

State Nutrition Profile: Tamil Nadu

ABOUT THIS DATA NOTE

This *Data Note* describes the trends for a set of key nutrition and health outcomes, determinants, and coverage of interventions. The findings are based on data from multiple rounds of the National Family Health Surveys using estimates from reports, factsheets, or unit level data. In addition to standard prevalence-based analyses, this *Data Note* includes headcount-based analyses aligned to the POSHAN Abhiyaan monitoring framework to provide evidence that helps identify priority districts and the number of districts where public health concerns exist as per the WHO guidelines¹. This *Data Note* also includes a color-coded dashboard to compare the coverage of nutrition interventions by district. It concludes with key takeaways for children, women, and men, and identifies areas for improvement.

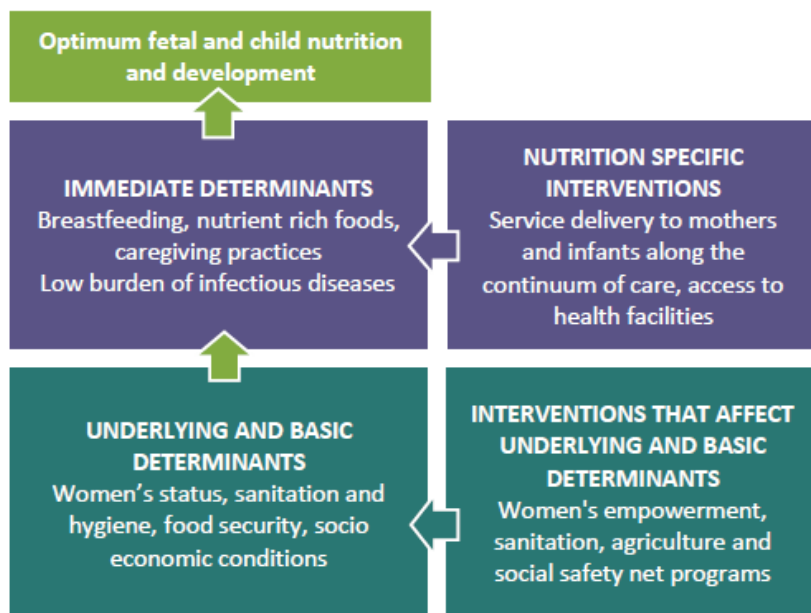
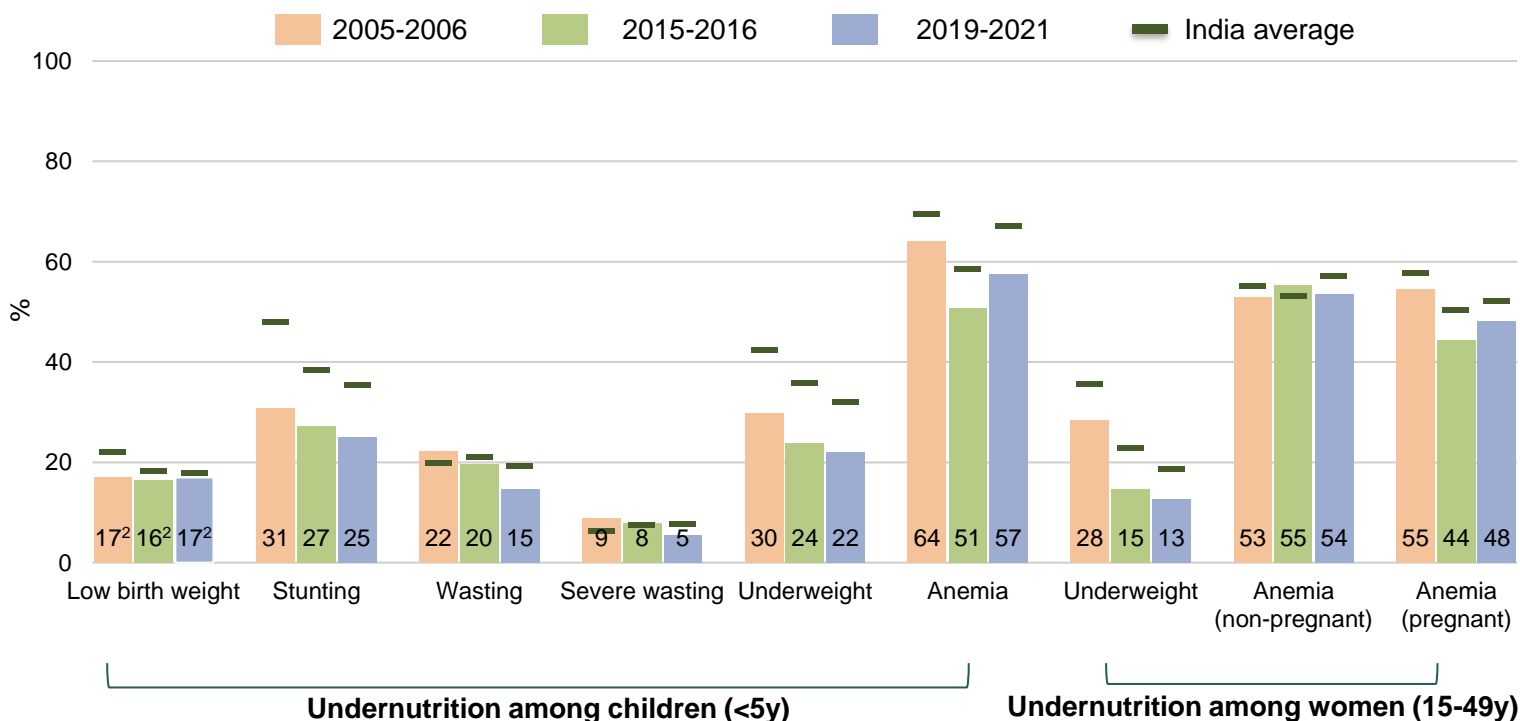


Figure 1. Trends in undernutrition outcomes 2005-2006, 2015-2016, 2019-2021



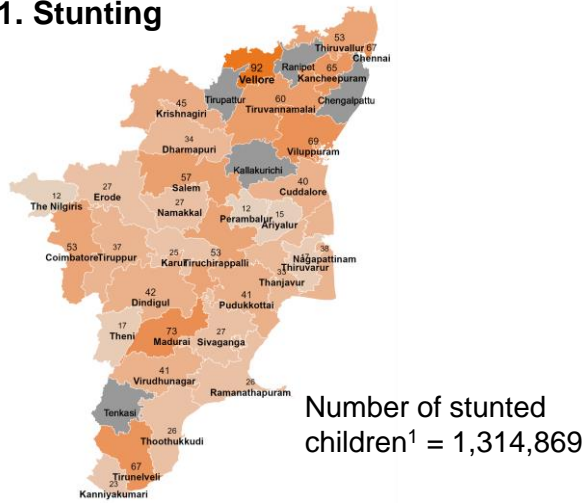
Source: NFHS-3 (2005-2006) national report and data [IFPRI estimates], NFHS-4 (2015-2016) national report, and NFHS-5 (2019-2021) national and state factsheets. Anemia among non-pregnant and pregnant women for 2005-2006 are IFPRI estimates using woman dataset.

¹WHO. Nutrition Landscape Information System (NLIS). Help Topic: Malnutrition in children. Stunting, wasting, overweight and underweight. (<https://apps.who.int/nutrition/landscape/help.aspx?menu=0&helpid=391&lang=EN>).

²In NFHS-3, NFHS-4 and NFHS-5, 9.8%, 1.2% and 0.7% of data were missing, respectively.

Map 1 & 2. Number of stunted & anemic children <5y, 2019-2021

Map 1. Stunting



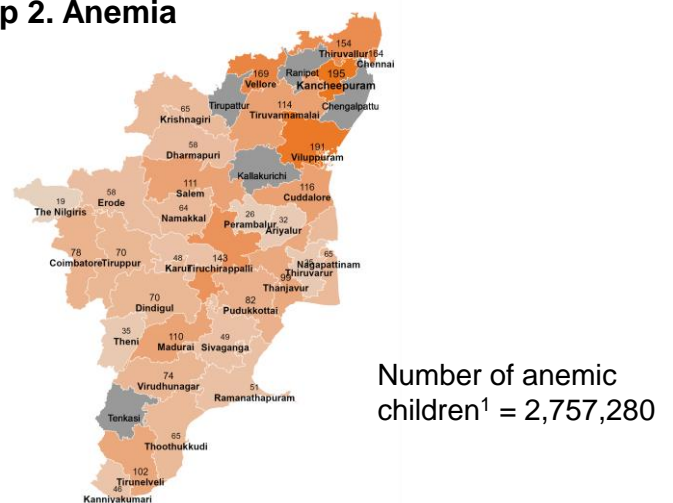
Note: Number in '000s in the above figure

