Objectives: To use historical influenza incidence time series data to develop a predictive model using time series analysis methods to forecast influenza cases.

Background: Influenza is a common disease associated with considerable economic burden, poor public health, and significant mortality. Detection and prediction of outbreaks is critical to enable early intervention and timely response to protect public health. For example, the United States has experienced significant influenza-related mortality and morbidity, leading to substantial morbidity and mortality.

Methods: Google Flu Trends project data from 2003 to 2014 was used to construct a predictive model. The data was seasonally adjusted and split up into a training set and a test set. The training set, which contained the first 311 weeks of data from 2003 to 2013, was used to fit a series of time series models using trigonometric functions to forecast influenza cases.

RESULTS: The AIC of 7727.8 for Model 1 and 7693.3 for Model 2. The best model was an SARIMA (1,1,1,0,4,1) with an MAPE of 6.06% and an SARIMA (1,1,1,0,3,1) with an MAPE of 5.82%.

CONCLUSIONS: Predicting influenza is a difficult undertaking. Even the best model in this work would have provided a more accurate forecasting model.


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