

### Key Findings and Public Health Messages

- The California Department of Public Health (CDPH) received reports of 225 cases of brucellosis with estimated onset dates from 2001 through 2008. This corresponds to an average annual incidence rate of 0.08 per 100,000 Californians.
- Brucellosis incidence rates decreased by 54.5 percent from 2001 (0.11 per 100,000) to 2008 (0.05 per 100,000), although incidence rates rose from 2003 to 2007.
- Average brucellosis incidence rates during the surveillance period were higher among persons 55 to 64 years of age (0.10 per 100,000) and 65 to 74 years of age (0.15 per 100,000).
- Brucellosis cases reported Hispanic ethnicity (86.4 percent) more frequently than would be expected based on the overall proportion of Hispanics (35.3 percent) in California during the surveillance period.
- Avoiding consumption of unpasteurized milk and dairy products, limiting exposure to infected domestic animals, and education of higher risk groups (especially those in higher risk occupations) may provide the best opportunities for human brucellosis prevention and control.

### Background

*Brucella* spp. are uncommon but important bacterial zoonotic pathogens in the United States (US), causing an estimated 100 to 200 cases per year. Consuming bovine or goat raw milk products, and contact through broken skin with infected animal tissues and fluids are leading sources of exposure in humans. Inhalation of bio-aerosols, notably in occupational settings such as laboratories, animal and veterinary settings, and accidental self-inoculation with animal vaccine strains can also result in infection. Person-to-person transmission is extremely rare. *Brucella* spp. are listed among the Centers for Disease Control and Prevention (CDC) category B bioterrorism (BT) agents.

Brucellosis has a variable and sometimes prolonged incubation period (5 days to 6 months) and often presents as a non-specific febrile syndrome (acute or insidious onset of fever, night sweats, undue fatigue, headache, and arthralgia). Brucellosis may occur in acute, chronic, and asymptomatic forms. Recurrent or 'undulant' fevers can occur if patients go untreated for long periods. Infections that last for more than 12 months can result in infections in bones, joints, liver, kidney, spleen, or heart valves.

We describe here the epidemiology of human brucellosis 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 Notes<sup>1</sup>.

### California reporting requirements and surveillance case definition

California Code of Regulations, Title 17, requires health care providers to report suspected cases of brucellosis to their local health department immediately by telephone. Laboratories must immediately communicate by telephone with the CDPH Microbial Diseases Laboratory for instruction whenever a specimen for laboratory diagnosis of suspected human brucellosis is received. Laboratories must also report to the local health department when laboratory testing yields evidence suggestive of *Brucella* spp; notification must occur within one hour after the health care provider has been notified.

California regulations also require local health officers to report to CDPH cases of brucellosis immediately by telephone. CDPH officially counted cases that satisfied the CDC surveillance case definition. CDC defined a confirmed case as one with an illness characterized by acute or insidious onset of fever, night sweats, undue fatigue, anorexia, weight loss, headache, and arthralgia and isolation of *Brucella* spp. from a clinical specimen or fourfold or greater rise in *Brucella* agglutination titer between serum specimens obtained at least 2 weeks apart and studied at the same laboratory, or demonstration by immunofluorescence of *Brucella* spp. in a clinical specimen. A probable case was one with clinically compatible illness and either an epidemiologic link to a confirmed case or supportive serology.

### Epidemiology of brucellosis in California

CDPH received reports of 225 cases of brucellosis with estimated onset dates from 2001 through 2008. This corresponds to an average annual incidence rate of 0.08 per 100,000 Californians. Annual brucellosis

incidence rates decreased by 54.5 percent from 2001 (0.11 per 100,000) to 2008 (0.05 per 100,000), although rates rose from 2003 (0.05 per 100,000) to 2006 (0.09 per 100,000) [Figure 1]. During the surveillance period, 1 (0.4 percent) case was reported to have died with brucellosis.

Average annual brucellosis incidence rates during the surveillance period were higher among persons 55 to 64 years of age (0.10 per 100,000) and 65 to 74 years of age (0.15 per 100,000) [Figure 2]. The ratio of male to female cases was 1.0:1.0. During the surveillance period, brucellosis cases with complete information on race/ethnicity (88.0 percent of all cases) reported Hispanic ethnicity (86.4 percent) more frequently than would be expected based on the overall proportion of Hispanics (35.3 percent) in the California population.

Average annual incidence rates for brucellosis were similar in Northern California and Southern California. However, average incidence rates for the San Diego (0.14 per 100,000), San Joaquin Valley (0.11 per 100,000), and Central Coast (0.11 per 100,000) regions were higher than other regions in the state [Figure 3].

From 2001 through 2008, CDPH received reports of 2 outbreaks of foodborne brucellosis involving 7 cases. Both outbreaks were associated with consumption of imported unpasteurized cheese.

**Comment**

Brucellosis in California occurred more frequently among persons of Hispanic ethnicity. Animal brucellosis control programs (vaccination and/or test-and-slaughter of infected animals) are central to preventing human cases. Avoiding consumption of unpasteurized dairy products, limiting exposure to infected domestic animals, and education of higher risk groups (especially persons in higher risk occupations such as laboratory workers and veterinarians) may provide the best opportunities for human brucellosis prevention and control.

**References and resources**

<sup>1</sup>Epidemiologic Summaries of Selected General Communicable Diseases in California, 2001-2008: Technical Notes <http://www.cdph.ca.gov/data/statistics/Documents/technicalnotes-episummary-aug2409.pdf>  
 CDPH brucellosis information website <http://www.cdph.ca.gov/HealthInfo/discond/Pages/Brucellosis.aspx>

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Figure 1. California brucellosis case counts and incidence rates

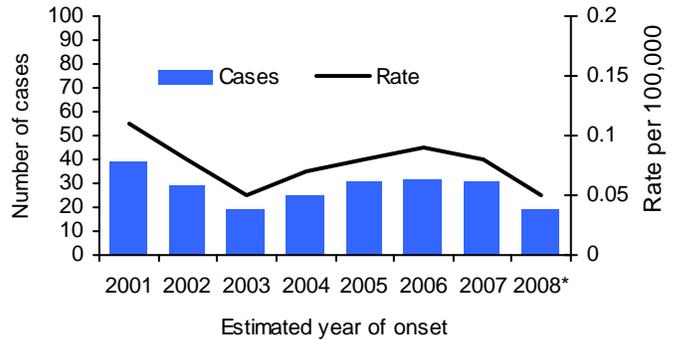


Figure 2. California brucellosis incidence rates by age 2001-2008\*

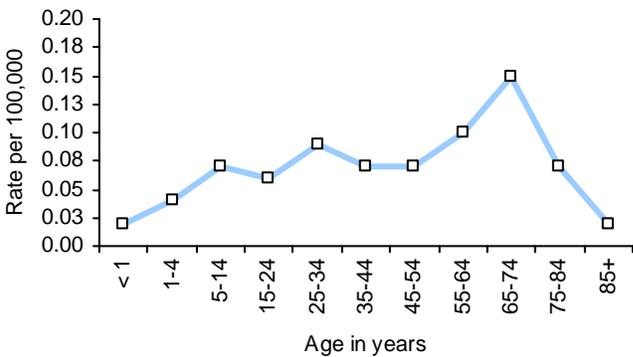


Figure 3. California county-specific brucellosis incidence rates 2001 - 2008\*



Notes for Figures 1-3  
 \*2008 data are provisional