Selected Reportable Communicable Disease Summary

2010 State of Oregon

Oregon Health Authority
PUBLIC HEALTH DIVISION

Selected Reportable Communicable Disease Summary 2010 State of Oregon

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About surveillance data

Oregon law specifies diseases of public health importance that must be reported to local public health authorities by diagnostic laboratories and health care professionals. This report reflects reporting laws in effect for 2010. In general, local public health officials investigate reports of a communicable disease in order to characterize the illness and collect demographic information about the case, to identify possible sources of the infection, and to take steps to prevent further transmission. Basic information about each case is forwarded to the Oregon Public Health Division. In some cases (e.g., *Salmonella* infection), laboratories are required to forward bacterial isolates to the Oregon State Public Health Laboratory for sub-typing. Together, these epidemiologic and laboratory data constitute our communicable disease surveillance system; data from 2010 and trends from recent years are summarized in this report.

But caveat lector! Disease surveillance data have many limitations.

First, for most diseases, reported cases represent but a fraction of the true number. The most important reason for this is that many patients — especially those with mild disease — do not present themselves for medical care. Even if they do, the health care professional may not order a test to identify the causative microorganism. The reader may be scandalized to learn that not every reportable disease gets reported as the law requires. Cases are "lost" to surveillance along each step of the path from patient to physician to laboratory to public health department; in the case of salmonellosis, for example, reported cases are estimated to account for only about 3% of the true number.

Second, cases that do get reported are a skewed sample of the total. More severe illnesses (e.g., meningococcal disease) are more likely to be reported than milder illnesses. Infection with hepatitis A virus is more likely to cause symptoms (and those symptoms are more likely to be severe) in adults than in children. Testing is not random; clinicians are more likely to test stool from children with bloody diarrhea for *E. coli* O157 than they are to test stool from adults with bloody diarrhea. Health care professionals may be more inclined to report contagious diseases such as tuberculosis — where the public health importance of doing so is obvious — than they are to report non-contagious diseases such as Lyme disease. Outbreaks of disease or media coverage about a particular disease can greatly increase testing and reporting rates.

Population estimates for rate calculations were obtained from the Center for Population Research at Portland State University (www.pdx.edu/prc). Using rates instead of case counts allows for comparisons between populations of different sizes — e.g., United States versus Oregon. Rates are usually reported as cases per 100,000 persons per year. However, if the population in which the rate is calculated is very small (e.g., in "frontier" counties in Oregon), a case or two might mean the difference between a rate of zero and a very high rate. To compensate for this, some of our maps showing rates by county give an average over multiple years of data or report case counts per county. Even with this aggregation, for some conditions,

the number of cases remains small. In addition, the rates presented are not adjusted for age due to the small number of cases in each age group.

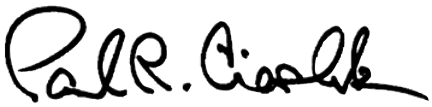
Incidence is annualized by onset date unless otherwise stated. Case counts include both confirmed and presumptive cases.

Also keep in mind that cases are assigned to the county of residence at the time of the report — not to the county in which the case received medical care, or the county where the exposure to infection occurred.

Even with these limitations, surveillance data are valuable in a variety of ways. They help identify demographic groups at higher risk of illness. They allow analysis of disease trends and identify outbreaks of disease.

With this in mind, we present the 2010 communicable disease summary. We present 23 years of data whenever possible. For most of the diseases, we include the following: figures showing case counts by year for the past 23 years; aggregate case counts by month to demonstrate any seasonal trends; incidence by age and sex; incidence in Oregon compared to national incidence over the past 23 years; and incidence by county. When appropriate, additional data on subtypes or risk factors for infection are included. At the end of this report you will find a tally of disease outbreaks reported in the past year, a summary of enhanced data on gastroenteritis outbreaks, a summary table of statewide case counts over the past 20 years and disease totals by county.

We hope that, with all their limitations, you will find these data useful. If you have additional questions, please call our epidemiology staff at 971-673-1111 or email ohd.acdp@state.or.us.



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AIDS and HIV infection

Human immunodeficiency virus (HIV) is spread by having sex, sharing injection drug equipment, or receiving a transfusion or transplant from an infected person. It can be spread from mother to fetus, to infant at the time of delivery, or by breastfeeding. Rarely, HIV spreads by inadvertent exposure to bodily fluids of an infected person such as a contaminated needle stick in a health care worker. The acquired immunodeficiency syndrome (AIDS) represents the late stage of HIV infection with immune system impairment, marked by low CD4-positive lymphocyte counts and opportunistic or atypical infections. There is no cure for HIV infection, but treatment can prolong life and reduce transmission.

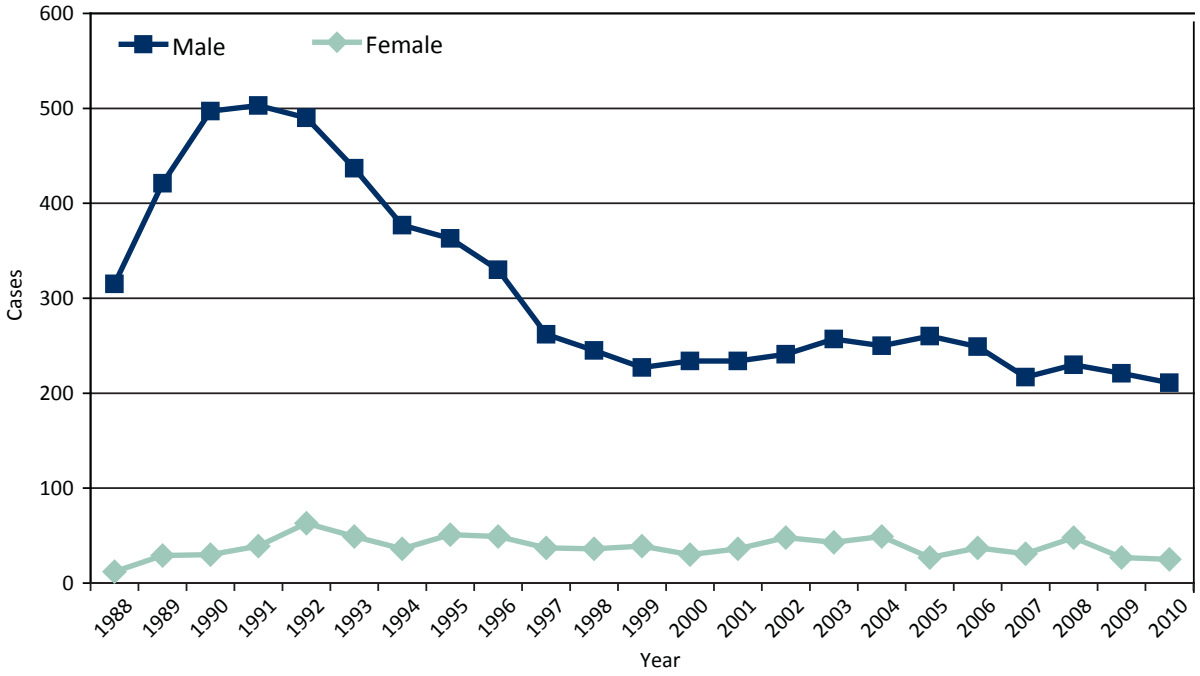
HIV infection can be avoided by abstaining from sex outside of a monogamous relationship with an uninfected partner and by not injecting recreational drugs. Using a condom during intercourse and not sharing injection drug equipment also reduce risk of acquiring HIV. A pregnant woman who is infected with HIV can minimize transmission of infection to her fetus by taking medication during pregnancy and refraining from breastfeeding. Caesarean section may also prevent transmission when the mother's infection is not well controlled.

As of May 2011, 8,743 cases of HIV infection (including cases that had, and cases that had not yet progressed to AIDS) had been diagnosed among Oregon residents between 1981 and 2010 and reported to the Oregon HIV/STD/TB Program; 3,516 of these case-patients had died, leaving 5,227 living with HIV infection. Approximately 64% of these infections had progressed to AIDS by the end of 2010. In addition, approximately 1,389 people are estimated to be infected, but not yet diagnosed; about 2,400 people with HIV infection who resided in another state at the time of their diagnosis had moved to Oregon by the end of 2010.

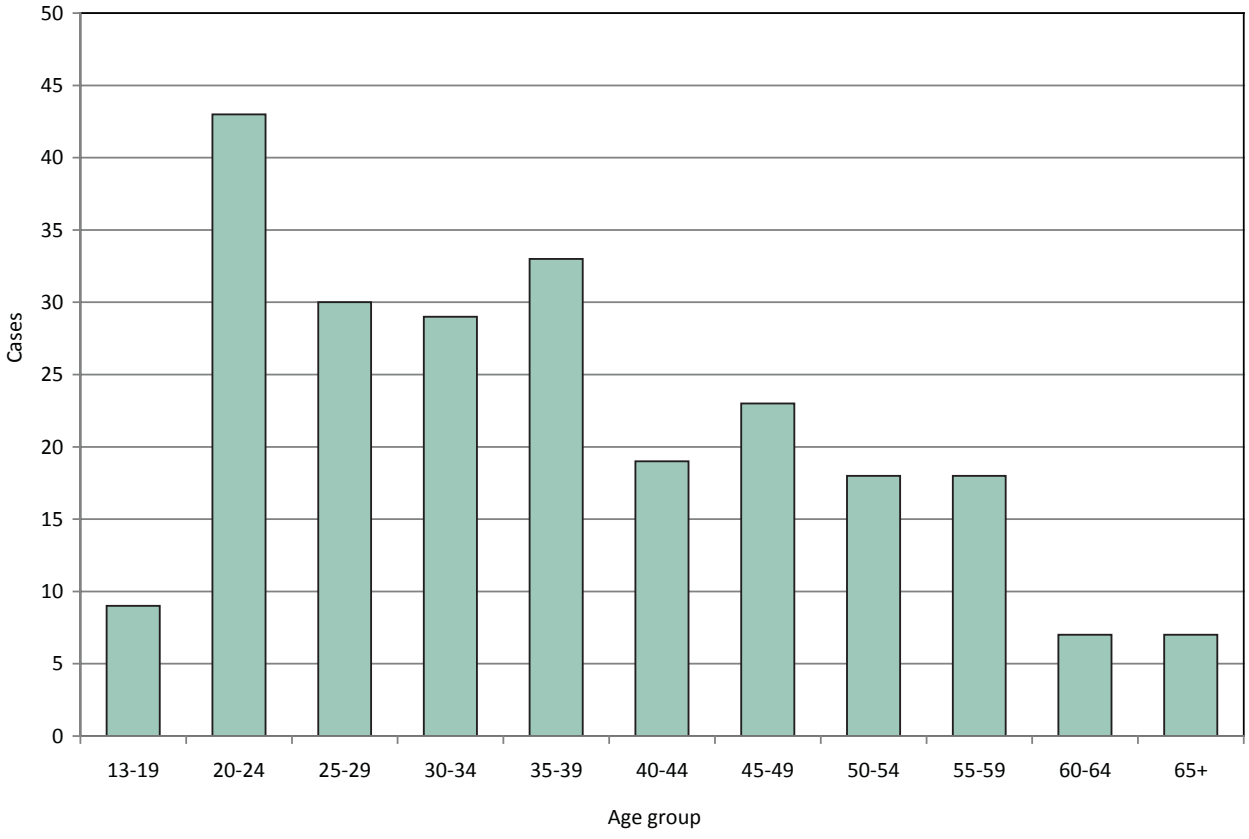
Men accounted for 88% of prevalent cases. Whites accounted for 78%, blacks and/or African Americans, 7%, and Hispanics, 12%. Among men, the five year average annual incidence of new HIV diagnoses was 10.6 cases per 100,000 whites, 27.3 cases per 100,000 blacks and/or African Americans and 18.7 per 100,000 among Hispanics. Among females, these rates were 1.2, 13.7, and 3.1 respectively.

