

Emerging Spatio-Temporal Trends in Dengue Incidence in Poojapitiya Medical Officer of Health (MOH), Central province, Sri Lanka

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Dengue has emerged as one of the major threats to the health sector of many countries including Sri Lanka, due to the increasing number of reported dengue cases over time. Therefore, a statistical and geo-informatics based analysis of the spatio-temporal trends in dengue distribution was carried out to identify recent spatial and temporal trends in dengue distribution patterns, while assessing the susceptibility of the population to dengue infection in the Poojapitiya Medical Officer of Health (MOH) area. Monthly records of reported dengue cases from 2009 to 2013 of the Poojapitiya MOH area were acquired and spatial maps of the recorded dengue case distribution in each Grama Niladhari Division (GND) were developed by using Arc GIS (version 10.2). Normal Chi square test coupled with Paired-Chi square test in MINITAB (version 14.12.0) were used to investigate the impact of gender and age on the infection. Galhinna GND indicated the highest susceptibility to dengue throughout the study period, while the rest of the GNDs indicate less (37 GNDs) or null (29 GNDs) susceptibilities. As suggested by the results of the Paired-Chi square test [$>X^2_{(66, 0.95)} = 85.951$], the emergence of dengue outbreaks indicated a significantly declining trend in recorded dengue cases in all of the GNDs (regardless of the outbreak in 2012) during recent years. The Percentage Infected Male : Female Ratio (PIMFR) suggested that the, males had a relatively high susceptibility for dengue infection than females with 63.9 : 36.1 of average PIMFER ($p=0.00<0.05$ at 95% of significance). According to the Paired-Chi square test, the vulnerability of the age groups shifts significantly throughout the study period [$>X^2(7, 0.95) = 14.067$], where the age groups of 11 - 20 and 21 – 30 indicated high vulnerability to dengue, while >61 age group remained as the least vulnerable group for dengue infection. The identification of the potential high risk GNDs with high susceptibility to the infection of dengue along with the vulnerable age groups in the community would assist the relevant vector controlling agencies to concentrate their efforts, ensuring the effective controlling of dengue outbreak occurrence within the of Poojapitiya MOH.

Keywords: Dengue, GIS, Temporal and Spatial Trends, Poojapitiya MOH

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