Integrating Geospatial, Census and Medical Data to the Study of Quality of Life and Dengue Incidences in Dhaka Metropolitan Area, Bangladesh

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Abstract: The objective of this paper is to analyse the relationship between quality of life and dengue incidences in the Dhaka Metropolitan Area (DMA) of Bangladesh. We use a range of both census data and spatial data from other sources, including remote sensing, to derive a Quality of Life index which is then tested as a potential predictor of dengue risk. Dengue data are aggregated from hospital admission records for the period 2005 to 2010, and have been used for spatial epidemiological analysis at the sale of the lowest available census.

The spatial and statistical structures of various other spatial data are analysed and Principal Axis Factoring is used to reduce the degree of co-linearity in the data. The resulting factors are combined into a Quality of Life index, which in turn, is used in a regression model of dengue occurrence and risk. Epidemiological investigation shows that there is a considerable difference between the number of male and female dengue cases over the years. From 3,169 recorded dengue patients, 72.6 % of total (2,301) were male, giving a male/female ratio of 2.65:1. Further to this, the age group of people most affected are between 18 and 34. The three Principal Factors used together explain 87% of the variance in the initial candidate predictors, which eminently qualifies them for use as a set of uncorrelated explanatory variables in a linear regression model. Spatial statistics, including local and global regressions, are being used to determine areas at risk from dengue occurrences in Dhaka. The results of this study would be of great aid to identify spatial risk factors, essential to develop the control and prevention measures to specific areas.

Keywords: DMA, Quality of Life, Dengue, Spatial Modelling, Remote Sensing

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