J Community Med Health Educ 2018, Volume 8
DOI: 10.4172/2161-0711-C4-042

Spatial distribution and predictors of vitamin A deficiency among children 6-23 months in Bungoma and Busia counties, Kenya

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The study analyses in details the existing spatial patterns using spatial indices and geographical visualizations of the presence and absence significant high and low values of vitamin A deficiency) (VAD) in Busia and Bungoma counties. ArcGIS and GeoDa 1.6 have been used for spatial analysis. A null hypothesis of spatial randomness was tested at $\alpha=0.005$ against the thought of Spatial Autocorrelation (SA) and rejected giving a strong evidence of significant spatial patterns in VAD distribution. Local Indicators of Spatial Association (LISA) was used to assess clustering. Regression analysis was conducted to model the most significant prediction equation for a set of 12 covariates both spatial and demographics. Exploratory Spatial Data Analysis (ESDA) was conducted followed by Ordinary Least Squares Regression (OLSR) on predictor variables. Corrected VAD was the dependent variable while spatial and demographic variables were independent. The results of the OLSR were scrutinized by a set of test diagnostics for the existence of spatial dependence (Lagrange Multiplier diagnostics). Analysis of Moran's Index in Bungoma and Busia revealed a heavy clustering of High-High ($MI\geq0.9$) values on upper parts of Bungoma and lower parts of Bungoma and Busia showed heavy clustering of Low-Low values of VAD ($MI\geq0.9$). Spatial error model yielded varying levels of coefficients with diverse spatial and non-spatial independent variables at $\alpha\leq0.005$ with a sensitivity of 999 permutations and model variables suffered from extreme cases of multicollinearity and heteroskedasticity. OLSR identified the length of the crop growing period, distance to health facilities and towns as the most significant spatial predictors of VAD.

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