

Abstract

The purposes of this project were 1) to establish the prediction model of the number of the influenza-like illness and 2) to establish the relationship between the number of the influenza-like illness and temperature in Taiwan. The data of influenza-like illness were retrieved from a weekly basis by a surveillance network implemented in Center for Disease Control since 1999. Three different approaches were used: polynomial trend model, seasonal auto-regressive integrated moving average model (SARIMA), and trigonometric model. Performance was compared across forecasting methods by calculating three error measures. Of the available weather variables, we used the average temperature, maximum temperature and minimum temperature in each week. We estimated the relation of influenza-like illness with temperature from four regions of Taiwan by using generalized least square with AR(1). All the analyses were performed with the SPSS and Stata statistical package.

The influenza-like illness series was best fitted by a seasonal ARIMA(1,1,0)(1,1,0)₅₂ model. Our comparison found that SARIMA model had the least error. The results also showed the adverse relations with the weekly average temperature and week minimum temperature. The SARIMA approach of analyzing weekly influenza-like illness provides early and reliable recognition of influenza epidemic.

Keywords : surveillance ; time series analysis ; predicted model ; influenza-like illness ; seasonal auto-regressive integrated moving average model (SARIMA)