During 2006–2010, 70% of infected men in Oregon acquired their infection by sex with other men, while 9% of men with HIV acknowledged both sex with other men and previous injection drug use, obscuring their most likely transmission mode. Injection drug use was the most likely transmission mode for 6% of males and heterosexual transmission the most likely mode for 5%. Among women with HIV infection, heterosexual transmission was believed to be the most likely mode for 75% and injection drug use for 20%.

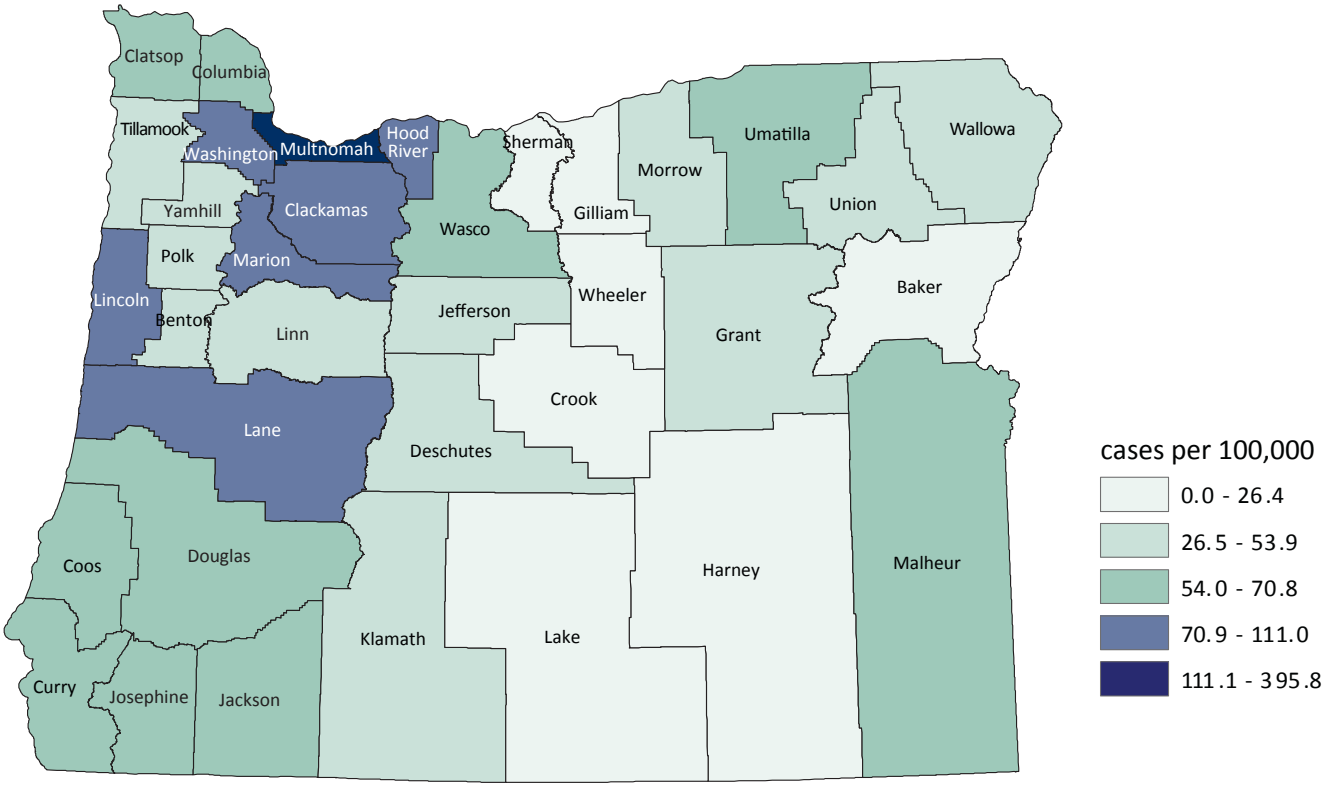
HIV infection diagnoses in Oregon by sex and year of diagnosis: 1981–2010



New cases of HIV infection by age at diagnosis: Oregon, 2010



Persons living with HIV or AIDS by county of residence: Oregon, 2010



Campylobacteriosis

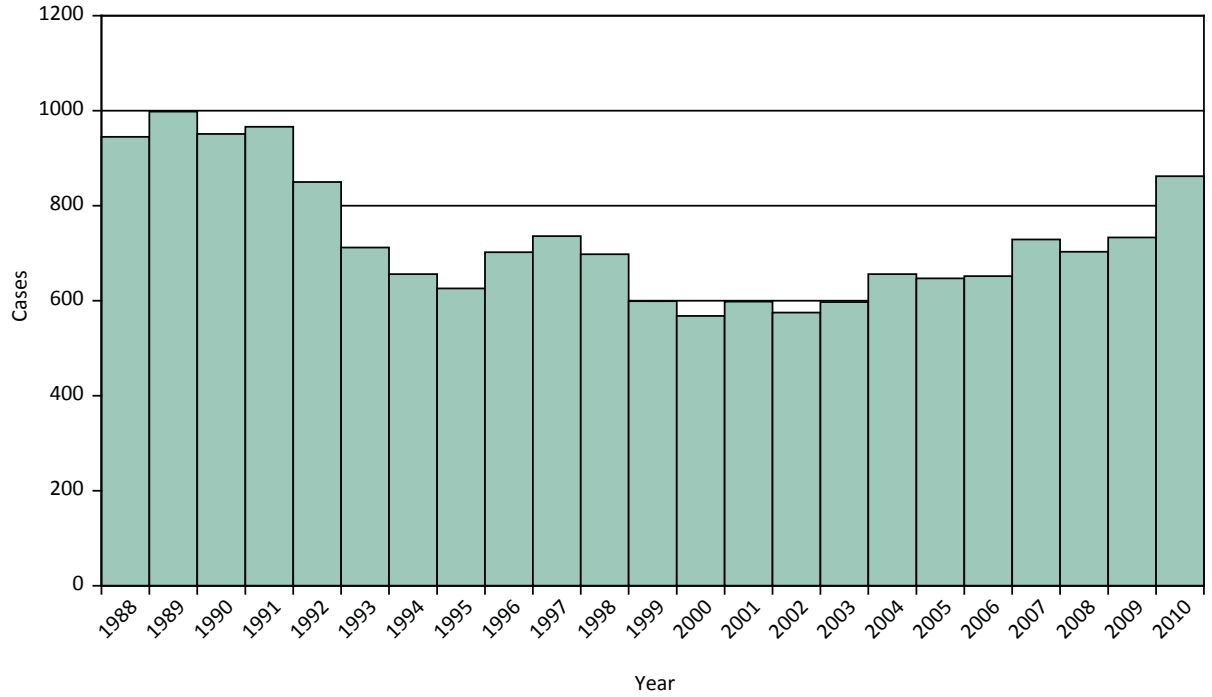
Campylobacteriosis is caused by a Gram-negative bacterium. It is characterized by acute onset of diarrhea, vomiting, abdominal pain, fever and malaise. Campylobacteriosis is the most common bacterial enteric infection reported. It is of worldwide epidemiologic importance due to the fecal-oral route of infection and the extensive reservoir of the organism in both wild and domestic animals.

Children aged 0–4 years have the highest rates of illness. Infections occur year-round in Oregon, with peak incidence in the summer months. Rates are highest in Malheur, Harney, and Lake counties.

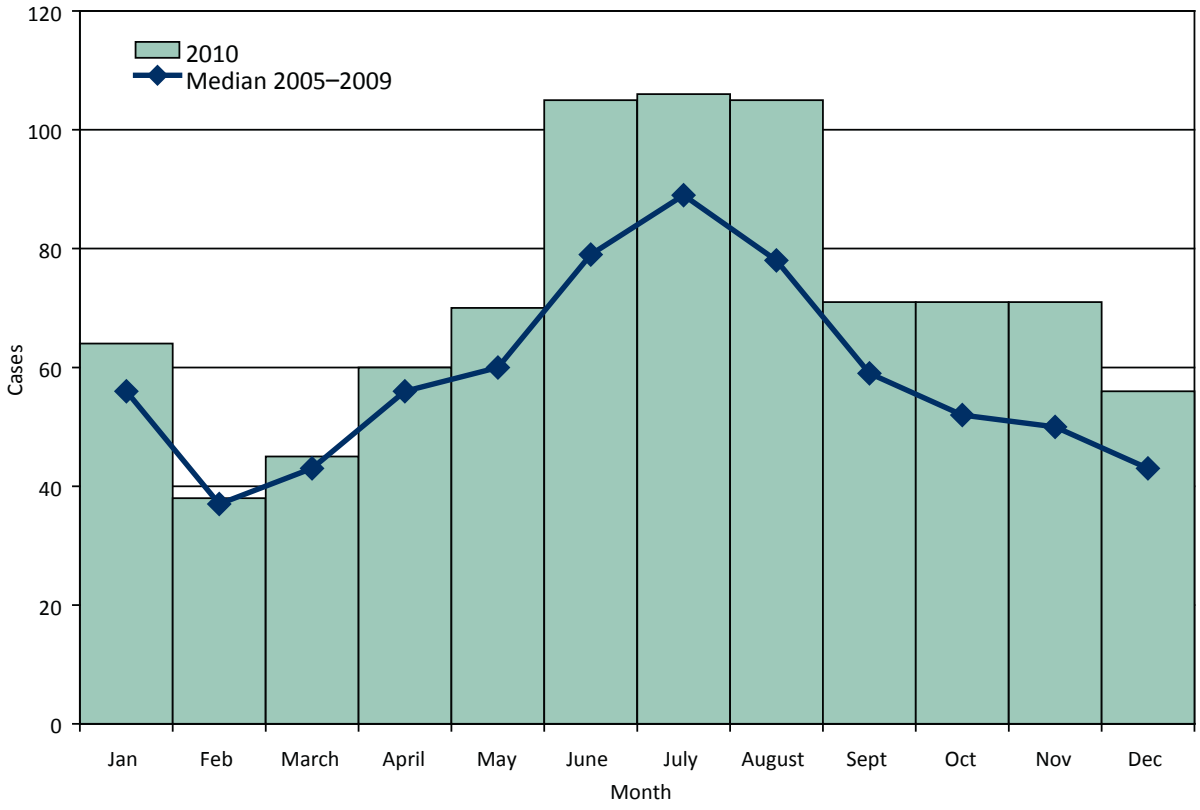
Campylobacteriosis is not a nationally reportable condition, but U.S. estimates from the FoodNet program (of which Oregon is a member) indicate that campylobacteriosis increased 2% in 2008–2009.

Most illnesses are sporadic, but outbreaks may be associated with undercooked meat (often chicken), unpasteurized milk, direct contact with animals or non-chlorinated water. Since 1998, eight outbreaks of campylobacteriosis have been investigated: three foodborne, two waterborne, two from animal contact, and one of unknown etiology. Proper food handling and water treatment, along with good hygienic practices (hand washing!) are the keys to prevention. No outbreaks of campylobacteriosis were reported in 2010.