Highest burden districts

1	Vellore	92,093
2	Madurai	72,818
3	Viluppuram	69,119
4	Chennai	67,179
5	Tirunelveli	66,801

No. of districts with public health concern²: 27 of 32

Map 2. Anemia



Note: Number in '000s in the above figure

Highest burden districts

1	Kancheepuram	195,010
2	Viluppuram	190,873
3	Vellore	169,091
4	Chennai	163,841
5	Thiruvallur	153,558

No. of districts with public health concern²: 30 of 32

Map 3 & 4. Number of wasted children <5y, 2019-2021

Map 3. Wasting



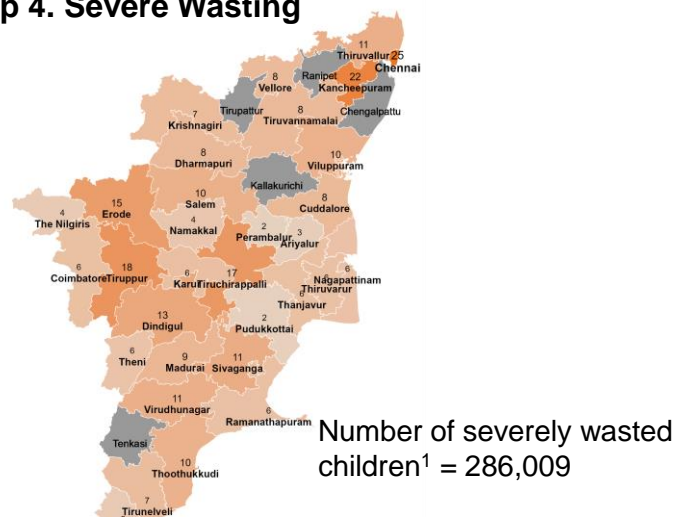
Note: Number in '000s in the above figure

Highest burden districts

1	Chennai	60,510
2	Thiruvallur	49,668
3	Kancheepuram	49,626
4	Tiruchirappalli	40,452
5	Vellore	40,329

No. of districts with public health concern²: 28 of 32

Map 4. Severe Wasting



Note: Number in '000s in the above figure

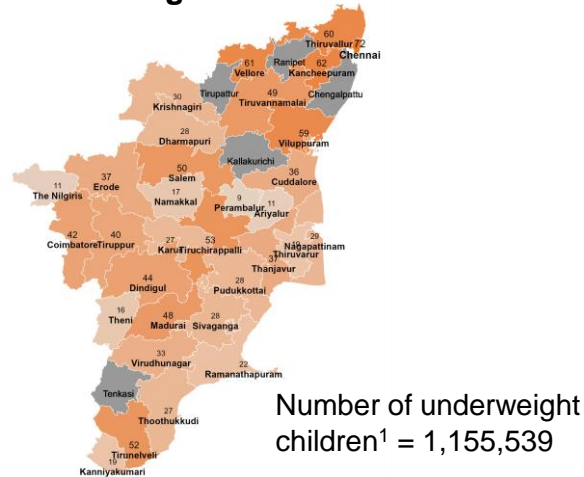
Highest burden districts

1	Chennai	25,023
2	Kancheepuram	21,863
3	Tiruppur	17,838
4	Tiruchirappalli	16,661
5	Erode	15,423

No. of districts with public health concern²: 31 of 32

Map 5 & 6. Number of underweight children (<5y) & women (15-49y), 2019-2021

Map 5. Underweight children



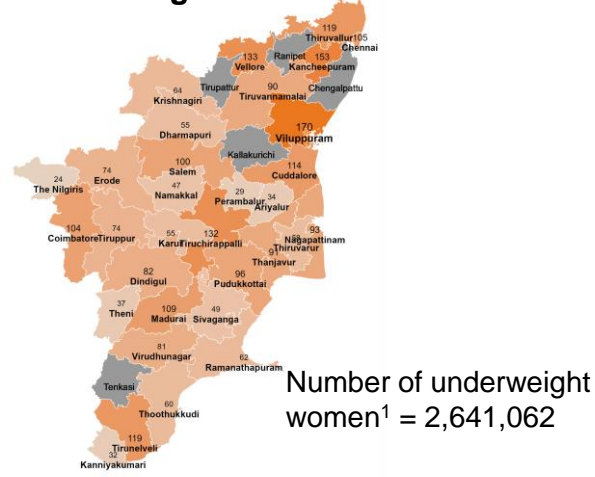
Note: Number in '000s in the above figure

Highest burden districts

1	Chennai	72,131
2	Kancheepuram	62,498
3	Vellore	60,849
4	Thiruvallur	60,198
5	Viluppuram	59,394

No. of districts with public health concern²: 24 of 32

Map 6. Underweight women



Note: Number in '000s in the above figure

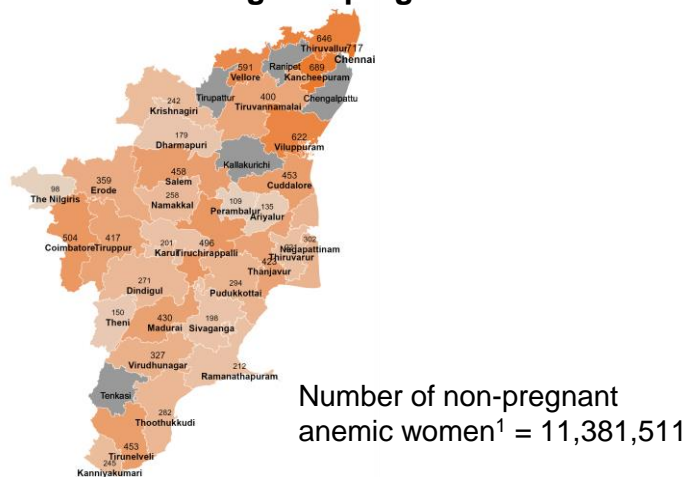
Highest burden districts

1	Viluppuram	170,484
2	Kancheepuram	152,566
3	Vellore	132,503
4	Tiruchirappalli	132,090
5	Thiruvallur	118,977

No. of districts with public health concern²: 28 of 32

Map 7 & 8. Number of anemic women (15-49y), 2019-2021

Map 7. Anemia among non-pregnant women



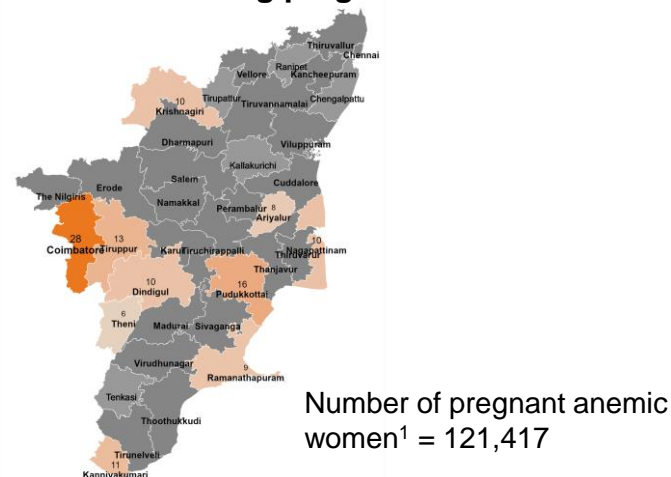
Note: Number in '000s in the above figure

Highest burden districts

1	Chennai	716,925
2	Kancheepuram	689,148
3	Thiruvallur	645,634
4	Viluppuram	621,931
5	Vellore	590,846

No. of districts with public health concern²: 32 of 32

Map 8. Anemia among pregnant women



Note: Number in '000s in the above figure

Highest burden districts

1	Coimbatore	28,033
2	Pudukkottai	15,874
3	Tiruppur	13,053
4	Kanniyakumari	11,337
5	Nagapattinam	9,917

No. of districts with public health concern²: 7 of 32

Source: IFPRI estimates - The headcount was calculated as the product of the undernutrition prevalence, and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS-5 (2019-2021; all child/woman data), and the projected population for 2019 was estimated using Census 2011. Note: Gray area in Maps 5-8 indicates districts for which data are not available. ¹The total number of children <5 years is 5,298,650, pregnant women 15-49 years is 1,039,415, and non-pregnant women 15-49 years is 20,148,745. ²Public health concern is defined as $\geq 20\%$ for underweight (children), $\geq 10\%$ for underweight (women), $\geq 40\%$ for anemia among non-pregnant women, and $\geq 40\%$ for anemia among pregnant women (WHO 2011).

