

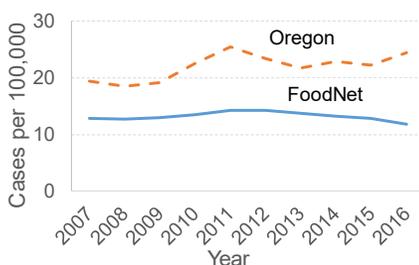
PEAKS AND VALLEYS OF REPORTABLE DISEASES, OREGON 2016

Diagnostic laboratories and health care professionals are required by law to report specific diseases and conditions to local health authorities. Public health officials investigate these diseases to characterize illnesses, collect demographic information about the cases, identify possible sources and take steps to prevent further transmission. In some cases, laboratories are required to forward bacterial isolates to the Oregon State Public Health Laboratory for subtyping. This *CD Summary* presents highlights of the diseases reported during 2016.

ELEVATED AND EMERGING ENTERIC PATHOGENS

Campylobacteriosis is the most common bacterial enteric infection reported in Oregon and nationally* (Figure 1). In Oregon in 2016, 994 cases were reported. Children aged 0–4 years have the highest rates of illness (34 per 100,000). Infections occur year-round in Oregon, with peak incidence in the summer months. Most illnesses are sporadic, but outbreaks may be associated with undercooked meat (often chicken), unpasteurized milk, or direct contact with animals or non-chlorinated water. Proper food

Figure 1. Incidence of campylobacteriosis: Oregon and U.S. (FoodNet sites), 2007–2016



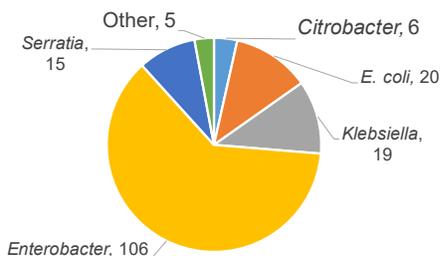
*National reporting is data from 10 states doing *Campylobacter* surveillance through FoodNet.

handling and water treatment, along with good hygienic practices, are the keys to prevention.

The *Enterobacteriaceae* are a large family of Gram-negative bacilli found in the human gastrointestinal tract. Carbapenem-resistant *Enterobacteriaceae* (CRE) are resistant to at least one carbapenem antibiotic. Infections caused by CRE occur most commonly among people with chronic medical conditions through use of invasive medical devices, frequent or prolonged stays in health care settings or extended courses of antibiotics.

By the end of 2016, Oregon had logged 15 carbapenemase-producing (CP) CRE — 10 *Klebsiella pneumoniae* carbapenemase (KPC), three New Delhi metallo-β-lactamase (NDM) and two Oxacillinase-48 (OXA-48) (Figure 2). Eleven of the CP-CRE were from patients with histories of health care exposure in other states or out of the U.S. We have instituted enhanced surveillance and prevention efforts to rapidly detect and stop the spread of CRE. Unlike much of the rest of the country, we have no indication that CP-CRE have spread in Oregon.

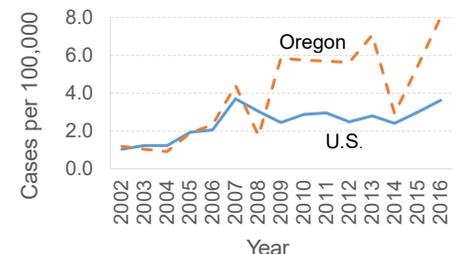
Figure 2. CRE by type, Oregon, 2016



Cryptosporidiosis in humans results from infection with protozoal parasites of the genus *Cryptosporidium* — most commonly *C. hominis* or *C. parvum*. In 2016, 327 cases were reported. The rate of infection with *Cryptosporidium*

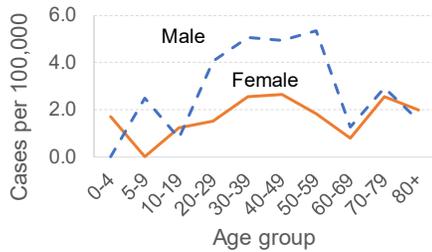
remains elevated over rates observed at the millennium, with the 2016 rate of 8.0 per 100,000 — the highest since reporting began (Figure 3). Oregon's reported incidence remains twice the national rate (3.6 per 100,000 persons). Cases occur year-round with a peak in August, coincident with increases in exposure to recreational water. Two swimming pool-associated outbreaks surfaced in the fall of 2016; 94 cases were associated with these two outbreaks.

