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Spatial dimensions of child malnutrition in Chhattisgarh and Jharkhand: A secondary data analysis based on NFHS-5

Dr. Ruchika Singh[1], Dr. Prashant Upadhyay[2]
[1] Department of Geography, DDU Gorakhpur University, Gorakhpur, Uttar Pradesh
[2] Dosctoral, Research Fellow, ICSSR, New Delhi, India

Abstract
Child malnutrition continues to remain one of the most serious public health concerns in India, particularly in socio-economically vulnerable and tribal-dominated states. The present study examines the spatial pattern of nutritional indicators among children in Chhattisgarh and Jharkhand using secondary data from the National Family Health Survey (NFHS-5), 2019–2021. The study analyses district-level variations in adequate diet among children aged 6–23 months, stunting, wasting, severe wasting, and underweight conditions among children under five years of age. The paper attempts to identify regional disparities and nutritional hotspots within the two states and interprets the observed patterns through socio-cultural, geographical, and developmental contexts.

The analysis indicates that both states continue to face significant nutritional challenges, although the severity and distribution vary spatially. Jharkhand demonstrates lower levels of adequate dietary intake among infants, while Chhattisgarh exhibits greater concentration of severe wasting and underweight conditions in several districts. Tribal districts in southern Chhattisgarh show comparatively better performance in certain indicators, whereas central and northern districts reveal persistent nutritional vulnerabilities. The study argues that nutritional outcomes are not merely biomedical concerns but are deeply linked with livelihood systems, food practices, accessibility, cultural continuity, poverty, and regional development.

The paper highlights the importance of spatially differentiated nutritional policies and argues for region-specific interventions that integrate food security, maternal health, cultural food systems, and community-based nutrition awareness. The study contributes to the growing discourse on nutrition geography and regional health disparities in India.

Keywords: Child malnutrition, NFHS-5, stunting, wasting, underweight, chhattisgarh, jharkhand, spatial analysis, nutritional geography

Introduction

Malnutrition remains one of the most persistent developmental challenges in India despite significant improvements in food production, health infrastructure, and social welfare schemes. Nutritional status, particularly among children under five years of age, serves as a critical indicator of public health, socio-economic development, maternal wellbeing, food security, and regional inequality. According to UNICEF (2021) [9], undernutrition contributes substantially to child morbidity and mortality across developing countries, while the World Health Organization (WHO) recognizes stunting, wasting, and underweight conditions as major indicators of chronic and acute nutritional deprivation.

India carries one of the largest burdens of child malnutrition globally. Although national programmes such as the Integrated Child Development Services (ICDS), Poshan Abhiyaan, Mid-Day Meal Scheme, and National Health Mission have attempted to address nutritional deficiencies, disparities continue to persist across states, districts, and socio-cultural groups. Particularly vulnerable are tribal-dominated regions, forested areas, economically backward districts, and geographically isolated communities.

Chhattisgarh and Jharkhand represent important regions for examining nutritional disparities due to their tribal population concentration, uneven developmental trajectories, forest-dependent livelihoods, and regional inequalities. Both states possess rich natural resources, yet continue to face significant socio-economic and health-related challenges. The nutritional condition of children in these regions is shaped by multiple factors including poverty, maternal literacy, healthcare accessibility, infant feeding practices, sanitation, livelihood insecurity, geographical isolation, and changing food cultures.

The major objective of the study is to analyse the district-level spatial pattern of child nutritional indicators in Chhattisgarh and Jharkhand.

The present study analyses district-level nutritional indicators in Chhattisgarh and Jharkhand using secondary data from NFHS-5 (2019–2021). The study focuses on:

- Adequate diet among children aged 6–23 months
- Stunting (Height-for-Age)
- Wasting (Weight-for-Height)
- Severe Wasting
- Underweight (Weight-for-Age)

The objective is not merely to describe nutritional outcomes but to understand their spatial distribution and regional disparities. The study adopts a geographical perspective and interprets nutrition as a socio-spatial phenomenon shaped by ecological, developmental, and cultural factors.

Review of Literature

The issue of child malnutrition has been widely studied in India and globally. Previous studies have highlighted the multidimensional causes of undernutrition including poverty, maternal health, food insecurity, sanitation, and inadequate healthcare access.

Smith and Haddad (2000) [8] emphasized that child malnutrition is closely associated with household food

security, women's education, and access to healthcare services. Black *et al*. (2013) [1] identified maternal and child undernutrition as one of the leading contributors to disease burden in low- and middle-income countries.

