

Geospatial Analysis of Child Malnutrition and Health Determinants for Public Health Planning in India

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ABSTRACT

India is facing a serious threat of under-five year child malnutrition despite the increase of GDP by 50% since 1991. The status of nutrition in India is worsening, and there is still a challenge to improve malnutrition condition in the country. Studies show a large interstate variation on a national average of malnutrition across districts of India. Using the National Family Health Survey 3 and 4 (2006–16), this study examined the spatial variation in malnutrition and the influencing determinants across India's districts and states. To investigate the spatial dependency and spatial clustering of child malnutrition and its determinants, spatial autocorrelation and regression analysis were used, which were adopted from the UNICEF conceptual framework. There is a reduction in underweight prevalence over the past decade but at a very slow rate which is not a significant improvement. On the other hand, wasting had an additional 10% increase in the states suffering from these forms of malnutrition. Out of the 640 districts in India, a very high prevalence of stunting, wasting, and underweight are occurring in 236, 472, and 370 districts, respectively. The result of univariate Moran's I statistics was 0.62, 0.46, and 0.71 for stunting, wasting, and underweight respectively, which implies a heterogeneity of malnutrition prevalence in India. The hotspot patterns of malnutrition prevalence were not the same for all the indicators in all the states, five of them contributed more than 80% of hotspot districts (Uttar Pradesh, Madhya Pradesh, Bihar and Jharkhand). The highlight of the investigation of this study is found from the spatial error regression model that maternal health such as low mother BMI, anemia during pregnancy, absence of antenatal care, early marriage and pregnancy and lack of improved sanitation facilities in the household were found as the most significant influencing factors on the occurrence and prevalence of malnutrition in India. Furthermore, the Bivariate LISA analysis revealed that the geographical pockets where the maternal care is low the malnutrition prevalence was higher and mainly clustered in the western, central and eastern districts of the country.

Keywords: Spatial Autocorrelation, Stunting, Wasting, Underweight and Spatial Regression