Connecticut Epidemiologist

Volume 38, No. 3 September 2018

An Increase in Legionellosis, Connecticut, 2018

In Connecticut, legionellosis is both physician and laboratory reportable to the Connecticut Department of Public Health (DPH), and to the patient's local health department. To identify possible common sources of exposure, DPH staff conducted follow-up on all confirmed legionellosis cases by contacting the healthcare provider of record and conducting patient interviews. This report summarizes the results of the patient interviews, and the increase in the number of legionellosis cases in 2018 when compared to 2016 and 2017 (Figures 1 and 2 see page 10).

From January 1 – September 24, 2018, the DPH received reports on 113 confirmed legionellosis cases. Of those, 77 (69%) cases were reported since July 1st (Figure 1). Interviews conducted on all case-patients using an extensive risk factor questionnaire, did not identify any common Connecticut locations or sources of exposure. Of the 107 case-patients with follow-up, 102 (95%) were hospitalized; 8 (8%) died. Confirmed cases resided in all Connecticut counties: New Haven County (35/31%), Hartford County (34/30%), Fairfield County (21/19%), Tolland County (7/6%), Middlesex County (5/4%), Windham County (5/4%), New London County (3/3%), and Litchfield County (3/3%); 67 (59%) were male; median age was 62 years (range 24-96).

The increase since January 1, 2018 appears to be region-wide in the mid-Atlantic and Northeastern United States. Legionellosis is treatable with appropriate antibiotics, but providers should be aware of the current increase so they can test and treat patients appropriately. Over the last 10 years, the incidence of legionellosis has been increasing both nationally (*1*) and in Connecticut (*2*). Although the causes of this increase are unknown, an aging population, aging plumbing systems, increased

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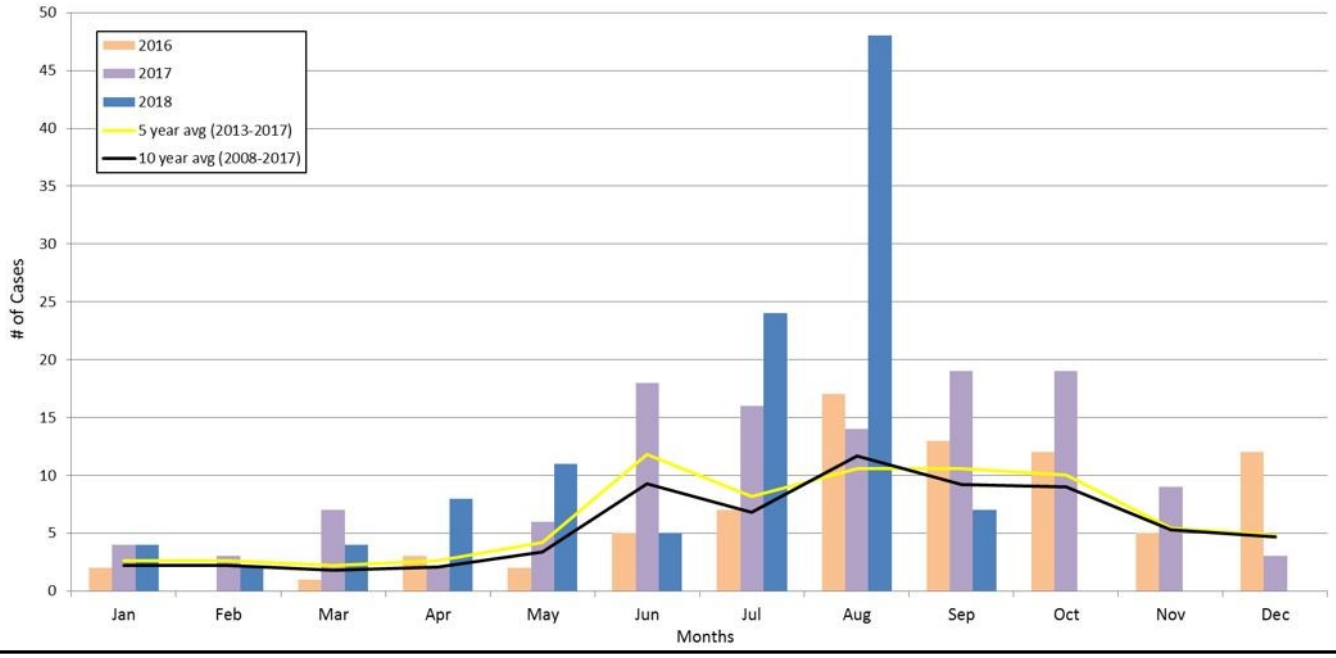
Figure 1. Legionellosis cases by month of onset, Connecticut, January 1, 2016 - September 24, 2018



