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Regional Disparities in Maternal and Child Health Indicators Across Indian States and Union Territories

A descriptive analysis of NFHS 6 data

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REGIONAL DISPARITIES IN MATERNAL AND CHILD HEALTH INDICATORS ACROSS INDIAN STATES AND UNION TERRITORIES

A descriptive analysis of NFHS 6 data

Abstract

Maternal and child health outcomes differ widely across Indian States and Union Territories (UTs). These differences were examined in the NFHS-6 factsheet data and explored how selected indicators relate to State income.

Total estimates for 35 States and UTs were analysed, their urban and rural estimates compared, and grouped into six regions. Pearson and Spearman correlations paired the NFHS-6 estimates with FY 2023–24 per-capita Net State Domestic Product (NSDP) reported by the Reserve Bank of India. Manipur was absent from the NFHS-6 dataset.

Mean stunting prevalence was 26.33% (SD 5.69; range 16.6%–37.1%), while coverage of at least four antenatal care visits averaged 70.87% (SD 17.07; range 32.5%–95.1%). Skilled birth attendance averaged 92.98% (SD 6.95). Full vaccination averaged 82.86% (SD 6.62) across 33 units with available total estimates. Per-capita NSDP was associated with lower stunting (Pearson $r = -0.525$, $p = 0.002$; Spearman $\rho = -0.570$, $p < 0.001$; $n = 32$) and higher skilled birth attendance ($r = 0.544$, $p = 0.001$) and antenatal care coverage ($r = 0.435$, $p = 0.013$). Its association with vaccination was weaker ($r = 0.343$, $p = 0.063$; $n = 30$).

The findings point to uneven maternal care and child nutrition across States and UTs. Income was associated with some indicators, but these State-level correlations cannot establish cause and effect.

Keywords: *NFHS-6, child health, maternal health, stunting, vaccination, antenatal care, regional disparities, India*

1 Introduction

Despite gains in maternal and child health services in India, access and outcomes still differ among States and Union Territories (UTs). Antenatal care, skilled delivery, vaccination, child feeding, and nutritional status capture different parts of that experience. Examining them together can show where strong service coverage coexists with poor nutrition or where progress in one service has not extended to another.

The National Family Health Survey (NFHS) provides comparable estimates for these measures. In this study, we describe variation in selected NFHS-6 indicators across available States and UTs, compare urban and rural

estimates, and examine six geographic regions. We also explore whether State-level estimates are associated with per-capita Net State Domestic Product (NSDP). Such comparisons can help identify patterns for closer investigation, although State averages cannot explain the circumstances of individual households.

This reports results reproduced from the NFHS-6 Factsheet and the Reserve Bank of India Handbook of Statistics on Indian States. The economic measure is FY 2023–24 per-capita Net State Domestic Product at current prices, which is the official State-level income measure. The RBI table reports no FY 2023–24 value for Gujarat, Dadra and Nagar Haveli and Daman and Diu, or Lakshadweep. Manipur has an RBI income value but is absent from the NFHS-6 data. Correlations therefore use complete matched observations only.

2 Methods

A cross-sectional analysis of secondary NFHS-6 factsheet data has been conducted, without individual-level records. The supplied dataset contains 108 records: India and 35 States and UTs, each with Urban, Rural, and Total estimates. Manipur is absent. The 35 State and UT Total records were used for the main comparisons and Urban and Rural records were analysed separately.

Indicators covered at least four antenatal care visits, pregnancy registration with a Mother and Child Protection (MCP) card, skilled birth attendance, postnatal care within two days, full vaccination at ages 12–23 months, adequate diet at ages 6–23 months, diarrhoea and acute respiratory infection symptoms in the preceding two weeks, exclusive breastfeeding under six months, stunting under five years, and hygienic menstrual protection among women aged 15–24 years.

For geographic comparisons, we assigned each unit to one of six regions: North (Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Ladakh, Punjab, Rajasthan); Central (Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Uttarakhand); East (Bihar, Jharkhand, Odisha, West Bengal); Northeast (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura); West (Dadra and Nagar Haveli and Daman and Diu, Goa, Gujarat, Maharashtra); and South (Andaman and Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, Tamil Nadu, Telangana). Manipur could not contribute to the regional calculations because its NFHS-6 record was unavailable.

The unweighted means, sample standard deviations, and ranges for available State and UT Total estimates were calculated. Urban and rural estimates were summarized separately, and regional means used Total records. Missing values were omitted only from the relevant indicator calculation; tables report the resulting sample sizes. Because each State or UT contributes equally, these means are not population-weighted estimates for India.

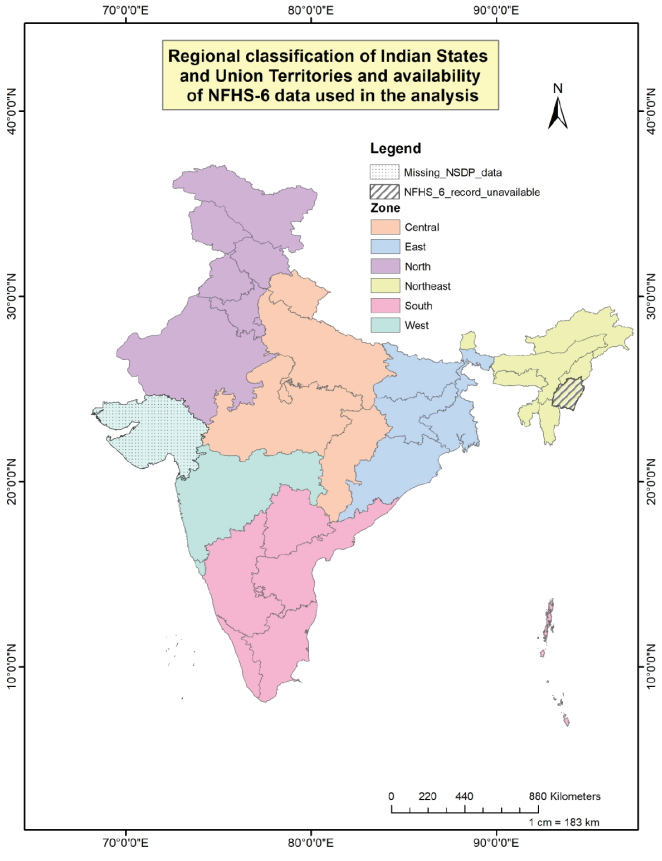


Figure 1: Regional classification of Indian States and Union Territories and availability of NFHS-6 data used in the analysis

Per-capita NSDP at current prices for FY 2023–24 came from Table 19 of the Reserve Bank of India Handbook of Statistics on Indian States. These values were matched to NFHS-6 Total records by State or UT name and Pearson and Spearman correlations for complete pairs calculated. The two-sided p-values without adjustment for multiple comparisons are reported.

