

## Epidemiologic Summary of Foodborne Botulism in California, 2013 - 2019

### Key Findings

Foodborne botulism is caused when a person eats or drinks something that is contaminated with the toxin produced by *Clostridium botulinum* (*C. botulinum*) bacteria. These bacteria can grow and produce botulinum toxin in foods or drinks that aren't processed, preserved, or stored properly. The botulinum toxin attacks the nervous system and causes paralysis, beginning with the muscles of the eyes, face, and throat. People who have botulism will have symptoms such as droopy eyelids, blurred or double vision, or slurred speech. Muscle weakness can then spread downwards, making breathing difficult, and can eventually cause total paralysis and death. Foodborne botulism is rare but can be deadly and requires immediate medical care. Treatment with botulinum antitoxin will stop the toxin from causing more harm.

### Foodborne Botulism in California from 2013 through 2019

**Total Cases:** There were a total of 24 new foodborne botulism cases from 2013 through 2019, with 0 to 15 cases reported per year. In 2017, 15 cases of foodborne botulism were reported, 10 of which were due to a large outbreak. During 2013-2019, three deaths from foodborne botulism were reported.

- **By County:** Cases were reported from 14 California counties. By region, more cases were reported in Northern California (20 cases, 10 of which were due to a large outbreak) than in Southern California (4 cases).
- **By Sex:** The same number of foodborne botulism cases were reported in males (12 cases) as in females (12 cases).
- **By Age Group:** More cases of foodborne botulism were reported in people aged 65 to 74 years (6 cases) and 35 to 44 years (5 cases) than in other age groups.
- **By Race/Ethnicity:** More cases of foodborne botulism were in people who reported Hispanic/Latino race/ethnicity (9 cases) and non-Hispanic Asian/Pacific Islander race/ethnicity (8 cases) than in other reported races/ethnicities.

To prevent foodborne botulism, foods and drinks should be properly preserved and stored to help keep *C. botulinum* bacteria from growing and making botulinum toxin. Always follow label instructions for refrigerating food, and never eat food that is moldy or smells bad, which can be a sign that the food is contaminated with bacteria that can make you sick. People who do home canning should follow strict instructions to safely can foods and reduce contamination. If someone has symptoms of botulism, immediately seek care at a hospital. Botulinum antitoxin for the treatment of botulism is only available from public health authorities.

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

## Background

*Clostridium botulinum* is an anaerobic, spore-forming bacterium that is ubiquitous in the environment. Under specific conditions, *C. botulinum* can grow and produce a potent neurotoxin that is a rare but important food intoxicant in the United States. Foodborne botulism follows ingestion of botulinum toxin in contaminated foods. Home-canned foods that have been improperly preserved or fermented have been most likely sources of foodborne botulism, as these provide the optimal conditions for *C. botulinum* to produce spores and toxin.<sup>1, 2</sup> Home-canned vegetables are the most common cause of foodborne botulism in the U.S.;<sup>3</sup> far less commonly, commercial foods can also be contaminated with botulinum toxin.<sup>1</sup> *C. botulinum* toxin is listed among the U.S. Centers for Disease Control and Prevention (CDC) category A bioterrorism agents.<sup>4</sup>

Botulism is a rare but severe neuroparalytic illness, and each case should be considered a medical and public health emergency. All patients with suspected botulism must be investigated immediately, and two or more suspected botulism patients that may have shared or consumed the same food or drink are considered to be part of an outbreak. Initial neurologic signs and symptoms result from paralysis of muscles of the eyes, face, and throat, such as droopy eyelids (ptosis), blurred or double vision, or slurred speech, and may appear from 18 to 36 hours after consumption of contaminated food or drink. Illness can progress to a symmetric, descending weakness and, if untreated, can lead to respiratory paralysis and death.<sup>5</sup> Botulinum antitoxin and supportive medical care are the mainstay of treatment. If administered early in the course of illness, botulinum antitoxin can stop the progression of, but cannot reverse, paralysis. Antitoxin is available exclusively from public health authorities.<sup>6, 7</sup>

This report describes the epidemiology of confirmed and probable foodborne botulism cases in California from 2013 through 2019. Case data in this report are based on surveillance data and should be considered estimates of true disease incidence. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to the *Technical Notes*.<sup>8</sup> The epidemiologic description of foodborne botulism for earlier surveillance periods can be found in the *Epidemiologic Summary of Foodborne Botulism in California, 2001-2008 and 2009-2012*.<sup>9, 10</sup>