In the Indian context, Dreze and Sen (2013) argued that despite economic growth, India's nutritional achievements remain inadequate due to social inequality and poor public service delivery. Studies based on NFHS datasets have repeatedly shown strong regional disparities in nutritional outcomes across states and districts.

Menon *et al*. (2018) [6] examined nutritional transitions in India and highlighted the importance of district-level analysis for identifying vulnerable populations. Studies on tribal populations have demonstrated that nutritional deprivation is often linked with forest displacement, livelihood insecurity, low institutional access, and dietary transition.

Research focusing on eastern and central India indicates that tribal and forested regions often experience complex nutritional conditions where food availability does not always translate into nutritional adequacy. Several studies have also emphasized that traditional food systems and indigenous dietary knowledge play an important role in sustaining nutritional diversity.

Geographical studies on nutrition have increasingly emphasized spatial inequality and regional analysis. Mapping of nutritional indicators allows identification of clusters of deprivation and assists in policy targeting. District-level nutritional mapping has become particularly important after the release of NFHS datasets. However, comparatively fewer studies have attempted a combined spatial analysis of Chhattisgarh and Jharkhand at district scale using multiple child nutrition indicators. The present study attempts to contribute to this gap.

Database and Methodology

The study is based entirely on secondary data obtained from the National Family Health Survey (NFHS-5), 2019–2021. District-level data related to child nutritional indicators were analysed for Chhattisgarh and Jharkhand.

The major indicators used include:

- Children aged 6–23 months receiving an adequate diet (%)
- Percentage of stunted children under five years
- Percentage of wasted children under five years
- Percentage of severely wasted children under five years
- Percentage of underweight children under five years

The study adopts descriptive and spatial analytical methods. District-level categorization was used to interpret regional variation. The findings are interpreted through socio-economic and geographical perspectives including tribal concentration, regional development patterns, accessibility, livelihood systems, and socio-cultural conditions. Maps and spatial comparisons help identify nutritional hotspots and areas requiring targeted intervention.

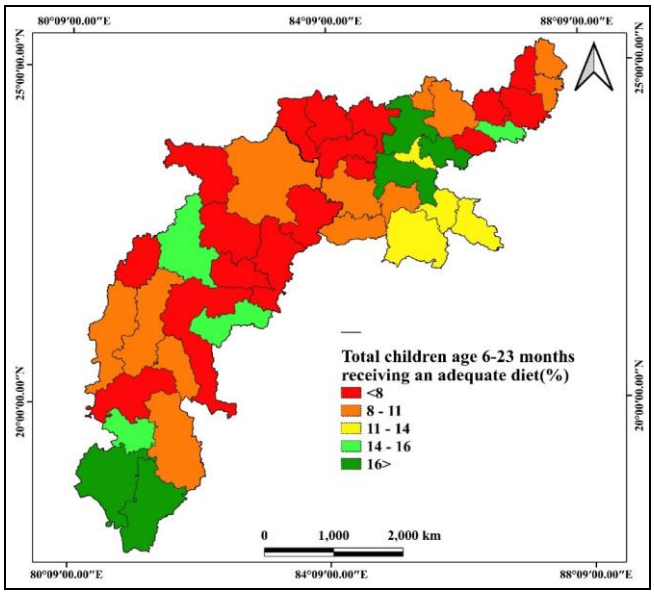
Adequate Diet among Children Aged 6–23 Months

Adequate dietary intake during infancy and early childhood is critical for physical growth, cognitive development, immunity, and long-term health outcomes. NFHS-5 data reveal that the proportion of children aged 6–23 months receiving an adequate diet remains alarmingly low in both Chhattisgarh and Jharkhand.

In Chhattisgarh, several districts fall within the lower categories ranging between 8–11 percent and 11–14 percent. Central districts continue to exhibit weak infant feeding outcomes. However, some southern tribal districts including Bastar and Dantewada show comparatively better values.

Jharkhand demonstrates a more severe nutritional situation. Many districts including Sahibganj, Pakur, Godda, Hazaribagh, and adjoining northern and central regions remain concentrated in the lowest dietary categories. Only a few districts demonstrate moderate improvement.

