Undernutrition Among Children Below Five Years of Age in Uganda: A Deep Dive into Space and Time

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Abstract : This study aimed at examining the variations of undernutrition among children below 5 years of age in Uganda. The approach of spatial and spatiotemporal analysis helped in identifying cluster patterns, hot spots and emerging hot spots. Data from the 6 Uganda Demographic and Health Surveys spanning from 1990 to 2016 were used with the main outcome variable being undernutrition among children <5 years of age. All data that were relevant to this study were retrieved from the survey datasets and combined with the 214 shape files for the districts of Uganda to enable spatial and spatiotemporal analysis. Spatial maps with the spatial distribution of the prevalence of undernutrition, both in space and time, were generated using ArcGIS Pro version 2.8. Moran's I, an index of spatial autocorrelation, rules out doubts of spatial randomness in order to identify spatially clustered patterns of hot or cold spot areas. Furthermore, space-time cubes were generated to establish the trend in undernutrition as well as to mirror its variations over time and across Uganda. Moreover, emerging hot spot analysis was done to help identify the patterns of undernutrition over time. The results indicate a heterogeneous distribution of undernutrition across Uganda and the same variations were also evident over time. Moran's I index confirmed spatial clustered patterns as opposed to random distributions of undernutrition prevalence. Four hot spot areas, namely; the Karamoja, the Sebei, the West Nile and the Toro regions were significantly evident, most of the central parts of Uganda were identified as cold spot clusters, while most of Western Uganda, the Acholi and the Lango regions had no statistically significant spatial patterns by the year 2016. The spatio-temporal analysis identified the Karamoja and Sebei regions as clusters of persistent, consecutive and intensifying hot spots, West Nile region was identified as a sporadic hot spot area while the Toro region was identified with both sporadic and emerging hotspots. In conclusion, undernutrition is a silent pandemic that needs to be handled with both hands. At 31.2 percent, the prevalence is still very high and unpleasant. The distribution across the country is nonuniform with some areas such as the Karamoja, the West Nile, the Sebei and the Toro regions being epicenters of undernutrition in Uganda. Over time, the same areas have experienced and exhibited high undernutrition prevalence. Policymakers, as well as the implementers, should bear in mind the spatial variations across the country and prioritize hot spot areas in order to have efficient, timely and region-specific interventions.

Keywords : undernutrition, spatial autocorrelation, hotspots analysis, geographically weighted regressions, emerging hotspots analysis, under-fives, Uganda