26 in the base year to 37.38 in the reference year. Tripura received a score of 43.51 and is the second-to-last State among this group. Notably, while Manipur, Meghalaya, Sikkim, Goa and Arunachal Pradesh are among the better performing Smaller States, these States scored only between 50 and 58 points on the Health Index in the reference year. This suggests that there is substantial scope for improvement even for these relatively better-performing states.

Figure 4.7 - Smaller States: Overall performance - Composite Index score and rank, base and reference years



Note: Lines depict changes in composite Index score rank from base to reference year. The composite Index score is presented in the circle.

Only two States, namely Manipur and Goa, improved their position from base year to reference year - each up by two positions. Mizoram, Meghalaya, and Nagaland retained their first, third, and eighth positions, respectively. The position of Sikkim worsened by two ranks (from second to fourth) and that of Arunachal Pradesh and Tripura worsened by one position from fifth to sixth and sixth to seventh, respectively.

Based on the composite Index score range for reference year (2015-16), Tripura and Nagaland (Table 4.3) are categorized as Aspirants, and have substantial scope for improvements, while Manipur, Meghalaya, Sikkim, Goa and Arunachal Pradesh are Achievers, and though have demonstrated better performance, still need to improve. Mizoram is categorized as a Front-runner - with the highest observed performance among the Smaller States. Despite relatively good performance, even Mizoram could further benefit from improvements.

Table 4.3 - Smaller States: Overall performance in reference year - Categorization

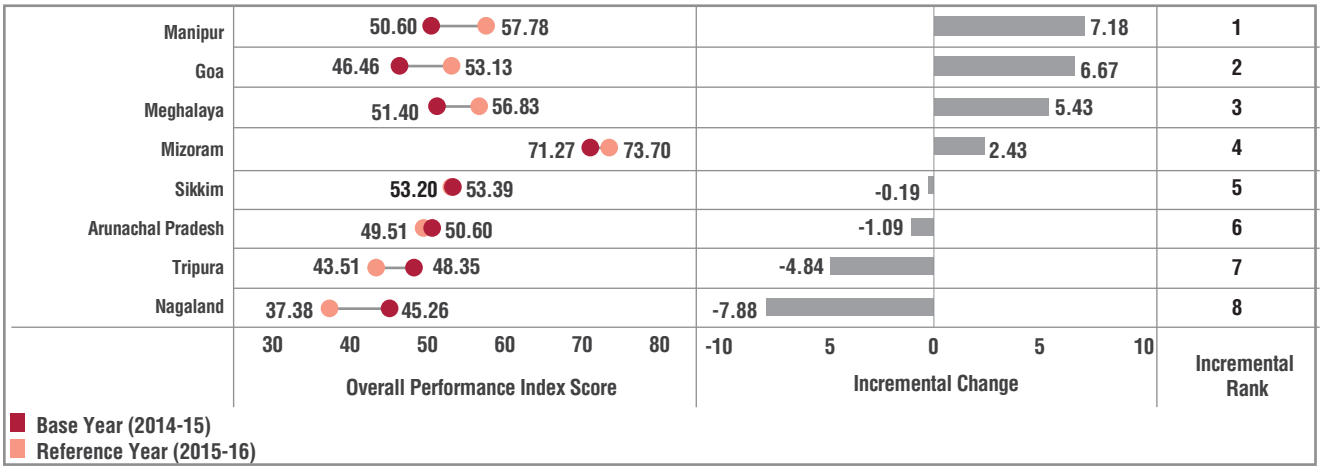
Aspirants	Achievers	Front-runners
Tripura Nagaland	Manipur Meghalaya Sikkim Goa Arunachal Pradesh	Mizoram

Note: The States are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>61.60), Achievers: mid one-third (Index score between 49.49 and 61.60), Aspirants: lowest one-third (Index score<49.49).

4.2.2 Incremental performance

Figure 4.8 presents the incremental progress made by the States along with their relative position to each other as well as the respective increments and ranks.

Figure 4.8 - Smaller States: Overall and incremental performance, base and reference years and incremental rank



From base to reference year, four States (Manipur, Goa, Meghalaya and Mizoram) showed positive incremental progress, while the remaining four States (Sikkim, Arunachal Pradesh, Tripura and Nagaland) registered negative incremental performance (Figure 4.8). The States of Manipur (ranked at the top), Goa and Meghalaya made significant incremental progress – recording increases in the Health Index score of 5 points or more between the base and reference years. Mizoram also made some incremental progress with a 2.43 point change in Index scores from base to reference year. Sikkim has observed almost no change in its Health Index score between the two periods. The Index score in Arunachal Pradesh and Tripura declined by 1.09 and 4.84 points, respectively. Nagaland observed the highest negative incremental change of -7.88 points between base and reference years.

Mizoram has shown incremental progress from base to reference year and has retained the top rank. Although, three States (Manipur, Goa, and Meghalaya) have observed positive incremental change in Index scores from base to reference year, only Manipur and Goa have been able to improve their overall performance ranks from base year to reference year. The remaining States with modest or negative incremental progress retained their base year position or have moved down in the ranking.

Based on their incremental performance from base to reference year, States are grouped into four categories: 'not improved', 'least improved', 'moderately improved', and 'most improved' (Table 4.4). Manipur, Goa, and Meghalaya are among the most improved states with an incremental Index score of more than 4 points. Meanwhile, Sikkim, Arunachal Pradesh, Tripura, and Nagaland have not improved and have in fact seen their overall Index scores decline between base and reference years.

Table 4.4 - Smaller States: Incremental performance from base to reference year - Categorization

Not improved	Least improved	Moderately improved	Most improved
Sikkim Arunachal Pradesh Tripura Nagaland	-	Mizoram	Manipur Goa Meghalaya

Note: The States are categorized on the basis of incremental Index score range into categories: 'not improved' (incremental Index score<=0), 'least improved' (incremental Index score between 0.01 and 2), 'moderately improved' (incremental Index score between 2.01 and 4), 'most improved' (incremental Index score>4).

Among the most improved States, Manipur registered maximum incremental progress from base to reference year due to good progress on indicators such as PLHIVs on ART (54 to 64 percent), average occupancy of 3 key state level officers (13 to 21 months), first trimester ANC registration (59 to 63 percent), IDSP reporting format for presumptive surveillance (P form) submission (35 to 63 percent), and CHC grading (0 to 29 percent). Further, Goa, ranked second and progress from base to reference year was notable on indicators such as low birth weight (17 to 16 percent), full immunization coverage (91 to 95 percent), average occupancy of three key State-level officers (15 to 22 months), CHC grading (25 to 75 percent), vacancy of medical officers at PHCs (31 to 14 percent) and specialists at district hospitals (43 to 40 percent).

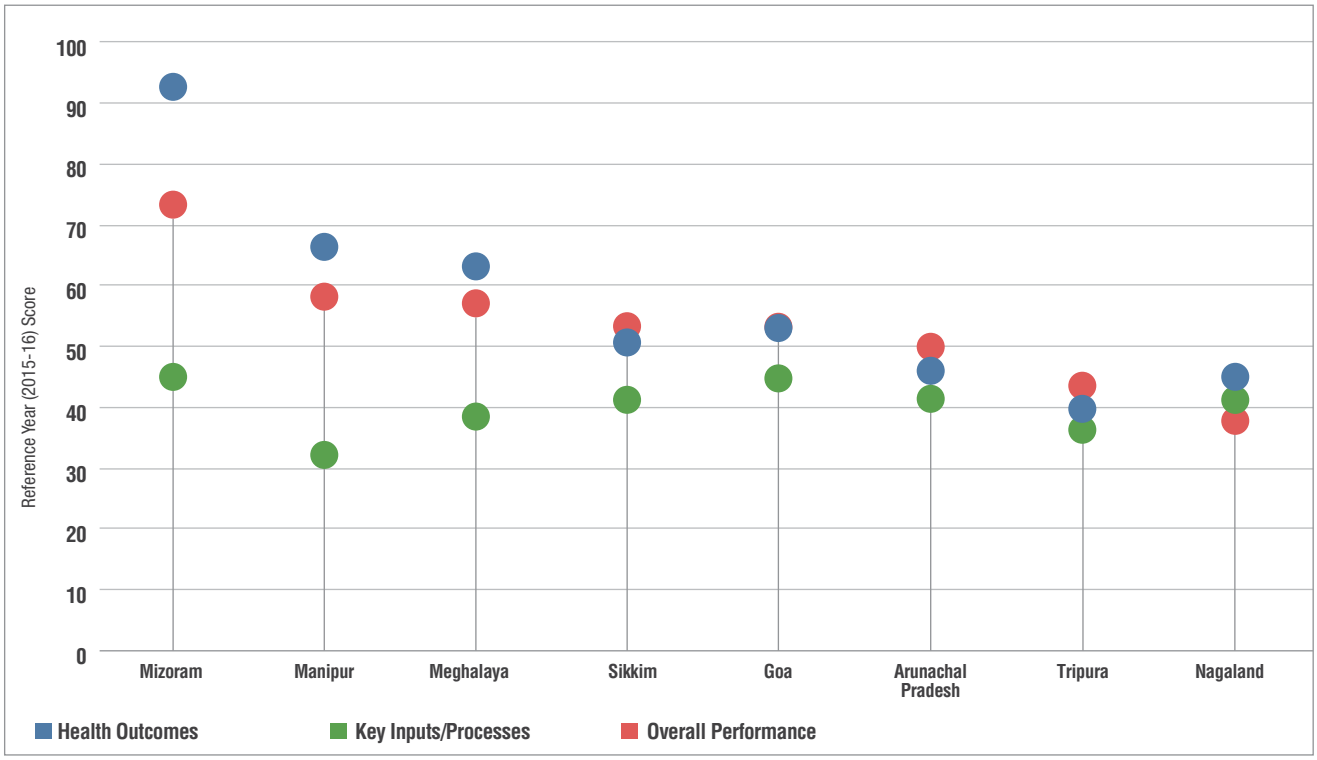
Among the States which have not shown any improvement from base year to reference year, Nagaland, ranked at the bottom, and performed poorly on indicators such as TB treatment success rate (91 to 72 percent), average occupancy of three key State-level officers (12 to 7 months), first trimester ANC registration (47 to 36 percent) and time taken to transfer Central NHM funds from State Treasury to implementation agency (101 to 213 days). Tripura, ranked second from the bottom, and fared poorly on indicators such as full immunization coverage (87 to 84 percent), TB case notification rate (195 to 61), PLHIVs on ART (23 to 6 percent), vacancies of Auxiliary Nurse Midwives (ANMs) at sub-centres (15 to 39 percent), and level of birth registration (91 to 82 percent).

The indicators where almost all Smaller States need to focus include filling vacancies of ANMs at sub-centres, establishment of functional district Cardiac Care Units, quality accreditation of public health facilities, and institutionalization of Human Resources Management Information System.

4.2.3 Domain-specific performance

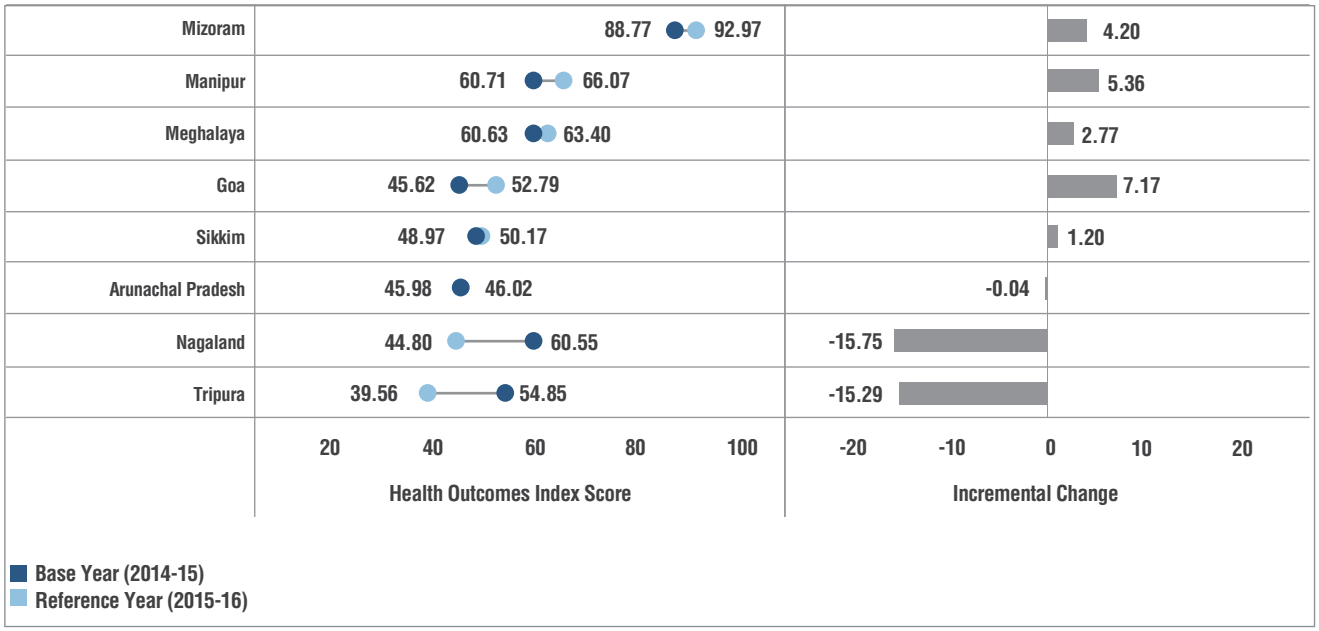
The overall performance of the States is not always consistent with the domain-specific performance (Figure 4.9). All Smaller States showed a better performance on Health Outcomes as compared to Key Inputs/Processes.

Figure 4.9 - Smaller States: Overall and domain-specific performance, reference year



In the domain of Health Outcomes, five States (Mizoram, Manipur, Meghalaya, Goa and Sikkim) improved their performance from base year to reference year and the performance of the remaining three States (Arunachal Pradesh, Nagaland and Tripura) has worsened (Figure 4.10). Mizoram achieved the highest score of 92.97 in the Health Outcomes domain. However, the range of scores was wide. Manipur received a second highest score of 66.07, while the poorest performing State of Tripura scored only 39.56 points.

Figure 4.10 - Smaller States: Performance in the Health Outcomes domain, base and reference years



Note: States ranked based on their reference year score in the Health Outcomes domain.

In the Key Inputs/Processes domain, all Smaller States performed quite poorly and the range of scores was significantly smaller. Goa received the highest score of only 44.65, while Manipur scored 32.18 points. Four States (Goa, Meghalaya, Tripura and Manipur) improved their performance; whereas the performance of the remaining four States of Mizoram, Sikkim, Arunachal Pradesh and Nagaland worsened (Figure 4.11).

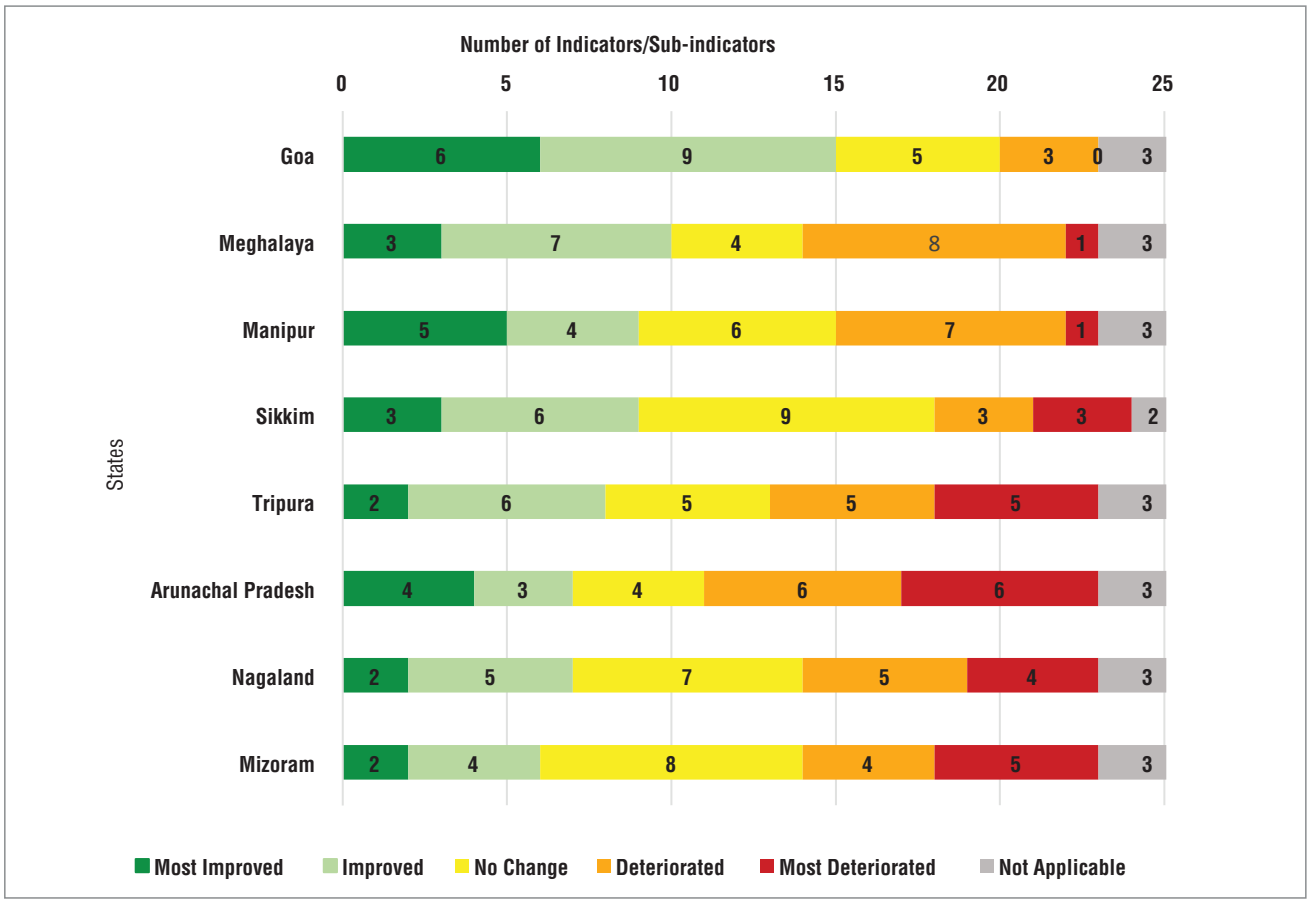
Figure 4.11 - Smaller States: Performance in the Key Inputs/Processes domain, base and reference years

Note: States ranked based on their reference year score in the Key Inputs/Processes domain.

4.2.4 Incremental performance on indicators

Figure 4.12 captures the incremental performance on indicators and sub-indicators and provides the number of indicators and sub-indicators in each category, i.e, 'most improved', 'improved', 'no change', 'deteriorated'and 'most detriorated'. Among the Smaller States, even though Goa has the highest number of indicators that have shown improvement, there are still nearly 30 percent of indicators that have either remained stagnant or deteriorated. Apart from Goa, other Smaller States did not record any improvements even in 40 percent of the indicators. Detailed indicator-specific performance snapshot of States is presented in the Annexure 4, which provides the direction as well as the magnitude of the incremental change of indicators from base year to reference year.

Figure 4.12 - Smaller States: Number of indicators/sub-indicators, by category of incremental performance



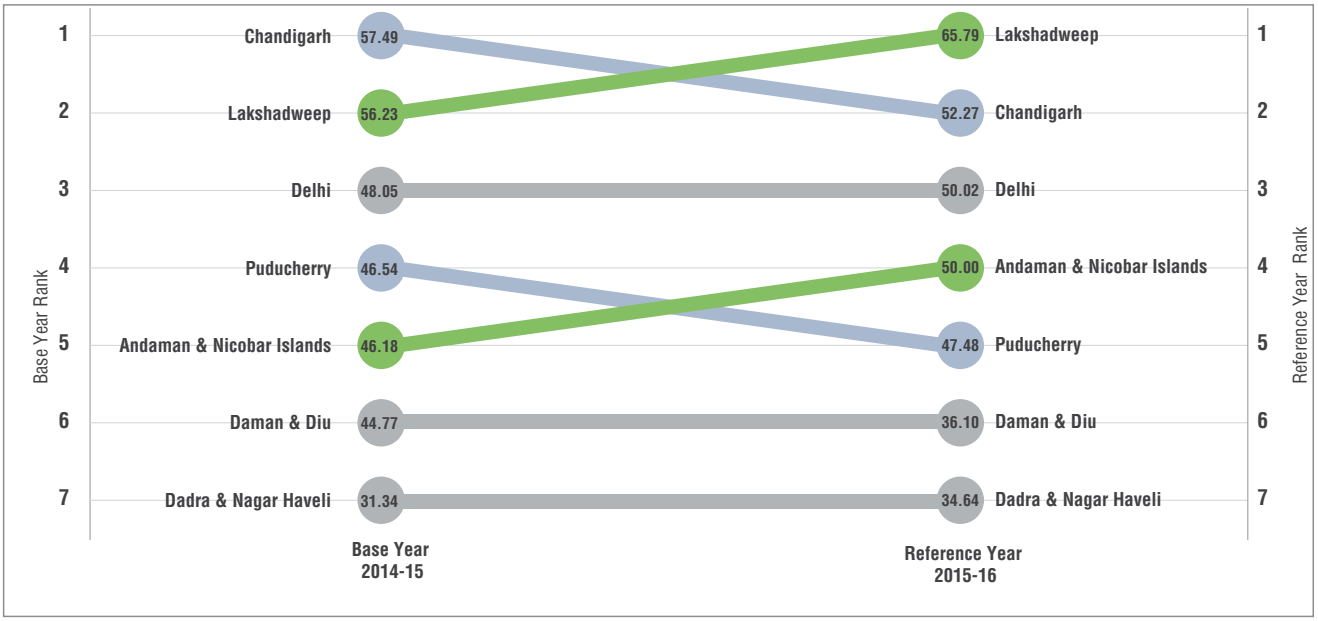
Note: For a State, the incremental performance on an indicator is classified as not applicable (NA) in instances such as: (i) Data Integrity Measure indicator wherein the same data has been used for base and reference years due to overlapping periods of NFHS-4; (ii) Service coverage indicators with 100 percent values in both base year and reference year; (iii) The data value for a particular indicator is NA in the base year or reference year or both.

4.3. PERFORMANCE OF UNION TERRITORIES

4.3.1 Overall performance

The overall performance based on the Health Index score of UTs for the base year ranged from 31.34 points for Dadra & Nagar Haveli to 57.49 points for Chandigarh.

Figure 4.13 - Union Territories: Overall performance - Composite Index score and rank, base and reference years



Note: Lines depict changes in composite Index score rank from base to reference year. The composite Index score is presented in the circle.

Some improvements were observed in the reference year, but the best and worst scores still differed by more than 30 points. Despite a modest improvement, Dadra & Nagar Haveli received the lowest score of 34.64 points, while Lakshadweep moved to first place with a score of 65.79 points (Figure 4.13).

Only two UTs, namely Lakshadweep and Andaman & Nicobar Islands, improved their position from base year to reference year - Lakshadweep from second to first and Andaman & Nicobar Islands from fifth to fourth position. Delhi has retained its third position during the period. Similarly, Daman & Diu and Dadra & Nagar Haveli did not change ranks and were ranked sixth and seventh, respectively. Puducherry and Chandigarh both fell by one position in the rankings (Puducherry from fourth to fifth, and Chandigarh from first to second).

Based on the composite Index score range for reference year (2015-16), the UTs are categorized into three categories: Aspirants, Achievers, and Front-runners. Daman & Diu and Dadra & Nagar Haveli are categorized as Aspirants, and are among the bottom one-third UTs, and have substantial scope for improvement. Chandigarh, Delhi, Andaman & Nicobar Islands and Puducherry are grouped as Achievers and also have significant room for improvement. Lakshadweep with the highest overall performance is categorized as Front-runner, and could also benefit from improvements with an Index score of 65.79, which is well below 100.

Table 4.5 - Union Territories: Overall performance in reference year - Categorization

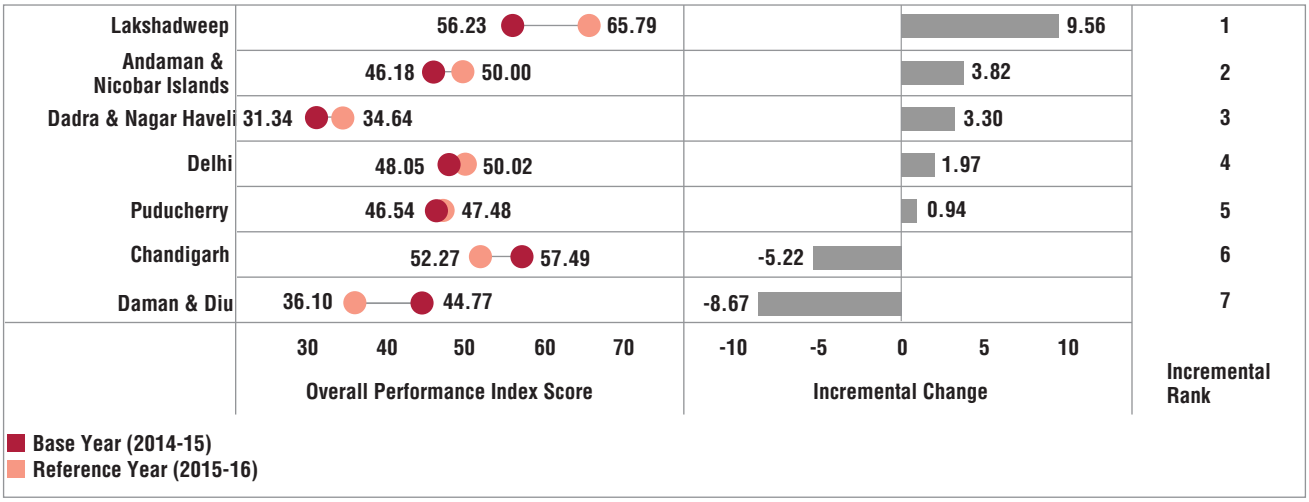
Aspirants	Achievers	Front-runners
Daman & Diu Dadra & Nagar Haveli	Chandigarh Delhi Andaman & Nicobar Islands Puducherry	Lakshadweep

Note: The UTs are categorized on the basis of reference year Index score range: Front-runners: top one-third (Index score>55), Achievers: mid one-third (Index score between 45 and 55), Aspirants: lowest one-third (Index score<45).

4.3.2 Incremental performance

Figure 4.14 shows that from base to reference year, five UTs (Lakshadweep, Andaman & Nicobar, Dadra & Nagar Haveli, Delhi and Puducherry) registered positive incremental progress and the remaining two UTs (Chandigarh and Daman & Diu) registered negative incremental change. From base year to reference year, Lakshadweep (ranked at the top) observed the highest incremental performance of 9.56 points. Andaman & Nicobar, Dadra & Nagar Haveli and Delhi saw an increase in the Health Index score of between 2 to 4 points from base year to reference year. Puducherry achieved approximately a one point incremental increase. Daman & Diu and Chandigarh reported negative changes in the Health Index score, with the Health Index score declining by 8.67 and 5.22 points, respectively, over the time period.

Figure 4.14 - Union Territories: Overall and incremental performance, base and reference years and incremental rank



Furthermore, five UTs (Lakshadweep, Andaman & Nicobar, Dadra & Nagar Haveli, Delhi and Puducherry) observed positive incremental performance in the Index scores from base to reference year, but only two UTs (Lakshadweep and Andaman & Nicobar) could move up in the overall performance ranks from base year to reference year. This suggests that only these two UTs made significant incremental progress leading to improvement in its overall performance position. The remaining UTs with modest or negative incremental progress retained their earlier position or have moved down in the rankings.

The categorization of States based on incremental performance is shown in Table 4.6.

Table 4.6 - Union Territories: Incremental performance from base to reference year - Categorization

Not improved	Least improved	Moderately improved	Most improved
Chandigarh Daman and Diu	Delhi Puducherry	Andaman and Nicobar Islands Dadra and Nagar Haveli	Lakshadweep

Note: The UTs are categorized on the basis of incremental Index score range into categories: 'not improved' (incremental Index score<=0), 'least improved' (incremental Index score between 0.01 and 2), 'moderately improved' (incremental Index score between 2.01 and 4), 'most improved' (incremental Index score>4).

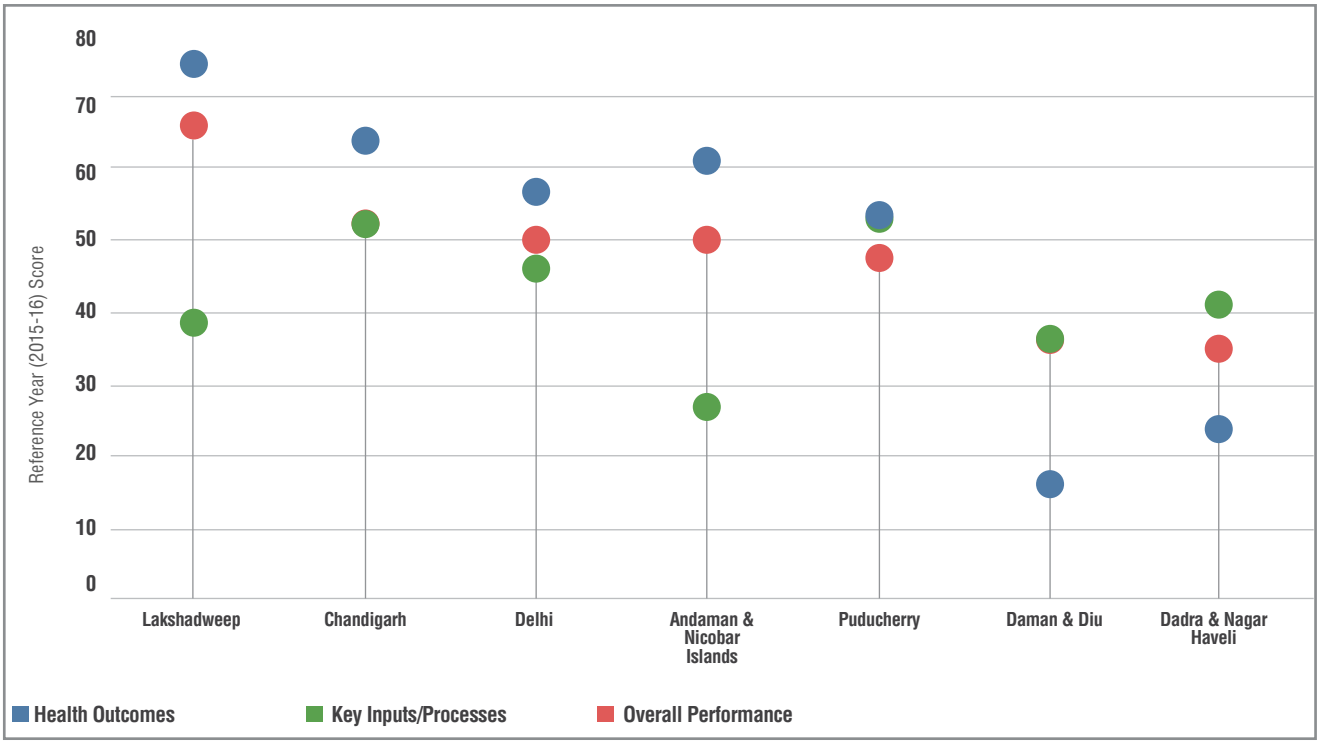
Lakshadweep is the most improved UT and ranked at the top with good incremental progress registered from base to reference years for indicators such as institutional deliveries (76 to 85 percent), TB treatment success rate (87 to 91 percent) and transfer of Central NHM funds from State Treasury to implementation agency (143 to 0 days). Among the UTs which did not register any incremental progress between the base and reference years, Daman & Diu fared poorly on indicators such as low birth weight (17 to 24 percent), full immunization (85 to 80 percent), institutional deliveries (75 to 72 percent), vacancy of specialists at district hospitals (38 to 47 percent), level of registration of births (98 to 76 percent), IDSP reporting format for presumptive surveillance (P-form) submission (100 to 75 percent) and IDSP reporting format for laboratory surveillance (L-form) submission (86 to 75 percent). Similarly, Chandigarh performed very poorly on first trimester ANC registration that fell from 50 percent in the base year to 37 percent in the reference year.

