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Review Article

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Analysis of NITI AAYOG (National Institution for Transforming India)Health Index Report on the Ranking of States and Union Territories: Round 2(2015-2016/ 2017-2018)-V2

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Abstract

India has committed to achieve the Sustainable Development Goals (SDGs) for Goal 3 of SDGs which is about ensuring healthy lives with promoting well-being for all. National Institution for Transforming India- (NITI) Aayog had started the State Health Index initiative for ranking, comparing, states and UTs for achieving desirable health outcomes. The key objective of NITI Aayog is to track development on health, to develop healthy competition and cross learning among states and UTs. Health Index Scores and rankings are generated to assess Incremental Performance (year-to-year progress) and Overall Performance of state/UT of India for achievement of health-related Sustainable Development Goals (SDGs) as well as Universal Health Coverage (UHC). This novel study second was a cross-sectional retrospective observational study. The Health Index consists of a set of indicators in the domains of Health Outcomes, Governance and Information, and Key Inputs/Processes. Health Outcomes are assigned the highest weight in this study; indicators were selected on the basis of their importance and availability of reliable data at least annually from pre- 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 only after validation by the IVA.

Keywords: Health index, Niti Aayog, Incremental Performance, Annual Incremental Performance, Index Score.

Introduction

Background

By adopting the Sustainable Development Goals (SDGs), India is committed for Goal 3 of SDGs which isfor ensuring healthy lives and promoting well-being for all.NITI Aayog in India has established the annual State Health Index tool for ranking the States/UTs on health outcomes, Governance and Information, and Key Inputs/Processes. The outcome is complemented with the MoHFW's (Ministry of Health and Family Welfare) Government of India to link a part of NHM funds to the States on this Index [1, 2]. I am presenting the second version of review of Round-2 of the Health Index, discussing the status of States and the UTs during the period 2015-16 (Base Year) and 2017-18 (Reference Year), i.e., a two-year period [3, 4]. The report on Health Index highlights the areas to focus by states and UTs for improvement in overall health outcomes.NITI Aayog measures the annual performance and rank States and UTs on the basis of incremental change. Health Index Scores and rankings are generated to assess Incremental Performance (year-to-year progress) and Overall Performance of state/ UT for achievement of health-related Sustainable Development Goals (SDGs) as well as Universal Health Coverage (UHC).

Objectives

Aim of NITI Aayog of India is to promote a co-operative positive competition amongst the States and UTs of Indiafor transformative action in achieving better health outcomes. The key Objective is to calculate and release a composite annual state/UTs Health Index byutilizing key health outcomes, health systems and service delivery indicators forgenerating Health Index scores and rankings of the States and UTs based on incremental performance and overall performance. Other objectivesare to calculate positive/negativedevelopment on health, to encourage healthy competition and mutual learning among states and UTs,to ensure States' participation and ownership,transparency by using an independent validation of data by an independent agency.

Methods

Study design

This was a cross-sectional retrospective observational quantitative and qualitative study.The Health Index consists of indicators in the domains of Health Outcomes, Governance and Information, and Key Inputs/Processes. Health Outcomes are assigned the highest weight, indicators were selected on the basis of their importance and availability of reliable data at least annually from pre- 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 only after validation by the IVA. A composite Index is calculated as a weighted average of various indicators, 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 is the annual incremental progress of each State. States and UTs were grouped in 3categories to ensure comparison among similar entities, namely 21 Larger States, 8 Smaller States, and 7 UTs [3, 4]. The same 23 indicators were used for the Health Index-2018 as in the first round. Taking into account importance and availability of reliable data 23 indicators were included in the Health Index. OOPE (out of pocket expenditure) used in first round was not available [3, 4].

Setting

For calculation of Index values and ranks, data was submitted online and validated by an Independent Validation Agency (IVA). The States were previously sensitized about the process for data submission through workshops and key stakeholders(Table-1). Data was submitted by participants States and UTsthrough online portal hosted by NITI Aayog and data from pre-existing sources in the public domain was pre-entered. After validation of data by an IVA it was used as an input into automated generation of Index values and ranks on the web-portal. The data was verified by IPE Global, an IVA prior to computing the Index and ranks for all States and UTs of India.

Table 1: List of key stakeholders - Roles and Responsibilities

Niti Aayog	states	technical Assistance (TA) Agency (the World Bank)	mentor Agencies	Independent Validation Agency (sambodhi)
Review, finalize and disseminate - the Health Index-2018 along with necessary guidance in close	Adopt and share Health Index2018 with various departments and districts as needed	TA to NITI Aayog in reviewing and finalizing the Health Index-2018 and protocols and guidelines	Mentor the States on data definitions and data requirements for the Health Index2018	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 agency, mentor agencies, and the IVA	Enter and submit data in a timely manner on the indicators as per identified sources in web portal	Technical oversight to the mentor agencies, portal agency and the IVA	Provide guidance to the States for submission of data including visiting State Health Departments/ Directorates as needed	Review of supporting documents and participation in data validation consultations with States
Host a web portal for States to enter data, its validation	Coordination with different districts, mentor agencies and the IVA	Provide technical support for generation of composite Index	Follow up with States for timely submission of data/ supporting documents on the on web portal	Final certification of data and generation and validation of Index scores and ranks
Overall coordination and management		Provide technical support for drafting and disseminating the report		Submission of a comprehensive report on validation with details to NITI Aayog
Source – NITI Aayog-India				

This novel study was conducted over a period of eight months in 2018-19 see table-5. The States and UTs participated for finalization of the indicators/variables, workshops for sharing the methodology, process of data submission.

Participants

All states and UTs of India were participants.Multiple stakeholders as discussed above contributed to the Index development: The various Index was developed by NITI Aayog with help of World Bank, States and UTs, the Ministry of Health and Family Welfare (MoHFW), domestic and international sector experts and other development partners Categorization of States and UTs for ranking were based on the size, and administration[3,4].The States were ranked in three categories, namely Larger States, Smaller States and UTs [1]

Table 2: 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
Source – NITI Aayog-India		

This categorization was done due to the following reasons: • The SRS data on health outcomes (NMR, U5MR, TFR and SRB) were not available for 8 Smaller States and 7 UTs, • reliable estimates for these outcome indicators/variables based on raw data obtained from SRS for the Smaller States and UTs could not be derived due to statistically small sample size and insufficient number of events.

Variables

The main criteria for inclusion of indicators/variables were the availability of reliable data with at least an annual frequency. **The output Index is a weighted composite Index based on indicators/variables in 3fields: (1) Health Outcomes; (2) Governance and Information; and (3) Key Inputs/Processes.**Each domain was assigned a weight based on its importance. The indicator values are scaled from 0 to 100for generating composite Index scores and performance rankings for **2015-16 (Base Year) to 2017-18 (Reference Year), i.e., a two-year period**. The annual incremental progress made from BY to RY is used to generate incremental ranks. Table 3shows the number of indicators/variables in each domain and sub-domain along with weights, while Table-4 provides the detailed Health Index with indicators/variables, their definitions, data sources, and specifics of base and reference years.

Table 3: Health Index: Summary

Domain	sub-domain	larger states		smaller state		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	5	250	5	250	4	200
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	23	1,080	19	680	18	630	
Source – NITI Aayog-India							

Here it is important to mention that for round-2 larger states have 23 indicators unlike 24 of round 1and total weight 1080 instead of 1130; smaller states 19 instead of 20 of round 1 and weight 680 instead of 730; UTs 18 indicators instead of 19 of round 1 and weight 630 instead of 680 for round1. * 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 RY Index and rank of round1.

Data sources/measurement

The Health Index consists of 23 indicators/variables related to Health Outcomes, Governance and Information, and Key Inputs/ Processes (Table 4 provides Health Index-indicator details and data sources).

