

Key Findings

Campylobacteriosis is an infection caused by *Campylobacter*, a type of bacteria that live naturally in the intestines and feces (poop) of many animals, including chickens, turkeys, and cows. Campylobacteriosis can make people sick with diarrhea, fever, and stomach cramps. People can get campylobacteriosis by eating or drinking something that has been contaminated with *Campylobacter*. Foods likely to be contaminated by *Campylobacter* include raw or undercooked poultry (or something that touched it), and raw (unpasteurized) milk. *Campylobacter* is the most common bacterial cause of diarrhea reported in the U.S., causing over a million infections each year.

Campylobacteriosis in California from 2013 through 2019

Total Cases: There were a total of 61,310 new campylobacteriosis cases from 2013 through 2019. This is an average of 8,759 cases each year.

Rate: The average annual rate of new campylobacteriosis cases during 2013-2019 was about 22 cases per 100,000 people in California.

- **By County:** The average rates were highest in San Francisco County (about 51 cases per 100,000 people), Marin County (about 42 cases per 100,000 people), and Mendocino County (about 39 cases per 100,000 people).
- **By Sex:** The average rate was higher in males (24 cases per 100,000 people) than in females (about 20 cases per 100,000 people).
- **By Age Group:** The average rates were highest in children aged 1 to 4 years (about 40 cases per 100,000 children in this age group) and children aged less than 1 year (38 cases per 100,000 children in this age group).
- **By Race/Ethnicity:** For cases where race and ethnicity information was available, the highest percentage of cases was in people who reported non-Hispanic White race/ethnicity (53%).
- **By Month:** There were more cases of campylobacteriosis in June through August (about 6,721 cases each month) than in all other months (about 4,572 cases each month).

To help prevent campylobacteriosis, do not eat undercooked poultry or drink unpasteurized milk. It is also important to [follow food safety guidelines](#) when preparing food, especially by keeping raw poultry away from ready-to-eat foods and cooking food to the right temperature. To prevent the spread of *Campylobacter*, people should always wash their hands with soap and water before preparing food, immediately after handling any raw poultry or meat, and after touching animals (including farm animals, chickens, and turkeys) or being in areas where animals live.

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

Background

Campylobacter are among the most commonly reported enteric bacterial pathogens in the United States, causing an estimated 1.3 million illnesses, 13,240 hospitalizations, and 119 deaths each year.¹ Of the approximately 20 *Campylobacter* species identified, the species *Campylobacter jejuni* causes about 90% of human *Campylobacter* illness in the U.S.² In 2018, the overall incidence rate of campylobacteriosis in the U.S. was 21.5 cases per 100,000 population.³ The national *Healthy People 2020* target objective for campylobacteriosis was to have an annual incidence rate lower than 8.5 cases per 100,000 population.⁴

Many animals, particularly poultry such as chickens and turkeys, but also cows and other mammals, can carry *Campylobacter* without becoming ill. Most people get campylobacteriosis from eating raw or undercooked poultry or eating something that has been contaminated by raw poultry (such as through contact with a cutting board). People can also get infected from eating or drinking other items that have been contaminated with *Campylobacter*, such as unpasteurized milk, meat, produce, seafood, and untreated water.⁵ Exposure to infected animals and their environments can also result in infection; since 2016, the U.S. Centers for Disease Control and Prevention (CDC) has investigated several outbreaks linked to contact with puppies.^{6, 7}

Most people with campylobacteriosis have diarrhea (often bloody), abdominal pain, and fever. Symptoms usually begin within 2 to 5 days after exposure, and last about 1 week. Treatment with antibiotics is not usually necessary. Asymptomatic infections may also occur. For some patients, illness may be severe and require hospitalization and antibiotic treatment, and death can result. Persons at higher risk for severe disease include adults aged 65 years and older, pregnant women, and immunocompromised persons. Complications, including irritable bowel syndrome, Guillain-Barré syndrome, and reactive arthritis, may also occur.² The identification of human and animal *Campylobacter* isolates with fluoroquinolone resistance has led to restrictions on the use of some fluoroquinolones in poultry in the U.S.⁸

This report describes the epidemiology of confirmed and probable campylobacteriosis infections in California from 2013 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*.⁹ The epidemiologic description of campylobacteriosis for earlier surveillance periods can be found in the *Epidemiologic Summary of Campylobacteriosis in California, 2001-2008 and 2009-2012*.^{10, 11}

