

Key Findings and Public Health Messages

- The California Department of Public Health (CDPH) received reports of 27,346 cases of confirmed and probable campylobacteriosis with estimated symptom onset dates from 2009 through 2012. This corresponds to an average annual incidence rate of 18.3 cases per 100,000 Californians.
- Campylobacteriosis annual incidence rate increased by 34.0 percent from 2009 (15.9 per 100,000) to 2012 (21.3 per 100,000).
- During the surveillance period, 29 (0.1 percent) case-patients were reported to have died with campylobacteriosis.
- Average annual campylobacteriosis incidence rates during the surveillance period were highest among children under 1 year of age (34.0 per 100,000) and 1 to 4 years of age (40.4 per 100,000). Incidence rates among all ages rose from 2009 to 2012 but increased the greatest among adults 75-84 years of age by 54.0 percent (from 16.3 to 25.1 per 100,000).
- From 2009 through 2012, CDPH received reports of 10 outbreaks of foodborne campylobacteriosis in California involving 132 cases.
- Decreasing contamination of poultry meat and dairy products, and educating consumers may provide the best opportunities for preventing and controlling campylobacteriosis.

Background

Campylobacter is among the most commonly

reported enteric bacterial pathogens in the United States (US) causing an estimated 845,000 foodborne illnesses, 8,463 hospitalizations, and 76 deaths each year.¹ The US Centers for Disease Control and Prevention (CDC) estimates that for every reported case of campylobacteriosis, there are 30 more undiagnosed incidents.^{1,2} The leading source of infection is foodborne, usually from consumption of contaminated animal products, particularly raw or undercooked poultry meat, and drinking of unpasteurized milk or contaminated water. Exposure to infected animals and their environments can also result in infection. Foodborne outbreaks of *Campylobacter* are relatively uncommon, in part because the organism does

Acute illness, usually gastroenteritis characterized by diarrhea, abdominal cramping and fever, occurs after an incubation period of 2 to 5 days, and usually lasts 1 week. Severe illness and death may rarely occur, particularly among immunocompromised persons. Complications, including Guillain-Barré syndrome and reactive arthritis, may also occur.⁵ The recent emergence of human and animal *Campylobacter* isolates with fluoroquinolone resistance has led to restrictions on the use of some fluoroquinolones in poultry in the US.⁶

This report describes the epidemiology of confirmed and probable campylobacteriosis cases in California with estimated illness onset from January 2009 through December 2012 that were reported to CDPH by April 2015. 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 Technical Notes.⁷ The epidemiologic description of campylobacteriosis for the 2001-2008 period can be found in the *Epidemiologic*

*Summary of Campylobacteriosis in California, 2001- 2008.*⁸

California reporting requirements and surveillance case definition

California Code of Regulations, Title 17, requires health care providers to report any cases of campylobacteriosis to their local health department within one working day of identification or immediately by telephone if an outbreak is suspected. Laboratories are also 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.

Local health officers are required by regulation to report to CDPH cases of campylobacteriosis. 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 as one with *Campylobacter* isolated from a clinical specimen including asymptomatic and extraintestinal infections.⁹ A probable case was one with clinically-compatible illness and an established epidemiologic link to a laboratory-confirmed case.

Epidemiology of campylobacteriosis in California

CDPH received reports of 27,346 cases of campylobacteriosis with estimated symptom onset dates from 2009 through 2012. This corresponds to an average annual incidence rate of 18.3 cases per 100,000 Californians. Reported campylobacteriosis incidence rates increased by 34.0 percent from 2009 (15.9 per 100,000) to 2012 (21.3 per 100,000) [Figure 1]. During the surveillance

period, 29 (0.1 percent) case-patients were reported to have died with campylobacteriosis.

Average annual campylobacteriosis incidence rates during the surveillance period were highest among children under 1 year of age (34.0 per 100,000) and 1 to 4 years of age (40.4 per 100,000). Incidence rates among all ages rose from 2009 to 2012 but increased the greatest among adults 75-84 years of age by 54.0 percent (from 16.3 to 25.1 per 100,000) [Figure 2]. The ratio of male to female cases was 1.2:1.0. Incidence rates by race/ethnicity were not calculated due to the substantial portion of missing data (58.3 percent). Of campylobacteriosis cases with complete data, reported race/ethnicities are roughly similar in proportions to the overall demographic profile of California [Figure 3].