Table 4: Health Index: Indicators/variables, definitions, data sources, base and reference years

s. no.	Indicator	Definition	Data source	Base Year (BY) and Reference Year (RY)
Domain: Health Outcomes				
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-filled]	BY:2015 RY:2016
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-filled]	BY:2015 RY:2016
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-filled]	BY:2015 RY:2016
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 health facility.	HMIS	BY:2015-16 RY:2017-18
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-filled]	BY:2013-15 RY:2014-16
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 measles against estimated number of infants during a specific year.	HMIS	BY:2015-16 RY:2017-18
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:2015-16 RY:2017-18
1.2.3	Total case notification rate of tuberculosis (TB)	Number of new and relapsed TB cases notified (public + private) per 1,00,000 population during a specific year.	Revised National Tuberculosis Control Programme (RNTCP) MIS, MoHFW [pre-filled]	BY:2016 RY:2017
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-filled]	BY:2015 RY:2016
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-filled]	BY:2015-16 RY:2017-18
s. no.	Indicator	Definition	Data source	Base Year (BY) and Reference Year (RY)
Domain: governance and Information				
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 (pre-filled)	BY and RY: 2015-16 (NFHS) BY and RY: 2011-12 to 2015-16 (HMIS)

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. M ission Director (NHM) 3. D irector (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, 2013-March 31, 2016 RY: April 1, 2015-March 31, 2018
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, 2013- March 31, 2016 RY: April 1, 2015-March 31, 2018
Domain: key Inputs and Processes				
3.1.1	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. Auxiliary Nurse Mid-wife (ANM) at sub-centres (SCs) b. S taff nurse (SN) at Primary Health Centres (PHCs) and Community Health Centres (CHCs) c. Medical officers (MOs) at PHCs d.Specialists at District Hospitals (Medicine, Surgery, Obstetrics and Gynaecology, Pediatrics, Anesthesia, Ophthalmology, Radiology, Pathology, Ear-NoseThroat (ENT), Dental, Psychiatry)	State Report	BY: As on March 31, 2016 RY: As on March 31, 2018
3.1.2	Proportion of total staff (regular + contractual) with e-payslip 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, 2016 RY: As on March 31, 2018
s. no.	Indicator	Definition	Data source	Base Year (BY) and Reference Year (RY)
3.1.3	a. Proportion of specified type of facilities functioning as First Referral Units (FRUs) as against required norm	Proportion of public sector facilities conducting specified number of C-sections8 per year (FRUs) against the norm of one FRU per 5,00,000 population during a specific year.	State Report on number of functional FRUs, MoHFW data on required number of FRUs	BY:2015-16 RY:2017-18
	b. Proportion of functional 24x7 PHCs as against required norm	Proportion of PHCs providing healthcare services9 as per the stipulated criteria against the norm of one 24x7 PHC per 1,00,000 population during a specific year.	State Report on number of functional 24x7 PHCs, MoHFW data on required number of PHCs	BY:2015-16 RY:2017-18

3.1.4	Average number of functional Cardiac Care Units (CCUs) per district (*100)	Number of 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] per districts *100.	State Report	BY: As on March 31, 2016 RY: As on March 31, 2018
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:2015-16 RY:2017-18
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-filled]	BY:2014 RY:2016
3.1.7	Completeness of Integrated Disease Surveillance Programme (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-filled]	BY:2015 RY:2017
3.1.8	Proportion of CHCs with grading 4 points or above	Proportion of CHCs that are graded 4 points or above against total number of CHCs during a specific year.	HMIS [pre-filled]	BY:2015-16 RY:2017-18
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, 2016 RY: As on March 31, 2018
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 Data10 [pre-filled]	BY:2015-16 RY:2017-18

Bias

Grouping and ranking the states according to size is a biased view. The researcher feels that population density/ per capita income/ literacy rate/ health workforce/ corruption-scam index etc. should be considered for ranking states. Summarizing the complexities and condensing it in an Index has limitations.Health Outcomes are assigned the highest weight knowing the fact that it is entirely dependent on input and governance. The governance in states such as Bihar is always controversial such as lack of Directorate, corruption, posting scams etc. [5].Hence the researcher feels that governance and input indicators are more important and it is a total biased view to provide health outcome highest weight which is totally dependent on other two.

Study size

All states and UTs of India were participants. Table 5 shows study period (This second edition of this exercise was conducted over a period of eight months in 2018-19.) The States were informed about the Health Index-2018 on July 14, 2018 through video conference chaired by the Chief Executive Officer (CEO), NITI Aayog. During the discussions an agreement was reached that the Base Year would be 2015-16, while the Reference Year would be 2017-18 for round 2.

Table 5: Study period

Timeline for development of Health Index2018						
		June 2018	**July-August 2018**	**September-November 2018**	**December-2018 February 2019**	**may-June 2019**
1	Finalization of Guide book and Dissemination to States					
2	Selection and training of mentors, Guidance to States and submission Of data on portal					
3	Selection and training of IVA, Validation of data by IVA, North East Regional Data Validation Workshop and Video Conference With all States on finalization of Validated data					
4	Index and rank generation and Report writing					
5	Dissemination of ranks					

Source – NITI Aayog-India

Quantitative variables

See table-4

Statistical methods

Methodological details of constructing the Index-Computation of Index scores and ranks

After validation of data by the IVA, data was used for the Health Index score calculations. Indicator value was scaled, based on the nature of the indicator, for positive indicators, where higher the value, better the performance, the scaled value (Si) for the ith indicator, with data value as Xi , was calculated as follows:

Scaled value (Si) for positive indicator= (Xi – Minimum value) x 100/ (Maximum value – Minimum value)

For negative indicators where lower the value, better the performance (e.g. NMR, U5MR,) scaled value was calculated as follows:

Scaled value (Si) for negative indicator= (Maximum value – Xi) x 100/ (Maximum value – 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. Indicator value lies between the ranges of 0 to 100; e.g. 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. 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 these scaled values (Si), a composite Index score was calculated for the base year and reference year by application of the weights using the formula:

Composite Index = (∑ Wi *Si)/ (∑ Wi) --Where Wi is the weight for ith indicator

The composite Index score has been used for generating overall performance ranks. The difference between the composite Index score of reference and base years was the annual incremental performance. The ranking is primarily based on the incremental progress, however, rankings based on Index scores for the base year and the reference year performance calculated to provide the overall performance of the States and UTs.

Results

In the Reference Year (2017-18), the average composite Health Index score among Larger States was 53.22, compared to the Base Year (2015-16) average of 52.59. Health Index score across States, range from 28.61 in Uttar Pradesh to 74.01 in Kerala. There is no indication that the gap between poorest performing State and best-performing State is narrowing. Compared to the Base Year, the Health Index scores have increased in twelve States in the Reference Year. However, the index score has declined both for the poorest performing State (Uttar Pradesh) and the best performing State (Kerala). I have already mentioned in version 1 that it is very difficult for states that are on top performance to improve moreand more and the lowest ranking states have more space in this field to improve and some states are also utilizing this to get advertisement of improvement [3, 4].The top five best performing States based on the overall performance were Kerala (74.01), Andhra Pradesh (65.13), Maharashtra (63.99), Gujarat (63.52) and Punjab

(63.01),while the 5 least performing States in the reference period were: Uttar Pradesh (28.61), Bihar (32.11), Odisha (35.97), Madhya Pradesh (38.39), and Uttarakhand (40.20).

Descriptive Data

Independent validation of data

IVA namely, Sambodhi Research and Communications Private Limited was hired by NITI Aayog to review and validate the data, Index scores and rankings of States and UTs. The data submitted on the portal was validated by the IVA from September to December 2018.

