

An Assessment of Health Hazards in Urban Communities: A Study of Spatial-Temporal Variations of Dengue Epidemic in Colombo, Sri Lanka

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Abstract : Dengue is an epidemic which is spread by *Aedes Egyptai* and *Aedes Albopictus* mosquitoes. The cases of dengue show a dramatic growth rate of the epidemic in urban and semi urban areas spatially in tropical and sub-tropical regions of the world. Incidence of dengue has become a prominent reason for hospitalization and deaths in Asian countries, including Sri Lanka. During the last decade the dengue epidemic began to spread from urban to semi-urban and then to rural settings of the country. The highest number of dengue infected patients was recorded in Sri Lanka in the year 2016 and the highest number of patients was identified in Colombo district. Together with the commercial, industrial, and other supporting services, the district suffers from rapid urbanization and high population density. Thus, drainage and waste disposal patterns of the people in this area exert an additional pressure to the environment. The district is situated in the wet zone and thus low lying lands constitute the largest portion of the district. This situation additionally facilitates mosquito breeding sites. Therefore, the purpose of the present study was to assess the spatial and temporal distribution patterns of dengue epidemic in Kolonnawa MOH area (Medical Officer of Health) in the district of Colombo. The study was carried out using 615 recorded dengue cases in Kollonnawa MOH area during the south east monsoon season from May to September 2016. The Moran's I and Kernel density estimation were used as analytical methods. The analysis of data was accomplished through the integrated use of ArcGIS 10.1 software packages along with Microsoft Excel analytical tool. Field observation was also carried out for verification purposes during the study period. Results of the Moran's I index indicates that the spatial distribution of dengue cases showed a cluster distribution pattern across the area. Kernel density estimation emphasis that dengue cases are high where the population has gathered, especially in areas comprising housing schemes. Results of the Kernel Density estimation further discloses that hot spots of dengue epidemic are located in the western half of the Kolonnawa MOH area, which is close to the Colombo municipal boundary and there is a significant relationship with high population density and unplanned urban land use practices. Results of the field observation confirm that the drainage systems in these areas function poorly and careless waste disposal methods of the people further encourage mosquito breeding sites. This situation has evolved harmfully from a public health issue to a social problem, which ultimately impacts on the economy and social lives of the country.

Keywords : Dengue epidemic, health hazards, Kernel density, Moran's I, Sri Lanka

Conference Title : ICGIST 2017 : International Conference on Geographic Information Systems and Technology

Conference Location : Sydney, Australia

Conference Dates : December 04-05, 2017