Forty-eight (82.8 percent) of 58 counties reported average annual incidence rates for the surveillance period that were above the *Healthy People 2020* objective. Average annual incidence rates for the surveillance period were 1.9 times higher in Northern California (24.9 per 100,000) than Southern California (13.2 per 100,000). From 2009 to 2012, incidence rates for Southern California increased by 45.9 percent (from 11.1 to 16.2 per 100,000) and rates for Northern California increased by 26.1 percent (from 22.2 to 28.0 per 100,000). County-specific incidence rates for the surveillance period ranged from 0.0 to 55.0 per 100,000 persons [Figure 4].

From 2009 through 2012, CDPH received reports of 10 confirmed outbreaks of foodborne campylobacteriosis in California involving 132 cases. One multi-county outbreak involved 33 confirmed case-patients and was associated with drinking unpasteurized milk.

Figure 1. California campylobacteriosis case counts and incidence rates by estimated year of illness onset, 2009—2012*

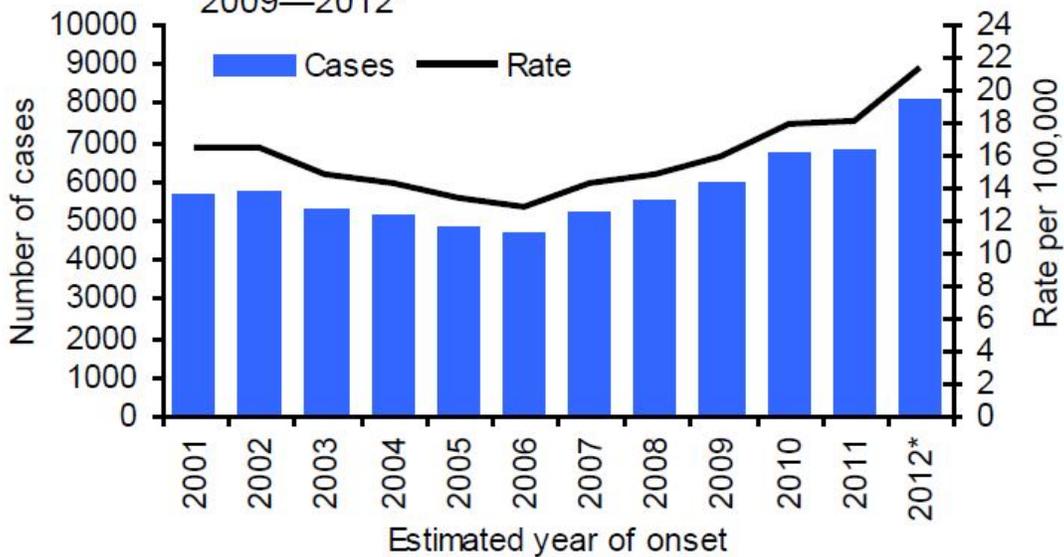


Figure 2. California campylobacteriosis incidence rates by age groups, 2009—2012*