The indicators where almost all UTs need to focus include filling vacancies of medical officers at PHCs and specialists at district hospitals, establishment of functional First Referral Units, 24X7 PHCs, and district Cardiac Care Units, CHC grading, quality accreditation of public health facilities, and institutionalization of Human Resources Management Information System.

4.3.3 Domain-specific performance

The overall performance of the UTs differs with the domain-specific performance and suggests some opportunities to improve the performance in the lagging domain(s) (Figure 4.15). While most UTs showed a better performance on most Health Outcomes, Daman & Diu and Dadra & Nagar Haveli performed better in terms of Key Inputs/Processes.

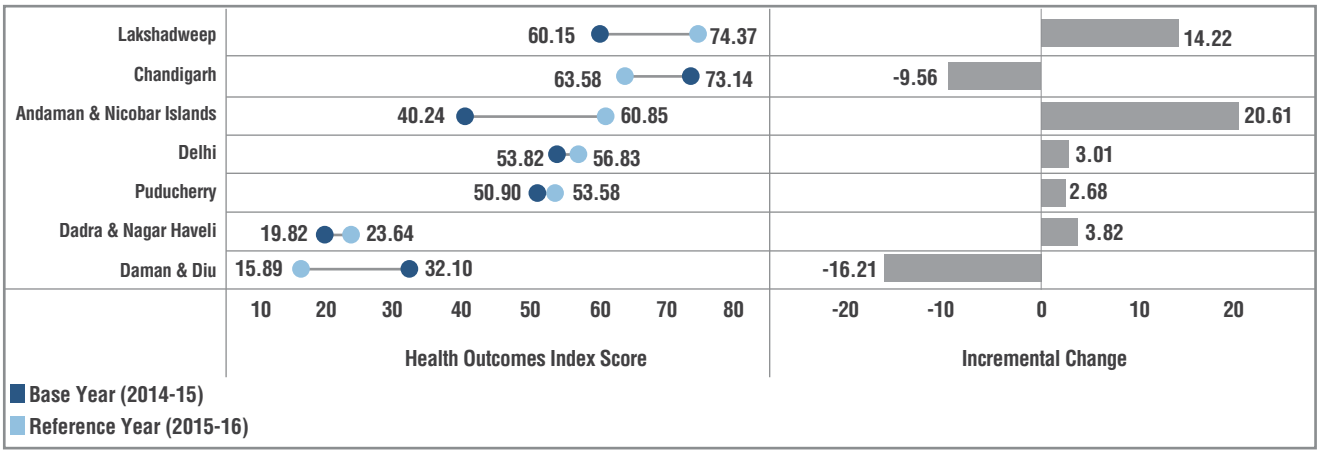
Figure 4.15 - Union Territories: Overall and domain-specific performance, reference year



Note: For Chandigarh and Daman and Diu, the Key Input/Processes domain score is the same as the overall performance score.

In the domain of Health Outcomes, all UTs except Chandigarh and Daman & Diu have improved their performance from base year to reference year (Figure 4.16). For the Health Outcomes domain in the reference year, the range of Index scores is very wide and Lakshadweep scored highest with 74.37 points compared to Daman & Diu's lowest score of 15.89.

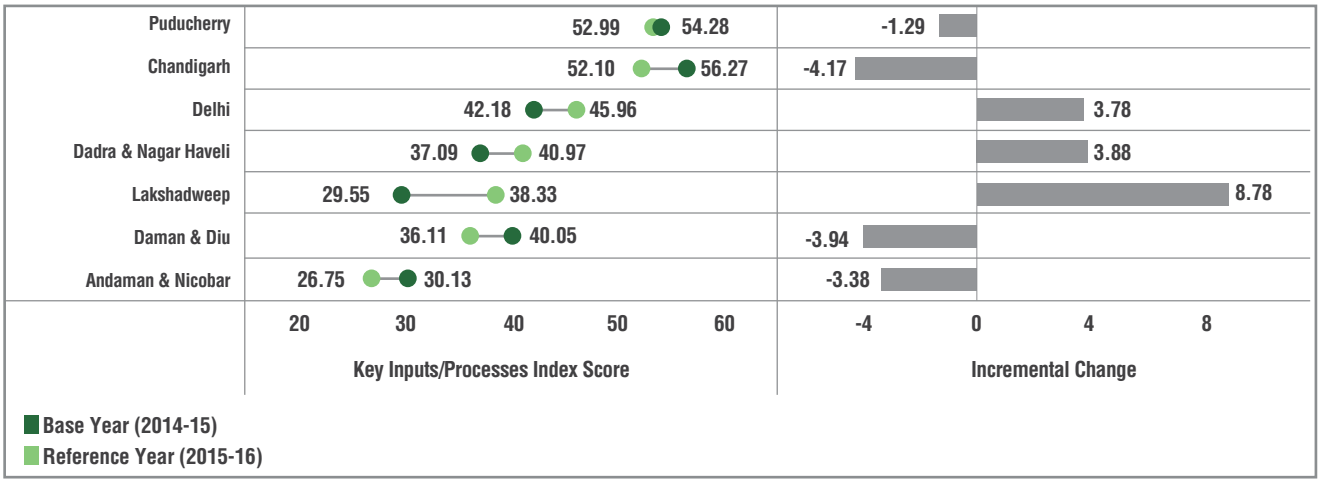
Figure 4.16 - Union Territories: Performance in the Health Outcomes domain, base and reference years



Note: States ranked based on their reference year score in the Health Outcomes domain.

In the case of the Key Inputs/Processes domain, three UTs (Delhi, Dadra & Nagar Haveli and Lakshadweep) improved their performance; whereas the performance of the remaining four UTs (Puducherry, Chandigarh, Daman & Diu and Andaman & Nicobar) has fallen. The range is smaller for the Key Inputs/Processes domain. In this domain, Puducherry scored highest with 52.99 points, while Andaman & Nicobar scored the lowest with 26.75 points. Overall, the range of scores is quite low and indicates that all UTs need to focus on this domain.

Figure 4.17 - Union Territories: Performance in the Key Inputs/Processes domain, base and reference years

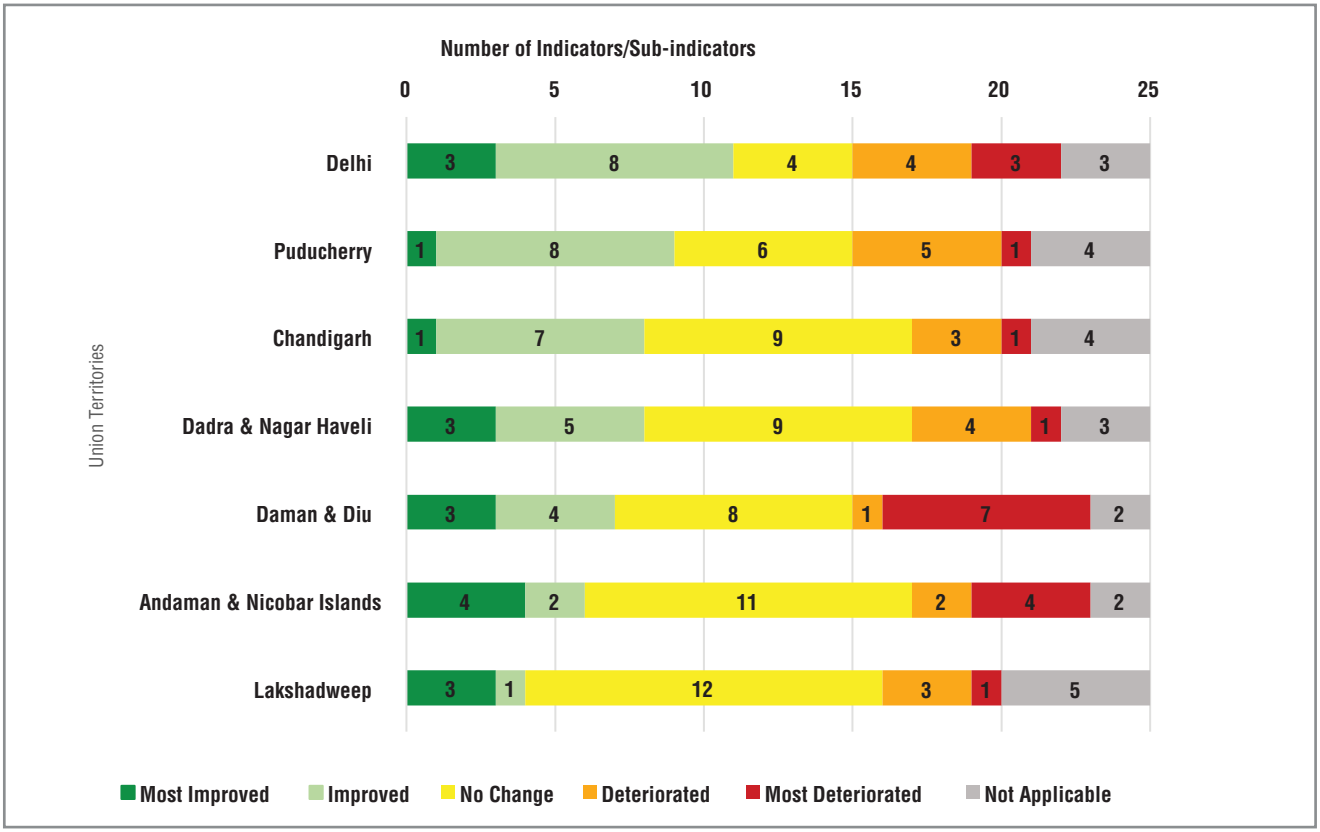


Note: States ranked based on their reference year score in the Key Inputs/Processes domain.

4.3.4 Incremental performance on indicators

Figure 4.18 captures the incremental performance on indicators and sub-indicators and provides the number of indicators and sub-indicators in each category, i.e, 'most improved', 'improved', 'no change', 'deteriorated' and 'most deteriorated'. Though Delhi had the highest number of indicators where performance has improved between the reference and base years, it has half the indicators where the performance had remained stagnant or deteriorated. This shows that there is substantial scope of improvement for all UTs to improve their performance on various indicators. Detailed indicator-specific performance snapshot of UTs is presented in Annexure 4, which provides direction as well as the magnitude of the incremental change of indicators from base year to reference year.

Figure 4.18 - Union Territories: Number of indicators/sub-indicators, by category of incremental performance



Note: For a UT, the incremental performance on an indicators is classified as not applicable (NA) in instances such as: (i) Data Integrity Measure indicator wherein the same data has been used for base year and reference year due to overlapping periods of NFHS-4; (ii) Service coverage indicators with 100 percent values in both base and reference years; (iii) The data value for a particular indicator is NA in base year or reference year or both.

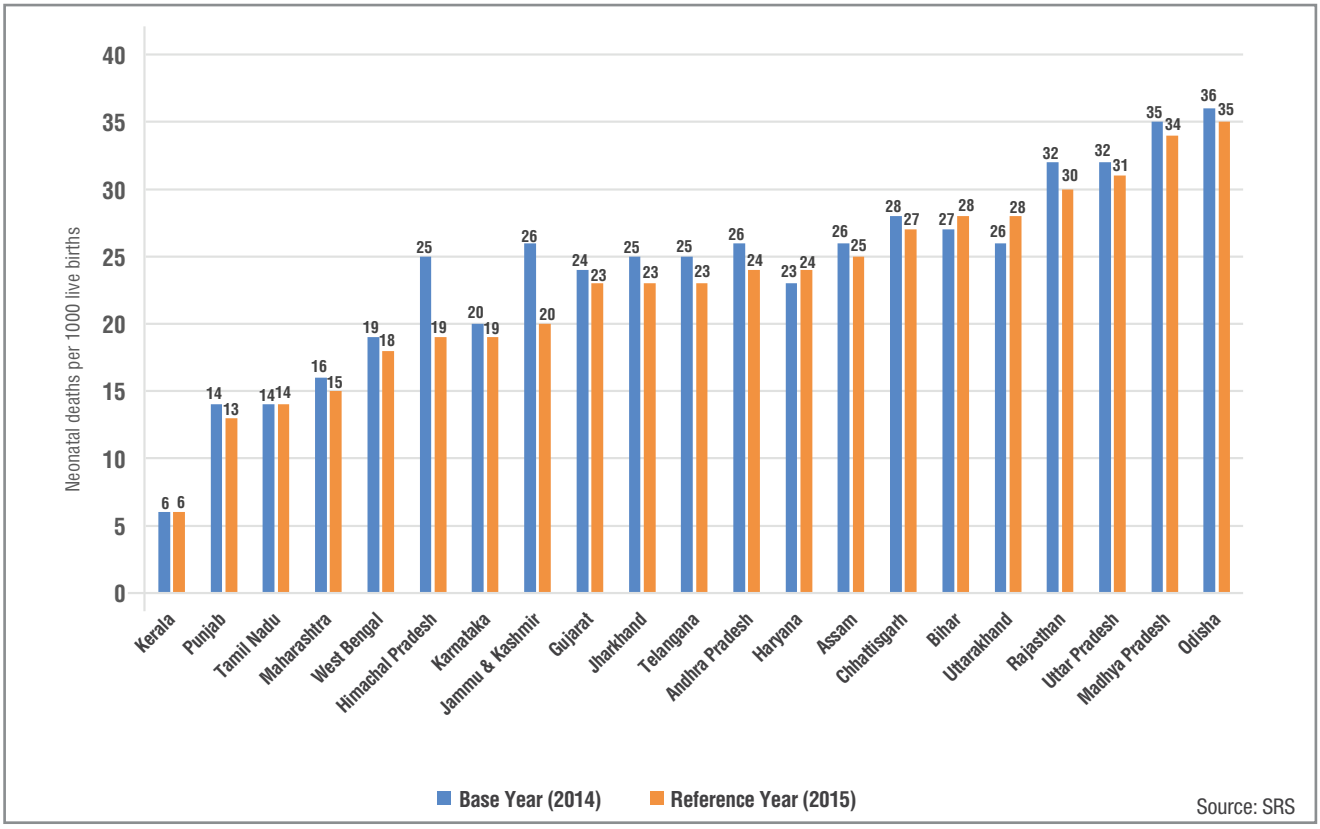
This section presents the findings related to State-wise performance by each indicator included in the Health Index. It also draws comparisons between the base year and reference year performance by each indicator.

DOMAIN 1: HEALTH OUTCOMES

SUB-DOMAIN 1.1: KEY OUTCOMES

Indicator 1.1.1: Neonatal Mortality Rate (NMR)

Figure 4.19 - Indicator 1.1.1: Neonatal Mortality Rate - Larger States



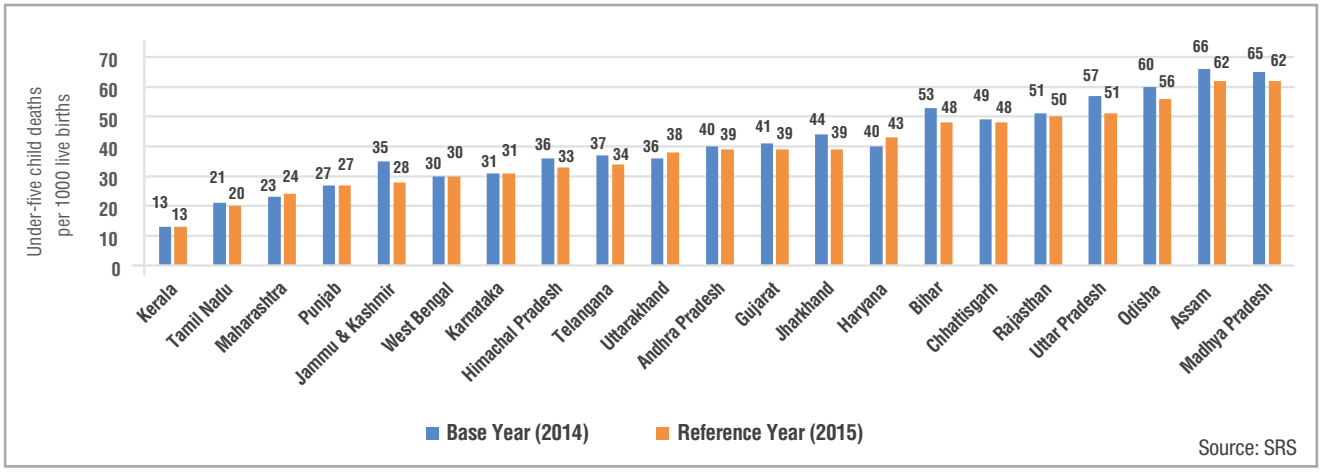
The NMR or the number of neonatal deaths (occurring in the first 28 days of life) per 1000 live births during a specific year reflects the quality of prenatal, intrapartum, and neonatal care services. This is an important indicator as approximately 68 percent of infant deaths in India occur during the neonatal period[8]. The NMR is available for the Larger States and is the highest in Odisha and the lowest in Kerala for both the base year (2014) and reference year (2015). All States reported a decline in the NMR from the base year (2014) to reference year (2015) except for Haryana, Bihar and Uttarakhand where it increased marginally, remaining static in Kerala and Tamil Nadu. The most progressive decline in the NMR was observed in Himachal Pradesh and Jammu & Kashmir where the decline was approximately 23 to 24 percent. Despite reductions, the NMR remains high in many States and concerted efforts need to be made to reach the NMR national policy goal of 16 deaths per 1000 live births by 2025[9]and 12 deaths per 1000 live births by 2030 (the SDGs). Kerala, Punjab, Tamil Nadu and Maharashtra have already attained the National Health Policy (NHP) 2017 NMR goal for 2025, while Kerala also has the notable distinction of surpassing the SDG 2030 target.

[8] Office of the Registrar General and Census Commissioner (India). India SRS Statistical Report 2015. New Delhi, India.
[9] Ministry of Health and Family Welfare, Government of India. National Health Policy – 2017. New Delhi: MoHFW; 2017.

Indicator 1.1.2: Under-five Mortality Rate (U5MR)

The U5MR reflects the probability of dying before attaining the age of 5. The U5MR or the number of deaths under the age of 5 per 1000 live births during a specific year reflects a combination of several factors, such as the nutritional status of children, health knowledge of mothers, level of immunization and oral rehydration therapy, access to maternal and child health services, income of the family, and availability of safe drinking water and basic sanitation services. The U5MR is available only for the Larger States; a comparison between the base year and reference year shows that U5MR declined in 14 States, remained stagnant in four (Kerala, Punjab, West Bengal, and Karnataka) and increased in three States (Maharashtra, Uttarakhand and Haryana). Jammu & Kashmir, Jharkhand, Bihar, and Uttar Pradesh recorded significant decline (between 9 to 20 percent) in U5MR between the base year (2014) and the reference year (2015). Kerala and Tamil Nadu have already achieved the National Health Policy 2017 U5MR target for 2025 of 23 deaths per 1000 live births. However, 12 States, namely Uttarakhand, Andhra Pradesh, Gujarat, Jharkhand, Haryana, Bihar, Chhattisgarh, Rajasthan, Uttar Pradesh, Odisha, Assam and Madhya Pradesh, with U5MR above 35 deaths per 1000 live births will require concerted effort to ensure that this target is achieved.

Figure 4.20 - Indicator 1.1.2: Under-five Mortality Rate - Larger States



Indicator 1.1.3: Total Fertility Rate (TFR)

The TFR represents the average number of children that would be born to a woman if she experiences the current age-specific fertility rate throughout her reproductive years (15-49 years). A high level of fertility is associated with extreme poverty, gender inequality, maternal mortality, and other dimensions of sustainable development. The TFR indicator is available only for the Larger States. In 2015, 12 of the 21 Larger States (Andhra Pradesh, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Odisha, Punjab, Tamil Nadu, Telangana, Uttarakhand and West Bengal) have achieved the replacement level fertility (TFR $\leq$ 2.1). The fertility rate remains at 2.7 or above in Bihar, Jharkhand, Madhya Pradesh, Rajasthan and Uttar Pradesh. The remaining three States (Assam, Gujarat, and Haryana) are close to achieving the replacement level of fertility with TFR levels between 2.2 and 2.3. A comparison between the base year (2014) and reference year (2015) indicates that six States (Chhattisgarh, Gujarat, Haryana, Jharkhand, Rajasthan and Uttar Pradesh) have showed a decline of 0.1 in TFR.

Indicator 1.1.4: Proportion of Low Birth Weight (LBW) among newborns

The LBW (≤2.5 kg) among newborns is an important predictor of newborn health and survival. There are several risk factors related to the mother that may contribute to low birth weight, such as child bearing at a young age, multiple pregnancies, poor nutrition, heart disease or hypertension, untreated coeliac disease, and insufficient prenatal care. Reduction in the proportion of babies born with LBW therefore requires the convergence of interventions across several determinants of health. The HMIS MoHFW data for base year (2014-15) and reference year (2015-16) show that the proportion of LBW among newborns is high in many States and UTs. Among all States and UTs, Dadra & Nagar Haveli report the highest percentage of LBW (35 percent in the base year and 29 percent in the reference year). Other States with a high (≥15 percent) proportion of LBW newborns include Haryana, West Bengal, Assam, Odisha, Rajasthan, Goa and all UTs except Lakshadweep. Across all States and UTs there has been little progress in reducing the proportion of LBW newborns between the base year and the reference year and, in fact, this has increased in several States. Hence, almost all States and UTs need to focus on strategies and interventions to address this issue and break the inter-generational cycle of malnutrition.

Figure 4.21 - Indicator 1.1.4: Proportion of Low Birth Weight among newborns - Larger States

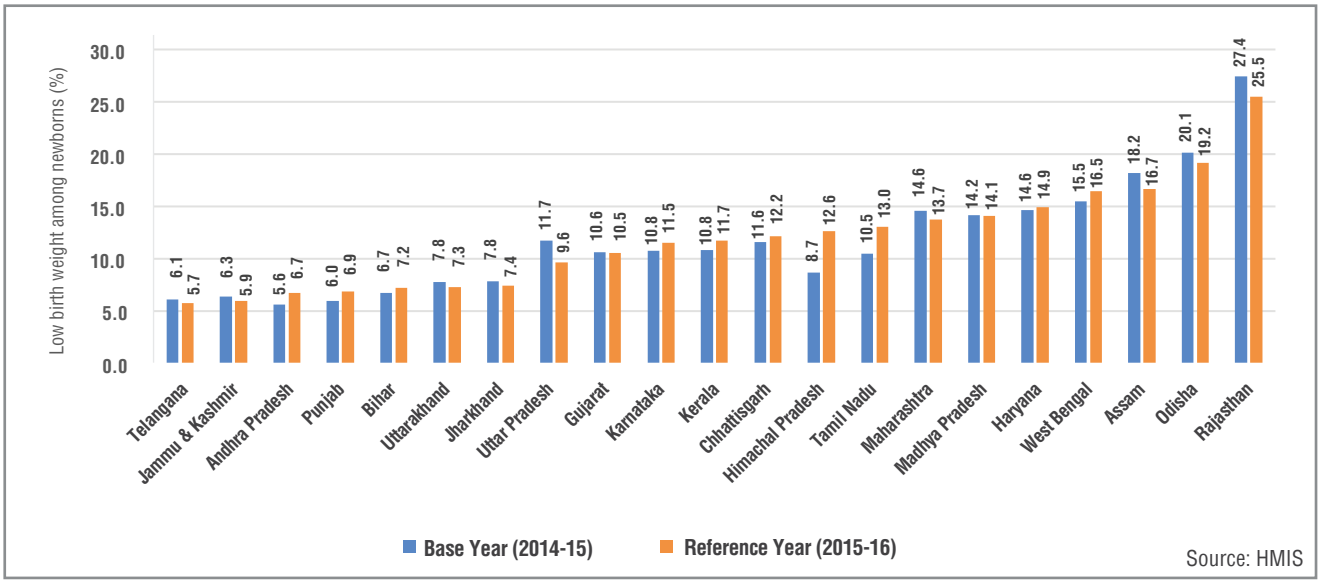
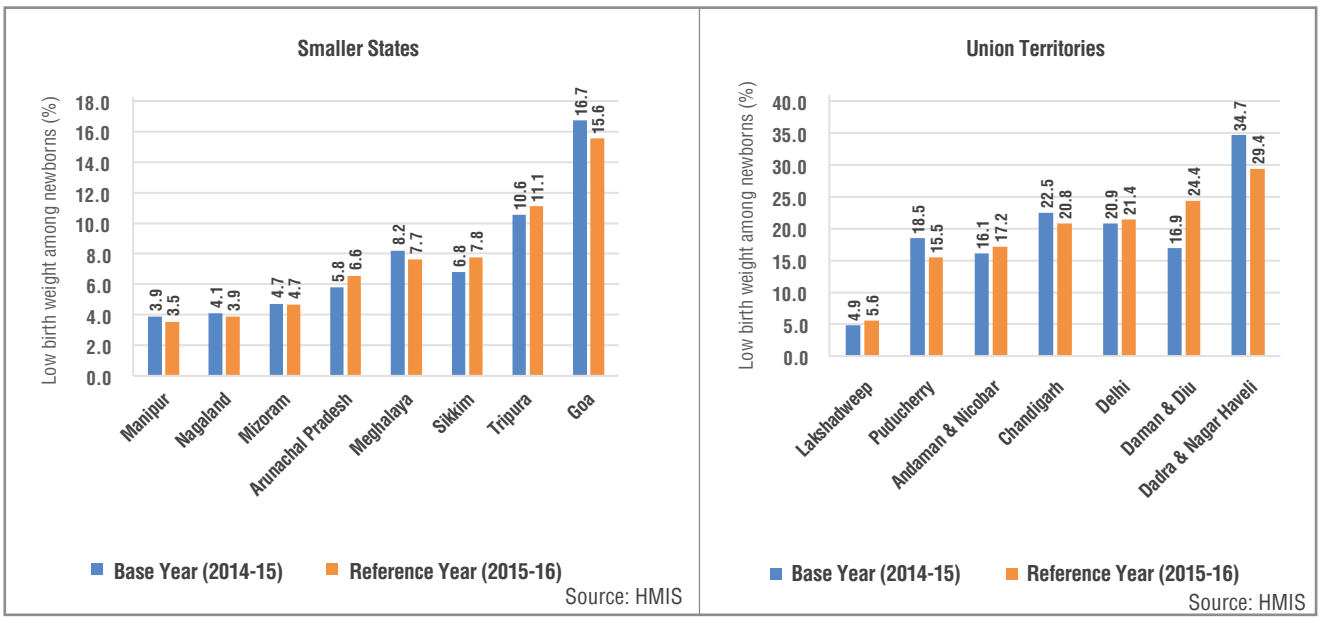


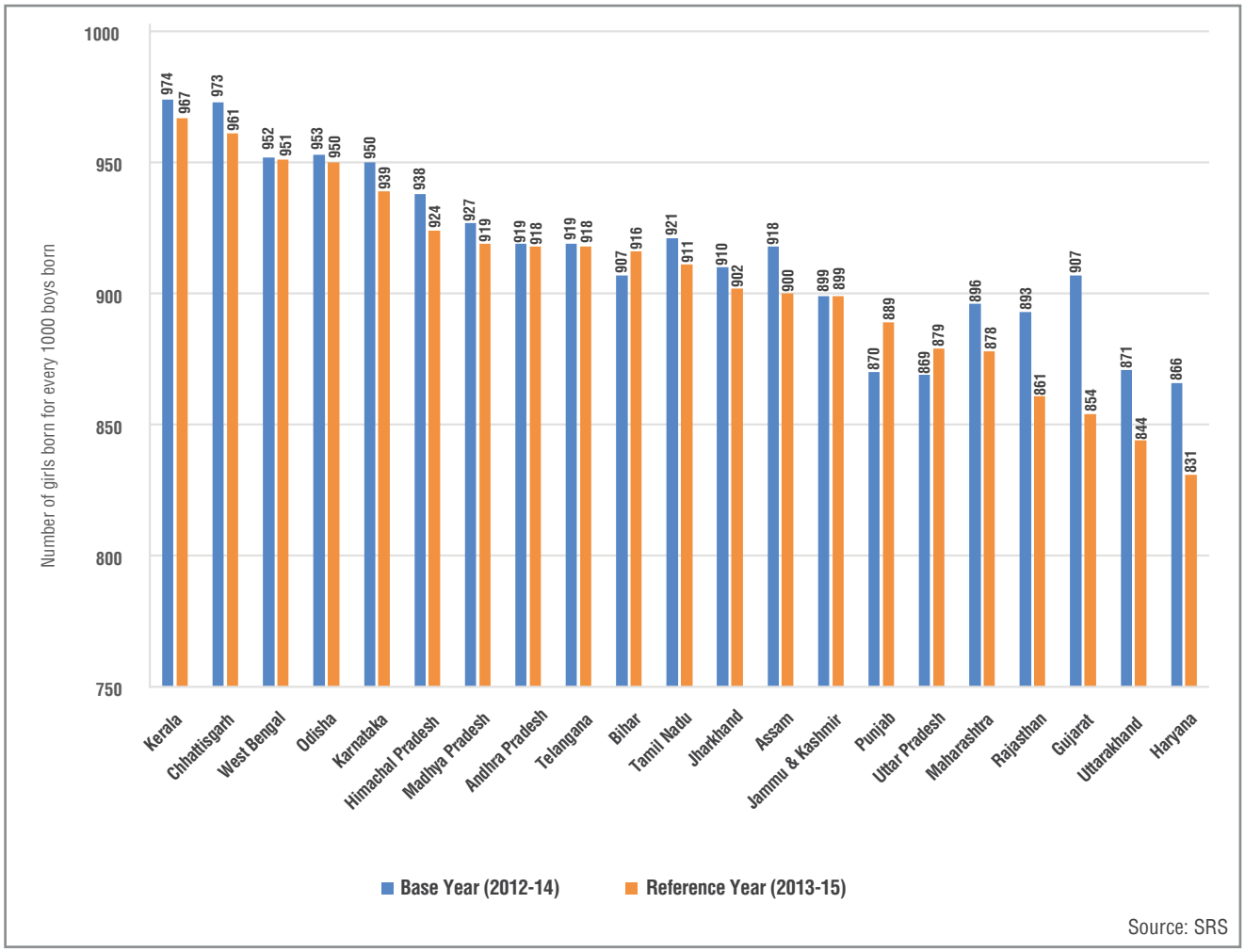
Figure 4.22 - Indicator 1.1.4: Proportion of Low Birth Weight among newborns - Smaller States and UTs



Indicator 1.1.5: Sex Ratio at Birth (SRB)

Sex Ratio at Birth or the number of girls born for every 1000 boys born during a specific year is an important indicator and reflects the extent to which there is reduction in the number of girl children born by sex-selective abortions. This indicator was only available for the category of Larger States. The SRB is substantially lower in almost all Larger States - 17 out of 21 States have SRB of less than 950 females per 1000 males. Further, in most States, SRB has declined between the base year (2012-14) and reference year (2013-15), except for Bihar, Punjab and Uttar Pradesh where improvements in SRB were noted, and Jammu & Kashmir where it stagnated. Chhattisgarh, Karnataka, Himachal Pradesh, Assam, Maharashtra, Rajasthan, Gujarat, Uttarakhand and Haryana recorded substantial drops (10 or more points) in this indicator. There is a clear need for States to effectively implement the Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 1994 and take appropriate measures to promote the value of the girl child.

Figure 4.23 - Indicator 1.1.5: Sex Ratio at Birth - Larger States



Source: SRS

SUB-DOMAIN 1.2: INTERMEDIATE OUTCOMES

Indicator 1.2.1: Full immunization coverage

This indicator reflects upon the success of the immunization programme and captures the proportion of infants between the ages of 9-11 months who have received one dose of BCG, 3 doses of DPT, 3 doses of OPV, and one dose of measles vaccine. Reference year data shows that 19 States and UTs have full immunization coverage of at least 90 percent, the 2025 target specified in the National Health Policy 2017. Jammu & Kashmir, Mizoram, Andaman & Nicobar Islands and Lakshadweep have 100 percentcoverage during the reference year (2015-16). Madhya Pradesh (75 percent), Nagaland

(64 percent) and Dadra & Nagar Haveli (77 percent) have the lowest coverage among the Larger States, Smaller States and UTs respectively. From base to reference year, Maharashtra, West Bengal, Kerala, Andhra Pradesh, Telangana, Odisha, Tamil Nadu, Rajasthan, Meghalaya, Tripura and Daman & Diu reported a decline in immunization coverage. It is evident that several States need to implement specific strategies to attain the goals set out in National Health Policy 2017, which targets more than 90 percent full immunization coverage by 2025. Telangana, Jharkhand, Assam, Odisha, Uttar Pradesh, Haryana, Tamil Nadu, Rajasthan, Madhya Pradesh, Tripura, Sikkim, Arunachal Pradesh, Nagaland, Daman & Diu, Puducherry and Dadra & Nagar Haveli fall short of the target of 90 percent coverage. Importantly, while the average full immunization coverage among the Larger States is 90 percent, it is significantly lower for Smaller States at 84 percent.