3 Results

3.1 Completeness of the NFHS 6 Dataset

The verified NFHS-6 block included 35 States and Union Territories in addition to India. Manipur was absent. Among the Total records, full vaccination was missing for Goa and Andaman and Nicobar Islands, leaving 33 observations. Adequate diet was missing for Goa, leaving 34 observations. All other indicators used in the Total summary had 35 observations. Urban and rural exclusive-breastfeeding records also contained missing or non-numeric entries and were summarized using available cases.

Table 1 : Completeness of NFHS-6 records and indicator-specific sample sizes

Record or indicator	Expected N	Available N	Missing unit(s)	Analytic rule
Administrative units	36	35	Manipur	One Total row expected per unit
ANC 4+ visits (%)	35	35	None	Total values only
MCP card (%)	35	35	None	Total values only
Skilled birth (%)	35	35	None	Total values only
PNC within 2 days (%)	35	35	None	Total values only
Full vaccination (%)	35	33	Goa; Andaman & Nicobar Islands	Total values only
Adequate diet (%)	35	34	Goa	Total values only
Diarrhoea (%)	35	35	None	Total values only

ARI symptoms (%)	35	35	None	Total values only
Exclusive breastfeeding (%)	35	35	None	Total values only
Stunting (%)	35	35	None	Total values only
Hygienic menstrual protection (%)	35	35	None	Total values only

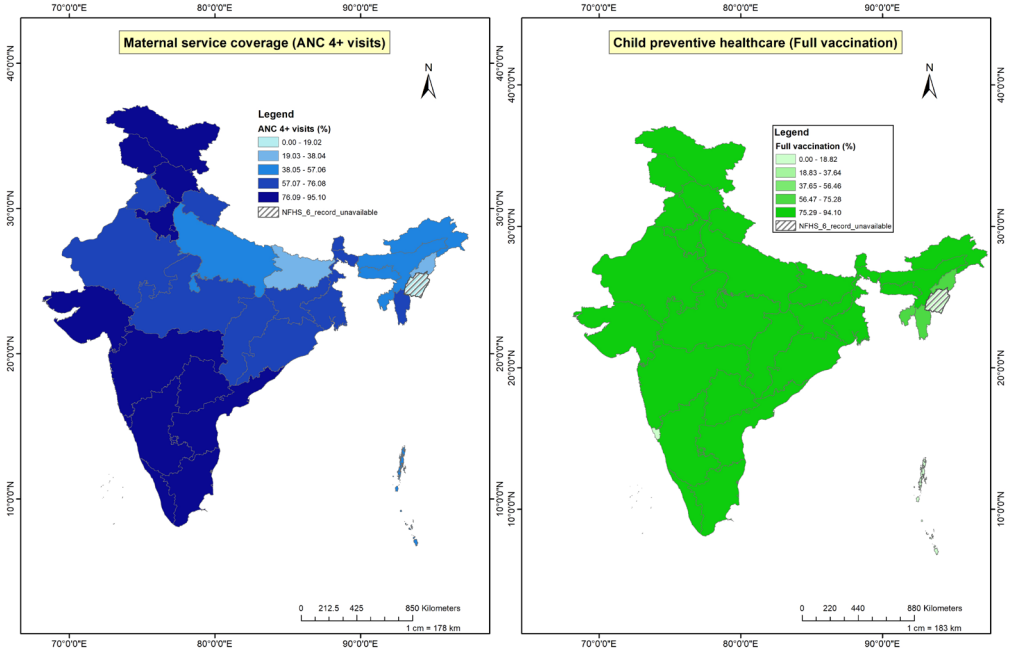
3.2 State and Union Territory Summary Statistics

Across the 35 available Total records, ANC coverage averaged 70.87% (SD 17.07) and ranged from 32.5% in Nagaland to 95.1% in Puducherry. Skilled birth attendance was high on average at 92.98% (SD 6.95), but ranged from 70.9% in Meghalaya to 99.8% in Kerala. Postnatal care within two days averaged 83.68% (SD 11.76), with values ranging from 51.9% in Meghalaya to 97.4% in Andhra Pradesh.

Full vaccination averaged 82.86% (SD 6.62) among 33 States and UTs with available Total values. Coverage ranged from 64.3% in Nagaland to 94.1% in Ladakh.

Mean stunting prevalence was 26.33% (SD 5.69), ranging from 16.6% in Puducherry to 37.1% in Dadra and Nagar Haveli and Daman and Diu. Adequate diet among children aged 6–23 months averaged only 16.14% (SD 5.67) across 34 available units, with a range of 7.8% in Gujarat to 28.3% in West Bengal.

Diarrhoea prevalence averaged 5.67% (SD 3.20), ranging from 0.4% in Ladakh to 13.0% in Uttar Pradesh. ARI symptoms averaged 1.24% (SD 0.88) and ranged from 0.2% in Andaman and Nicobar Islands to 3.2% in Bihar. MCP card coverage was consistently high, averaging 96.47% (SD 3.08).



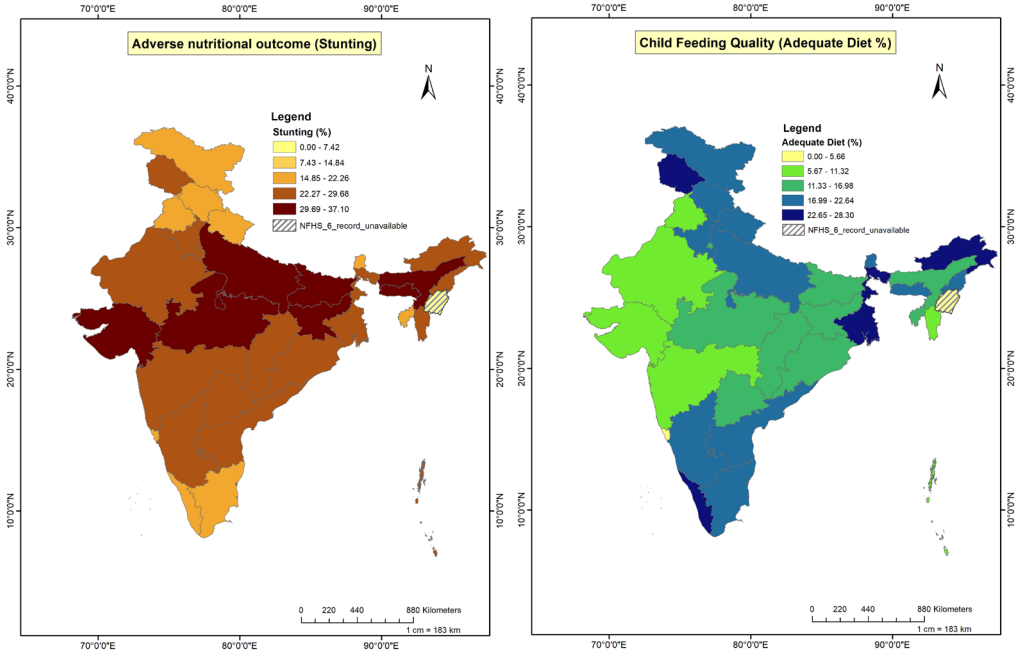


Figure 2 : State and Union Territory distribution of selected maternal and child health indicators in NFHS-6