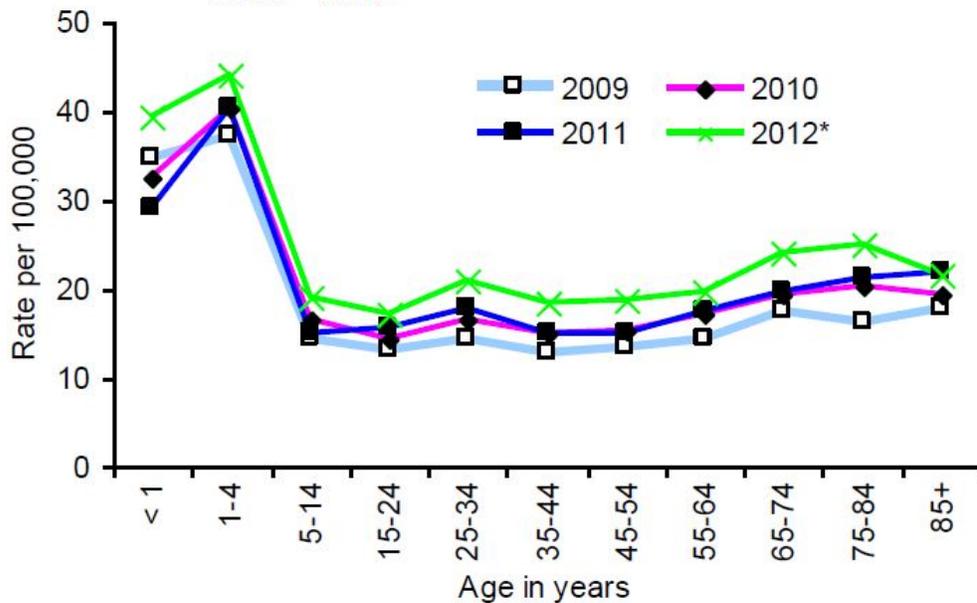
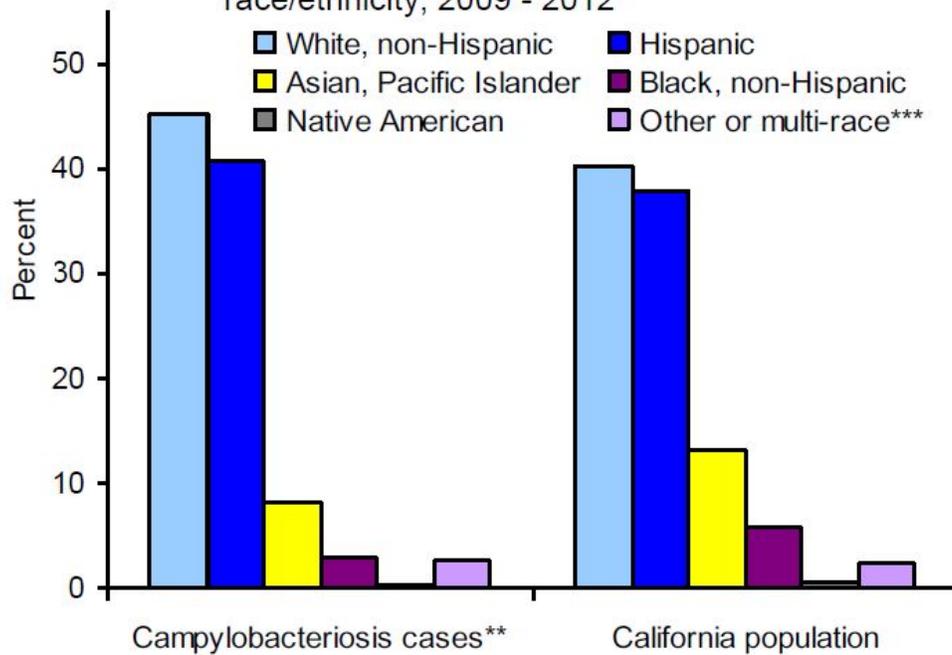


Figure 3. California campylobacteriosis cases and population by race/ethnicity, 2009 - 2012*