Figure 3. Incidence of cryptosporidiosis: Oregon vs. nationwide: 2002–2016



Shigellosis is an acute bacterial infection characterized by diarrhea (sometimes bloody), abdominal cramps and, often, fever. In Oregon, shigellosis is usually caused by *S. sonnei* or *S. flexneri*. The rate has historically been highest among children 1–4 years of age; however, in 2016 Oregon's rate was highest among those aged 30–59 years (3.7 per 100,000; Figure 4, page 2). After hitting a historic low in 2014, the number of cases jumped to 112 in 2015; 101 cases were reported in 2016. The increase in 2015–2016 was mainly driven by an outbreak that started among men who have sex with men and spread among people who were homeless. In 2016, 64% of cases were in men. Of the 101 cases, 78 were *S. sonnei*, and 21 were *S. flexneri*.

Figure 4. Incidence of shigellosis by age and sex: Oregon, 2016



In 2016, 448 salmonellosis cases were reported in Oregon. Eleven outbreaks were identified, accounting for 46 cases. Four were associated with animal contact, and six were foodborne; transmission in one remains indeterminate. One large outbreak with 13 confirmed Oregon cases was associated with a Mexican-style “fast casual” restaurant chain. Another outbreak involving six cases was associated with consuming raw hazelnuts sold on an Oregon farm.

Yersiniosis is a bacterial infection also characterized by diarrhea (sometimes bloody), and abdominal pain. In 2016, 34 cases were reported in Oregon, the largest number in 29 years. Sixty-five percent resided in the Portland tri-county area. Eighty-eight percent of cases were sporadic; two represented household transmission, and two cases were part of an unsolved cluster of *Y. pseudotuberculosis* infections. The vast majority were *Yersinia enterocolitica* (25); two were *Y. frederiksenii*, three were *Y. intermedia*, and one was *Y. kristensenii*.

ZENITH OF ZIKA

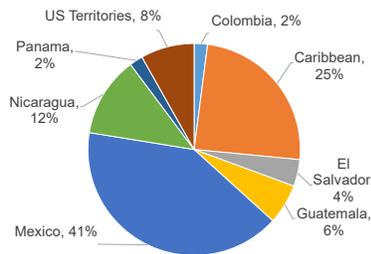
Zika is a primarily mosquito-borne viral infection caused by a flavivirus (related to West Nile, dengue, and yellow fever viruses).

In early 2016, due to the increasing spread of Zika and the recognition of birth defects among infants born to Zika-infected mothers, the Centers for Disease Control and Prevention (CDC) expanded its surveillance and testing capabilities and recommended testing of asymptomatic pregnant women.

Forty-nine cases of Zika virus disease were reported among Oregon residents in 2016. Additionally, testing of asymptomatic pregnant women identified five who had laboratory evidence of Zika virus infection but no Zika-compatible symptoms. All cases or their sexual partners reported foreign travel. Most had traveled to areas with active Zika transmission in

the Americas, including Latin America, the Caribbean, Mexico and Puerto Rico (Figure 5).

Figure 5. Zika virus by area of exposure: 2016



LYME CASES CLIMBING

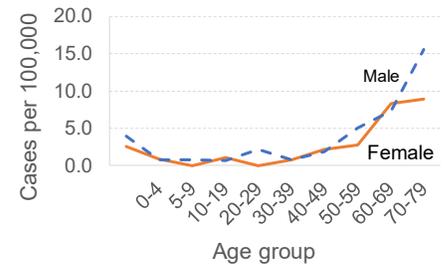
Lyme disease is a tick-borne zoonotic disease caused by the spirochete *Borrelia burgdorferi*. The first manifestation in approximately 60% of patients appears as a red spot or bump that expands slowly with clearing in the middle, forming a ring or “target” or a “bull’s eye,” sometimes with multiple similar lesions. In most cases, the tick must be attached for 36–48 hours or more before *B. burgdorferi* can be transmitted.