The observed pattern reflects deeper structural issues including maternal education, dietary diversity, poverty, food insecurity, and healthcare accessibility. In many rural and tribal areas, complementary feeding practices remain inadequate. Limited awareness regarding balanced infant nutrition, coupled with low household purchasing power, further contributes to poor dietary intake. The low percentage of adequate di*et al*so reflects broader socio-economic disparities. Although both states possess rich agricultural and forest resources, nutritional outcomes remain uneven due to unequal access, seasonal livelihood vulnerability, and changing food habits.



Stunting among Children under Five Years

Stunting represents chronic undernutrition and reflects long-term nutritional deprivation. Height-for-age indicators are widely used to assess cumulative growth failure.

The spatial pattern of stunting in Chhattisgarh demonstrates significant regional variation. Central and northern districts including Raipur, Durg, Rajnandgaon, Bilaspur, and adjoining areas show high concentration of stunting. Southern districts such as Bastar and Dantewada display comparatively better outcomes. In Jharkhand, the pattern appears relatively moderate, although several western and central districts continue to experience substantial nutritional stress. Districts such as Palamu, Garhwa, Hazaribagh, and Ranchi belt display variations associated with uneven socio-economic development. The persistence of stunting indicates long-term deprivation linked with maternal nutrition, recurrent infections, poor sanitation, and inadequate dietary intake during early childhood. Stunting is also associated with intergenerational cycles of poverty and malnutrition.

The comparatively better performance of certain tribal districts in Chhattisgarh may indicate the continued role of

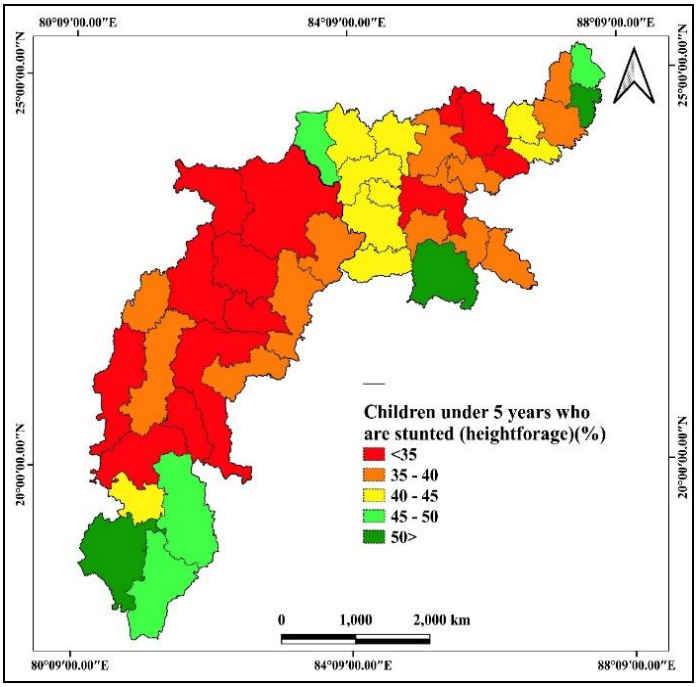
traditional food systems, forest-based diets, and localized food cultures. However, this pattern requires deeper field-based investigation.

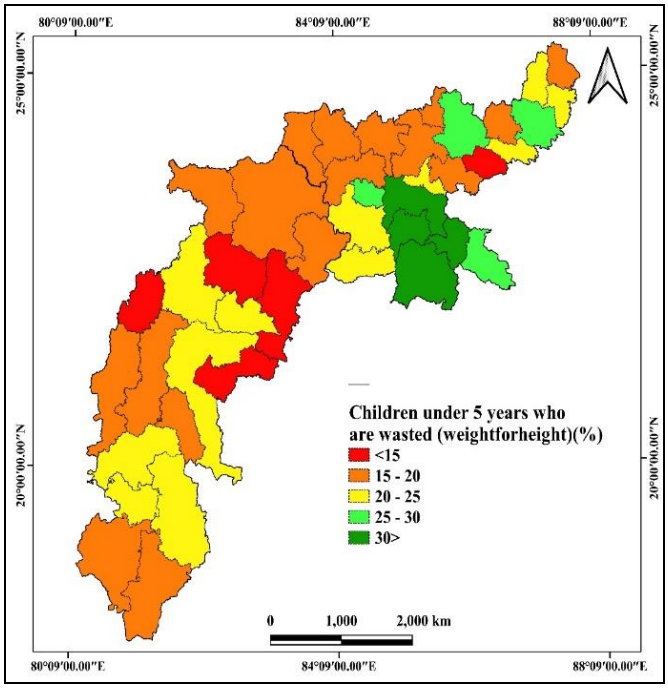
Wasting among Children under Five Years

Wasting reflects acute undernutrition and is associated with recent weight loss or inadequate nutritional intake. The spatial distribution of wasting indicates moderate but uneven prevalence across both states.