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 campylobacteriosis to their local health department within one working day of identification or immediately by telephone if an outbreak is suspected.¹² Per CCR, Title 17, Section 2505, laboratories are required to report laboratory testing results suggestive of *Campylobacter* infection to either the California Reportable Disease Information Exchange (CalREDIE) via electronic laboratory reporting or to the local health department; reporting must occur within one working day after the health care provider has been notified.¹³

California regulations require cases of campylobacteriosis 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 or probable case. During the surveillance period, CDC defined a confirmed case of campylobacteriosis as an infection in which *Campylobacter* was isolated from a clinical specimen, including asymptomatic and extraintestinal infections. From 2013 through 2014, a probable case was defined as a clinically compatible illness with an established epidemiologic link to a confirmed case. Beginning in 2015, a probable case was defined as an infection in which *Campylobacter* was detected in a clinical specimen using a culture-independent diagnostic test (CIDT), or one with clinically compatible illness and an established epidemiologic link to a probable or confirmed case.¹⁴

Epidemiology of Campylobacteriosis in California, 2013-2019

CDPH received reports of 61,310 total cases of campylobacteriosis with estimated symptom onset dates from 2013 through 2019. This corresponds to an average of 8,759 cases each year and an average annual incidence rate of 22.3 cases per 100,000 population. Incidence rates increased 25% during this surveillance period, from 20.0 per 100,000 (7,696 cases) in 2013 to 25.0 per 100,000 (10,001 cases) in 2019 [Figure 1].

County-specific average annual incidence rates per 100,000 population during 2013-2019 ranged from 0 to 50.7, with the highest rates in San Francisco County (50.7 per 100,000; 3,092 cases), Marin County (41.8 per 100,000; 765 cases), and Mendocino County (39.2 per 100,000; 243 cases) [Figure 2]. Of the 58 California counties, 56 (96.6%) had an average annual incidence rate that was above the national *Healthy People 2020* target rate for campylobacteriosis of 8.5 cases per 100,000 population.⁴ Of note, Los Angeles County had the highest number of campylobacteriosis cases during the surveillance period with 12,845 (21.0%) cases, but its average annual incidence rate was 18.0 per 100,000 population, lower than the state average annual incidence rate.

From 2013 through 2019, the average annual incidence rate was higher among males (24.0 per 100,000; 32,911 cases) than among females (20.1 per 100,000; 27,796 cases); 54.2% of campylobacteriosis case-patients were male and 45.8% were female.

By age group, the average annual campylobacteriosis incidence rates during the surveillance period were highest among children aged 1 to 4 years (40.5 cases per 100,000; 5,601 cases) and children aged less than 1 year (38.0 cases per 100,000; 1,284 cases) [Figure 3].

For campylobacteriosis cases with complete race/ethnicity information (see *Technical Notes*), the highest percentage of cases was among those who reported non-Hispanic White race/ethnicity (53.0%), which was disproportionately higher than the percentage of the non-Hispanic White racial/ethnic population in California during the same time period (53.0% vs. 38.0%, respectively) [Figure 4].

By month, the highest number of cases occurred in June, July, and August, consistent with the summer seasonality of campylobacteriosis [Figure 5]. During 2013-2019, 32.9% (20,162) of all campylobacteriosis cases had estimated symptom onsets during June, July and August, an average of 6,721 cases each month. In comparison, an average of 4,572 cases occurred each month during September through May.

From 2013 through 2019, there were 15 foodborne outbreaks of campylobacteriosis involving 198 California case-patients. The outbreaks ranged in size from 3 to 61 case-patients (median 6 case-patients). Confirmed and suspected outbreak sources included unpasteurized milk, guacamole, oysters, chicken, and pork.¹⁵

