

## Key Findings and Public Health Messages

- The California Department of Public Health (CDPH) received reports of 69 cases of Q fever with estimated illness onset dates from 2009 through 2012. This corresponds to an incidence rate of 0.05 per 100,000 population per year.
- Q fever incidence increased by 25.0 percent from 2009 (15 cases; 0.04 per 100,000 population) to 2012 (20 cases; 0.05 per 100,000 population). Although the increase during this surveillance period was small, the highest incidence (0.06 per 100,000 population in 2011) equaled the highest observed in the previous surveillance period (0.06 per 100,000 population in 2006 and in 2008).
- The Q fever incidence rate during the surveillance period was highest among persons 55 to 64 years of age (0.12 per 100,000 population per year).
- The ratio of male to female case-patients in 2009 to 2012 was 2.3:1.
- By region, incidence rates were highest in the Sacramento Metro (0.13 per 100,000 population per year) and San Joaquin Valley (0.13 per 100,000 population per year) regions.
- Persons in higher risk occupations, such as farmers and veterinarians, should limit contact with infected animals, their tissues, and their environments to reduce the opportunity for exposure to Q fever bacteria.

### Background

*Coxiella burnetii* is a bacterial zoonotic pathogen 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 other animal fluids (e.g., milk, urine), inhalation of aerosolized particulates from contaminated environmental materials (e.g., hay, dust), and bites by infected ticks may also result in infection.<sup>1,2</sup> *C. burnetii* is listed among the Centers for Disease Control and Prevention (CDC) category B bioterrorism agents.<sup>3</sup>

Q fever has an incubation period of 2 to 3 weeks. Clinical manifestations vary widely in severity and symptoms, according to the route and size of inoculum and host factors. Up to one-half of infections are asymptomatic. Acute Q fever presents most commonly as an influenza-like febrile syndrome; pneumonia and hepatitis are other presentations of acute Q fever. 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. Treatment with tetracycline antimicrobials is recommended for patients with, or at increased risk for, chronic Q fever<sup>(1,2,4)</sup>.

We describe here the epidemiology of human Q fever cases reported in California from 2009 through 2012. Cases that met criteria for confirmed or probable acute and chronic infection were included. Data for 2012 are provisional and may differ from data in future publications. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to the Technical Notes.<sup>5</sup> The epidemiological description of Q fever for the 2001-2008 surveillance period can be found in the Epidemiologic Summary of Q fever in California, 2001-2008.<sup>6</sup>

### California reporting requirements and surveillance case definition

California Code of Regulations, Title 17, requires health care providers to report suspected cases of Q fever to their local health department within one working day of identification. Since 2010, CCR, Title 17, Section 2505 has required laboratories to notify local health officials of test results suggestive of Q fever.

California regulations also require local health officers to report to CDPH cases of Q fever. CDPH officially counted cases that satisfied the CDC/Council of State and Territorial Epidemiologists' surveillance case definition for Q fever.<sup>7</sup> During the surveillance period, CDC defined a confirmed acute case as one with (i) clinically compatible illness or an epidemiological link and (ii) laboratory confirmation defined as  $\geq 4$ -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 immunohisto-

chemical methods. A probable acute case was one with clinically compatible illness and supportive serology, defined as a single titer of IgG Phase II antibody > 1:128 by IFA or a single elevated IgG Phase II by ELISA or latex agglutination. The case definition of a chronic case includes laboratory results either confirming (indicating a confirmed case) or supportive of (indicating a probable case) IgG antibody to *C. burnetii* phase I antigen.

### Epidemiology of Q Fever in California

CDPH received reports of 69 cases of Q fever with estimated illness onset dates from 2009 through 2012, corresponding to an incidence rate of 0.05 per 100,000 population per year. Q fever incidence increased by 25.0 percent from 2009 (15 cases; 0.04 per 100,000 population) to 2012 (20 cases; 0.05 per 100,000 population). During 2001-2012, the incidence peaked at 0.06 per 100,000 population in 2006, 2008, and 2011 [Figure 1].

Of 2009-2012 incident cases, 11 (15.9 percent) met the case definition of a confirmed case and 58 (84.1 percent) were determined to be probable cases. One case-patient was reported to have died with probable Q fever.

The Q fever incidence rate for the four-year surveillance period was highest among persons 55 to 64 years of age (0.12 per 100,000 population per year) [Figure 2]. The ratio of male to female case-patients was 2.3:1. Incidence rates by race/ethnicity were not calculated because data were not available for 23.2 percent of reported cases. However, for Q fever cases with complete information on race/ethnicity, White non-Hispanic was over-represented (49.1 percent) and Asian/Pacific Islander (5.7 percent) under-represented compared to their respective proportions in the California population.

