

## Epidemiologic Summary of Zika in California, 2017 - 2019

### Key Findings

Zika is an infectious disease caused by a virus that spreads to people mainly through bites of infected mosquitoes. Zika is also spread through sex with an infected partner, or from a pregnant woman to her developing baby. Zika virus infection during pregnancy can cause serious birth defects. Zika occurs in many tropical and subtropical areas of the world, including Africa, Asia, and Central and South America. The mosquitoes that can spread the Zika virus, *Aedes aegypti* and *Aedes albopictus*, have invaded [many areas of California](#). To date, *Aedes* mosquitoes in California are not known to be infected with Zika, and locally acquired cases of Zika have not been reported.

### Zika in California from 2017 through 2019

**Total Cases:** There were a total of 236 new Zika cases from 2017 through 2019. Required reporting for this disease in California began in mid-2016.

**Rate:** The average annual rate of new Zika cases during 2017-2019 was less than 1 case per 100,000 people in California.

- **By County:** The average rate was highest in San Francisco County (about 1 case per 100,000 people) and Sonoma County (less than 1 case per 100,000 people).
- **By Sex:** The average rates for both males and females were less than 1 case per 100,000 people, but females made up more than 75% of all new cases.
- **By Age Group:** The average rates were highest in children aged less than 1 year and adults aged 25 to 34 years (both with less than 1 case per 100,000 people).
- **By Race/Ethnicity:** For cases where race and ethnicity information was available, the highest percentage of cases was in people who reported Hispanic/Latino race/ethnicity (about 56%).

To prevent Zika, pregnant women should avoid traveling to areas where Zika is occurring. Anyone traveling in areas with Zika should prevent mosquito bites by using mosquito repellent on clothes and exposed skin, sleeping under a mosquito bed net, and keeping mosquitoes out of living spaces by using window and door screens. Because Zika can also spread through sex, it is important to use condoms, practice safe sex, and delay pregnancy if a person or their sexual partner has recently been in areas with Zika. Men should practice safe sex and delay pregnancy for 3 months, and women should practice safe sex and delay pregnancy for 2 months. Women planning pregnancy with a man who has recently been in areas with Zika should wait 3 months before trying to get pregnant. After returning from an area where Zika occurs, people should continue to use mosquito repellent for three weeks to prevent spreading Zika to mosquitoes around their home.

For more information about Zika in California, please visit the [CDPH Zika webpage](#). For details about key infectious diseases in California, please visit the [CDPH Surveillance and Statistics Section webpage](#).

## Background

Zika virus disease is caused by a virus that is transmitted to people primarily through bites from infected mosquitoes, specifically *Aedes aegypti* and *Aedes albopictus*. Mosquitoes become infected when they bite and feed on a person who is already infected with the virus. Because the virus can be present in the semen and vaginal fluids of an infected person, as well as in blood and other tissue, transmission can also occur via unprotected sex, blood transfusion, or notably, from an infected pregnant woman to her fetus during pregnancy or around the time of birth.<sup>1</sup>

Many people infected with Zika virus are asymptomatic. Those who do have symptoms may develop fever, maculopapular rash, joint pain, and/or conjunctivitis about 3-7 days after exposure to the virus. Illness is usually mild and lasts up to 7 days. Death due to Zika is very rare.<sup>2</sup>

Pregnant women and their developing fetuses have the greatest risk of serious complications caused by Zika virus infection. In utero transmission of Zika virus can cause congenital abnormalities, including microcephaly, which is a birth defect that results in an abnormally small head and brain. Prenatal infection can also result in miscarriage, stillbirth, and premature birth.<sup>3</sup> Additionally, Guillain-Barré syndrome, an autoimmune disorder of the nervous system that causes muscle weakness and can result in paralysis, is associated rarely with Zika.<sup>4</sup>

There is no specific therapy for Zika. General treatment includes symptom management, rest, and hydration. For pain, acetaminophen should be taken instead of aspirin or non-steroidal anti-inflammatory drugs.<sup>5</sup> Pregnant women with Zika, as well as mothers exposed to Zika but without laboratory evidence of the virus, should be monitored by a healthcare provider during pregnancy to evaluate fetal development.<sup>3</sup> Currently, there is no vaccine that prevents Zika.<sup>5</sup>