Table 2 : Summary statistics for maternal and child health indicators using State and UT Total values

Indicator	N	Mean	SD	Minimum	Maximum	Range
ANC 4+ visits (%)	35	70.87	17.07	32.50	95.10	62.60
MCP card (%)	35	96.47	3.08	87.90	99.90	12.00
Skilled birth (%)	35	92.98	6.95	70.90	99.80	28.90
PNC within 2 days (%)	35	83.68	11.76	51.90	97.40	45.50
Full vaccination (%)	33	82.86	6.62	64.30	94.10	29.80
Adequate diet (%)	34	16.14	5.67	7.80	28.30	20.50
Diarrhoea (%)	35	5.67	3.20	0.40	13.00	12.60
ARI symptoms (%)	35	1.24	0.88	0.20	3.20	3.00
Exclusive breastfeeding (%)	35	54.92	18.18	0.00	85.60	85.60
Stunting (%)	35	26.33	5.69	16.60	37.10	20.50
Hygienic menstrual protection (%)	35	87.55	10.86	63.00	99.70	36.70

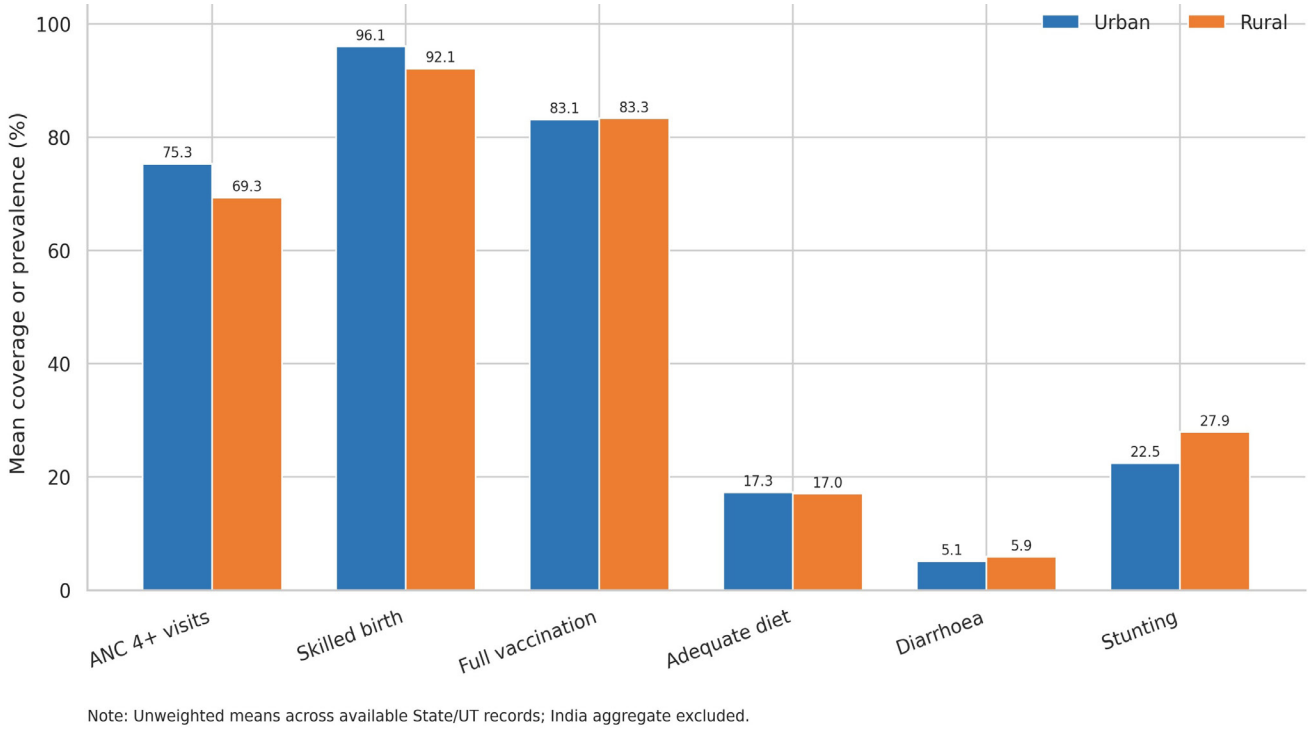
3.3 Urban and Rural Patterns

The unweighted rural mean for stunting was 27.94% (SD 6.96), compared with 22.46% (SD 4.27) for urban records, a difference of 5.48 percentage points. ANC coverage averaged 69.33% in rural records and 75.35% in urban records. Skilled birth attendance averaged 92.14% in rural records and 96.06% in urban records, while postnatal care within two days averaged 82.72% and 87.04%, respectively.

Vaccination showed little difference in these unweighted summaries: 83.33% in rural records and 83.14% in urban records. Adequate diet was also similar, averaging 17.02% in rural records and 17.30% in urban records. These comparisons are descriptive and do not account for State population size, sampling uncertainty, or the paired structure of urban and rural estimates within each State or UT.

Table 3 : Urban and rural summary statistics for selected NFHS-6 indicators

Indicator	Urban N	Urban mean	Urban SD	Urban min	Urban max	Rural N	Rural mean	Rural SD	Rural min	Rural max	Difference (pp)
ANC 4+ visits (%)	35	75.35	15.26	39.40	99.20	35.00	69.33	17.66	27.50	94.70	6.02
Skilled birth (%)	35	96.06	3.38	86.90	100.00	35.00	92.14	7.87	68.80	100.00	3.92
PNC within 2 days (%)	35	87.04	9.38	60.10	98.40	35.00	82.72	12.09	50.20	97.50	4.31
Full vaccination (%)	35	83.14	7.04	64.10	94.20	35.00	83.33	7.33	64.40	96.90	-0.19
Adequate diet (%)	35	17.30	6.65	4.80	33.00	35.00	17.02	6.00	6.50	31.50	0.28
Diarrhoea (%)	35	5.10	3.31	0.00	12.20	35.00	5.89	3.58	0.00	16.10	-0.79
Stunting (%)	35	22.46	4.27	15.50	32.70	35.00	27.94	6.96	17.80	45.00	-5.48



Note: Unweighted means across available State/UT records; India aggregate excluded.