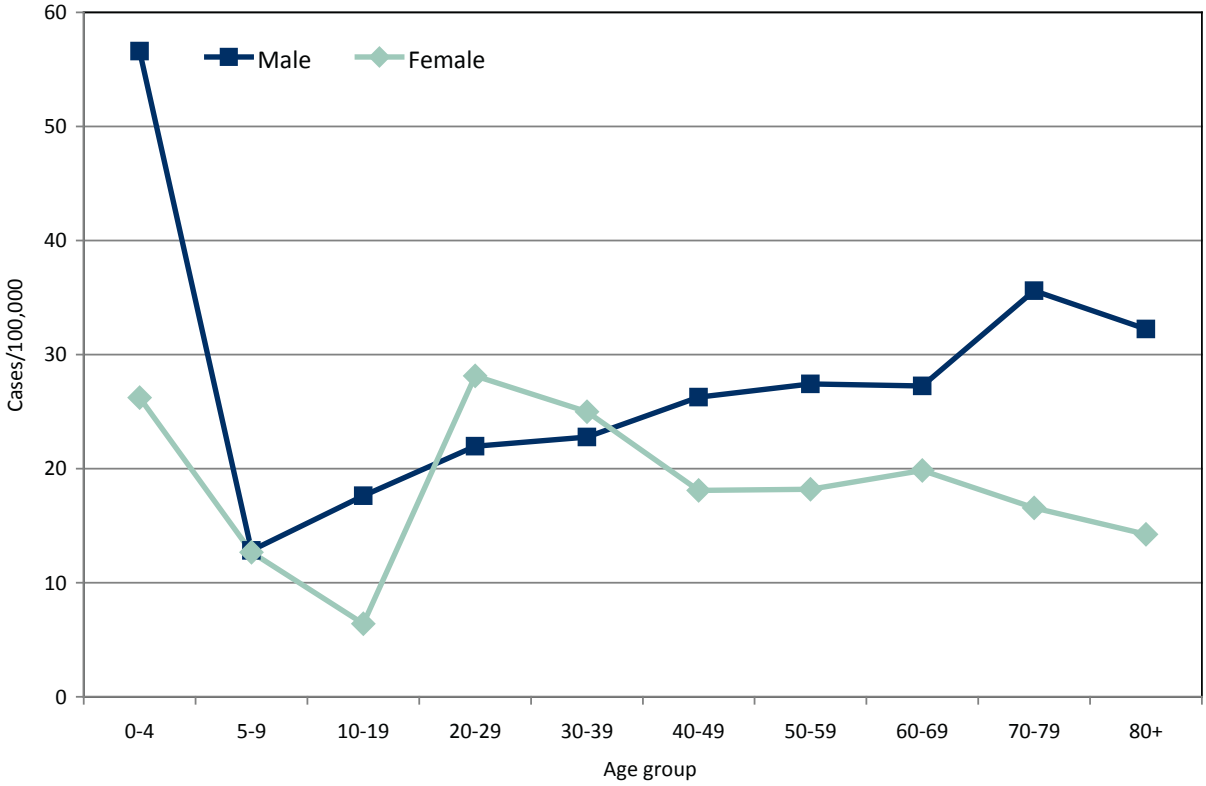
Campylobacteriosis by year: Oregon, 1988–2010



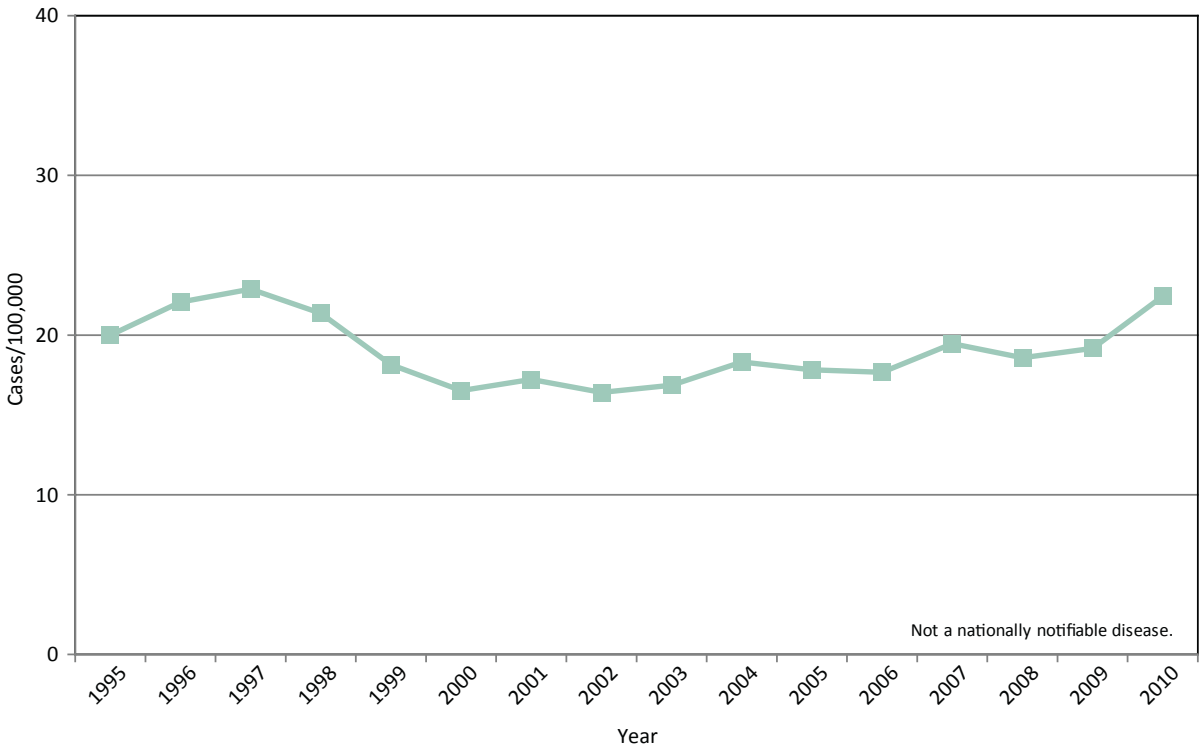
Campylobacteriosis by report month: Oregon, 2010



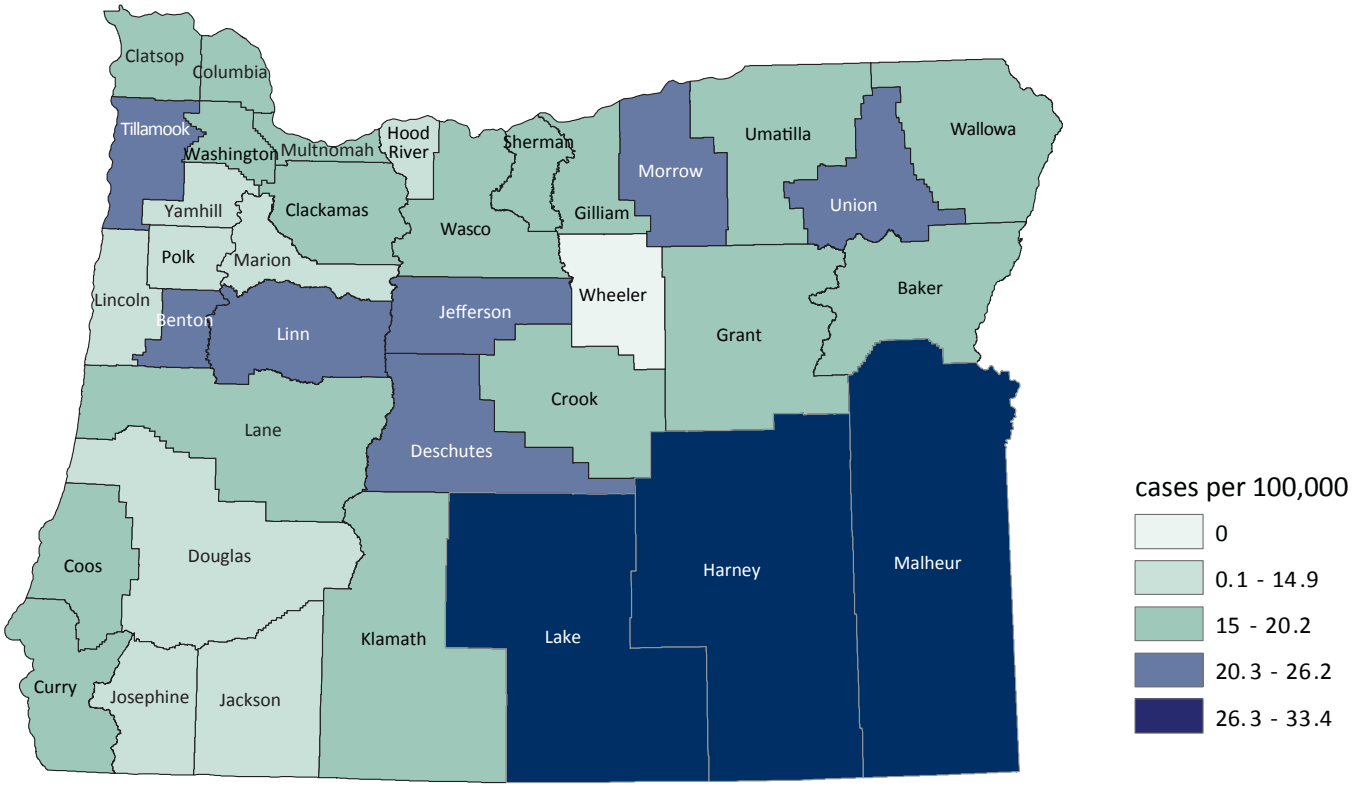
Incidence of campylobacteriosis by age and sex: Oregon, 2010