awareness and testing practices, and precipitation weather events have been linked to increases in sporadic legionellosis cases (*3*). An analysis of Connecticut precipitation data (2011-August 9, 2018) revealed that a one-inch increase in precipitation seven days prior to onset date was associated with a relative risk of 9.42 (95% CI: 5.38, 16.49). It is unknown why cases increase following a precipitation weather event, but some hypotheses are that rain may disrupt biofilms and release *Legionella* spp., or that rain may strain water treatment plants or contaminate ground water sources (*3*).

What Providers Should Do

- When evaluating patients with community-acquired pneumonia, consider legionellosis as a potential diagnosis.
- Obtain respiratory or lung tissue cultures AND utilize rapid urine antigen testing on all suspect cases.
- Report all laboratory confirmed cases to the DPH at 860-509-7994, and to the local health department in the town where the patient resides. All legionellosis cases are investigated and follow-up questions include date of onset, method of diagnosis, occupation, travel history, and health care and water exposures. Providers can also report to DPH via fax at 860-509-7910.

Reported by

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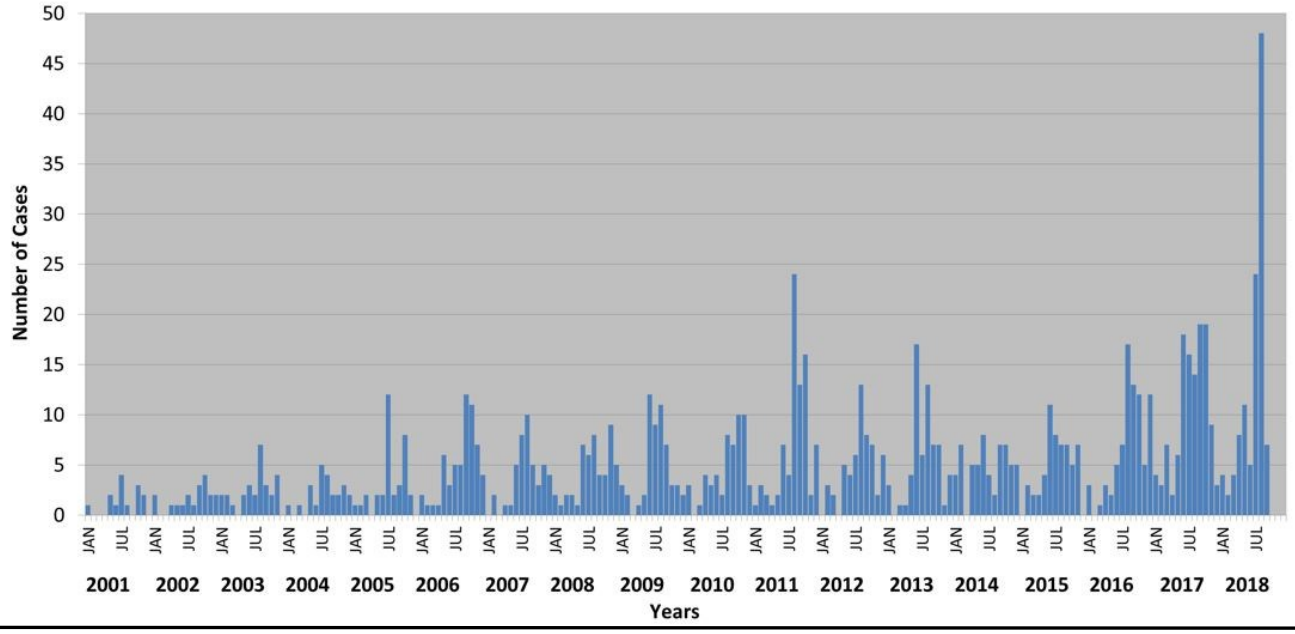
An Outbreak of *Clostridium Perfringens* Gastroenterities Associated with a Restaurant, Connecticut, 2018