Figure 4.24 - Indicator 1.2.1: Full immunization coverage - Larger States

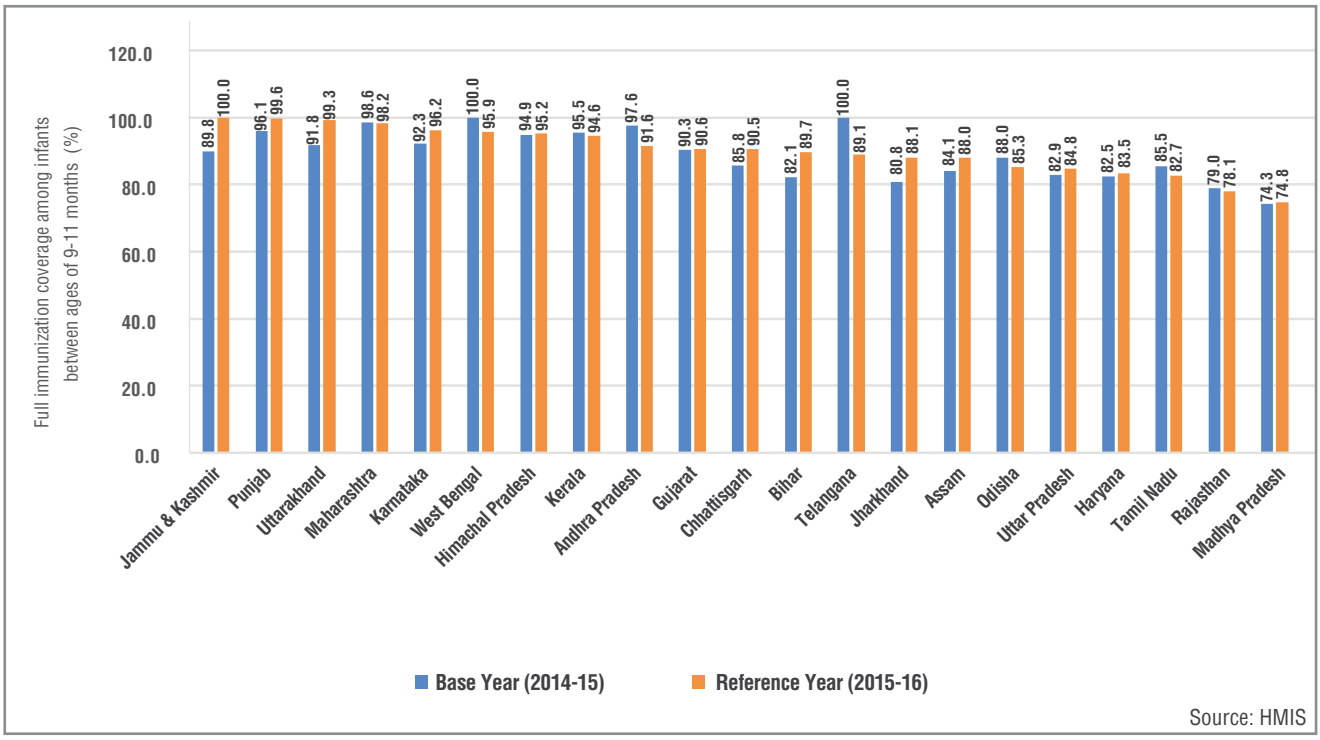
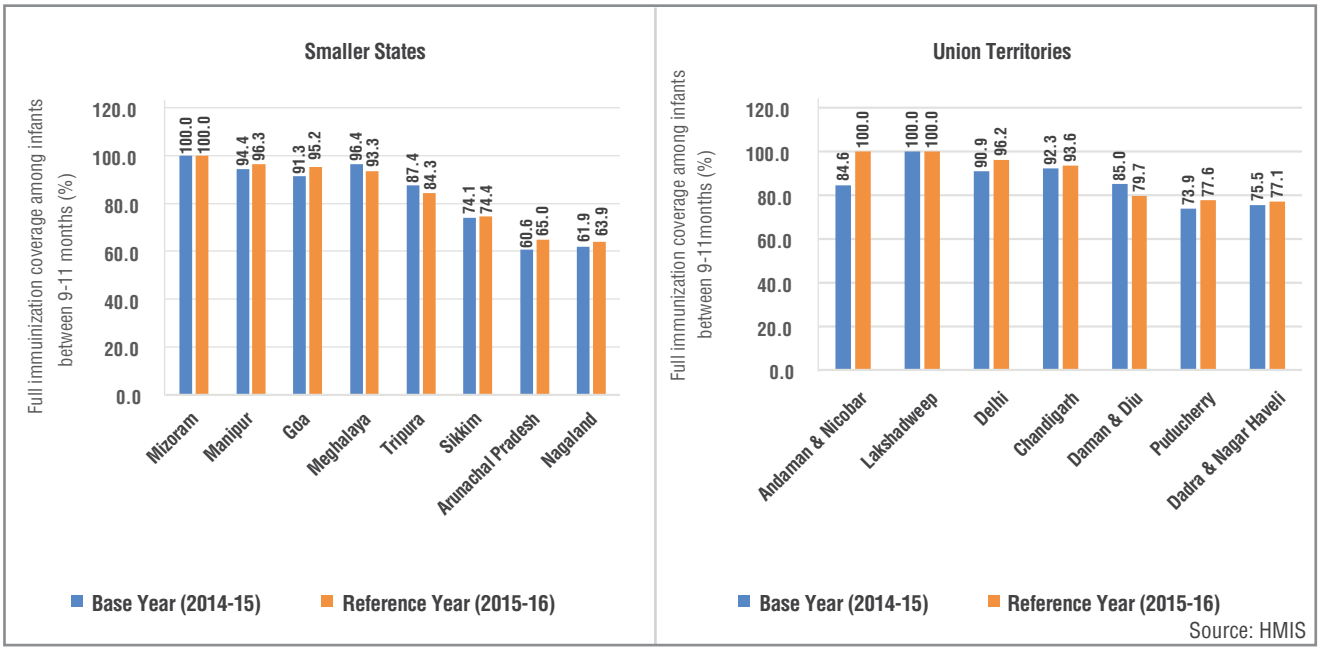


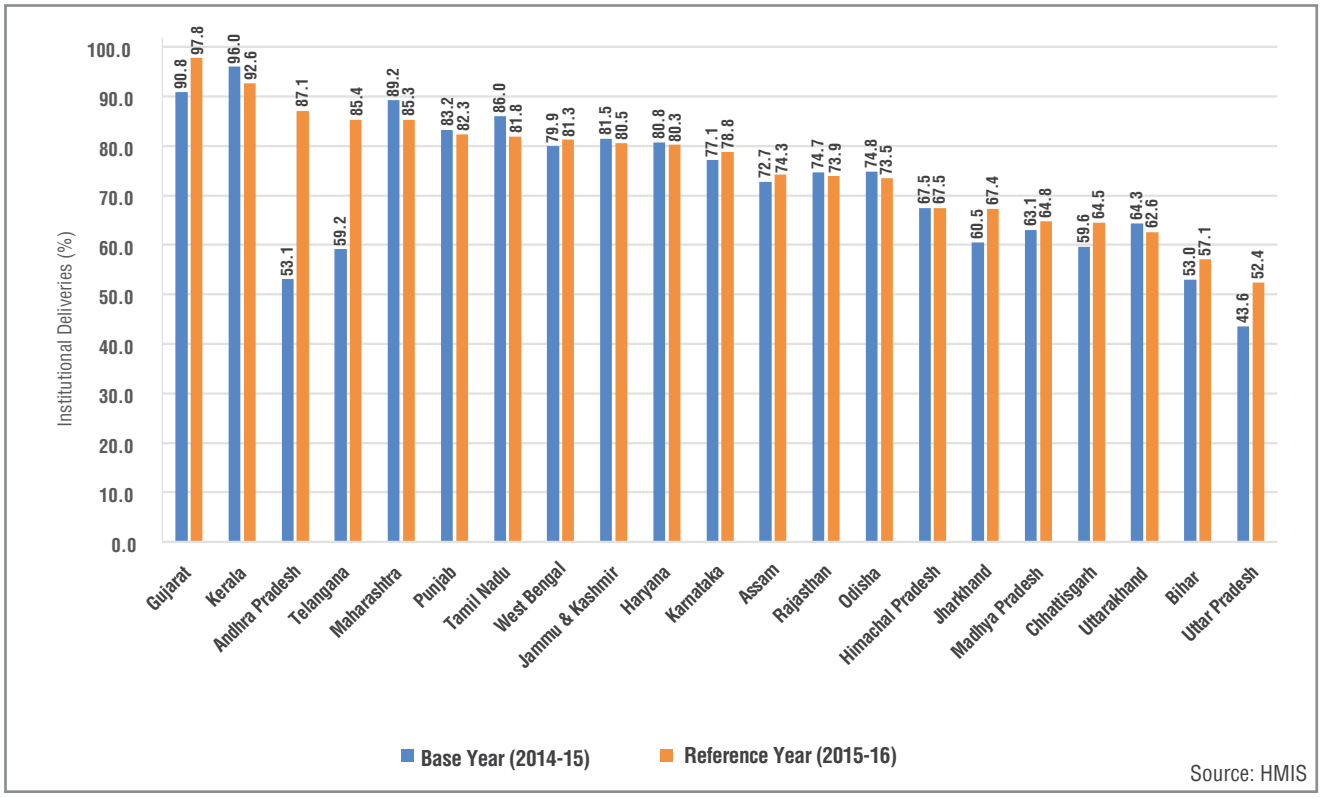
Figure 4.25 - Indicator 1.2.1: Full immunization coverage - Smaller States and UTs



Indicator 1.2.2: Proportion of institutional deliveries

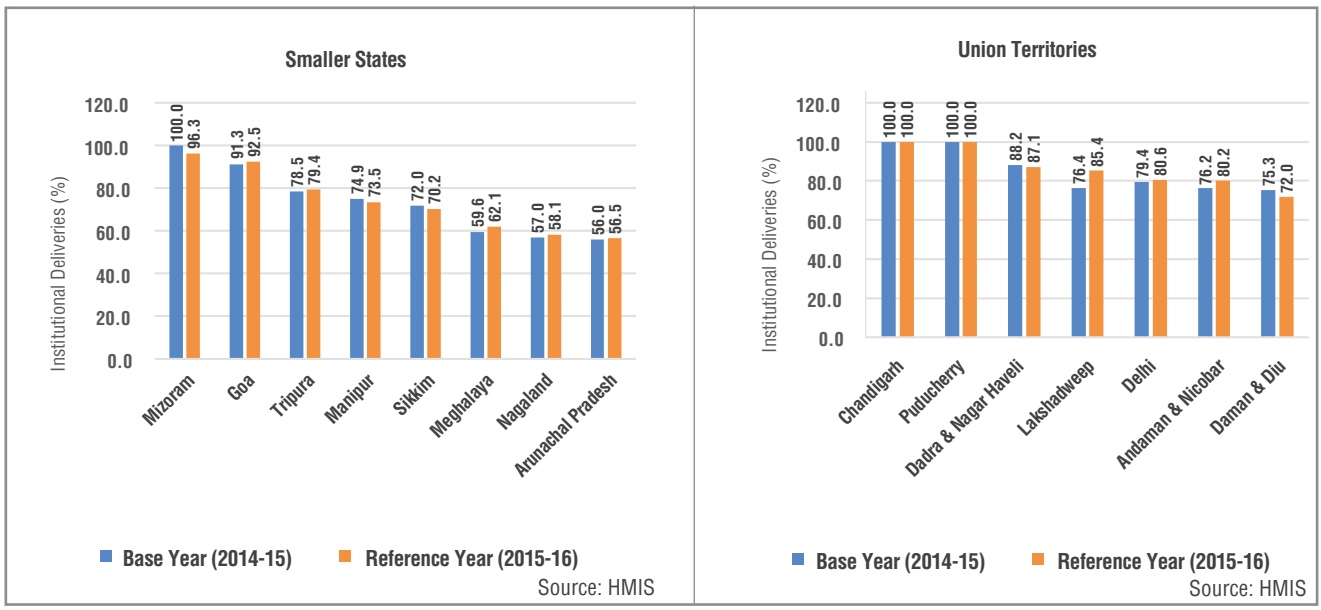
Institutional deliveries (public and private) can play a substantial role in addressing maternal and infant mortality and morbidity. In the reference year (2015-16), only six States and UTs achieved more than 90 percent coverage - Gujarat and Kerala among Larger States; Mizoram and Goa among Smaller States; and Chandigarh and Puducherry among UTs. Other States need to make substantial efforts to improve the coverage of institutional deliveries, particularly Madhya Pradesh, Chhattisgarh, Uttarakhand, Bihar, Uttar Pradesh, Meghalaya, Nagaland and Arunachal Pradesh, where less than two-thirds of deliveries currently take place at health facilities. In terms of incremental progress, approximately 40 percent of the States and UTs made modest or no progress in institutional deliveries coverage. Andhra Pradesh (64 percent) and Telangana (44 percent) made the most notable progress and the coverage increased by more than 40 percent between base year (2014-15) and reference year (2015-16).

Figure 4.26 - Indicator 1.2.2: Proportion of institutional deliveries - Larger States



Source: HMIS

Figure 4.27 - Indicator 1.2.2: Proportion of institutional deliveries - Smaller States and UTs



Indicator 1.2.3: Total case notification rate of tuberculosis (TB)

Total case notification rate is the number of new and relapsed TB cases notified, in both public and private facilities per 100,000 population during a specific year. It is an important indicator reflecting diagnosis and reporting of TB cases in the National Surveillance System and is an essential element for effective implementation of the End TB Strategy. The total case notification varied between 72 per 100,000 population in Jammu & Kashmir to 207 per 100,000 population in Himachal Pradesh. The total case notification rate increased by 10 cases per 100,000 population or more in Gujarat, Madhya Pradesh, Kerala, Chhattisgarh, Uttar Pradesh, Tamil Nadu, Telangana, Bihar, Tamil Nadu, Uttar Pradesh, Chhattisgarh, Kerala, Madhya Pradesh, Gujarat, Sikkim, Delhi and Daman & Diu and has decreased by 10 cases per 100,000 population or more in Nagaland, Meghalaya, Tripura, Andaman & Nicobar and Lakshadweep.

Figure 4.28 - Indicator 1.2.3: Total case notification rate of TB - Larger States

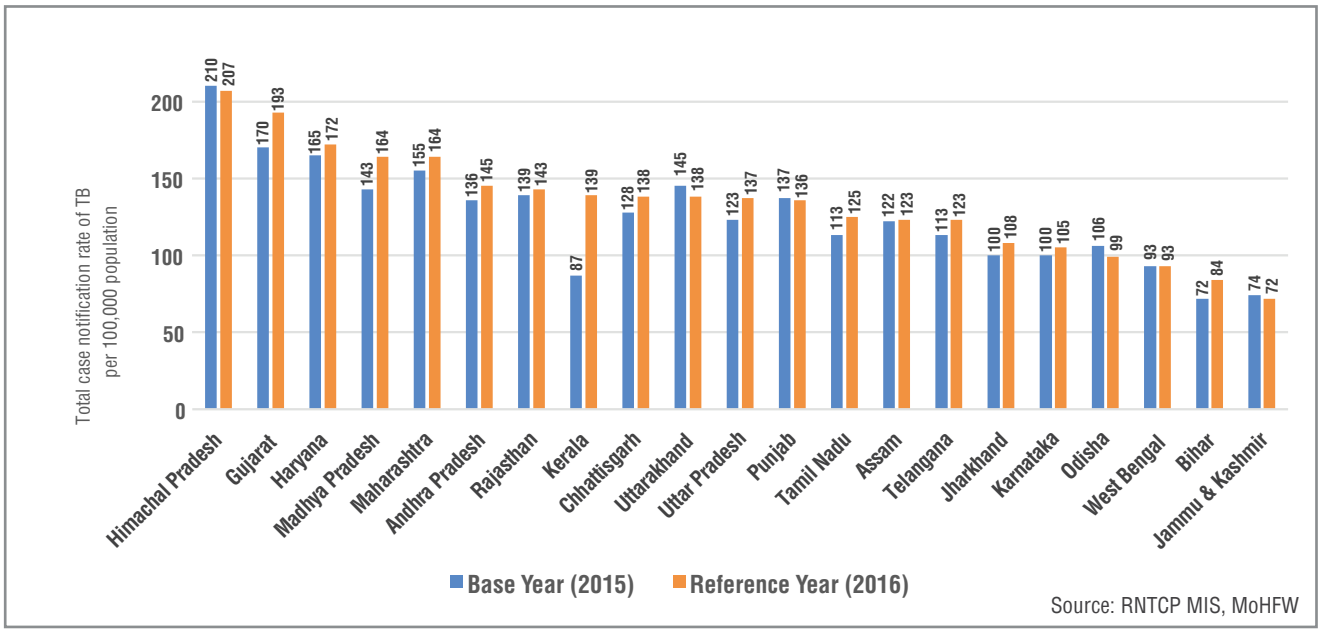
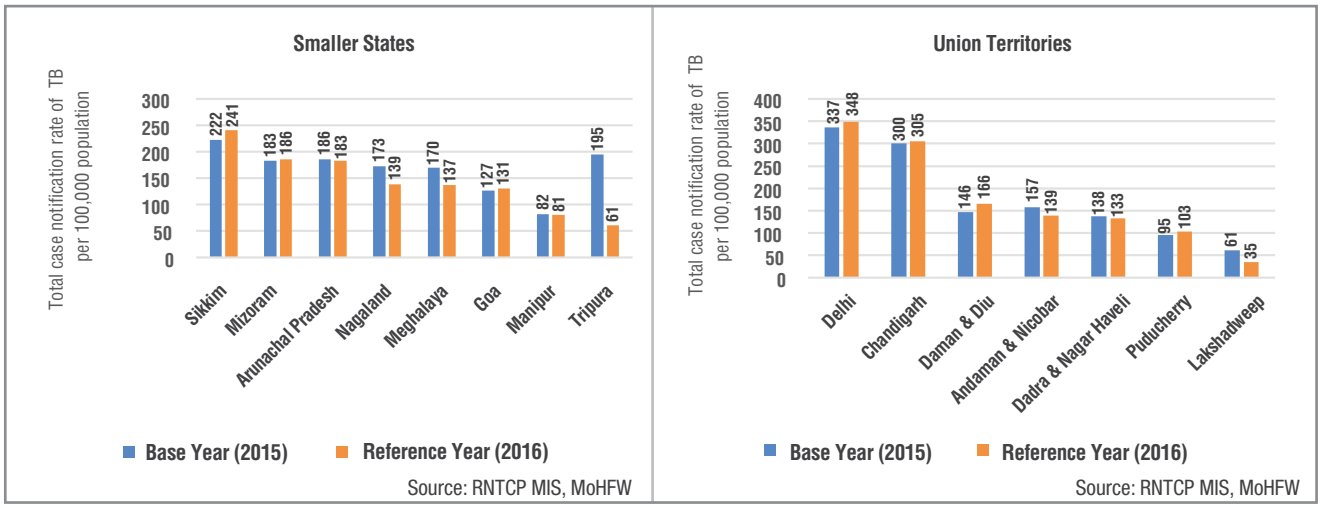


Figure 4.29 - Indicator 1.2.3: Total case notification rate of TB - Smaller States and UTs



Indicator 1.2.4: Treatment success rate of new microbiologically confirmed TB cases

Treatment success rate of TB cases is the proportion of new cases cured and their treatment completed against the total number of new microbiologically confirmed TB cases registered during a specific year. It is an important indicator that reflects the performance of the Revised National Tuberculosis Control Programme. The National Health Policy 2017 establishes a target of ≥85 percent for treatment success rate of TB cases, which was achieved by most States and UTs except Karnataka, Maharashtra, Manipur, Sikkim, Nagaland (dropped from base year) and Daman & Diu.

Figure 4.30 - Indicator 1.2.4: Treatment success rate of new microbiologically confirmed TB cases - Larger States

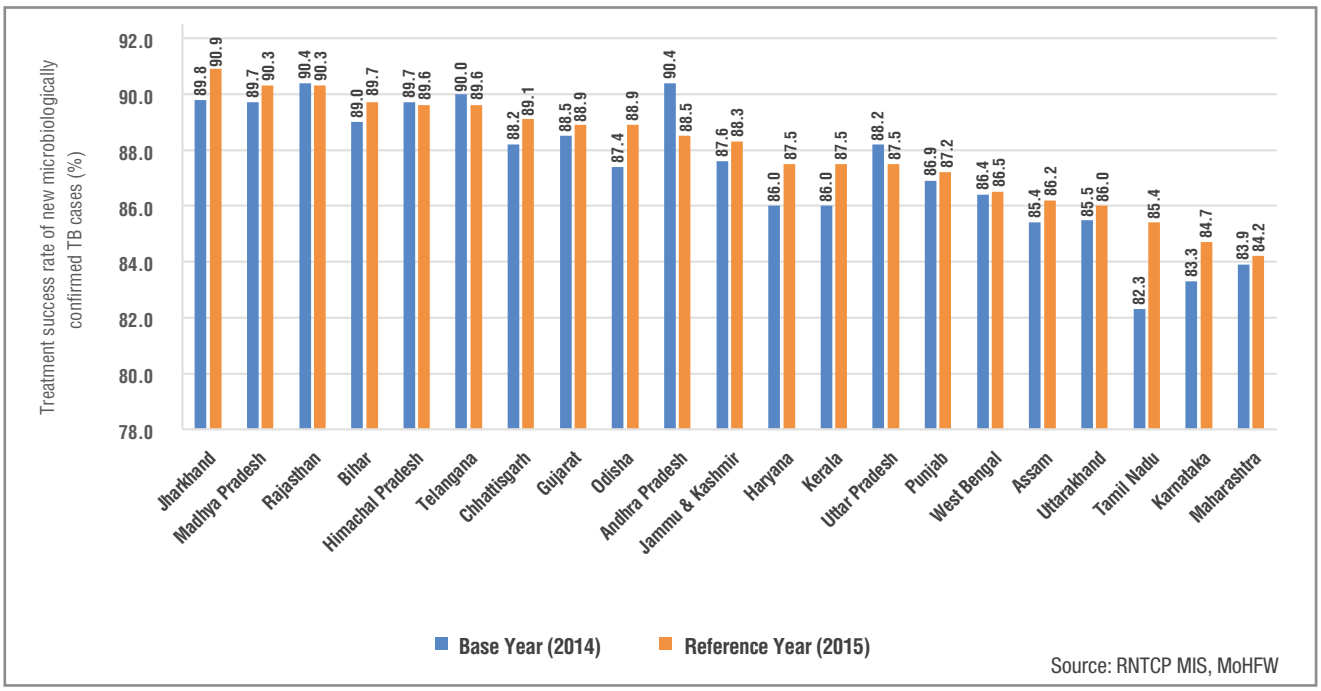
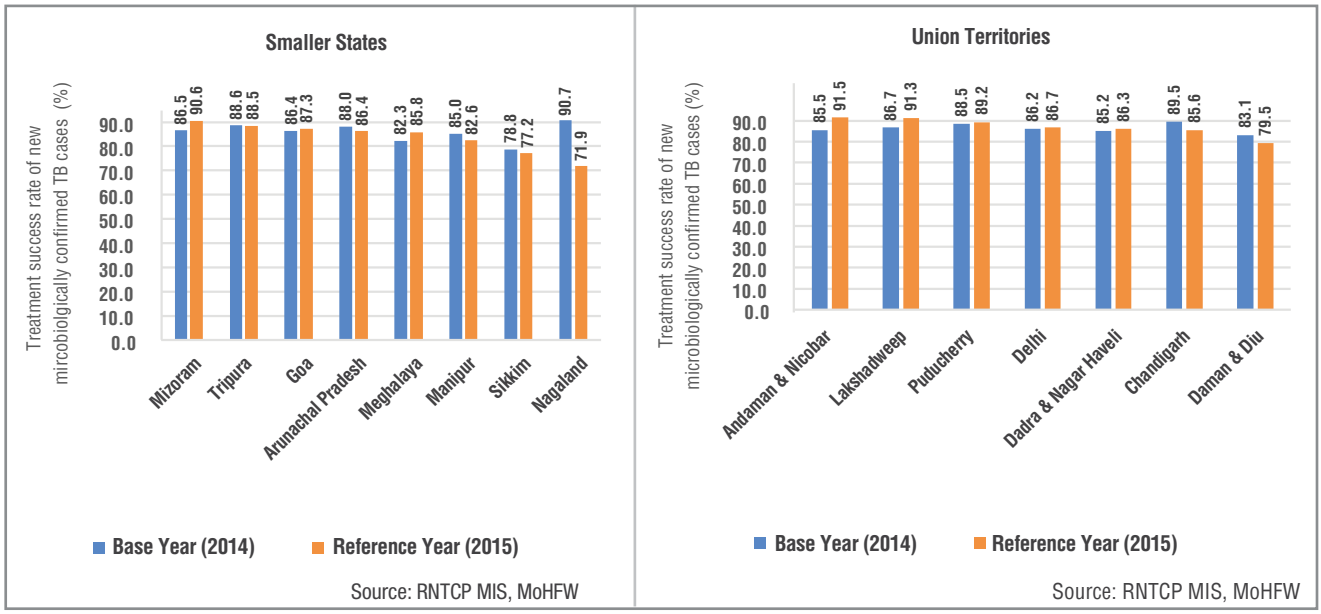


Figure 4.31 - Indicator 1.2.4: Treatment success rate of new microbiologically confirmed TB cases - Smaller States and UTs



Indicator 1.2.5: Proportion of people living with HIV (PLHIV) on antiretroviral therapy (ART)

This indicator tracks progress in access to treatment for PLHIV for the category of Larger and Smaller States, but not for UTs (data not available for some UTs). The National Health Policy 2017 sets a specific goal corresponding to achieving the global target of 2020, namely to ensure that 90 percent of all people tested positive for HIV receive sustained ART. Out of 29 States, three (Jammu & Kashmir, Meghalaya and Mizoram) have achieved this target while five have 80 to 90 percent of PLHIV on ART in the reference year (2015-16). Eight states have less than 50 percent of the PLHIV on ART (reference year 2015-16), namely Rajasthan, Jharkhand, Bihar, West Bengal, Odisha, Sikkim, Arunachal Pradesh and Tripura. Apart from Tripura, the other 28 states have shown some incremental progress in this indicator. However, significant improvements are needed to achieve 90 percent coverage.

Figure 4.32 - Indicator 1.2.5: Proportion of people living with HIV on antiretroviral therapy - Larger States

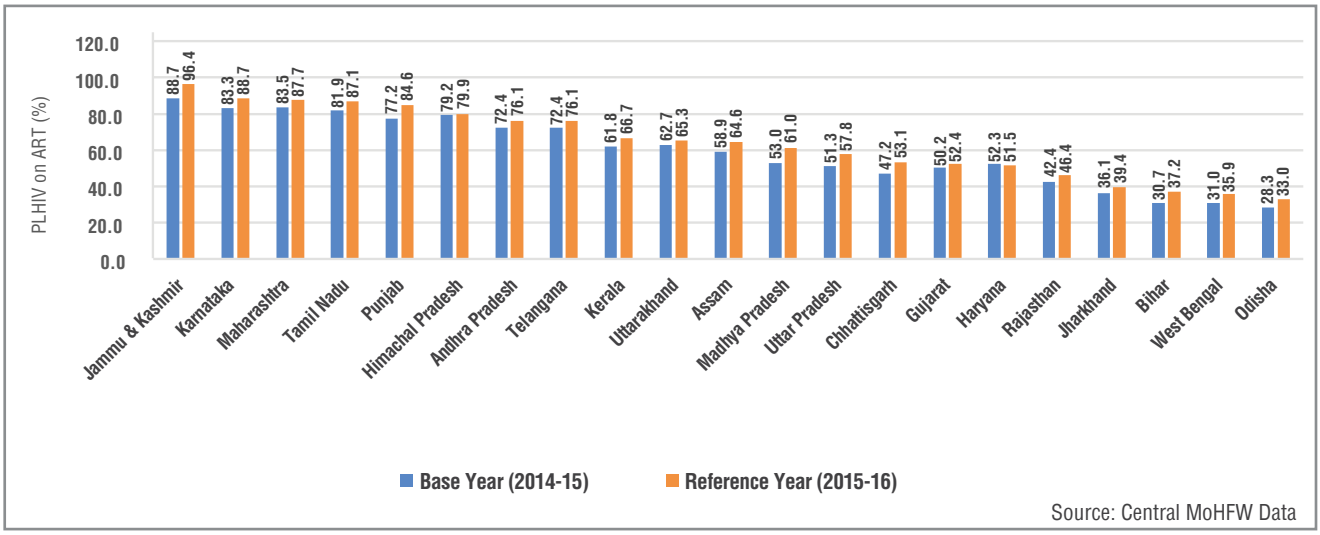
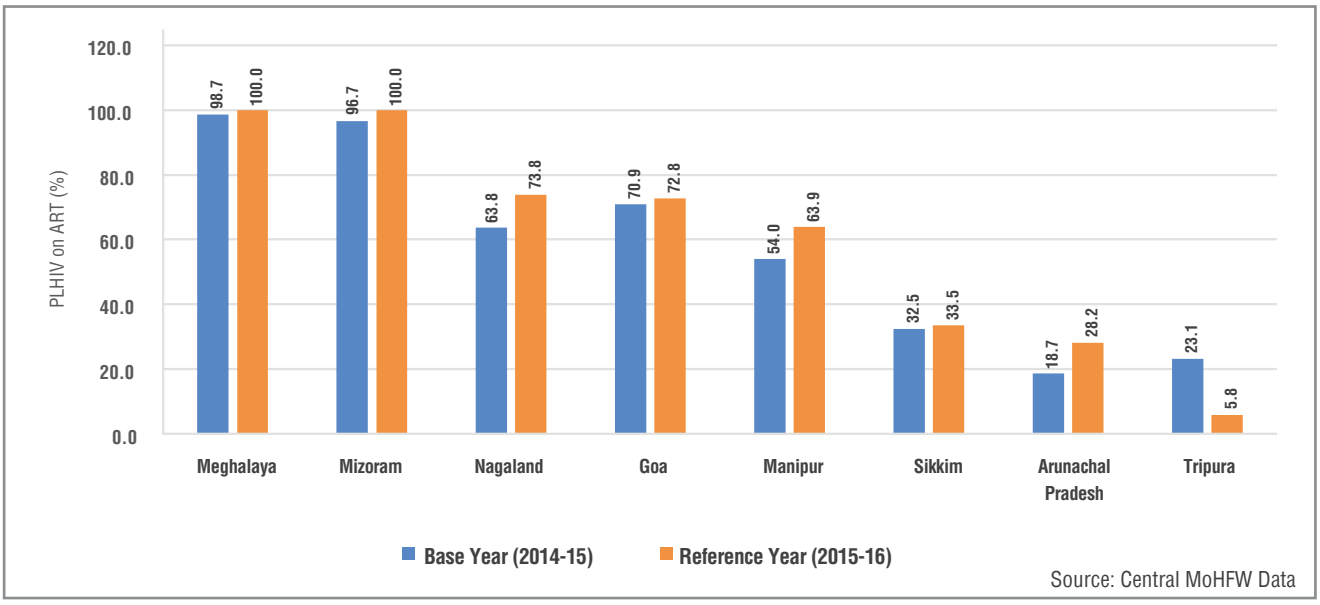


Figure 4.33 - Indicator 1.2.5: Proportion of people living with HIV on antiretroviral therapy - Smaller States



Indicator 1.2.6: Average out-of-pocket expenditure per delivery in public health facility

The National Family Health Survey (NFHS)-4 data on average out-of-pocket (OOP) expenditure per delivery in public health facility is considered here as a proxy indicator for overall OOP expenditure. This data is available only for 2015-16 and hence the indicator is reported only for the reference year. There is significant variation in the average OOP expenditure across the States. The expenditures range from as low as INR 471 in Dadra & Nagar Haveli to as high as INR 10,076 in Manipur. The top five States and UTs with average expenditure above INR 6,000 per delivery in a public facility are Manipur (INR 10,076), Delhi (INR 8,719), West Bengal (INR 7,782), Kerala (INR 6,901), and Arunachal Pradesh (INR 6,474). The average OOP expenditure per delivery in public health facility for Larger States is INR 3,080, for Smaller States it is INR 5,170, and for UTs it is INR 2,995. Given the number of NHM interventions targeting pregnant women, such as Janani Suraksha Yojana (JSY), Janani Shishu Suraksha Karyakram (JSSK), and Referral Transport to ensure free delivery at public health facilities, the States should aim to reduce the OOP expenditure.

