

Epidemiologic Summary of Q Fever in California, 2013-2019

Key Findings

Q fever is an infectious disease caused by *Coxiella burnetii*, a type of bacteria that naturally infect some animals, including goats, sheep, and cattle. These animals can shed Q fever bacteria when they give birth, and also in their milk, urine, or feces (poop). People can get Q fever through contact with an infected animal or by breathing in dust that contains bacteria from an animal's poop, urine, milk, or when it has given birth. People can also get Q fever by eating or drinking raw (unpasteurized) milk and cheese. Q fever usually causes flu-like symptoms in people who are infected and may cause infection in the liver or lungs. People such as veterinarians and farmers who have direct contact with animals, especially when the animals are giving birth, are more likely to get Q fever.

Q Fever in California from 2013 through 2019

Total Cases: There were a total of 276 new Q fever cases from 2013 through 2019.

Rate: The average annual rate of new Q fever cases during 2013-2019 was less than 1 case per 100,000 people in California.

- **By County:** Only three California counties (Los Angeles, Riverside, and Stanislaus) reported at least one case of Q fever each year during 2013-2019, each with a rate of less than 1 case per 100,000 people.
- **By Sex:** The average rate was higher in males than in females, but rates for each group were less than 1 case per 100,000 people.
- **By Age Group:** The average rates were highest in adults aged 55 to 64 years, but rates were 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 46%).

To help prevent Q fever, people should take preventative measures with animals that are giving birth by wearing gloves, keeping pregnant and birthing animals away from other animals and in areas that can be easily cleaned, and by removing and destroying all birth products. It is also important to avoid eating or drinking dairy products, such as milk and cheese, that have not been pasteurized. Veterinarians and people who work on farms, dairies, and in slaughterhouses should practice preventive measures, including wearing masks and gloves, when handling infected animals and their tissues. Proper management of animals, especially pregnant females, and the environment where infected animals live can help to reduce contact with the bacteria that cause Q fever.

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

Background

The causative agent of Q fever, *Coxiella burnetii*, is a zoonotic bacteria that is widespread throughout the United States and the world. Transmission occurs chiefly through inhalation of aerosolized reproductive fluids from infected animals (especially parturient goats, sheep, and cattle). Contact with animal feces, secretions, and excretions (e.g., milk, urine), inhalation of aerosolized particulates from contaminated environmental materials (e.g., hay, dust), consumption of unpasteurized dairy products, and bites by infected ticks may also result in infection. Person-to-person transmission via blood transfusion, transplacental exposure, and sexual contact is possible, but rare.^{1, 2} Persons at greatest risk for Q fever infection include veterinarians and those who are employed on ranches, dairy farms, and livestock facilities.³

Q fever has an incubation period of 2 to 3 weeks. Clinical manifestations vary widely in severity and symptoms with up to one-half of infections being asymptomatic. Acute Q fever presents most commonly as an influenza-like febrile syndrome; signs of pneumonia and hepatitis are also common. Infected pregnant women are at risk for miscarriage, stillbirth, and pre-term delivery. Less than five percent of infections proceed to chronic Q fever, which manifests most frequently as endocarditis in patients with preexisting cardiac pathology (e.g., valvular disease). Most cases of acute Q fever are self-limited, and patients recover in 1 to 2 weeks without complication.⁴ Doxycycline can be used as a first-line antibiotic treatment for non-pregnant adults with acute Q fever and is recommended for patients with, or at increased risk for, chronic Q fever.⁵ *C. burnetii* is a highly infectious agent, with as few as one organism capable of causing illness.⁶ The bacteria are resistant to heat, desiccation, and common disinfectants³, and *C. burnetii* is listed among the U.S. Centers for Disease Control and Prevention (CDC) category B bioterrorism agents.⁷

This report describes the epidemiology of Q fever cases in California from 2013 through 2019. Cases that met criteria for confirmed or probable, acute or chronic cases were included. Incidence rates presented in this report are based on surveillance data and should be considered estimates of true disease incidence. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to the *Technical Notes*.⁸ The epidemiologic description of Q fever for earlier surveillance periods can be found in the *Epidemiologic Summary of Q Fever in California, 2001-2008 and 2009-2012*.^{9, 10}

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 Q fever to their local health department within one working day of identification by electronic transmission, fax, or telephone, if an outbreak is suspected.¹¹ Per CCR, Title 17, Section 2505, laboratories are required to report laboratory testing results suggestive of *C. burnetii* 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.¹²