Outcome Data

See Table-6, 7, 8, 9, 10, 11, 12, 13, and 14 for outcome data,

Table 6: Larger States: Health Outcomes domain indicators base and reference years

Larger States	1.1.1. NMR (PER 1,000 LIVE BIRTHS)		1.1.2. U5MR (PER 1,000 LIVE BIRTHS)		1.1.3. TFR*		1.1.4. LBW (PERCENTAGE)		1.1.5. SEX RATIO AT BIRTH (NO. OF GIRLS BORN FOR EVERY 1,000 BOYS BORN)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
ANDHRA PRADESH	24	23	39	37	1.7	1.7	6.73	5.58	918	913
ASSAM	25	23	62	52	2.3	2.3	16.68	14.41	900	896
BIHAR	28	27	48	43	3.2	3.3	7.22	9.23	916	908
CHHATTISGARH	27	26	48	49	2.5	2.5	12.15	10.05	961	963
GUJARAT	23	21	39	33	2.2	2.2	10.51	12.33	854	848
HARYANA	24	22	43	37	2.2	2.3	14.90	8.47	831	832
HIMACHAL PRADESH	19	16	33	27	1.7	1.7	12.63	12.59	924	917
JAMMU & KASHMIR	20	18	28	26	1.6	1.7	5.93	5.48	899	906
JHARKHAND	23	21	39	33	2.7	2.6	7.42	7.12	902	918
KARNATAKA	19	18	31	29	1.8	1.8	11.49	10.01	939	935
KERALA	6	6	13	11	1.8	1.8	11.72	11.42	967	959
MADHYA PRADESH	34	32	62	55	2.8	2.8	14.10	14.30	919	922
MAHARASHTRA	15	13	24	21	1.8	1.8	13.74	12.06	878	876
ODISHA	35	32	56	50	2.0	2.0	19.16	18.25	950	948
PUNJAB	13	13	27	24	1.7	1.7	6.88	8.41	889	893
RAJASTHAN	30	28	50	45	2.7	2.7	25.51	14.01	861	857
TAMIL NADU	14	12	20	19	1.6	1.6	13.03	15.49	911	915

TELANGANA	23	21	34	34	1.8	1.7	5.70	7.14	918	901
UTTAR PRADESH	31	30	51	47	3.1	3.1	9.60	11.18	879	882
UTTARAKHAND	28	30	38	41	2.0	1.9	7.26	8.23	844	850
WEST BENGAL	18	17	30	27	1.6	1.6	16.45	16.45	951	937

Larger States	1.2.1. FULL IMMUNIZATION (PERCENTAGE)		1.2.2. INSTITUTIONAL DELIVERY (PERCENTAGE)		1.2.3. TB CASE NOTIFICATION RATE (PER 1,00,000 POPULATION)		1.2.4. TB TREATMENT SUCCESS RATE (PERCENTAGE)		1.2.5. PLHIV ON ART** (PERCENTAGE)
	BY	RY	BY	RY	BY	RY	BY	RY	BY/RY
ANDHRA PRADESH	91.62	100.00	87.08	85.90	145	161	88.50	89.00	76.11
ASSAM	88.00	83.34	74.25	72.04	123	119	86.20	77.50	64.58
BIHAR	89.73	89.74	57.10	56.01	84	82	89.70	71.90	37.18
CHHATTISGARH	90.53	86.93	64.51	75.82	138	145	89.10	88.60	53.06
GUJARAT	90.55	92.00	97.78	91.58	193	224	88.90	88.10	52.43
HARYANA	83.47	88.86	80.25	84.19	172	145	87.50	78.90	51.53
HIMACHAL PRADESH	95.22	79.37	67.49	67.64	207	226	89.60	89.00	79.89
JAMMU & KASHMIR	100.00	100.00	80.51	85.49	72	74	88.30	85.00	96.41
JHARKHAND	88.10	100.00	67.36	88.15	108	118	90.90	91.70	39.40
KARNATAKA	96.24	94.07	78.78	79.60	105	123	84.70	79.70	88.68
KERALA	94.61	100.00	92.62	90.90	139	67	87.50	83.70	66.72
MADHYA PRADESH	74.78	77.97	64.79	62.27	164	167	90.30	82.50	61.01
MAHARASHTRA	98.22	95.70	85.30	89.78	164	159	84.20	79.50	87.71
ODISHA	85.32	59.81	73.49	70.90	99	159	88.90	72.50	32.95
PUNJAB	99.64	92.73	82.33	82.24	136	153	87.20	85.90	84.62
RAJASTHAN	78.06	81.59	73.85	74.83	143	139	90.30	89.90	46.41
TAMIL NADU	82.66	76.10	81.82	80.50	125	119	85.40	75.90	87.06
TELANGANA	89.09	90.31	85.35	91.68	123	107	89.60	90.40	76.11
UTTAR PRADESH	84.82	84.68	52.38	50.56	137	140	87.50	64.00	57.81
UTTARAKHAND	99.30	94.96	62.63	67.02	138	151	86.00	77.60	65.25
WEST BENGAL	95.85	95.85	81.28	81.28	93	100	86.50	85.70	35.92

**The data shown in grey colour 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.

Source – NITI Aayog-India

Table 7: Larger States: Governance and Information domain indicators, base and reference years

Larger States	2.1.1.A. DATA INTEGRITY: INSTITUTIONAL DELIVERY (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	15.42	17.51	23.99	13.22	9.25
ASSAM	0.25	21.16	12.11	21.99	7.95	13.76
BIHAR	18.21	16.33	13.01	18.98	11.88	13.25
CHHATTISGARH	22.34	25.90	11.40	8.97	25.40	18.07
GUJARAT	0.68	2.06	20.71	22.21	18.09	18.98
HARYANA	4.62	19.08	11.21	7.35	12.56	13.20
HIMACHAL PRADESH	12.72	7.30	12.39	15.65	10.50	18.33
JAMMU & KASHMIR	12.42	13.50	13.81	8.98	11.77	13.32
JHARKHAND	7.95	53.48	12.00	10.77	11.46	10.01
KARNATAKA	21.22	8.20	6.49	6.69	13.23	15.69
KERALA	3.71	24.86	12.02	11.72	11.72	13.14
MADHYA PRADESH	23.09	9.19	16.00	19.98	17.62	14.73
MAHARASHTRA	1.16	5.61	15.74	9.98	15.64	17.37
ODISHA	13.82	22.09	12.01	15.86	13.95	13.48
PUNJAB	12.41	9.97	20.42	14.36	10.19	8.41
RAJASTHAN	12.44	18.43	22.02	23.98	11.94	17.32
TAMIL NADU	10.92	22.75	16.51	26.39	7.29	7.74
TELANGANA	21.06	15.80	7.81	15.98	11.19	16.48
UTTAR PRADESH	36.59	0.92	19.64	9.67	14.15	10.53
UTTARAKHAND	14.93	10.77	10.35	10.99	13.93	10.06
WEST BENGAL	2.12	42.44	28.02	28.02	14.10	14.10

+ Same data have been used for Base and Reference Years due to non-availability of updated NFHS data.
Source – NITI Aayog-India

Table 8:Larger States: Key Inputs/Processes domain indicators, base and reference years

Larger 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-PAY SLIP (PERCENTAGE)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
ANDHRA PRADESH	15.67	17.08	20.48	12.75	12.76	10.57	30.41	25.05	58.65	100.00
ASSAM	8.99	4.60	8.95	11.81	17.77	25.46	41.72	46.99	0.00	0.00
BIHAR	59.30	59.45	50.28	50.74	63.60	34.08	60.58	59.72	0.00	0.00
CHHATTISGARH	9.23	9.47	37.28	41.26	45.02	57.25	77.68	70.83	0.00	12.04
GUJARAT	28.08	10.32	36.46	23.67	32.03	30.23	55.50	21.00	35.61	39.54
HARYANA	15.23	15.25	43.24	35.39	25.35	22.36	0.00	21.08	0.00	99.98
HIMACHAL PRADESH	9.87	22.58	27.19	47.52	21.73	32.06	NA	NA	8.07	100.00
JAMMU & KASHMIR	10.28	9.44	27.48	17.93	30.15	28.80	22.22	25.40	0.00	0.00
JHARKHAND	19.73	19.18	74.94	54.23	48.67	46.33	50.32	47.18	0.00	0.00
KARNATAKA	22.59	33.39	25.97	21.73	11.48	4.61	21.53	37.66	49.35	44.96
KERALA	4.49	5.30	5.30	3.62	5.86	2.41	21.48	13.50	100.00	100.00
MADHYA PRADESH	14.23	13.84	33.50	42.22	58.34	55.08	50.98	49.13	0.00	0.00
MAHARASHTRA	9.46	9.75	15.67	15.33	16.96	22.79	30.34	47.25	67.60	86.29
ODISHA	0.00	0.00	0.00	0.00	26.91	31.87	19.04	27.38	75.79	76.38
PUNJAB	8.48	11.99	33.98	12.91	7.77	17.66	47.72	18.41	0.00	0.00
RAJASTHAN	19.24	24.22	47.26	50.46	14.86	12.15	45.77	22.40	0.00	69.38
TAMIL NADU	15.97	9.78	19.09	18.82	7.58	15.06	16.73	15.78	84.72	84.38
TELANGANA	18.01	14.64	12.79	7.22	22.31	14.99	54.81	53.53	0.00	33.03
UTTAR PRADESH	0.00	0.00	1.89	0.00	26.73	4.78	32.41	28.66	0.00	54.58
UTTARAKHAND	16.88	16.88	20.02	16.32	12.19	69.65	60.33	68.00	0.00	0.00
WEST BENGAL	0.77	0.77	9.70	9.70	41.23	41.23	20.18	20.18	81.23	81.23

