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CD Summary

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COMMUNICABLE DISEASE OUTBREAKS, 2016

Outbreaks can be thought of as an increase in cases of disease that are clustered in time, a geographic region, or a particular population. Outbreaks in Oregon are reportable to Public Health departments because we are interested in identifying what, if anything, the cases might have in common (e.g., eating a common food item, attending a common event) — with the goal of preventing additional cases. Prevention might include removing a contaminated food item from sale, or providing vaccination or antibiotic prophylaxis to susceptible persons. This *CD Summary* reviews disease outbreaks investigated in Oregon in 2016 and summarizes highlights.

OUTBREAK OVERVIEW

Outbreaks can be categorized in different ways. We typically hear about clusters of illness based on the clinical manifestations (e.g., respiratory, gastrointestinal, rash). This is, of course, useful information when trying to determine the likely cause. Outbreaks can also be categorized by the pathogenic agent (e.g., bacterial, viral, parasitic). We often hear about outbreaks where we might have only have a couple of cases in Oregon, but they are linked to a national outbreak through a common molecular subtyping pattern (e.g. pulsed-field gel electrophoresis [PFGE]). We also categorize outbreaks by their mode of transmission, including point-source foodborne during an event or from a commercial product; water-borne; person-to-person (physical contact, droplet spread, or airborne); or vector-borne or zoonotic due to contact with infected insects or animals, respectively. Identifying the type of outbreak, causative agent, and mode of transmission is the "bread and butter" of what we do, and is crucial in helping us to stop transmission.

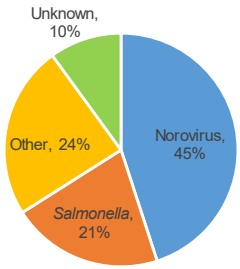
2016 OREGON SUMMARY

In 2016, a total of 303 outbreaks were reported in Oregon, affecting at least 6,282 people. This 2016 outbreak total was 4% higher than the 291 reported in 2015. Viruses were responsible for 205 (68%) of all outbreaks. The causative agents for 24 (8%) of the 303 outbreaks were bacteria, *Salmonella* being the most common (46%). The causative agents for 6 (2%) outbreaks included parasites and toxins. For 66 (22%) outbreaks, the etiology was unknown.

Gastrointestinal. Of the 303 outbreaks reported, 200 (66%) were gastrointestinal (GI). Twenty-nine (14%) of the GI outbreaks were foodborne, 2 (1%) were waterborne, 77 (38%) were from person-to-person transmission, 5 (2%) were due to contact with animals, and for 86 (43%) of the outbreaks, we could not determine the mode of transmission.

Which pathogen most commonly causes foodborne outbreaks? If you guessed norovirus, you are on the right track: 45%. Next to norovirus is *Salmonella*, which was the etiology for 6 (21%) of the foodborne outbreaks, involving 39 people. Other pathogens included Shiga toxin-producing *Escherichia coli*, hepatitis A, scombroid, and *Vibrio* (Figure). When we look at the settings where the foodborne outbreaks occurred, a plurality were associated with eating in a restaurant (40%), followed by private homes (33%). A food vehicle was identified in 60% of foodborne outbreaks.

Figure. Etiology of foodborne GI outbreaks, Oregon, 2016



Respiratory. Eighty-seven (29%) of the 303 reported outbreaks were respiratory outbreaks, the vast majority being influenza (69%). Influenza A was the predominant strain (81%). Other pathogens included *Bordetella pertussis*, coronavirus, and respiratory syncytial virus (RSV). The mode of transmission for the respiratory outbreaks was person-to-person. Seventy percent of the respiratory outbreaks occurred in long-term care facilities (LTCF). Five pertussis and two mumps outbreaks were also reported.

NOTABLE OUTBREAKS

Lest you doubt the notion that animal exposure can propagate large outbreaks, you can just about count on at least one occurring every spring. Several multistate outbreaks of *Salmonella* infections associated with exposure to live poultry — mostly baby chicks — were reported to the Centers for Disease Control and Prevention (CDC) in 2016.[1] *Salmonella* serotype Indiana was the etiology for a multistate outbreak with a total of 86 cases from 20 states, including 3 cases from Oregon. Onsets of illness were during March–June 2016. Most victims were young children: although cases ranged in age from 1–87 years, the median age was 7 years. Sixty percent were male, and 28% of them were hospitalized. Eighty-one percent of these *S.* Indiana cases confessed to contact with live poultry in the week before they got sick.

An even larger outbreak. *Salmonella* serotype Infantis was responsible for 219 cases from 39 states, including one case from Oregon. Illness onsets ranged from February–September. Fifty percent reported contact with poultry in the week before they got

sick. *S*. Braenderup in baby chicks was the causative organism for 14 cases from 7 states, including 3 from Oregon. Illness onsets ranged from August–October. All 3 Oregon cases reported contact with live poultry. Traceback investigation revealed that baby chicks were bought from a single hatchery.