Incidence of campylobacteriosis: Oregon, 1995–2010



Incidence of campylobacteriosis by county of residence: Oregon, 2000–2010

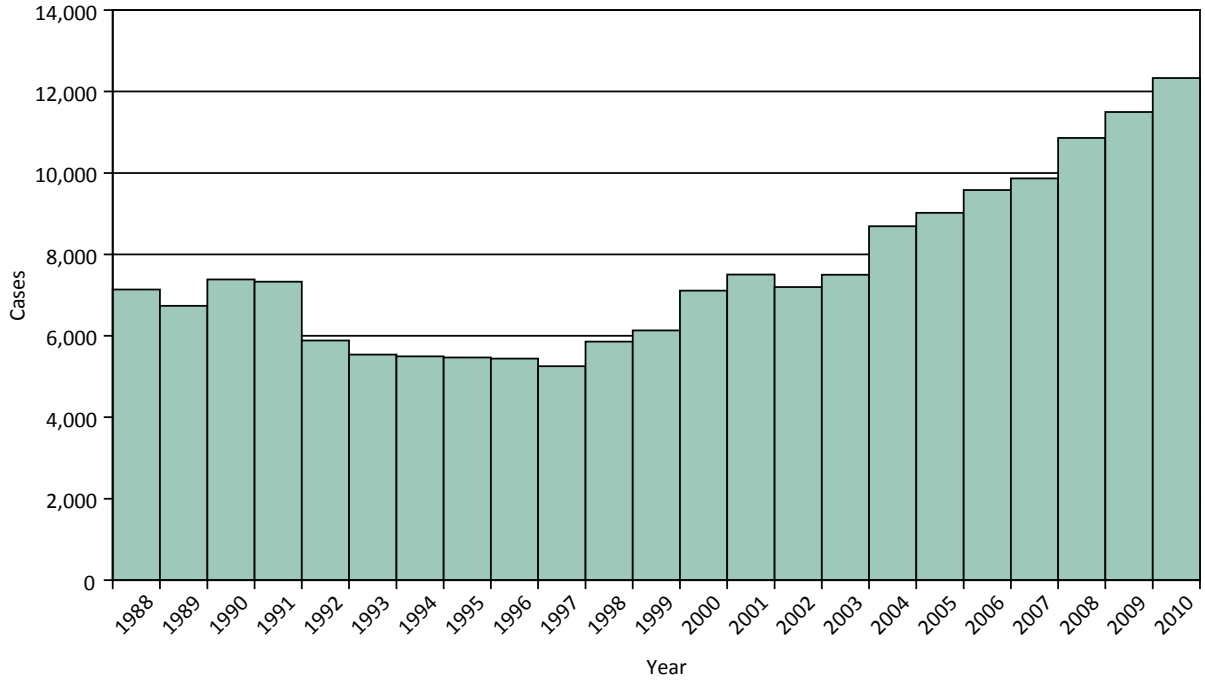


Chlamydiosis

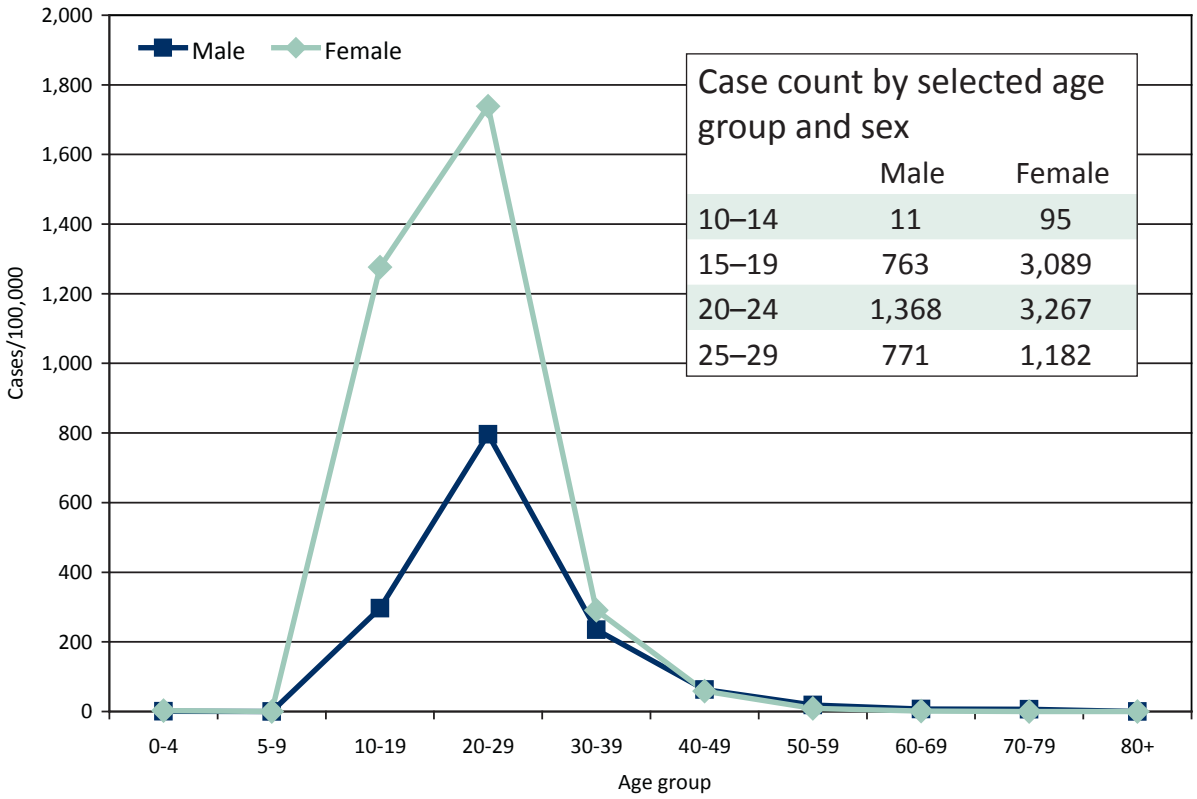
Chlamydia trachomatis is Oregon's most commonly reported infection. In 2010, there were 12,333 cases reported for a rate of 320.8 cases per 100,000 population. The highest rates of infection in 2010 were observed in females aged 20–24 followed closely by females aged 15–19. As with gonorrhea and syphilis, chlamydial infections are transmitted by vaginal, rectal and oral sexual contact. Chlamydiosis may be prevented by abstaining from sexual contact or only having sex with one uninfected sex partner. Those who are sexually active outside of a mutually monogamous relationship can lower their risks of infection by using a condom when engaging in sexual activity.

Chlamydial infections are likely to be silent, with neither men nor women having symptoms. However, reproductive health complications, especially among women, may lead to infertility and an increased risk of tubal pregnancy.

Chlamydiosis by year: Oregon, 1988–2010



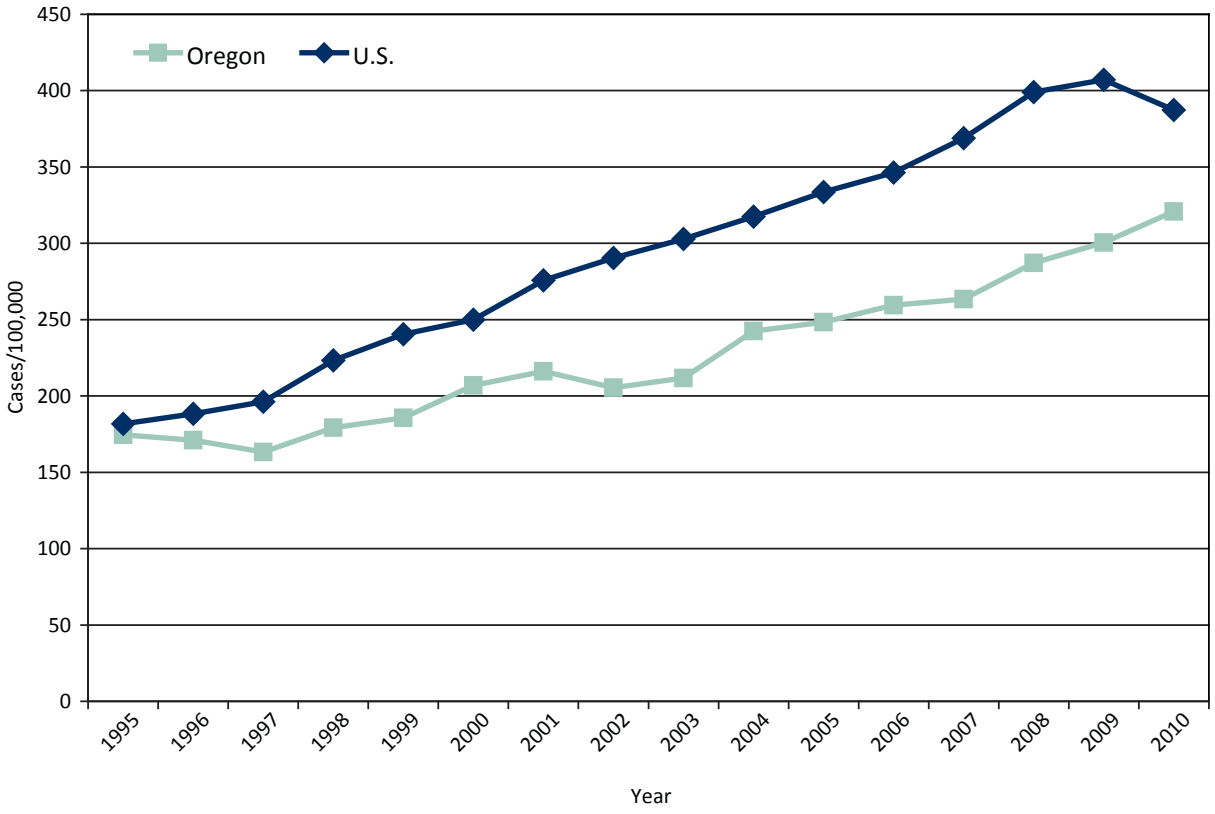
Incidence of chlamydiosis by age and sex: Oregon, 2010



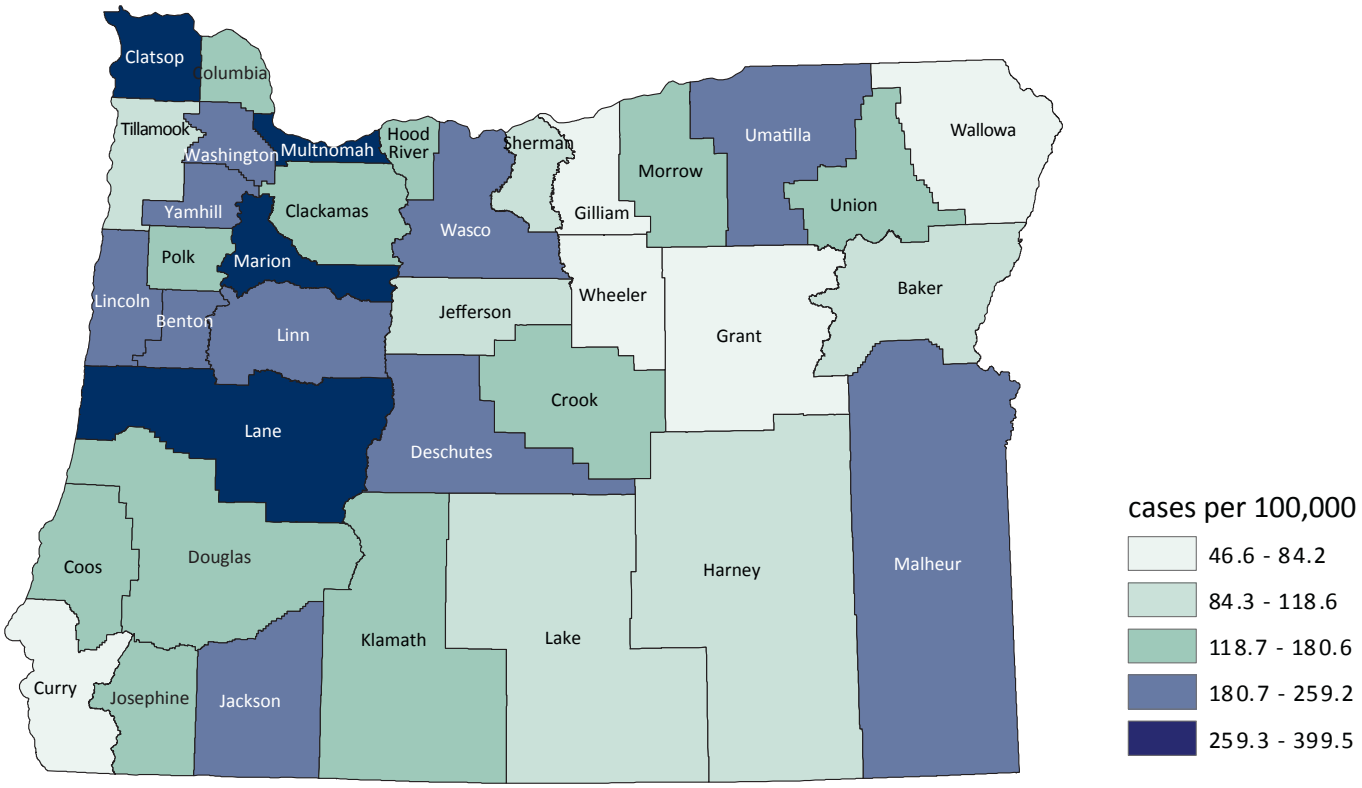
Case count by selected age group and sex

