(105)

An Assessment of Health Hazards in Urban Communities: A Study of Spatial Temporal Variations and Trends 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.According to the records of World Health Organization one third of the world population are exposed to dengue.As a tropical country, Sri Lanka is also seriously affected by this disease.The year 2017 is the year claimed for highest number of Dengue patients in the Sri Lankan history. During the past seven months about 120,000 Dengue patients have been recorded and among them the highest had been identified in Colombo district. Kolonnawa Divisional Secretariat (DS) division is one of the highly affected areas in the district. Therefore, Kolonnawa DS division has been selected for this study.All the recorded Dengue patients in the Kolonnawa Medical Office of Health (MOH)area in Colombo district during the period of May to September in 2016 were used for data analysis.Field observation has also been carried out for verification purposes during the study period. The absolute location of the residences of dengue patients were recorded by a hand held GPS.Total of 615 locations of 615 dengue patients have been recorded. The spatial distribution of the recorded dengue patients was identified using nearest neighbourhood analysis in ArcGIS 10.1.Trend analysis was also carried out to recognize the future trend of Dengue cases in the area. The agglomerations of those patients were identified using Kernel Density Estimation. The results revealed that hot spots of dengue epidemic are located in western half of the Kolonnawa MOH area which is close to the Colombo municipal boundary. This analysis further disclosed that there was a significant relationship with high population density and unplanned urban land use practices. Results of the field observation confirmed that the drainage systems in this area were poorly functioning and careless waste disposal methods of the people have further encouraged mosquito breeding sites. This situation is evolved harmfully from a public health issue to a social problem that ultimately impacts on the economy of the country. According to the results 20 hot spots were found out within the Kolonnawa DS division. North East and South West areas were identified as the potential areas for spreading of future Dengue cases in Kolonnawa DS division. South West area is highly vulnerable for Dengueepidemic than other areas. The results of the study will be important for Dengue prediction and prevention. These findings will be useful forconducting Dengue awareness programmes and Dengue prevention campaigns.

*Keywords:*Dengue epidemic, Nearest neighbourhood analysis, Kernel density   estimation

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81