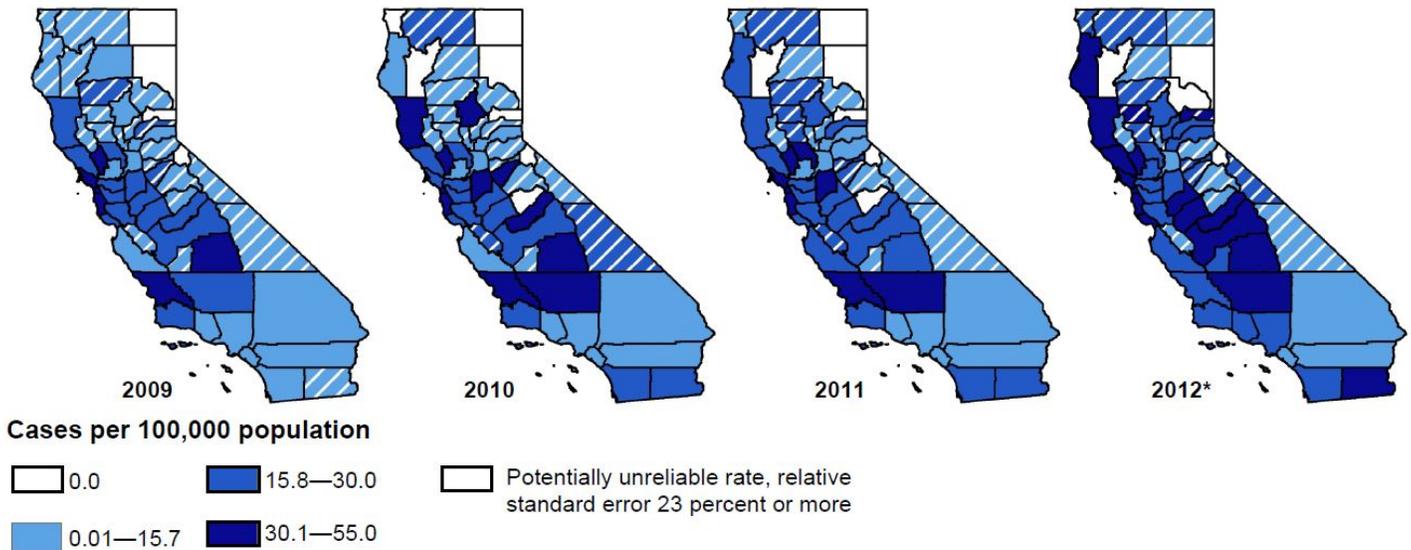
Notes for Figures 1-3

*2008 data are provisional

**Unknowns were excluded

***Includes cases who identified 'other' as their race and Californians ('population') who identified more than one race

Figure 4. California county-specific campylobacteriosis incidence rates



Comment

Between 2009 and 2012, California has experienced an increase in campylobacteriosis incidence with the highest rate occurring in 2012 (21.3 per 100,000). The reason for this recent increase is unknown. Continued monitoring of annual rates is needed.

Consuming contaminated poultry is heavily cited as the leading source of *Campylobacter* infection. Efforts have been taken to address this issue. In 2011, the United States Department of Agriculture (USDA) implemented the first-ever performance standard for detection of *Campylobacter* in poultry by setting a maximum percentage of samples that test positive at slaughterhouses.¹⁰ Further measures were proposed in 2015 to increase the frequency of testing at these facilities.¹¹ Both efforts are predicted to reduce the presence of *Campylobacter* in poultry but because the pathogen cannot be entirely eradicated from the food-borne source, consumers must be educated in safe food handling and preparation methods to reduce risk. Decreasing the contamination of poultry meat and dairy products, and consumer education may provide the best opportunities for preventing and controlling campylobacteriosis.

References and resources

¹Scallan E, Hoekstra RM, Anquio FJ et al. Foodborne illness acquired in the United States—major pathogens. *Emerg Infect Dis* 2011;17:7- 15.

²[Centers for Disease Control and Prevention. Food safety progress report for 2012.](http://www.cdc.gov/features/dsfoodnet2012/reportcard.html)
<http://www.cdc.gov/features/dsfoodnet2012/reportcard.html>

³Gallay A, Bousquet V, Siret V. et al. Risk factors for acquiring sporadic *Campylobacter* infection in France: results from a national case- control study. *J Infect Dis* 2008;197:1477-1483.

⁴Taylor EV, Herman KM, Ailes EC. et al. Common source outbreaks of *Campylobacter* infection in the USA, 1997–2008. *Epidemiol Infect* 2013;141:987-996.

⁵Allos BM. *Campylobacter jejuni* infections: update on emerging issues and trends. *Clinical Infectious Diseases* 2001;32:1201-6.

⁶Nelson JM, Chiller TM, Powers JH et al. Fluoroquinolone-resistant *Campylobacter* species and the withdrawal of fluoroquinolones from use in poultry; a public health success story. *Clinical Infectious Diseases* 2007;44:977-980.

⁷[Epidemiologic Summaries of Selected General Communicable Diseases in California, 2009—2012: Technical Notes](http://www.cdph.ca.gov/programs/sss/Pages/EpiSummariesofCDsCA09-12.aspx)
<http://www.cdph.ca.gov/programs/sss/Pages/EpiSummariesofCDsCA09-12.aspx>

⁸[Epidemiological Summaries of Selected General Communicable Diseases in California, 2001—2008: Campylobacteriosis](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf#page=11)
<http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf#page=11>

⁹[National Notifiable Diseases Surveillance System, Case Definitions, Campylobacteriosis.](http://wwwn.cdc.gov/nndss/conditions/campylobacteriosis/) Centers for Disease Control and Prevention, 2015.
<http://wwwn.cdc.gov/nndss/conditions/campylobacteriosis/>

¹⁰United States Department of Agriculture. [USDA announces new performance standards for salmonella](#)

[and campylobacter 2010.](#)

<http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2010/05/0246.xml>

¹¹United States Department of Agriculture.
[USDA proposes new measures to reduce salmonella and campylobacter in poultry products 2015.](#)

<http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2015/01/0013.xml>

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