	Male	Female
10–14	11	95
15–19	763	3,089
20–24	1,368	3,267
25–29	771	1,182

Incidence of chlamydiosis: Oregon vs. nationwide, 1995–2010



Incidence of chlamydiosis by county of residence: Oregon, 2000–2010



Cryptosporidiosis

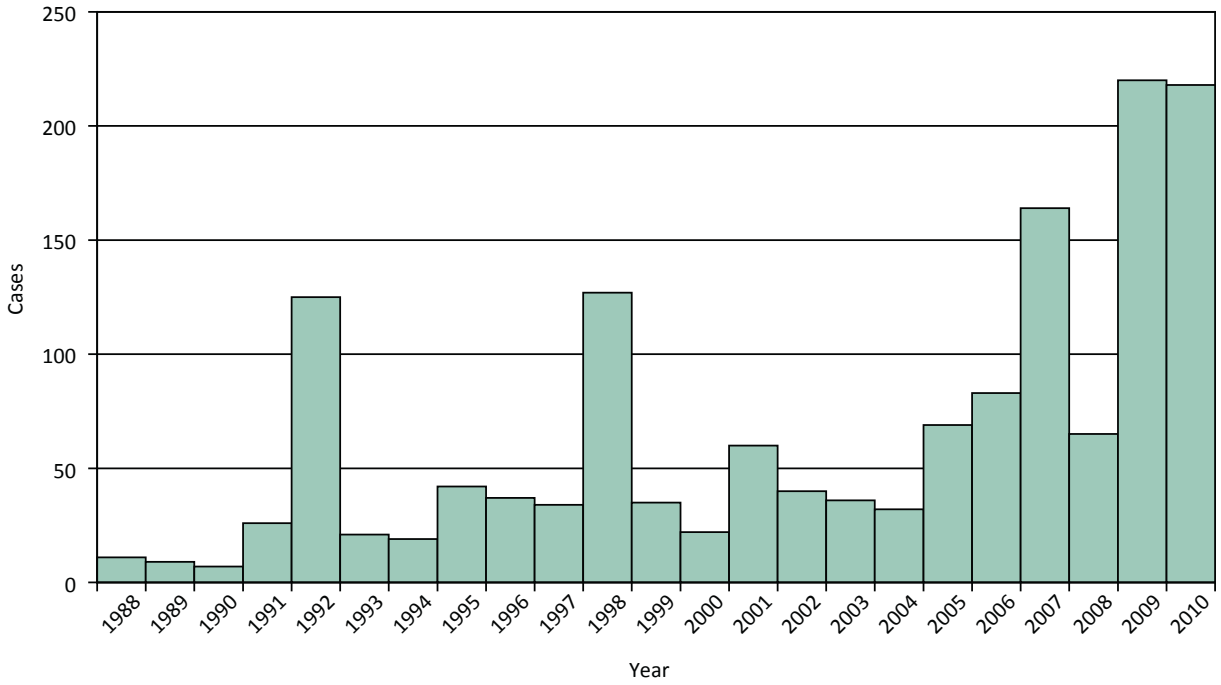
Cryptosporidiosis in humans results from infection with protozoal parasites in the genus *Cryptosporidium* — most commonly *C. hominis* or *C. parvum*. Symptomatic infections are characterized by watery diarrhea and abdominal cramps. Symptoms typically resolve in one to four weeks in immunocompetent persons. Infections can be difficult to control among the immunocompromised. Studies suggest that the prevalence of cryptosporidiosis among young children, particularly those in large child care facilities, is surprisingly high. Many of these infections are asymptomatic.

In Oregon the rate of infection with *Cryptosporidium* has been increasing steadily since 2005, despite a slight lull in cases in 2008. Nationally infections were on the rise in the early millennium but incidence has been decreasing since 2008. Cases occur year-round with peak reports of illness in August, coincident with increases in exposure to recreational water.

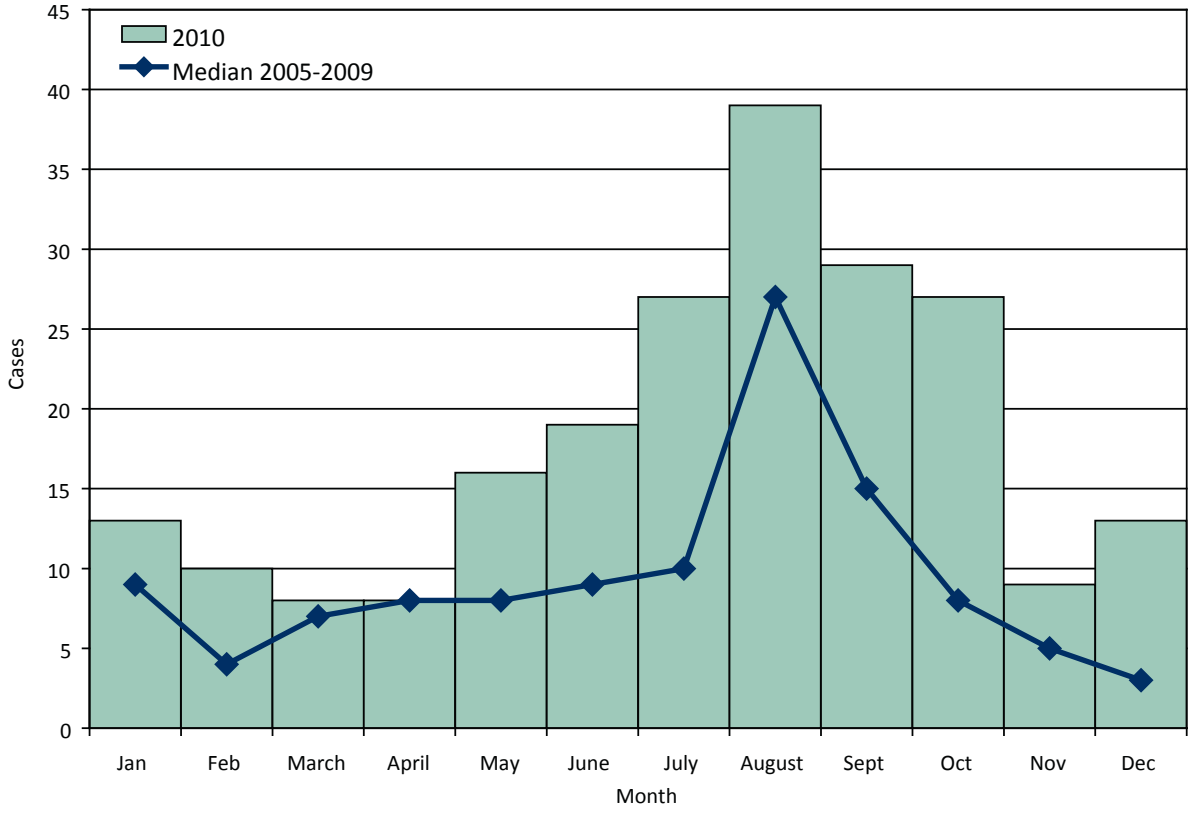
New anitgen tests for *Cryptosporidium* might be playing a role in these fluctuations. In 2010, 218 cases were reported, down from an Oregon record of 220 cases in 2009. In 2007, the Oregon investigative guidelines were changed to reflect the increasing numbers of cases; previously, investigations were required only for abnormally high case counts. All cases are now routinely investigated to identify the source of infection. Two recreational-water associated outbreaks in 2010 accounted for 30 Oregon cases.

Given the number of asymptomatic and undiagnosed infections, surveillance data can be difficult to interpret. However, these data have been used to identify a number of outbreaks over the years, most commonly associated with child care or water (both drinking and recreational).

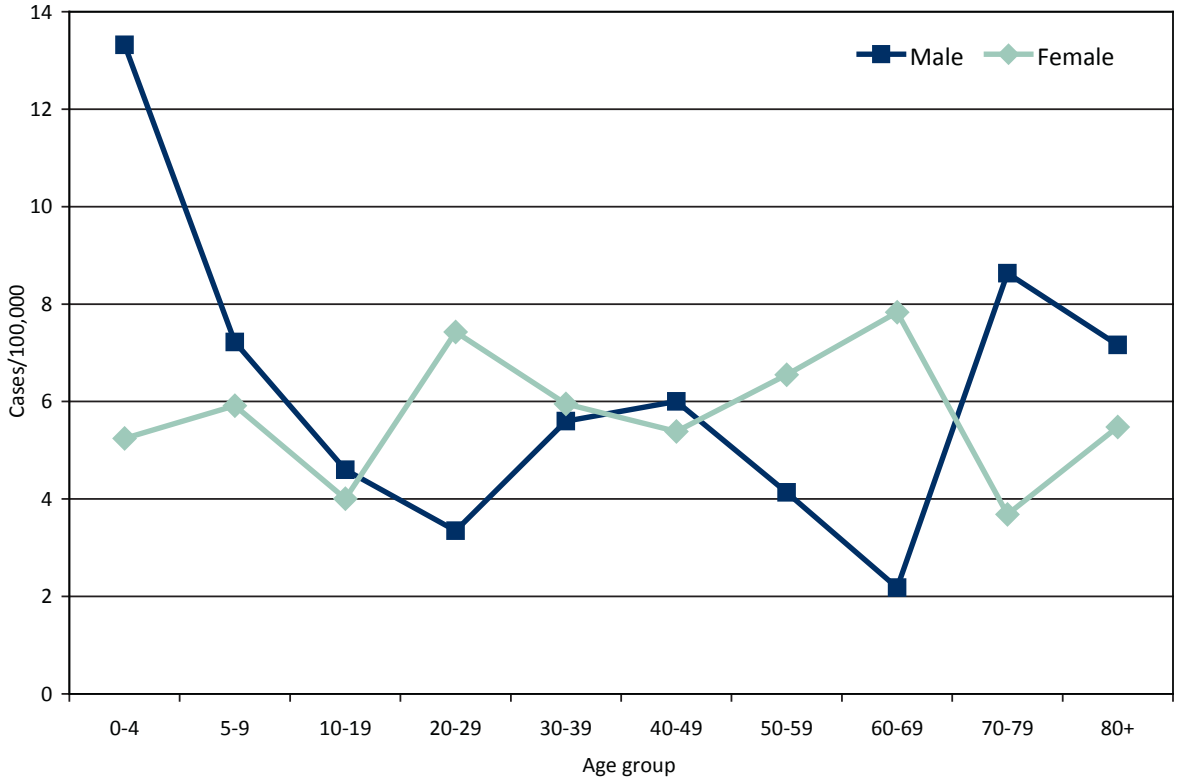
Cryptosporidiosis by year: Oregon, 1988–2010