Larger States	3.1.3.A. FUNCTIONAL FRUS (PERCENTAGE)		3.1.3.B. FUNCTIONAL 24/7 PHC (PERCENTAGE)		3.1.4. FUNCTIONAL CCUS PER DISTRICT *100 (PERCENTAGE)		3.1.5. PROPORTION OF FIRST TRIMESTER ANC REGISTRATION (PERCENTAGE)		3.1.6. LEVEL OF BIRTH REGISTRATION (PERCENTAGE)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
ANDHRA PRADESH	57.58	89.90	29.15	22.67	53.85	53.85	74.38	78.68	100.00	95.70
ASSAM	72.58	90.32	176.92	83.01	0.00	0.00	80.55	84.76	100.00	100.00
BIHAR	11.54	15.38	73.58	53.79	0.00	5.26	55.47	61.75	64.20	60.70
CHHATTISGARH	23.53	27.45	40.39	111.37	3.70	3.70	74.60	89.49	100.00	100.00
GUJARAT	42.98	63.64	31.46	56.29	48.48	48.48	74.91	78.40	95.00	98.80
HARYANA	50.98	52.94	77.56	67.32	19.05	38.10	62.20	71.46	100.00	99.90
HIMACHAL PRADESH	121.43	107.14	5.80	5.80	91.67	83.33	81.39	85.14	93.10	89.20
JAMMU & KASHMIR	196.00	220.00	45.60	38.40	27.27	31.82	52.95	64.83	75.50	77.60
JHARKHAND	22.73	30.30	33.03	29.39	0.00	0.00	36.36	51.65	82.00	90.20
KARNATAKA	116.39	121.31	69.23	62.68	43.33	20.00	71.22	79.09	97.80	100.00
KERALA	120.90	107.46	0.00	0.00	64.29	78.57	80.63	83.22	100.00	97.10
MADHYA PRADESH	49.66	51.03	56.47	68.32	9.80	9.80	63.79	62.78	82.60	74.60
MAHARASHTRA	32.44	63.14	46.71	35.14	22.86	58.33	66.82	71.50	100.00	94.00
ODISHA	65.48	69.05	30.00	26.43	3.33	33.33	75.75	83.64	98.50	97.50
PUNJAB	141.82	130.91	26.35	27.08	63.64	63.64	73.01	75.17	100.00	100.00
RAJASTHAN	29.20	32.85	68.03	43.50	70.59	24.24	60.66	62.77	98.20	100.00
TAMIL NADU	122.92	134.03	34.95	24.13	56.25	90.62	94.35	94.11	100.00	100.00
TELANGANA	80.00	114.29	26.99	25.57	0.00	0.00	55.90	47.27	95.60	97.30
UTTAR PRADESH	15.75	25.75	17.42	20.42	0.00	0.00	48.72	45.21	68.30	60.70
UTTARAKHAND	95.00	65.00	54.46	50.50	0.00	15.38	62.47	60.96	86.00	100.00
WEST BENGAL	49.18	49.18	5.91	5.91	76.92	76.92	77.00	77.00	92.50	97.90

Larger States	3.1.7. IDSP REPORTING OF P FORM (PERCENTAGE)		3.1.7. IDSP REPORTING 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	99	100	99	100	37.24	87.37	0.00	12.82	0.00	0.51	127	93
ASSAM	88	93	88	95	31.13	62.42	0.00	0.00	0.00	0.00	242	28

BIHAR	88	84	87	84	20.34	19.05	27.16	0.00	1.52	0.00	40	191
CHHATTISGARH	84	87	82	79	47.74	67.07	0.00	0.00	0.00	0.00	57	61
GUJARAT	95	85	96	89	49.40	29.78	2.99	31.03	0.60	8.26	24	68
HARYANA	84	83	88	87	22.02	41.54	0.00	9.30	0.00	7.56	42	58
HIMACHAL PRADESH	66	88	62	86	5.06	2.60	1.37	0.00	0.00	0.00	47	58
JAMMU & KASHMIR	80	80	75	76	61.90	62.07	0.00	0.00	0.00	0.00	107	137
JHARKHAND	73	73	72	74	54.40	55.31	0.00	0.00	0.00	0.00	67	187
KARNATAKA	95	92	94	90	31.27	50.24	0.53	1.60	0.00	0.00	139	105
KERALA	96	92	96	95	0.44	0.43	10.00	7.59	6.52	4.64	107	107
MADHYA PRADESH	80	75	80	75	57.19	67.59	0.00	2.56	0.57	0.58	41	37
MAHARASHTRA	79	88	76	84	38.52	59.30	0.00	0.00	0.27	0.28	66	95
ODISHA	83	90	74	82	22.81	46.42	15.25	15.25	0.00	0.00	59	19
PUNJAB	73	76	85	88	26.67	38.36	0.00	7.94	0.00	0.00	78	148
RAJASTHAN	73	80	68	78	54.48	56.30	0.00	1.82	0.00	0.00	48	109
TAMIL NADU	90	76	87	75	76.10	62.08	4.29	2.26	4.94	1.56	50	46
TELANGANA	97	93	95	95	11.63	36.59	0.00	0.00	0.00	0.00	287	0
UTTAR PRADESH	42	69	57	67	44.13	48.21	0.00	7.50	0.00	0.00	93	118
UTTARAKHAND	93	88	93	88	8.33	11.76	0.00	0.00	0.00	0.00	27	109
WEST BENGAL	78	91	80	87	53.74	74.43	0.00	0.00	0.00	0.00	51	64

Source – NITI Aayog-India

Table 9: Smaller States: Health Outcomes domain indicators, base and reference years

Smaller States	1.1.4. LBW (PERCENTAGE)		1.2.1. FULL IMMUNIZATION (PERCENTAGE)		1.2.2. INSTITUTIONAL DELIVERY (PERCENTAGE)		1.2.3. TB CASE NOTIFICATION RATE (PER 1,00,000 POPULATION)		1.2.4. TB TREATMENT SUCCESS RATE (PERCENTAGE)		1.2.5. PLHIV ON ART** (PERCENTAGE)
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY	BY/RY
ARUNACHAL PRADESH	6.55	6.41	64.95	65.50	56.46	63.00	183	203	86.40	64.80	28.19
GOA	15.56	15.56	95.24	97.05	92.46	86.60	131	128	87.30	85.40	72.75
MANIPUR	3.53	4.45	96.32	99.99	73.47	79.73	81	94	82.60	79.50	63.87
MEGHALAYA	7.65	7.70	93.34	77.61	62.11	62.65	137	116	85.80	79.70	100.00
MIZORAM	4.65	4.72	100.00	90.76	96.29	95.10	186	186	90.60	73.50	100.00
NAGALAND	3.89	4.09	63.86	58.23	58.07	54.30	139	148	71.90	67.60	73.80
SIKKIM	7.76	7.63	74.44	70.04	70.19	66.33	241	197	77.20	66.20	33.51
TRIPURA	11.11	13.55	84.33	86.13	79.36	88.41	61	44	88.50	70.90	5.80

** Data repeated for Reference Year due to change in indicator definition necessitated by change in program guidelines.

Source – NITI Aayog-India

Table 10:Smaller States: Governance and Information domain indicators, base and reference years