Figure 2. Trends in overweight/obesity & NCDs¹
2005-2006, 2015-2016, 2019-2021

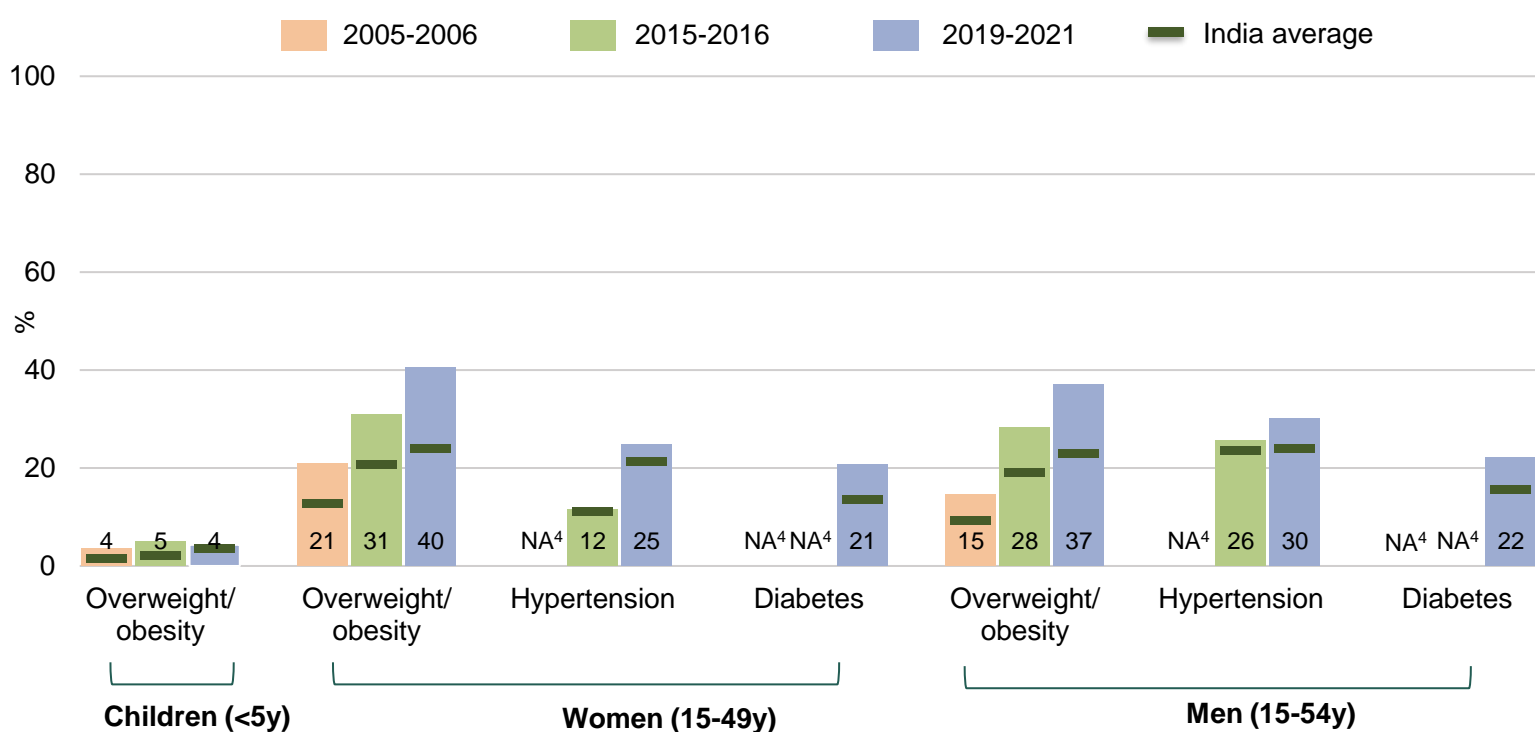


Table 1. Overweight/obesity & NCDs¹ at district-level
2015-2016, 2019-2021

Category	Outcomes	Worst performing districts (pp)	Best performing districts (pp)	Highest burden districts (thousands) ²	No of districts with public health concern ³ (total=32)
		<i>Difference between (2019-2021) & (2015-2016)⁶</i>	<i>Difference between (2019-2021) & (2015-2016)⁶</i>	2019-2021	2019-2021
Children <5 years	Overweight/obesity	Sivaganga: +8.3 Krishnagiri: +6.4	Erode: -12.6 Chennai: -7.9	Chennai: 31 Krishnagiri: 16	0
	Overweight/obesity	Namakkal: +18.6 Tiruppur: +16.9	<i>Not applicable⁵</i>	Chennai: 594 Kancheepuram: 562	32
Women (15-49 years)	Hypertension	Tiruppur: +16.9 The Nilgiris: +16.6	<i>Not applicable⁵</i>	Chennai: 408 Vellore: 302	29
	Diabetes	<i>Not available⁴</i>		Chennai: 386 Kancheepuram: 277	18
Men (15-54 years)	Overweight/obesity	<i>Not available⁴</i>			
	Hypertension	Dindigul: +15.2 Chennai: +15.1	Virudhunagar: -21.0 Kanniyakumari: -11.9	Chennai: 521 Kancheepuram: 428	32
	Diabetes	<i>Not available⁴</i>		Chennai: 347 Kancheepuram: 325	24

pp: percentage points.

Source: NFHS-3 (2005-2006) national report, NFHS-4 (2015-16) national report and data [IFPRI estimates], and NFHS-5 (2019-2021) national and state factsheets.

¹NCDs: non-communicable diseases. ²Burden: The headcount was calculated as the product of the prevalence, and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS-5 (2019-2021) and projected population for 2019 was estimated using Census 2011. ³Public health concern is defined as prevalence $\geq 15\%$ for overweight/obesity (children), $\geq 20\%$ for overweight/obesity (women and men), $\geq 20\%$ hypertension (women and men), and $\geq 20\%$ diabetes (women and men) (WHO 2011). ⁴Indicates unavailability of data for a particular indicator in the specified NFHS round. Diabetes not available in NFHS-4. ⁵Prevalence did not increase or decrease in any of the districts. ⁶The difference is calculated only between districts that are comparable between 2015-2016 and 2019-2021. All districts in Tamil Nadu are comparable.