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

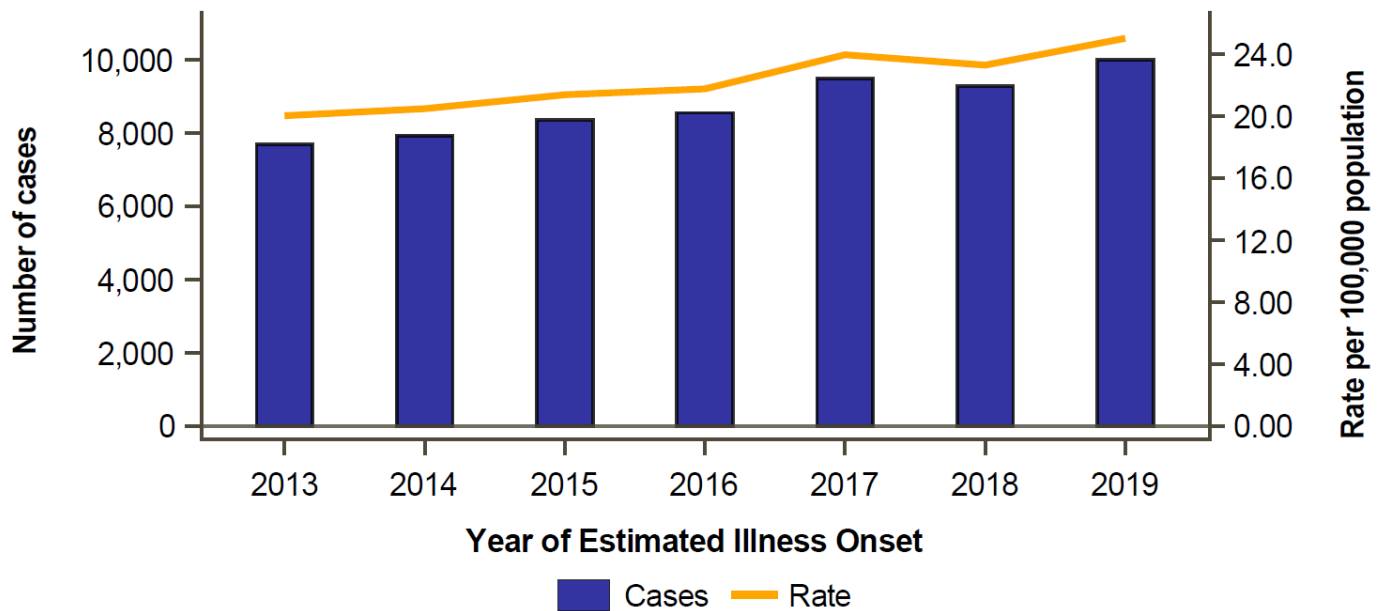


Figure 3. Campylobacteriosis Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2013-2019