Figure 4.34 - Indicator 1.2.6: Average out-of-pocket expenditure per delivery in public health facility (in INR) - Larger States

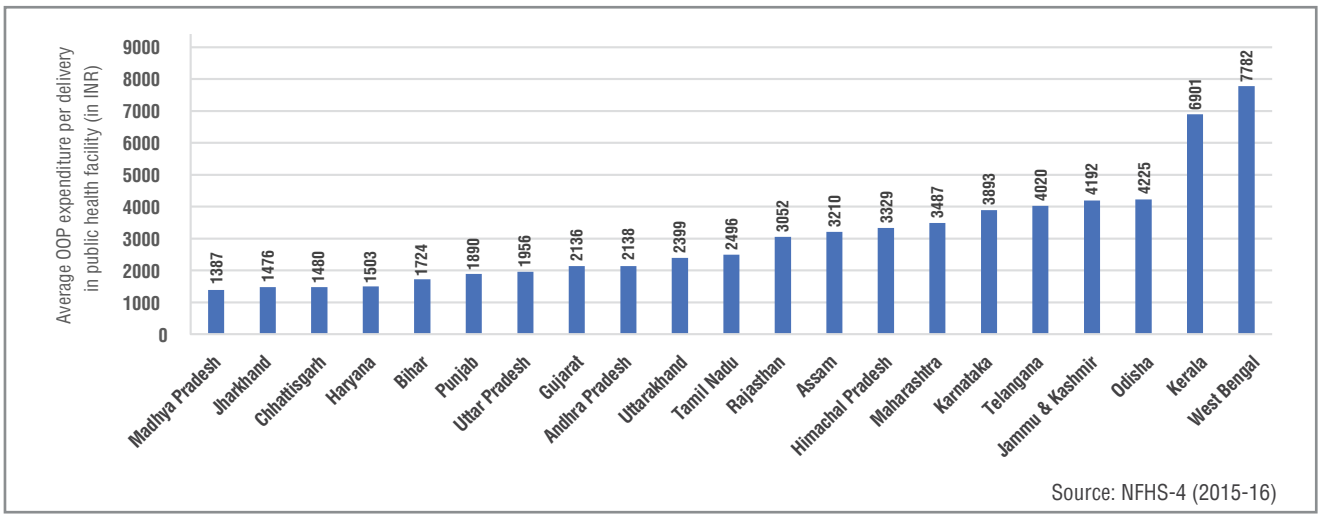
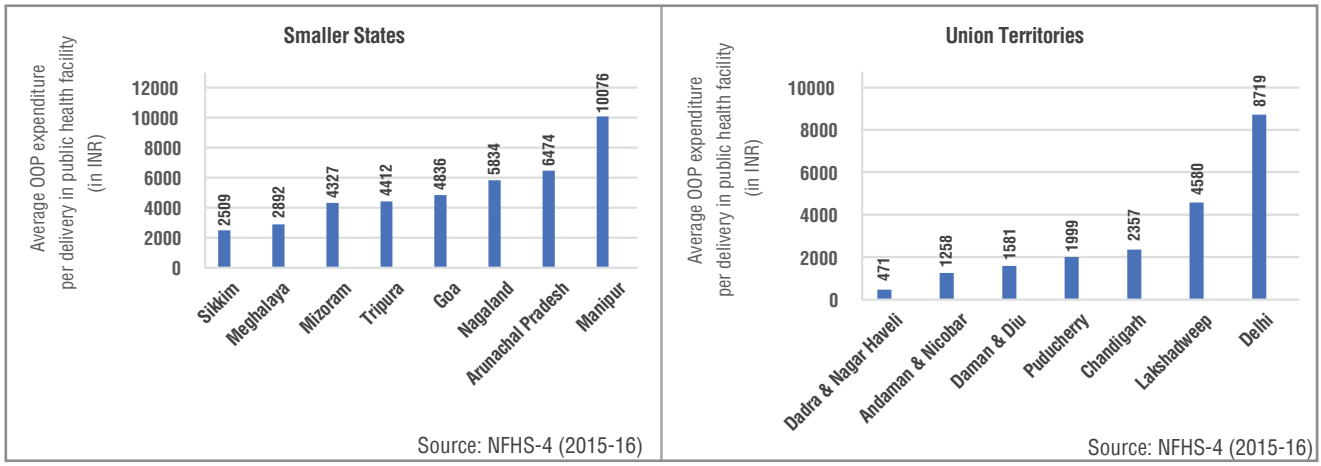


Figure 4.35 - Indicator 1.2.6: Average out-of-pocket expenditure per delivery in public health facility (in INR) - Smaller States and UTs



DOMAIN 2: GOVERNANCE AND INFORMATION

SUB-DOMAIN 2.1: HEALTH MONITORING AND DATA INTEGRITY

Indicator 2.1.1: Data Integrity Measure: Institutional deliveries and ANC registered within first trimester

This indicator captures the percentage deviation of HMIS reported data from the NFHS-4 data in order to assess the quality and integrity of reported data. Specifically, data from HMIS for last 5 years (2011-12 to 2015-16) on the proportion of institutional deliveries and ANC registered within the first trimester is compared with NFHS-4 conducted during 2015-16.

Figure 4.36 - Indicator 2.1.1: Data Integrity Measure - Institutional deliveries - Larger States

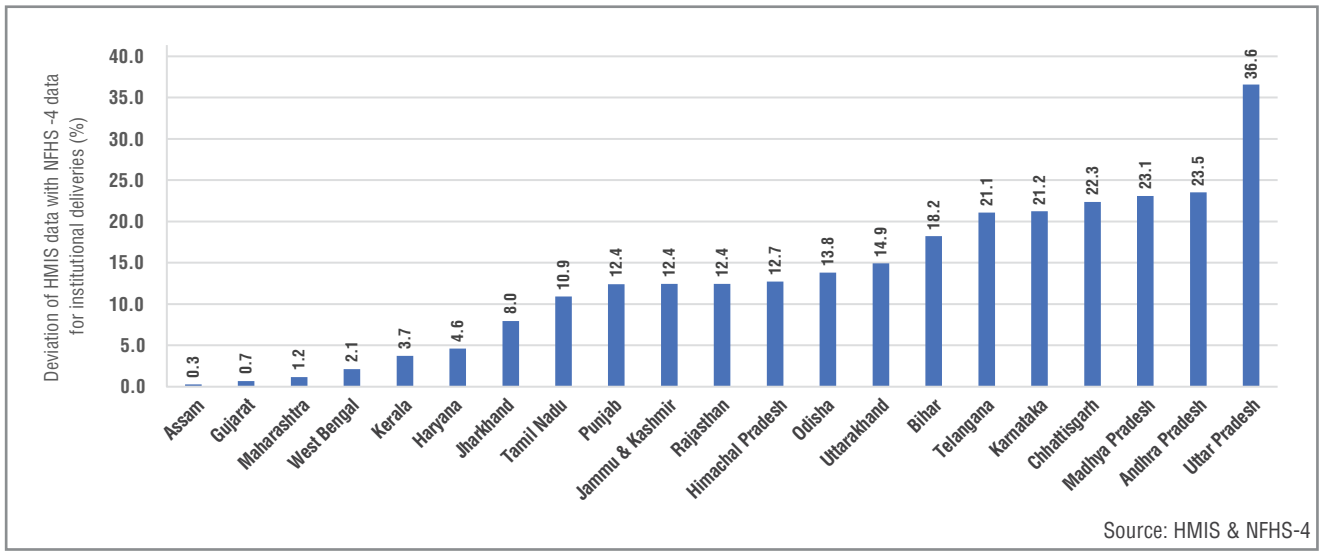


Figure 4.37 - Indicator 2.1.1: Data Integrity Measure - ANC registered within first trimester - Larger States

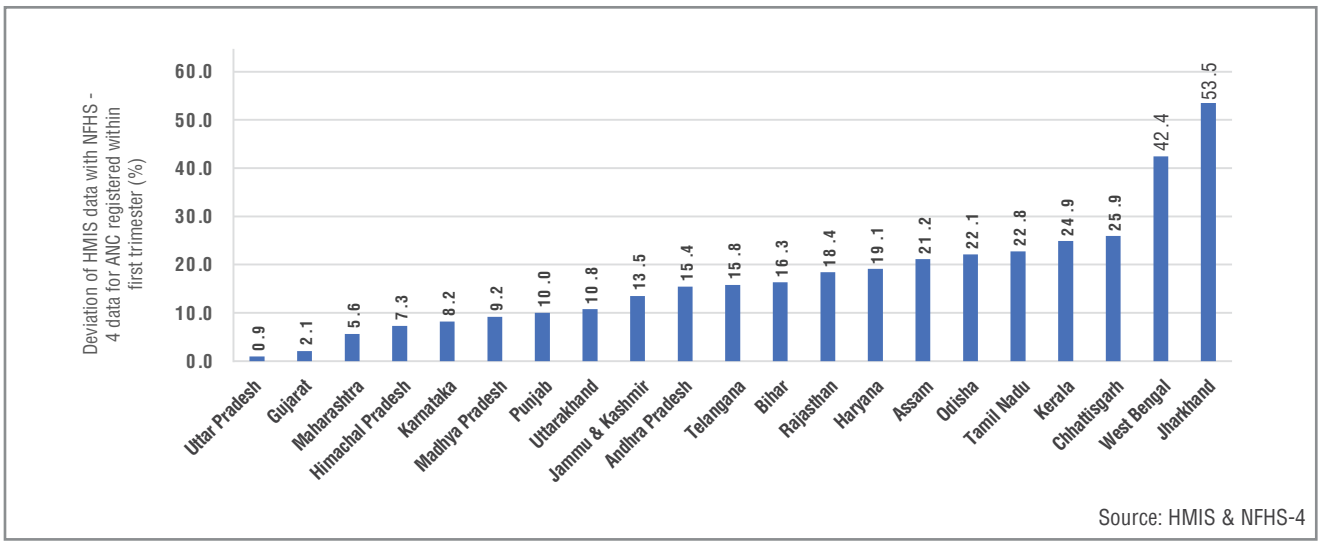


Figure 4.38 - Indicator 2.1.1: Data Integrity Measure - Institutional deliveries - Smaller States and UTs

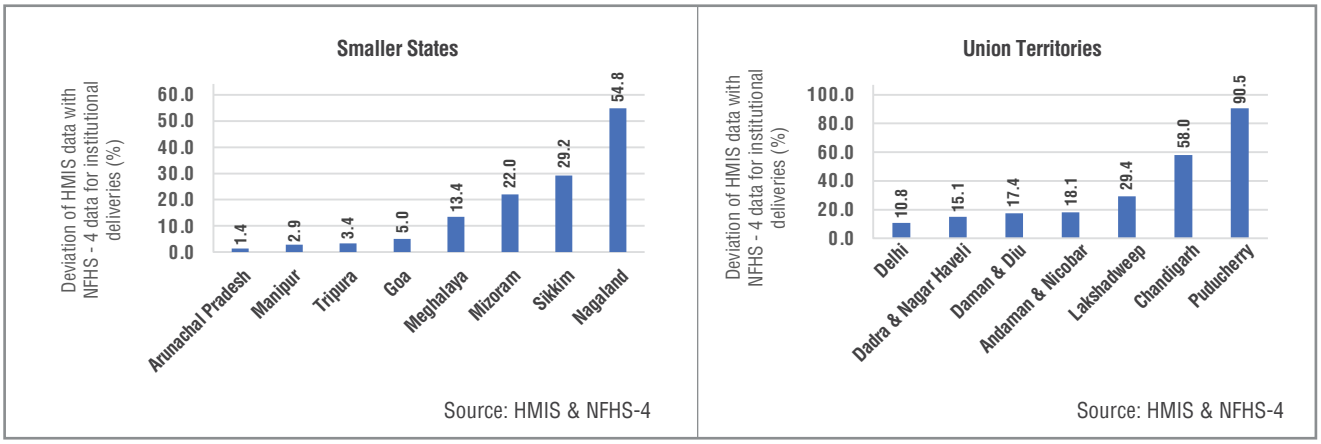
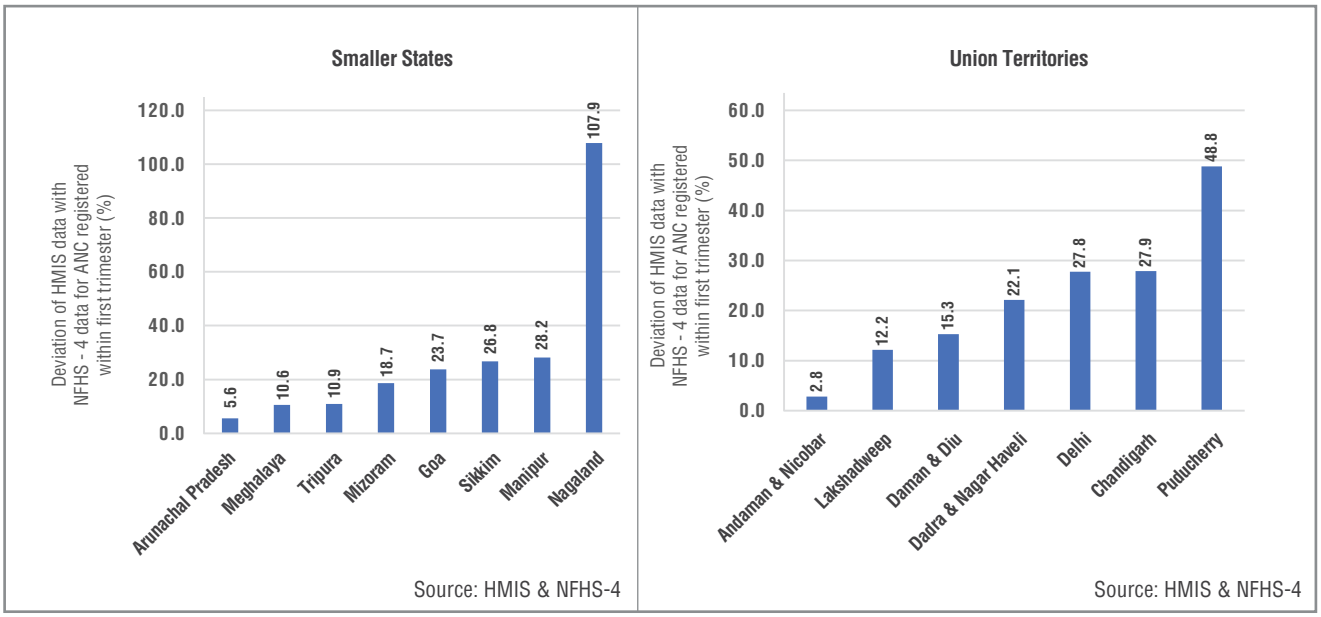


Figure 4.39 - Indicator 2.1.1: Data Integrity Measure - ANC registered within first trimester - Smaller States and UTs

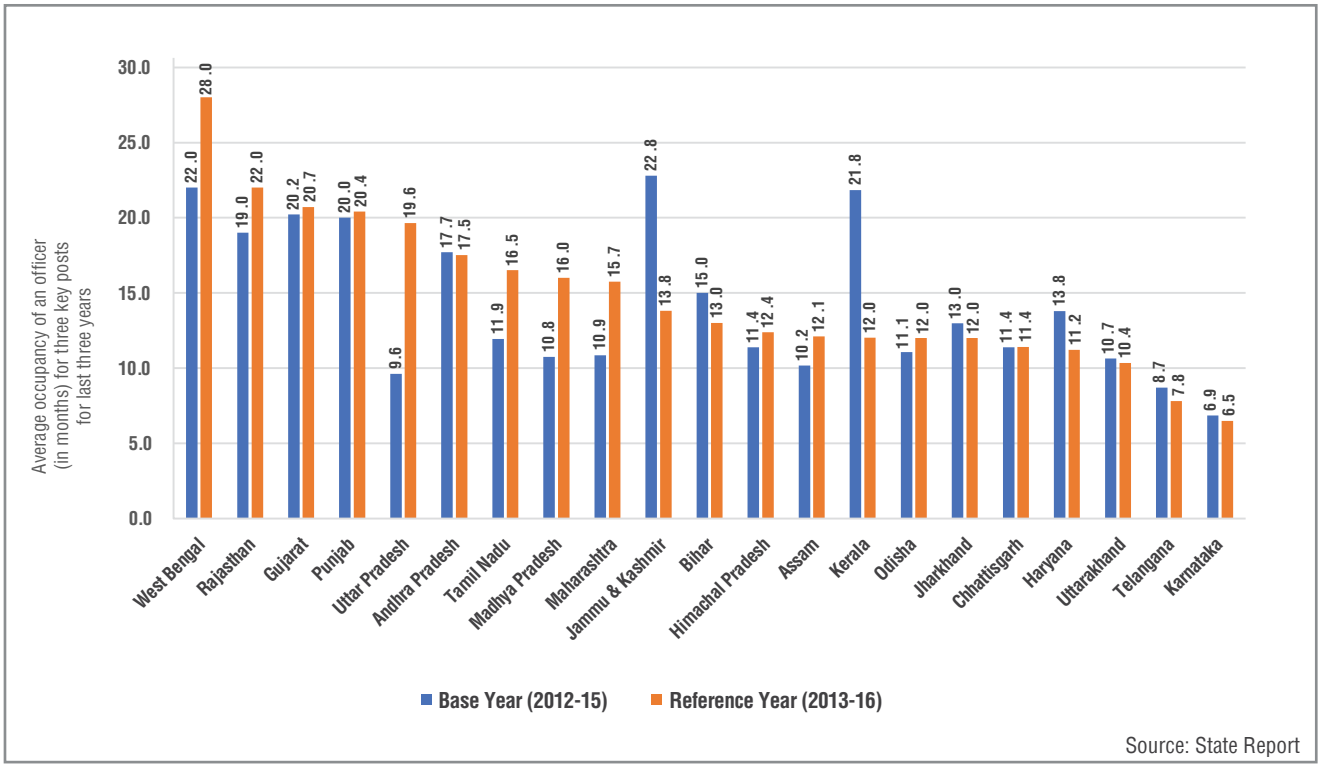


In the case of institutional deliveries, Uttar Pradesh, Nagaland and Puducherry have the widest discrepancy between HMIS and NFHS-4 data. The trend is somewhat different in the case of ANC registered within the first trimester, where Jharkhand, Nagaland, and Puducherry have the widest variation between the HMIS and NFHS-4 data. The States, UTs and MoHFW need to ensure that this deviation is minimized by adopting robust data quality mechanisms.

Indicator 2.2.1: Average occupancy of an officer (in months) combined for three key posts at State-level for last three years

This indicator reflects the average occupancy of key administrative officials (in months), combined for the posts of Principal Secretary, Mission Director (NHM) and Director (Health Services) in the last three years. A stable tenure for key administrative positions is very critical for effective implementation of the programs. The data reveals that the average occupancy of Principal Secretary, Mission Director (NHM), and Director (Health Services) or equivalent positions in a period of 36 months (3 years) is the highest in West Bengal (28 months) among the Larger States, Sikkim (24 months) among the Smaller States and Lakshadweep (27 months) among UTs. Many States have an average occupancy per officer for the three key administrative positions of less than 12 months - Chhattisgarh, Haryana, Uttarakhand, Telangana, Karnataka, Tripura, Mizoram, Nagaland and Delhi in the reference year (2013-16). Significant improvements (5 months or more) have been achieved in West Bengal, Uttar Pradesh, Madhya Pradesh, Goa and Manipur, but in Jammu & Kashmir, Kerala, Arunachal Pradesh, Nagaland and Andaman & Nicobar, the occupancy has declined substantially from the base year (2012-15) to the reference year (2013-16). Among the Larger States between the base year (2012-15) and reference year (2013-16), Uttar Pradesh has shown the maximum progress where the average occupancy doubled from 10 to 20 months, while Kerala has shown the maximum decline in the tenure of these officers where the tenure has almost halved from 22 to 12 months.

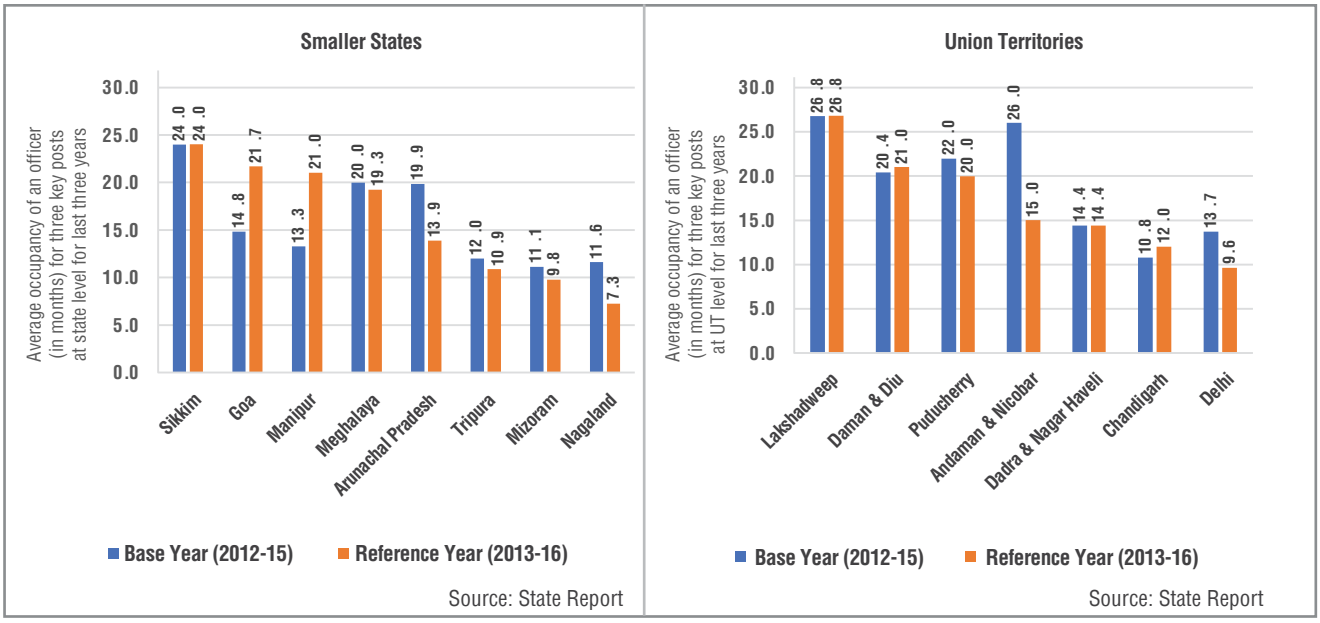
Figure 4.40 - Indicator 2.2.1: Average occupancy of an officer (in months) combined for three key posts at State-level for last three years - Larger States



Source: State Report

Note: Three key posts are Principal Secretary (Health), Mission Director (NHM) and Director (Health Services).

Figure 4.41 - Indicator 2.2.1: Average occupancy of an officer (in months) combined for three key posts at State-level for last three years - Smaller States and UTs

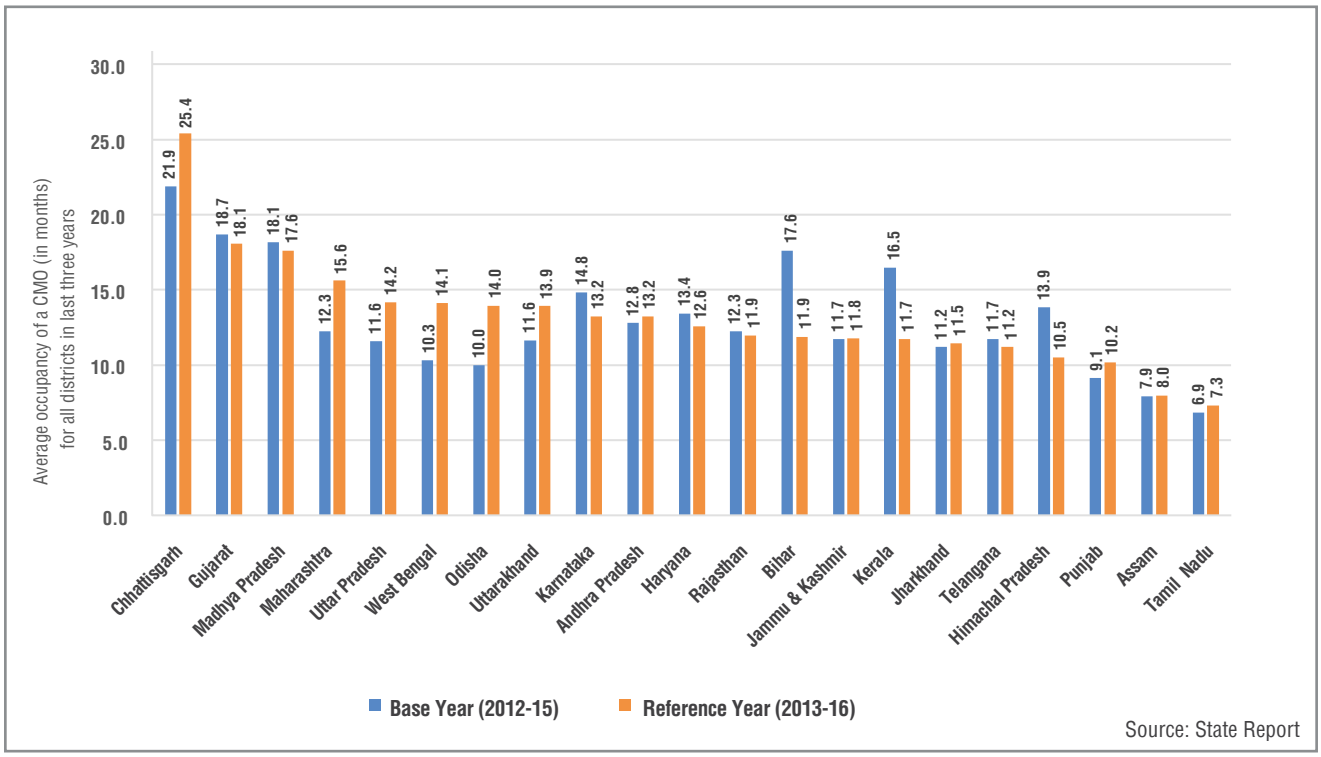


Note: Three key posts are Principal Secretary (Health), Mission Director (NHM) and Director (Health Services).

Indicator 2.2.2: Average occupancy of a full-time officer (in months) for all the districts in last three years - CMOs or equivalent post (heading District Health Services)

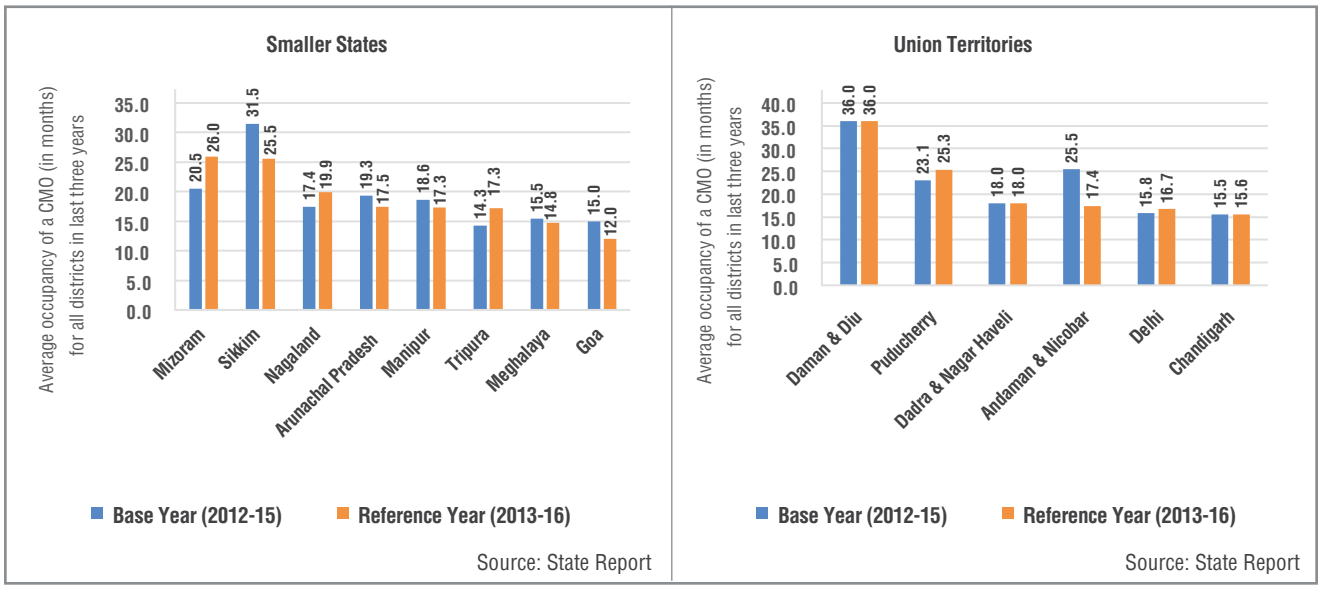
In one-third of the States and UTs, the average occupancy of a full-time Chief Medical Officer (CMO) or equivalent post heading the Health Services at the district level is 12 months or less, which hinders effective implementation of programs. A small number of States and UTs (Chhattisgarh, Mizoram, Sikkim, Daman & Diu and Puducherry) reported an average occupancy of more than 24 months. Bihar, Sikkim and Andaman & Nicobar Islands have shown a decline of five or more months in the average occupancy of the CMO from the base year (2012-15) to the reference year (2013-16). This indicator was modified for Andaman & Nicobar Islands and Dadra & Nagar Haveli, where the CMO equivalent posts of Medical Superintendent and regular medical officer were included in the calculation of average occupancy. In Lakshadweep, there was no CMO or equivalent post and hence this indicator is not applicable.

Figure 4.42 - Indicator 2.2.2: Average occupancy of a full-time officer (in months) for all the districts in last three years - CMOs or equivalent post - Larger States



Source: State Report

Figure 4.43 - Indicator 2.2.2: Average occupancy of a full-time officer (in months) for all the districts in last three years - CMOs or equivalent post - Smaller States and UTs



Source: State Report

Source: State Report

Indicator 3.1.1: Proportion of vacant healthcare provider positions (regular + contractual) in public health facilities

Vacancies of key health staff are linked with both access to healthcare services as well as their quality. The vacancy status vis-a-vis the total sanctioned positions, for both regular and contractual healthcare providers for key positions in public health facilities including ANMs at sub-centres (SCs), staff nurses at PHCs and CHCs, medical officers (MOs) at PHCs, and Specialists at district hospitals (DHs) is provided below.

a. ANMs at sub-centres: Among the Larger States, less than 25 percent of ANM positions were vacant except for Gujarat and Bihar, which reported 28 percent and 59 percent vacancies respectively. Odisha, Uttar Pradesh, West Bengal and Kerala reported less than 5 percent vacancy of ANM positions. Similarly, among the Smaller States and UTs, less than 25 percent positions were vacant except in Manipur (30 percent), Goa (30 percent), Tripura (39 percent) and Chandigarh (29 percent). Between the base year (2014-15) and reference year (2015-16), Uttar Pradesh, Jammu & Kashmir, Andhra Pradesh, Rajasthan, Karnataka and Bihar have shown significant progress and the ANM vacancies have declined by 5 or more percentage points. Madhya Pradesh, Haryana, Gujarat, Mizoram, Arunachal Pradesh, Manipur, Goa, Tripura and Delhi have shown significant increases (5 or more percentage points) in ANM vacancies during the same period.