Figure 3. Trends in immediate determinants (%)
2005-2006, 2015-2016, 2019-2021

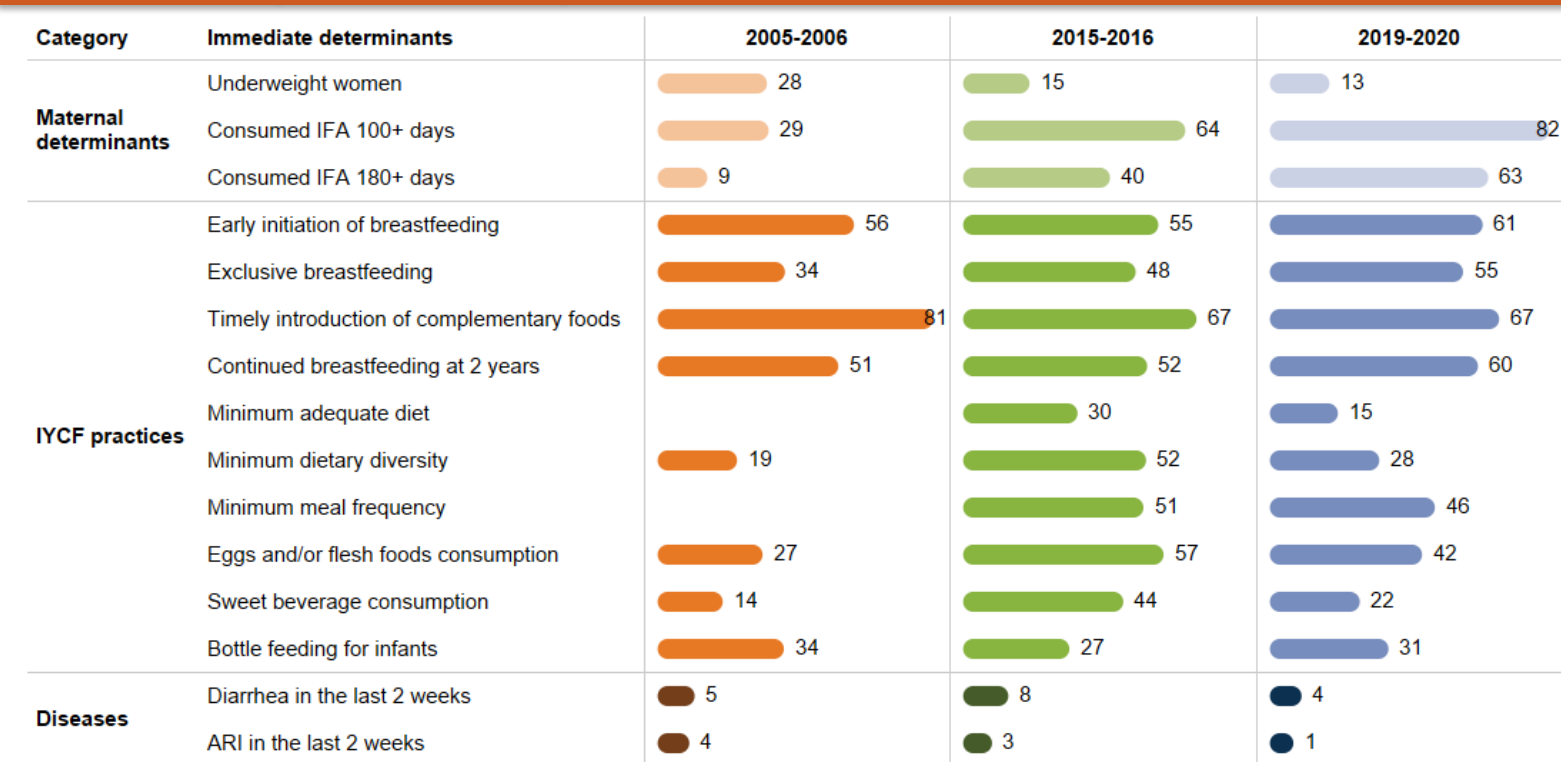


Table 2. Immediate determinants at district-level
2015-2016, 2019-2021

Category	Immediate determinants	Worst performing districts (pp)	Best performing districts (pp)	Top coverage districts (%) ²
		<i>Difference between (2019-2021) & (2015-2016)¹</i>	<i>Difference between (2019-2021) & (2015-2016)¹</i>	<i>2019-2021</i>
Maternal determinants	Underweight women	Kancheepuram: +3.2 Karur: +3.0	Sivaganga: -7.4 2 Districts ⁵ : -6.4	Kanniyakumari: 5.9 Chennai: 7.4
	Consumed IFA 100+ days	Karur: -4.3	Tirunelveli: +42.6 Dharmapuri: +41.8	Tiruppur: 95.0 Vellore: 94.2
IYCF practices	Early initiation of breastfeeding	Dindigul: -23.3 Karur: -21.0	Chennai: +35.5 Dharmapuri: +31.6	Vellore: 80.9 Chennai: 78.5
	Exclusive breastfeeding	NA ³		Theni: 53.9 Dindigul: 36.4
	Timely introduction of complementary foods	NA ³		
	Minimum adequate diet	Perambalur: -33.6 Namakkal: -27.9	Thiruvallur: +6.1 Chennai: +1.5	Thiruvallur: 25.3 Madurai: 24.6
Diseases	Diarrhea in the last 2 weeks	Virudhunagar: +1.0 Nagapattinam: +0.4	Perambalur: -11.2 Krishnagiri: -9.2	Salem: 0.7 Kanniyakumari: 0.9
	ARI in the last 2 weeks	Pudukkottai: +1.9 Chennai: +0.6	Perambalur: -7.5 Tirunelveli: -5.9	11 Districts ⁴ : 0.0

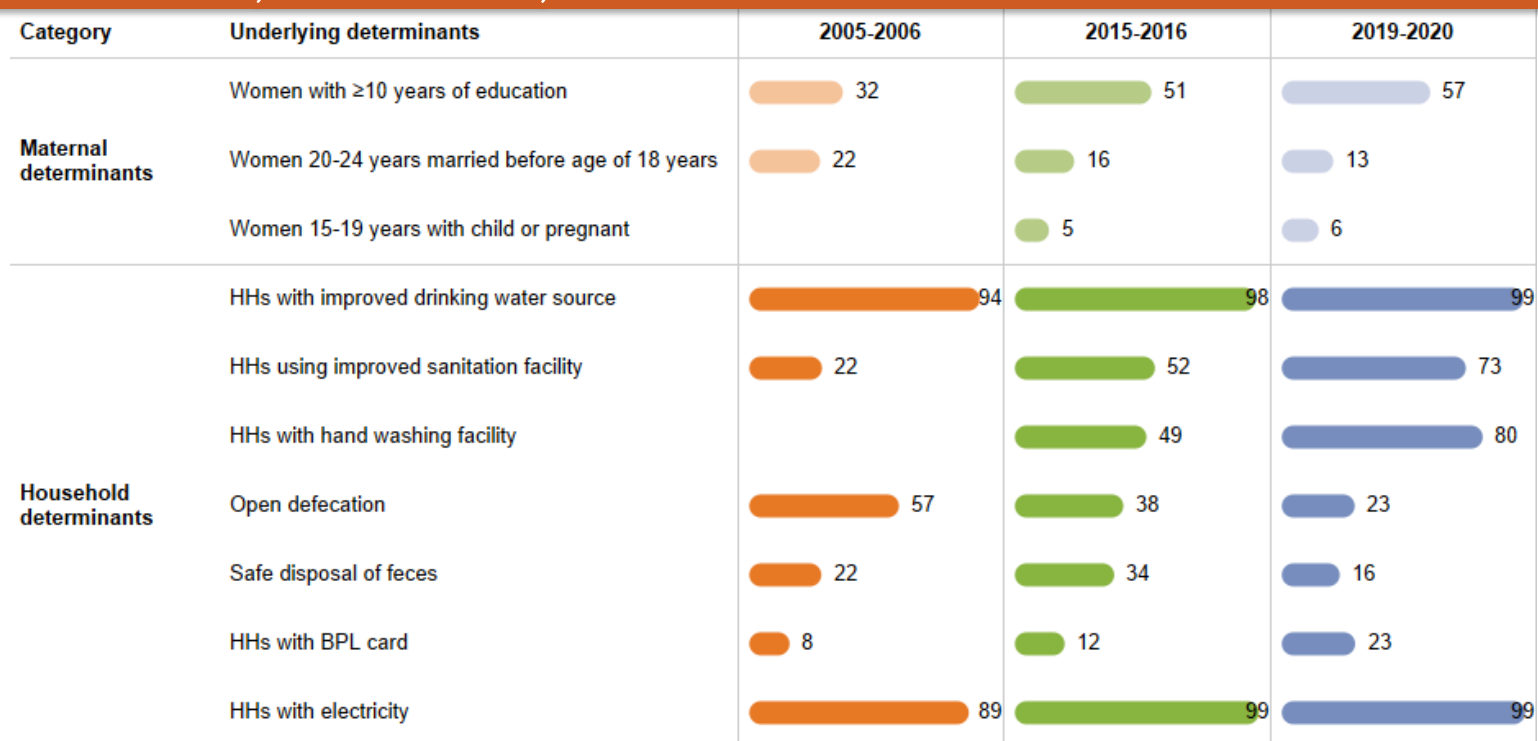
pp: percentage points.

Source: NFHS-3 (2005-2006) national and state reports and data [IFPRI estimates], NFHS-4 (2015-2016) state report and data [IFPRI estimates], and NFHS-5 (2019-21) national and state reports, factsheets, and data [IFPRI estimates].

Note: Definitions of IYCF indicators are based on WHO guidelines.

¹The difference is calculated only between districts that are comparable between 2015-2016 and 2019-2021. All districts in Tamil Nadu are comparable. ²For all indicators, top coverage districts refer to the districts with the highest prevalence in immediate determinants, except for underweight women, diarrhea in the last 2 weeks, and ARI in the last 2 weeks, for which it refers to the districts with the lowest prevalence in coverage. ³Indicates unavailability of data for a particular indicator in the specified NFHS round. ⁴11 Districts: Ariyalur, Dharmapuri, Erode, Kanniyakumari, Namakkal, Perambalur, Ramanathapuram, Sivaganga, The Nilgiris, Tirunelveli and Virudhunagar. ⁵2 Districts: Krishnagiri and Kanniyakumari

**Figure 4. Trends in underlying determinants (%)
2005-2006, 2015-2016, 2019-2021**



**Table 3. Underlying determinants at district-level
2015-2016, 2019-2021**

Category	Underlying determinants	Worst performing districts (pp)	Best performing districts (pp)	Top coverage districts (%) ²
		<i>Difference between (2019-2021) & (2015-2016)¹</i>	<i>Difference between (2019-2021) & (2015-2016)¹</i>	2019-2021
Maternal determinants	Women with ≥10 years education	Kancheepuram: -1.2 Salem: -0.3	Tirunelveli: 14.2 Virudhunagar: +13.8	Kanniyakumari: 77.1 Chennai: 76.7
	Women 20-24 years married before age of 18 years	Perambalur: +7.4 Tirunelveli: +4.7	Theni: -13.1 Dharmapuri: -11.2	Chennai: 1.9 Thanjavur: 4.1
	Women 15-19 years with child or pregnant	Erode: +8.8 Pudukkottai: +6.8	Madurai: -8.0 Ramanathapuram: -3.5	Thoothukkudi: 0.9 Kancheepuram: 2.5
Household determinants	HHs with improved drinking water source	Ariyalur: -6.1 Thoothukkudi: -2.2	Nagapattinam: +6.4 2 Districts ⁵ : +6.1	3 Districts ⁶ : 100.0
	HHs using improved sanitation facility	<i>Not applicable</i> ³	Dharmapuri: +34.9 Tirunelveli: +33.1	Kanniyakumari: 96.2 Chennai: 90.4
	HHs with electricity	Ariyalur: -0.5 3 Districts ⁴ : 0.4	Theni: +1.9 Thoothukkudi: +1.3	Thoothukkudi: 100.0 Chennai: 99.9

pp: percentage points.

