
Time series model to predict the Leptospirosis outbreak in Kalutara district, Sri Lanka

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Leptospirosis is an infectious disease, contracted through animals, it leads to organ damage, specifically kidney damage. Increasing outbreaks have been reported recently from several countries. The disease is endemic in Sri Lanka and Kalutara district is one of the highly endemic area which is known to be overcrowded with agricultural communities. Hence, forecasting Leptospirosis incidence is an essential aspect. The aim of this study was to find a time series model to forecast Leptospirosis cases in the Kalutara district, Sri Lanka. In this study we mainly focused on the number of Leptospirosis cases reported monthly during the period from January 2010 to December 2020. An Auto-Regressive Integrated Moving Average (ARIMA) model was fitted to predict the monthly Leptospirosis cases in Kalutara district. The forecasting accuracy measures, such as Akaike Information Criterion (AIC), Mean Absolute Error (MAE), and Root Mean Square Error (RMSE), were used to explore the best forecasting model based on the lowest measure of accuracy. According to the data, the highest number of Leptospirosis outbreaks (275) were reported in September 2020 and the lowest reported Leptospirosis outbreak (7) occurred in September 2019. Moreover, the average monthly Leptospirosis outbreak was 44. ARIMA (3, 1, 1) was found as the best model to predict the future outbreak of Leptospirosis. At the present time being ARIMA (3, 1, 1) model could applicable for the successful alleviation of Leptospirosis consequently shifting towards socio-economic advancement of the nation.

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