Geo – Statistics based modeling on Vector-Borne diseases planning in Monaragala district: a ten year data analysis with reference to malaria cases, rainfall and population

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Malaria is a life – threatening parasitic disease transmitted from person to person through the bite of a female *Anopheles* mosquito. Malaria and other vector – borne diseases are major epidemiological problems in tropical region and generally the global incidence of malaria is presently estimated to be more than 300 million cases per year. It is responsible for at least one million deaths annually throughout the world according to the World Health Organization (WHO).

Malaria is one of major public health problems in Sri Lanka, with almost 300,000 infections being reported yearly in a population of 20 million. It has made a major impact on health, economic, education and development. Hence, this study is mainly focuses the major issues of (1) Existing trends & spatial distribution pattern of malaria (2) Impact of population and rainfall on malaria and (3) Lack of micro level GIS analysis for public health planning in Sri Lanka.

The objective of this study is to explore the impact of rainfall and population on malaria cases, based on the GIS – Statistical modeling which scoping a micro level GIS – management system for vector borne diseases planning.

To achieve the above objective, this study utilizes malaria cases, rainfall data and population for the period 1996 - 2005 in the level of Grama Niladhari (GN) divisions of Monaragala district in Sri Lanka. Further, statistical methods of Correlation, Regression and Time series Analysis have been applied with micro level GIS database to address the issues of this study.

This study revealed a positive correlation between two months lagged rainfall data and malaria cases integrated with population density. Spatial patterns of risks have been identified by the use of geo – statistical modeling. Further, two apparent seasonal periods found in each year that can be used for the pre – preparedness to health planning and strategies to prevent the malaria incidence.

Key words: GIS, Statistical modeling, Vector – Borne diseases, Malaria risk areas, Public health planning.

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