



To: CAHAN San Diego Participants
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From: Public Health Services, Epidemiology and Immunizations Services Branch

VECTOR-BORNE ILLNESSES OF PUBLIC HEALTH SIGNIFICANCE

This health notice informs local healthcare providers about vector-borne illnesses of clinical significance in San Diego County, including selected mosquito-borne illnesses of interest to those caring for travelers. Such conditions include illnesses caused by West Nile virus (WNV), chikungunya virus (CHIKV), and dengue virus, as well as Lyme disease, and other tick-borne and vector-borne diseases. Information on Zika virus has been provided in [separate CAHAN advisories](#).

West Nile Virus

To date in 2017, no human WNV infections have been detected in San Diego County; however, eleven dead birds and three batches of mosquitoes collected from surveillance traps have tested positive for the virus this year. The latest information on WNV activity in San Diego County is available at the Department of Environmental Health Vector Control Program (DEH VCP) [WNV website](#).

In 2016, 20 WNV disease cases were reported among San Diego County residents; of these, 16 (80%) were classified as neuroinvasive disease (i.e., meningitis, encephalitis or acute flaccid paralysis), including two fatalities. The median age of the case-patients was 57.5 years (range: 27 to 94 years) and 10 (50%) were male. Dates of symptom onset ranged from July 22 to October 26, 2016. In addition, two asymptomatic WNV-positive blood donors were identified in 2016. The San Diego County DEH VCP found 266 dead birds that tested positive for the virus in 2016, as well as 99 batches of mosquitoes, nine sentinel chickens and one horse. [Statewide](#), a total of 442 symptomatic and 41 asymptomatic WNV human infections were identified in 2016. Of the 442 clinical cases, 329 (74%) had neuroinvasive disease and 19 people died. [Nationwide](#), WNV remained the leading cause of domestically-acquired arboviral disease in 2016, with 2,038 cases reported in 45 states and the District of Columbia.

Local clinicians are encouraged to consider WNV infection in patients presenting with aseptic meningitis, encephalitis, atypical Guillain-Barré syndrome, or prolonged fever. WNV testing is available, free of charge, through the California Department of Public Health (CDPH) via submittal to the San Diego County Public Health Laboratory (SDCPHL). Clinical guidelines, testing algorithms, and specimen submission forms are available at the County of San Diego (COSD) [WNV website](#). Information about clinical presentation, diagnosis and management of WNV may be found at the CDPH [WNV website](#) or the Centers for Disease Control and Prevention (CDC) [WNV website](#).

Dengue

[Dengue](#) continues to be a public health problem both worldwide and in the Americas. It is a dynamic systemic infectious disease that can range from an asymptomatic presentation to one with a broad clinical spectrum. As many as 400 million people are infected yearly by the disease. As of August 11, 2017, 368,159 cases of confirmed or probable dengue have been [reported](#) in the Americas in 2017, including 1,611 severe cases and 196 deaths. In Mexico, 29,826 confirmed or probable dengue cases have been [reported](#) in 2017. Local transmission of dengue in Baja California has only been detected in the past several years, and five confirmed and 93 probable cases have been reported there so far in 2017.

There have been no confirmed or suspect locally-acquired cases of dengue in California, though the mosquito vectors (*Aedes aegypti* and *Aedes albopictus*) have been found in San Diego and other California counties. To date in 2017, San Diego has had 10 confirmed/probable cases, all travel-associated. In California as of July 7, 2017, 226 imported dengue cases were reported in 2016-2017.

Symptoms of dengue include fever, joint pain, headache, retro-orbital pain, rash, myalgia, arthralgia, general weakness, and extreme fatigue. Sometimes hemorrhagic symptoms manifest including blood in vomit, urine, and stool or from the gums. Severe cases may result in shock, fluid accumulation, and respiratory distress.

Dengue, Zika virus infection, and chikungunya should be considered in the differential diagnosis for each other. Dengue is typically [diagnosed using serology](#), but to avoid false negative or indeterminate results, serum specimens should also be collected during the convalescent phase (at least six days after onset of symptoms). Ideally, both acute (first five days post symptom onset) and convalescent phase (six or more days post symptom onset) specimens are needed to make a diagnosis of dengue infection. If a patient with suspected dengue infection submits a late, acute phase specimen that is negative (e.g., by RT-PCR or MAC-ELISA), and a convalescent specimen is not submitted, then the case is classified as laboratory-indeterminate.

For more information on dengue, and for clinical and laboratory guidance, go to the [CDC dengue website](#) or the [CDPH Aedes website](#). CDC maintains a continuing medical education (CME) accredited [online course on dengue](#) and the World Health Organization published a comprehensive [dengue resource](#) in 2009.

Chikungunya Virus

Like dengue, [chikungunya](#) (CHIKV) is transmitted to humans through the bites of infected *Aedes aegypti* and *Aedes albopictus* mosquitoes. CHIKV was introduced into the Americas in late 2013, became epidemic through 2016 with 504,373 confirmed and suspected cases reported. As of August 18, 2017, 141,458 confirmed or suspected cases have been reported in 2017 in the Americas, with over 93% of the cases from Brazil. Only 22 CHIKV cases have been reported in Mexico this year, and local transmission has never been reported in Baja California. Updated information on the epidemic is available at the Pan American Health Organization (PAHO) [CHIKV website](#).

