

Key Findings and Public Health Messages

- The California Department of Public Health (CDPH) received reports of 120 cases of Q Fever with estimated onset dates from 2001 through 2008. This corresponds to an average annual incidence rate of 0.04 per 100,000 Californians.
- Annual Q Fever incidence rates increased by 150.0 percent from 2001 (0.02 per 100,000) to 2008 (0.05 per 100,000).
- Average annual Q Fever incidence rates during the surveillance period were higher among persons 55 to 64 years of age (0.10 per 100,000).
- The ratio of male to female cases was 4.7:1.0.
- Average annual incidence rates were higher in the regions of: the Sierras (0.33 per 100,000), Inland Empire (0.33 per 100,000), and San Joaquin Valley (0.11 per 100,000).
- Limiting exposure to infected animals and their environments (especially livestock birthing areas), and educating higher risk groups (especially persons in higher risk occupations) may provide the best opportunities for human Q Fever prevention and control.

Background

Coxiella burnetii is an uncommon but important bacterial zoonotic pathogen in the United States (US). Inhaling bio-aerosols generated from infected animals (especially parturient goats, sheep, and cattle) and their byproducts is a leading source of human exposure. Contact with bio-droplets and fomites, and consumption of raw milk products may also result in infection. *C. burnetii* is listed among the Centers for Disease Control and Prevention (CDC) category B bioterrorism (BT) agents.

Q Fever has a variable incubation period (usually 3 to 30 days) that is dose-dependent, may manifest as a non-specific febrile syndrome, pneumonia, or hepatitis, and can oc-

cur in acute, chronic, and asymptomatic forms. Most cases resolve without complication. Chronic Q Fever occurs in fewer than 1 percent of cases and may be accompanied by severe endocarditis or granulomatous hepatitis. There is no vaccine licensed in the United States to protect against Q Fever.

We describe here the epidemiology of human Q Fever in California from 2001 through 2008. Data for 2008 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 Technical Notes¹.

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 7 calendar days of identification or immediately by telephone if an outbreak is suspected.

California regulations also require local health officers to report to CDPH cases of Q Fever. CDPH officially counted cases that satisfied the CDC surveillance case definition. From 2001 through 2007, CDC defined a confirmed case as with one with (i) clinically compatible illness or an epidemiological link and (ii) laboratory confirmation defined as ≥ 4 fold change in antibody titer to *C. burnetii* phase I or II antigen in paired serum specimens, or isolation of *C. burnetii* from a clinical specimen by culture, or demonstration of *C. burnetii* in a clinical specimen by detection of antigen or nucleic acid. A probable case was one with supportive serology and clinically compatible illness or an epidemiologic link to a confirmed case. In 2008, CDC revised the surveillance case definition to distinguish acute from chronic Q Fever cases and to include laboratory detection of *C. burnetii* DNA in a clinical specimen by amplification of a specific target by polymerase chain reaction assay or by immunohistochemical methods.

Epidemiology of Q Fever in California

CDPH received reports of 120 cases of Q Fever with estimated onset dates from 2001 through 2008. This corresponds to an average annual incidence rate of 0.04 per 100,000 Californians. Q Fever incidence rates increased by 150.0 percent from 2001 (0.02 per 100,000) to 2008 (0.05 per 100,000) ($p < .001$) [Figure 1]. During the surveillance period, no cases were reported to have died with Q Fever.

Average annual Q Fever incidence rates for the surveillance period were highest among persons 55 to 64 years of age (0.10 per 100,000) [Figure 2]. The ratio

of male to female cases was 4.7:1.0. During the surveillance period, Q Fever cases with complete information on race/ethnicity (80.3 percent) reported White non-Hispanic race/ethnicities (59.8 percent) more frequently than would be expected based on the overall proportion of White non-Hispanics (44.4 percent) in the California population.

