



Outbreak 2018-4979 Shigellosis at a Wedding Updated June 8, 2019

Background

On August 14, 2018, the Oregon Health Authority (OHA) and Yamhill County Health and Human Services (YCHHS) independently received reports of persons with gastrointestinal illness days after attending a wedding and reception in Yamhill County on August 11. Over the next two days, additional wedding attendees reported gastrointestinal illness. OHA notified the Multnomah County Health Department (MCHD), and the agencies initiated an investigation to determine the cause of the outbreak and to prevent additional cases. YCHHS contacted the Oregon Department of Agriculture (ODA), which regulates some food-service establishments in Oregon.

By August 15, 10 cases had been reported to OHA. A Health Alert Network notice was sent to the ORCD1 group,* advising them to ask patients with gastrointestinal illness whether they had attended a wedding in Yamhill County and, if they were willing, to submit a stool sample.

Fecal samples from patients were cultured and isolates serotyped at the Oregon State Public Health Laboratory. On August 20, *Shigella flexneri* type 3a was first identified from a patient specimen. OHA consulted with subject matter experts at the Centers for Disease Control and Prevention (CDC) for information on this *Shigella* serotype.

Methods

YCHHS public health investigators obtained contact information for attendees and the caterer. The caterer is based in Multnomah County. MCHD officials contacted the caterer to obtain a menu of foods served at the wedding. Using this information, on August 16 OHA epidemiologists emailed to wedding attendees a link to an online survey asking them to identify foods they had eaten and to determine whether they had illnesses meeting the case definition.

Information from the first survey indicated that there was a cocktail hour between the wedding ceremony and the reception. Because *S. flexneri* infections have been associated with international travel,[†] and there were additional food exposures, OHA invited wedding attendees to complete a second online survey on August 24. OHA asked respondents about their illness on this survey, too.

A confirmed case had *S. flexneri* cultured from a clinical specimen and attended the wedding reception. A presumptive case was reported diarrhea or vomiting in a person who attended the wedding reception.

* The ORCD1 group comprises Oregon state, county, tribal, lab, and preparedness users, infection preventionists and Emergency Department managers.

[†] Kotloff KL, et al. Global burden of *Shigella* infections: implications for vaccine development and implementation of control strategies. [Bull WHO 1999; 77:651–6.](#)