Source: NFHS-3 (2005-2006) national and state reports and data [IFPRI estimates], NFHS-4 (2015-2016) national and state reports and data [IFPRI estimates], and NFHS-5 (2019-2021) state and district factsheets, state report, and data [IFPRI estimates].

¹The difference is calculated only between districts that are comparable between 2015-2016 and 2019-2021. All districts in Tamil Nadu are comparable.

²For all indicators, top coverage districts refer to the districts with the highest prevalence in underlying determinants, except for women 20-24 years married before age of 18 years and women 15-19 years with child or pregnant for which it refers to the districts with the lowest prevalence in coverage.

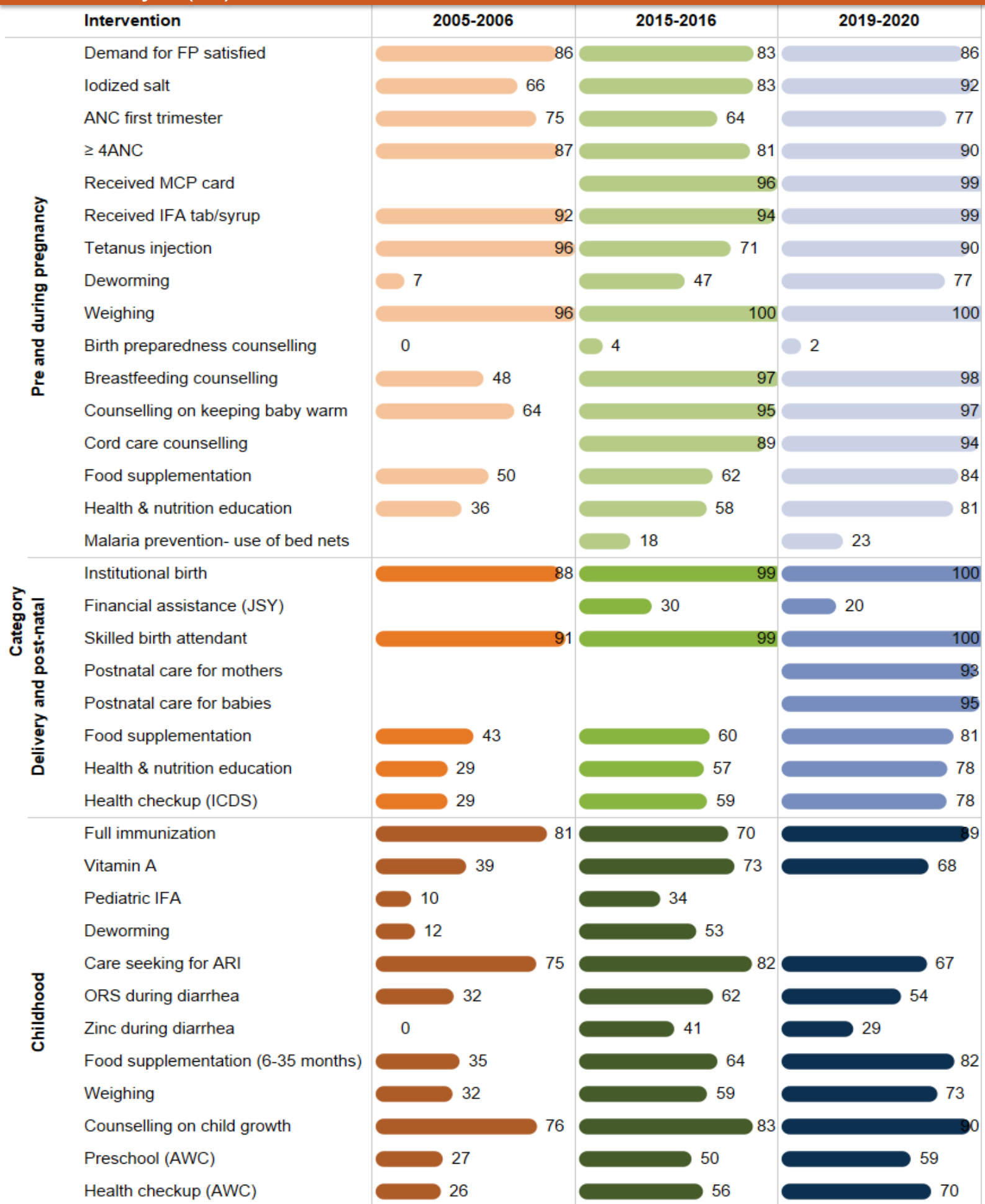
³Prevalence did not decrease in any of the districts.

⁴3 Districts: Kancheepuram, Madurai and Namakkal.

⁵2 Districts: Madurai and Perambalur.

⁶3 Districts: Nagapattinam, Perambalur and Thiruvarur.

Figure 5. Trends in coverage of interventions across the first 1,000 days (%), 2005-2006, 2015-2016, 2019-2021



Source: NFHS-3 (2005-2006) national and state reports and data [IFPRI estimates], NFHS-4 (2015-2016) national and state reports and data [IFPRI estimates] and NFHS-5 (2019-2021) state factsheet, state and national report, and data [IFPRI estimates].

Note 1: Refer to district dashboard for the inter-district variability in the coverage of interventions.

