

The influence of climate variability on dengue transmission in urban Colombo: A cross wavelet approach

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Dengue is a major public health problem mainly in tropical and sub-tropical regions around the world. Prevalence of dengue is highest in tropical areas of Asia and the Americas, with 50-100 million estimated cases of dengue fever and 250,000-500,000 cases of dengue hemorrhagic fever reported yearly worldwide as explosive outbreaks mainly in urban and suburban areas. The epidemiology and the dynamics of the dengue disease are complex, and climatic fluctuations as well as social and demographic factors heavily influence its incidence. The virus is mainly transmitted to the human by a mosquito vector *Aedes Aegypti*. Increases in temperature and precipitation as well as urbanization can lead to increase in mosquito abundance by increasing their development rate, decreasing the length of reproductive cycles, stimulating egg-hatching and providing sites for egg deposition. We analyzed three time series, namely average weekly maximum temperature, minimum temperature and precipitation in urban Colombo versus the weekly dengue cases. We aimed to identify the significant influences of climate variations on the transmission of dengue in urban Colombo. Cross wavelet power spectral analysis was used in the study to examine the spectral relationships between the climate parameters and the dengue incidents from year 2006 to 2011. We used the MATLAB package to obtain the graphical results. Through the spectral analysis we identified some significant relationships between dengue incidents and climate parameters such as average rainfall and average maximum temperature. The average rainfall seems to be leading dengue cases by approximately eight weeks as indicated by the in-phase relationship in the power spectrum.