In Chhattisgarh, several districts fall within the 20–25 percent and 25–30 percent categories. Southern and central regions reveal higher concentrations of wasting. In Jharkhand, many districts remain within the 15–20 percent and 20–25 percent categories, although some northern and central districts exhibit relatively higher levels.

The geographical distribution of wasting indicates acute nutritional stress associated with seasonal food insecurity, recurrent illness, and inadequate healthcare services. Wasting is often aggravated by diarrhoeal diseases, poor drinking water quality, and low maternal health conditions. The concentration of wasting in southern Chhattisgarh may also reflect accessibility challenges and infrastructural limitations in remote forested areas.

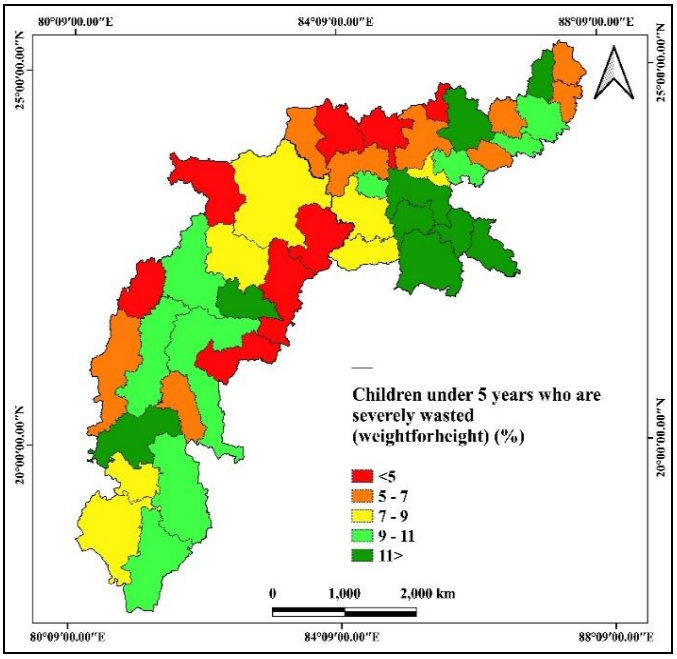


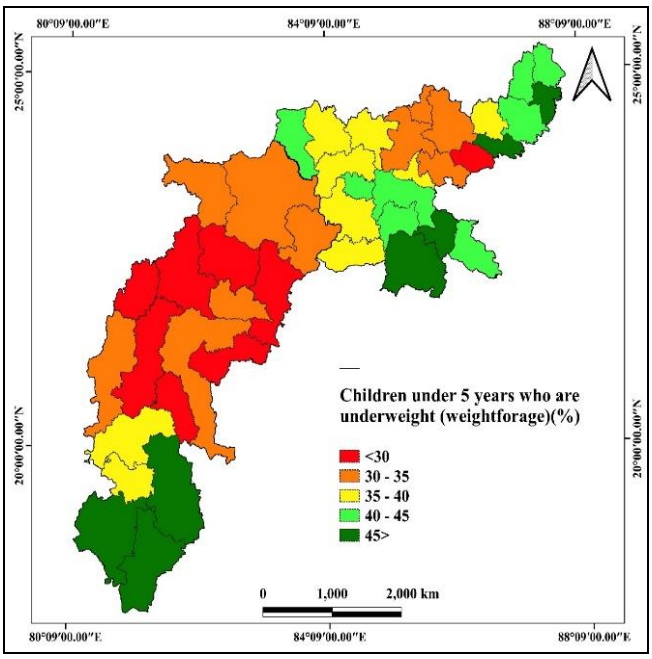


Severe Wasting among Children under Five Years

Severe wasting represents one of the most critical forms of acute malnutrition. Children suffering from severe wasting face significantly higher risks of mortality and disease vulnerability.

The spatial pattern indicates that Chhattisgarh demonstrates relatively higher prevalence of severe wasting compared to Jharkhand. Districts such as Bastar, Dantewada, Sukma, and adjoining southern districts fall within the higher prevalence categories.