Figure 4.44 - Indicator 3.1.1a: Proportion of vacant healthcare provider positions - ANMs at sub-centres - Larger States

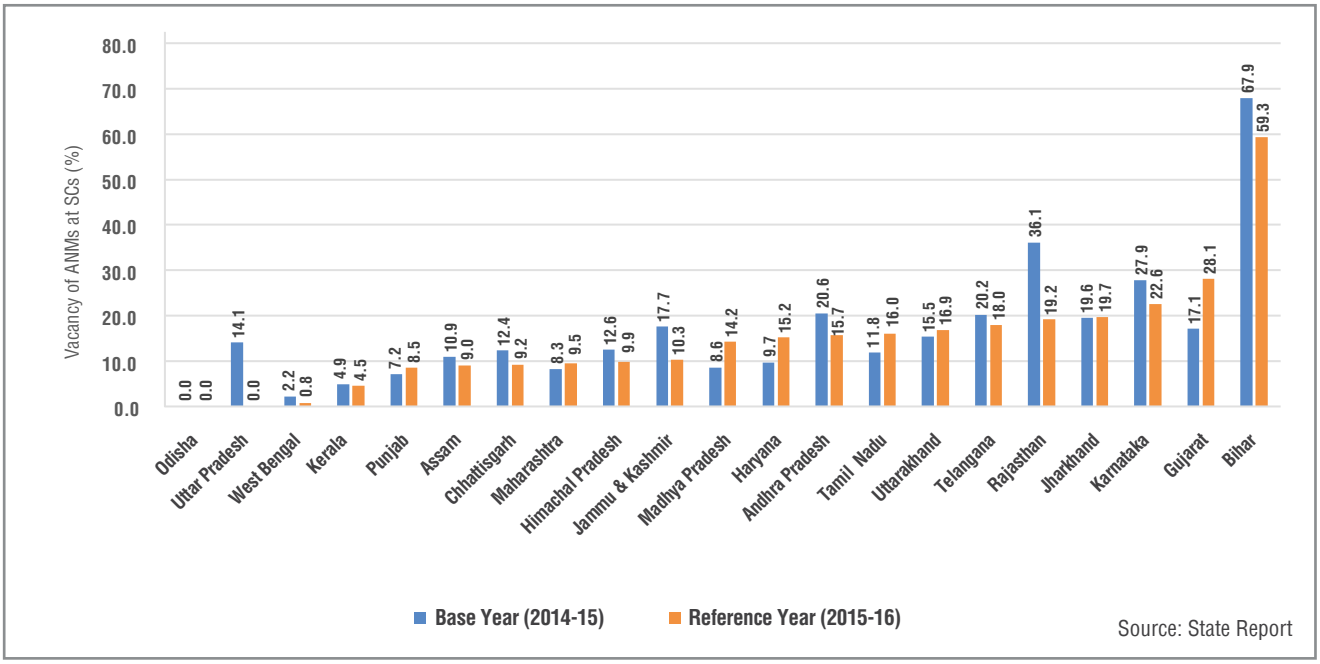
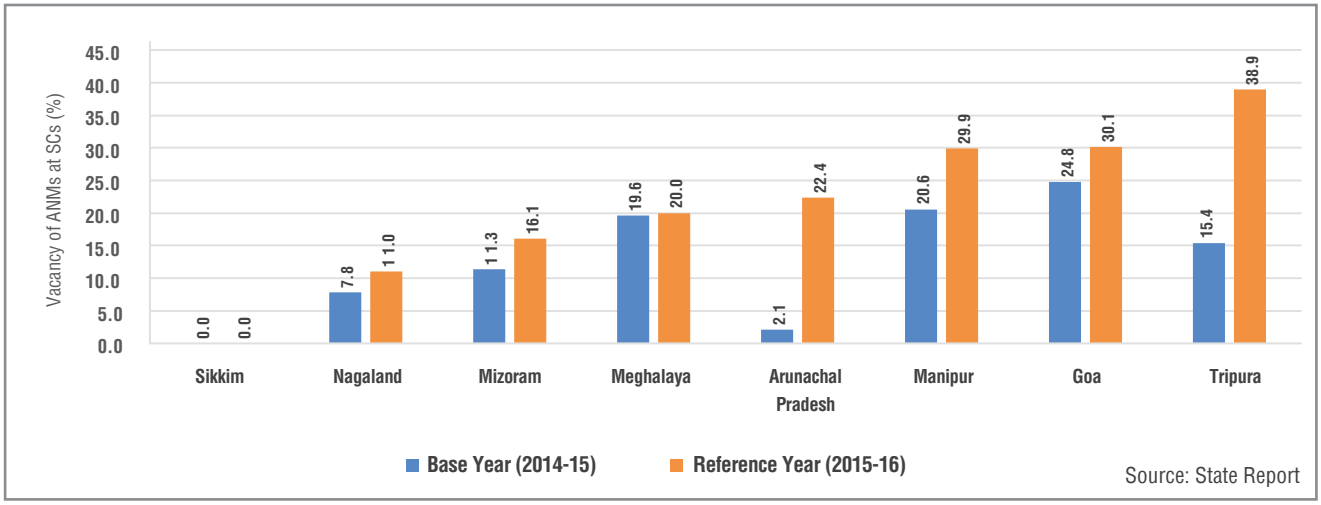
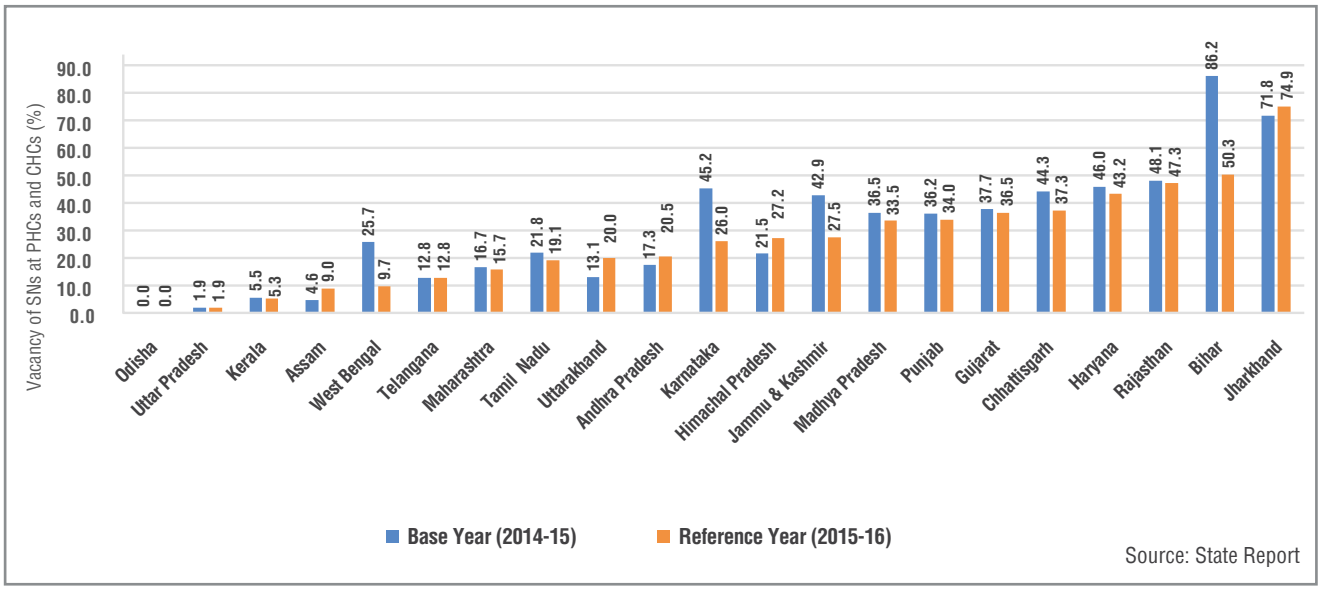


Figure 4.45 - Indicator 3.1.1a: Proportion of vacant healthcare provider positions - ANMs at sub-centres - Smaller States



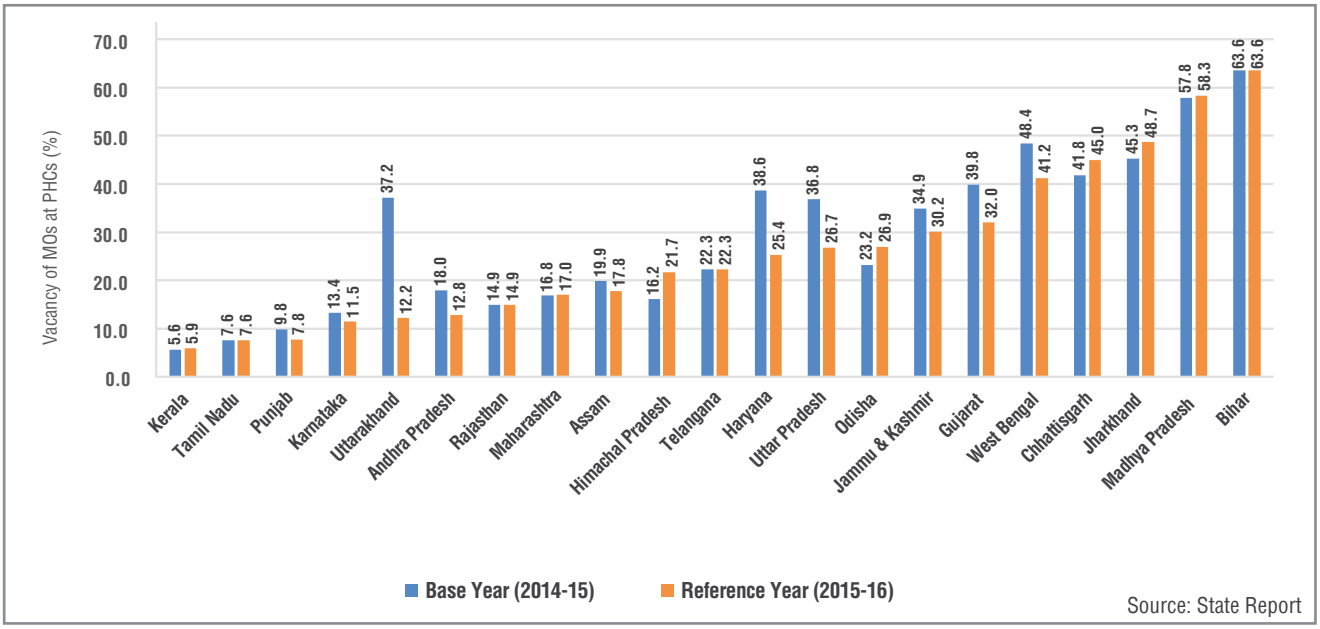
b. Staff nurses at PHCs and CHCs: Among the Larger States, the vacancy of staff nurses in PHCs and CHCs was more than 40 percent in Haryana (43 percent), Rajasthan (47 percent), Bihar (50 percent) and Jharkhand (75 percent). From base year (2014-15) to reference year (2015-16), there was significant reduction (16 to 36 percent) in the proportion of vacant position for staff nurses in West Bengal, Karnataka, Jammu & Kashmir and Bihar. Among the Smaller States, Sikkim has the highest vacancy rate (62 percent) followed by Meghalaya (31 percent) and both these States have shown no progress in addressing the vacancies of staff nurses at PHCs and CHCs between the base year and reference year. Tripura made tremendous progress with 22 percentage points reduction in vacancies, bringing the vacancy position of staff nurses at CHCs and PHCs to zero. The vacancies of staff nurses at PHCs and CHCs has increased significantly in Manipur (from 5 to 19 percent) and Arunachal Pradesh (from 4 to 29 percent). The vacancy rate in all UTs is less than 8 percent except Delhi where it increased substantially from 32 to 41 percent.

Figure 4.46 - Indicator 3.1.1b: Proportion of vacant healthcare provider positions - Staff nurses at PHCs and CHCs - Larger States



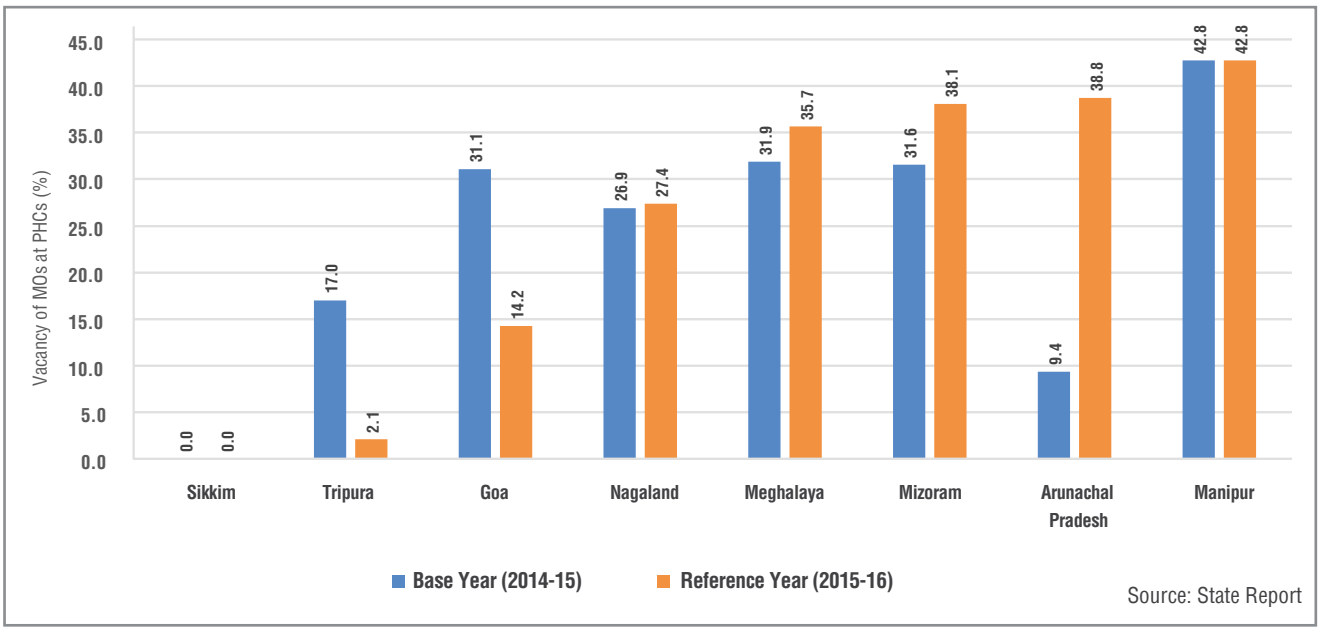
c. Medical officers (MOs) at PHCs: Among the Larger States, the vacancy of MOs at PHCs is the highest in Bihar (64 percent) followed by Madhya Pradesh (58 percent), Jharkhand (49 percent), Chhattisgarh (45 percent) and West Bengal (41 percent). It is the lowest in Kerala (6 percent) followed by Tamil Nadu (8 percent) and Punjab (8 percent). From base to reference year, there has been reduction in MO vacancies in the range of 5 to 25 percentage points in Uttarakhand, Andhra Pradesh, Haryana, Uttar Pradesh, Gujarat and West Bengal. In Himachal Pradesh, MO vacancies increased by 5 percentage points. Among the Smaller States, Meghalaya, Mizoram, Arunachal Pradesh and Manipur also have a high proportion (36 to 43 percent) of vacant positions of MO at PHCs and no reduction in MO vacancies from base to reference year. Tripura and Goa have shown a reduction of 15 percentage points and 17 percentage points in vacant MO positions at PHCs respectively, whereas these have increased in Arunachal Pradesh (from 9 to 39 percent). Among the UTs, Chandigarh has the highest proportion of vacant MO positions at PHCs (69 percent) followed by Andaman & Nicobar (36 percent) with no reduction from base to reference year. There was no MO vacancy in Lakshadweep, while vacancies in the remaining UTs lay in the range of 7 to 17 percent.

Figure 4.47 - Indicator 3.1.1c: Proportion of vacant healthcare provider positions - Medical officers at PHCs - Larger States



Source: State Report

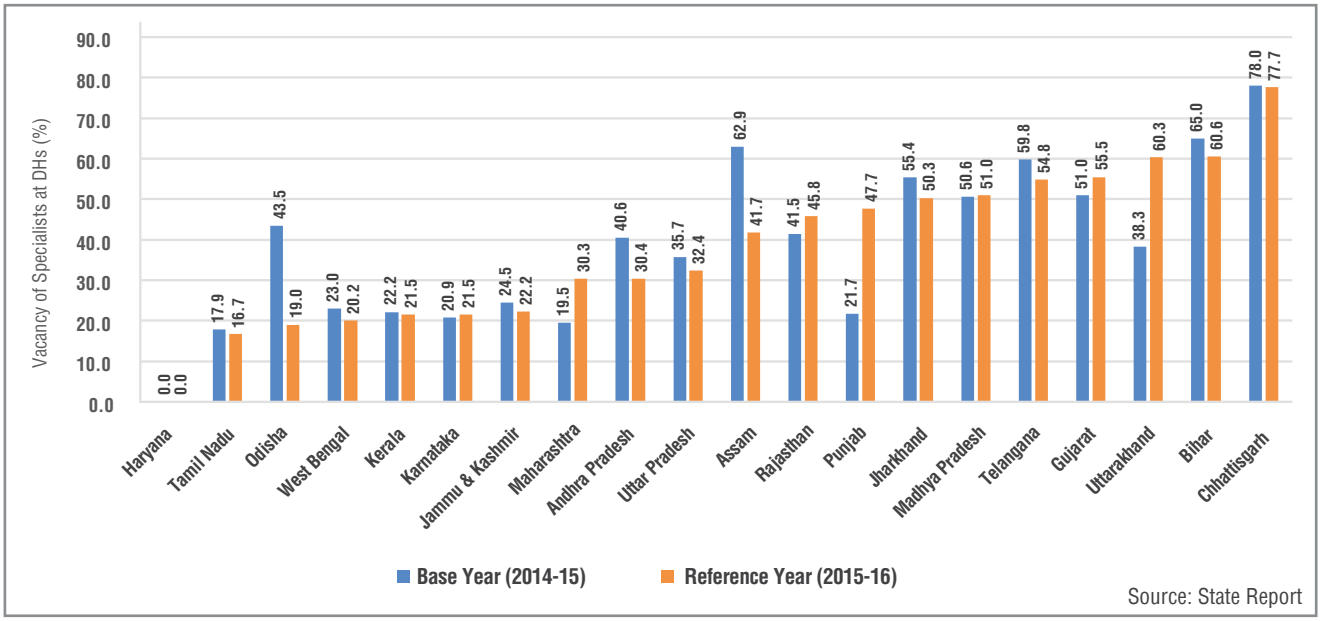
Figure 4.48 - Indicator 3.1.1c: Proportion of vacant healthcare provider positions - Medical officers at PHCs - Smaller States



Source: State Report

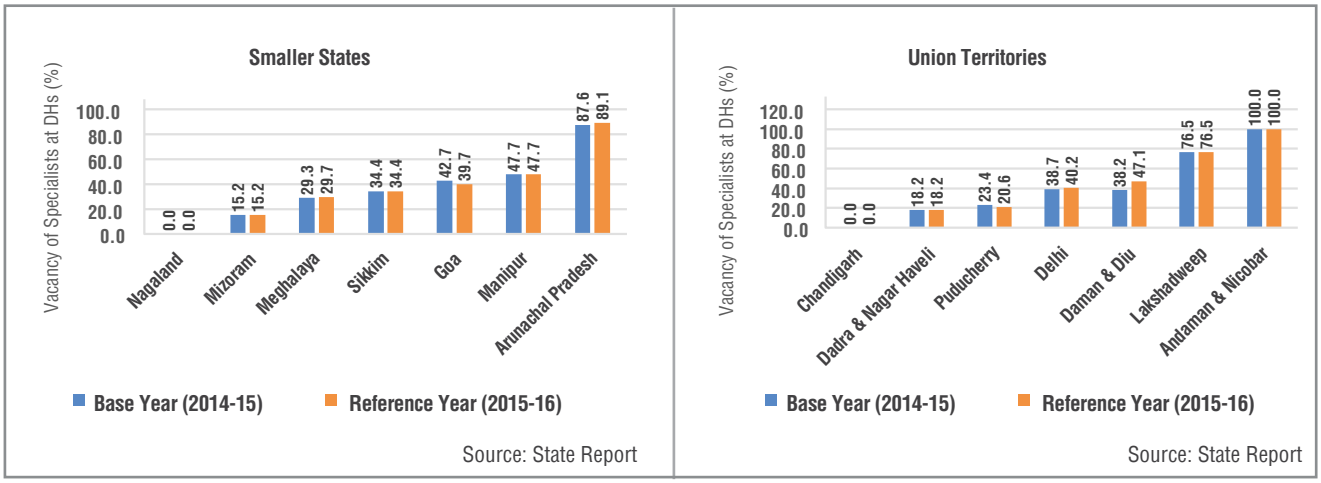
d. Specialists at district hospital (Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, Anaesthesia, Ophthalmology, Radiology, Pathology, Ear-Nose-Throat, Dental, Psychiatry):

Figure 4.49 - Indicator 3.1.1.d: Proportion of vacant healthcare provider positions - Specialists at district hospitals - Larger States



Several Larger States have a high proportion of vacant specialist positions in district hospitals, particularly in Chhattisgarh (78 percent), Bihar (61 percent), Uttarakhand (60 percent), Gujarat (56 percent), Telangana (55 percent), Madhya Pradesh (51 percent), Jharkhand (50 percent) and Punjab (48 percent). Most States have made limited progress (<5 percentage points) in reducing the vacancies of specialists at district hospitals from base to reference year, except Odisha, Andhra Pradesh, Assam, Jharkhand and Telangana; at the same time, Maharashtra, Punjab and Uttarakhand have shown substantial increases of specialists, ranging between 11 to 26 percentage points. Among the Smaller States, the vacancies among specialist positions is high in Manipur (48 percent), Goa (40 percent) and Arunachal Pradesh (89 percent). While all specialist positions have been filled in Nagaland, specialist vacancies in the remaining States range from 15 to 40 percent. Overall, the Smaller States have shown little or no reduction in vacancies among specialists at district hospitals from base to reference year. A similar situation was observed among the UTs as shown in Figure 4.50.

Figure 4.50 - Indicator 3.1.1d: Proportion of vacant healthcare provider positions - Specialists at district hospitals - Smaller States and UTs



Indicator 3.1.2: Proportion of total staff (regular and contractual) for whom an e-payslip can be generated in the IT enabled Human Resources Management Information System (HRMIS)

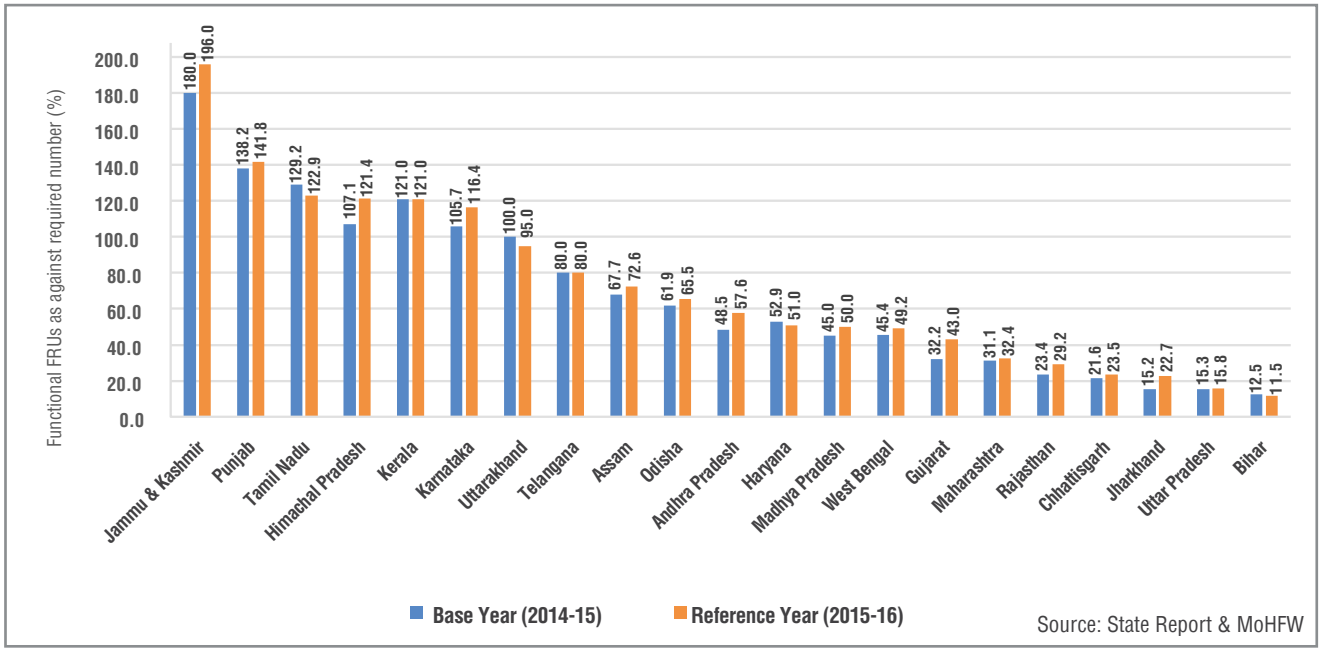
It is expected that a well-functioning HRMIS leads to efficient financial and personnel management. However, in 2015-16, among the 21 Larger States, only 9 States used e-payslips to disburse staff salaries, using HRMIS. Among them, the proportion of staff receiving such payments varies from as low as 8 to 100 percent. The States with the highest rates of e-payments are Kerala (100 percent), Maharashtra (68 percent), Odisha (76 percent), Tamil Nadu (85 percent) and West Bengal (81 percent), while Andhra Pradesh, Gujarat and Karnataka are using HRMIS based e-payments for 36 to 59 percent of their staff. It is important for other States to initiate and fully operationalize HRMIS for effective human resources management. All the Smaller States except Arunachal Pradesh (39 percent) have not yet initiated HRMIS based e-payments to staff. Among the UTs, Andaman & Nicobar, Dadra & Nagar Haveli, Daman & Diu and Lakshadweep are yet to initiate e-payments. The remaining UTs are making use of HRMIS based e-payslip generation (61 to 78 percent).

Indicator 3.1.3.a: Proportion of specified type of facilities functioning as First Referral Units (FRUs)

This is a proxy indicator to assess the functionality of the FRUs and captures the number of facilities conducting a specified number of C-sections per year against the number of required FRUs per MoHFW guidelines (one FRU per 500,000 population) during a specific year. Functional FRUs provide specialized services close to the community and can help to improve access and decongest the client load at higher level facilities. The proxy criteria for a facility to be considered as fully operational FRUs is:

- For sub-district hospitals and CHCs: conducting a minimum of 60 C-Sections per year (36 C-sections per year for Hilly and North-Eastern States, except Assam).
- For district hospitals: conducting a minimum of 120 C-Sections per year (72 C-sections per year for Hilly and North-Eastern States, except Assam).

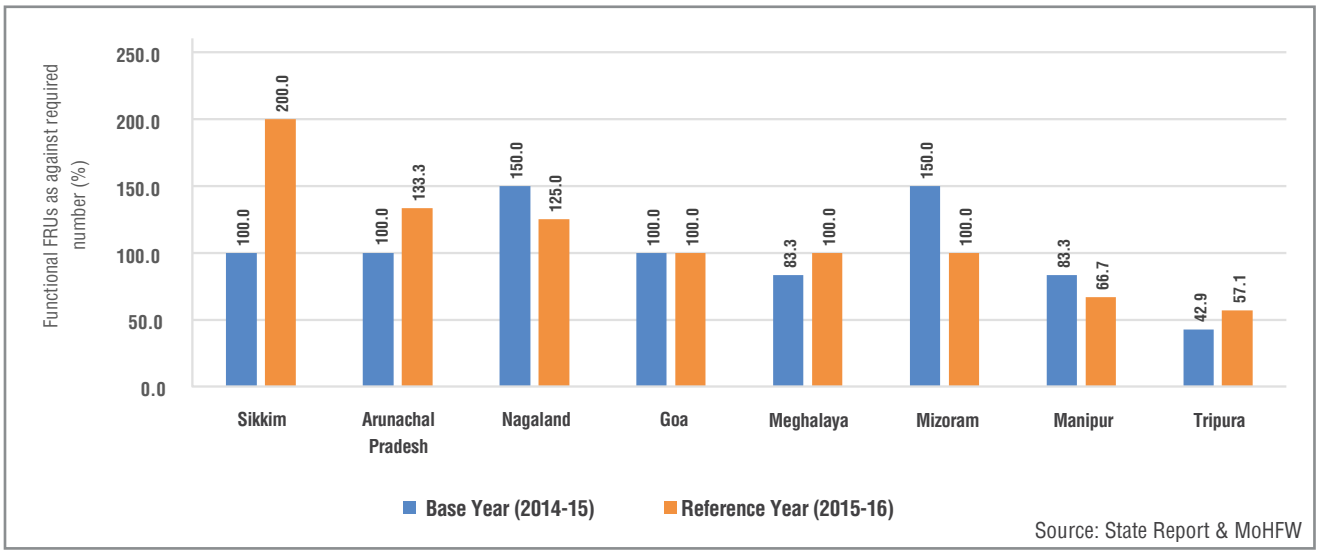
Figure 4.51 - Indicator 3.1.3.a: Proportion of specified type of facilities functioning as First Referral Units - Larger States



Note: The number of required FRUs is based on MoHFW guidelines.

As shown in Figures 4.51 and 4.52, many States have achieved the numerical target of functional FRUs (Jammu & Kashmir, Punjab, Tamil Nadu, Himachal Pradesh, Kerala, Karnataka, Mizoram, Meghalaya, Goa, Nagaland, Arunachal Pradesh and Sikkim). However, several States (West Bengal, Gujarat, Maharashtra, Rajasthan, Chhattisgarh, Jharkhand, Uttar Pradesh and Bihar) lag behind substantially with 50 percent or less of the required functional FRUs. These States need to plan strategically for operationalizing more facilities as FRUs, which are critical for saving the lives of mothers and children. Almost all UTs have the required number of fully functional FRUs. From base to reference year, most States and UTs have either maintained the earlier level or shown minimal increase in the percentage of functional FRUs. None of the facilities in Andaman & Nicobar function as FRU despite the need of one functional FRU as per MoHFW guidelines.

Figure 4.52 - Indicator 3.1.3.a: Proportion of specified type of facilities functioning as First Referral Units - Smaller States

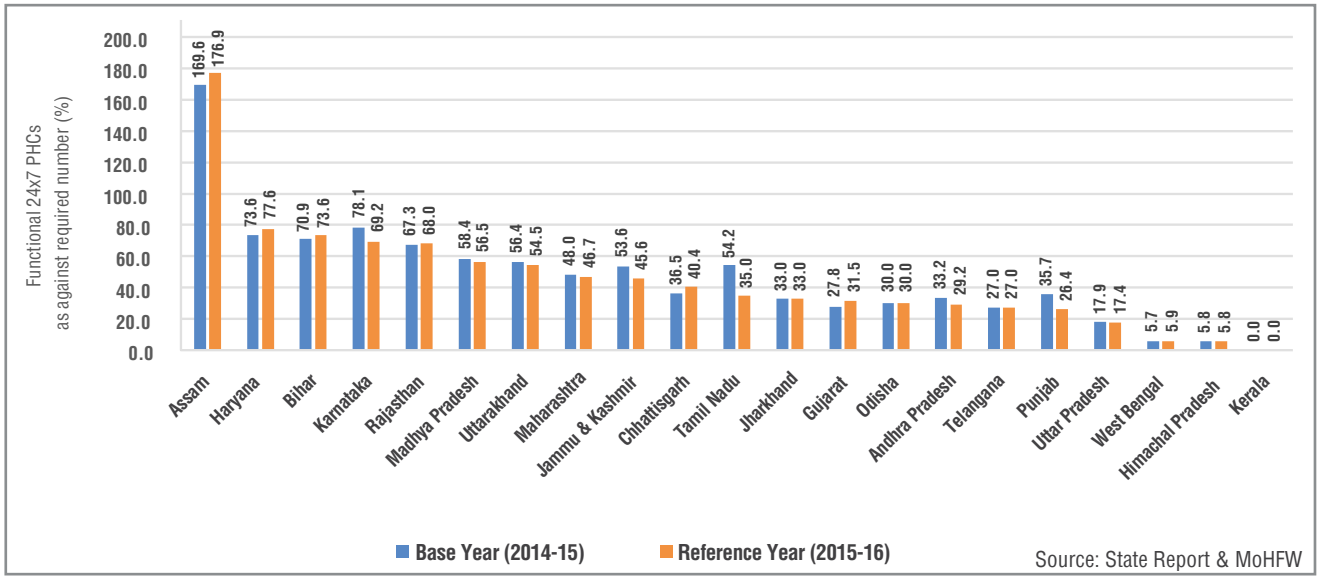


Note: The number of required FRUs is based on MoHFW guidelines.