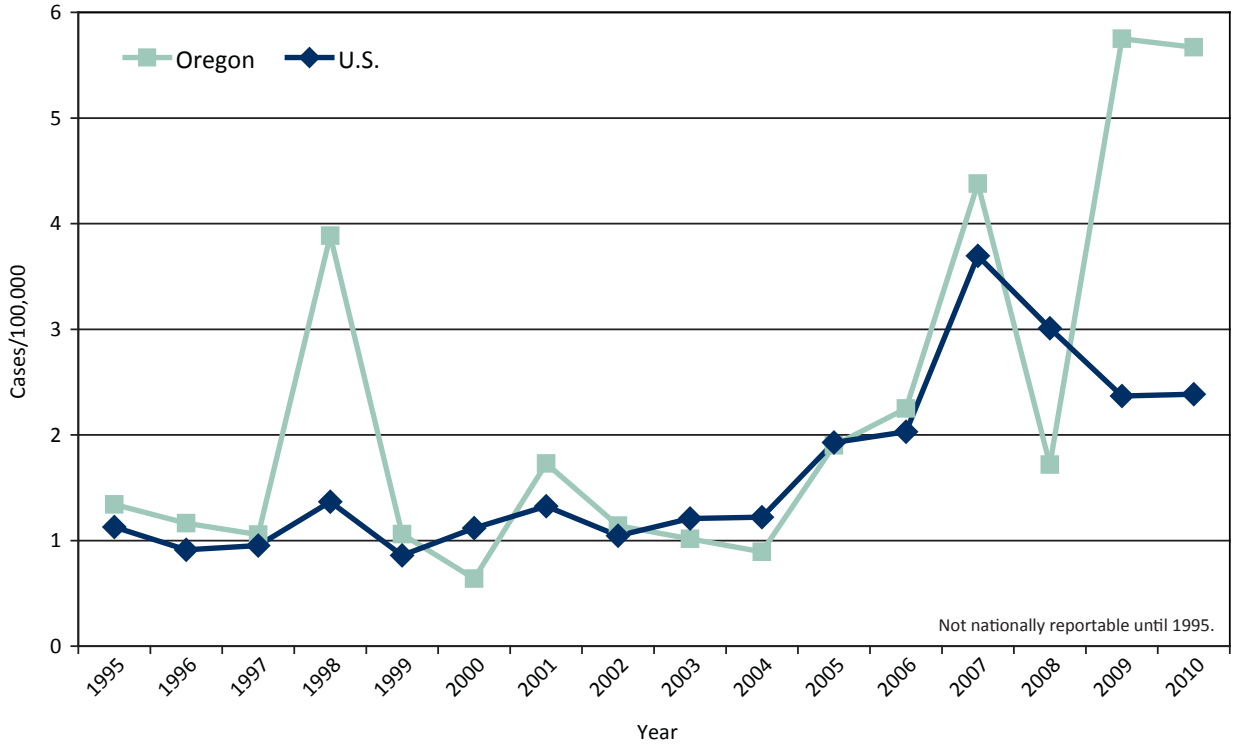
Cryptosporidiosis by onset month: Oregon, 2010



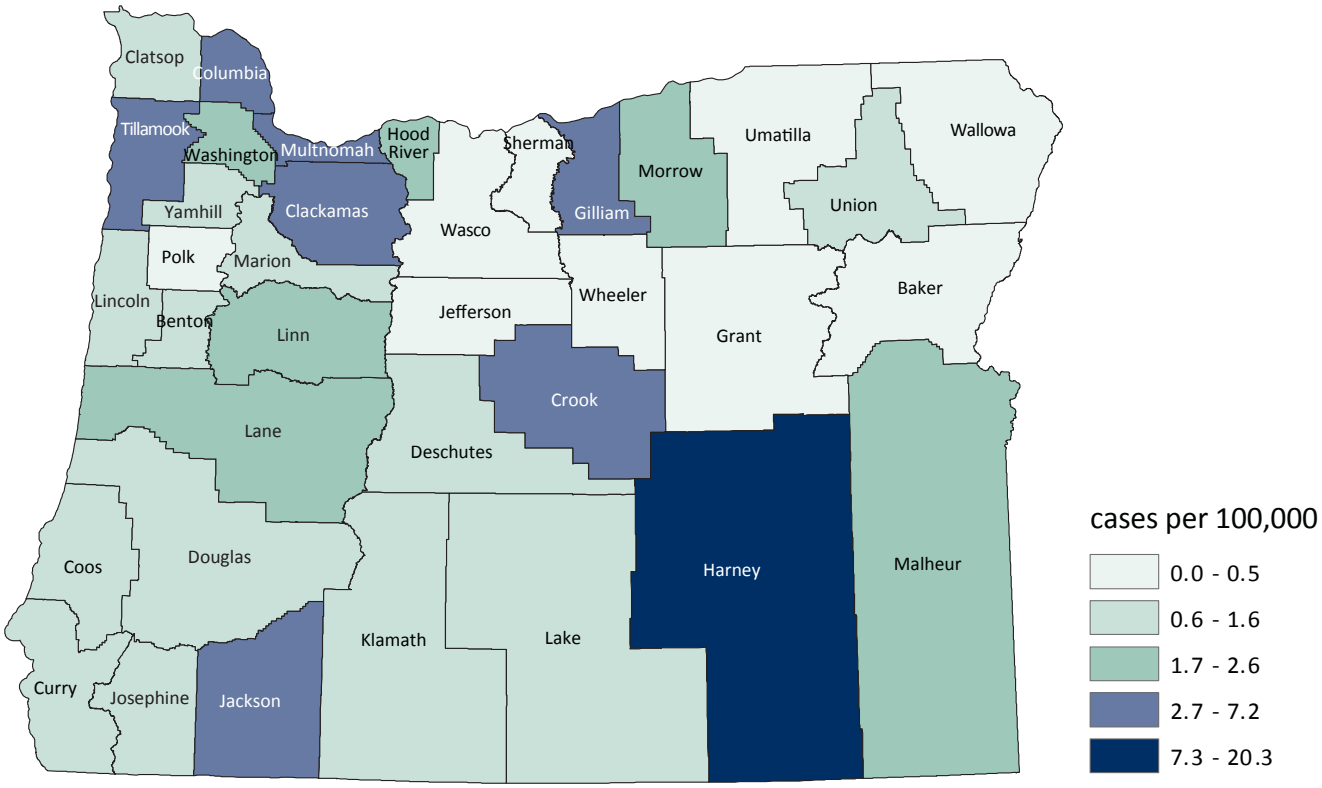
Incidence of cryptosporidiosis by age and sex: Oregon, 2010



Incidence of cryptosporidiosis: Oregon vs. nationwide, 1995–2010



Incidence of cryptosporidiosis by county of residence: Oregon, 2000–2010



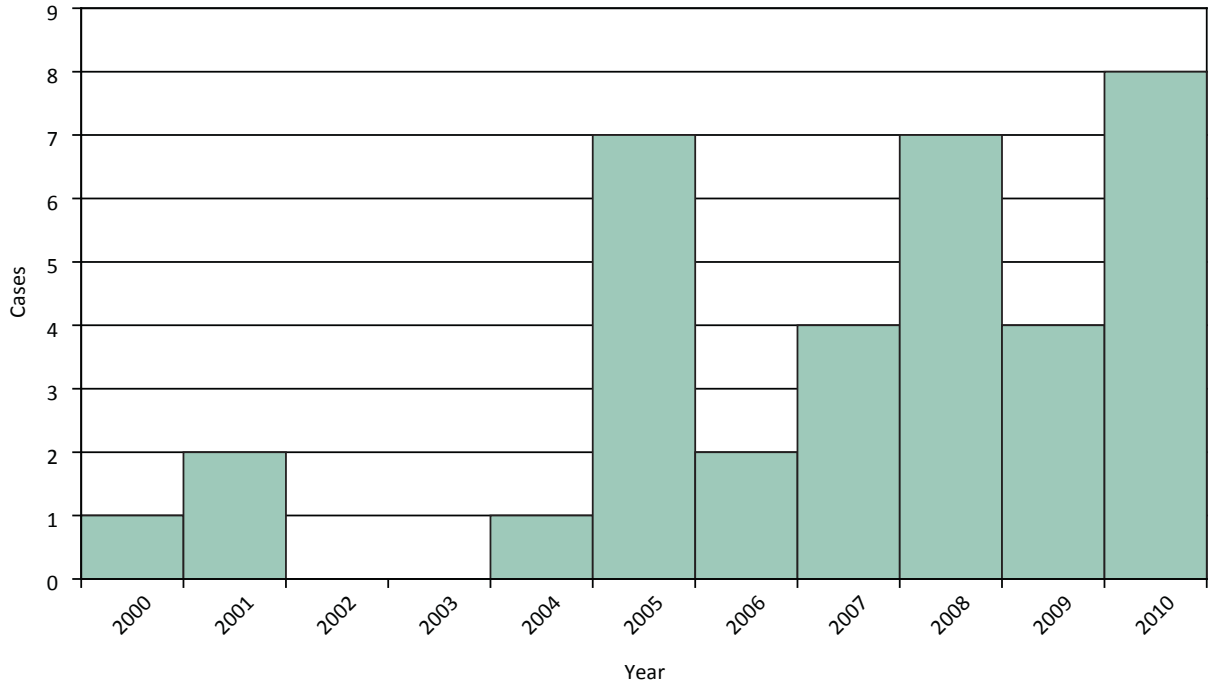
Dengue fever

Dengue is a mosquito-borne viral infection. It is caused by a *flavivirus* (the same genus as West Nile virus and yellow fever) and there are four serotypes. We don't have evidence of transmission here in Oregon. The typical vectors, *Aedes albopictus* and *Aedes aegypti*, are not native to Oregon. The disease is limited primarily to the tropics and sub-tropics.

Symptom severity ranges from sub-clinical, asymptomatic infections (the norm) to high fever, headache, muscle aches and rash. A subset of patients may develop frank hemorrhagic fever, with bleeding diathesis and shock. There is no immunization available and treatment is supportive.

Eight cases were reported in 2010.

Dengue infection by year: Oregon, 2000–2010



Escherichia coli O157 and other Shiga toxin producing *Escherichia coli* (STEC) infections

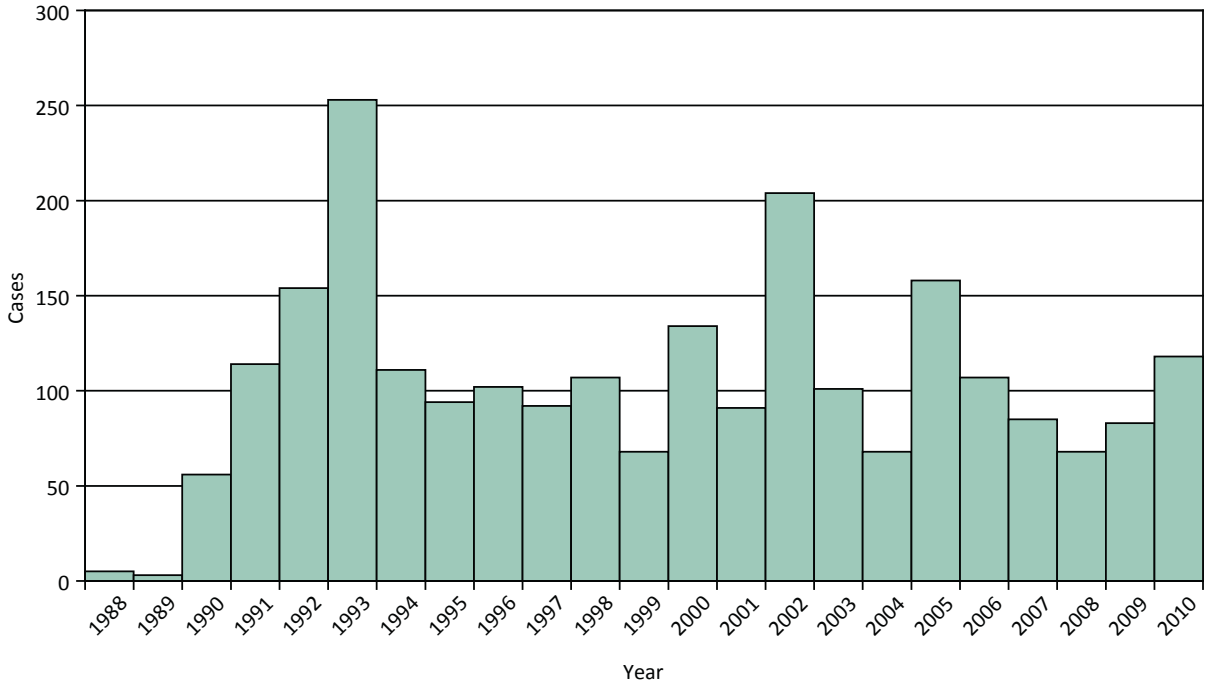
E. coli O157 (O157) has become one of the most feared common causes of infectious diarrhea. Oregon has been the setting for many O157 outbreaks, and investigations of those outbreaks combined with the analysis of other surveillance information have contributed greatly to our understanding of this pathogen. Spread by the fecal-oral route, O157 has a number of animal reservoirs, the most important of which are ruminants, including cattle, goats, sheep, deer and elk. Transmission often occurs from consumption of contaminated food or water, as well as direct person-to-person spread.

