



SAN LUIS OBISPO COUNTY *Messenger* Public Health Laboratory

November 2015

El Niño and Infectious Disease

The World Health Organization (WHO) recently made some predictions about the effect that the El Niño may have on the upcoming weather pattern. California has some special factors to consider. Climate change appears to have increased the frequency of extreme weather events, and it is wise for all to prepare for possible disruptions of commerce, travel and infrastructure that often attend these events. It is also prudent to consider the increased risk of some infections.

Both temperature and surface water have important influences on the insects which carry vector-borne infectious diseases. Of particular importance are vector mosquito species, which spread malaria and viral diseases such as dengue, chikungunya and yellow fever. Mosquitoes need access to stagnant water in order to breed, and the adults need humid conditions for viability. Warmer temperatures enhance vector breeding and reduce the pathogen's maturation period within the vector. Orange County is already reporting detection of two vector species *Aedes albopictus* and *A. aegyptii* at multiple locations. Travelers infected with viruses such as Yellow Fever, Dengue or Chikungunya that have returned to the US are a risk for establishing the disease if fed upon by one of these vectors.

Today, malaria is largely confined to tropical and subtropical regions, although the disease was endemic in the US until the 1950s. With 1500 to 2000 cases in travelers each year, there is a constant risk of reintroduction. El Niño may increase transmission of malaria in areas contiguous with the US. In developing countries, populations lack protective immunity and are prone to epidemics when weather conditions facilitate transmission.

Coccidioides immitis, the agent of Valley Fever in California, proliferates in soils after abundant rainfall, only to form spores after the rainy season that are dispersed by soil disturbance activities months later, resulting in a predictable spike in human cases.

Rodents are known to proliferate in temperate regions following wet winters and growth of vegetation, acting as reservoirs for various diseases. Certain rodent-borne diseases are associated with flooding, including leptospirosis, tularemia and viral hemorrhagic diseases. Other diseases associated with rodents and ticks, associated with climatic variability, include Lyme disease, tick borne encephalitis, and hantavirus pulmonary syndrome.

Many diarrheal diseases vary seasonally, suggesting sensitivity to climate. In the tropics diarrheal diseases typically peak during the rainy season. Both floods and droughts increase the risk of infection. Major causes of diarrhea linked to heavy rainfall and contaminated water supplies are: cholera, cryptosporidium, *E.coli* infections, giardia, shigella, typhoid, and viruses such as hepatitis A.

While El Niño brings promise of relief from an enduring drought, it is also important to recognize that excess rainfall and flooding may result in conditions that favor transmission of some infectious diseases.

The *Messenger* will no longer be faxed, but will be sent by e-mail and posted on the San Luis Obispo County Public Health Laboratory website www.slopublichealth.org/lab.