Indicator 3.1.3.b: Proportion of functional 24x7 PHCs

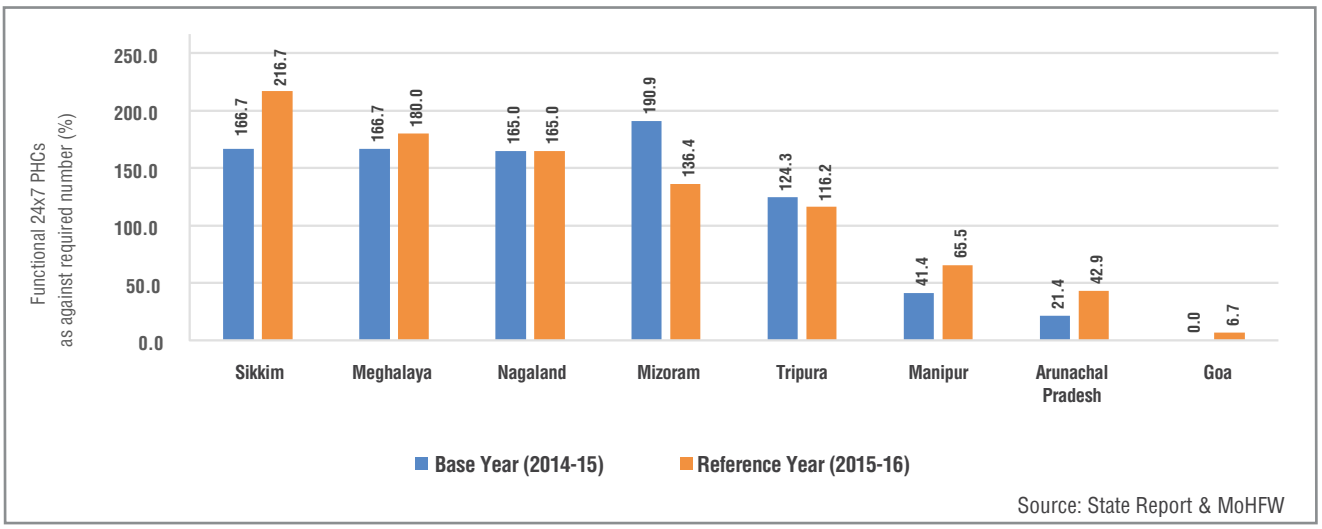
The functioning of 24x7 PHCs is important for providing a basic package of health services to the community and for reducing the workload at higher level facilities. To assess the proportion of functional 24x7 PHCs providing all stipulated healthcare services round the clock during a specific year, the norm of at least ten (five in Hilly States) deliveries per month was considered. The required number of functional 24x7 PHCs per state was calculated using the norm of one 24x7 PHC per 100,000 population. On the basis of this norm, only Assam, Sikkim, Meghalaya, Nagaland, Mizoram, Tripura, Andaman & Nicobar and Dadra & Nagar Haveli have achieved the target of the required number of 24x7 PHCs, whereas Kerala, Chandigarh, Lakshadweep and Puducherry are yet to operationalize a single 24x7 PHC. Most Larger States need to substantially increase the number of functional 24x7 PHCs in order to reach the required target. Among the Smaller States, Manipur, Arunachal Pradesh and Goa need to deploy strategic effort to operationalize more 24x7 PHCs. From base to reference year, an increase of five or higher percentage points in functional 24x7 PHCs as against required number was observed in Assam (7 percentage points), Sikkim (50 percentage points), Meghalaya (13 percentage points), Manipur (24 percentage points), Arunachal Pradesh (22 percentage points), and Dadra & Nagar Haveli (33 percentage points), whereas a decline of five or more percentage points was observed in Karnataka (9 percentage points), Jammu & Kashmir (8 percentage points), Tamil Nadu (19 percentage points), Punjab (9 percentage points), Mizoram (55 percentage points) and Tripura (8 percentage points).

Figure 4.53 - Indicator 3.1.3.b: Proportion of functional 24x7 PHCs - Larger States



Note: The number of required 24x7 PHCs is based on MoHFW guidelines.

Figure 4.54 - Indicator 3.1.3.b: Proportion of functional 24x7 PHCs - Smaller States

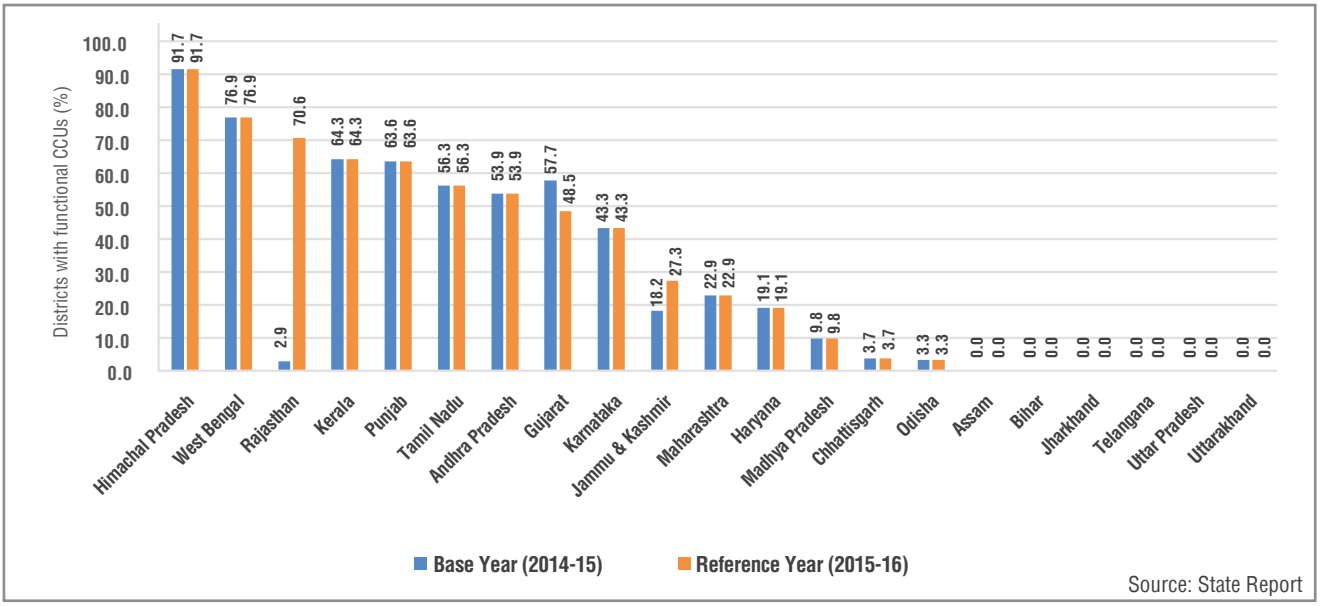


Note: The number of required 24x7 PHCs is based on MoHFW guidelines.

Indicator 3.1.4: Proportion of districts with functional Cardiac Care Units (CCUs)

A functioning CCU is important for the availability of specialized cardiac care services at the district level and for reducing the workload at tertiary level facilities. The State-provided data on the number of functional CCUs in district hospitals alongside the total number of districts was considered. However, CCUs in medical colleges were not considered for this indicator, except for Delhi where hospitals are not designated as district hospitals.

Figure 4.55 - Indicator 3.1.4: Proportion of districts with functional Cardiac Care Units - Larger States



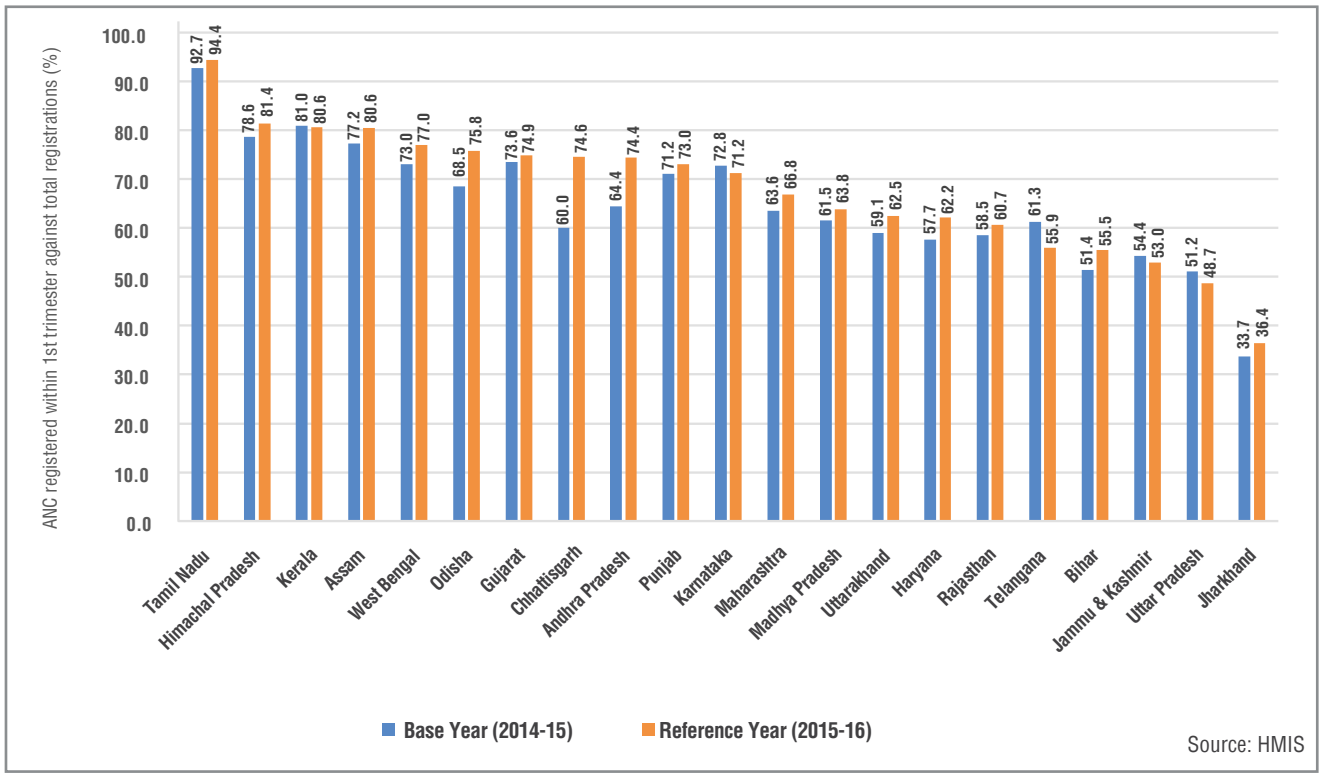
Source: State Report

Assam, Bihar, Jharkhand, Telangana, Uttar Pradesh, Uttarakhand, Arunachal Pradesh, Goa, Manipur, Meghalaya, Sikkim, Tripura, Andaman & Nicobar, Chandigarh, Dadra & Nagar Haveli and Daman & Diu do not have a single district with functional CCUs in public hospitals. Himachal Pradesh, West Bengal, Rajasthan, Kerala, Punjab, Tamil Nadu, Andhra Pradesh, Lakshadweep and Delhi have made satisfactory progress by establishing CCUs in 50 percent or more districts. The remaining States need to operationalize CCUs, given the increasing load of cardiovascular diseases. Among UTs, only Delhi and Lakshadweep have the required number of CCUs. From base to reference year, notable increases in the percentage of districts with CCUs was observed in Rajasthan (68 percentage points), Jammu & Kashmir (9 percentage points) and Nagaland (9 percentage points), whereas a decline of 9 percentage points was observed in Gujarat.

Indicator 3.1.5: Proportion of ANC registered within first trimester against total registrations

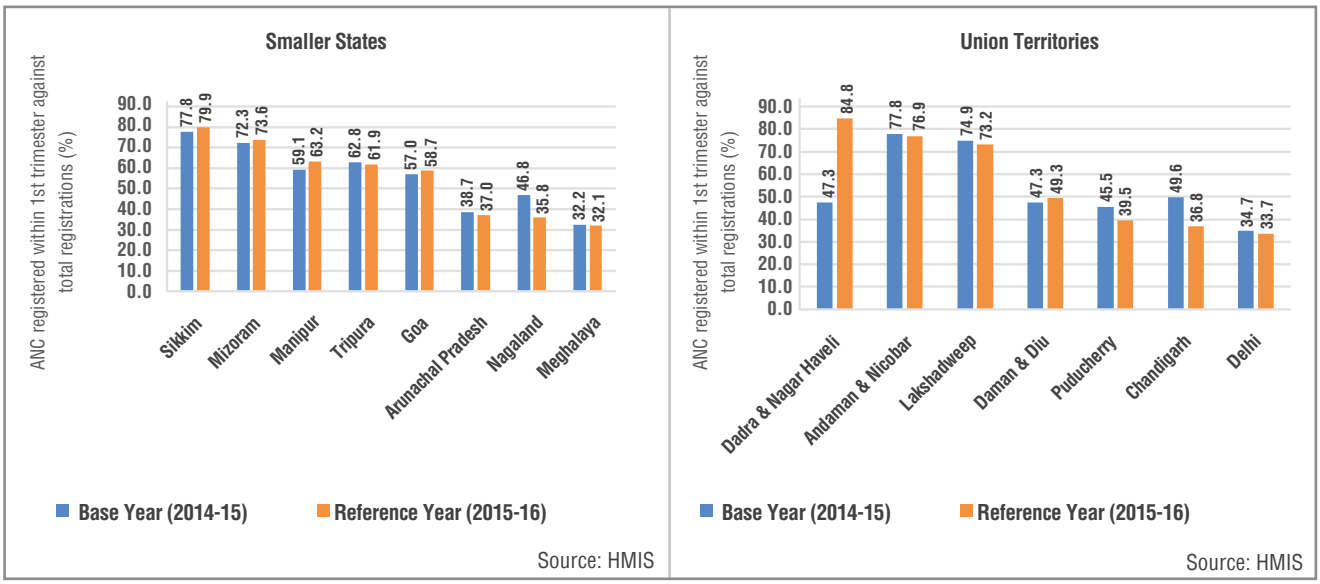
The ANC registration in the first trimester is a critical indicator depicting the effectiveness of a health service delivery system to enrol pregnant women in early pregnancy, this being necessary for maternal and foetal well-being. Among the 21 Larger States, 11 have more than 70 percent of ANCs registered in the first trimester. Telangana, Bihar, Jammu & Kashmir, Uttar Pradesh and Jharkhand, with less than 60 percent ANC registration in the first trimester, need to improve performance in this regard. Almost all States (except Karnataka, Telangana, Jammu & Kashmir and Uttar Pradesh) have shown incremental progress in the registration of ANCs in the first trimester.

Figure 4.56 - Indicator 3.1.5: Proportion of ANC registered within first trimester against total registrations - Larger States



Similarly, among the Smaller States, Sikkim (80 percent) and Mizoram (74 percent) have achieved more than 70 percent first trimester registration and the remaining States need to put in special efforts to increase first trimester registrations. From base to reference year, some incremental progress (1 to 8 percentage points) was observed in Sikkim, Mizoram, Manipur and Goa, whereas some decline was observed in Tripura (1 percentage point), Arunachal Pradesh (2 percentage points), Nagaland (11 percentage points). No change was observed in Meghalaya where the first trimester registration remains at 32 percent. Among UTs, Dadra & Nagar Haveli, Andaman & Nicobar, and Lakshadweep have achieved satisfactory performance levels (ranging between 73 to 85 percent), while the remaining UTs need to significantly improve their performance.

Figure 4.57 - Indicator 3.1.5: Proportion of ANC registered within first trimester against total registrations - Smaller States and UTs



Indicator 3.1.6: Level of registration of births

Registration of birth not only provides the child with an official identification document, but also allows for area-specific estimation of birth rates. The level of registration is defined as the proportion of births registered under the Civil Registration System (CRS) against the estimated number of births during a specific year. Seventeen States/ UTs including Andhra Pradesh, Assam, Chhattisgarh, Haryana, Kerala, Maharashtra, Punjab, Tamil Nadu, Arunachal Pradesh, Goa, Manipur, Meghalaya, Mizoram, Nagaland, Chandigarh, Puducherry and Delhi have achieved 100 percent registration of births. However, Uttarakhand, Madhya Pradesh, Jharkhand, Jammu & Kashmir, Uttar Pradesh, Bihar, Tripura, Sikkim, Daman & Diu, Andaman & Nicobar, Dadra & Nagar Haveli and Lakshadweep, (with level of registration in the range of 60 to 86 percent) need to make rapid progress in this regard. From base to reference year, the States and UTs showing a decline in registration are Telangana (4 percentage points), Gujarat (5 percentage points), Himachal Pradesh (7 percentage points), Tripura (9 percentage points), Sikkim (6 percentage points), Daman and Diu (22 percentage points), Andaman and Nicobar (25 percentage points) and Dadra and Nagar Haveli (7 percentage points). The states with 5 percentage points or more increase in birth registration are Chhattisgarh (12 percentage points), Odisha (5 percentage points), Uttarakhand (9 percentage points) and Bihar (7 percentage points).

Figure 4.58 - Indicator 3.1.6: Level of registration of births - Larger States

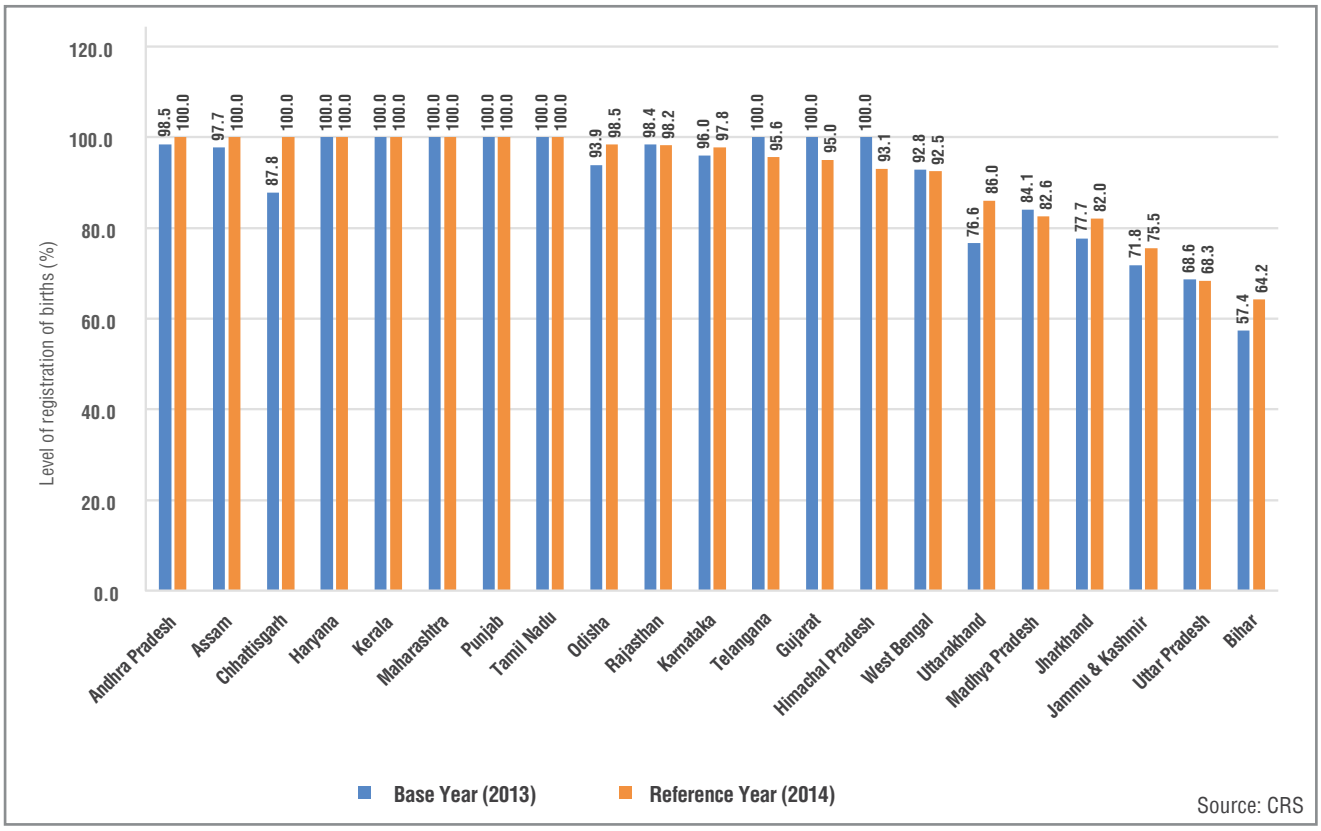
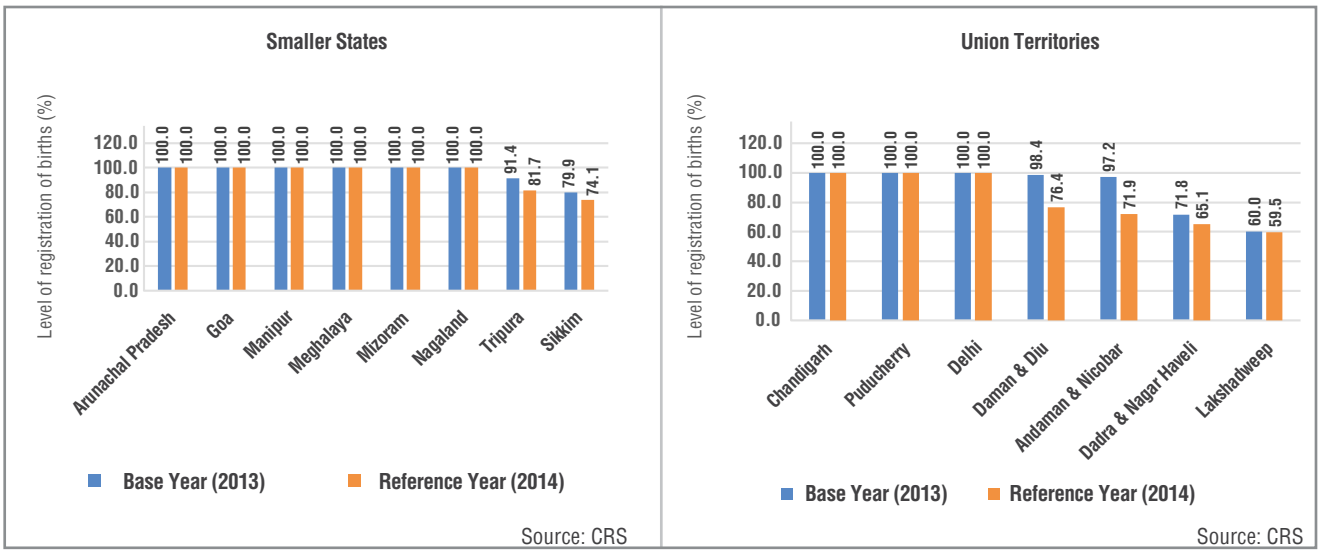


Figure 4.59 - Indicator 3.1.6: Level of registration of births - Smaller States and UTs



Indicator 3.1.7: Completeness of Integrated Disease Surveillance Programme (IDSP) reporting of P and L forms

This indicator captures the proportion of Reporting Units (RUs) reporting in the stipulated time for IDSP reporting format for presumptive surveillance (P form) and IDSP reporting format for laboratory surveillance (L form) during a specific year and is an important monitoring indicator reflecting the functioning of IDSP.

Seven of the Larger States (Andhra Pradesh, Telangana, Kerala, Gujarat, Karnataka, Uttarakhand and Tamil Nadu) have at least 90 percent of the reporting units submitting P form in a timely manner. The performance of Himachal Pradesh and Uttar Pradesh is poor wherein only 66 percent and 42 percent units, respectively,report in a timely manner. From base to reference year, there has been a decline in the percentage of reporting units in Assam, Haryana, Madhya Pradesh, Punjab and Uttar Pradesh, whereas reporting has increased in the remaining States, Karnataka, Tamil Nadu, Odisha, Jammu & Kashmir, West Bengal, Rajasthan and Himachal Pradesh where the increase was more than 10 percentage points. Among the Smaller States and UTs, all (except Mizoram, Dadra & Nagar Haveli, Chandigarh and Daman & Diu) had incremental progress. Manipur (63 percent), Mizoram (48 percent), Andaman & Nicobar (50 percent), Lakshadweep (0 percent) and Delhi (56 percent) need to take corrective steps to improve the reporting completeness of P form.

Figure 4.60 - Indicator 3.1.7: Completeness of IDSP reporting of P form - Larger States

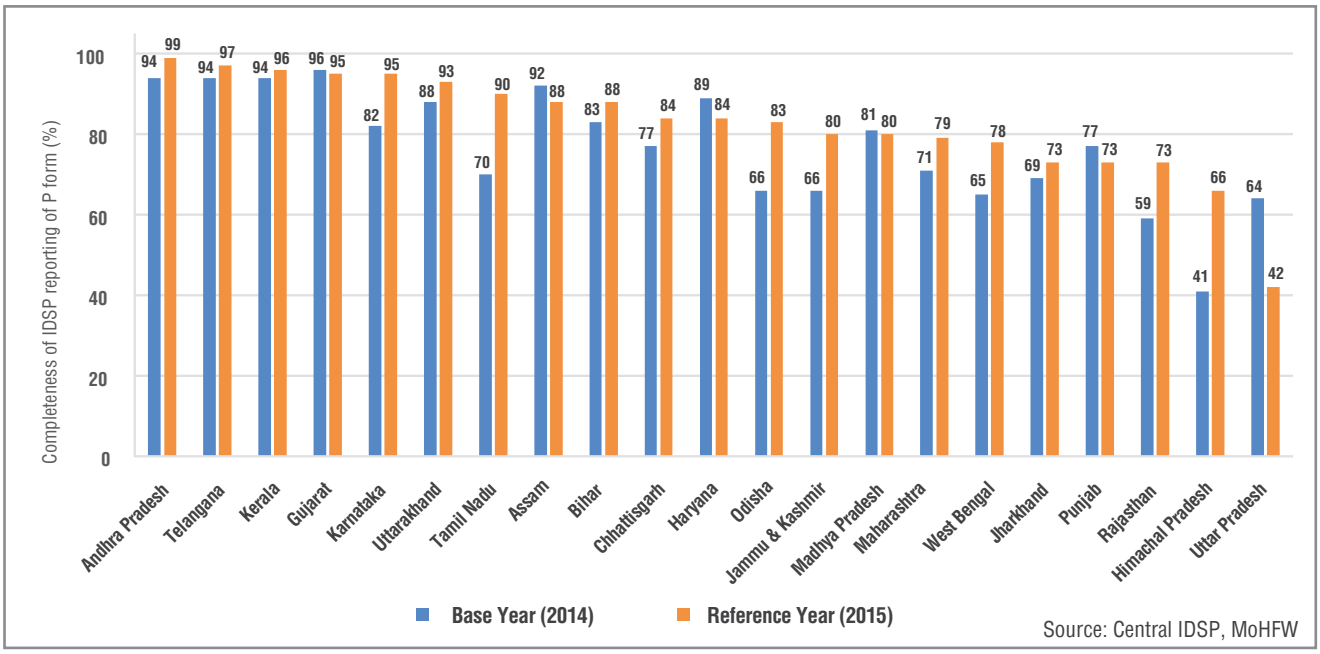
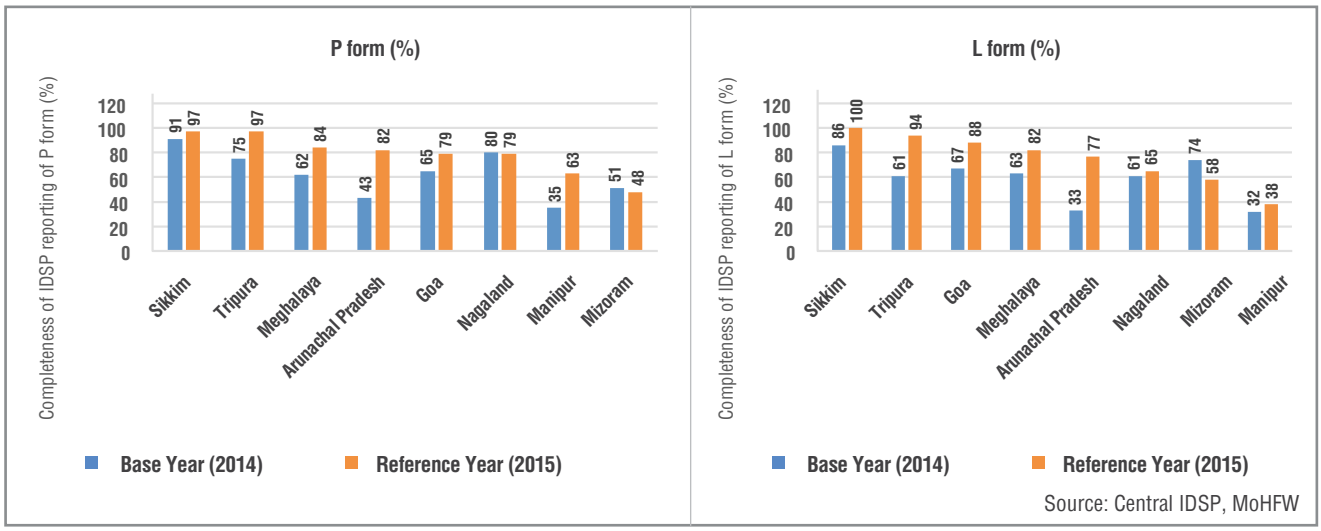


Figure 4.61 - Indicator 3.1.7: Completeness of IDSP reporting of P and L forms - Smaller States



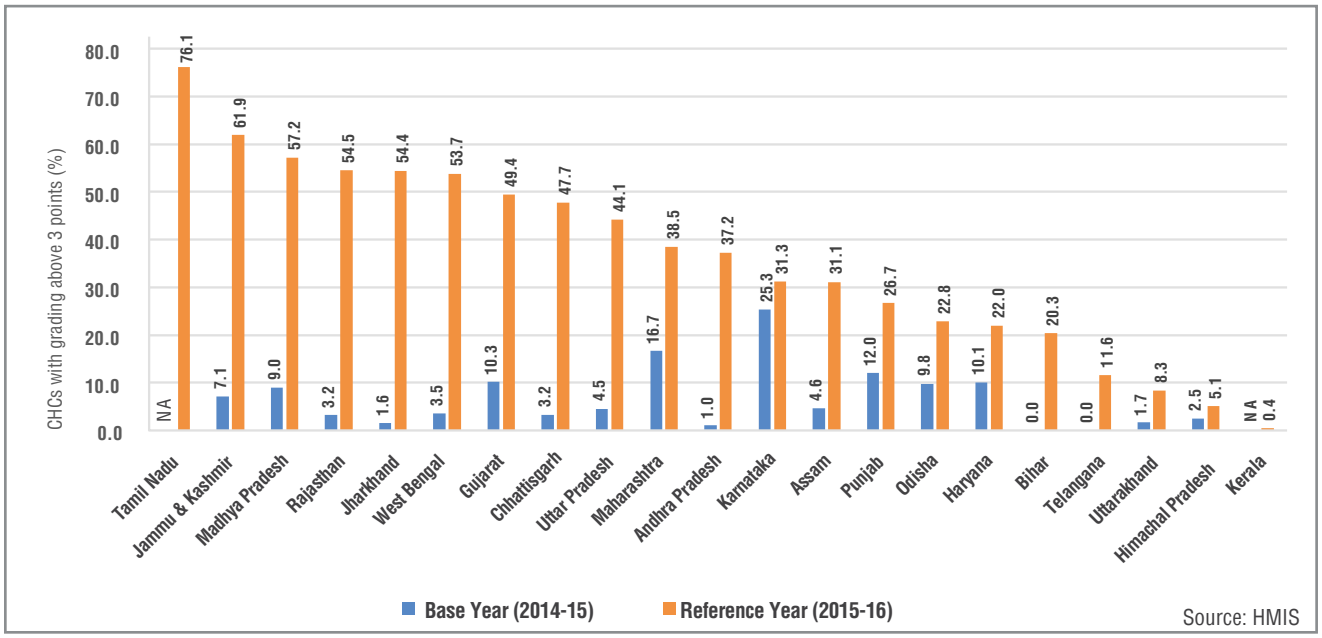
The status of L form reporting is similar to the P form reporting. Thus, Rajasthan (68 percent), Himachal Pradesh (62 percent), Uttar Pradesh (57 percent), Manipur (38 percent), Mizoram (58 percent), Andaman & Nicobar (21 percent) and Lakshadweep (0 percent) need to make concerted efforts to raise the percentage of reporting units timely L form reporting.