Figure 3 : Urban and rural mean values for ANC, skilled birth attendance, vaccination, adequate diet, diarrhoea, and stunting

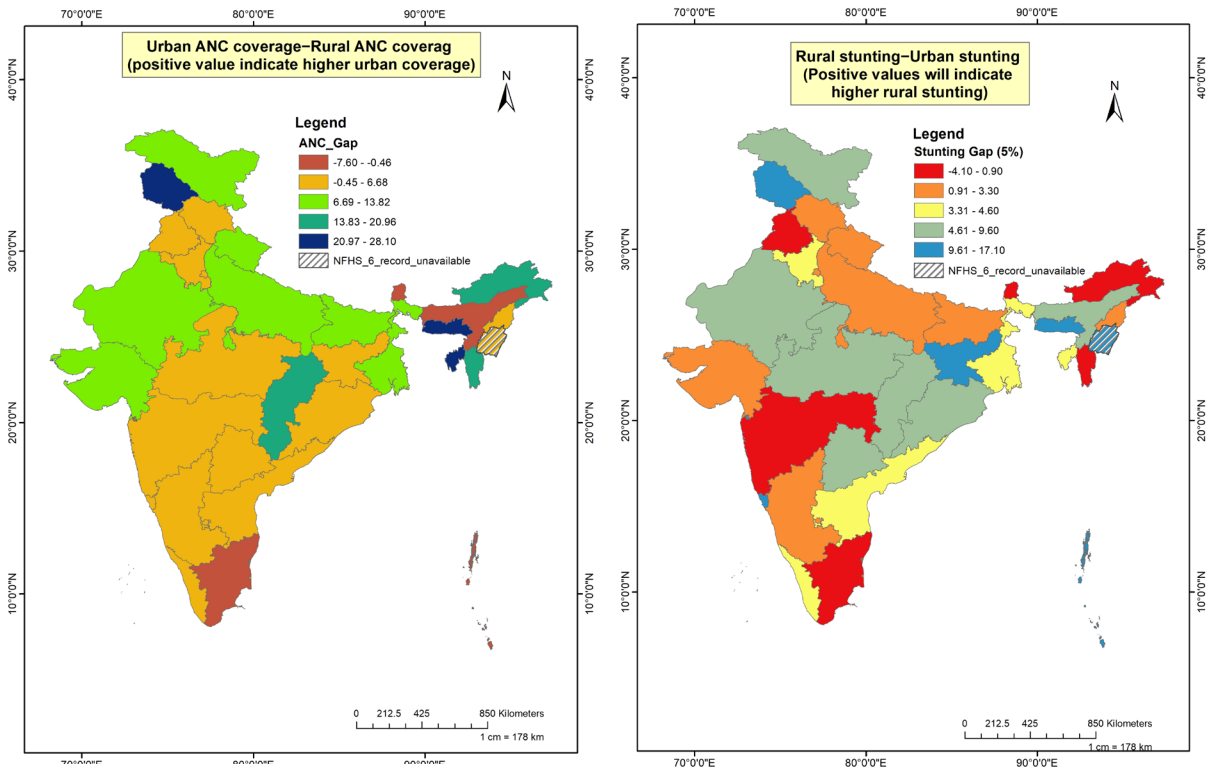


Figure 4 : State and Union Territory differences between rural and urban estimates for stunting and antenatal care coverage

3.4 Regional Patterns

Regional summaries showed substantial variation. ANC coverage was highest in the West (82.75%) and South (82.00%) and lowest in the Northeast (54.06%) and East (58.68%). Skilled birth attendance ranged from 86.61% in the Northeast and 88.35% in the East to 98.96% in the South. The Central region recorded the highest mean diarrhoea prevalence at 10.22%, followed by the East at 8.02%; the Northeast recorded the lowest regional mean at 3.00%.

Mean stunting was highest in the West at 30.32%, followed by the East at 29.95% and Central region at 27.60%. The North had the lowest mean stunting at 23.66%, followed by the South at 24.54%. These values do not support a simple North–South gradient. The regional pattern depends on the indicator and on the composition and number of administrative units in each region.

Vaccination averaged 86.94% in the South, 84.70% in the West, 84.19% in the North, 83.57% in the East, 81.70% in Central India, and 76.74% in the Northeast. The West vaccination mean used only three observations because Goa had no reported Total value; the South mean used seven because Andaman and Nicobar Islands had no reported Total value. Manipur was absent from all Northeast calculations.

Table 4 : Regional means for selected NFHS-6 indicators using State and UT Total values

Region	States/ UTs repre-sented	Vaccina-tion mean (N)	Stunting mean (N)	ANC mean (N)	Skilled birth mean (N)	Diarrhoea mean (N)
North	8	84.19 (n=8)	23.66 (n=8)	77.75 (n=8)	95.66 (n=8)	5.78 (n=8)
Central	4	81.70 (n=4)	27.60 (n=4)	64.60 (n=4)	88.98 (n=4)	10.23 (n=4)
East	4	83.57 (n=4)	29.95 (n=4)	58.68 (n=4)	88.35 (n=4)	8.03 (n=4)
Northeast	7	76.74 (n=7)	26.34 (n=7)	54.06 (n=7)	86.61 (n=7)	3.00 (n=7)
West	4	84.70 (n=3)	30.33 (n=4)	82.75 (n=4)	95.43 (n=4)	3.83 (n=4)
South	8	86.94 (n=7)	24.54 (n=8)	82.00 (n=8)	98.96 (n=8)	5.38 (n=8)