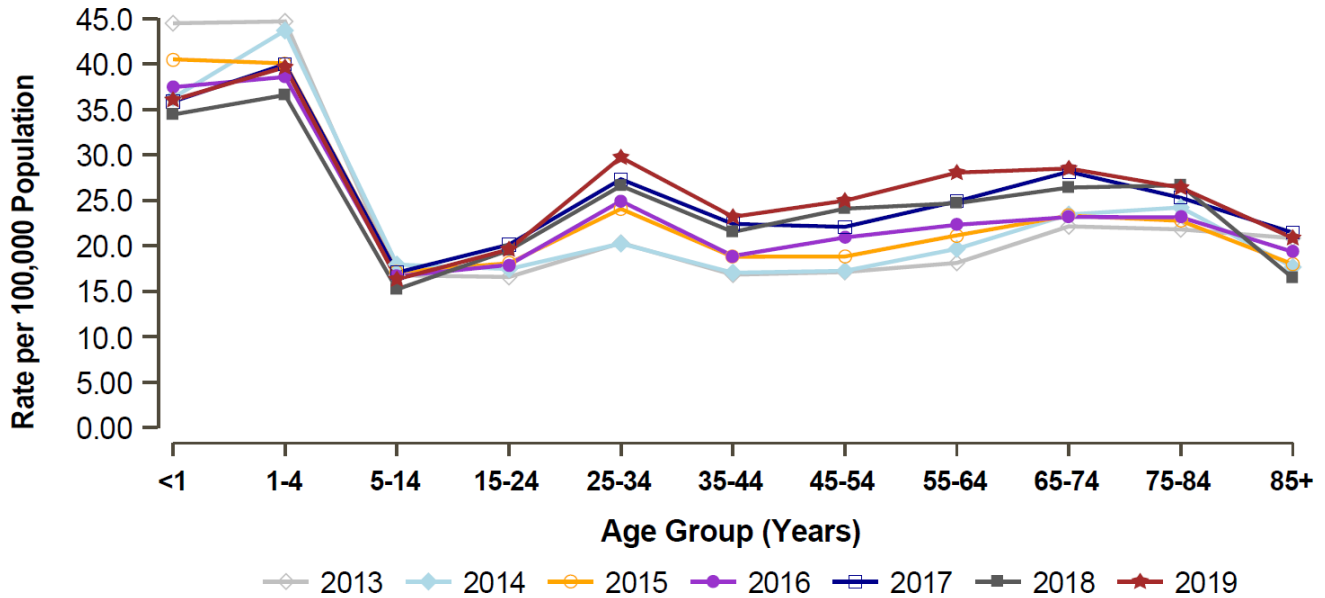
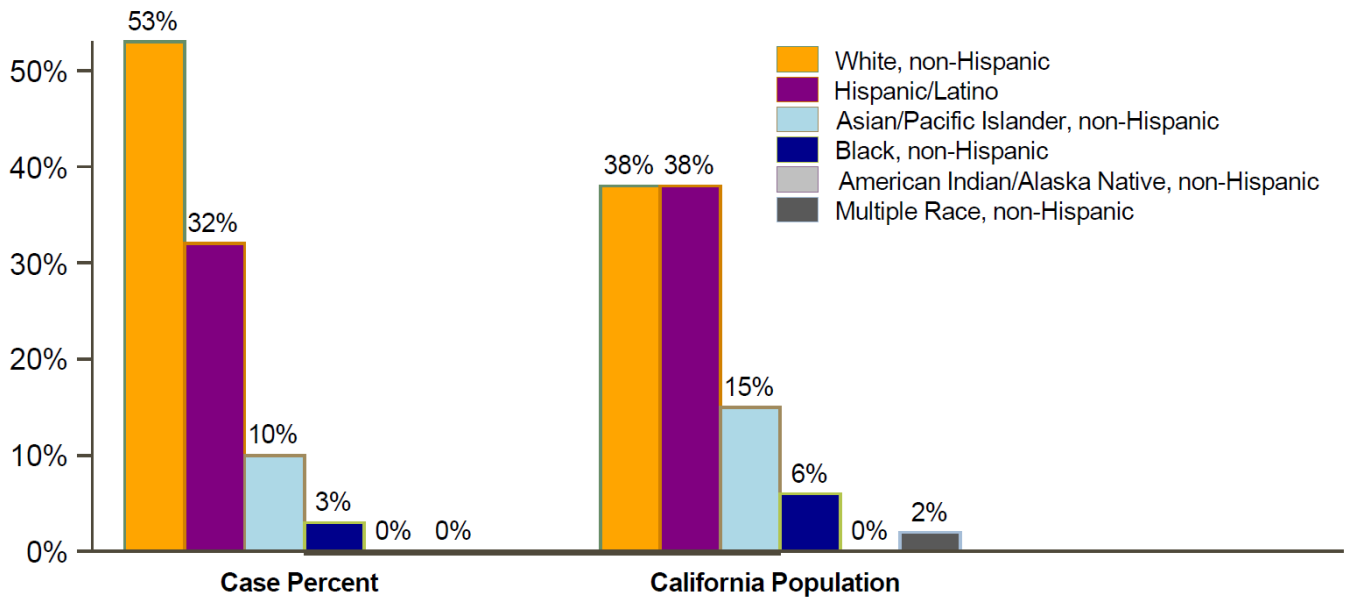
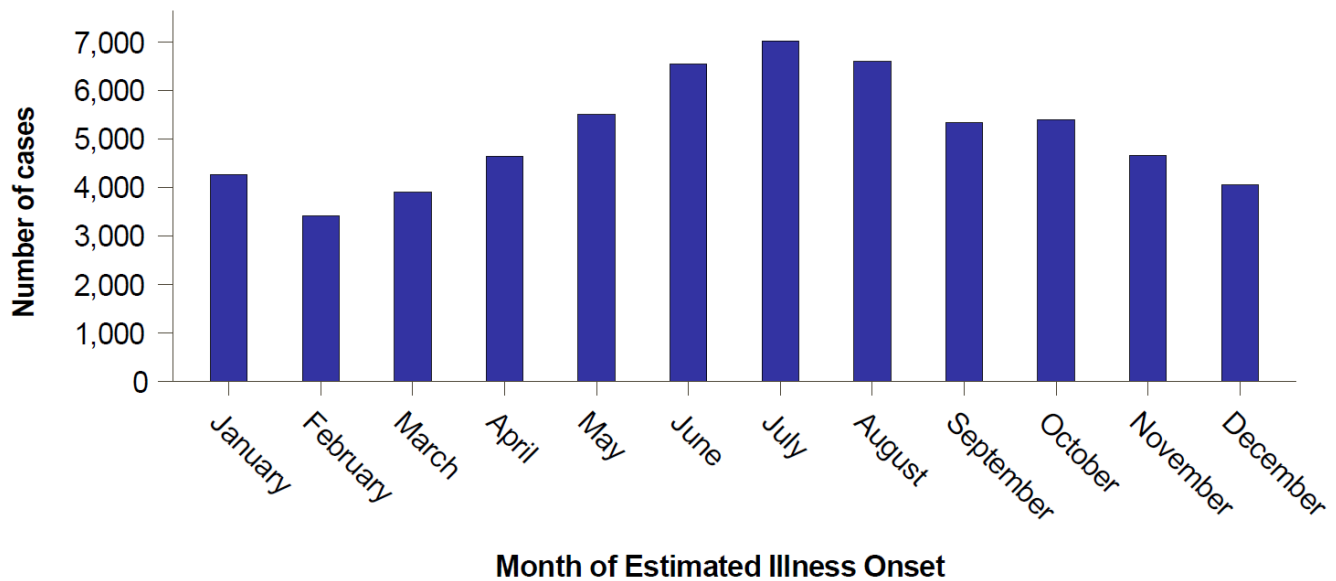