Caveat Emptor; Caveat Caenator

Several large outbreaks due to widely distributed, contaminated food items included cases in Oregon residents. *S*. Virchow, a rare serotype, was responsible for a multistate outbreak of 33 cases from 23 states, including one case in Oregon. Illness onsets ranged from December 2015 to March 2016. Age range was 1–84 years, with 53% female. Epidemiologic and laboratory evidence indicated that a raw organic shake and meal replacement product was the likely source.[2]

A cluster of 5 cases of infection by *S*. Typhimurium with matching PFGE patterns were reported from 4 Oregon counties in November of 2016. Ages were 54–74 years, and 4 of them were female. Hypothesis-generating interviews indicated that 4 of the 5 cases consumed hazelnuts in the week prior to illness. Three recalled purchasing hazelnuts from the same farm. Leftover hazelnuts from the homes of 2 cases tested positive for the same strain of *Salmonella*. A press release was issued, and the product was recalled.

A multistate outbreak of STEC O121 infection with a total of 63 cases from 24 states, including one case from Oregon, lingered for several months. Illnesses struck from December 2015–September 2016. Seventy-six percent of the cases reported that they or someone in their household had used flour in the week before they got sick. Epidemiologic, laboratory, and traceback investigation revealed that flour produced by General Mills was the likely source of the outbreak. STEC O121 was isolated from an open container, and the isolate proved to be closely related genetically to the STEC O121 isolated from ill people. The company recalled the product. This underscores the inadvisability of eating or tasting raw dough.[3]

ENVIRONMENTAL AND WATERBORNE

Three cases of STEC O157 infection were reported in August of 2016. All three were from Washington County, and they attended the county fair in the 10 days before they got sick. The age range was 3–15 years. Two developed hemolytic uremic syndrome (HUS), the dreaded complication of STEC infection characterized by hemolytic anemia, thrombocytopenia, and acute renal failure. All three cases had spent considerable time in the fairground's goat and sheep area. Environmental samples subsequently taken tested negative for STEC. This is a good reminder to emphasize hand washing after touching animals at state or county fairs or petting zoos. It is worth recalling that the largest O157 outbreak ever documented in Oregon—ultimately with 71 confirmed and 9 presumptive cases, including 12 with hemolytic uremic syndrome — was associated with visiting the small animal exhibition hall at a county fair.*

Three cases of cryptosporidiosis were reported from Clackamas County in November of 2016. Investigation revealed that all three swam at the same swimming pool. A health alert was sent to swimming pool operators, daycare centers, and health care providers, regarding the increase in *Cryptosporidium* cases. A survey was sent to pool members to find additional cases. Eighty-three persons responded that they had been sick with GI symptoms. The swimming pool was cleaned properly and cases ceased. Children and adults with *Cryptosporidium* infection should not swim in pools or use hot tubs for two weeks after the diarrhea stops.

MENINGOCOCCAL DISEASE

In November 2016, a case of meningococcal infection in a student at Oregon State University (OSU) was reported to the Benton County Health Department (BCHD). A second case was identified within three days. BCHD officials worked with those from OSU to identify close contacts. About 500 people were given prophylactic antibiotics and were educated about symptoms. A third case emerged in February 2017. More than 40 more contacts were given antibiotics and educated about symptoms; and a vaccination campaign was launched, with recommendations for all undergraduate students 10–25 years of age at the Corvallis campus to be vaccinated. To date there have been no more cases.

* *CD Summary*. www.oregon.gov/OHA/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/CDSUMMARYNEWSLETTER/Documents/2002/ohd5119.pdf Case counts updated after publication of this article.

CONTROL MEASURES

Why do we investigate outbreaks? To truncate transmission and prevent additional cases from occurring. Here is what we do:

Foodborne outbreaks: if a commercial product is implicated, we issue a press release warning the public not to eat the implicated food item, and work with retailers and distributors to pull the product from shelves. For point-source outbreaks, we provide education to foodhandlers about hand hygiene, proper preparation and holding foods at safe temperatures.

Person-to-person transmission: we emphasize handwashing and other control measures, such as cohorting ill LTCF residents, canceling group activities, and restricting new admissions. Control measures for GI outbreaks in LTCFs are found on our website. For influenza outbreaks in LTCFs, we recommend antiviral prophylaxis for all residents.

Zoonotic: we educate people about the importance of washing their hands after touching animals — for example, at a state or county fair, petting zoos, reptile exhibits or after handling pets at home and other animals, such as baby chicks.

EPILOGUE

Many of the most consequential outbreaks are reported by astute clinicians like those who read the *CD Summary*. If you suspect an outbreak of *any* illness, please alert your local health department promptly; their phone numbers are available on our web site at www.healthoregon.org/lhddirectory

FOR MORE INFORMATION

Information outbreaks can be found at: http://healthoregon.org/outbreaks.

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