The Q fever incidence rate was higher in Northern California (0.07 per 100,000 population per year) than in Southern California (0.03 per 100,000 population per year). For the four-year surveillance period, incidence rates reported from the regions of the Sacramento Metro (0.13 per 100,000 population per year) and San Joaquin Valley (0.13 per 100,000 population per year) were the highest in the state.

### Comment

There was a small increase in the incidence of Q fever in California during 2009 to 2012. However, the highest incidence - 0.06 per 100,000 population in 2011 -

Figure 1. California Q Fever case counts and incidence rates

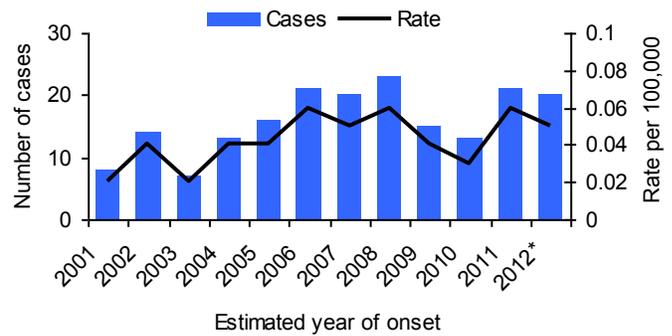
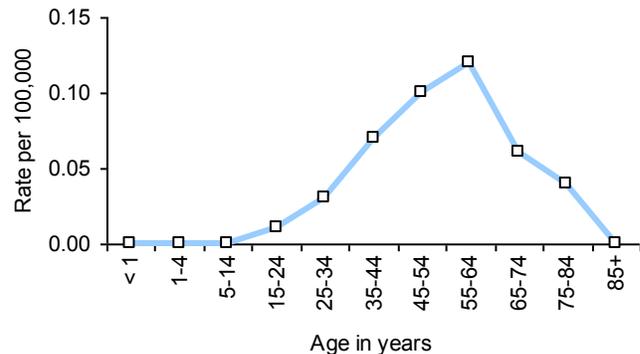


Figure 2. California Q Fever incidence rates by age, 2009-2012\*



**Notes for Figures 1-2**  
\*2012 data are provisional

equaled that of the previous surveillance period of 2001-2008, during which incidence increased significantly. The age and race/ethnicity distribution of cases during 2009-2012 remained fairly consistent with that of 2001-2008.<sup>6</sup> In contrast, while more men than women became ill with Q fever during both surveillance periods, a greater proportion of the 2009-2012 case-patients were female than in 2001-2008. There were no known outbreaks of Q fever in California during 2009-2012.

Individuals who have routine direct contact with ruminants on farms, at slaughterhouses, or in research facilities are at an increased risk of exposure to *C. burnetii*.<sup>4</sup> Limiting exposure to infected animals and their environments (especially livestock birthing areas), and

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educating higher risk groups (especially persons in higher risk occupations) may provide the best opportunities for human Q fever prevention and control.

### References and resources

- <sup>1</sup>Q Fever. California Department of Public Health.  
<http://www.cdph.ca.gov/HealthInfo/discond/Pages/QFever.aspx>
- <sup>2</sup>Q Fever. Centers for Disease Control and Prevention.  
<http://www.cdc.gov/qfever/index.html>
- <sup>3</sup>Bioterrorism Agents/Diseases. Centers for Disease Control and Prevention, Emergency Preparedness and Response.  
<http://www.bt.cdc.gov/agent/agentlist-category.asp>
- <sup>4</sup>Diagnosis and Management of Q Fever – United States, 2013: Recommendations from CDC and the Q Fever Working Group. MMWR March 29 2013, 62 (RR-03); 1-30.  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6203a1.htm>
- <sup>5</sup>Epidemiologic Summaries of Selected General Communicable Diseases in California, 2009-2012: Technical Notes.  
<http://www.cdph.ca.gov/programs/sss/Documents/TechnicalNotes01-08and09-12.pdf>
- <sup>6</sup>Epidemiological Summaries of Selected General Communicable Diseases in California, 2001-2008: Q Fever.  
<http://www.cdph.ca.gov/data/statistics/Pages/EpiSummariesCDsCA-01-08.aspx>
- <sup>7</sup>National Notifiable Diseases Surveillance System, Case Definitions, Q Fever. Centers for Disease Control and Prevention.  
<http://www.cdc.gov/NNDSS/script/conditionsummary.aspx?CondID=119>

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