NOAA, 2012 Climate Prediction Applications Science Workshop (CPASW), Climate Services for National Security Challenges: Abstract Submission

Poster Presentation Title:
Measuring El Niño and Climate Impacts on Cholera in Piura, Peru during the 1997-98 El Niño

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Poster Presentation Abstract:

One of the current priorities at the Centers for Disease Control and Prevention’s Climate and Health Program is to better understand the effects of climate and anticipated impacts of climate change on human health and security. In this study, we contribute to these efforts and the growing body of knowledge on climate and health by examining cholera, a diarrheal disease caused by the bacterium *V. cholerae*, which currently afflicts an estimated 3 to 5 million people annually.

Using a retrospective case study, we examine the impacts of climate on cholera incidence in Piura, Peru during the strongest El Niño of the 20th century in 1998. Bivariate regression analyses were conducted to assess the impact of climate variables (a) Niño 3.4 sea surface temperature anomaly (SSTA), (b) Niño 1+2 SSTA, (c) Paita SSTA, (d) maximum temperature anomaly (TMAXA), (e) minimum temperature anomaly (TMINA), (f) mean temperature anomaly (TMEANA), and (g) total rainfall on cholera incidence at the district level. Temporal lag associations from zero to 7 months were also explored. The strongest associations were mapped in ArcGIS 9.2 to explore the spatial variation of the climate-cholera associations.

The results showed that the strength of associations varied by climate variable, temporal lag and district. The climate variable with the strongest association was rainfall (1 and 2 month lags) and explains how cholera may have spread via flooding during the 1997-98 El Niño. Impacts were generally found in districts located on the west coast of Piura; however, associations were also observed in central Piura. This study illustrates the potential usefulness of temporal-spatial climate and health information for future epidemic preparedness and infectious disease prevention. It also demonstrates the challenges faced by public health scientists, particularly in developing countries, in the assessment of climate impacts on human health.