Prior to 2015, Zika occurred primarily in areas of Africa, Southeast Asia, and the Pacific Islands. In May 2015, cases were detected for the first time in Brazil; the virus then spread rapidly and caused outbreaks in Mexico, the Caribbean, and countries throughout Central and South America.<sup>6</sup> Zika soon became widespread in the U.S. territories of Puerto Rico and U.S. Virgin Islands. The first cases identified in mainland U.S., including the first known case of Zika in California, were in 2015 among people who traveled outside of the U.S. to an area affected by Zika.<sup>7</sup> By 2016, Florida and Texas began reporting locally transmitted cases.<sup>8</sup> The *Aedes* mosquitoes that can spread the Zika virus have invaded [many areas of California](#), but to date, there has been no known local mosquito-borne transmission of Zika in California.<sup>9, 10</sup> Required reporting of California Zika cases to the California Department of Public Health (CDPH) began on June 1, 2016; prior to this date, cases were reported under the general category of “unusual” diseases and were summarized by CDPH to describe travel-associated cases and assess the potential threat of local Zika virus transmission in California.<sup>11, 12</sup>

This report describes the epidemiology of confirmed and probable Zika cases, including symptomatic and asymptomatic cases, in California from 2017 (the first year case data were available for the full year) through 2019. Due to multiple factors that can contribute to underreporting, data in this report are likely underestimates of actual disease incidence. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to the *Technical Notes*.<sup>13</sup>

## California Reporting Requirements and Surveillance Case Definition

California Code of Regulations (CCR), Title 17, Section 2500 requires health care providers to report suspected cases of Zika to their local health department within one working day of identification or immediately by telephone if an outbreak is suspected.<sup>14</sup> Per CCR, Title 17, Section 2505, laboratories are required to report laboratory testing results suggestive of Zika virus infection to either the California Reportable Disease Information Exchange (CalREDIE) via electronic laboratory reporting or the local health department; reporting must occur within one working day after the health care provider has been notified.<sup>15</sup>

California regulations require cases of Zika to be reported to CDPH. CDPH counted cases that satisfied the U.S. Centers for Disease Control and Prevention/Council of State and Territorial Epidemiologists surveillance case definition of a confirmed or probable case. During the surveillance period (2017-2019), a confirmed case of Zika was defined as either an asymptomatic infection or an infection that meets clinical criteria for disease (clinically compatible illness, complication of pregnancy, or Guillain-Barré syndrome or other neurologic manifestations not explained by another etiology) that also has laboratory evidence of recent Zika virus infection by detection of Zika virus by culture, viral antigen or RNA in serum, cerebrospinal fluid (CSF), tissue, or other specimen, or has a positive Zika virus IgM antibody test of serum or CSF along with positive Zika virus neutralizing antibody titers and negative neutralizing antibody titers against dengue or other flaviviruses endemic to the region where exposure occurred. A probable case was defined as either an asymptomatic infection or an infection that meets clinical criteria for disease that also has laboratory evidence of recent Zika virus infection by positive Zika virus IgM antibody test of serum or CSF with either positive Zika virus neutralizing antibody titers against Zika virus, dengue virus, or other flaviviruses endemic to the region of exposure or a negative dengue IgM antibody test in the absence of a neutralizing antibody test.<sup>16</sup>

## Epidemiology of Zika in California, 2017-2019

CDPH received reports of 236 total cases of Zika with estimated symptom onset dates from 2017 through 2019. The overall average annual incidence of Zika was 0.2 per 100,000 population. Zika incidence rates decreased 66.7% from 2017 (0.3 per 100,000; 133 cases) to 2019 (0.1 per 100,000; 35 cases) [Figure 1]. Of the 236 total cases, 127 (53.8%) were asymptomatic. At the time of infection, 124 (52.5%) case-patients were pregnant. No case-patients were reported to have died with Zika, and no pregnancy losses due to Zika-related birth defects were reported.

Fifteen (6.4%) case-patients were infants born with congenital infections; 9 (60.0%) of the 15 infants were born with Zika-related birth defects, including either microcephaly, intracranial calcifications, an abnormal hearing screen or eye exam, or an abnormal brain imaging or eye exam finding.

Of the 221 case-patients with non-congenital Zika, 200 (90.5%) case-patients reported traveling outside of the U.S. during the incubation period, and 21 (9.5%) case-patients either traveled outside the incubation period or provided insufficient travel-related information. Nine (4.1%) cases were sexually transmitted.

From 2017 through 2019, there were 9 California counties in which at least one Zika case occurred each year. Cases from these 9 counties accounted for 81.8% of the total Zika cases:

