El Niño Southern Oscillation and Leptospirosis outbreaks in New Caledonia

Author(s): Weinberger D, Baroux N, Grangeon JP, Ko AI, Goarant C  
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Abstract:

Leptospirosis is an important cause of seasonal outbreaks in New Caledonia and the tropics. Using time series derived from high-quality laboratory-based surveillance from 2000-2012, we evaluated whether climatic factors, including El Niño Southern Oscillation (ENSO) and meteorological conditions allow for the prediction of leptospirosis outbreaks in New Caledonia. We found that La Niña periods are associated with high rainfall, and both of these factors were in turn, temporally associated with outbreaks of leptospirosis. The sea surface temperature in El Niño Box 4 allowed forecasting of leptospirosis outbreaks four months into the future, a time lag allowing public health authorities to increase preparedness. To our knowledge, our observations in New Caledonia are the first demonstration that ENSO has a strong association with leptospirosis. This association should be tested in other regions in the South Pacific, Asia or Latin America where ENSO may drive climate variability and the risk for leptospirosis outbreaks.

Resource Description

**Exposure**: Ecosystem Change, El Nino Southern Oscillation, Precipitation, Temperature, Other Exposure, Specify, Water Quality

**Temperature**: Variability

**Water Quality**: Marine or Freshwater pathogen

**Other Exposure**: sea surface temperature

**Geographic Feature**: Ocean/Coastal

**Geographic Location**: Non-United States

**Non-United States**: Australasia

**Health Impact**: Infectious Disease

**Infectious Disease**: Waterborne Disease

**Waterborne Disease**: Leptospirosis

**Model/Methodology**: Outcome Change Prediction

**Model Timescale**: Inter-Annual (1-10 years)
Resource Type: Research Article

Special Topics: Adaptation

Adaptation: Secondary Health Impacts of Adaptation, Vulnerability Assessment, Early Warning System