Oregon is a low-incidence state for Lyme disease; however, during 2016, 54 cases of Lyme disease were reported in Oregon, the highest ever. The median age of infected persons was 42 years. Twenty-seven (57%) of the cases were female. Fifteen cases most likely acquired the infection outside of Oregon.

A RESPIRATORY REVIVAL

Until the advent of an effective vaccine against it, Haemophilus influenzae type b (Hib) was the leading cause of bacterial meningitis in children <5 years of age in Oregon and elsewhere. In 2016, Hib was cultured from the normally sterile body fluids of only one Oregonian; however, 98 cases of non-Hib invasive *H. influenzae* disease (IHid) were reported. With the decline in iHid in children, nontype b and nontypeable cases in persons >5 years of age, especially among those >65 years of age, have been increasingly reported. In 2016, 72% of cases were nontypeable, 12% were identified as type f, 9% type a, and the remaining cases were other types. The burden of IHid in 2016 was highest (9.2/100,000 persons) among those >70 years of age, followed by those 60–69 years of age (3.9/100,000 persons) and then those <5 years of age (3.3/100,000 persons; Figure 6). In 2016, the top clinical

Figure 6. Incidence of *H. influenzae* infection by age and sex: Oregon, 2016



syndrome of invasive IHid reported in Oregon was bacteremia (22%); 98% of cases were hospitalized. Fourteen deaths were related to IHid infection. All children should be vaccinated against Hib at 2, 4, 6 and 12–15 months of age. *Haemophilus influenzae* infection is treated with antibiotics, and infection can be prevented in close contacts of Hib cases with prophylactic antibiotics.

Legionellosis is usually an acute respiratory tract infection that begins 2–14 days after exposure to *Legionella* spp. Signs of the disease can include fever, chills, cough, headache, and myalgia. *Legionella* bacteria are transmitted by inhalation of aerosolized water or soil infected with the bacteria. In 2016, 47 cases of legionellosis were reported among Oregonians; 91% were hospitalized, and six died (Figure 7). Rates of reported illness have increased each year, both in Oregon and nationally. The cause of the rise is unknown; however, increases in older persons and those with underlying disease, aging plumbing infrastructure,[†] and increased detection and reporting may play a role.

Figure 7. Incidence of legionellosis: Oregon vs. nationwide, 2002–2016



Mumps is an acute viral illness characterized by fever and swelling of the salivary glands, typically the parotids. Transmission is generally through respiratory droplets or direct contact with nasal secretions.

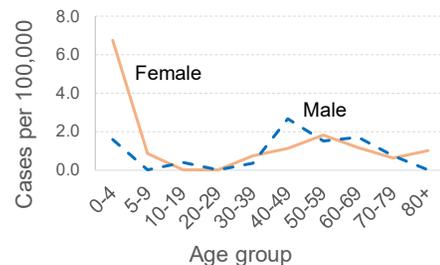
[†] building plumbing, that is

Oregon discontinued reporting this vaccine-preventable viral infection in 1981, but reestablished it on July 1, 2006, prompted by outbreaks. Twenty-seven cases were reported in Oregon during 2016 — 20 of them from Marion and Washington counties. Clusters broke out among Pacific Islanders and among middle- and high-school wrestlers. Among 16 cases <19 years of age, 15 were up-to-date on vaccination. The driving forces for the outbreaks in 2016 might have been a combination of imperfect vaccine effectiveness, waning immunity and intensity of exposure. Still, high vaccination coverage helps limit the size, duration and spread of mumps cases.

MOUNTAIN OF NTM

Oregon surveillance for extrapulmonary nontuberculous mycobacterial (NTM) disease started in January 2014. Case reporting is used to identify outbreaks and potential sources of acquisition, and to prevent further transmission (Figure 8).