## 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 botulism to their local health department immediately by telephone. In the event that a commercial food product is suspected as the source, special instructions will be given by the California Department of Public Health (CDPH).<sup>11</sup> Per CCR, Title 17, Section 2505, laboratories must immediately communicate by telephone with the CDPH Microbial Diseases Laboratory for instruction whenever a specimen for laboratory diagnosis of suspected botulism is received. Laboratories must report to the local health department when laboratory testing yields evidence suggestive of *C. botulinum*; notification must occur within one hour after the health care provider has been notified.<sup>12</sup>

California regulations require cases of foodborne botulism to be reported to 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 2013-2019 surveillance period, a confirmed case of foodborne botulism was defined as one

with clinically compatible illness and either (i) laboratory confirmation including detection of botulinum toxin in serum, stool, or patient's food or isolation of *C. botulinum* from stool, or (ii) a history of consuming the same food as persons with laboratory-confirmed botulism. A probable case was defined as one with clinically compatible illness and an epidemiologic exposure (e.g., ingestion of a home-canned food within the previous 48 hours).<sup>13</sup> Two or more cases of foodborne botulism were defined as an outbreak if a common exposure in food was suspected, implicated, or determined to be the source.<sup>14</sup>

## Epidemiology of Foodborne Botulism in California, 2013-2019

CDPH received reports of 24 cases of foodborne botulism with estimated symptom onset dates from 2013 through 2019, with 0 to 15 cases reported per year [Figure 1]. In 2017, 15 cases were reported, 10 of which were due to a large outbreak. During 2013-2019, three case-patients were reported to have died with foodborne botulism.

During the surveillance period, cases were reported from 14 California counties, with more than one case reported from Sacramento (4 cases), San Joaquin (4), Contra Costa (2), Orange (2), Santa Clara (2), and Tulare (2) counties. By region (see *Technical Notes*), more cases of foodborne botulism were reported in Northern California (20 cases, 10 of which were due to a large outbreak) than in Southern California (4).

Cases of foodborne botulism were reported equally frequently among males (12 cases) and females (12). By age group, case-patients were aged 15-24 years (3 cases), 25-34 years (2), 35-44 years (5), 55-64 years (4), 65-74 years (6), 75-84 years (2), and 85 years and older (2). No cases were reported among those aged less than 15 years and between the ages of 45 and 54 years. By race/ethnicity, case-patients reported Hispanic/Latino race/ethnicity (9 cases) and non-Hispanic Asian/Pacific Islander race/ethnicity (8) more frequently than other reported racial/ethnic groups.