Smaller States	2.1.1.A. DATA INTEGRITY: INSTITUTIONAL DELIVERY (PERCENTAGE)+	2.1.1.B DATA INTEGRITY: FIRST TRIMESTER ANC REGISTRATION (PERCENTAGE)+	2.2.1. AVERAGE OCCUPANCY: STATE-LEVEL 3 KEY POST (IN MONTHS)		2.2.2. AVERAGE OCCUPANCY: CMOS (IN MONTHS)	
	BY/RY	BY/RY	BY	RY	BY	RY
ARUNACHAL PRADESH	1.36	5.62	13.87	11.35	17.50	18.21
GOA	5.01	23.74	21.69	13.99	12.00	11.98
MANIPUR	2.87	28.19	21.02	11.98	17.31	25.92
MEGHALAYA	13.44	10.56	19.25	9.97	14.76	22.67
MIZORAM	22.00	18.71	9.77	13.91	25.98	25.98
NAGALAND	54.79	107.87	7.25	5.81	19.94	23.44
SIKKIM	29.16	26.76	24.02	23.99	25.52	25.49
TRIPURA	3.35	10.89	10.87	11.85	17.26	24.90

Source – NITI Aayog-India

Table 11:Smaller States: Key Inputs/Processes domain indicators, base and reference years

Smaller 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	22.37	13.51	28.78	15.63	38.75	30.23	89.11	69.96	38.75	21.49
GOA	30.10	20.00	11.68	28.57	14.22	20.19	39.70	36.74	0.00	0.00
MANIPUR	29.89	27.27	18.98	20.12	42.76	43.06	47.67	45.10	0.00	0.00
MEGHALAYA	20.00	10.71	31.05	12.56	35.67	30.90	29.73	41.55	0.00	0.00
MIZORAM	16.07	20.23	6.11	7.12	38.10	2.38	15.22	15.58	0.00	0.00
NAGALAND	11.01	0.00	0.00	0.00	27.36	0.00	0.00	0.00	0.00	0.00
SIKKIM	0.00	0.00	61.96	30.43	0.00	0.00	34.38	31.25	0.00	0.00
TRIPURA	38.90	24.63	0.00	0.00	2.06	0.00	NA	1.41	0.00	100.00

Smaller States	3.1.3.A. FUNCTIONAL FRUS (PERCENTAGE)		3.1.3.B. FUNCTIONAL 24/7 PHC (PERCENTAGE)		3.1.4. FUNCTIONAL CCUS PER DISTRICT *100 (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	133.33	200.00	42.86	35.71	0.00	0.00	36.99	34.73	100.00	100.00
GOA	100.00	100.00	6.67	0.00	0.00	50.00	58.74	55.33	100.00	84.40
MANIPUR	66.67	66.67	65.52	44.83	0.00	0.00	63.23	61.14	100.00	100.00
MEGHALAYA	100.00	66.67	180.00	203.33	0.00	0.00	32.07	34.38	100.00	100.00
MIZORAM	100.00	200.00	136.36	118.18	11.11	11.11	73.61	75.36	100.00	100.00
NAGALAND	125.00	100.00	165.00	150.00	9.09	9.09	35.83	29.73	100.00	100.00
SIKKIM	200.00	200.00	216.67	366.67	0.00	0.00	79.89	76.97	74.10	66.20
TRIPURA	57.14	85.71	116.22	121.62	0.00	0.00	61.85	60.92	81.70	82.40

Smaller States	3.1.7. IDSP REPORTING OF P FORM (PERCENTAGE)		3.1.7. IDSP REPORTING 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	82	82	77	74	0.00	3.23	5.00	0.00	0.00	0.00	143	108
GOA	79	80	88	82	75.00	100.00	0.00	0.00	0.00	0.00	154	151

MANIPUR	63	77	38	60	29.41	23.53	12.50	0.00	0.00	0.00	258	119
MEGHALAYA	84	91	82	89	7.41	10.34	0.00	9.09	0.00	0.00	38	58
MIZORAM	48	96	58	96	0.00	0.00	0.00	10.00	0.00	0.00	177	61
NAGALAND	79	71	65	65	0.00	0.00	0.00	0.00	0.00	0.00	213	94
SIKKIM	97	100	100	95	0.00	0.00	0.00	0.00	0.00	0.00	153	133
TRIPURA	97	93	94	86	0.00	0.00	0.00	5.56	0.00	0.00	69	38

Source – NITI Aayog-India

Table 12:(UT) Union Territories: Health Outcomes domain indicators, base and reference years

UT	1.1.4. LBW (PERCENTAGE)		1.2.1. FULL IMMUNIZATION (PERCENTAGE)		1.2.2. INSTITUTIONAL DELIVERY (PERCENTAGE)		1.2.3. TB CASE NOTIFICATION RATE (PER 1,00,000 POPULATION)		1.2.4. TB TREATMENT SUCCESS RATE (PERCENTAGE)	
	BY	RY	BY	RY	BY	RY	BY	RY	BY	RY
ANDAMAN & NICOBAR ISLANDS	17.17	16.63	100.00	77.22	80.20	75.71	139	76	91.50	83.90
CHANDIGARH	20.77	20.89	93.58	83.40	100.00	100.00	305	523	85.60	86.80
DADRA & NAGAR HAVELI	29.39	36.88	77.06	79.12	87.09	87.21	133	225	86.30	89.60
DAMAN & DIU	24.37	20.68	79.67	52.83	72.00	47.37	166	151	79.50	92.60
DELHI	21.43	19.60	96.21	99.82	80.60	82.84	348	360	86.70	84.80
LAKSHADWEEP	5.56	7.44	100.00	77.08	85.40	65.00	35	70	91.30	93.80
PUDUCHERRY	15.50	14.61	77.60	69.50	100.00	100.00	103	114	89.20	88.80

Source – NITI Aayog-India

Table 13: Union Territories: Governance and Information domain indicators, base and reference years

UT	2.1.1.A. DATA INTEGRITY: INSTITUTIONAL DELIVERY (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	2.84	15.01	14.35	17.43	13.29
CHANDIGARH	57.98	27.88	12.01	17.96	15.55	8.95
DADRA & NAGAR HAVELI	15.11	22.12	14.41	18.98	18.01	36.00
DAMAN & DIU	17.43	15.27	21.02	10.78	36.03	17.98
DELHI	10.76	27.77	9.63	6.98	16.72	25.02
LAKSHADWEEP	29.35	12.19	26.79	13.98	NA	NA
PUDUCHERRY	90.52	48.82	19.98	24.69	25.32	22.48

+ Same data have been used for Base and Reference Years due to non-availability of updated NFHS data.Source – NITI Aayog-India

Table 14:Union Territories: Key Inputs/Processes domain indicators, base and reference years

UT	3.1.1.A. VACANCY: ANMS AT SCS (PERCENTAGE)		3.1.1.B. VACANCY: SN 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	9.80	7.45	4.35	36.36	10.61	100.00	71.43	0.00	0.00
CHANDIGARH	29.41	14.71	6.19	0.00	69.17	0.00	0.00	11.36	61.33	100.00
DADRA & NAGAR HAVELI	0.00	0.93	4.88	2.13	16.67	16.67	18.18	12.50	0.00	0.00
DAMAN & DIU	11.86	0.00	0.00	8.89	7.14	28.57	47.06	56.41	0.00	0.00
DELHI	19.75	8.91	40.75	46.94	14.21	26.29	40.21	40.81	68.81	55.77
LAKSHADWEEP	0.00	0.00	0.00	0.00	0.00	0.00	76.47	46.15	0.00	0.00
PUDUCHERRY	8.73	11.72	2.38	4.62	12.78	16.14	20.56	35.11	78.35	90.20