California regulations require cases of Q fever to be reported to the California Department of Public Health (CDPH). CDPH counted cases that satisfied the CDC/Council of State and Territorial Epidemiologists surveillance case definition of a confirmed and probable case. During the surveillance period (2013-2019), CDC defined a confirmed acute case of Q fever as one with (i) clinically compatible illness or an epidemiological link to a laboratory confirmed case, and (ii)

laboratory confirmation defined as ≥ 4 -fold change in IgG antibody titer to *C. burnetii* Phase II antigen in paired serum specimens, or isolation of *C. burnetii* from a clinical specimen by culture, or demonstration of *C. burnetii* DNA in a clinical specimen by amplification of a specific target by polymerase chain reaction assay or by immunohistochemical methods. A probable acute case was one with clinically compatible illness and supportive serology, defined as a single elevated IgG antibody titer ($\geq 1:128$) to Phase II antigen.¹³ A confirmed chronic case was defined as one with (i) clinically compatible illness and (ii) laboratory confirmation defined as Phase I IgG antibody to *C. burnetii* of $\geq 1:800$. A probable chronic case was one with clinically compatible illness and supportive serology, defined as a single elevated Phase I IgG antibody titer $\geq 1:128$ and $< 1:800$.

Epidemiology of Q Fever in California, 2013-2019

CDPH received reports of 276 total cases of Q fever with estimated symptom onset dates from 2013 through 2019. The average annual incidence of Q fever for the surveillance period was 0.1 per 100,000 population. Incidence rates fluctuated over time but showed a slight increase from 2013 (0.05 per 100,000; 19 cases) through 2019 (0.12 per 100,000; 46 cases) [Figure 1]. Of the 252 Q fever cases with a disease type classification, 209 (82.9%) were classified as acute disease and 43 (17.1%) as chronic disease.

Statewide from 2013 through 2019, only 3 counties reported at least 1 case of Q fever for each year of the surveillance period with the following average annual incidence rates: Los Angeles (0.03 per 100,000; 25 cases), Riverside (0.3 per 100,000; 57 cases), and Stanislaus (0.5 per 100,000; 18 cases) counties. Cases from these three counties comprised 36.2% of the total Q fever cases reported.

From 2013 through 2019, incidence was higher among males (0.16 per 100,000, 226 total cases) than among females (0.04 per 100,000, 50 total cases). Of the 276 total cases reported with complete sex data, 226 (81.9%) were among males and 50 (18.1%) were among females.

By age group, average annual incidence rates were highest among adults aged 55-64 years (0.3 per 100,000; 82 cases) and 65-74 years (0.2 per 100,000; 45 cases) [Figure 2].

For Q fever cases with complete race/ethnicity data (see *Technical Notes*), the highest percentage of cases was among those who reported Hispanic/Latino race/ethnicity (45.8%) [Figure 3].

Among the 276 total cases of Q fever, 63 (22.8%) reported exposure to goats, and 55 (20.0%) reported exposure to cattle. During the 2-3 weeks preceding onset of illness, 61 (22.1%) case-patients reported employment at or visiting an animal farm or ranch, 12 (4.3%) reported employment at or visiting specifically a dairy farm, and 11 (3.9%) reported employment in veterinary medicine. Twenty-eight case-patients (10.1%) reported consuming unpasteurized milk or another unpasteurized dairy product during the incubation period.