Mid-to-late summer is the peak season for *E. coli* O157 infections. The overall number of STEC cases increased from 83 in 2009 to 118 in 2010. Most of that trend was driven by increasing recognition of non-O157 serotypes; the numbers for O157 infections specifically changed very little (65 to 72). More labs are testing for the presence of Shiga toxin rather than just O157. Unfortunately, at the same time many labs are dropping culture-based methods, leaving clinicians (and epidemiologists) in the dark as to the specifics of the etiologic agent, and putting more of the diagnostic burden on the public health reference lab.

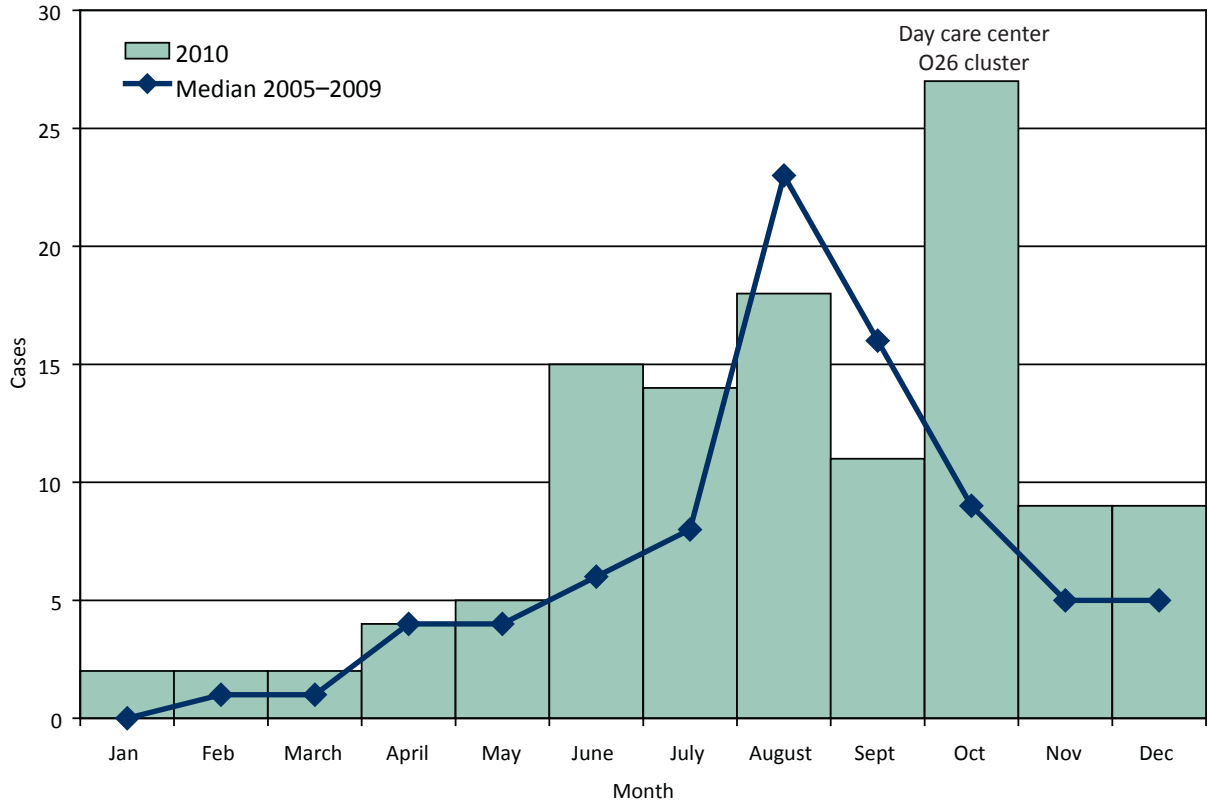
We investigated eight clusters of STEC infections in 2010: seven O157 outbreaks and one cluster of O26 infections—the latter the largest in US history (which turns out to be not saying much, and only a minority of the infected children at this day care center were even symptomatic, much less seriously so). One cluster with 11 cases was presumptively foodborne, but no source was identified. One very interesting cluster was traced to consumption of artisanal cheese from Washington state. Only a single Oregon case led to the unraveling of that mystery and unfortunately also to the untimely end of that producer's storied career.

Non-O157 STEC are a small but growing proportion of the problem, with increasing use of Shiga-toxin screening tests driving that trend. In 2010, 55 (27.5%) of 200 STEC for which the serotype had been determined were not O157, up from 12% in 2008–2009. The most common serogroups, other than O157, remain O26, O121, O111 and O103. No cases of O104 infection (the serogroup behind the massive 2011 German outbreak) have ever been seen in Oregon. Eternal vigilance is the price of freedom.

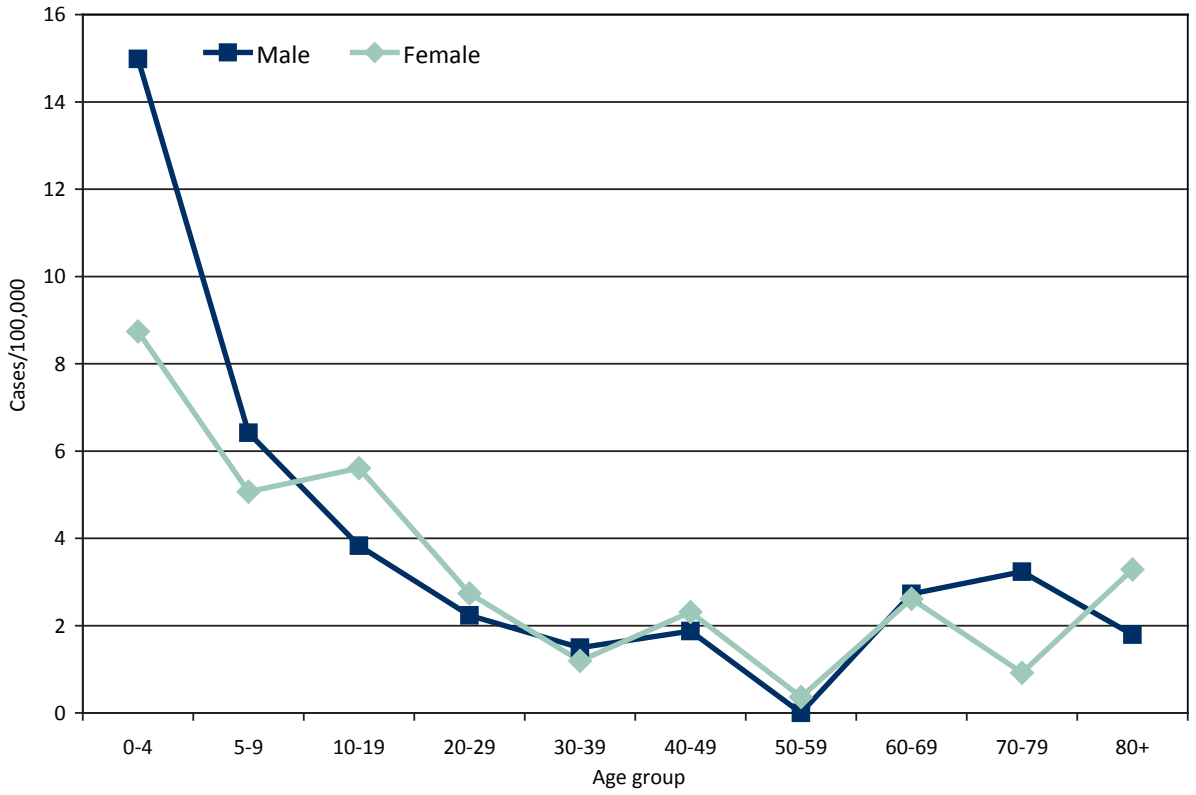
STEC infection by year: Oregon, 1988–2010



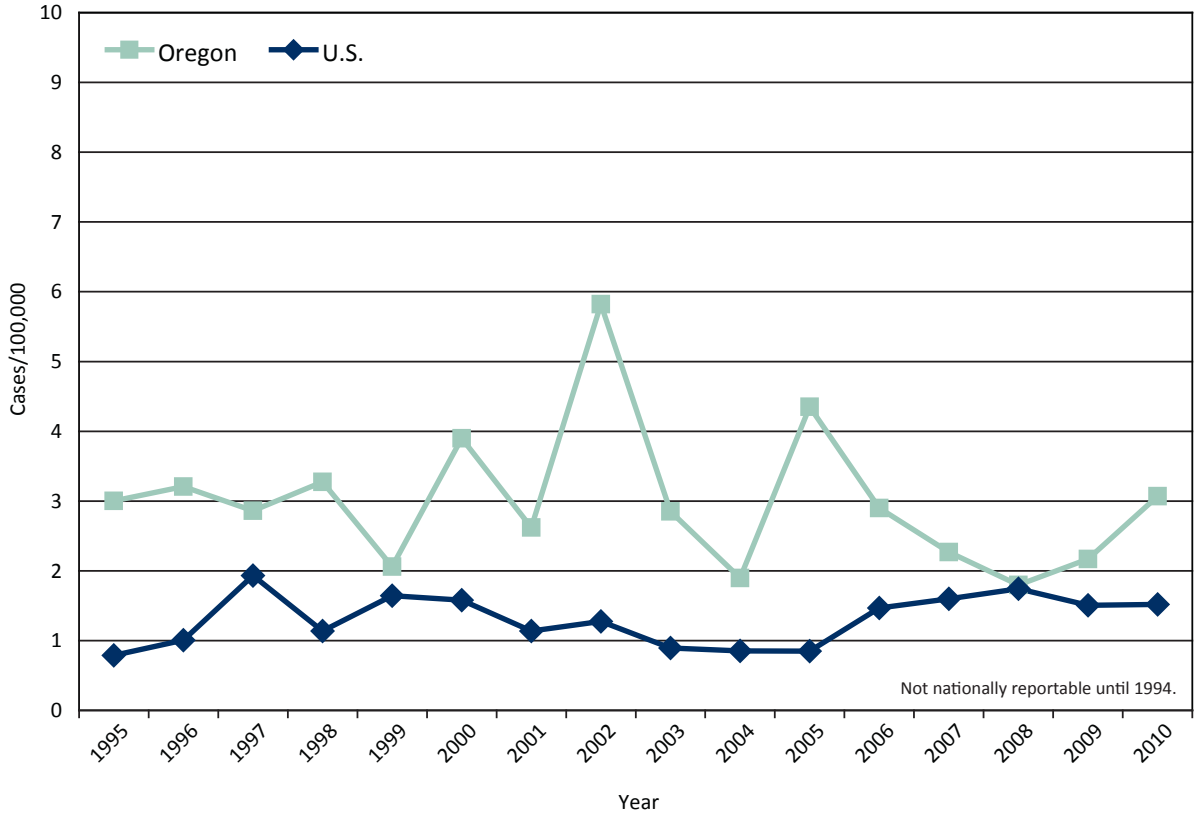
STEC infection by onset month: Oregon, 2010