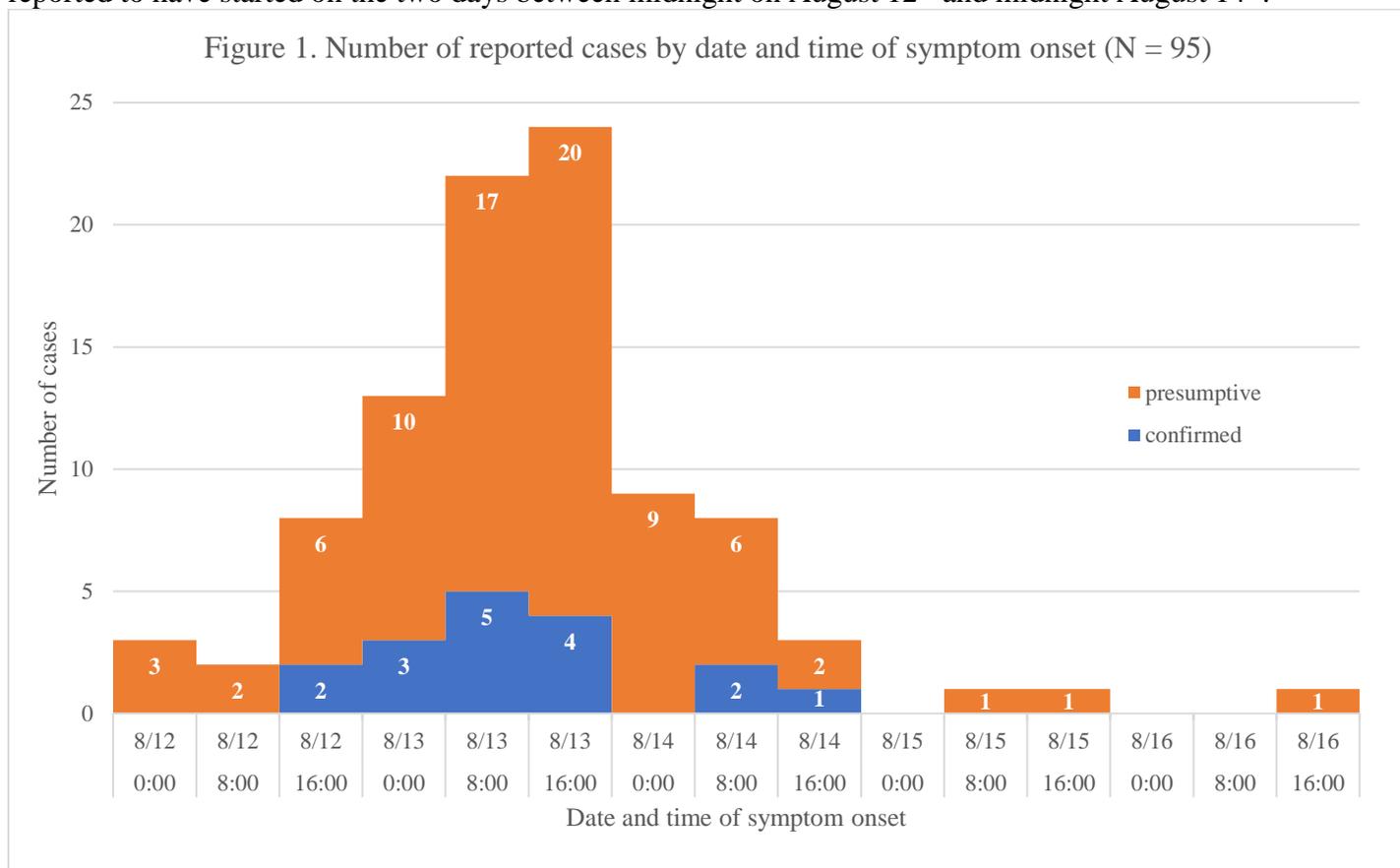
An ODA environmental health specialist inspected the venue, collected water samples and leftover strawberries and cucumbers, and examined general biosecurity. Yamhill County environmental health specialists collected leftover potatoes. Well-water samples were tested using the Colilert® test for total coliforms.[‡] Food samples were tested for *Shigella* species using polymerase chain reaction testing. Multnomah County environmental health specialists inspected the caterer. They observed hygiene practices and asked that people who prepared food for the reception submit stool samples for testing.

Results

Among 263 wedding attendees and reception venue staff, 192 were represented on the first survey and 128 on the second survey; some people completed the survey for their children, spouses, or other relatives. In total, 200 people were represented by the two surveys combined.

One hundred twelve cases were identified; 23 (21%) were confirmed. Eighty-seven (78%) of the cases were Oregon residents; the remainder were residents of 11 other states. Oregon cases resided in 11 different counties.

Cases by time of illness onset are shown in Figure 1. Of the 95 cases with onset information, 92 (97%) were reported to have started on the two days between midnight on August 12th and midnight August 14th.



[‡] Colilert® is a test from IDEXX for coliforms in water. More information can be found here: <https://www.idexx.com/en/water/water-products-services/colilert/>

The median age of ill people was 30 years. Of 112 female attendees, 62 (55%) became ill. Of 88 male attendees, 49 (56%) became ill. Of 18 persons ≤ 18 years of age, 5 (28%) were ill. Of 181 persons > 18 years of age, 107 (58%) were ill (Table 1). Persons ≤ 18 years of age were significantly less likely to become ill ($p = 0.03$).

Age (years)	Ill	Well	Total
≤ 18	5	13	18
> 18	107	76	183
Total	112	89	201

Table 2 shows the symptoms reported by ill people.