In Jharkhand, most districts remain within moderate categories, although pockets of severe nutritional stress are visible in central and northern districts. The persistence of severe wasting highlights the need for immediate nutritional intervention, supplementary feeding, maternal support programmes, and improved healthcare access. The findings also indicate that nutritional vulnerability is highly localized and cannot be addressed through uniform state-level policies alone.

Underweight Children under Five Years

The underweight indicator combines elements of both chronic and acute undernutrition and remains one of the most commonly used measures of child nutritional status.

The spatial pattern in Chhattisgarh reveals a strong concentration of underweight prevalence in central and northern districts including Raipur, Durg, Rajnandgaon, Bilaspur, Janjgir-Champa, and Korba.Southern tribal districts including Bastar, Dantewada, Sukma, and Narayanpur demonstrate relatively better outcomes.

In Jharkhand, southern and eastern districts including West Singhbhum, East Singhbhum, Simdega, and Saraikela-Kharsawan perform comparatively better, while northern districts including Sahibganj, Pakur, and Godda continue to exhibit greater vulnerability.

The regional variation suggests that nutritional outcomes are influenced not only by economic indicators but also by ecological conditions, food cultures, forest dependence, and livelihood systems.

Discussion on the Spatial Dimensions

The analysis reveals that nutritional inequality in Chhattisgarh and Jharkhand is spatially differentiated and regionally complex. Although both states are characterized by tribal concentration and developmental challenges, the nutritional geography differs considerably. Jharkhand demonstrates lower dietary adequacy among infants, while Chhattisgarh shows stronger concentration of severe wasting and underweight conditions in certain districts.

The relatively better performance of certain tribal districts raises important questions regarding the role of traditional food systems and indigenous dietary knowledge. Modern nutritional interventions often overlook localized food diversity and culturally embedded dietary practices. The study also highlights the importance of geography in nutritional analysis. Nutritional vulnerability is not uniformly distributed but clustered across particular ecological and socio-economic regions.

The present study highlights that child malnutrition in Chhattisgarh and Jharkhand is not uniformly distributed but demonstrates strong regional and spatial disparities. The district-wise variation in indicators such as adequate diet, stunting, wasting, severe wasting, and underweight conditions reflects the multidimensional nature of nutritional deprivation in India. The findings align with previous studies that emphasize that malnutrition is deeply connected with poverty, livelihood insecurity, maternal health, sanitation, education, and unequal access to healthcare services (Black *et al*., 2013; Smith & Haddad, 2000) [1, 8].

One of the most significant findings of the study is the extremely low proportion of children aged 6–23 months receiving an adequate diet, particularly in Jharkhand. Infant and young child feeding practices are critical determinants of long-term nutritional outcomes. According to UNICEF (2021) [9], inadequate complementary feeding during the first two years of life contributes significantly to stunting, weakened immunity, and cognitive impairment. The NFHS-5 data indicate that despite national nutritional programmes, dietary adequacy remains poor in many districts, especially in socio-economically marginalized regions.

The study also demonstrates that stunting remains a major concern across both states. Stunting is widely recognized as an indicator of chronic undernutrition and cumulative deprivation (WHO, 2020). The persistence of high stunting levels suggests that nutritional challenges are not merely short-term food deficits but are linked with long-term structural inequalities including poor maternal nutrition, repeated infections, low sanitation coverage, and intergenerational poverty. Drèze and Sen (2013) [2] argued that India's nutritional crisis cannot be understood solely through food production or economic growth indicators, as social inequality and unequal access to public services continue to shape nutritional outcomes.

The geographical concentration of wasting and severe wasting in several districts of Chhattisgarh reflects conditions of acute nutritional stress. Wasting often emerges from immediate food insecurity, illness, poor dietary intake, and inadequate healthcare access (WHO, 2020). The concentration of severe wasting in southern districts such as Bastar, Dantewada, and Sukma may also be associated with remoteness, forested terrain, infrastructural limitations, and healthcare accessibility challenges. Similar observations have been noted in studies on tribal and forest-dominated regions of central India where geographical isolation affects healthcare delivery and nutritional intervention programmes (Menon *et al*., 2018) [6].