Intervention coverage at district level, 2019-2021

<20% 20-<40% 40-<60% 60-<80% >=80% Not Available

District name	Pre-pregnancy		Pregnancy										Delivery & postnatal										Early childhood													
	Demand for FP satisfied	Indexed salt	ANC first trimester	≥4 ANC	Received MCP card	Received IFA tab/syrup	Tetanus injection	Deworming	Weighting	Birth preparedness counselling	Breastfeeding counselling	Counselling on keeping baby warm	Cord care counselling	Food supplementation	Health & nutrition education	Malaria prevention - use of bed nets	Institutional birth	Financial assistance (USY)	Skilled birth attendant	Postnatal care for mothers	Postnatal care for babies	Food supplementation	Health & nutrition education	Health checkup	Full immunization	Vitamin A	Paediatric IFA	Deworming	Care seeking for ARI	ORS during diarrhoea	Zinc during diarrhoea	Food supplementation (6-35 months)	Weighting	Counselling on child growth	Preschool at AWC	Health checkup
Tamil Nadu	86.1	92.0	77.4	89.9	98.8	98.7	89.7	76.7	99.9	1.6	98.0	97.0	94.4	83.8	81.0	23.5	99.6	19.9	99.8	93.2	94.9	81.2	78.0	77.6	89.2	68.2	28.4	33.1	67.4	53.8	28.9	81.7	72.8	90.0	58.8	69.5
Ariyalur	88.0	81.6	65.0	91.4	100.0	99.2	88.4	81.6	100.0	2.3	98.2	97.7	96.3	97.0	92.0	28.4	100.0	31.0	100.0	95.7	96.2	95.8	91.2	92.4	90.8	61.7	29.8	29.0				88.8	84.4	94.2	76.6	89.0
Chennai	87.5	97.6	81.4	89.9	96.8	97.6	96.1	73.3	100.0	4.3	95.3	95.3	94.8	65.5	60.5	19.3	100.0	21.8	100.0	95.0	96.7	65.5	60.9	61.6	96.6	56.4	27.5	29.9				54.2	50.2	95.9	33.3	47.0
Coimbatore	82.0	98.8	72.6	90.0	100.0	98.4	91.8	73.2	100.0	1.1	100.0	100.0	93.3	84.8	83.5	28.4	100.0	27.7	100.0	95.4	98.6	81.0	80.4	80.4	94.5	75.2	31.9	34.1				87.0	74.0	91.8	56.8	74.3
Cuddalore	85.1	88.1	75.5	82.2	98.3	97.3	88.1	64.1	100.0	1.9	96.4	94.2	89.6	71.9	69.2	23.7	99.2	3.7	99.1	87.7	93.9	68.3	62.5	65.2	79.0	72.7	32.0	31.4	82.6			68.1	61.8	83.0	61.3	64.1
Dharmapuri	86.6	93.4	78.4	94.5	100.0	99.1	95.9	84.4	100.0	0.0	99.0	99.0	98.5	91.3	90.9	17.0	99.6	26.5	99.6	98.0	95.9	90.0	89.5	90.0	90.6	66.2	24.6	41.3				91.3	79.5	94.3	71.6	82.7
Dindigul	88.7	81.6	71.9	96.2	99.1	98.8	87.4	79.5	100.0	6.2	100.0	99.5	98.7	96.0	95.3	25.7	97.0	23.4	98.6	95.3	96.2	92.6	92.3	92.3	92.6	84.0	33.9	40.9				91.1	85.8	92.6	83.9	88.1
Erode	89.3	97.6	87.8	93.9	100.0	99.2	97.5	66.1	100.0	2.0	99.6	100.0	99.3	94.8	93.7	17.5	100.0	15.3	100.0	96.5	98.4	93.2	92.5	92.9	95.9	64.2	19.6	30.0				91.6	77.2	97.3	80.0	76.2
Kancheepuram	88.1	88.8	62.6	76.1	97.6	97.8	76.8	55.3	100.0	0.0	94.3	91.2	83.2	67.7	64.5	18.6	100.0	6.6	100.0	87.3	93.0	65.5	63.6	63.6	69.1	67.9	24.9	27.5				74.0	57.7	78.3	52.4	54.9
Kanniyakumari	88.5	97.2	65.6	84.2	97.3	97.7	82.1	79.4	100.0	3.6	100.0	99.3	98.8	93.1	89.3	32.1	100.0	26.3	100.0	86.0	88.2	92.6	88.9	88.9	96.0	78.4	28.5	31.4				88.0	83.0	94.6	73.6	83.9
Karur	86.6	94.2	83.3	95.7	97.3	100.0	82.7	69.1	100.0	0.6	97.0	95.9	91.2	87.2	77.7	38.7	100.0	10.0	99.2	96.4	91.9	80.3	72.2	72.4	82.5	48.5	23.5	28.5				78.5	71.7	86.4	66.0	69.8
Krishnagiri	90.5	95.2	84.5	93.1	99.5	98.5	93.7	89.8	100.0	0.0	100.0	100.0	100.0	92.5	91.0	17.0	99.6	24.3	100.0	95.5	94.0	92.3	89.7	86.7	87.3	68.5	31.6	39.3				91.0	83.5	89.9	79.1	86.4
Madurai	87.3	88.4	70.0	89.5	100.0	99.5	85.6	90.5	99.5	3.1	96.0	96.0	93.1	81.9	78.8	21.2	100.0	34.6	100.0	91.4	94.5	78.2	76.0	75.5	88.8	66.6	27.0	35.4				82.0	72.5	89.9	59.1	71.2
Nagapattinam	83.3	93.3	89.4	93.1	100.0	98.4	93.0	82.7	100.0	1.3	97.8	96.3	91.8	86.0	80.6	37.3	99.7	24.9	100.0	91.9	97.4	83.4	77.4	74.8	93.8	63.4	23.1	28.1	80.8			78.7	70.9	85.6	61.5	67.1
Namakkal	87.0	95.7	76.2	97.8	100.0	99.2	96.3	69.0	100.0	0.0	100.0	100.0	100.0	89.0	85.4	27.9	100.0	35.9	100.0	94.8	89.9	87.9	85.1	82.4	83.9	66.2	30.6	35.5				95.6	78.9	98.5	61.0	80.0
Perambalur	79.0	92.7	85.8	92.2	99.4	99.4	94.1	85.3	100.0	0.0	99.3	97.7	96.4	94.7	89.9	21.6	100.0	18.7	100.0	90.1	92.6	89.2	84.4	86.4	92.5	64.1	26.9	31.4				86.3	74.0	88.8	58.5	70.5
Pudukkottai	80.2	90.6	77.9	91.6	99.2	99.4	89.9	68.6	100.0	1.0	95.4	90.8	85.9	90.5	85.3	22.2	100.0	10.0	100.0	95.4	94.5	80.4	78.4	75.8	83.3	69.0	27.0	28.3	63.8			85.1	77.4	85.9	78.2	78.0
Ramanathapuram	85.0	90.6	82.9	88.2	100.0	97.5	89.1	79.2	99.7	0.9	96.4	95.1	97.1	90.8	86.3	27.4	99.6	17.1	99.3	94.9	95.8	87.0	82.7	80.2	90.4	75.0	34.1	38.1				91.8	78.5	85.7	63.8	78.8
Salem	86.0	95.7	74.7	85.0	100.0	99.1	89.3	78.1	100.0	3.6	100.0	100.0	98.6	85.7	85.0	28.2	100.0	16.5	100.0	92.9	96.0	80.3	80.0	79.4	77.0	67.8	23.8	36.4				77.4	69.1	86.1	62.3	71.8
Sivaganga	88.9	93.2	72.6	90.9	99.3	100.0	76.1	86.3	100.0	0.9	100.0	100.0	99.3	86.5	85.6	22.2	100.0	52.2	100.0	89.1	92.5	86.9	86.6	87.6	89.4	73.2	38.5	39.8				84.3	78.3	94.1	70.5	81.2
Thanjavur	81.7	95.3	86.1	93.7	99.0	96.6	89.5	73.1	100.0	0.0	96.1	93.4	90.4	72.3	66.5	35.3	100.0	15.5	100.0	93.8	97.1	62.5	54.2	54.7	78.5	49.8	25.4	24.9	69.4			78.5	63.0	80.3	57.6	59.5
The Nilgiris	89.0	98.4	80.0	92.5	99.4	99.6	94.1	81.5	100.0	1.5	99.2	99.2	97.7	85.0	83.9	14.5	100.0	21.0	100.0	91.5	90.9	81.2	81.2	80.6	90.1	69.4	27.1	38.3				90.6	81.1	95.8	52.3	80.7
Theni	86.1	76.8	88.8	98.7	100.0	97.1	90.0	84.2	100.0	1.4	99.2	98.6	97.4	87.2	87.6	12.9	100.0	4.8	100.0	97.1	97.8	88.1	88.6	88.8	95.2	74.0	32.4	38.5				86.6	79.8	94.3	62.8	72.5
Thiruvallur	85.4	83.8	77.6	85.4	95.6	99.6	76.8	72.4	100.0	1.2	93.3	89.9	78.6	67.3	64.8	37.9	100.0	12.3	100.0	90.3	95.2	52.0	48.7	47.1	88.6	62.9	22.5	21.8	57.4			60.1	46.4	80.1	42.6	48.9
Thiruvavur	83.6	94.6	80.5	92.3	97.2	98.8	86.8	78.5	100.0	1.5	100.0	100.0	99.3	91.9	89.5	30.2	100.0	13.3	100.0	89.5	92.2	91.5	89.2	89.2	97.1	70.9	26.8	35.1				93.7	81.6	98.8	64.7	83.5
Thoothukkudi	84.3	89.0	59.2	80.7	100.0	99.4	89.1	76.4	100.0	2.1	99.4	98.6	97.5	85.9	79.9	17.1	100.0	35.2	100.0	94.8	97.2	86.2	80.5	85.3	100.0	63.0	32.7	37.3				86.0	85.6	90.3	85.5	85.0
Thiruchirappalli	77.7	94.2	86.1	90.5	98.8	99.4	92.2	77.3	100.0	0.3	98.8	97.6	97.3	86.5	82.6	20.5	98.6	6.3	99.0	97.6	94.6	82.1	78.7	79.8	97.1	63.8	24.4	28.4	62.5			83.2	75.6	93.9	63.9	74.1
Trichelvelli	83.7	89.9	84.5	85.0	98.0	100.0	90.8	86.1	100.0	1.8	97.2	95.9	97.5	89.1	86.5	19.3	100.0	13.5	100.0	92.9	93.0	89.6	85.7	83.3	93.3	69.0	26.2	33.9				87.0	81.5	91.6	63.6	77.2
Truppur	89.4	98.3	68.6	95.5	100.0	100.0	95.0	85.9	99.1	1.2	100.0	100.0	97.8	91.8	91.2	27.6	100.0	26.8	100.0	98.4	99.3	90.3	89.0	87.7		74.2	31.1	37.5				81.4	74.5	95.5	59.1	77.4
Trivannamalai	89.2	90.3	81.2	97.7	100.0	97.9	94.3	76.1	100.0	1.6	96.9	96.2	95.5	92.8	90.8	15.1	99.1	26.0	99.1	98.6	91.1	98.6	91.1	88.6	97.1	64.3	24.8	31.0				91.3	86.1	93.6	72.8	85.1
Vellore	86.0	93.8	84.4	95.4	100.0	97.9	96.8	79.3	100.0	0.0	100.0	100.0	98.4	88.7	83.1	8.8	99.5	21.2	100.0	98.6	96.7	87.2	82.6	83.7	92.7	71.6	34.8	40.0				79.9	80.0	91.6	72.4	81.1
Viluppuram	88.9	88.1	80.1	94.9	96.0	98.9	95.4	80.1	100.0	0.0	99.4	98.5	91.8	91.7	86.5	25.3	99.1	19.2	100.0	88.1	94.0	86.8	75.4	73.0	88.5	73.2	30.6	29.0	67.0			90.2	80.8	83.1	69.6	82.8
Virudhunagar	89.0	89.5	65.0	83.4	99.3	99.4																														