Figure 1. Q Fever Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2013-2019

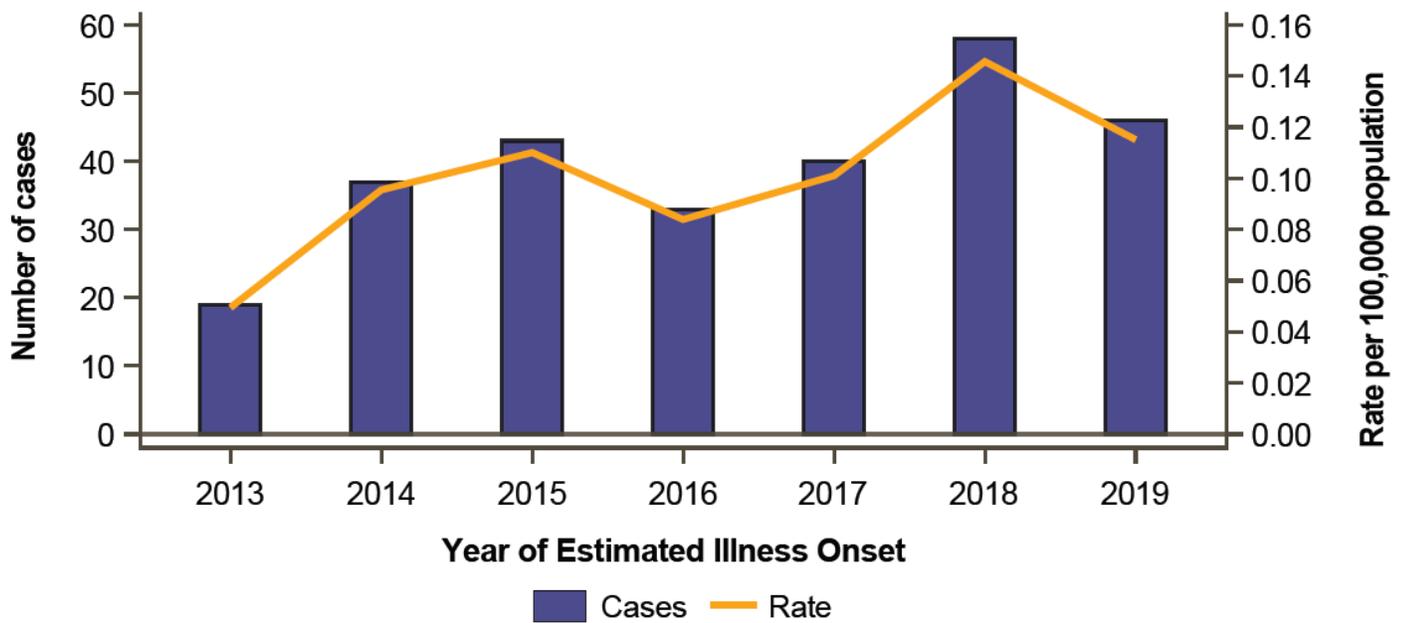
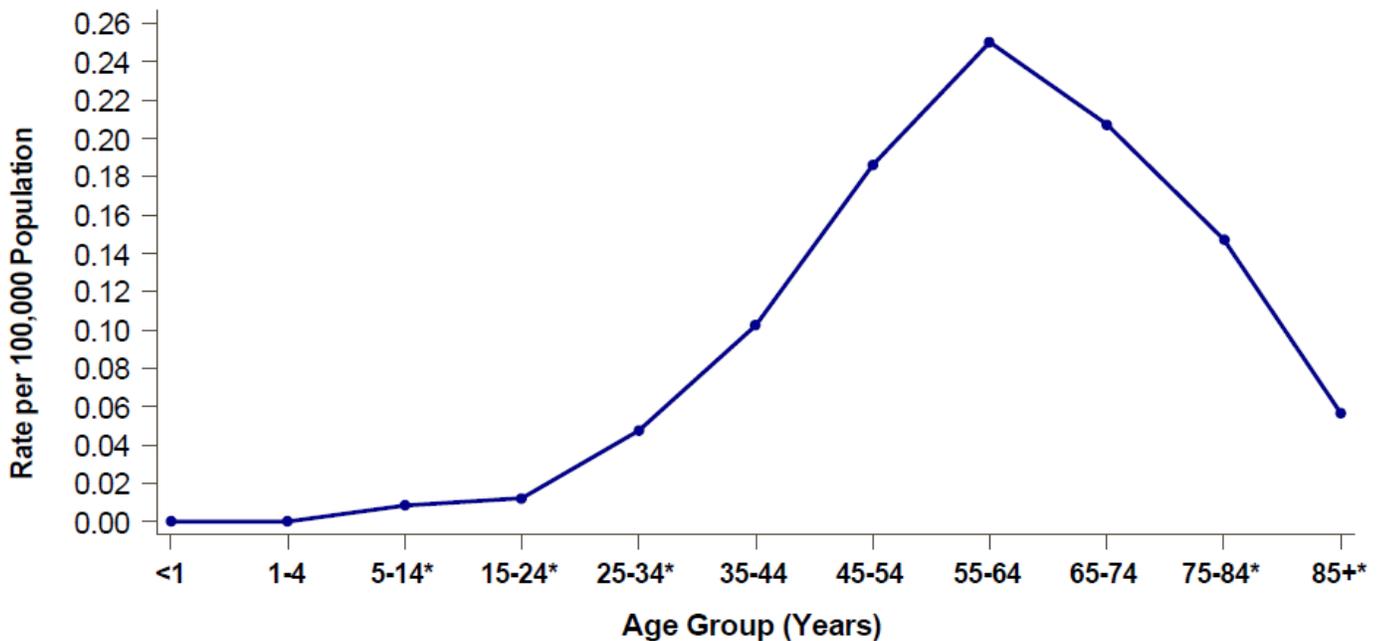
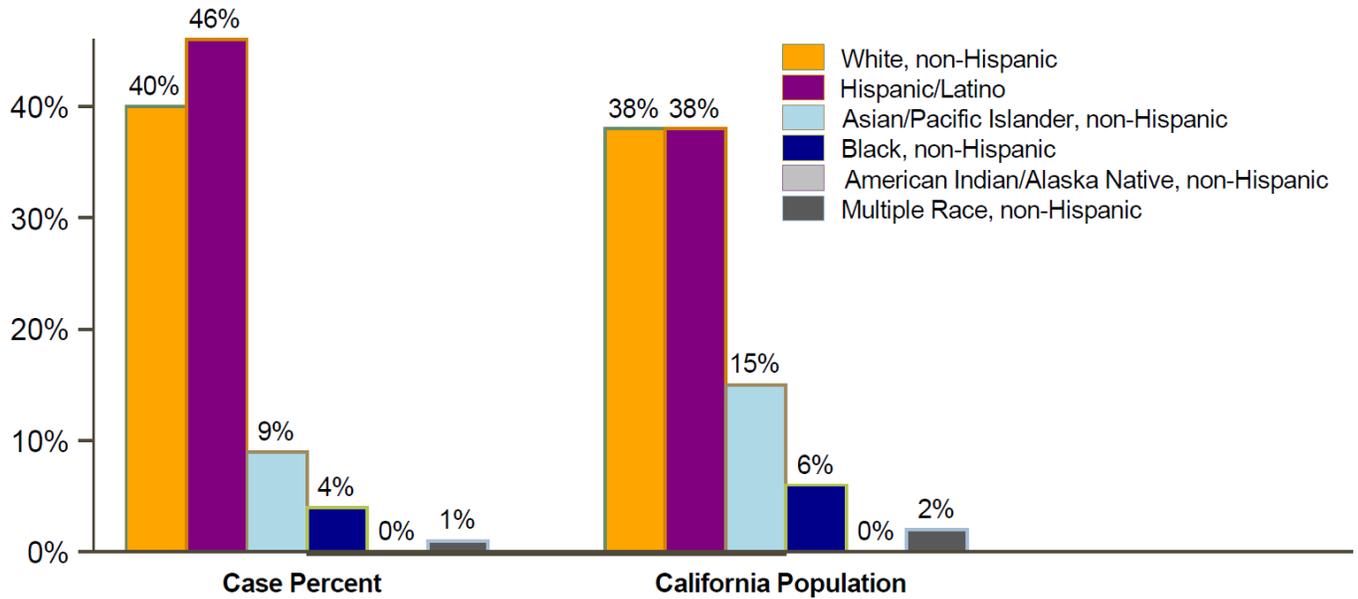


Figure 2. Q Fever Average Annual Incidence Rates by Age Group, California, 2013-2019



*Potentially unreliable rate: relative standard error 23 percent or more.

Figure 3. Q Fever Cases and Population by Race/Ethnicity, California, 2013-2019



18.5% (n=51) of reported incidents of Q Fever did not identify race/ethnicity and 4% (n=11) 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

The average annual incidence rate of Q fever in California increased by 100% from the 2009-2012 surveillance period (0.05 per 100,000; 69 total cases) to the 2013-2019 surveillance period (0.10 per 100,000; 276 total cases). Average annual Q fever incidence rates were also similar in trend between the two surveillance periods for age group and sex.¹⁰

To reduce transmission of Q fever bacteria, persons in higher risk occupations, including farmers, veterinarians, and slaughterhouse workers, should exercise caution and utilize personal protective equipment when in contact with infected ruminants, their tissues, and their environments. Personal protective equipment should also be used when in contact with birthing ruminants; animal birthing areas should be kept separate, clean, and have all birth products promptly removed and destroyed. Proper management of ruminants, especially pregnant females, and the environment where infected ruminants live can help to reduce contact with the bacteria that cause Q fever. Persons should also avoid consuming unpasteurized dairy products to prevent Q fever.

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References

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