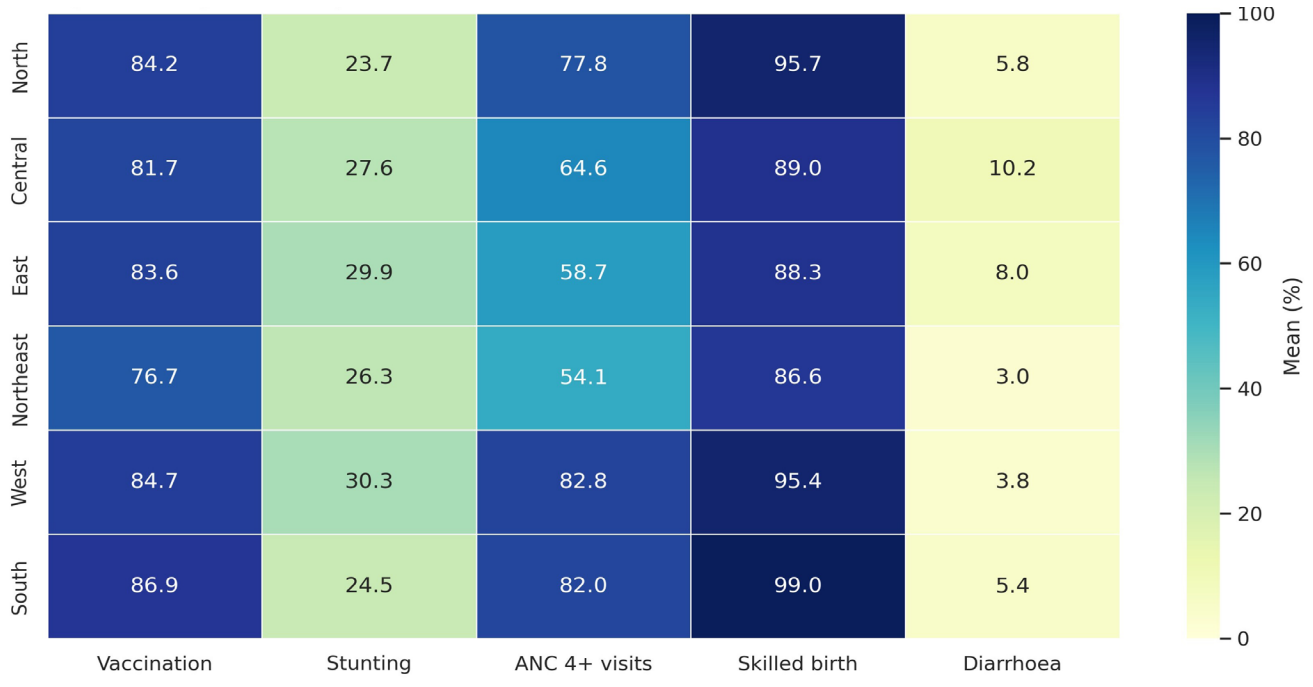


Figure 5 : Regional comparison of vaccination, stunting, ANC, skilled birth attendance, and diarrhoea

3.5 State and Union Territory Extremes

The widest service-coverage range was observed for ANC, which differed by 62.6 percentage points between Nagaland and Puducherry. Skilled birth attendance varied by 28.9 percentage points between Meghalaya and Kerala. Full vaccination varied by 29.8 percentage points between Nagaland and Ladakh among units with available values.

Nutrition indicators also showed pronounced variation. Stunting differed by 20.5 percentage points between Puducherry and Dadra and Nagar Haveli and Daman and Diu. Adequate diet differed by 20.5 percentage points between Gujarat and West Bengal.

Table 5 : Highest and lowest State and UT values for selected indicators

Indicator	Lowest State/ UT	Lowest (%)	Highest State/UT	Highest (%)	Range (pp)	N
ANC 4+ visits (%)	Nagaland	32.5	Puducherry	95.1	62.6	35
Skilled birth (%)	Meghalaya	70.9	Puducherry	99.8	28.9	35
PNC within 2 days (%)	Meghalaya	51.9	Andhra Pradesh	97.4	45.5	35

Full vaccination (%)	Nagaland	64.3	Ladakh	94.1	29.8	33
Adequate diet (%)	Gujarat	7.8	West Bengal	28.3	20.5	34
Diarrhoea (%)	Ladakh	0.4	Uttar Pradesh	13.0	12.6	35
Stunting (%)	Puducherry	16.6	Dadra and Nagar Haveli & Daman and Diu	37.1	20.5	35
MCP card (%)	Lakshadweep	87.9	Sikkim	99.9	12.0	35