UT	3.1.3.A. FUNCTIONAL FRUS (PERCENTAGE)		3.1.3.B. FUNCTIONAL 24/7 PHC (PERCENTAGE)		3.1.4. FUNCTIONAL CCUS PER DISTRICT *100 (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	0.00	0.00	0.00	76.94	75.11	71.90	75.60
CHANDIGARH	150.00	250.00	0.00	0.00	0.00	200.00	36.79	66.34	100.00	100.00
DADRA & NAGAR HAVELI	100.00	100.00	133.33	66.67	0.00	100.00	84.77	95.90	65.10	86.20
DAMAN & DIU	100.00	200.00	50.00	100.00	0.00	0.00	49.26	80.79	76.40	49.90
DELHI	100.00	82.35	0.60	0.00	90.91	72.73	33.69	33.18	100.00	100.00
LAKSHADWEEP	100.00	100.00	0.00	0.00	100.00	100.00	73.24	79.72	59.50	54.50
PUDUCHERRY	200.00	400.00	0.00	0.00	25.00	50.00	39.54	33.58	100.00	100.00

UT	3.1.7. IDSP REPORTING OF P FORM (PERCENTAGE)		3.1.7. IDSP REPORTING 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	50	82	21	82	0.00	50.00	0.00	0.00	0.00	0.00	78	0
CHANDIGARH	78	94	88	93	100.00	100.00	0.00	0.00	0.00	0.00	35	0
DADRA & NAGAR HAVELI	91	100	89	92	NA	100.00	0.00	50.00	0.00	0.00	62	0
DAMAN & DIU	75	100	75	100	0.00	0.00	0.00	0.00	0.00	0.00	0	0
DELHI	57	78	56	81	0.00	4.00	8.93	7.02	0.00	0.00	89	123
LAKSHADWEEP	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
PUDUCHERRY	90	100	88	100	25.00	25.00	0.00	0.00	0.00	0.00	55	85

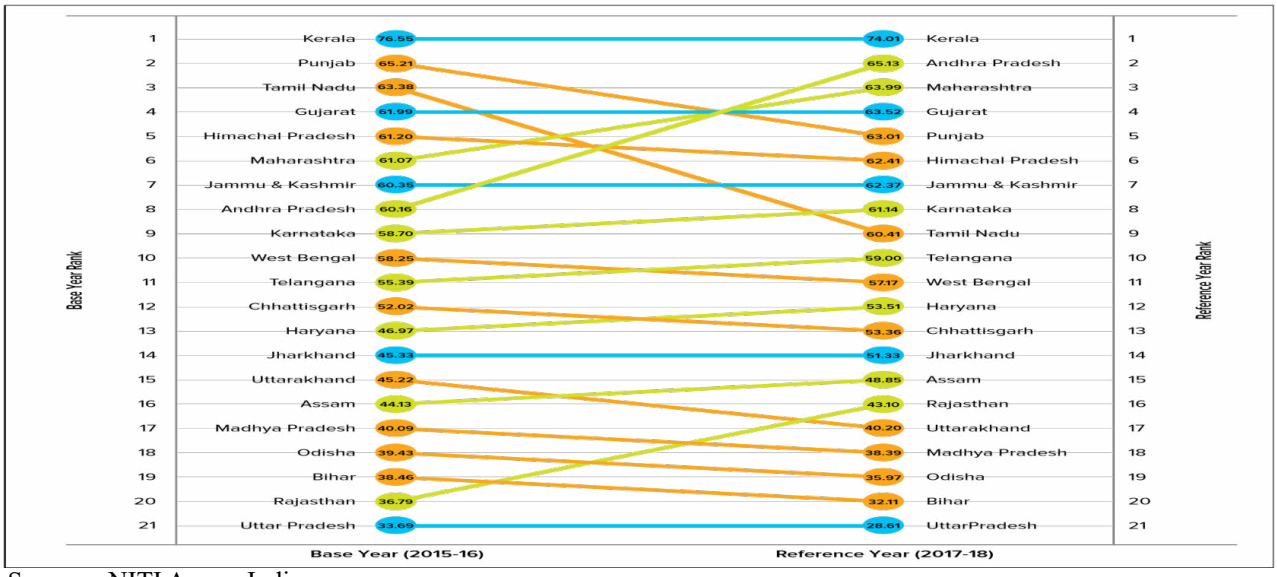
Source – NITI Aayog-India

Main results

See Figure 4.1/ E.1/E.2/ E.3 and table- 15/16/17/E.3

Larger States: Incremental scores and ranks, with overall performance from base year to reference year and ranks

FIGURE 4.1 Larger States: Overall performance - Composite Index score and rank, Base and Reference Years



Source – NITI Aayog-India

Table 15: Larger States: Overall performance in Reference Year - Categorization

Incremental Performance	Overall Performance		
	Aspirants	**Achievers**	**Front-runners**
not Improved (0 or less)	Madhya Pradesh Odisha Uttarakhand Uttar Pradesh Bihar	West Bengal	Kerala Punjab Tamil Nadu
least Improved (0.01-2.0)	–	Chhattisgarh	Gujarat Himachal Pradesh
moderately Improved (2.01-4.0)	–	–	Maharashtra Jammu & Kashmir Karnataka Telangana
most Improved (more than 4.0)	Rajasthan	Haryana Jharkhand Assam	Andhra Pradesh
Source – NITI Aayog-India			

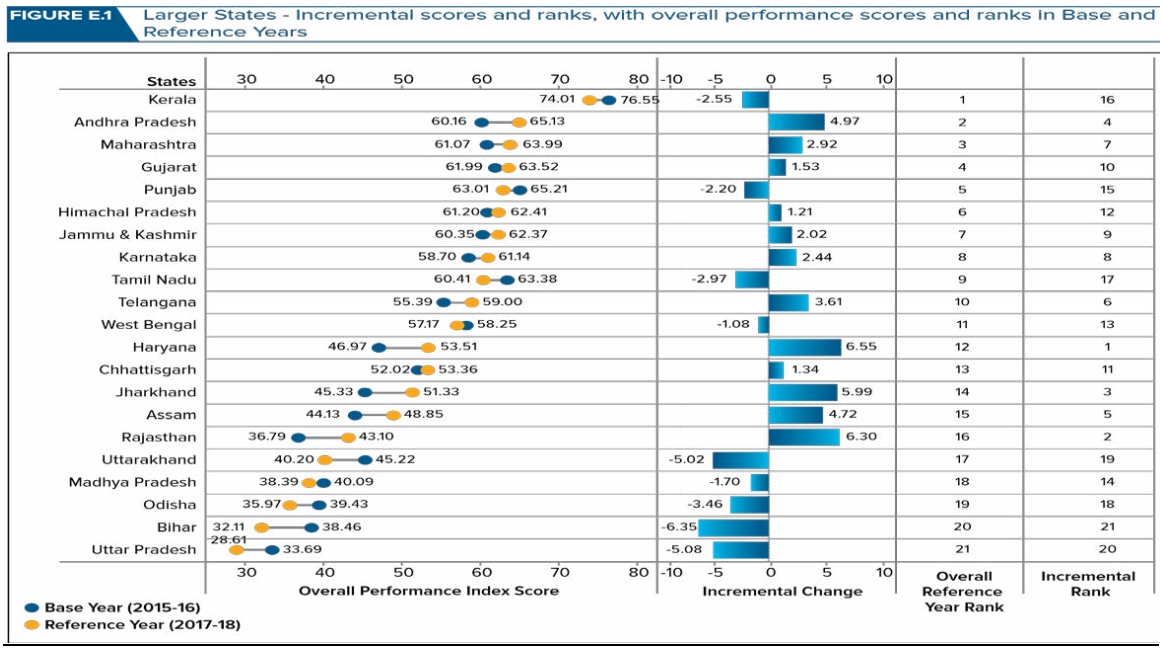


Figure E.1: Larger States: Overall and incremental performance, Base and Reference Years and incremental rank

Note: As West Bengal did not submit data on the portal, the overall and incremental performance scores were generated based on pre-filled indicator data for 12 indicators and for the remaining 11 indicators the data from the Base Year were repeated for the Reference Year.

