Abstract

Objective. The goal of this study was to assess linkages between microclimate and longer-term ENSO-related weather forcing on the week-to-week changes in dengue prevalence in Matamoros, Tamaulipas, Mexico, over a recent decade of dengue observations. Material and Methods. An auto-regressive model to evaluate the role of climatic factors (seasurface temperature) and weather (maximum temperature, minimum temperature, precipitation) on dengue incidence over the period 1995-2005, was developed by conducting time-series analysis. Results. Dengue incidence increased by 2.6% (95% CI: 0.2-5.1) one week after every 1ºC increase in weekly maximum temperature and increased 1.9% (95% CI: -0.1-3.9) two weeks after every 1 cm increase in weekly precipitation. Every 1ºC increase in sea surface temperatures (El Niño region 3.4) was followed by a 19.4% (95% CI: -4.7-43.5) increase in dengue incidence (18 weeks later). Conclusions. Climate and weather factors play a small but significant role in dengue transmission in Matamoros, Mexico. This study may provide baseline information for identifying potential longer-term effects of global climate change on dengue expected in the coming decades. To our knowledge, this is the first study to investigate the potential associations between climate and weather events and dengue incidence in this geographical area.

Keywords

Climate, El Niño, dengue, border health, United States, Mexico.