In March 2018, the Connecticut Department of Public Health (DPH) received notification of a possible foodborne outbreak among attendees of a birthday party held at a Hartford County food service establishment (FSE). Foods served at the party included a variety of Indian dishes served buffet-style as well as a cake purchased from a grocery store. The DPH Epidemiology and Food Protection Programs assisted the local health department (LHD) in the investigation to determine the extent and source of the outbreak, as well as the implementation of control measures.

Figure 2. Reported cases of confirmed legionellosis by month of onset, Connecticut, January 1, 2001 – September 24, 2018



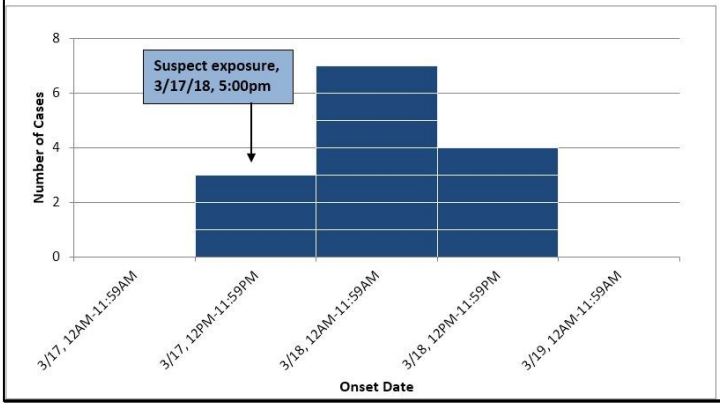
Epidemiologic Investigation

A standardized questionnaire was developed and administered to party attendees via Survey Monkey. A case was defined as vomiting or diarrhea (three or more stools in a 24 hour period) in an individual who ate food served at the party, with symptom onset during March 17-18. The link to the online questionnaire was provided to the party host for further distribution to event attendees (approximately 100). Twenty-two (22%) attendees completed the survey. Four respondents were excluded from analysis due to missing or conflicting response data. Of the remaining 18 respondents, 14 (78%) met the case definition. The median age of cases was 31 years (range 19-59 years); 10 (71%) were female.

Onset of illness ranged from March 17-18 (Figure). The median incubation period was 16 hours (range 5-27.5) and median duration of illness was 48 hours (range 24 - 72). Reported symptoms among cases included diarrhea (93%), cramps (79%), headache (77%), chills (46%), vomiting (43%), muscle aches (31%) and fever (15%). Two cases sought medical attention; none were hospitalized.

A case-control study was conducted to determine associations of illness with food exposures. Multiple food items were significantly associated with illness, including chicken chettinadu [Odds Ratio (OR)= 27; 95% Confidence Interval (CI)= 0.97-748.88; *p*-value<0.05], mutton biryani (OR= 29; 95% CI= 1.05-801.98; *p*-value<0.05) and payasum (rice pudding) (OR= 19; 95% CI= 0.83-434.45; *p*-value<0.05).

Figure. Number of *C. Perfringens* cases by date and time of onset, Hartford County, Connecticut, March 2018



Laboratory Investigation

Stool specimens collected from four ill patrons and from 10 food workers (FW) at the FSE tested negative at the CT DPH State Laboratory (DPHL) for routine enteric bacterial pathogens (*Campylobacter, Escherichia coli* O157:H7, *Salmonella and Shigella*). All four patron and three FW specimens were tested for Norovirus by RT-PCR and were negative. Additionally, all four patron specimens tested negative for all pathogens targeted on the BioFire FilmArray multiplex PCR system (https://www.biofiredx.com/products/the-filmarray-panels/#gastrointestinal).