The incubation period is typically 3-7 days (range 1-12 days) after exposure. Acute onset of fever and polyarthralgia are the primary clinical findings. Joint symptoms are usually symmetric, often occur in the hands and feet, and can be severe and debilitating. Other symptoms may include headache, myalgia, arthritis, conjunctivitis, nausea/vomiting, or maculopapular rash. More information about the clinical presentation, diagnosis, and management of CHIKV infection may be found at the [CDC chikungunya website](#).

As of July 7, 2017, there have been 61 imported cases reported in California, with 11 being reported among San Diego residents in 2016-2017. The invasive *Aedes aegypti* mosquito has been [identified in several locations](#) within the county by the DEH VCP. Please report any indoor daytime biting mosquitoes to the DEH VCP as this is one of the hallmarks of this invasive mosquito. Clinicians should consider the illness in travelers with fever and polyarthralgia. Serologic testing (IgG and IgM by IFA) for exposure to CHIKV is available through commercial laboratories (e.g., Focus/Quest), as well as from the CDPH Viral and Rickettsial Disease Laboratory ([VRDL](#))

Lyme Disease and Other Tick-borne Diseases

[Lyme disease](#) is the most common tick-borne disease in the United States and is caused by the spirochete *Borrelia burgdorferi*. Symptoms include dermatologic, rheumatologic, neuralgic, and cardiac abnormalities. The most common clinical marker for the disease is *erythema migrans* (EM), the initial skin lesion that occurs in 60-80% of patients, which usually appears 3 to 32 days after tick exposure (mean 7 to 10 days). For the purpose of surveillance, the definition of a qualified laboratory assay is two-tier testing: 1) EIA or IFA and 2) Western Blot IgG and IgM along with clinical symptoms consistent with acute and/or chronic forms of the disease.

San Diego County tick surveillance by DEH VCP has occasionally found ticks that harbor *Borrelia burgdorferi*. Locally acquired Lyme disease is rare, so a travel history is important when evaluating patients with compatible symptoms.

Francisella tularensis, the cause of [tularemia](#), is also occasionally found in local ticks. The signs and symptoms of tularemia vary depending on how the bacteria enter the body, although all forms have fever. The major forms of tularemia are ulceroglandular, glandular, oculoglandular, oropharyngeal, pneumonic, and typhoidal. The last human case of tularemia in San Diego was reported in 2004. A local animal case of tularemia was [reported](#) in 2014, which is the most recent year that positive ticks were [detected in the county](#).

[Spotted fever group Rickettsia](#) have been detected in local ticks, with approximately 5% of Pacific Coast ticks harboring *Rickettsia philipii*, which can cause an [eschar-associated febrile illness](#). Clinicians should be aware of [continued reports](#) of rickettsial disease transmitted by the brown dog tick (*Rhipicephalus sanguineus*) in Mexico, especially in northern Baja California. The last San Diego resident with a tick-borne illness confirmed as [Rocky Mountain spotted fever](#) (acquired outside the county) was in 2015.

Clinicians should **never delay treatment** for suspected rickettsiosis while awaiting laboratory confirmation. Doxycycline is the antibiotic of choice for all patients. The adult dose is 100 mg bid for 14 days or until three days after fever subsides. The pediatric dose is 2.2 mg/kg (up to 100 mg) bid. For more information on the symptoms, diagnosis, treatment, and prevention of tick-borne diseases, please visit the [CDC Tick-borne disease website](#) where the most recent reference manual for healthcare providers entitled "[Tickborne Diseases of the United States](#)" is available to download.

Other Vector-borne Diseases (Murine Typhus, Plague, and Hantavirus)

[Murine typhus](#) is endemic in southern California. A serologically confirmed case of this flea-borne disease reported was reported, in July 2017, in a San Diego resident with no travel history who had recently brought some feral kittens into her home. Murine typhus should be considered in the differential diagnosis if a patient presents with persistent fever of 3 to 5 days duration without explanation, and if a history of local exposure to opossum or cats and flea contact is likely, or if there is a history of travel to tropical or semitropical environments where large rat populations are likely to exist.

[Plague](#) is endemic in limited areas of San Diego County and evidence of infection was detected in a [squirrel at Palomar Mountain](#) in 2015. Plague symptoms depend on how the patient was exposed to the plague bacteria. Plague can take different clinical forms, but the most common are bubonic, pneumonic, and septicemic. No human case of plague has been reported in the county in decades, although two human cases were reported in [California in 2015](#).

[Hantavirus](#) has been found in rodents in various locations throughout the county, the most recent being in a [Western harvest mouse in San Marcos](#) in August 2017. Infection with hantavirus can progress to [hantavirus pulmonary syndrome](#), which can be fatal. The last locally acquired human case of hantavirus was reported in San Diego County in 2004.

Report suspected cases of any of the vector-borne diseases noted in this health advisory to the Epidemiology Program by calling 619-692-8499 during normal business hours, or 858-565-5255 after hours, weekends or County-observed holidays. For more information on preventive measures for the public and about vector-borne disease surveillance in San Diego County, visit www.SDVector.com or call the Vector Control Program at 858-694-2888.

Thank you for your continued participation.

CAHAN San Diego

County of San Diego, Health & Human Services Agency
Epidemiology and Immunization Services Branch
Phone: (619) 515-6620, Fax: (858) 715-6458

E-mail: cahan@sdcounty.ca.gov
Secure Website: <http://cahan.ca.gov>
Public-Access Website: <http://www.cahansandiego.com>