Geophysical Research Abstracts
Vol. 15, EGU2013-3764-1, 2013
EGU General Assembly 2013

Meteorological factors and dengue fever transmission in South Taiwan

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The variations in meteorological conditions induced by climate change causes the diffusion pattern of infectious disease and serious epidemic situation. The objective of this study is to investigate the impact of meteorological variables to the temporal variation of dengue fever epidemic in weekly basis in south Taiwan. Several extreme and average index of meteorological variables, i.e. temperature and humidity, were used for this analysis, including averaged, maximum and minimum temperature, and average rainfall, maximum 1-hr rainfall, and maximum 24-hr rainfall. This study applies the distributed lag nonlinear model (DLNM) to reveal the significant meteorological variables and their temporal lag effects to the dengue fever epidemic by analyzing the dengue fever records from 1998-2011. Results show that the weekly minimum temperature (minT) and 1-hr maximum rainfall (maxR) are significantly important to the dengue fever spread. Among them, once minT is higher than 20°C, the relative risk of dengue fever of nine-fourteen week later will be significantly elevated. On the other hand, the incidences of maxR higher than 80mm can also increase the relative risk of dengue fever occurrences around nine-fourteen weeks afterwards.