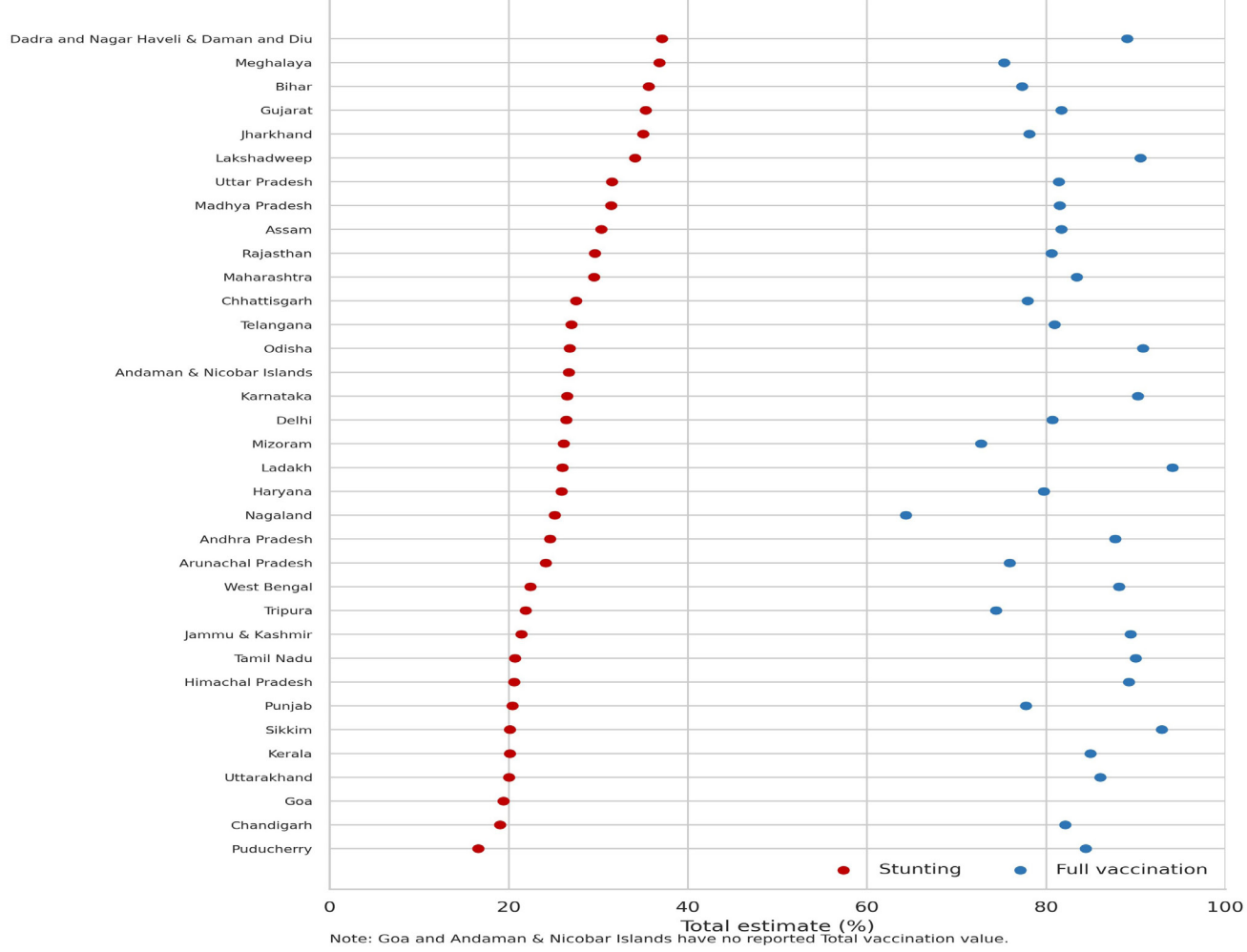


Figure 6 : State and UT distribution of stunting and vaccination coverage

3.6 Correlation with Per Capita State Income

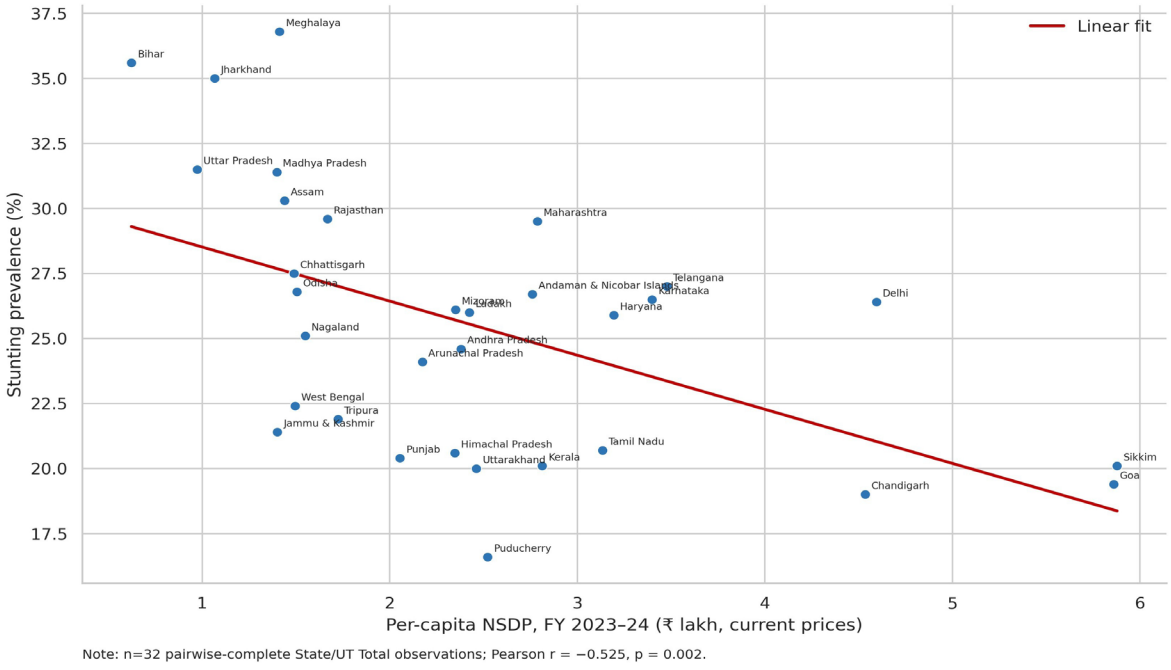
Complete FY 2023–24 per-capita NSDP and NFHS-6 Total records were available for 32 States and UTs for most indicators. Vaccination used 30 observations because Total vaccination values were also missing for Goa and Andaman and Nicobar Islands; adequate diet used 31 because Goa was missing.

Per-capita NSDP had a moderate inverse association with stunting (Pearson $r = -0.525$, $p = 0.002$; Spearman $\rho = -0.570$, $p < 0.001$). Positive associations were observed for skilled birth attendance ($r = 0.544$, $p = 0.001$; $\rho = 0.707$, $p < 0.001$), postnatal care within two days ($r = 0.477$, $p = 0.006$; $\rho = 0.619$, $p < 0.001$), and ANC coverage ($r = 0.435$, $p = 0.013$; $\rho = 0.501$, $p = 0.004$).

Vaccination had a weaker positive correlation that did not reach the 0.05 significance threshold ($r = 0.343$, $p = 0.063$; $\rho = 0.338$, $p = 0.067$). Adequate diet ($r = 0.126$, $p = 0.501$), diarrhoea ($r = -0.276$, $p = 0.126$), and MCP-card coverage ($r = 0.131$, $p = 0.475$) were not significantly correlated with per-capita NSDP. These ecological associations do not imply that State income directly causes the observed health outcomes.

Table 6 : Pearson and Spearman correlations between FY 2023–24 per-capita NSDP and NFHS-6 Total indicators

Indicator	N	Pearson r	P-value	Spearman ρ	P-value
Vaccination coverage	30	0.343	0.063	0.338	0.067
Stunting prevalence	32	-0.525	0.002	-0.570	0.001
ANC 4+ visits	32	0.435	0.013	0.501	0.003
Skilled birth attendance	32	0.544	0.001	0.707	0.000
PNC within 2 days	32	0.477	0.006	0.619	0.000
Adequate diet	31	0.126	0.501	0.164	0.377
Diarrhoea prevalence	32	-0.276	0.126	-0.181	0.322
MCP card registration	32	0.131	0.474	0.208	0.254



Note: n=32 pairwise-complete State/UT Total observations; Pearson r = −0.525, p = 0.002.

Figure 7 : Per-capita NSDP and stunting, with fitted linear trend and State and UT labels

4 Discussion

4.1 Principal Findings

Skilled birth attendance was high in most States and UTs, while antenatal care and early postnatal care varied more. Adequate diet remained low, and stunting differed considerably between places. Regional patterns also changed with the indicator examined: no one region consistently led or lagged on every measure.

4.2 Maternal Health Services

The contrast between skilled birth attendance and ANC coverage is important. A State may achieve high coverage at delivery while still missing opportunities for early risk detection and continuity of care during pregnancy. The low regional ANC means in the Northeast and East indicate that improving the number and completion of antenatal contacts remains a priority. Service accessibility, continuity, perceived quality, and outreach should be examined rather than assuming that delivery coverage reflects the whole maternal-care pathway.

4.3 Child Nutrition

Few children aged 6–23 months received an adequate diet, and stunting remained common in several States and UTs. Food availability, feeding practices, sanitation, and the reach of nutrition services may all matter. Rural estimates showed more stunting on average than urban estimates.

4.4 Vaccination and Childhood Illness

Vaccination coverage was high in most States and Union Territories (UTs), but it varied across them. Nagaland had

the lowest reported overall coverage. The averages for urban and rural areas were similar, although the gap may be wider within some States. The diarrhoea and respiratory illness figures describe symptoms reported in the two weeks before the survey. These figures may vary with the season, when the survey was conducted, and how well respondents recalled recent illness. Small differences between regions should therefore be interpreted with caution.

4.5 Interpretation of Regional Averages

Regional means offer a broad view, but each State or UT has equal weight regardless of population size. Kerala, for example, contributes as much as Lakshadweep. The regions also contain different numbers of units: four in the West, eight in the South, and seven available in the Northeast because Manipur is missing. Some indicators have further missing values. State and UT results should therefore be read alongside regional means.

4.6 Interpretation of the Economic Associations

States and UTs with higher per-capita income tended to have lower stunting and better coverage of several maternal services. Income may coincide with stronger health services and better household living conditions, but these correlations cannot show which factors are responsible or describe relationships within households.

The correlation with vaccination was weaker and did not meet the stated significance threshold. This may reflect the reach of vaccination programmes across different income levels, but missing values, local access, and programme delivery could also affect the pattern. The results describe associations at State and UT level; they do not establish an income threshold or a causal effect.

