Forecasting models for Dengue outbreak in Northern province of Sri Lanka

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The Dengue Hemorrhagic fever is one of frequently chronicled epidemiological scenario in the past and ongoing time frame worldwide. Recently, trend of its outbreak seems numerous incidents partially deviated compare to existing pattern from the past literature. Institutional bodies involved in pandemic alleviation of Dengue outbreak in great difficulties to develop an efficient management plan because of complicated pattern of its outbreak. This study aimed towards finding an appropriate time series forecasting model for the number of Dengue incidents recorded in Northern province of Sri Lanka by tracing of Auto Regressive Integrated Moving Average (ARIMA) model regardless of climatic factors such as, ambient temperature, rainfall and also the demographic factors associated with the data set for the period of January 2009 to December 2014 on monthly basis. Appropriate model was derived through sequential process includes; formulate stationary series, tentative model selection, model optimization, model validation and error & accuracy analysis. As far as the appropriateness was concerned throughout above processes concluded that the best fitted model for the Northern province is ARIMA (3, 1, 4) model which could applicable to forecast the dengue incidences in Northern province for near future and it could be more reinforced by considering weather factors in future. Morbidity of Dengue in Northern province has been recorded as in intermittently increasing during the study period while regular difference data series as stationary. At the present time being ARIMA (3, 1, 4) model could applicable for the successful alleviation of Dengue consequently shifting towards socio-economic advancement of the nation.

Keywords: Autoregressive Integrted Moving Average, Dengue, Forecasting