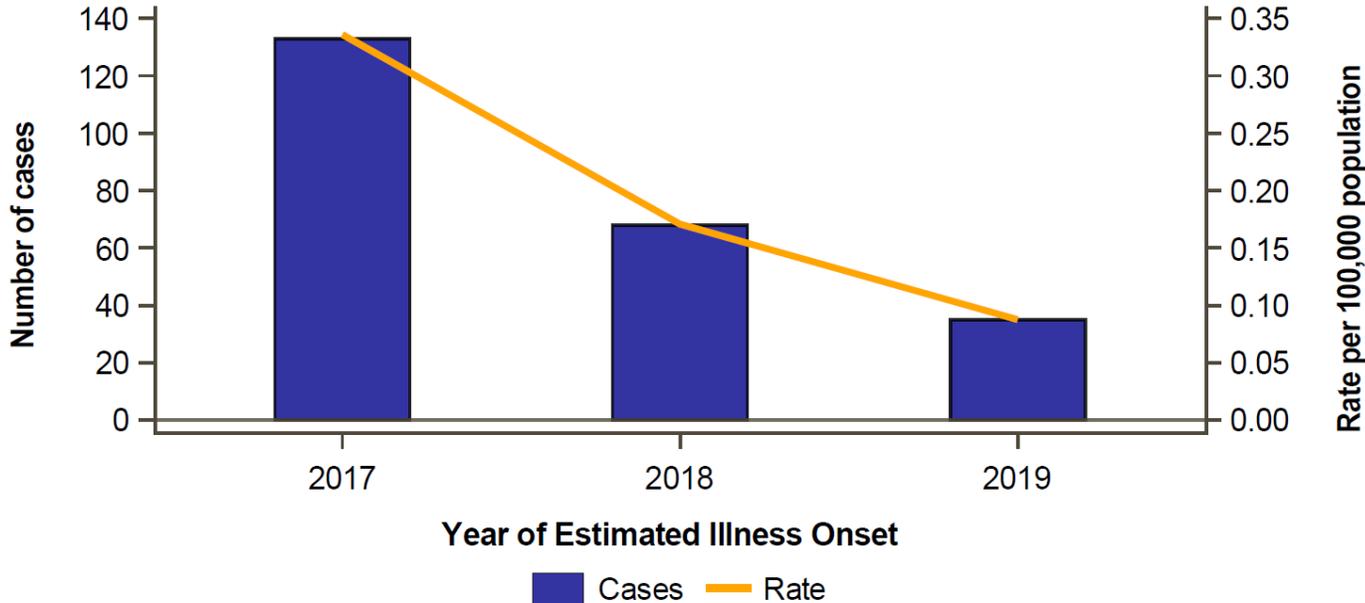
Los Angeles (47 cases), San Diego (37 cases), Santa Clara (24 cases), San Francisco (22 cases), Alameda (19 cases), Orange (19 cases), Sonoma (9 cases), San Mateo (9 cases), and Riverside (7 cases). Of these counties, San Francisco County (0.8 per 100,000) and Sonoma County (0.6 per 100,000) had the highest average annual incidence rates. By region (see *Technical Notes*), the Bay Area (0.4 per 100,000; 94 cases) and San Diego (0.4 per 100,000; 38 cases) regions had the highest average annual incidence rates [Figure 2].

The average annual incidence rate during the surveillance period was higher among females (0.3 per 100,000; 183 cases) than among males (0.1 per 100,000; 53 cases); 77.5% of Zika case-patients were female and 22.5% were male.

By age group, average annual Zika incidence was highest among children aged less than 1 year (0.4 per 100,000; 15 cases), followed by case-patients aged 25 to 34 years (0.2 per 100,000; 89 cases), and patients aged 15 to 24 years and 35 to 44 years (both 0.1 per 100,000; 49 cases).

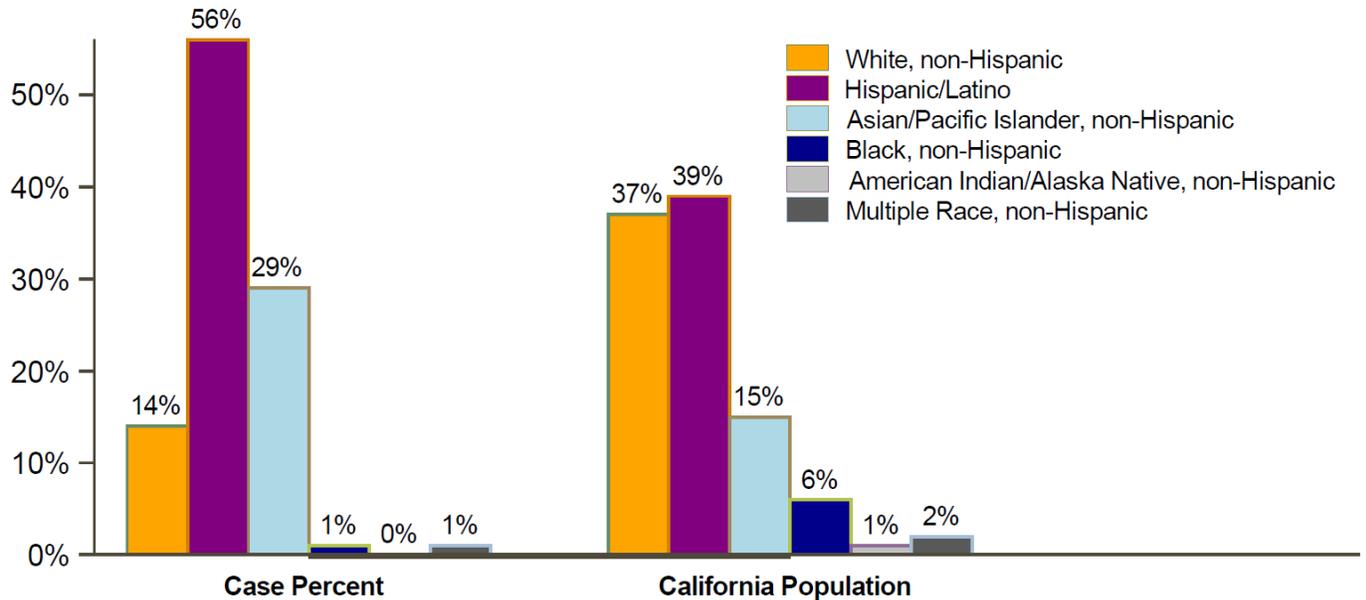
For Zika cases with complete race/ethnicity information, the highest percentage of cases was in people who reported Hispanic/Latino race/ethnicity. Cases reported Hispanic/Latino race/ethnicity (55.6%) and non-Hispanic Asian/Pacific Islander race/ethnicity (29.2%) more frequently than would be expected compared to the percentage of these groups in California during the 2017-2019 time period (38.7% and 15.4%, respectively) [Figure 3].