Figure 8. Incidence of nontuberculous mycobacterial infection by age and sex; Oregon, 2016



NTM are environmental organisms, usually associated with water and soil. Extrapulmonary NTM disease presents as cutaneous, bone, joint, lymph node or central nervous system disease. Cutaneous infections typically result from either direct inoculation during trauma; surgical or medical procedures; exposures to whirlpool baths; or settings such as nail salons or tattoo procedures. The high rate of NTM infection in Oregon children <5 years of age is consistent with reports in the literature. These cases were predominately cervical lymphadenitis in otherwise healthy children.

Treatment is based upon the species identified and the site of infection. One hundred thirty-eight cases of extrapulmonary NTM were reported among Oregon residents from 2014–2016. The median case age was 51 (range 0–92) years; 72

(52%) were female; 46 (33%) were hospitalized at the time of specimen collection. Tissue and wound cultures accounted for 70 (51%) of the cases. *M. avium* complex accounted for 60 (43%); 16 of those were from lymph nodes in children 1–4 years of age.

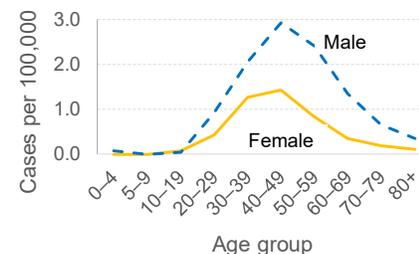
DOWN IN THE VALLEY—ACUTE HEPATITIDES

Implementation of routine vaccination of children against both hepatitis A and hepatitis B resulted in a dramatic decrease in their incidences in Oregon, with rates of each less than one per 100,000 persons during 2016.

Hepatitis A is spread through fecal-oral contact. Most cases in Oregon are “sporadic” and occur mainly in persons who travel outside the United States. In 2016, Oregon logged 15 cases of acute hepatitis A — approximately half the 27 cases reported in the previous year and near the historic low of nine reached in 2012. Six of the 15 cases were acquired by venturing outside of Oregon or from household members with foreign travel, often to countries with high rates of hepatitis A. Eight cases had no identifiable risk factor for hepatitis A. Eight cases were >40 years of age.

Hepatitis B is spread primarily through contact with blood or semen, usually through sexual contact, sharing needles or childbirth. Acute hepatitis B rates have been declining in Oregon since the hepatitis B vaccine was licensed in 1982. Local health departments investigated 21 acute cases in 2016. Rates were highest in men ages 30–69 years (Figure 9). The most commonly reported risk factors included potential health care exposure and men who have sex with men. No risk factor was identified for 23% of cases. Nationwide, the successful integration of hepatitis B vaccine into the immunization schedule has contributed to a 96% decline in the

Figure 9. Incidence of acute hepatitis B by age and sex, Oregon, 2007–2016

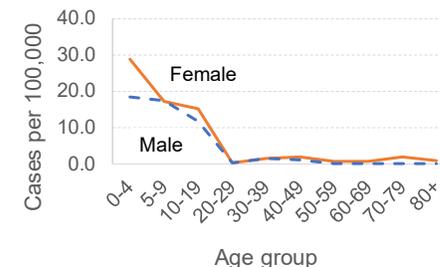


incidence of acute hepatitis B among children and adolescents.

PERTUSSIS PETERING OUT

Pertussis is a highly contagious, acute respiratory infection caused by the bacterium *Bordetella pertussis*. It is transmitted from person to person through contact with respiratory secretions (i.e., droplet transmission). The disease is most severe in infants and young children, many of whom suffer the intense fits of coughing that may end with an inspiratory “whoop.” In 2016, the reported pertussis incidence in Oregon was 4.7/100,000 (Figure 10) — the lowest since 2008. The incidence is highest among infants and adolescents. Immunity wanes with time, so adolescents and adults need a Tdap booster dose, both to protect themselves and to avoid spreading it to vulnerable infants. Women should receive Tdap during each pregnancy, preferably at 27–36 weeks’ gestation, so they can develop antibodies to pertussis and pass them to their babies before birth.

Figure 10. Incidence of pertussis by age and sex, Oregon, 2016



FOR MORE INFORMATION

- [2016 Communicable Disease Annual Report \(pdf\)](#)
- [Case counts by county of residence \(2016\) \(pdf\)](#)
- [Select diseases by year \(1995–2016\) \(pdf\)](#)



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