Average annual incidence rates for Q Fever were higher in Northern California (0.05 per 100,000) than in Southern California (0.03 per 100,000). For the surveillance period, average annual incidence rates reported from the regions of the Sierras (0.33 per 100,000), Inland Empire (0.33 per 100,000), and San Joaquin Valley (0.11 per 100,000) were the highest in the state [Figure 3].

Comment

California has experienced a significant increase in the incidence of human Q Fever from 2001 to 2008. Regions of California with higher Q Fever incidence rates are areas associated with large numbers of commercial and backyard goat and sheep flocks.

Nationally reported Q Fever, introduced in 1999, increased by 714 percent from 2000 (21 cases) to 2007 (171 cases)^{2,3}. Classification of *C. burnetii* as a BT agent and the subsequent introduction of national reporting has likely been accompanied by increased diagnostic suspicion and reporting. Further study is needed to determine the fraction of California's increases that were attributable to increases in disease activity, detection, and/or reporting.

Limiting exposure to infected animals and their environments (especially livestock birthing areas), and 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

¹Epidemiologic Summaries of Selected General Communicable Diseases in California, 2001-2008: Technical Notes <http://www.cdph.ca.gov/data/statistics/Documents/technicalnotes-episummary-aug2409.pdf>

²Karakousis PC et al. Chronic Q Fever in the United States. J Clin Microbiol 2006;44:2283-7.

³CDC. Surveillance of notifiable diseases - United States, 2007. MMWR 2009;56:1-94.

CDPH Q Fever information website: <http://www.cdph.ca.gov/HealthInfo/discond/Pages/QFever.aspx>

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Figure 1. California Q Fever case counts and incidence rates

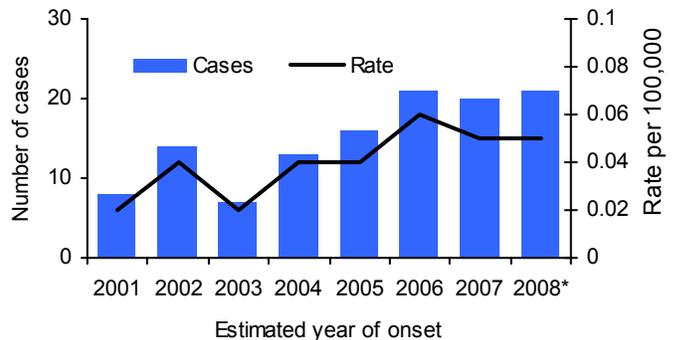


Figure 2. California Q Fever incidence rates by age, 2001-2008*

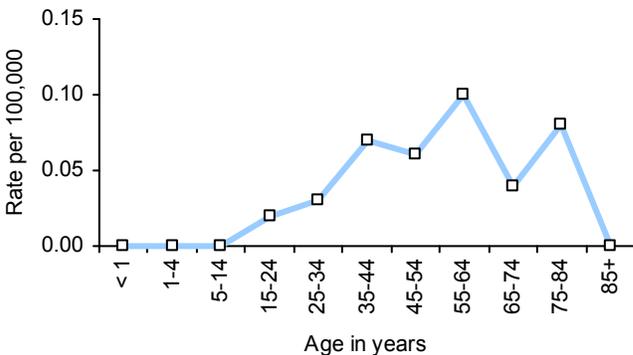
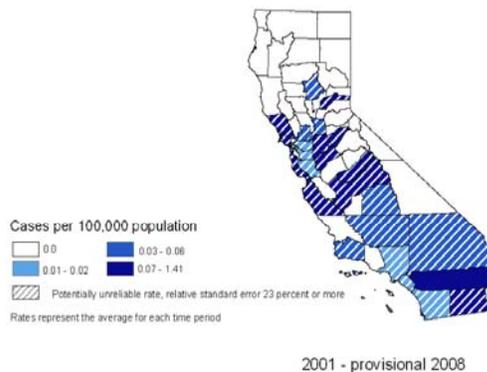


Figure 3. California county-specific Q Fever incidence rates, 2001 - 2008*



Notes for Figures 1-3

*2008 data are provisional