Central European Journal of Geography and Sustainable Development 2020, Volume 2, Issue 2, Pages: 5-14
ISSN 2668-4322, ISSN-L 2668-4322

A Geo-Statistical Analysis for Prediction Modeling of Filariasis (Elephantiasis) Transmission Risk in Bangladesh Using Geographic Information Systems

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Received: 16 July 2020; Revised: 12 September 2020; Accepted: 15 September 2020;
Published online: 23 September 2020

Abstract: Various socio-economic and environmental factors play a vital role in the transmission of many infectious diseases of which some are among the most important cause of mortality and morbidity in the developing countries. Filariasis is the disease of the poor people and has been neglected for more than 50 years in Bangladesh and it is endemic in 23 out of 64 districts of Bangladesh so far. The affected people are generally the poorest and most vulnerable segment of the country. This research article has been made to analyze the prediction of filariasis disease. It discusses how GIS technology can be utilized as an array of several databases and as an effective tool for integrating different sectoral and information of various significant decision-making processes. It utilizes the kriging and cokriging methods of ArcGIS Geostatistical Analyst to predict filariasis occurrences using various socio-economic and environmental parameters and comparing the predicted models for Bangladesh's northern region which is highly filariasis prone. The resultant prediction model indicates that the probability of filariasis is higher in upazilas neighboring another upazila with high occurrences. The result also shows that the disease incidences decreases with increasing distance from the disease affected regions.

Key words: filariasis, geostatistics, kriging, cokriging, spatial interpolation

Citation: Karim, R., & Islam, S.S. (2020). A Geo-Statistical Analysis for Prediction Modeling of Filariasis (Elephantiasis) Transmission Risk in Bangladesh Using Geographic Information Systems. *Central European Journal of Geography and Sustainable Development*, *2*(2), 5-14. https://doi.org/10.47246/CEJGSD.2020.2.2.1

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