Spatial Disparities and Determinants of Child Stunting in Thailand: Evidence from the 2019 Multiple Indicator Cluster Survey

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Abstract

Child stunting is still a big public health problem in Thailand, and there are big differences between regions. This study suggests a spatially based modeling framework to assess provincial level variations in stunting risk and to extrapolate findings to regions with incomplete data. A logistic regression model was applied to cross-sectional data from 12 provinces to identify socio-demographic determinants and estimate province-level effects. These estimated coefficients were subsequently considered as spatial signals and disseminated across adjacent regions via a triangular spatial network, enabling the interpolation of province level effects for unsampled areas. The findings demonstrate substantial heterogeneity among provinces ($p < 0.001$), with increased risks observed in Narathiwat, Satun, Tak, and Nakhon Ratchasima compared to Bangkok. Boys and kids between the ages of 6 and 23 months were at a higher risk, as were important factors at the household level. The spatial interpolation showed that there were coherent geographic clusters, with high risk areas mostly in the Northeast and some in the North and South. The proposed framework allows you to build continuous risk surfaces from sparse data by using model-based coefficients and local spatial connectivity. This method is different from traditional methods that rely on dense spatial observations. This method provides a computationally efficient and comprehensible option for small area estimation in settings with limited resources. The results show that combining regression based inference with spatial interpolation can be useful for making flexible risk maps. This proposed method is useful for both methods and practice in spatial epidemiology.

Keywords

Stunting, Logistic Regression, Spatial Analysis, Thailand, Child Undernutrition, Provincial Disparities.