Spatial-Temporal Clustering Characteristics of Dengue in the Northern Region of Sri Lanka, 2010-2013

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Abstract : Dengue outbreaks are affected by biological, ecological, socio-economic and demographic factors that vary over time and space. These factors have been examined separately and still require systematic clarification. The present study aimed to investigate the spatial-temporal clustering relationships between these factors and dengue outbreaks in the northern region of Sri Lanka. Remote sensing (RS) data gathered from a plurality of satellites were used to develop an index comprising rainfall, humidity and temperature data. RS data gathered by ALOS/AVNIR-2 were used to detect urbanization, and a digital land cover map was used to extract land cover information. Other data on relevant factors and dengue outbreaks were collected through institutions and extant databases. The analyzed RS data and databases were integrated into geographic information systems, enabling temporal analysis, spatial statistical analysis and space-time clustering analysis. Our present results showed that increases in the number of the combination of ecological factor and socio-economic and demographic factors with above the average or the presence contribute to significantly high rates of space-time dengue clusters.

Keywords : ALOS/AVNIR-2, dengue, space-time clustering analysis, Sri Lanka

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