An important observation emerging from the analysis is that some tribal districts demonstrate comparatively better outcomes in selected indicators than economically better-connected central districts. This finding suggests that nutritional status is influenced not only by income or urbanization but also by food culture, ecological conditions, dietary diversity, and traditional food systems. Existing literature on indigenous food systems indicates that traditional forest-based diets often contain nutritionally rich local foods, millets, tubers, wild fruits, and diverse plant resources that contribute to dietary resilience (FAO, 2022). However, rapid dietary transition, market penetration, and declining traditional food practices may gradually affect this balance.

The study further emphasizes the importance of adopting a geographical perspective in nutritional research. Nutritional vulnerability is spatially clustered and regionally differentiated. District-level analysis provides more meaningful understanding than state-level averages because nutritional deprivation often remains hidden within aggregate statistics. Menon *et al*. (2018) [6] highlighted that district-level nutritional mapping is essential for identifying localized hotspots of deprivation and for improving targeted interventions.

Another important aspect emerging from the analysis is the relationship between maternal education, healthcare accessibility, and nutritional outcomes. Several studies have shown that maternal literacy and awareness significantly influence breastfeeding practices, dietary diversity, immunization, and healthcare utilization (Black *et al*., 2013) [1]. In many rural and tribal areas of both states, limited

healthcare infrastructure, difficult terrain, poor transport connectivity, and low institutional accessibility continue to affect nutritional service delivery.

The findings also indicate that nutritional interventions should not remain limited to calorie supplementation alone. Nutrition is closely linked with sanitation, drinking water quality, women's health, livelihood security, social equity, and food accessibility. The multidimensional nature of malnutrition has also been emphasized in the National Multidimensional Poverty Index (NITI Aayog, 2021) [7], where health and nutrition form key indicators of deprivation. The study supports the argument that region-specific nutritional planning is essential. Uniform policy approaches may fail to address localized realities. Tribal areas, forest-dependent communities, urbanizing districts, and agriculturally vulnerable regions require differentiated nutritional strategies based on local socio-cultural and ecological contexts. Community participation, strengthening of Anganwadi systems, promotion of traditional nutritious foods, maternal awareness programmes, and improved healthcare accessibility remain important policy priorities.

Finally, the study demonstrates that child malnutrition should be understood not merely as a health issue but as a socio-spatial developmental challenge. Geography plays a crucial role in shaping access to food, health, livelihood, and public services. Therefore, nutritional planning must integrate spatial analysis, regional inequality assessment, and localized intervention strategies for achieving sustainable improvements in child health and nutrition.

Summary

The present study demonstrates that child malnutrition continues to remain a major developmental challenge in Chhattisgarh and Jharkhand. Significant regional disparities exist across districts in terms of adequate dietary intake, stunting, wasting, severe wasting, and underweight prevalence. The analysis indicates that nutritional outcomes are deeply embedded within socio-spatial realities and cannot be understood merely through aggregate state-level statistics. District-level and region-specific analysis is essential for identifying vulnerable populations and designing effective interventions. The study further highlights the need for culturally sensitive and geographically differentiated nutritional policies. Strengthening maternal health, improving dietary diversity, promoting localized food systems, enhancing healthcare accessibility, and integrating community participation remain critical.

Acknowledgement

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References

1. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, *et al*. Maternal and child undernutrition and overweight in low-income and middle-income countries. The Lancet,2013:382(9890):427–451. https://doi.org/10.1016/S0140-6736(13)60937-X
2. Drèze J, Sen A. An uncertain glory: India and its contradictions. Princeton University Press, 2013.
3. Food and Agriculture Organization. Nutrition and food systems report. FAO, 2022.
4. Government of India, Ministry of Health and Family Welfare. National Family Health Survey (NFHS-5) state fact sheets, 2019–21. Government of India, 2021.
5. International Institute for Population Sciences (IIPS), ICF. National Family Health Survey (NFHS-5), 2019–21: India report. IIPS and ICF, 2021.
6. Menon P, Headey D, Avula R, Nguyen PH. Understanding the geographical burden of stunting in India: A regression-decomposition analysis of district-level data from 2015–16. Maternal & Child Nutrition,2018:14(4):e12620. https://doi.org/10.1111/mcn.12620
7. NITI Aayog. National multidimensional poverty index: Baseline report. Government of India, 2021.
8. Smith LC, Haddad L. Explaining child malnutrition in developing countries: A cross-country analysis. International Food Policy Research Institute, 2000.
9. UNICEF. The state of the world's children 2021: On my mind—Promoting, protecting and caring for children's mental health. UNICEF, 2021.
10. World Health Organization. Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates. WHO, 2020.