



International Journal of Science, Architecture, Technology and Environment

Regional Disparities in Malnutrition Across India: A Comprehensive Nationwide Analysis

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DOI: <https://doi.org/10.63680/ijstate0825011.40>

Abstract

Malnutrition remains a major public health challenge in India, contributing significantly to child morbidity, maternal mortality, and intergenerational cycles of poverty. Despite overall improvements in national nutritional indicators, stark regional disparities persist across Indian states and union territories. This study conducts a comprehensive analysis of malnutrition trends across regions using data from the National Family Health Survey (NFHS-5). Key indicators such as stunting, wasting, underweight prevalence, and anemia are examined across states, with a focus on socioeconomic determinants including education, income levels, and access to health services. The findings highlight critical regional inequalities—especially in the central and eastern parts of India—and call for targeted, region-specific interventions to reduce the nutritional burden and promote equity.

Keywords: Malnutrition, Regional disparities, Wasting, National Family Health Survey (NFHS-5), Nutritional equity and Nutritional indicators

1. Introduction

1.1 Background

Malnutrition, particularly in the forms of undernutrition (stunting, wasting, and underweight), continues to pose serious health and developmental challenges in India. The country is home to nearly one-third of the world's stunted children under the age of five. Though there have been notable national improvements, regional disparities remain a pressing concern. India carries one of the highest burdens of malnutrition globally. According to UNICEF (2021), nearly 35% of the world's stunted children under five live in India. Despite progress through initiatives like the Integrated Child Development Services (ICDS) and POSHAN Abhiyaan, malnutrition rates remain high in many regions (Ministry of Women and Child Development [MWCD], 2020).

1.2 Rationale

Malnutrition—defined as deficiencies, excesses, or imbalances in a person’s intake of energy and/or nutrients—remains a critical global health issue. However, its prevalence and manifestation vary significantly across different regions due to a wide array of social, economic, environmental, and political factors. Understanding the geographic and regional variation in malnutrition is critical to designing localized and effective policy interventions. Given the diversity of India's states in terms of socioeconomic status, governance, healthcare infrastructure, and cultural practices, a nationwide average often masks substantial intra-country inequalities. India’s vast geographic and socioeconomic diversity necessitates regional analyses. National averages mask the realities faced by poorer and underserved populations in states like Bihar, Uttar Pradesh, and Madhya Pradesh (Smith et al., 2022).

1.3 Objectives

This study aims to:

- i. Analyze regional patterns of malnutrition across Indian states.
- ii. Identify the key socioeconomic and health-related determinants of malnutrition.
- iii. Recommend region-specific policy responses to address these disparities.

2. Methodology

2.1 Data Source

The analysis uses secondary data from the **National Family Health Survey (NFHS-5, 2019–21)**, which provides comprehensive demographic and health indicators at the national, state, and district levels.

2.2 Indicators Analyzed

- **Child stunting** (height-for-age)
- **Wasting** (weight-for-height)
- **Underweight** (weight-for-age)
- **Anemia** in children and women
- Socioeconomic indicators (maternal education, household wealth index, access to clean water and sanitation)

2.3 Regional Classification

For this analysis, India is categorized into six regions:

- North (e.g., Punjab, Haryana)
- South (e.g., Kerala, Tamil Nadu)
- East (e.g., Bihar, West Bengal)
- West (e.g., Rajasthan, Gujarat)
- Central (e.g., Madhya Pradesh, Uttar Pradesh)

- Northeast (e.g., Assam, Meghalaya)

3. Results and Discussion

3.1 Regional Disparities in Malnutrition

Table -01

Region	Stunting (%)	Wasting (%)	Underweight (%)	Anemia in Women (%)
North	28.1	17.2	26.3	54.1
South	23.5	15.1	21.8	49.3
East	35.4	20.7	32.8	62.5
West	31.0	18.9	28.5	53.7
Central	38.2	21.5	36.4	64.1
Northeast	29.4	16.3	27.5	50.2

Source: NFHS-5 (IIPS & ICF, 2021)

In the Table -01, The **Central and Eastern regions** show the highest burden of stunting and underweight children, with Madhya Pradesh and Bihar among the worst-performing states (IIPS & ICF, 2021). In contrast, **Southern states** like Kerala and Tamil Nadu report significantly lower rates due to better health infrastructure and female literacy (Avula et al., 2019).