Indicator 3.1.8: Proportion of CHCs with grading above 3 points

CHCs are graded under the MoHFW's grading system using the data on service utilization, client orientation, service availability, drugs and supplies, human resource and infrastructure. This indicator represents the share of CHCs that receive a score greater than 3 (out of 5 points) of the total number of CHCs in that State.

Larger States have made substantial incremental progress in increasing the proportion of CHCs with a score of more than 3 points. This, however, could be due to a reporting issue. The grading system was first introduced in 2014-15 (base year), and reporting has improved significantly in 2015-16 (reference year). Many of the Smaller States and UTs (Arunachal Pradesh, Mizoram, Nagaland, Sikkim, Tripura, Andaman and Nicobar, Dadra and Nagar Haveli, Daman and Diu, Delhi and Lakshadweep) are yet to report on this indicator.

Figure 4.62 - Indicator 3.1.8: Proportion of CHCs with grading above 3 points - Larger States



Indicator 3.1.9: Proportion of public health facilities with accreditation certificates by a standard quality assurance program (NQAS/ NABH/ ISO/ AHPI)

To ensure a high quality of health services, the Government of India encourages public health facilities across States to apply for quality assurance programs such as National Quality Assurance Standards (NQAS), National Accreditation Board for Hospitals and Healthcare Providers (NABH), International Organization for Standardization (ISO), and Association of Healthcare Providers (India) (AHPI). The performance of health facilities is assessed against pre-determined standards. Only a few States, namely Bihar, Kerala, Odisha, Tamil Nadu, Arunachal Pradesh, Manipur, and Delhi have initiated accreditation under the standard quality assurance program, but less than 15 percent facilities have been accredited under such programs by any State.

Indicator 3.1.10: Average number of days for transfer of Central National Health Mission (NHM) funds from State Treasury to implementation agency (Department/ Society) based on all tranches of the last financial year

This is an important indicator for assessing the system's efficiency in timely flow of funds to the implementing agencies. The average number of days taken by the State to transfer money to the implementation agency ranged between 0 (Daman & Diu and Lakshadweep) and 287 (Telangana) days. The data came from records and analysis shared by the central NHM finance department of MoHFW. As shown in the graphs below, almost all States and UTs (except Daman & Diu and Lakshadweep) have lengthy delays in transfer of funds from the State Treasury to State health societies, thereby adversely affecting timely implementation of various NHM initiatives. There is a need to take urgent steps to reduce this delay. From base to reference year, Gujarat, Uttarakhand, Bihar, Himachal Pradesh, Rajasthan, West Bengal, Chhattisgarh, Maharashtra, Jharkhand and Punjab have shown good progress (reduction by 19 or more days), whereas delays have increased in Uttar Pradesh, Jammu & Kashmir, Kerala, Andhra Pradesh, Karnataka, Assam, Telangana and in all Smaller States (except Meghalaya and Tripura).

Figure 4.63 - Indicator 3.1.10: Average number of days for transfer of Central NHM funds from State Treasury to implementation agency (Department/ Society) based on all tranches of the last financial year - Larger States

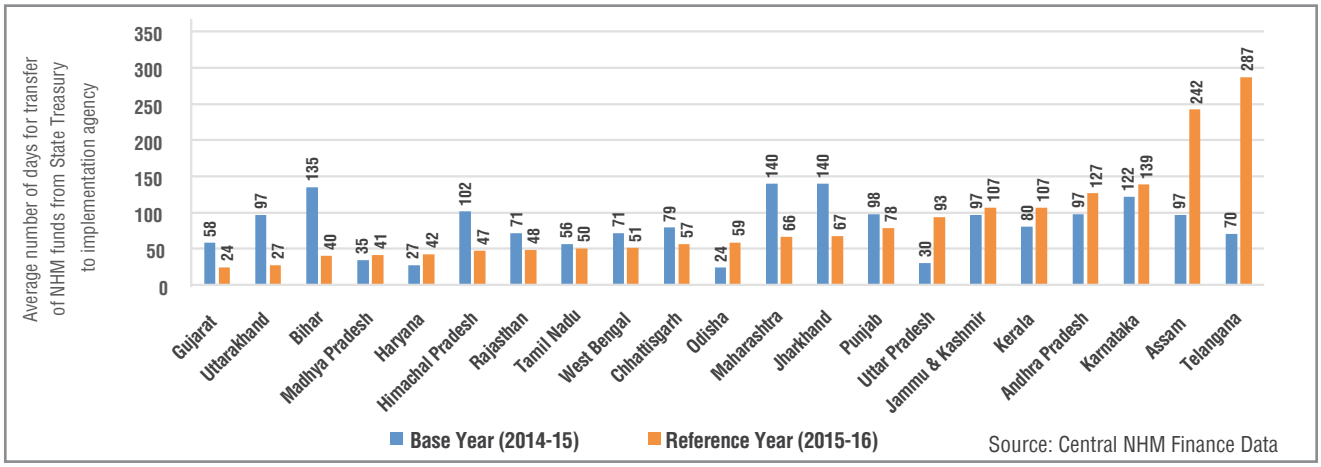
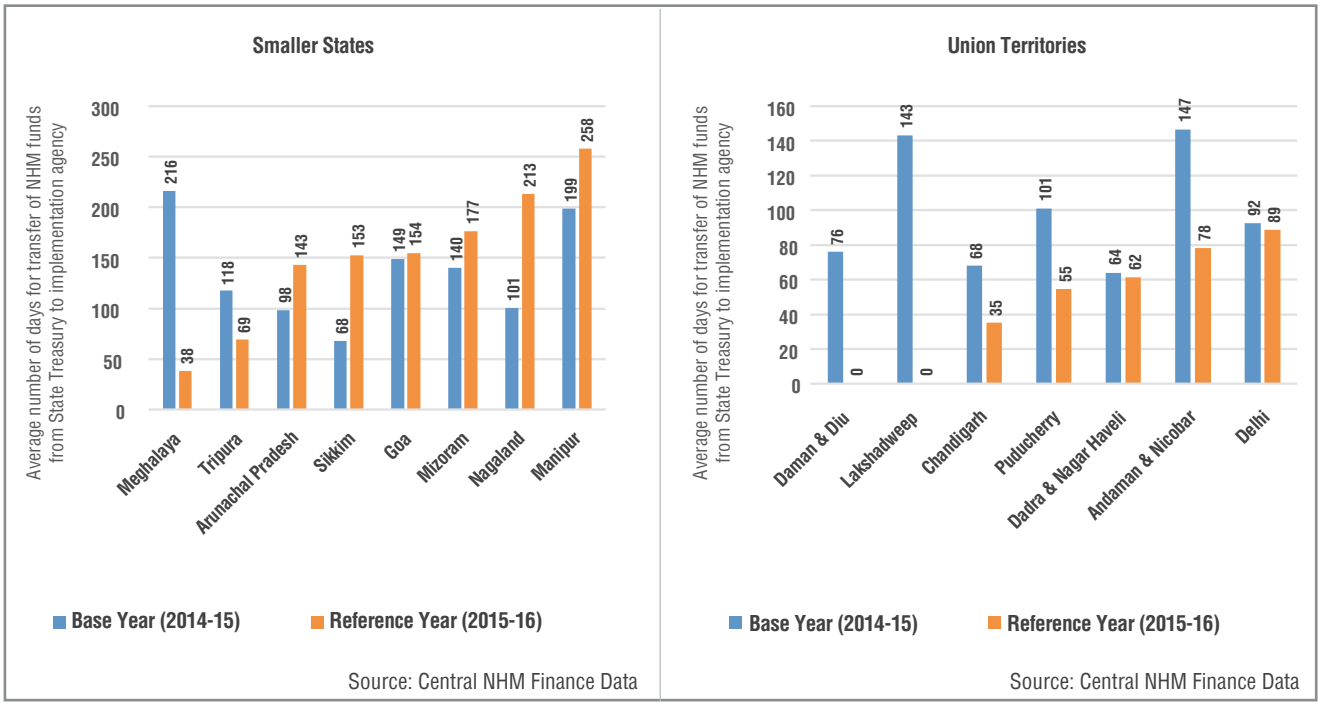


Figure 4.64 - Indicator 3.1.10: Average number of days for transfer of Central NHM funds from State Treasury to implementation agency (Department/ Society) based on all tranches of the last financial year - Smaller States and UTs



Way Forward

5. Institutionalization – taking the Index ahead

The composite Health Index has been prepared and disseminated as a first attempt to promote a co-operative and competitive spirit among the States and UTs to rapidly bring about transformative action in achieving the desired health outcomes. The Health Index will be calculated and disseminated annually, with a focus on measuring and highlighting annual incremental improvements by the States and UTs. The MoHFW has underlined the importance of such an exercise to link the Index with incentives to States and UTs under the NHM. The Index is also a tool for States and UTs to identify problem areas and focus their interventions in these areas.

During the process of development of the Health Index, rich learnings have emerged which will guide the refining of the Index for the coming year. It is envisaged that a thorough review of indicators will be undertaken to include data on new thrust areas and addition of new data sources. The current methodology will also be reconsidered to address some of the limitations listed earlier.

The exercise calls for urgent improvement of the data system in health for timeliness, accuracy and relevance. The quality of HMIS and program-specific MIS data needs to be improved in terms of consistency between Center and State data, coverage of private sector data, data scrutiny, thrust area indicators and data definitions. The MIS also needs strengthening to provide appropriate denominators. For example, the HMIS captures the number of anemic women but does not provide data on the appropriate denominator (i.e. total number of women tested for anemia). Furthermore, the SRS needs to generate data in a timely manner and should explore the possibility of generating the data on key health outcomes including NMR, U5MR, TFR, MMR and SRB for all States and UTs. Data sourced at the State-level on key areas such as human resources and finances needs to be strengthened in terms of availability and its quality. Thus, in the successive rounds, continuous improvement of both the methods and the data will be undertaken to make the Index better.

ANNEXURES

Annexure 1: Discrepancies in data and resolution

The data was finalized by the IVA after resolution of all discrepancies in consultation with State and Central governments, who, after thorough review of the data and supporting documentation, identified gaps and data discrepancies which were then discussed with state nodal officers (SNOs) and State-level authorities. A State-specific validation report was prepared and shared with the Principal Secretaries, Mission Directors and SNOs highlighting the results of the validation exercise. The States were requested to review the validation report and provide feedback. Subsequently, the IVA also presented the validation results through five video conferences held during August 16-18, 2017, with groups of 7-8 States to share the findings and discuss discrepancies, data gaps, variations and deviations.

Specific issues encountered during validation were discussed with stakeholders (NITI Aayog, MoHFW, the World Bank, validation agency and subject experts) and the following decisions were taken:

- For States that have achieved replacement level of fertility (TFR≤2.1), it was decided to assign the weight of this indicator on a pro-rata basis to the remaining parameters in that sub-domain, i.e. key health outcomes.

- For service delivery indicators, such as 'full immunization', 'institutional delivery', 'ANC registered within first trimester', and 'people living with HIV on antiretroviral therapy,' in instances where percentages exceeded 100 percent, it was decided to cap them at 100 percent.

- For calculating the functionality of FRUs and 24x7 PHCs, the denominator was captured as the required number of FRUs and 24x7 PHCs as per MOHFW norms of one FRU per 500,000 population and one 24x7 PHC per 100,000 population.

- CHC grading for Dadra & Nagar Haveli (reference year), Kerala and Tamil Nadu (base year) was not available and the value against this indicator for that specific year was considered as not applicable (NA). The weight of the indicator was distributed among other indicators in that domain.

- In several States, the specified health worker positions were not sanctioned and/or overlapped with other functions. Lakshadweep for example, did not have a sanctioned position of a CMO or a Medical Superintendent. Therefore, for Lakshadweep this indicator was considered as NA. In Dadra & Nagar Haveli, the Director of Health was also in charge of the District Hospital and thus his tenure was considered for CMO as well. In Tripura and Himachal Pradesh, there were no designated specialist positions (with General Duty Medical Officers filling the positions of specialists), and hence the IVA accepted the NA entry submitted against the vacancy of specialist. In the case of Chandigarh, in place of sanctioned positions the required number of specialists was used for the denominator. Uttar Pradesh and Bihar did not share the total number of staff (regular and contractual) for Indicator 3.1.2 on HRMIS generated e-payslip and thus the IVA treated the entry as zero.

Annexure 2: Original Health Index

At the launch of the *Guidebook on Performance on Health Outcomes*[10] in December 2016, the Index comprised 28 indicators. Table A.2.1 provides an overview of the original set of indicators. However, this Index was subsequently revised as described in Section 2, Table 2.3 and the revised Index has been used for the generation of ranks.

Based on issues related to availability and quality of data, certain indicators had to be excluded or modified from the original Index and the rationale for this is summarized at the end of the table.

Table A.2.1 - Original Health Index indicators: A snapshot

Domain	Sub-domain	Number of Indicators	Weight
Health Outcomes	Key Outcomes	07	700
	Intermediate Outcomes	07	350
Governance and	Health Monitoring and Data Integrity	01	70
Information	Governance	02	60
Key Inputs/ Processes	Health Systems/Service Delivery	11	220
TOTAL		28	1400

Table A.2.2 - Original Health Index: Indicators, definitions and data sources

Indicators	Definition	Data Source	Remarks
DOMAIN 1 - HEALTH OUTCOMES			
Sub-domain 1.1 - Key Outcomes (Weight – 700)			
Still Birth Rate (SBR)	Number of still births per thousand live births during a specific year.	SRS	Excluded in final Health Index
Neonatal Mortality Rate (NMR)	Number of infant deaths of less than 29 days per thousand live births during a specific year.	SRS	
Under-five Mortality Rate (U5MR)	Number of child deaths of less than 5 years per thousand live births during a specific year.	SRS	
Maternal Mortality Ratio (MMR)	Number of maternal deaths from any cause related to or aggravated by pregnancy or its management during pregnancy, childbirth, or within 42 days of termination of pregnancy, per 100,000 live births during the specific period.	SRS	Excluded in final Health Index
Total Fertility Rate (TFR)	Average number of children that would be born to a woman if she experiences the current fertility pattern throughout her reproductive span (15-49 years), during a specific year.	SRS	
Proportion of Low Birth Weight among newborns	Proportion of low birth weight (<=2.5 kg) newborns out of the total number of newborns weighed during a specific year.	HMIS	
Sex Ratio at Birth (SRB)	The number of girls born for every 1,000 boys born during a specific year.	SRS	
Sub-domain 1.2 - Intermediate Outcomes (Weight – 350)			
Full immunization coverage	Proportion of infants 9-11 months old who have received BCG, 3 doses of DPT, 3 doses of OPV and measles against estimated number of infants during a specific year.	HMIS	

[10] Performance on Health Outcomes, A Reference Guidebook, NITI Aayog, December 2016.

Indicators	Definition	Data Source	Remarks
Proportion of institutional deliveries	Proportion of deliveries conducted in public and private health facilities against the number of estimated deliveries during a specific year.	HMIS	
Proportion of pregnant women aged 15-49 years who are anemic	Proportion of pregnant women aged 15-49 years who are anemic (<11.0 g/dl) against total number of pregnant women registered for ANC during a specific year.	HMIS	Excluded in final Health Index
Total case notification rate of tuberculosis (TB)	Number of new and relapsed TB cases notified (public + private) per 100, 000 population during a specific year.	RNTCP MIS	Indicator source modified as 'RNTCP MIS, MoHFW data'
Treatment success rate of new microbiologically confirmed TB cases	Proportion of new cured and their treatment completed against the total number of new microbiologically confirmed TB cases registered during a specific year.	RNTCP MIS	Indicator source modified as 'RNTCP MIS, MoHFW data'
Proportion of people living with HIV (PLHIV) on antiretroviral therapy (ART)	Proportion of PLHIV receiving ART treatment against the number of estimated PLHIVs who needed ART treatment for the specific year.	NACO State Report	Excluded for the category of UTs
Out-of-pocket expenditure on drugs and diagnostics incurred per delivery in public health facilities (using pregnant women as proxy to all patients)	Average out-of-pocket expenditure (INR) on drugs and diagnostics incurred per delivery in public health facilities during a specific year.	Mother and Child Tracking Facilitation Centre (MCTFC)	Excluded in final Index for incremental ranking; Retained for reference year ranking only
DOMAIN 2 – GOVERNANCE AND INFORMATION			
Sub-domain 2.1 – Health Monitoring and Data Integrity (Weight – 70)			
Data Integrity Measure: a. Institutional deliveries b. ANC registered within first trimester	Percentage deviation of reported data from standard survey data to assess the quality/ integrity of reported data for a specific period.	HMIS and NFHS-4	
Sub-domain 2.2 – Governance (Weight – 60)			
Average occupancy of an officer (in months), combined for following three key posts at State-level for last three years: 1. Principal Secretary 2. Mission Director (NHM) 3. Director (Health Services)	Average occupancy of an officer (in months), combined for following key posts at State-level in last three years: 1. Principal Secretary 2. Mission Director (NHM) 3. Director (Health Services)	State Report	
Average occupancy of a full-time officer (in months) for all the districts in last three years - District Chief Medical Officers (CMOs) or equivalent post (heading District Health Services)	Average occupancy of a full time CMO (in months) for all the districts in last three years.	State Report	

Indicators	Definition	Data Source	Remarks
DOMAIN 3 – KEY INPUTS/PROCESSES			
Sub-domain 3.1 – Health Systems/Service Delivery (Weight – 220)			
Proportion of vacant health care provider positions (regular + contractual) in public health facilities	Vacant healthcare provider positions in public health facilities against total sanctioned health care provider positions for following cadres (separately for each cadre) during a specific year: a. ANMs at sub-centres (SCs) b. Staff nurse at Primary Health Centers (PHCs) and Community Health Centers (CHCs) c. MOs at PHCs d. Specialists at DH (Medicine, Surgery, Obstetrics and Gynaecology, Pediatrics, Anesthesia, Ophthalmology, Radiology, Pathology, ENT, Dental, Psychiatry)	State Report	
Proportion of total staff (regular + contractual) for whom an e-payslip can be generated in the IT enabled Human Resources Management Information System (HRMIS)	Proportion of staff (regular + contractual)for whom an e-payslip can be generated in the IT enabled HRMIS against total number of staff (regular + contractual) during a specific year.	State Report	
a. Proportion of specified type of facilities functioning as First Referral Units (FRUs)	Proportion of facilities of specified type conducting specified number of C-sections per year (FRUs) against total number of specified type of facilities (CHCs, SDHs, DHs) during a specific year.	HMIS	Indicator definition modified
b. Proportion of functional 24x7 PHCs	Proportion of PHCs providing all stipulated healthcare services round the clock against total number of PHCs during a specific year.	MIS Report, MoHFW	Indicator definition modified
Proportion of districts with functional Cardiac Care Units (CCUs)	Proportion of districts with functional CCUs [with desired equipment (ventilator, monitor, defibrillator, CCU beds, portable ECG machine, pulse oxymeter etc.), drugs, diagnostics and desired staff as per programme guidelines] against total number of districts.	State Report	
Proportion of ANC registered within first trimester against total registrations	Proportion of pregnant women registered for ANC within 12 weeks of pregnancy during a specific year.	HMIS	
Level of registration of births	Proportion of births registered under Civil Registration System (CRS) against the estimated number of births during a specific year.	CRS	
Completeness of IDSP reporting of P and L forms	Proportion of Reporting Units (RUs) reporting in stipulated time period against total RUs, for P and L forms during a specific year.	IDSP Report	Indicator source modified as 'Central IDSP, MoHFW data'
Proportion of CHCs with grading above 3 points	Proportion of CHCs that are graded above 3 points against total number of CHCs during a specific year.	HMIS	
Proportion of public health facilities with accreditation certificates by a standard quality assurance program (NQAS/ NABH/ ISO/ AHPI)	Proportion of specified type of public health facilities with accreditation certificates by a standard quality assurance program against the total number of following specified type of facilities during a specific year. 1. District hospital (DH)/ Sub-district hospital (SDH) 2. CHC/ Block PHC	State Report	

Indicators	Definition	Data Source	Remarks
Average number of days for transfer of Central NHM funds from State Treasury to implementation agency (Department/ Society) based on all tranches of the last financial year	Average time taken (in number of days) by the State Treasury to transfer funds to implementation agencies during a specific year.	State Report	Indicator source modified as 'Central NHM Finance data'
Proportion of National Health Mission (NHM) funds utilized by the end of 3rd quarter	Proportion of funds utilized against the total funds allocated under NHM by the end of 3rd quarter of specific year.	State Report	Excluded in final Health Index

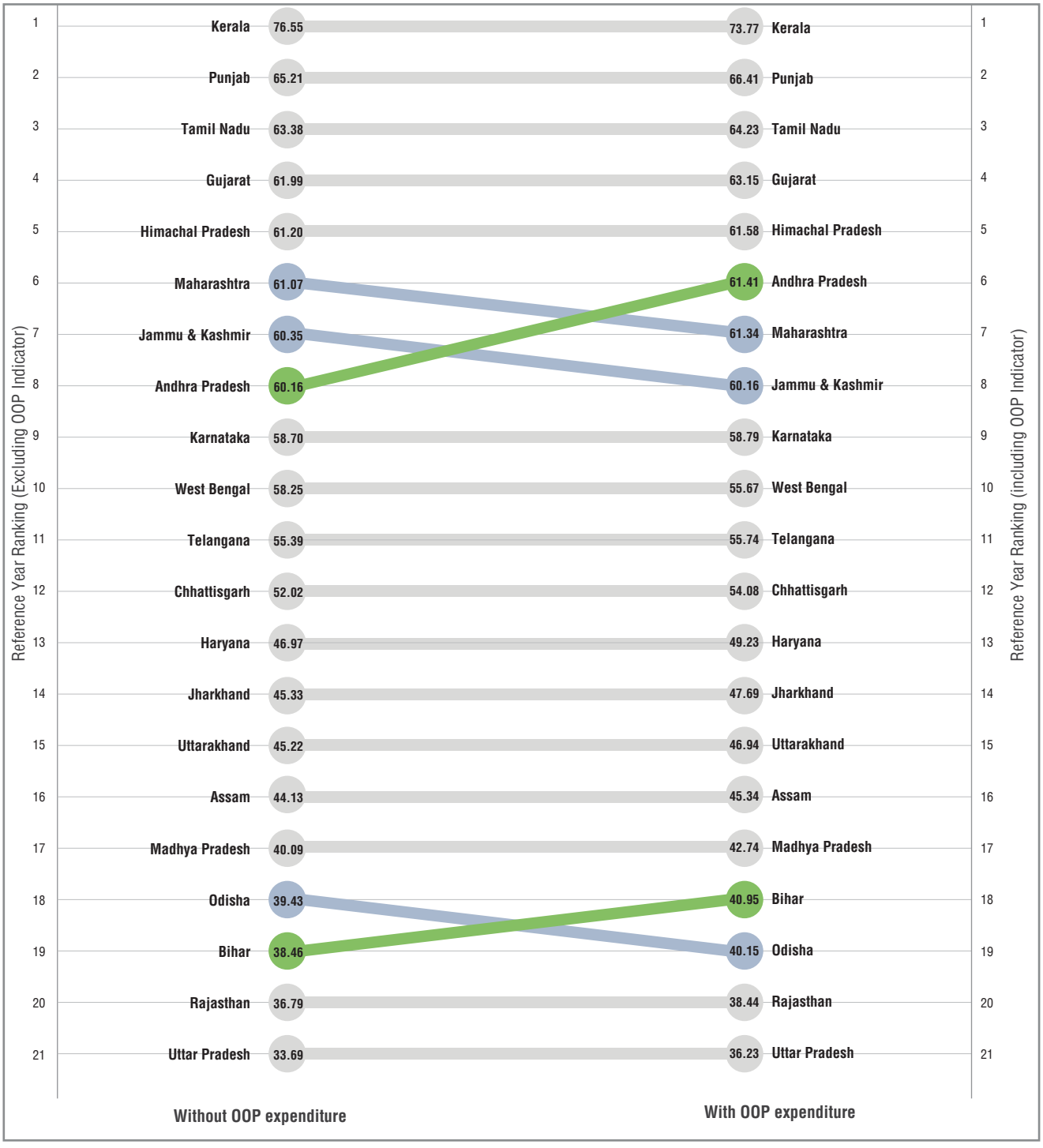
The estimates for SRS-related indicators such as NMR, U5MR, TFR, MMR and SRB in the Index were not available for Smaller States and UTs. Experts were consulted to generate estimates for these States and UTs from the SRS raw data obtained by NITI Aayog. However, it was decided that these estimates could not be generated due to the insufficient sample size. Further, in the Larger States category, MMR estimates were not available separately for eight states, which belonged previously to four undivided States, and also not available for Himachal Pradesh and Jammu & Kashmir. In the case of Still Birth Rate (SBR), the States as well as the IVA reported that data for this indicator was unreliable. In case of the indicator 'proportion of pregnant women age 15-49 years who are anemic', data on the appropriate denominator (i.e. total number of women tested for anemia) was not available in the HMIS. Besides, the indicator for 'proportion of people living with HIV (PLHIV) on ART' was excluded for the UTs category since no ART center was available in four UTs. For the indicator 'proportion of NHM funds utilized by the end of 3rd quarter', neither State nor central level data was found to be valid.

For the sake of uniformity and comparability across the States, central data was used for a few indicators such as 'proportion of people living with HIV (PLHIV) on antiretroviral therapy (ART)', 'average number of days for transfer of central NHM funds from State Treasury to implementation agency' and 'completeness of IDSP reporting of P and L forms'. The NFHS-4 data for the indicator 'out-of-pocket expenditure on drugs and diagnostics incurred per delivery in public health facilities' was used in the reference year Index. However, for the base year, this data was not available and could therefore not be factored in for generating base year ranks or incremental ranks or drawing comparisons between the base and reference years.

Annexure 3: Reference Year Index (with and without the indicator on out-of-pocket expenditure)

As described in the background section, the OOP expenditure data was available only for 2015-16 and hence was used to calculate the reference year Index and rank independently. Overall, the inclusion of the OOP expenditure indicator in the Index score calculations does not substantially change the rankings (Figure A.3.1). The only exceptions are Andhra Pradesh and Bihar which, after the inclusion of OOP expenditure, move up by two and one positions, respectively; while Maharashtra, Jammu & Kashmir, and Odisha move down by one position in the ranking.

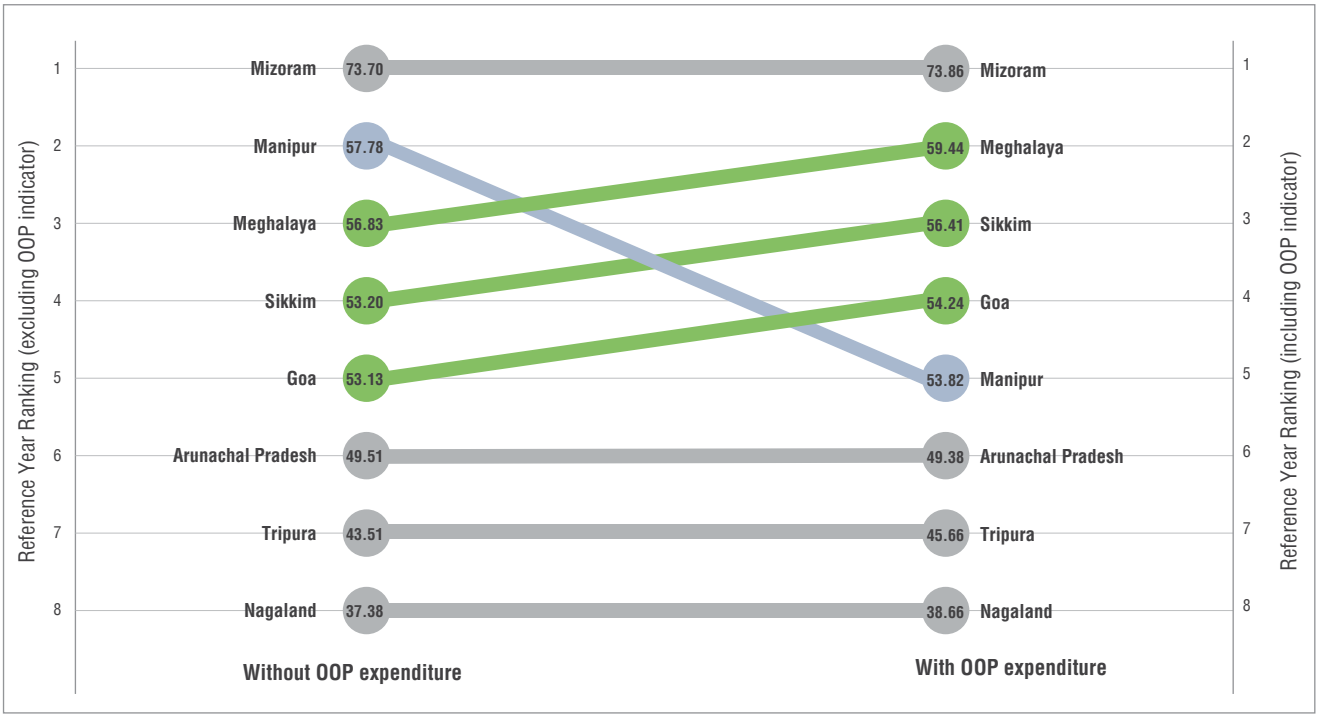
Figure A.3.1 - Larger States: Ranking for reference year (2015-16) with and without the OOP expenditure indicator



Note: Lines depict changes in composite Index score rank. The composite Index score is presented in the circle.

For the Smaller States, the inclusion of OOP expenditure in the Health Index results in some changes in the rankings (Figure A.3.2), whereby Meghalaya, Sikkim, and Goa move up by one position, while Manipur falls by three positions (from second to fifth place).

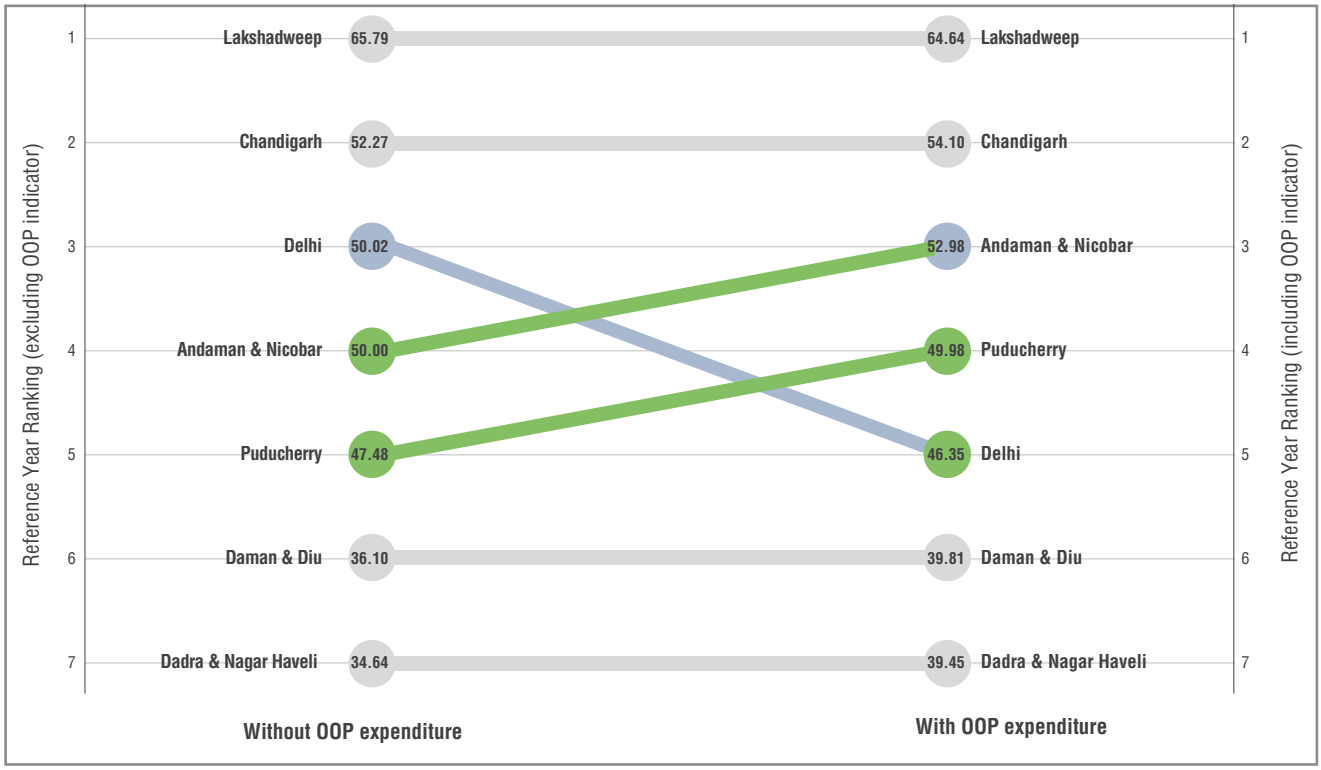
Figure A.3.2 - Smaller States: Ranking for reference year (2015-16) with and without OOP expenditure indicator



Note: Lines depict changes in composite Index score rank. The composite Index score is presented in the circle.