**Table 4. Intervention coverage at district-level
2015-2016, 2019-2021**

Category	Interventions	Worst performing districts (pp)	Best performing districts (pp)	Top coverage districts (%)
		<i>Difference between (2019-2021) & (2015-2016)¹</i>	<i>Difference between (2019-2021) & (2015-2016)¹</i>	<i>2019-2021</i>
Pregnancy	ANC first trimester	Tiruppur: -15.9 Coimbatore: -4.8	Theni: +45.1 Tirunelveli: +43.2	Nagapattinam: 89.4 Theni: 88.8
	≥4 ANC visits	Thiruvallur: -6.2 Cuddalore: -3.3	Nagapattinam: +24.8 Theni: +22.7	Theni: 98.7 Namakkal: 97.8
	Received MCP Card	Chennai: -2.7 Thiruvallur: -2.7	Kanniyakumari: +20.1 Virudhunagar: 11.0	14 Districts ⁴ : 100.0
	Tetanus injection	<i>Not applicable²</i>	Theni: +49.7 Tiruchirappalli: +40.7	Erode: 97.5 Vellore: 96.8
Delivery and post-natal	Institutional birth	Dindigul: -2.3 Vellore: -0.5	Krishnagiri: +4.5 Theni: +3.4	21 Districts ⁵ : 100.0
	Skilled birth attendant	Dindigul: -1.2 Karur: -0.8	Krishnagiri: +4.2 Thoothukkudi: +3.1	25 Districts ⁶ : 100.0
	Postnatal care for mothers	<i>Not applicable³</i>	<i>Not applicable³</i>	Vellore: 98.6 Tiruppur: 98.4
	Postnatal care for babies	<i>Not applicable³</i>	<i>Not applicable³</i>	Tiruppur: 99.3 Coimbatore: 98.6
Early childhood	Full immunization	Karur: -4.9	Nagapattinam: +54.8 Thoothukkudi: +52.3	Thoothukkudi: 100.0 2 Districts ⁷ : 97.1
	Vitamin A supplementation	Karur: -27.1 Tiruvannamalai: -26.0	Ramanathapuram: +18.6 Kanniyakumari: +14.2	Dindigul: 84.0 Kanniyakumari: 78.4
	Care seeking for ARI ⁸	Thiruvallur: -31.8 Tiruchirappalli: -28.1	Nagapattinam: +14.9 Cuddalore: +4.1	Cuddalore: 82.6 Nagapattinam: 80.8
	ORS treatment during diarrhea	<i>Not available⁸</i>		
	Zinc treatment during diarrhea	<i>Not available⁸</i>		

Key takeaways

Children: Stunting and underweight declined by 4 percentage points (pp) and 6pp respectively, from 2006 to 2016 and continued to decline by 2pp from 2016 to 2021. Anemia among children declined by 13pp from 2006 to 2016 but increased by 6pp from 2016 to 2021.

Women: Underweight declined by 13 pp from 2006 to 2016 and continued to decline by 2pp from 2016 to 2021. Anemia in non-pregnant women increased by 2pp from 2006 to 2016 but declined by 1pp from 2016 to 2021. Overweight/obesity increased by 10pp from 2006 to 2016 and continued to increase by 9pp from 2016 to 2021.

Men: Overweight/obesity increased by 13pp from 2006 to 2016 and continued to increase by 9pp from 2016 to 2021.

Attention is needed to improve (%s in 2021):

- **Outcomes:** Stunting (25%) and anemia in children (57%); anemia in non-pregnant (54%) and pregnant (48%) women
- **Immediate determinants:** Minimum adequate diet (15%); minimum dietary diversity (28%)
- **Underlying determinants:** Women with ≥10 years education (57%)
- **Coverage of interventions:** Financial assistance (20%); Zinc during diarrhea (29%).

pp: percentage points. Source: NFHS-3 state and national reports and data [IFPRI estimates], NFHS-4 (2015-2016) state and national reports and data [IFPRI estimates], and NFHS-5 (2019-2021) state and national reports/factsheets and data [IFPRI estimates]. Note: Interventions' coverage are based on the last child data. ¹The difference is calculated only between districts that are comparable between 2015-2016 and 2019-2021. ²Prevalence did not decrease in any of the districts. ³Indicators postnatal care for women and babies are not comparable between NFHS-4 and 5. All districts in Tamil Nadu are comparable. ⁴14 districts: Ariyalur, Coimbatore, Dharmapuri, Erode, Madurai, Namakkal, Salem, Ramanathapuram, Nagapattinam, Tiruppur, Theni, Tiruvannamalai, Thoothukkudi, Vellore. ⁵21 Districts: Ariyalur, Coimbatore, Chennai, Erode, Karur, Kanniyakumari, Kancheepuram, Madurai, Namakkal, Pudukkottai, Perambalur, Sivaganga, Salem, The Nilgiris, Thanjavur, Tiruppur, Tirunelveli, Thiruvallur, Theni, Thiruvarur, Thoothukkudi. ⁶25 districts: Ariyalur, Coimbatore, Chennai, Erode, Kanniyakumari, Kancheepuram, Krishnagiri, Madurai, Namakkal, Nagapattinam, Pudukkottai, Perambalur, Sivaganga, Salem, The Nilgiris, Thanjavur, Tiruppur, Tirunelveli, Thiruvallur, Theni, Thoothukkudi, Thiruvarur, Virudhunagar, Vellore, Viluppuram. ⁷2 districts: Tiruvannamalai, Tiruchirappalli. ⁸Indicates unavailability of data for a particular indicator in the specified NFHS round.

Indicator definition

Nutrition outcomes	Definition
Low birth weight^{3,5}	% live births in 5 years (y) preceding the survey with a reported birth weight <2.5 kilograms (kg), based on either a written record or the mother's recall
Stunting	% children 0-59 months (m) whose height-for-age z score < -2 standard deviations (SD)
Wasting	% children 0-59 m whose weight-for-height z score < -2SD
Severe wasting	% children 0-59 m whose weight-for-height z score < -3SD
Underweight children	% children 0-59 m whose weight-for-age z score < -2SD
Anemia among children	% children 6-59 m whose haemoglobin (Hb) <11.0 g/dl
Underweight women	% women 15-49 y whose Body Mass Index (BMI)<18.5 kg/m ² ; sample excluded pregnant women and women with a birth in the preceding 2 m
Anemia among non-pregnant women¹	% non-pregnant women 15-49 y whose Hb<12.0 g/dl
Anemia among pregnant women¹	% pregnant women 15-49 y whose Hb<11.0 g/dl
Overweight/obesity – children	% children 0-59 m whose weight-for-height z score > 2SD
Overweight/obesity – women	% women 15-49 y whose BMI ≥25.0 kg/m ² ; sample excluded pregnant women and women with a birth in the preceding 2 m
Overweight/obesity – men	% men 15-49 y whose BMI ≥25.0 kg/m ²
Hypertension among women^{2,3,10}	% women 15-49 y with elevated blood pressure (systolic ≥140 mm Hg or diastolic ≥90 mm Hg) or are currently taking medication to control blood pressure
Hypertension among men^{2,3,10}	% men 15-54 y with elevated blood pressure (systolic ≥140 mm Hg or diastolic ≥90 mm Hg) or are currently taking medication to control blood pressure
Diabetes among women¹⁰	% women 15-49 y with high (>140 mg/dl) or very high (>160 mg/dl) blood sugar or are currently taking medication to control blood sugar
Diabetes among men¹⁰	% men 15-54 y with high (>140 mg/dl) or very high (>160 mg/dl) blood sugar or are currently taking medication to control blood sugar
Immediate determinants	Definition
Underweight women	% women 15-49 y whose BMI<18.5 kg/m ² ; sample excluded pregnant women and women with a birth in the preceding 2 m
Consumed IFA 100+ days¹	% women 15-49 y who consumed iron folic acid (IFA) for 100 days or more during pregnancy for the most recent live birth in the 5 y preceding the survey
Consumed IFA 180+ days¹	% women 15-49 y who consumed IFA for 180 days or more during pregnancy for the most recent live birth in the 5 y preceding the survey
Early initiation of breastfeeding^{1,2,3,8,9}	% youngest children <2 y who started breastfeeding <1 hour of birth
Exclusive breastfeeding	% youngest children 0-5 m who were fed exclusively with breastmilk the previous day
Timely introduction of complementary foods	% youngest children 6-8 m living with their mother who received solid or semi-solid food and breastmilk
Continued breastfeeding at 2 years^{1,3,4,5,6}	% youngest children 12-23 m living with their mother who were fed breastmilk during the previous day
Minimum adequate diet^{2,3,4,5,9,10}	% youngest children 6-23 m who consumed a minimum acceptable diet during the previous day
Minimum dietary diversity^{1,2,3,4,5,9}	% youngest children 6-23 m who consumed foods and beverages from at least 5 out of 8 defined food groups during the previous day
Minimum meal frequency^{2,3,4,5,9,10}	% youngest children 6-23 m who consumed solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) at least the minimum number of times during the previous day
Eggs and/or flesh foods consumption^{1,2,3,4,5,9}	% youngest children 6-23 m who consumed egg and/or flesh food during the previous day
Sweet beverage consumption^{1,2,3,4,5,9}	% youngest children 6-23 m who consumed a sweet beverage during the previous day
Bottle feeding for infants^{1,2,3,4,5,9}	% youngest children 0-23 m who were fed from a bottle with a nipple during the previous day
Diarrhea in the last 2 weeks	% children <5 y who had diarrhea in the 2 weeks preceding the survey
ARI in the last 2 weeks	% children <5 y who had symptoms of acute respiratory infection (ARI) in the 2 weeks preceding the survey
Underlying determinants	Definition
Women with ≥10 years of education	% women 15-49 y with ≥10 y of schooling
Women 20-24 years married before age of 18 years¹	% women 20-24 y who were married when <18 y
Women 15-19 years with child or pregnant¹⁰	% women 15-19 y who were mothers or pregnant at the time of the survey
HHS with improved drinking water source	% population living in households whose source of drinking water is piped into dwelling/yard/plot, piped to neighbour, public tap/standpipe, tube well or borehole, protected dug well, protected spring, rainwater, tanker truck, cart with small tank, bottled water, or community RO plant
HHS using improved sanitation facility	% population living in households using flush to pipe sewer system, flush to septic tank, flush to pit latrine, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab or twin pit/composting toilet, which is not shared with any other household
HHS with hand washing facility^{2,4,10}	% households where a place for washing hands with water and soap was present
Open defecation^{6,7}	% households that have no toilet facility/defecate in open space or field
Safe disposal of feces^{3,4,5}	% youngest children <5 y living with their mother whose stools were disposed of safely
HHS with BPL card^{3,5,6,7}	% households possessing a BPL card
HHS with electricity	% population living in households with electricity