- Base (2015-16) Year
- Reference Year (2017-18)Source – NITI Aayog-India

Table 16: Larger States: Incremental performance from Base to Reference Year – Categorization

NOT IMPROVED	LEAST IMPROVED	MODERATELY IMPROVED	MOST IMPROVED
WEST BENGAL MADHYA PRADESH PUNJAB KERALA TAMIL NADU ODISHA UTTARAKHAND UTTAR PRADESH BIHAR	GUJARAT CHHATTISGARH HIMACHAL PRADESH	TELANGANA MAHARASHTRA JAMMU AND KASHMIR KARNATAKA	HARYANA RAJASTHAN JHARKHAND ANDHRA PRADESH ASSAM
Source – NITI Aayog-India			

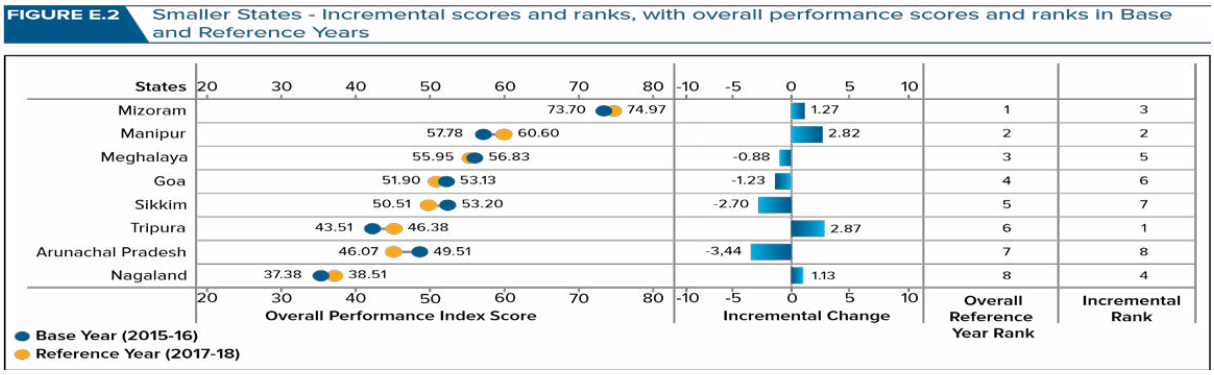


Figure E.2: Smaller States: Incremental scores and ranks, with overall performance from base year to reference year and ranks
Source – NITI Aayog-India

Table 17: Categorization of Smaller States on incremental performance and overall performance

Incremental Performance	Overall Performance		
	Aspirants	Achievers	Front-runners
not Improved (0 or less)	Arunachal Pradesh Sikkim	Meghalaya Goa	–
least Improved (0.01-2.0)	Nagaland	–	Mizoram
moderately Improved (2.01-4.0)	Tripura	Manipur	–
most Improved (more than 4.0)	–	–	–

Note: The States are categorized on the basis of Reference Year Index score range: Front-runners: top one-third (Index score >62.82), Achievers: middle one-third (Index score between 50.67 and 62.82), Aspirants: lowest one-third (Index score <50.67). The States are categorized into four groups based on incremental performance: 'Not Improved' (<=0 incremental changes), 'Least Improved' (0.01 to 2.0 points increase), 'Moderately Improved' (2.01 to 4.0 points increase), and 'Most Improved' (>4 points increase).
Source – NITI Aayog-India

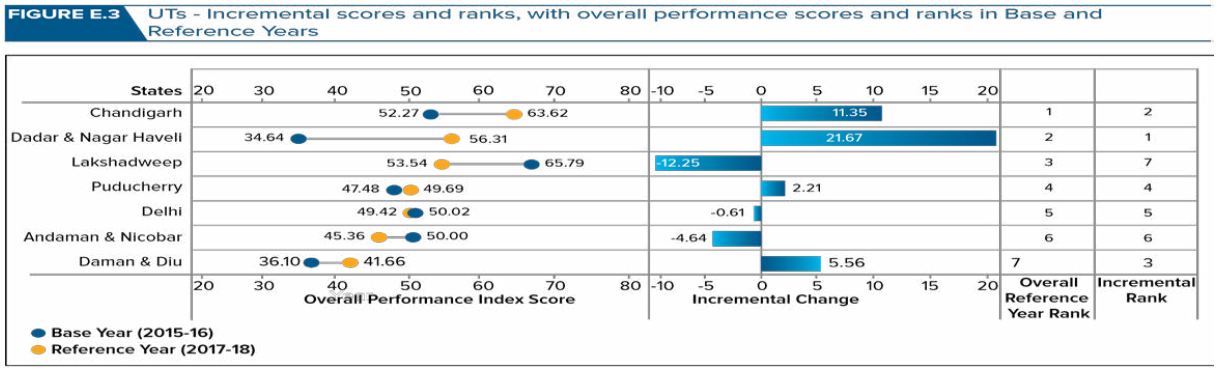


TABLE E.3 Categorization of UTs on incremental performance and overall performance

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

Incremental Performance	Overall Performance		
	Aspirants	Achievers	Front-runners
not Improved (0 or less)	Andaman and Nicobar	Delhi Lakshadweep	
least Improved (0.01–2.0)			
moderately Improved (2.01–4.0)		Puducherry	
most Improved (more than 4.0)	Daman and Diu		Chandigarh Dadra and Nagar Haveli

Source – NITI Aayog-India

Other analyses: see figure E.4 and E.5

It was found that the Health Index scores and the economic development levels of States and UTs as measured by per capita Net State Domestic Product (NSDP) are directly related to performance of States / UTs see-Figure E.4.,except a few States with low level of economic development performed well in the Health Index, such as Jammu and Kashmir, Manipur, Mizoram, Andhra Pradesh, and Punjab.

Lesson learned

Jammu and Kashmir, Manipur, Mizoram, Andhra Pradesh, and Punjab may provide some insights on how to improve Health Index scores in States with similarly low level of economic development such as Bihar. Exceptions on the other end are States and UTs with high level of economic development but not performing well in Health Index score, e.g Goa, Delhi and Sikkim.

FIGURE E.4 Composite Index scores in Reference Year and per capita Net State Domestic Product at current prices (INR) in 2016-17

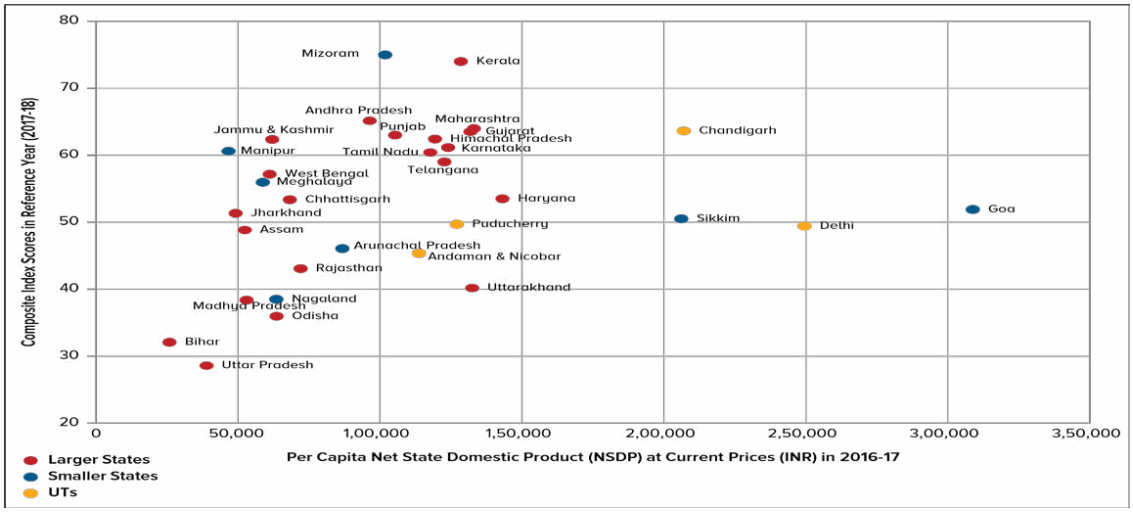
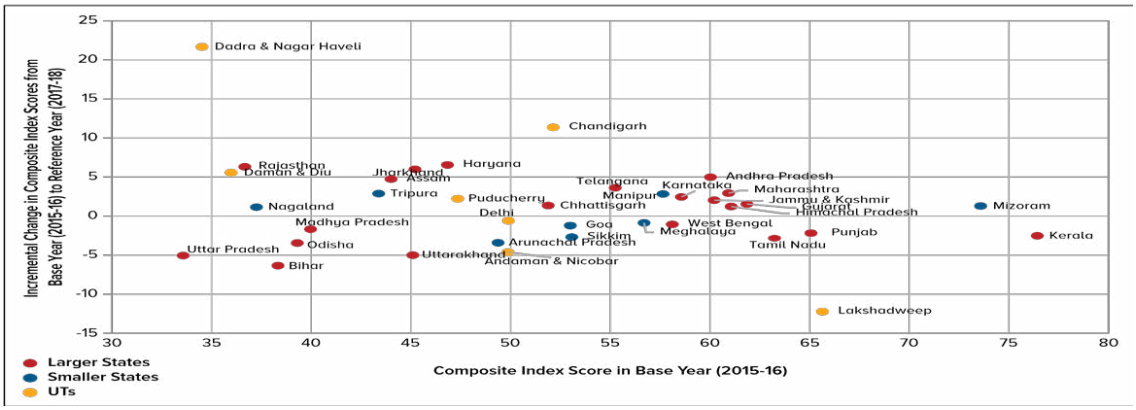