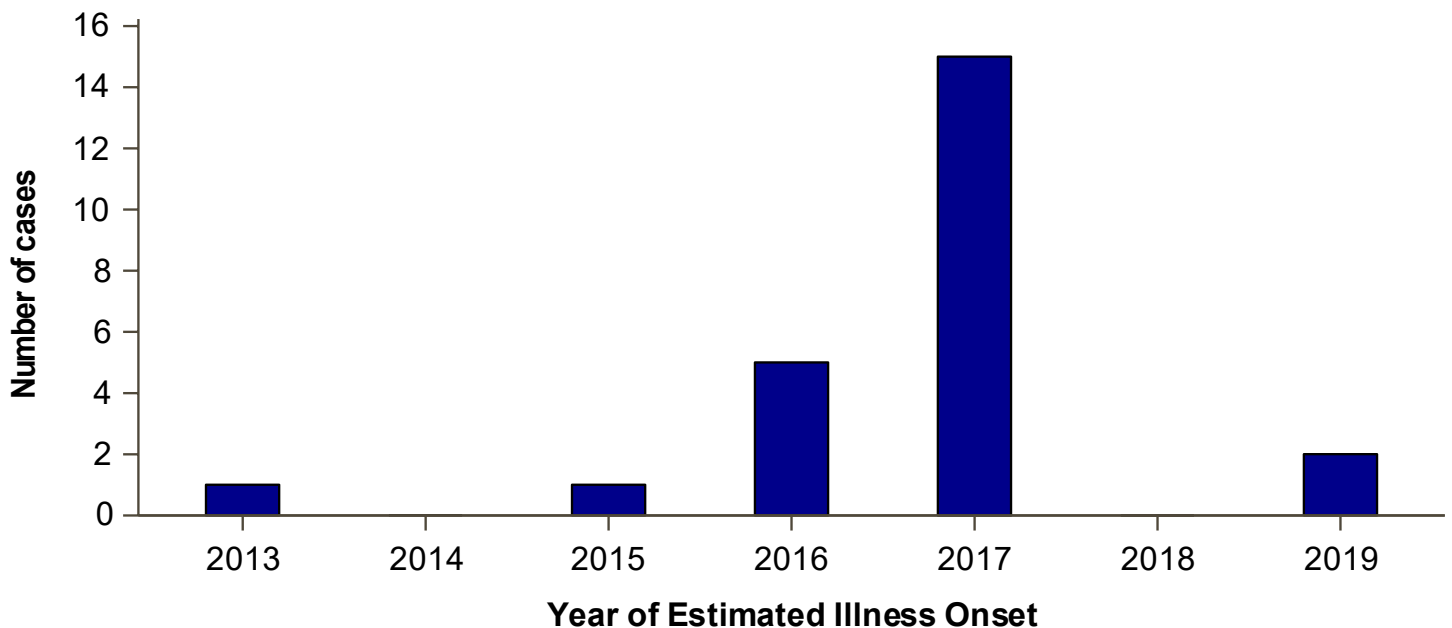
Of the 24 foodborne botulism cases reported during 2013-2019, 12 (50.0%) cases had a food source that was laboratory confirmed for *C. botulinum*: nacho cheese sauce (10 cases), crisp black fungus (1), and a packaged grain product (1). Improper food handling or storage was a contributing factor for the proliferation of *C. botulinum* and toxin production in all confirmed food sources. Of the total cases, 7 (29.2%) did not have a confirmed food source, but reported food items or food processes known to harbor or promote the growth of *C. botulinum*; of these, 2 case-patients shared one food/supplement item (prepackaged liquid tea from the same batch), 2 case-patients had several shared meals including fermented food items and dried fish, and 3 patients reported consuming home canned/preserved food items. Of the total cases, 5 (20.8%) case-patients had no food source identified in interview of patient or family, or the patient was lost to follow-up.<sup>a</sup>

Three outbreaks of foodborne botulism were reported during 2013-2019. The implicated food source was known in two 2017 outbreaks: nacho cheese sauce linked to a gas station (10 cases)<sup>15</sup> and prepackaged liquid herbal tea (2)<sup>16</sup>. The food source was unknown in one 2016 outbreak with two cases.

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<sup>a</sup> Patients were laboratory confirmed for *Clostridium botulinum* toxin and/or toxin producing organisms and were classified as foodborne due to a lack of evidence of other modes of transmission. This included no wounds, no history of injection drug use, no recent surgeries or fractures, no risk of iatrogenic botulism, and no risk factors for adult intestinal toxemia.

**Figure 1. Foodborne Botulism Cases by Year of Estimated Illness Onset, California, 2013-2019**



## Comments

Although foodborne botulism during 2013-2019 remained a rare occurrence in California, each case represented a medical and public health emergency. Due to the large 2017 outbreak of botulism due to nacho cheese sauce, more cases were reported in that year (15 cases) than in any other individual year during the 2001-2008, 2009-2012, and 2013-2019 surveillance periods.<sup>9, 10</sup> From 2013-2019, more cases were reported in Northern California than in Southern California.

Surveillance and response to foodborne botulism is intensive because the contaminated food item must be identified and removed from distribution (whether it is commercial or homemade) without delay. Rapid diagnosis and treatment, including administration of botulinum antitoxin obtained from public health authorities, provide the best opportunities for minimizing the morbidity and mortality associated with foodborne botulism. Educating about proper food preparation and preservation practices may provide the best opportunities to prevent and control foodborne botulism.

Patients having symptoms of foodborne botulism should immediately seek medical care at a hospital. Foodborne botulism can be prevented by strict adherence to proper food preservation and fermenting guidelines; the U.S. Department of Agriculture has information and guidelines for canning foods at home.<sup>17</sup> Consumers should always follow label instructions for the refrigeration of commercial foods; foods that are moldy or have a bad odor should not be eaten, as these may be signs of contamination.

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[2500 \(2021\).](#)

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