Note: Unless specified, state and district estimates taken from NFHS-3 national/state report for NFHS-3, NFHS-4 national/state report or NFHS-5 factsheet for NFHS-4, and NFHS-5 national/state report or factsheet for NFHS-5.

¹Indicator estimated using NFHS-3 unit-level data (state level)

²Indicator estimated using NFHS-4 unit-level data (state level)

³Indicator estimated using NFHS-4 unit-level data (district level)

⁴Indicator estimated using NFHS-5 unit-level data state level

⁵Indicator estimated using NFHS-5 unit-level data (district level)

⁶Indicator estimated using NFHS-4 unit-level data for union territories as their summary reports are not available (state level)

⁷Indicator estimated using NFHS-5 unit-level data for union territories as their summary reports are not available (state level)

⁸Indicator estimated using NFHS-5 unit-level data for union territories as their summary reports are not available (district level)

⁹Indicator constructed following WHO guidelines

¹⁰Indicator not available in NFHS-3 and/or 4 tool or not comparable between NFHS-3/4 and 5

Indicator definition

Interventions	Definition
Demand for FP satisfied ^{1,3,5}	% currently married women 15-49 years (y) with demand for family planning (FP) satisfied by modern methods
Iodized salt	% households using iodized salt
ANC first trimester	% women 15-49 y who received antenatal care (ANC) during the first trimester for the most recent live birth in the 5 y preceding the survey
≥ 4ANC¹	% women 15-49 y who received ≥4 ANC visits for the most recent live birth in the 5 y preceding the survey
Received MCP card¹⁰	% women 15-49 y who received a mother and child protection (MCP) card during pregnancy for the most recent live birth in the 5 y preceding the survey
Received IFA tab/syrup^{3,8}	% women 15-49 y who received IFA (given or purchased) during pregnancy for the most recent live birth in the 5 y preceding the survey
Tetanus injection¹	% women 15-49 y whose most recent live birth in the 5 y preceding the survey was protected against neonatal tetanus
Deworming- pregnancy^{3,8}	% women 15-49 y who took deworming medication during pregnancy for the most recent live birth in the 5 y preceding the survey
Weighing- pregnancy^{3,5,6,7}	% women 15-49 y who were weighed during ANC for the most recent live birth in the 5 y preceding the survey
Birth preparedness counselling^{1,2,3,4,5}	% women 15-49 y with a child 0-60 months (m) who had ≥1 contacts with a community health worker in the 3 m preceding the survey and were advised on birth preparedness
Breastfeeding counselling^{1,3,5,6,7}	% women 15-49 y who met with a community health worker in the last 3 m of pregnancy for the most recent live birth in the 5 y preceding the survey and were advised on breastfeeding
Counselling on keeping baby warm^{1,5,6,7}	% women 15-49 y who met with a community health worker in the last 3 m of pregnancy for the most recent live birth in the 5 y preceding the survey and were advised on keeping the baby warm
Cord care counselling^{5,6,7,10}	% women 15-49 y who met with a community health worker in the last 3 m of pregnancy for the most recent live birth in the 5 y preceding the survey and were advised on cord care
Food supplementation – pregnancy^{3,5}	% women 15-49 y with a child <6 y who received food supplements from ICDS during pregnancy
Health & nutrition education – pregnancy⁵	% women 15-49 y with a child <6 y who received health and nutrition education from ICDS during pregnancy
Malaria prevention- use of bed nets^{2,4,5,10}	% women 15-49 y who slept under a treated bed net during pregnancy of the most recent live birth in the 5 y preceding the survey
Institutional birth	% live births in the 5 y preceding the survey to women 15-49 y delivered in a health facility
Financial assistance (JSY)^{6,7,8,10}	% women 15-49 y who received financial assistance under Janani Suraksha Yojana (JSY) for the most recent live birth that took place in a health facility in the 5 y preceding the survey
Skilled birth attendant	% live births in the 5 y preceding the survey to women 15-49 y that were assisted by a skilled provider
Postnatal care for mothers¹⁰	% women 15-49 y who received postnatal care from a doctor/nurse/LHV/auxiliary nurse midwife (ANM)/midwife/other health personnel <2 days of delivery for the most recent live birth in the 5 y preceding the survey
Postnatal care for babies¹⁰	% most recent live births in the 5 y preceding the survey to women 15-49 y with a postnatal check for the newborn from a doctor/nurse/LHV/ANM/midwife/other health personnel <2 days of delivery
Food supplementation – postnatal^{3,5}	% women 15-49 y with a child <6 y who received food supplements from ICDS during breastfeeding
Health & nutrition education – postnatal^{3,5}	% women 15-49 y with a child <6 y who received health and nutrition education from ICDS during breastfeeding
Health checkup (ICDS)^{3,5}	% women 15-49 y with a child <6 y who received a health check-up from ICDS during breastfeeding
Full immunization	% children 12-23 m fully vaccinated based on information from either vaccination card or mother's recall
Vitamin A – early childhood¹	% children 9-35 m who received a vitamin A dose in the 6 m preceding the survey
Pediatric IFA^{3,4,5,10}	¹¹ % children 6-59 m who were given iron supplements in the 7 days preceding the survey ¹² % children 6-36 m who were given iron supplements in the 7 days preceding the survey
Deworming – early childhood^{3,4,5,10}	¹¹ % children 6-59 m who received deworming medication in the 6 m preceding the survey ¹² % children 6-36 m who received deworming medication in the 6 m preceding the survey
Care seeking for ARI	% children <5 y with fever or symptoms of ARI in the 2 weeks preceding the survey taken to a health facility or health provider
ORS during diarrhea	% children <5 y with diarrhea in the 2 weeks preceding the survey who received Oral Rehydration Solutions (ORS)
Zinc during diarrhea	% children <5 y with diarrhea in the 2 weeks preceding the survey who received zinc
Food supplementation (children 6-35 months)^{1,2,3,4,5}	% youngest children 6-35 m who received food supplements from ICDS in the 12 m preceding the survey
Weighing – early childhood^{3,5}	% children <5 y who were weighed at an anganwadi centre (AWC) or ICDS centre in the 12 m preceding the survey
Counselling on child growth^{3,5,10}	% mothers with a child <5 y who received counselling from an ICDS/anganwadi worker or ANM after they were weighed at an AWC in the 12 m preceding the survey
Preschool (AWC)^{3,5}	% children 36-71 m who went for early childhood care/preschool at an AWC in the 12 m preceding the survey
Health checkup (AWC)^{3,5}	% children <6 y who received health checkups from an AWC in the 12 m preceding the survey

Note: Unless specified, state and districts estimates taken from NFHS-3 national/state report for NFHS-3, NFHS-4 national/state report or NFHS-5 factsheet for NFHS-4, and NFHS-5 national/state report or factsheet for NFHS-5.

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⁹Indicator constructed following WHO guidelines

¹⁰Indicator not available in NFHS-3 and/or 4 tool or not comparable between NFHS-3/4 and 5

¹¹Definition as per NFHS-3 and 4 construction

¹²Definition as per NFHS-5 construction

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ABOUT POSHAN

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<http://poshan.ifpri.info/>

ABOUT DATA NOTES

POSHAN Data Notes focus on data visualization to highlight geographic and/or thematic issues related to nutrition in India. They draw on multiple sources of publically available data.

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