

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

OUTBREAKS: FOODBORNE AND GASTROINTESTINAL—2013

Outbreaks of any disease are reportable to public health authorities in Oregon. They are investigated to various degrees as dictated by some combination of magnitude of the health threat, effective public health response, and availability of personnel. This *CD Summary* summarizes the most commonly reported type of outbreak — viz., of gastrointestinal (GI) disease — reported in Oregon for 2013.

GI OUTBREAK PRIMER

Gastroenteritis outbreaks are usefully classified as long-term care facility (LTCF) outbreaks; event-centered outbreaks; and outbreaks that occur as a result of commercial product contamination. Because most of the latter two types involve transmission by contaminated food vehicles, we tend to lump “GI” and “foodborne” outbreaks together — recognizing that outbreaks of norovirus infection in LTCFs seem usually to be spread by the person-to-person route, and that not all “foodborne” diseases are gastroenteritis (think botulism, scombroid, listeriosis). GI and foodborne outbreaks have in common the acquisition of the pathogen through ingestion.

LTCF outbreaks are the most commonly reported type of GI outbreak. Event-centered outbreaks are mostly foodborne (e.g., potlucks, weddings, etc.). Outbreaks that result from commercial product contamination can persist for long periods of time if the contaminated product is not identified and removed promptly from the market.

DATA OVERVIEW

In Oregon, 219 foodborne and GI outbreaks were reported in 2013 — that’s 14% more than the 192 outbreaks reported in 2012 (Figure 1). These 219 outbreaks involved 4,997 cases of illness.

Modes of transmission included:

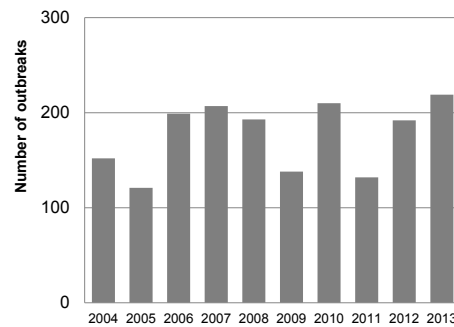
- 145 (66%) person-to-person
- 31 (14%) foodborne
- 3 (1.4%) animal contact
- 1 (0.5%) waterborne
- 39 (18%) undetermined

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Figure 1. Foodborne/GI outbreaks, Oregon 2004–2013

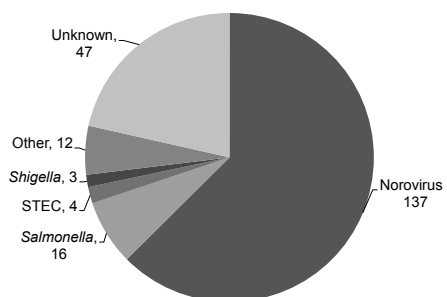


ETIOLOGY

For each outbreak we attempt to identify a causative agent. Norovirus was the culprit in 137 (61%) of the 219 foodborne/GI outbreaks: 16 (7%) were caused by *Salmonella*, 4 (2%) by Shiga-toxigenic *E. coli*, 3 (1%) by *Shigella* and 12 (5%) by other organisms including *Cryptosporidium*, *Giardia*, *Vibrio parahaemolyticus* and *Clostridium perfringens*; 47 (21%) of the outbreaks had no confirmed etiology — i.e., a common pathogen was not identified in specimens from ≥2 cases in the outbreak (Figure 2).

Norovirus was by far the most common cause of the 112 GI outbreaks reported in LTCFs in 2013, having caused 88 (78%) of them.

Figure 2. Etiology of 2013 outbreaks, Oregon



Norovirus outbreaks are confirmed by RT-PCR testing of fecal specimens at the Oregon State Public Health Laboratory. Sequencing of the virus allows distinction of viral genogroups and subgroups. Genogroup II (GII) was the most common last year, responsible for 90 (67%) of the outbreaks, while GI was responsible for 20 (15%). GI.4 became more predominant in LTCFs in 2013 (47%), when a new strain, GI.4 “Sydney” was introduced in late 2012. In 2011 and 2012, GI.4 “New Orleans” was the predominant type in LTCFs (24%).