FIGURE E.5 Incremental change in Composite Index scores from Base to Reference Year and Composite Index score in Base Year



Source – NITI Aayog-India

There is narrowing gap in performance from Base Year to Reference Year among UTs (Figure E.5). There was a convergence in Health Index scores from Base Year to Reference Year across UTs, that is, UTs with higher Health Index scores in the Base Year tended to deteriorate whereas least performing UTs in the Base Year tended to improve their performance in the Reference Year. Among the Larger and Smaller States, there was neither divergence nor convergence in Health Index scores over time [1, 2].

Discussion

Key results

The Health Index revealed large disparities in overall performance across States and UTs. Among the Larger States, the overall Health Index score of the best-performing State is greater than 2.5 times of the least-performing State. Kerala was at top with overall score of 74.01, while Uttar Pradesh was at bottom with overall score of 28.61 (Figure E.1). For the Smaller States, scores varied between least 38.51 in Nagaland and top 74.97 in Mizoram (Figure E.2). Among the UTs, the scores were between 41.66 in Daman and Diu to 63.62 in Chandigarh (Figure E.3). Among the least performing States/UTs such as Bihar and Uttar Pradesh, there is an urgent need to increase efforts to increase performance.

Kerala and Tamil Nadu have reached the 2030 SDG target for NMR, which are 12 neonatal deaths per 1,000 live births.Tamil Nadu, Maharashtra and Punjab have achieved the SDG target related to Under-Five Mortality Rate (U5MR), which is 25 deaths per 1,000 live births. Among the eight EAG States, only three of the States Rajasthan, Jharkhand and Chhattisgarh showed improvement Among the eight EAG States, only three of the States Rajasthan, Jharkhand and Chhattisgarh showed improvement ,least-performing States (mostly EAG1 States) further deteriorated, leading to a wider performance gap across Larger States (Table 15/16). Thetop ten performerswere Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka and Telangana. **The six leastperforming States were Uttar Pradesh, Bihar, Odisha, Madhya Pradesh, Uttarakhand, and Rajasthan, five had decline in the overall performance scores, with the exception of Rajasthan which improved the score by 6.30 points.**

Note1. EAG States - Empowered Action Group States includes Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Rajasthan, Uttarakhand, Uttar Pradesh, and Odisha.

In Bihar, the deterioration was primarily due to the performance related to total fertility rate, low birth weight, Sex Ratio at Birth, TB treatment success rate, quality accreditation of public health facilities, and time-taken for NHM fund transfer, while in the case of Uttar Pradesh the performance related to low birth weight, TB treatment success rate, average tenure of key positions at state and district level and level of birth registration accounted for the deterioration. Kerala maintained its ranking as the top performing Larger State.

Smaller States- Mizoram ranked first while Tripura and Manipur were top two States in terms of incremental performance (Figure E.2 and Table 17). Sikkim and Arunachal Pradesh had bigger decrease in overall Health Index scores due to poor performance of several indicators such as institutional deliveries, TB case notification rate, TB treatment success rate, 1st trimester ANCs, level of birth registration, and IDSP reporting of L-form. UTs- Chandigarh ranked first in while Dadra and Nagar Haveli improved the most (Figure E.3 and Table E.3)., ranked second in terms of overall performance ranking. Decline in the overall Health Index scores of Lakshadweep and Andaman & Nicobar Islands is due to deterioration of health outcome indicators, 3 indicators deteriorated in Lakshadweep (low birth weight, full immunization, institutional delivery), and 4 indicators in Andaman & Nicobar (full immunization, institutional deliveries, TB case notification, and TB treatment success rate).

The indicators/variables where most States and UTs need to focus 1.vacancies in key staff, 2.establishment of functional district Cardiac Care Units (CCUs),3.Quality accreditation of public health facilities, and 4.institutionalization of Human Resources Management Information System (HRMIS),5. Larger States need to focus on improving the Sex Ratio at Birth (SRB).

Limitations

For proper comparisons there is need for making outcome data available for smaller states, updated outcomes for non-communicable diseases and financial protection, robust programmatic data for continuous monitoring were important issues, could not be addressed optimally. There are huge disparities across States and Union Territories (UTs). The health outcomes of some States are comparable to that of some upper middle-income countries and high income countries (for example, Neonatal Mortality Rate (NMR) in Kerala is similar to that of Brazil or Argentina), while some other States have health outcomes similar to that in the poorest countries in the world (for example, NMR in Odisha is close to that of Sierra Leone).

Limitations of the Index

1. Infectious diseases, non-communicable diseases (NCDs), mental health, governance, and financial risk protection could not be fully captured in the Index due to non-availability of acceptable quality data on an annual basis.
2. For several indicators, the data are limited to public facilities due to the paucity and uneven availability of private sector data on health services in the HMIS.
3. For several key outcome indicators, data were available only for Larger States.
4. Non-availability of acceptable quality of data on an annual basis.
5. Assignment of highest weight to health outcomes is biased and not appropriate. Everyone knows that it is totally dependent on input and governance and these two are given low weight is amazing. Actually these two should be given more

weight, it is evident from states like Bihar that there are failure/ignorance/corruption/scams in these areas then how the state will improve without input and transparent good governance [5]. This may be an attempt to put everything on doctors and health staff and at the same time protect policy makers and administration from getting exposed.

Interpretation

The Health Index score ranking is an annual systematic tool for measurement of performance across States and UTs of health parameters. The results provide an important insight into the areas in which States have improved, stagnated or declined which will help in better targeting of interventions.

Conclusion

The Health Index is a useful tool to measure and compare the overall performance and incremental performance across States and UTs over time. The Health Index is an important instrument in understanding the variations and complexity of the nation's performance in health. This exercise triggered many useful discussions, including how best to measure health performance, how to strengthen the data collection system, how to identify barriers and motivate actions using data, and how to promote positive competition and learning among the States and UTs. The report in the second round highlights the areas each State/UT should focus on to facilitate improvement in overall health outcomes.

Generalisability

The States and UTs rank differently on performance, States and UTs at lower levels of the Health Index (lower levels of development of their health systems) are at an advantage in notching up incremental progress over States with high Health Index score. 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.

Other information

This is the second version of the report. There are loopholes and drawbacks in report of Niti Aayog of which few are discussed. The next version 3 is under study.

Abbreviations

AHPI Association of Healthcare Providers (India), ANC Antenatal Care ,ANM Auxiliary Nurse Midwife, ART Antiretroviral Therapy, BCG Bacillus Calmette–Guérin ,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,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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Declarations

This version of paper has not been previously published in any peer reviewed journal and is not currently under consideration by any journal. The document is Microsoft word with English (India) language & 9001 words excluding reference and declaration etc. (9621 words Total including all).

Ethics approval and consent to participate

Not applicable. This study has not involved any human or animals in real or for experiments. The submitted work does not contain any identifiable patient/participant information.

Consent for publication

The author provides consent for publication.

Availability of data and materials

Electronic records from HMIS (health management information system) of MoHFW (ministry of health and family welfare), Government of India, NITI Aayog.

Conflicts of Interest/ Competing Interest

There are no conflicts / competing of interest

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