5 Policy Implications

5.1 Improve Maternal Care Throughout Pregnancy and After Birth

States with low antenatal care (ANC) coverage should help women register early, complete the recommended visits, and reach health facilities when needed. Community health workers and facilities should also coordinate care. Monitoring should look at the care women receive during visits, as well as the number of visits completed.

5.2 Address Child Nutrition Alongside Household Needs

Few young children receive an adequate diet, and stunting remains common in several States and Union Territories (UTs). Efforts to improve nutrition should include feeding advice for families, access to food, maternal nutrition, safe water, sanitation, and well-run nutrition services. District-level data can help States find communities whose needs are hidden by State averages.

5.3 Look Beyond State and Regional Averages

States and UTs with similar health-

service coverage may have different levels of child malnutrition or illness. Programme reviews should examine where difficulties arise, from reaching families and supporting healthy practices at home to the quality of care and follow-up.

5.4 Improve Data Quality and Reporting

Future studies should clearly state where each measure came from, what it means, which values are missing, and how many States and UTs were included in each calculation. They should also keep the analysis steps available for others to check. Manipur is absent from the NFHS-6 data, and some indicators have missing overall values. These gaps should be addressed.

6 Strengths and Limitations

This study uses a clear approach: it analyses overall State and UT estimates separately from urban and rural estimates, reports how many observations are available for each indicator, and places each State and UT in one of six regions. It also makes clear that a simple average across States and UTs differs from the published estimate for India as a whole.

The supplied data have several gaps. Manipur is absent, some indicator values are missing, and the factsheet does not provide the sample sizes or confidence intervals needed to judge the precision of its estimates. The Reserve Bank of India did not report FY 2023–24 per-capita net State domestic product (NSDP) for Gujarat, Dadra and Nagar Haveli and Daman and Diu, or Lakshadweep. Because the comparisons are made at State and UT level, they cannot show what happens within households or establish cause and effect. Giving each State and UT equal weight also means that the averages depend on which units are included. Finally, several correlations were tested without adjusting for multiple comparisons, so individual p-values should be treated cautiously.

7 Conclusion

Maternal and child health indicators vary widely across the States and UTs covered by the supplied NFHS-6 data. Skilled birth attendance is generally high, but antenatal care, children's diets, stunting, and recent childhood illness differ across places. Average stunting is higher in rural than in urban records, and no single geographic pattern applies to every indicator.

States and UTs with higher FY 2023–24 per-capita NSDP tended to have lower stunting and higher coverage of antenatal care, skilled birth attendance, and early postnatal care. Vaccination and adequate diet did not show statistically significant linear associations with income. State income alone therefore cannot explain the differences seen in these data. State and district-level analysis is needed to understand where services and support should be improved.

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Appendices

Appendix A : Verified NFHS-6 Total values by State and Union Territory, including regional classification and missing-value flags

State/UT	Region	Per-capita NSDP FY2023-24 (`)	ANC 4+ visits (%)	MCP card (%)	Skilled birth (%)	PNC within 2 days (%)	Full vaccination (%)	Adequate diet (%)	Diarrhoea (%)	ARI symptoms (%)	Exclusive breastfeeding (%)	Stunting (%)	Hygienic menstrual protection (%)	NFHS-6 Total available	NSDP available
Chandigarh	North	`4,53,457	55.8	96.5	97.0	87.9	82.1	13.9	6.3	1.0	0.0	19.0	98.8	Yes	Yes
Delhi	North	`4,59,408	85.8	91.7	94.1	81.9	80.7	13.1	8.8	1.3	48.3	26.4	97.0	Yes	Yes
Haryana	North	`3,19,363	79.0	96.3	96.0	95.2	79.7	17.0	10.7	1.2	41.2	25.9	94.3	Yes	Yes
Himachal Pradesh	North	`2,34,721	83.2	98.3	92.4	87.4	89.2	18.5	4.6	1.0	60.8	20.6	94.9	Yes	Yes
Jammu & Kashmir	North	`1,40,051	90.6	99.0	94.8	88.2	89.4	18.9	4.1	2.1	59.2	21.4	82.5	Yes	Yes
Ladakh	North	`2,42,360	94.6	99.8	99.1	93.0	94.1	23.1	0.4	0.4	52.1	26.0	87.8	Yes	Yes
Punjab	North	`2,05,374	72.0	96.2	97.0	87.8	77.7	11.1	5.5	0.5	51.0	20.4	94.6	Yes	Yes
Rajasthan	North	`1,66,647	61.0	97.5	94.9	86.7	80.6	8.7	5.8	1.7	54.3	29.6	88.5	Yes	Yes
Chhattisgarh	Central	`1,48,922	68.8	94.5	88.6	81.6	77.9	12.4	7.4	0.7	75.8	27.5	72.7	Yes	Yes
Madhya Pradesh	Central	`1,39,713	69.5	97.5	89.4	83.0	81.5	12.0	10.5	1.4	56.4	31.4	65.4	Yes	Yes
Uttar Pradesh	Central	`97,364	51.8	93.1	87.6	76.7	81.4	17.1	13.0	2.6	34.6	31.5	69.2	Yes	Yes
Uttarakhand	Central	`2,46,178	68.3	98.6	90.3	86.5	86.0	19.2	10.0	2.9	40.8	20.0	89.8	Yes	Yes
Bihar	East	`62,201	37.6	89.5	84.0	69.9	77.3	11.9	7.7	3.2	62.5	35.6	63.0	Yes	Yes
Jharkhand	East	`1,06,529	59.0	90.6	80.3	73.8	78.1	13.3	10.3	2.3	63.8	35.0	81.1	Yes	Yes
Odisha	East	`1,50,414	73.6	99.3	93.0	86.3	90.8	14.9	11.2	1.2	66.7	26.8	88.7	Yes	Yes
West Bengal	East	`1,49,515	64.5	98.8	96.1	81.2	88.1	28.3	2.9	2.4	58.4	22.4	88.8	Yes	Yes
Arunachal Pradesh	North-east	`2,17,325	46.0	97.2	88.1	61.5	75.9	24.0	3.8	0.5	50.5	24.1	96.7	Yes	Yes
Assam	North-east	`1,43,852	51.4	98.1	90.7	67.4	81.7	16.4	1.9	0.6	54.3	30.3	75.1	Yes	Yes
Manipur	North-east	`1,19,938												No	Yes
Meghalaya	North-east	`1,41,195	53.2	98.1	70.9	51.9	75.3	18.9	3.6	1.0	42.7	36.8	68.7	Yes	Yes
Mizoram	North-east	`2,34,996	72.1	96.1	93.1	68.0	72.7	8.0	2.2	0.6	64.9	26.1	91.0	Yes	Yes
Nagaland	North-east	`1,54,828	32.5	92.7	74.4	59.1	64.3	18.0	3.0	0.3	37.4	25.1	89.6	Yes	Yes
Sikkim	North-east	`5,87,743	73.6	99.9	97.9	85.1	92.9	22.2	2.5	0.2	39.0	20.1	99.1	Yes	Yes
Tripura	North-east	`1,72,299	49.6	96.1	91.2	68.1	74.4	15.9	4.0	1.3	53.4	21.9	83.0	Yes	Yes
Dadra and Nagar Haveli & Daman and Diu	West		83.2	99.2	94.4	94.0	89.0	9.2	3.0	0.4	74.3	37.1	89.3	Yes	No
Goa	West	`5,85,953	88.0	93.4	99.6	96.9			0.7	0.6	0.0	19.4	97.5	Yes	Yes
Gujarat	West		82.3	97.2	93.2	92.2	81.7	7.8	5.7	0.8	71.4	35.3	66.9	Yes	No