Salmonella. Essentially all *Salmonella* that cause human illness are members of a single species — viz., *enterica*, which are most usefully subcategorized by serotype — i.e., by their lipopolysaccharide (“O”) and flagellar (“H”) antigens. Handily, and unlike the situation with *E. coli* “O157:H7,” the cumbersome antigenic designations of *S. enterica* are typically given names like “Typhimurium,” “Newport,” or “Heidelberg.” *Salmonella* serotype Typhimurium was the causative organism for six of the 16 outbreaks of *Salmonella* infections; serotype I 4,[5],12:i:—caused 2 outbreaks; serotypes Overchie, Braenderup, Heidelberg, Infantis, Lomalinda, Reading, Saintpaul, and Thompson caused one outbreak each.

NOTABLE OUTBREAKS

Baker City Water. In July 2013, contamination of the Baker City water supply caused an sizable outbreak of cryptosporidiosis. Water samples collected at the tap in Baker City and samples taken from multiple water intakes tested positive for *Cryptosporidium* oocysts. A boil-water advisory was issued by the Baker City Water Department on July 31st and remained in place 20 days; it was lifted on August 20th after water samples from each intake tested negative.

Public Health Division epidemiologists surveyed a random sample of Baker City residents door-to-door to determine the citywide attack rate. Ultimately, a total of 23 confirmed and 96 presumptive cases were logged, but based on the survey, the

* This serotype looks like a Typhimurium that has lost its phase 2 flagellar antigen. See what we mean by “cumbersome”?

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attack rate was 28%; extrapolating to the population served by the Baker City Water Department, we estimate that about 2,781 people were sickened during this outbreak. The source of water contamination could not be determined, but *Cryptosporidium's* reservoir is the intestines of many animal species. Local residents speculated that mountain goats, known to have been grazing in the vicinity of a reservoir, were the culprits; but the organism was not identified in any of 81 samples of goat scat collected as part of the investigation. Further testing from human samples identified the species as *C. parvum*, which is commonly found in cattle; although there was no positive sample from cattle, cattle-grazing lands almost completely encircle one of the watersheds. This outbreak highlights the importance of continuous monitoring of drinking water sources.

Foodborne: Event associated. Four event-associated foodborne outbreaks in which the vehicle was identified were as follows:

- 52 people were sickened by *C. perfringens* toxin after eating beef stroganoff at an outdoor school
- 22 people came down with norovirus after eating fruit salad at a country club social event
- 16 people became ill with norovirus infection after eating mixed fruit at an employee luncheon
- 11 people became infected with norovirus after eating chicken tostadas at a teacher's meeting.

Foodborne: Commercial product.

- 17 cases of *Salmonella* Heidelberg associated with Foster Farms chicken were logged in Oregon in 2013. These cases proved to be part of a multi-state

outbreak with a total of 621 cases in 29 states, predominantly in the West.¹

- 9 cases of *S. Typhimurium* occurred after eating carne asada sold at small ethnic grocery stores.
- 2 cases of *S. Saintpaul* infection were part of a multi-state outbreak associated with Mexican cucumbers. Ultimately, 84 cases were reported in 18 states.²
- **Foodborne: Restaurant associated.** 38 people contracted norovirus infection after eating ceviche at a restaurant.
- 19 cases of *S. Typhimurium* infection were associated with Mexican food catered by a restaurant or food purchased from a carnicera (butcher). No vehicle was identified.
- 4 restaurant-associated outbreaks of *Vibrio parahaemolyticus* infection involving 17 cases of illness were associated with eating raw oysters.
- 1 cluster of *Salmonella* Reading involved 2 cases in Oregon, 1 in Washington and 1 in Idaho who consumed raw oysters a few days before illness onset. One case required hospitalization. This is the first oyster-associated outbreak of salmonellosis reported in Oregon, though *Salmonella* has been cultured from oysters in the past.³

Other commercial. A multi-state outbreak of *S. Typhimurium* infections associated with baby chicks tallied 356 cases from 39 states, including 12 from Oregon.⁴

Other foodborne. Nineteen other outbreaks were presumptively foodborne, as they occurred in restaurants or at gatherings, but a food vehicle could not be identified.

CAVEATS

Most of the outbreaks summarized here were investigated because

they were reported to local health departments; the true number that occurred in Oregon during 2013 was surely higher.

BOTTOM LINE

Foodborne/GI outbreaks occur for predictable reasons. Everyone should be reminded to:

- Wash hands and cutting surfaces before preparing food
- Cook meat thoroughly
- Don't cross-contaminate
- Eating raw filter feeders (e.g., oysters) poses a risk, especially to those with underlying immunosuppression
- When cooking for events, meticulous food handling includes keeping hot foods hot and cold foods cold, in addition to the above.

FOR MORE INFORMATION

See <http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/Outbreaks/Pages/index.aspx>

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