Figure 4. Campylobacteriosis Cases and Population by Race/Ethnicity, California, 2013-2019



40.4% (n=24747) of reported incidents of Campylobacteriosis did not identify race/ethnicity and 8% (n=4876) 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.

Figure 5. Campylobacteriosis Cases by Month of Estimated Illness Onset, California, 2013-2019



Comments

Campylobacteriosis incidence rates per 100,000 population in California increased by 25% during 2013-2019. This increase may be due to the increased use of CIDT and a more inclusive probable case definition. The average annual rate of 22.3 per 100,000 population during 2013-2019 was a continued increase compared to the average annual rate of 18.3 per 100,000 population during 2009-2012 and of 14.4 per 100,000 population during 2001-2008.^{10, 11} However, the age group, sex, and regional epidemiologic profiles of incident cases during 2013-2019 were similar to those reported in epidemiologic summaries from earlier years.^{10, 11}

During the 2013-2019 surveillance period, 96.6% of California counties had a campylobacteriosis incidence rate above the national *Healthy People 2020* target, compared to 82.8% of counties during the 2009-2012 surveillance period.¹¹ As it is estimated that only 1 of every 30 people who are infected with *Campylobacter* bacteria seek medical care and are diagnosed with campylobacteriosis, the true infection rates are likely to be much higher.¹

Most campylobacteriosis cases are thought to be the result of direct or indirect foodborne exposure to contaminated poultry. To address this issue, the U.S. Department of Agriculture implemented the performance standard for detection of *Campylobacter* in poultry in 2011 by setting a maximum limit on the percentage of samples that test positive at slaughterhouses.¹⁶ Additional measures were implemented in 2016 to further reduce *Campylobacter* contamination rates in poultry products at processing plants.¹⁷ These efforts are expected to reduce but not eradicate the presence of *Campylobacter* in poultry products. Thus, consumers, including retail and food service establishments, must be educated in safe food handling and preparation methods to further reduce risk. Decreasing the contamination of poultry meat and dairy products, as well as consumer education on safe food handling and avoiding undercooked poultry and unpasteurized milk, may provide the best opportunities for preventing and controlling campylobacteriosis.

To prevent campylobacteriosis, persons should avoid consuming raw or undercooked poultry and unpasteurized milk. [Food safety guidelines should be strictly followed](#) when preparing food, especially by keeping raw poultry separate from ready-to-eat foods and by thoroughly cooking food. To prevent the spread of *Campylobacter*, persons should always wash their hands with soap and water before preparing food, immediately after handling raw poultry or meat, and after touching animals (including farm animals, chickens, and turkeys) or being in animal environments.

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