ABSTRACT

ASSESSING THE IMPACT OF CLIMATE ON THE REPORTED INCIDENCE OF LEPTOSPIROSIS IN JAMAICA FROM 1992-2007

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Changes in Caribbean climate are due to variations in temperature and precipitation. These changes are attributed to social factors such as urbanization, population growth and industrialization, which seemingly influence variation in reported cases of rodent-borne diseases such as: leptospirosis. This research focuses on investigating the relationship between the incidence of leptospirosis in Jamaica and climate variables such as temperature and precipitation by using wavelet analysis. Wavelet analysis takes into account the characteristics which are unique to climate and epidemiological data which many spectral techniques have failed to achieve.

In tandem, the climatological plots, correlations and model analysis indicate that the period October-November is a significant season for an outbreak of leptospirosis with temperature and precipitation playing an important role in the spread of the virus. The monitoring of both variables holds reasonable promise for predicting conditions for the likelihood of the disease outbreak, with lead times of one to two months.

Wavelet analysis also suggests points worth noting. The wavelet coherency plot between leptospirosis and precipitation shows dominant modes of 1-2 years and 3, 4 and 6 year bands for various periods in the record. The same bands are also evident in the coherency plot between leptospirosis and temperature. The common 3-6 year signal may indicate that the El Niño phenomenon could also be playing a role in the outbreak of the disease.

Keywords: Tatrice Wendy-Kay Batchelor; climate; leptospirosis; precipitation; temperature; wavelet analysis; wavelet power spectrum; wavelet coherency plot; Jamaica