Maharash-tra	West	`2,78,681	77.5	97.5	94.5	91.1	83.4	9.3	5.9	1.8	64.7	29.5	90.4	Yes	Yes
Andaman & Nicobar Islands	South	`2,76,000	45.4	99.5	99.6	92.5		11.3	1.5	0.2	85.6	26.7	98.7	Yes	Yes
Andhra Pradesh	South	`2,37,951	85.5	98.7	98.7	97.4	87.7	19.2	4.8	1.0	69.5	24.6	94.3	Yes	Yes
Karnataka	South	`3,39,813	84.5	97.6	96.6	93.6	90.2	18.3	6.2	0.8	61.6	26.5	84.1	Yes	Yes
Kerala	South	`2,81,269	88.6	94.1	99.8	94.0	84.9	26.0	5.6	2.8	72.7	20.1	92.5	Yes	Yes
Lakshad-weep	South		89.0	87.9	99.8	94.5	90.5	7.9	9.3	2.8	60.8	34.1	99.7	Yes	No
Puducherry	South	`2,52,164	95.1	98.4	99.8	91.6	84.4	27.2	6.0	0.8	73.1	16.6	97.5	Yes	Yes
Tamil Nadu	South	`3,13,329	87.6	99.1	99.7	90.5	90.0	20.6	5.1	0.6	55.6	20.7	97.7	Yes	Yes
Telangana	South	`3,47,714	80.3	98.6	97.7	92.3	80.9	15.3	4.5	0.4	64.8	27.0	95.3	Yes	Yes

Appendix B: Statistical Methods: Reproducible calculation details, variable mapping, and missing-data rules

Item	Definition or source field	Rule or note
Unit of analysis	State/UT Total	One record per available State/UT; India aggregate excluded from State-level calculations.
Urban/rural analysis	Urban and Rural records	Summarized separately; not pooled with Total because the observations overlap.
Summary mean	Arithmetic mean	Unweighted across available State/UT estimates.
Standard deviation	Sample SD	Denominator n−1; missing values excluded indicator by indicator.
Region	Six mutually exclusive groups	North, Central, East, Northeast, West, South; see Sources & Methods sheet for membership.
Economic variable	Per-capita NSDP	RBI Table 19, current prices, FY 2023–24; not total GDP/GSDP.
Pearson correlation	Linear association	Two-sided p-value; pairwise-complete Total observations.
Spearman correlation	Rank association	Two-sided p-value; pairwise-complete Total observations.
Full vaccination	NFHS source column	Children aged 12–23 months fully vaccinated; Total missing for Goa and Andaman & Nicobar Islands.
Stunting	NFHS source column	Children under five below −2 SD height-for-age.
ANC 4+ visits	NFHS source column	Mothers receiving at least four antenatal care visits.
Skilled birth	NFHS source column	Births attended by skilled health personnel.
Adequate diet	NFHS source column	Children aged 6–23 months receiving an adequate diet; Total missing for Goa.
Missing administrative unit	Manipur	Absent from the supplied NFHS-6 block; not imputed.
Missing RBI values	Three units	Gujarat; Dadra and Nagar Haveli & Daman and Diu; Lakshadweep; not imputed.

Appendix C: Economic Analysis : FY 2023–24 per-capita NSDP at current prices and matched NFHS-6 availability by State and UT

State/UT	Region	Per-capita NSDP (`)	RBI value available	NFHS-6 Total available	Matched for analysis
Chandigarh	North	`4,53,457	Yes	Yes	Yes
Delhi	North	`4,59,408	Yes	Yes	Yes
Haryana	North	`3,19,363	Yes	Yes	Yes
Himachal Pradesh	North	`2,34,721	Yes	Yes	Yes
Jammu & Kashmir	North	`1,40,051	Yes	Yes	Yes
Ladakh	North	`2,42,360	Yes	Yes	Yes
Punjab	North	`2,05,374	Yes	Yes	Yes
Rajasthan	North	`1,66,647	Yes	Yes	Yes
Chhattisgarh	Central	`1,48,922	Yes	Yes	Yes
Madhya Pradesh	Central	`1,39,713	Yes	Yes	Yes
Uttar Pradesh	Central	`97,364	Yes	Yes	Yes
Uttarakhand	Central	`2,46,178	Yes	Yes	Yes
Bihar	East	`62,201	Yes	Yes	Yes
Jharkhand	East	`1,06,529	Yes	Yes	Yes
Odisha	East	`1,50,414	Yes	Yes	Yes
West Bengal	East	`1,49,515	Yes	Yes	Yes
Arunachal Pradesh	Northeast	`2,17,325	Yes	Yes	Yes
Assam	Northeast	`1,43,852	Yes	Yes	Yes
Manipur	Northeast	`1,19,938	Yes	No	No
Meghalaya	Northeast	`1,41,195	Yes	Yes	Yes
Mizoram	Northeast	`2,34,996	Yes	Yes	Yes
Nagaland	Northeast	`1,54,828	Yes	Yes	Yes
Sikkim	Northeast	`5,87,743	Yes	Yes	Yes
Tripura	Northeast	`1,72,299	Yes	Yes	Yes
Dadra and Nagar Haveli & Daman and Diu	West		No	Yes	No
Goa	West	`5,85,953	Yes	Yes	Yes
Gujarat	West		No	Yes	No
Maharashtra	West	`2,78,681	Yes	Yes	Yes
Andaman & Nicobar Islands	South	`2,76,000	Yes	Yes	Yes
Andhra Pradesh	South	`2,37,951	Yes	Yes	Yes
Karnataka	South	`3,39,813	Yes	Yes	Yes
Kerala	South	`2,81,269	Yes	Yes	Yes
Lakshadweep	South		No	Yes	No
Puducherry	South	`2,52,164	Yes	Yes	Yes
Tamil Nadu	South	`3,13,329	Yes	Yes	Yes
Telangana	South	`3,47,714	Yes	Yes	Yes