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Modeling of dengue fever temporal variations in central Thailand

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The incidence and distribution of dengue related illness have grown dramatically in recent decades. Monitoring and predicting dengue incidence can facilitate early warning and disease control and prevention. This study aimed at developing a predicting model on the incidence rate of dengue fever in central of Thailand using time series analysis. Data on monthly-notified cases of dengue fever over the period 1981-2011 were collected from the Bureau of Epidemiology, Department of Disease Control, Ministry of Public Health. Seasonal Autoregressive Integrated Moving Average (SARIMA) model was performed using data on monthly incidence rate of dengue fever from 1981 to 2009, and validated using the monthly rate collected for the period 2010 to 2011. The SARIMA(1,0,1)(1,1,1)12 model has been found as the most suitable model with the least Root Mean Square Error (RMSE) of 4.114, Mean Absolute Percent Error (MAPE) of 20.175 and Bayesian information criterion (BIC) of 2.915. The residuals in the model appeared to fluctuate randomly around zero, with no obvious trend in variation, as the predicted incidence values increase. The model demonstrated goodness-of-fit with R2 of 92.90%. Our findings indicate that SARIMA model is useful tool for monitoring dengue incidence in central, Thailand. Furthermore, this model can be applied to surveillance data for predicting trends in dengue incidence in Thailand.

Biography

Siriwan Wongkoon has completed her Ph.D in Computational Science at Walailak University, Thailand. She has done on "Thailand GLOBE Mosquito Protocol" for Thai schools with Assoc. Prof. Dr. Mullica Jaroensutasinee and Assoc. Prof. Dr. Krisanadej Jaroensutasinee, the GLOBE Thailand Program, the Institute for the Promotion of Teaching Science and Technology (IPST) and Center of Excellence for Ecoinformatics, NECTEC/Walailak University. She has published more than 28 papers in reputed local and international journals.

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