Reported symptom	Count (%)
Diarrhea or loose stools	111 (99%)
3 or more loose stools in any 24-hour period	105 (94%)
Fatigue	100 (90%)
Abdominal cramps	99 (89%)
Fever	95 (85%)
Shaking chills	89 (80%)
Nausea	88 (79%)
Muscle aches	86 (77%)
Any blood in stools	53 (47%)
Vomiting	52 (47%)

Of ill people, 74/105 (70%) missed school or work, 57/106 (54%) saw a clinician, 38/105 (36%) visited the emergency room, and 10/106 (9%) were hospitalized overnight.

Among the 58 cases whose illness had resolved when they completed the survey, illness duration ranged from 3 to 14 (median, 5) days. Forty-four cases were still ill when they completed their survey. No deaths were reported.

Persons ($n = 55$) who attended the rehearsal dinner were no more likely to become ill than those who did not attend it (RR 1.2, $p = 0.51$); therefore, the epidemiologic investigation focused on food exposures at the wedding reception. Food was served buffet-style. Six food items were each associated with a significantly increased risk of illness: asparagus, au gratin potatoes, bread, butter, the aioli that was served with the asparagus, and salad. Asparagus was most strongly associated with illness: of those who ate asparagus, 66% became ill, compared to 12.5% of those who denied eating asparagus (RR 5.3, 95% CI 2.1–13.3). Asparagus consumption also accounted for a higher percentage of cases (96%) than any other exposure (Table 3). In further analysis of these six foods, including stratified and multivariable analyses, asparagus consumption was the only exposure significantly associated with increased likelihood of becoming ill.

There was a children's buffet. Some persons aged < 10 years old ate food from the rest of the buffet, and some adults ate food from the children's buffet. Persons aged < 10 years old were significantly more likely to have eaten from the kid's buffet ($p < 0.01$) and significantly less likely to have eaten any adult food ($p < 0.01$).

Food	Attack Rate		RR	95% CI	p
	Ate	Didn't eat			
Asparagus	99/150 (66%)	4/32 (12%)	5.3	2.1–13.3	<0.001
Butter	80/124 (65%)	23/61 (38%)	1.7	1.2–2.4	0.001
Bread	91/148 (61%)	13/38 (34%)	1.8	1.1–2.8	0.005
Potatoes	97/159 (61%)	6/24 (25%)	2.4	1.2–4.9	0.002
Aioli	49/72 (68%)	45/97 (46%)	1.5	1.1–1.9	0.008
Salad	82/132 (62%)	22/51 (43%)	1.4	1.0–2.0	0.031

When visiting the caterer, Multnomah County inspectors did not observe any food-handling violations. Stool samples were submitted by some of the food-handling staff; none were positive for *Shigella*. Food preparers were primarily responsible for specific dishes. When analyzing attendees' exposures by who was responsible for the foods they consumed, illness rates did not differ significantly by food preparer. Catering records revealed that the caterer served some of the same foods, including the grilled asparagus dish, at multiple events that same weekend. The asparagus was sourced domestically. No illnesses related to those other events were reported to OHA.

The ODA inspector concluded that biosecurity on the venue's water supply was sufficient to protect against intentional contamination. The water tested negative for bacterial contamination. The leftover strawberries, cucumbers and potatoes tested negative on bacterial culture; no asparagus had been left over for testing.

Conclusions

An outbreak of *Shigella flexneri* type 3a infections was most likely caused by contaminated asparagus consumed by people who attended a wedding reception in Yamhill County on August 11, 2018. Bread was also associated with illness, but it is less likely to be the cause of the outbreak. Asparagus accounts for a higher proportion of cases, and the age breakdown of illness is better explained by asparagus consumption patterns.

This is the second-largest foodborne outbreak of *S. flexneri* infections reported in the U.S. since 1988. The source of the contamination was not definitively identified. Because humans are the natural reservoir for *Shigella* species, and there were no concurrent outbreaks to suggest upstream contamination, poor food-handler hygiene is the most likely cause.