Table -02: Regional Disparities in Malnutrition in India

Region	States/UTs Covered	Stunting (%)	Wasting (%)	Underweight (%)	Remarks
North	Punjab, Haryana, Himachal Pradesh, etc.	30–35	12–15	25–30	Moderate levels; better in urban areas
East	Bihar, Jharkhand, West Bengal, Odisha	35–42	15–20	30–40	High burden, especially in Bihar & Jharkhand
West	Rajasthan, Gujarat, Maharashtra, Goa	32–38	15–18	28–35	Rajasthan and Gujarat show higher disparities
South	Kerala, Tamil Nadu, Karnataka, Telangana	20–30	10–14	20–28	Best outcomes in Kerala
Central	Madhya Pradesh, Chhattisgarh, Uttar Pradesh	38–43	16–20	35–40	Highest levels of malnutrition
North-East	Assam, Meghalaya, Tripura, etc.	28–35	10–16	25–32	Varied, some tribal populations vulnerable

Above table-02 titled "**Regional Disparities in Malnutrition in India**", showing key indicators like stunting, wasting, and underweight prevalence among children across different Indian regions. Data is based on National Family Health Survey (NFHS-5) 2019-21.

Table -03: Regional Disparities in Anemia in India

Region	States/UTs Covered	Children (6–59 mo)	Women (15–49 yrs)	Pregnant Women	Remarks
North	Punjab, Haryana, HP, J&K, etc.	65–70%	50–60%	45–55%	Moderate to high; better in urban zones
East	Bihar, Jharkhand, Odisha, WB	68–75%	60–68%	55–65%	High anemia prevalence in both women and children
West	Rajasthan, Gujarat, Maharashtra	65–70%	55–65%	50–60%	Rural tribal areas worst affected
South	Kerala, Tamil Nadu, Andhra Pradesh, etc.	58–65%	48–55%	40–50%	Best region overall, Kerala leads in improvement
Central	UP, MP, Chhattisgarh	70–76%	62–70%	60–68%	Highest anemia burden in India
North-East	Assam, Meghalaya, Manipur, etc.	60–68%	50–58%	45–55%	Some tribal pockets show high prevalence

Definition (as per WHO standards):

- Children Anemia: **Hemoglobin <11.0 g/dL**
- Non-pregnant Women Anemia: **<12.0 g/dL**
- Pregnant Women Anemia: **<11.0 g/dL**

In the table -03 titled "**Regional Disparities in Anemia Among Women and Children in India**", based on **NFHS-5 (2019–21)** data. It shows the percentage of **anemia prevalence among children (6–59 months)**, **women (15–49 years)**, and **pregnant women** by region.

3.2 Determinants of Regional Disparities

- **Maternal Education:** Maternal schooling correlates strongly with improved child nutrition outcomes (Gupta et al., 2020).
- **Poverty:** States with higher poverty indices (e.g., Bihar, Jharkhand) show higher malnutrition levels (World Bank, 2021).
- **Sanitation and Water Access:** Poor WASH conditions are linked with wasting and infection-driven undernutrition (Jadhav & Thorat, 2019).

- **Health Services:** Antenatal care and institutional delivery rates are significantly higher in southern states (MoHFW, 2021).

3.3 Determinants of Malnutrition

Key determinants contributing to regional differences include:

- **Maternal education:** Higher education correlates with lower malnutrition.
- **Poverty and food insecurity:** Common in Central and Eastern regions.
- **Sanitation and water access:** Directly linked with wasting and diarrhea-related malnutrition.
- **Healthcare access:** Better in South and West India.

3.4 Government Programs and Implementation Challenges

While POSHAN Abhiyaan and ICDS are promising in design, challenges persist in execution, especially in states with low administrative capacity and community outreach (MWCD, 2020). Nutrition-specific interventions often fail to integrate with broader health and social protection systems (NITI Aayog, 2021).

3.5 Policy and Programmatic Gaps

- Ineffective implementation of schemes like **POSHAN Abhiyaan** in high-burden regions.
- Poor intersectoral coordination at state and district levels.
- Lack of cultural adaptation in nutrition programs.

4. Recommendations

- **Region-specific interventions:** Tailor strategies based on the nutritional and socioeconomic profile of each state.
- **Strengthen frontline healthcare:** Particularly in underperforming regions.
- **Behavior change communication:** To improve child feeding practices and maternal nutrition.
- **Data-driven monitoring:** Use real-time tracking tools for program evaluation and accountability.

5. Conclusion

This study underscores the significant regional disparities in malnutrition across India. Despite national policy frameworks aimed at improving nutritional outcomes, Central and Eastern India continue to lag behind. A one-size-fits-all approach is insufficient; instead, state-specific strategies that address local socioeconomic and health conditions are essential. Strengthening health infrastructure, improving maternal education, and ensuring effective delivery of nutrition programs can reduce these disparities and promote equitable growth.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship and publication of this article.

Funding

The author received no financial support for the research, authorship and publication of this article.

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