

Detecting Local Clusters of Childhood Malnutrition in the Island Province of Marinduque, Philippines Using Spatial Scan Statistic

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Abstract : Under-five malnutrition continues to persist in the Philippines, particularly in the island Province of Marinduque, with prevalence of some forms of malnutrition even worsening in recent years. Local spatial cluster detection provides a spatial perspective in understanding this phenomenon as key in analyzing patterns of geographic variation, identification of community-appropriate programs and interventions, and focused targeting on high-risk areas. Using data from a province-wide household-based census conducted in 2014–2016, this study aimed to determine and evaluate spatial clusters of under-five malnutrition, across the province and within each municipality at the individual level using household location. Malnutrition was defined as weight-for-age z-score that fall outside the ± 2 standard deviations from the median of the WHO reference population. The Kulldorff's elliptical spatial scan statistic in binomial model was used to locate clusters with high-risk of malnutrition, while adjusting for age and membership to government conditional cash transfer program as proxy for socio-economic status. One large significant cluster of under-five malnutrition was found southwest of the province, in which living in these areas at least doubles the risk of malnutrition. Additionally, at least one significant cluster were identified within each municipality—mostly located along the coastal areas. All these indicate apparent geographical variations across and within municipalities in the province. There were also similarities and disparities in the patterns of risk of malnutrition in each cluster across municipalities, and even within municipality, suggesting underlying causes at work that warrants further investigation. Therefore, community-appropriate programs and interventions should be identified and should be focused on high-risk areas to maximize limited government resources. Further studies are also recommended to determine factors affecting variations in childhood malnutrition considering the evidence of spatial clustering found in this study.

Keywords : Binomial model, Kulldorff's elliptical spatial scan statistic, Philippines, under-five malnutrition

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