Leftover food items including samosas, payasum, and mutton biryani were collected and tested negative for *Bacillus cereus*. Because no etiology had been identified through testing at the DPHL, patron specimens as well as the payasum and mutton biryani were submitted to the Minnesota Department of Health Lab where they underwent additional testing. Three of four patron specimens tested positive for *Clostridium perfringens* enterotoxin A. All four patron specimens tested culture-positive for *C. perfringens* and displayed indistinguishable pulsed-field gel electrophoresis patterns. Both food samples tested negative for *C. perfringens*.

Environmental Investigation

The environmental investigation was conducted by staff of the LHD and DPH Food Protection Program with onsite evaluations of the FSE on March 20, 22 and 29. Onsite evaluation included interviews of food workers, collection of stool specimens, and assessment of large-event food handling practices and procedures. Upon interview, no food workers reported gastrointestinal illness during the month before the party. Review of food preparation and procedures revealed advance preparation of large volumes of food, which were then held until time of service, reheated, and hot-held during self-service buffet. Improper cooling of large quantities of various foods was also noted, and several containers of food were voluntarily discarded.

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Editorial

Clostridium perfringens is a gram-positive, spore-forming bacillus that is commonly present in the environment, the intestinal tract of humans and animals, and in raw meat and poultry (*1*). It is estimated to be the second most common bacterial cause of foodborne illness in the United States, causing nearly one million illnesses each year (*2*). Ingestion of this organism is most often associated with foods prepared in large quantities, cooled slowly, and stored inappropriately for prolonged periods. Illness results from ingesting high numbers of vegetative organism (>10^5 colony forming units/ g), which then produce heat-labile enterotoxin in the intestine (*1*).

In this outbreak, consumption of chicken chettinadu, mutton biryani and payasum served at the party was significantly associated with illnesses. The environmental investigation revealed that these and other hot foods were cooked in advance, improperly cooled and then reheated at the time of service. Resulting lack of temperature control likely resulted in proliferation of *C. perfringens* spores, which can survive cooking, germinate and multiply rapidly during slow cooling, and inadequate reheating (*1*). To confirm the outbreak etiology as *C. perfringens*, presence of enterotoxin in the stool of two or more ill persons is sufficient (*3*); here, three of four patron stools tested positive for enterotoxin.

It is possible that the leftover foods that were associated with illness tested negative due to the conditions under which the foods were held before collection. To ensure recovery of *C. perfringens* cells by DPHL, food samples must be tested promptly or treated with buffered glycerin-salt solution and rapidly frozen to ultra-low (under -70 degrees celcius) temperatures for storage and shipping (*4*). Leftover foods were stored by the host at an unknown temperature for 10 days before collection by the LHD, and were not treated with buffered glycerin-salt solution. Since *C. perfringens* cells lose their viability when frozen or held under prolonged refrigeration in the absence of treatment, the resulting samples were not acceptable for testing by DPHL, and may have been compromised upon receipt in MN.

Outbreaks caused by *C. perfringens* may be prevented either before preparation at the farm or slaughterhouse by preventing contamination of raw meat or poultry (*2*), or during preparation through proper cooking and temperature control. Foods should be cooked and held at or over 60°C or cooler than 7°C, and meat dishes should be served hot directly after cooking. Foods should not be cooled at room temperature. Rather, they should be refrigerated as soon as possible after cooking and/or serving and within two hours of preparation (*1*). Additionally, portioning large volumes of hot foods into small batches after cooking facilitates the cooling process and can discourage growth of bacteria. Following the investigation, the LHD began conducting weekly site visits to educate FSE staff on proper cooling procedures, and recommended that the owner purchase cooling wands and smaller pans to promote adequate cooling of hot foods.

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