The inclusion of the OOP expenditure indicator in calculation of the Health Index results in some changes in the reference year ranking among the UTs (Figure A.3.3). Notably, Andaman & Nicobar and Puducherry move up by one position in the ranking, while Delhi moves down by two positions. The inclusion of OOP expenditure does not affect the rankings of the other UTs.

Figure A.3.3 - Union Territories: Ranking for reference year (2015-16) with and without OOP expenditure indicator



Note: Lines depict changes in composite Index score rank. The composite Index score is presented in the circle.

Annexure 4: Snapshot: State-wise performance on indicators

Section 4 of the report on 'Unveiling performance - encouraging actions', provided insights about the State-wise overall, incremental and domain-specific performance. This Annexure presents a quick snapshot of State-wise performance on all indicators included in the Index. This can help the States to easily identify specific areas requiring attention. The tables present data for base year (BY) and reference year (RY) of each indicator for all States. The direction as well as the magnitude of incremental change in the value of indicators from the base year to reference year is depicted by categorization ('most improved', 'improved', 'no change', 'deteriorated', 'most deteriorated', 'not applicable') and is visually identifiable by appropriate color coding.

1. Incremental change in performance for an indicator is calculated by subtracting base year value from reference year value. For indicators, such as NMR, U5MR, and vacancies, a negative change from base to reference year denotes improvement, while a positive change denotes deterioration. In the case of indicators such as those that reflect service coverage, a positive change denotes improvement, while a negative change denotes deterioration. The range of improvement is calculated by subtracting the minimum value of change from the maximum value of change. This range is then divided into two equal parts and the half towards maximum value of change is termed as 'most improved' and the half towards the minimum value of change is termed as 'improved'.

2. Similarly, the range of deterioration is calculated by subtracting the minimum value of change from the maximum value of change. This range is then divided into two equal parts and the half towards maximum value of change is termed as 'deteriorated' and the other half towards minimum value of change is termed as 'most deteriorated' respectively. If the indicator value is stagnant and there has been no incremental change from base to reference year, the indicator is labeled as 'no change'.

3. For a State, the incremental performance on an indicator is classified as 'not applicable' (NA) in instances such as: (i) If State has achieved TFR <= 2.1 in both base and reference years; (ii) Data Integrity Measure indicator wherein the same data has been used for base year and reference year due to overlapping periods of NFHS-4; (iii) Service coverage indicators with 100 percent values in both base and reference years; (iv) The data value for a particular indicator is NA in base year or reference year or both.

Table A.4.1 - Larger States: Health Outcomes domain indicators, base and reference years

States	1.1.1 NMR (per '000 live births)		1.1.2 U5MR (per '000 live births)		1.1.3 TFR*		1.1.4 LBW (percentage)		1.1.5 SRB (no. of girls born for every 1,000 boys born)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andhra Pradesh	26	24	40	39	1.8	1.7	5.62	6.73	919	918
Assam	26	25	66	62	2.3	2.3	18.19	16.68	918	900
Bihar	27	28	53	48	3.2	3.2	6.70	7.22	907	916
Chhattisgarh	28	27	49	48	2.6	2.5	11.61	12.15	973	961
Gujarat	24	23	41	39	2.3	2.2	10.58	10.51	907	854
Haryana	23	24	40	43	2.3	2.2	14.61	14.90	866	831
Himachal Pradesh	25	19	36	33	1.7	1.7	8.66	12.63	938	924
Jammu & Kashmir	26	20	35	28	1.7	1.6	6.33	5.93	899	899
Jharkhand	25	23	44	39	2.8	2.7	7.81	7.42	910	902
Karnataka	20	19	31	31	1.8	1.8	10.76	11.49	950	939
Kerala	6	6	13	13	1.9	1.8	10.81	11.72	974	967
Madhya Pradesh	35	34	65	62	2.8	2.8	14.16	14.10	927	919
Maharashtra	16	15	23	24	1.8	1.8	14.57	13.74	896	878
Odisha	36	35	60	56	2.1	2.0	20.10	19.16	953	950
Punjab	14	13	27	27	1.7	1.7	5.95	6.88	870	889
Rajasthan	32	30	51	50	2.8	2.7	27.43	25.51	893	861
Tamil Nadu	14	14	21	20	1.7	1.6	10.46	13.03	921	911
Telangana	25	23	37	34	1.8	1.8	6.11	5.70	919	918
Uttar Pradesh	32	31	57	51	3.2	3.1	11.74	9.60	869	879
Uttarakhand	26	28	36	38	2.0	2.0	7.77	7.26	871	844
West Bengal	19	18	30	30	1.6	1.6	15.48	16.45	952	951

**The data shown in grey color is for 'not applicable' category wherein the States with TFR <= 2.1 (replacement level fertility) in both base and reference years are not considered for incremental change.

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable

Table A.4.1 (Continued) - Larger States: Health Outcomes domain indicators, base and reference years

States	1.2.1 Full immunization (percentage)		1.2.2 Institutional deliveries (percentage)		1.2.3 TB case notification rate (per 100,000 population)		1.2.4 TB treatment success rate (percentage)		1.2.5 PLHIV on ART (percentage)		1.2.6 OOP expenditure (in INR)#
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	RY
Andhra Pradesh	97.58	91.62	53.09	87.08	136	145	90.40	88.50	72.39	76.11	2138
Assam	84.10	88.00	72.70	74.25	122	123	85.40	86.20	58.94	64.58	3210
Bihar	82.10	89.73	52.96	57.10	72	84	89.00	89.70	30.73	37.18	1724
Chhattisgarh	85.81	90.53	59.64	64.51	128	138	88.20	89.10	47.20	53.06	1480
Gujarat	90.26	90.55	90.83	97.78	170	193	88.50	88.90	50.23	52.43	2136
Haryana	82.54	83.47	80.76	80.25	165	172	86.00	87.50	52.31	51.53	1503
Himachal Pradesh	94.90	95.22	67.50	67.49	210	207	89.70	89.60	79.22	79.89	3329
Jammu & Kashmir	89.80	100.00	81.45	80.51	74	72	87.60	88.30	88.72	96.41	4192
Jharkhand	80.82	88.10	60.52	67.36	100	108	89.80	90.90	36.07	39.40	1476
Karnataka	92.30	96.24	77.12	78.78	100	105	83.30	84.70	83.25	88.68	3893
Kerala	95.50	94.61	95.99	92.62	87	139	86.00	87.50	61.79	66.72	6901
Madhya Pradesh	74.26	74.78	63.07	64.79	143	164	89.70	90.30	53.04	61.01	1387
Maharashtra	98.55	98.22	89.19	85.30	155	164	83.90	84.20	83.46	87.71	3487
Odisha	88.03	85.32	74.76	73.49	106	99	87.40	88.90	28.33	32.95	4225
Punjab	96.08	99.64	83.23	82.33	137	136	86.90	87.20	77.22	84.62	1890
Rajasthan	78.95	78.06	74.67	73.85	139	143	90.40	90.30	42.44	46.41	3052
Tamil Nadu	85.54	82.66	85.97	81.82	113	125	82.30	85.40	81.93	87.06	2496
Telangana	100.00	89.09	59.15	85.35	113	123	90.00	89.60	72.39	76.11	4020
Uttar Pradesh	82.88	84.82	43.55	52.38	123	137	88.20	87.50	51.30	57.81	1956
Uttarakhand	91.77	99.30	64.32	62.63	145	138	85.50	86.00	62.67	65.25	2399
West Bengal	100.00	95.85	79.92	81.28	93	93	86.40	86.50	31.00	35.92	7782

#Data for this indicator is available and used only for reference year and hence this indicator comes under 'not applicable' category.

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable

Table A.4.2 - Larger States: Governance and Information domain indicators, base and reference years

States	2.1.1.a Data Integrity: Institutional deliveries (percentage)		2.1.1.b Data Integrity: First trimester ANC registration (percentage)		2.2.1 Average occupancy: State-level 3 key posts (in months)		2.2.2 Average occupancy: CMOs (in months)	
	BY**	RY	BY**	RY	BY	RY	BY	RY
Andhra Pradesh	23.53	23.53	15.42	15.42	17.70	17.51	12.80	13.22
Assam	0.25	0.25	21.16	21.16	10.17	12.11	7.92	7.95
Bihar	18.21	18.21	16.33	16.33	15.00	13.01	17.62	11.88
Chhattisgarh	22.34	22.34	25.90	25.90	11.39	11.40	21.88	25.40
Gujarat	0.68	0.68	2.06	2.06	20.22	20.71	18.68	18.09
Haryana	4.62	4.62	19.08	19.08	13.80	11.21	13.43	12.56
Himachal Pradesh	12.72	12.72	7.30	7.30	11.38	12.39	13.86	10.50
Jammu & Kashmir	12.42	12.42	13.50	13.50	22.80	13.81	11.72	11.77
Jharkhand	7.95	7.95	53.48	53.48	12.98	12.00	11.19	11.46
Karnataka	21.22	21.22	8.20	8.20	6.85	6.49	14.83	13.23
Kerala	3.71	3.71	24.86	24.86	21.84	12.02	16.47	11.72
Madhya Pradesh	23.09	23.09	9.19	9.19	10.75	16.00	18.14	17.62
Maharashtra	1.16	1.16	5.61	5.61	10.86	15.74	12.25	15.64
Odisha	13.82	13.82	22.09	22.09	11.07	12.01	9.97	13.95
Punjab	12.41	12.41	9.97	9.97	20.00	20.42	9.12	10.19
Rajasthan	12.44	12.44	18.43	18.43	19.00	22.02	12.26	11.94
Tamil Nadu	10.92	10.92	22.75	22.75	11.94	16.51	6.85	7.29
Telangana	21.06	21.06	15.80	15.80	8.71	7.81	11.72	11.19
Uttar Pradesh	36.59	36.59	0.92	0.92	9.62	19.64	11.57	14.15
Uttarakhand	14.93	14.93	10.77	10.77	10.65	10.35	11.63	13.93
West Bengal	2.12	2.12	42.44	42.44	22.00	28.02	10.29	14.10

** Same data has been used for base and reference years due to overlapping periods of NFHS-4. Hence this indicator comes under 'not applicable' category.

Table A.4.3 - Larger States: Key Inputs/Processes domain indicators, base and reference years

States	3.1.1.a Vacancy: ANMs at SCs (percentage)		3.1.1.b Vacancy: SNs at PHCs and CHCs (percentage)		3.1.1.c Vacancy: MOs at PHCs (percentage)		3.1.1.d Vacancy: Specialists at DHs (percentage)		3.1.2 E-payslip (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andhra Pradesh	20.56	15.67	17.33	20.48	17.97	12.76	40.55	30.41	59.60	58.65
Assam	10.93	8.99	4.57	8.95	19.92	17.77	62.91	41.72	0.00	0.00
Bihar	67.86	59.30	86.15	50.28	63.60	63.60	64.96	60.58	0.00	0.00
Chhattisgarh	12.35	9.23	44.27	37.28	41.83	45.02	77.98	77.68	0.00	0.00
Gujarat	17.13	28.08	37.71	36.46	39.78	32.03	51.02	55.50	35.60	35.61
Haryana	9.66	15.23	45.95	43.24	38.64	25.35	0.00	0.00	0.00	0.00
Himachal Pradesh	12.57	9.87	21.51	27.19	16.19	21.73	NA	NA	3.32	8.07
Jammu & Kashmir	17.65	10.28	42.88	27.48	34.92	30.15	24.52	22.22	0.00	0.00
Jharkhand	19.57	19.73	71.80	74.94	45.29	48.67	55.37	50.32	0.00	0.00
Karnataka	27.85	22.59	45.20	25.97	13.35	11.48	20.90	21.53	48.89	49.35
Kerala	4.88	4.49	5.54	5.30	5.59	5.86	22.15	21.48	88.61	100.00
Madhya Pradesh	8.58	14.23	36.45	33.50	57.81	58.34	50.56	50.98	0.00	0.00
Maharashtra	8.25	9.46	16.74	15.67	16.82	16.96	19.47	30.34	66.55	67.60
Odisha	0.00	0.00	0.00	0.00	23.17	26.91	43.53	19.04	75.79	75.79
Punjab	7.17	8.48	36.22	33.98	9.83	7.77	21.74	47.72	0.00	0.00
Rajasthan	36.12	19.24	48.12	47.26	14.93	14.86	41.47	45.77	0.00	0.00
Tamil Nadu	11.82	15.97	21.78	19.09	7.56	7.58	17.86	16.73	84.62	84.72
Telangana	20.20	18.01	12.79	12.79	22.31	22.31	59.83	54.81	0.00	0.00
Uttar Pradesh	14.06	0.00	1.89	1.89	36.83	26.73	35.74	32.41	0.00	0.00
Uttarakhand	15.47	16.88	13.11	20.02	37.16	12.19	38.30	60.33	0.00	0.00
West Bengal	2.16	0.77	25.72	9.70	48.43	41.23	22.97	20.18	81.78	81.23

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable

Table A.4.3 (Continued) - Larger States: Key Inputs/Processes domain indicators, for base and reference years

States	3.1.3.a Functional FRUs (percentage)		3.1.3.b Functional 24x7 PHCs (percentage)		3.1.4 Districts with functional CCUs (percentage)		3.1.5 Proportion of first trimester ANC (percentage)		3.1.6 Level of birth registration (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andhra Pradesh	48.48	57.58	33.20	29.15	53.85	53.85	64.42	74.38	98.50	100.00
Assam	67.74	72.58	169.55	176.92	0.00	0.00	77.24	80.55	97.70	100.00
Bihar	12.50	11.54	70.89	73.58	0.00	0.00	51.43	55.47	57.40	64.20
Chhattisgarh	21.57	23.53	36.47	40.39	3.70	3.70	59.99	74.60	87.80	100.00
Gujarat	32.23	42.98	27.81	31.46	57.69	48.48	73.58	74.91	100.00	95.00
Haryana	52.94	50.98	73.62	77.56	19.05	19.05	57.68	62.20	100.00	100.00
Himachal Pradesh	107.14	121.43	5.80	5.80	91.67	91.67	78.62	81.39	100.00	93.10
Jammu & Kashmir	180.00	196.00	53.60	45.60	18.18	27.27	54.37	52.95	71.80	75.50
Jharkhand	15.15	22.73	33.03	33.03	0.00	0.00	33.67	36.36	77.70	82.00
Karnataka	105.74	116.39	78.07	69.23	43.33	43.33	72.82	71.22	96.00	97.80
Kerala	120.90	120.90	0.00	0.00	64.29	64.29	80.98	80.63	100.00	100.00
Madhya Pradesh	44.83	49.66	58.40	56.47	9.80	9.80	61.54	63.79	84.10	82.60
Maharashtra	31.11	32.44	48.04	46.71	22.86	22.86	63.58	66.82	100.00	100.00
Odisha	61.90	65.48	30.00	30.00	3.33	3.33	68.48	75.75	93.90	98.50
Punjab	138.18	141.82	35.74	26.35	63.64	63.64	71.16	73.01	100.00	100.00
Rajasthan	23.36	29.20	67.30	68.03	2.94	70.59	58.50	60.66	98.40	98.20
Tamil Nadu	129.17	122.92	54.23	34.95	56.25	56.25	92.72	94.35	100.00	100.00
Telangana	80.00	80.00	26.99	26.99	0.00	0.00	61.26	55.90	100.00	95.60
Uttar Pradesh	15.25	15.75	17.92	17.42	0.00	0.00	51.19	48.72	68.60	68.30
Uttarakhand	100.00	95.00	56.44	54.46	0.00	0.00	59.06	62.47	76.60	86.00
West Bengal	45.36	49.18	5.70	5.91	76.92	76.92	73.03	77.00	92.80	92.50

Table A.4.3 (Continued) - Larger States: Key Inputs/Processes domain indicators, base and reference years

States	3.1.7 IDSP reporting of P form (percentage)		3.1.7 IDSP reporting of L form (percentage)		3.1.8 CHC grading (percentage)		3.1.9 Quality accreditation DH-SDH (percentage)		3.1.9 Quality accreditation CHC-PHC (percentage)		3.1.10 Fund transfer (no. of days)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andhra Pradesh	94	99	94	99	1.02	37.24	0.00	0.00	0.00	0.00	97	127
Assam	92	88	92	88	4.64	31.13	0.00	0.00	0.00	0.00	97	242
Bihar	83	88	83	87	0.00	20.34	27.16	27.16	2.36	1.52	135	40
Chhattisgarh	77	84	66	82	3.23	47.74	0.00	0.00	0.00	0.00	79	57
Gujarat	96	95	98	96	10.25	49.40	6.35	2.99	1.24	0.60	58	24
Haryana	89	84	90	88	10.09	22.02	0.00	0.00	0.00	0.00	27	42
Himachal Pradesh	41	66	35	62	2.53	5.06	0.00	1.37	0.00	0.00	102	47
Jammu & Kashmir	66	80	61	75	7.14	61.90	0.00	0.00	0.00	0.00	97	107
Jharkhand	69	73	68	72	1.55	54.40	0.00	0.00	0.00	0.00	140	67
Karnataka	82	95	82	94	25.34	31.27	0.00	0.53	0.00	0.00	122	139
Kerala	94	96	93	96	NA	0.44	10.00	10.00	5.07	6.52	80	107
Madhya Pradesh	81	80	82	80	8.98	57.19	0.00	0.00	0.29	0.57	35	41
Maharashtra	71	79	72	76	16.67	38.52	0.00	0.00	0.27	0.27	140	66
Odisha	66	83	63	74	9.81	22.81	15.25	15.25	0.00	0.00	24	59
Punjab	77	73	93	85	12.00	26.67	0.00	0.00	0.00	0.00	98	78
Rajasthan	59	73	57	68	3.19	54.48	0.00	0.00	0.00	0.00	71	48
Tamil Nadu	70	90	72	87	NA	76.10	0.74	4.29	7.27	4.94	56	50
Telangana	94	97	94	95	0.00	11.63	0.00	0.00	0.00	0.00	70	287
Uttar Pradesh	64	42	70	57	4.53	44.13	0.00	0.00	0.00	0.00	30	93
Uttarakhand	88	93	84	93	1.67	8.33	0.00	0.00	0.00	0.00	97	27
West Bengal	65	78	72	80	3.49	53.74	0.00	0.00	0.00	0.00	71	51

Table A.4.4 - Smaller States: Health Outcomes domain indicators, base and reference years

States	1.1.4 LBW (percentage)		1.2.1 Full immunization (percentage)		1.2.2 Institutional deliveries (percentage)		1.2.3 TB case notification rate (per 100,000 population)		1.2.4 TB treatment success rate (percentage)		1.2.5 PLHIV on ART (percentage)		1.2.6 OOP expenditure (in INR)#
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	RY
Arunachal Pradesh	5.79	6.55	60.58	64.95	55.99	56.46	186	183	88.00	86.40	18.69	28.19	6474
Goa	16.72	15.56	91.26	95.24	91.27	92.46	127	131	86.40	87.30	70.92	72.75	4836
Manipur	3.90	3.53	94.39	96.32	74.93	73.47	82	81	85.00	82.60	53.95	63.87	10076
Meghalaya	8.19	7.65	96.43	93.34	59.57	62.11	170	137	82.30	85.80	98.66	100.00	2892
Mizoram	4.73	4.65	100.00	100.00	100.00	96.29	183	186	86.50	90.60	96.68	100.00	4327
Nagaland	4.10	3.89	61.91	63.86	56.95	58.07	173	139	90.70	71.90	63.81	73.80	5834
Sikkim	6.78	7.76	74.07	74.44	71.96	70.19	222	241	78.80	77.20	32.45	33.51	2509
Tripura	10.56	11.11	87.43	84.33	78.48	79.36	195	61	88.60	88.50	23.14	5.80	4412

#Data for this indicator is available and used only for reference year and hence this indicator comes under 'not applicable' category.

Table A.4.5 - Smaller States: Governance and Information domain indicators, base and reference years

States	2.1.1.a Data Integrity: Institutional deliveries (percentage)		2.1.1.b Data Integrity: First trimester ANC registration (percentage)		2.2.1 Average occupancy: State-level 3 key posts (in months)		2.2.2 Average occupancy: CMOs (in months)	
	BY**	RY	BY**	RY	BY	RY	BY	RY
Arunachal Pradesh	1.36	1.36	5.62	5.62	19.85	13.87	19.29	17.50
Goa	5.01	5.01	23.74	23.74	14.84	21.69	15.00	12.00
Manipur	2.87	2.87	28.19	28.19	13.29	21.02	18.64	17.31
Meghalaya	13.44	13.44	10.56	10.56	19.99	19.25	15.49	14.76
Mizoram	22.00	22.00	18.71	18.71	11.12	9.77	20.51	25.98
Nagaland	54.79	54.79	107.87	107.87	11.61	7.25	17.43	19.94
Sikkim	29.16	29.16	26.76	26.76	24.00	24.02	31.50	25.52
Tripura	3.35	3.35	10.89	10.89	11.99	10.87	14.32	17.26

** Same data has been used for base and reference years due to overlapping periods of NFHS-4. Hence this indicator comes under 'not applicable' category.

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable

Table A.4.6 - Smaller States: Key Inputs/Processes domain indicators, base and reference years

States	3.1.1.a Vacancy: ANMs at SCs (percentage)		3.1.1.b Vacancy: SNs at PHCs and CHCs (percentage)		3.1.1.c Vacancy: MOs at PHCs (percentage)		3.1.1.d Vacancy: Specialists at DHs (percentage)		3.1.2 E-payslip (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Arunachal Pradesh	2.07	22.37	4.05	28.78	9.38	38.75	87.55	89.11	45.89	38.75
Goa	24.75	30.10	12.54	11.68	31.11	14.22	42.71	39.70	0.00	0.00
Manipur	20.57	29.89	5.08	18.98	42.76	42.76	47.67	47.67	0.00	0.00
Meghalaya	19.56	20.00	30.90	31.05	31.85	35.67	29.28	29.73	0.00	0.00
Mizoram	11.33	16.07	6.11	6.11	31.58	38.10	15.22	15.22	0.00	0.00
Nagaland	7.80	11.01	0.00	0.00	26.89	27.36	0.00	0.00	0.00	0.00
Sikkim	0.00	0.00	61.96	61.96	0.00	0.00	34.38	34.38	0.00	0.00
Tripura	15.37	38.90	22.20	0.00	17.03	2.06	NA	NA	0.00	0.00

Table A.4.6 (Continued) - Smaller States: Key Inputs/Processes domain indicators, base and reference years

States	3.1.3.a Functional FRUs (percentage)		3.1.3.b Functional 24x7 PHCs (percentage)		3.1.4 Districts with functional CCUs (percentage)		3.1.5 Proportion of first trimester ANC (percentage)		3.1.6 Level of birth registration (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Arunachal Pradesh	100.00	133.33	21.43	42.86	0.00	0.00	38.66	36.99	100.00	100.00
Goa	100.00	100.00	0.00	6.67	0.00	0.00	57.00	58.74	100.00	100.00
Manipur	83.33	66.67	41.38	65.52	0.00	0.00	59.07	63.23	100.00	100.00
Meghalaya	83.33	100.00	166.67	180.00	0.00	0.00	32.24	32.07	100.00	100.00
Mizoram	150.00	100.00	190.91	136.36	11.11	11.11	72.26	73.61	100.00	100.00
Nagaland	150.00	125.00	165.00	165.00	0.00	9.09	46.80	35.83	100.00	100.00
Sikkim	100.00	200.00	166.67	216.67	0.00	0.00	77.81	79.89	79.90	74.10
Tripura	42.86	57.14	124.32	116.22	0.00	0.00	62.75	61.85	91.40	81.70

** Same data has been used for base and reference years due to overlapping periods of NFHS-4. Hence this indicator comes under 'not applicable' category.

Table A.4.6 (Continued) - Smaller States: Key Inputs/Processes domain indicators, base and reference years

States	3.1.7 IDSP reporting of P form (percentage)		3.1.7 IDSP reporting of L form (percentage)		3.1.8 CHC grading (percentage)		3.1.9 Quality accreditation DH-SDH (percentage)		3.1.9 Quality accreditation CHC-PHC (percentage)		3.1.10 Fund transfer (no.of days)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Arunachal Pradesh	43	82	33	77	0.00	0.00	5.00	5.00	0.00	0.00	98	143
Goa	65	79	67	88	25.00	75.00	0.00	0.00	0.00	0.00	149	154
Manipur	35	63	32	38	0.00	29.41	12.50	12.50	0.00	0.00	199	258
Meghalaya	62	84	63	82	3.70	7.41	0.00	0.00	0.00	0.00	216	38
Mizoram	51	48	74	58	0.00	0.00	0.00	0.00	0.00	0.00	140	177
Nagaland	80	79	61	65	0.00	0.00	0.00	0.00	0.00	0.00	101	213
Sikkim	91	97	86	100	0.00	0.00	0.00	0.00	0.00	0.00	68	153
Tripura	75	97	61	94	0.00	0.00	0.00	0.00	0.00	0.00	118	69

Table A.4.7 - Union Territories: Health Outcomes domain indicators, base and reference years

UTs	1.1.4 LBW (percentage)		1.2.1 Full immunization (percentage)		1.2.2 Institutional deliveries (percentage)		1.2.3 TB case notification rate (per 100,000 population)		1.2.4 TB treatment success rate (percentage)		1.2.6 OOP expenditure (in INR)#
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	RY
Andaman & Nicobar Islands	16.13	17.17	84.62	100.00	76.21	80.20	157	139	85.50	91.50	1258
Chandigarh	22.49	20.77	92.30	93.58	100.00	100.00	300	305	89.50	85.60	2357
Dadra & Nagar Haveli	34.70	29.39	75.48	77.06	88.20	87.09	138	133	85.20	86.30	471
Daman & Diu	16.91	24.37	85.04	79.67	75.29	72.00	146	166	83.10	79.50	1581
Delhi	20.85	21.43	90.88	96.21	79.41	80.60	337	348	86.20	86.70	8719
Lakshadweep	4.85	5.56	100.00	100.00	76.44	85.40	61	35	86.70	91.30	4580
Puducherry	18.48	15.50	73.93	77.60	100.00	100.00	95	103	88.50	89.20	1999

#Data for this indicator is available and used only for reference year and hence this indicator comes under 'not applicable' category.

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable

Table A.4.8 - Union Territories: Governance and Information domain indicators, base and reference years

UTs	2.1.1.a Data Integrity: Institutional deliveries (percentage)		2.1.1.b Data Integrity: First trimester ANC registration (percentage)		2.2.1 Average occupancy: State-level 3 key posts (in months)		2.2.2 Average occupancy: CMOs (in months)	
	BY**	RY	BY**	RY	BY	RY	BY	RY
Andaman & Nicobar Islands	18.05	18.05	2.84	2.84	26.00	15.01	25.49	17.43
Chandigarh	57.98	57.98	27.88	27.88	10.80	12.01	15.53	15.55
Dadra & Nagar Haveli	15.11	15.11	22.12	22.12	14.40	14.41	18.00	18.01
Daman & Diu	17.43	17.43	15.27	15.27	20.40	21.02	36.00	36.03
Delhi	10.76	10.76	27.77	27.77	13.70	9.63	15.82	16.72
Lakshadweep	29.35	29.35	12.19	12.19	26.77	26.79	NA	NA
Puducherry	90.52	90.52	48.82	48.82	21.96	19.98	23.05	25.32

** Same data has been used for base and reference years due to overlapping periods of NFHS-4. Hence this indicator comes under 'not applicable' category.

Table A.4.9 - Union Territories: Key Inputs/Processes domain indicators, base and reference years

UTs	3.1.1.a Vacancy: ANMs at SCs (percentage)		3.1.1.b Vacancy: SNs at PHCs and CHCs (percentage)		3.1.1.c Vacancy: MOs at PHCs (percentage)		3.1.1.d Vacancy: Specialists at DHs (percentage)		3.1.2 E-payslip (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andaman & Nicobar Islands	7.84	7.84	7.45	7.45	36.36	36.36	100.00	100.00	0.00	0.00
Chandigarh	31.25	29.41	6.19	6.19	69.17	69.17	0.00	0.00	59.97	61.33
Dadra & Nagar Haveli	0.00	0.00	4.88	4.88	16.67	16.67	18.18	18.18	0.00	0.00
Daman & Diu	13.56	11.86	2.38	0.00	7.14	7.14	38.24	47.06	0.00	0.00
Delhi	4.88	19.75	32.00	40.75	8.33	14.21	38.74	40.21	0.00	68.81
Lakshadweep	0.00	0.00	0.00	0.00	0.00	0.00	76.47	76.47	0.00	0.00
Puducherry	7.23	8.73	1.19	2.38	12.78	12.78	23.36	20.56	80.74	78.35

Table A.4.9 (Continued) - Union Territories: Key Inputs/Processes domain indicators, base and reference years

UTs	3.1.3.a Functional FRUs (percentage)		3.1.3.b Functional 24x7 PHCs (percentage)		3.1.4 Districts with functional CCUs (percentage)		3.1.5 Proportion of first trimester ANC (percentage)		3.1.6 Level of birth registration (percentage)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andaman & Nicobar Islands	0.00	0.00	500.00	500.00	0.00	0.00	77.84	76.94	97.20	71.90
Chandigarh	150.00	150.00	0.00	0.00	0.00	0.00	49.63	36.79	100.00	100.00
Dadra & Nagar Haveli	100.00	100.00	100.00	133.33	0.00	0.00	47.27	84.77	71.80	65.10
Daman & Diu	100.00	100.00	50.00	50.00	0.00	0.00	47.32	49.26	98.40	76.40
Delhi	91.18	100.00	0.60	0.60	90.91	90.91	34.74	33.69	100.00	100.00
Lakshadweep	100.00	100.00	0.00	0.00	100.00	100.00	74.88	73.24	60.00	59.50
Puducherry	300.00	200.00	0.00	0.00	25.00	25.00	45.53	39.54	100.00	100.00

Table A.4.9 (Continued) - Union Territories: Key Inputs/Processes domain indicators, base and reference years

UTs	3.1.7 IDSP reporting of P form (percentage)		3.1.7 IDSP reporting of L form (percentage)		3.1.8 CHC grading (percentage)		3.1.9 Quality accreditation DH-SDH (percentage)		3.1.9 Quality accreditation CHC-PHC (percentage)		3.1.10 Fund transfer (no. of days)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
Andaman & Nicobar Islands	12	50	5	21	0.00	0.00	0.00	0.00	0.00	0.00	147	78
Chandigarh	84	78	93	88	100.00	100.00	0.00	0.00	0.00	0.00	68	35
Dadra & Nagar Haveli	100	91	100	89	0.00	NA	0.00	0.00	0.00	0.00	64	62
Daman & Diu	100	75	86	75	0.00	0.00	0.00	0.00	0.00	0.00	76	0
Delhi	40	57	42	56	0.00	0.00	1.79	8.93	0.00	0.00	92	89
Lakshadweep	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	143	0
Puducherry	82	90	77	88	25.00	25.00	0.00	0.00	0.00	0.00	101	55

Most Improved | Improved | No Change | Deteriorated | Most Deteriorated | Not Applicable