**Figure 1. Zika Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2017-2019**





**Figure 3. Zika Cases and Population by Race/Ethnicity, California, 2017-2019**



35.6% (n=84) of reported incidents of Zika did not identify race/ethnicity and 3.4% (n=8) of incidents identified as 'Other' race/ethnicity and are not included in the Case Percent calculation. Information presented with a large percentage of missing data should be interpreted with caution.

## Comments

Required reporting of Zika virus infection in California began on June 1, 2016. Therefore, this epidemiologic summary only covers the period of 2017 through 2019 for which case data were available for the full year. Descriptions of Zika virus cases in California in 2016 can be found in the *CDPH Vector-Borne Disease Section Annual Report, 2016*.<sup>12</sup>

Zika is currently rare in California; there were only 35 cases reported to CDPH in 2019. By 2019, the incidence of Zika cases worldwide had decreased substantially. While there were still outbreaks in isolated areas, the global pandemic was controlled. The decreasing incidence of Zika cases in California during the surveillance period (2017-2019) aligns with the decreasing global incidence and what would be expected of a travel-related illness.

The risk of serious complications caused by Zika virus infection to pregnant women and their developing fetuses may have biased Zika incidence in California. Due to the profound risk of birth defects, including microcephaly, from Zika infection during pregnancy, it was recommended that pregnant women be screened during their prenatal visits and tested for Zika if they or their partner had traveled to a region with ongoing Zika transmission. Also of note, although children aged less than 1 year had the highest average annual Zika incidence of all age groups during the surveillance period, all such case-patients were newborns who were exposed during pregnancy or around the time of birth to the Zika virus via their infected mother.

As *Aedes* mosquitoes have become established in cities throughout California in recent years, there is a potential for them to continue to spread to other areas of California.<sup>9</sup> The presence of

*Aedes* mosquitoes in California presents the risk that Zika virus could be transmitted locally from returned infected travelers. Although there have been no Zika virus-positive mosquitoes collected in California and no known locally acquired Zika cases detected in California to date, transmission is an ongoing concern in areas with *Aedes* mosquitoes as travelers return and visitors come from areas with Zika.<sup>9, 10</sup>

To prevent Zika, pregnant women should avoid traveling to areas where Zika is occurring. All individuals traveling in areas with Zika should prevent mosquito bites by using mosquito repellent on clothes and exposed skin, sleeping under a mosquito bed net, and keeping mosquitoes out of living spaces by using window and door screens. To prevent sexual transmission of Zika, sexual partners should use condoms and practice safe sex while in areas with Zika or if a sexual partner has recently traveled in areas with Zika. Individuals who have possible exposure to Zika through sex or travel should also delay pregnancy. Males who have traveled should practice safe sex and wait at least 3 months after return from travel or start of symptoms before trying to conceive. Females who have traveled should practice safe sex and wait at least 2 months after return from travel or start of symptoms before trying to conceive. Females planning pregnancy with a male who has possible exposure to Zika should wait at least 3 months after the male's return from travel or start of symptoms before trying to conceive. All persons with possible exposure to Zika through travel should use mosquito repellent for three weeks after returning from travel to prevent mosquitoes in local areas from becoming infected with Zika virus.

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