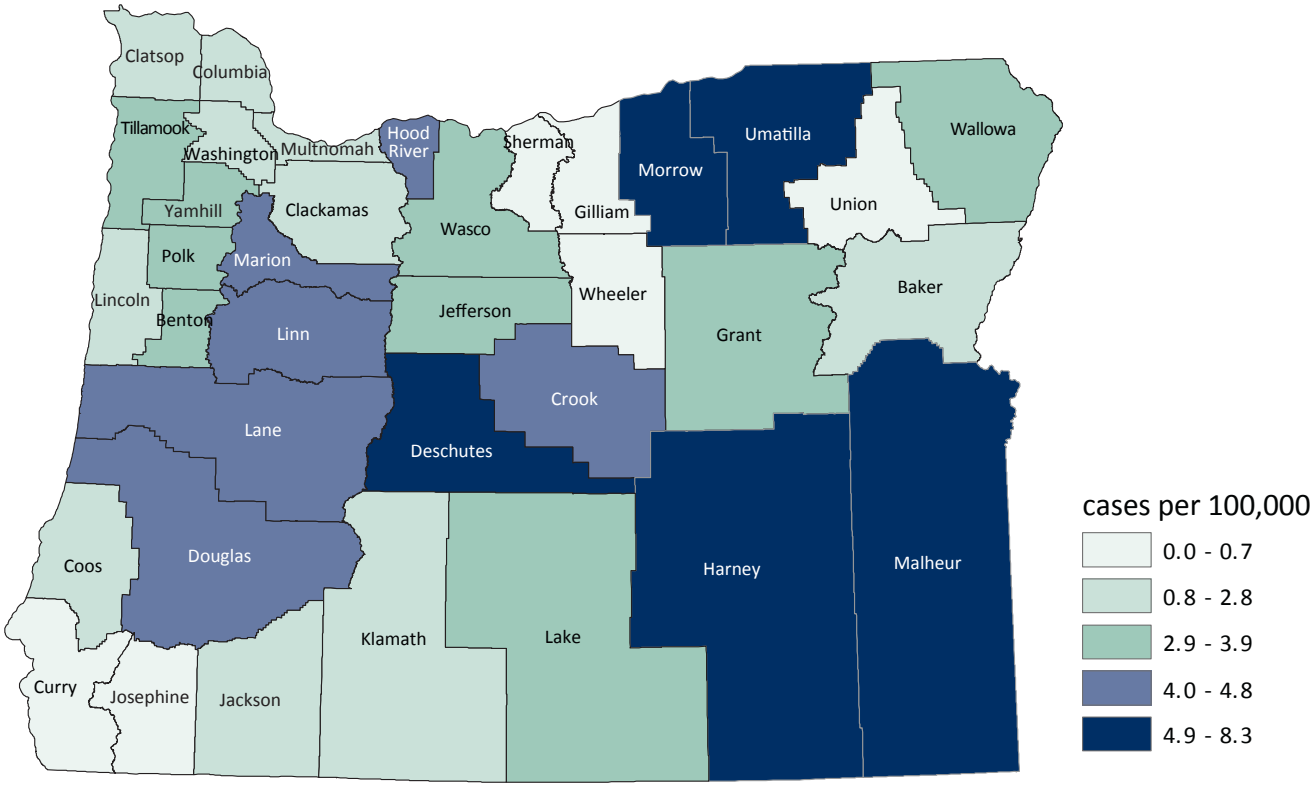
Incidence of STEC infection by age and sex: Oregon, 2010



Incidence of STEC infection: Oregon vs. nationwide, 1995–2010



Incidence of STEC infection by county of residence: Oregon, 2000–2010



Giardiasis

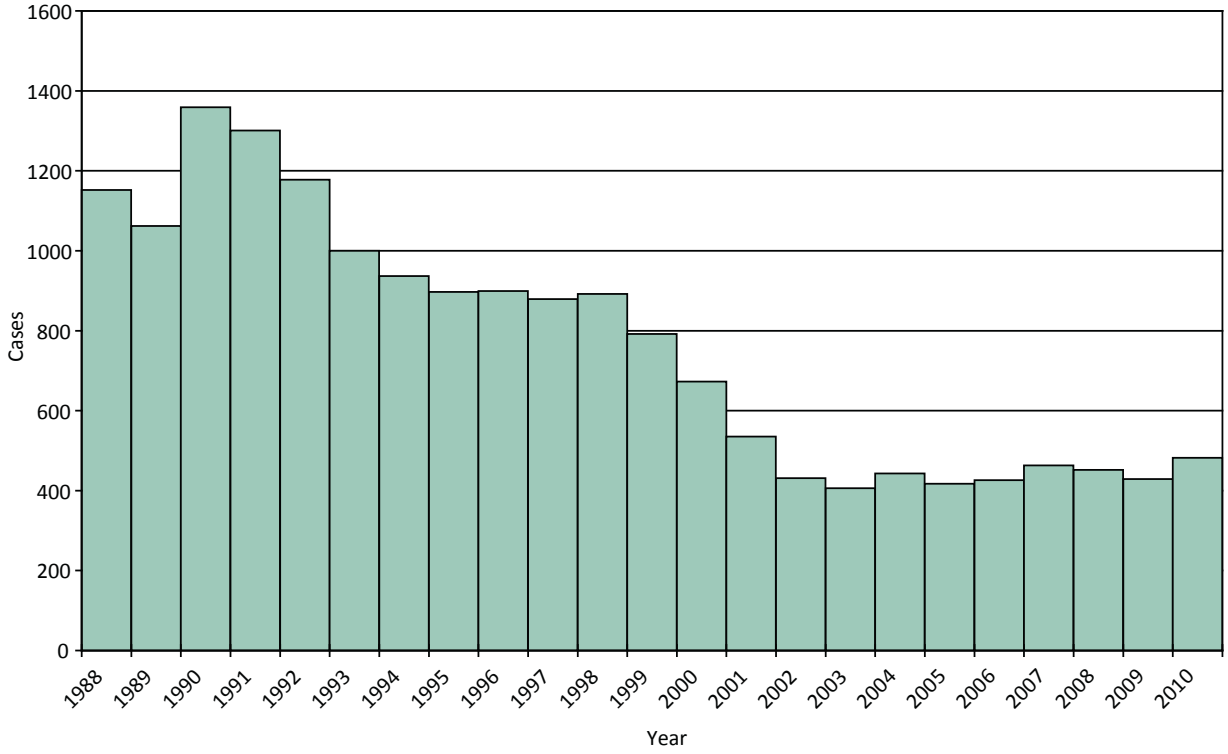
Giardia intestinalis, the flagellated protozoan originally named G. *lamblia*, is the most commonly identified parasitic pathogen in the United States. Children in daycare and their close contacts are at greatest risk, as are backpackers and campers (by drinking unfiltered, untreated water), persons drinking from shallow wells, travelers to disease-endemic areas, and men who have sex with men. *Giardia* cysts can be excreted in the stool intermittently for weeks or months, resulting in a protracted period of communicability. Transmission occurs when as few as 10 cysts are ingested through person-to-person or animal-to-person contact, or by ingestion of fecally contaminated water or food.

The majority of *Giardia* infections occur without symptoms. When symptomatic, patients report chronic diarrhea, steatorrhea, abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue, and weight loss.

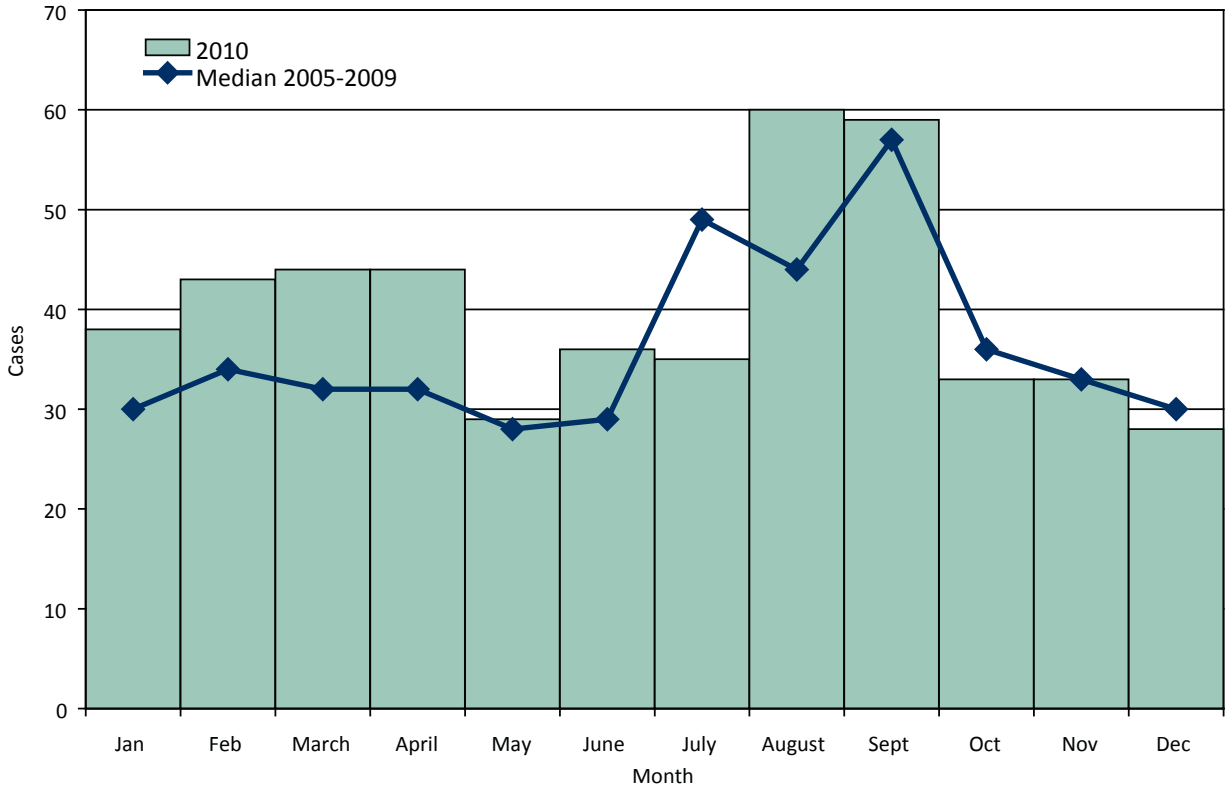
In 2010, the reported incidence of giardiasis in Oregon remained twice that of the rest of the United States, with 12.5 cases per 100,000 population. Fifty-one percent of 2010 cases were reported as sporadic, 8% as household-associated; no outbreaks were reported. Children less than 5 years of age continue to have the highest incidence, with 39 cases per 100,000 population. Rates of infection tend to be higher in the summer months with transmission related to outdoor activities in or near untreated water.

Prevention depends upon good personal hygiene (hand washing!) and avoiding consumption of fecally contaminated water. Travel warnings on water quality should be heeded.

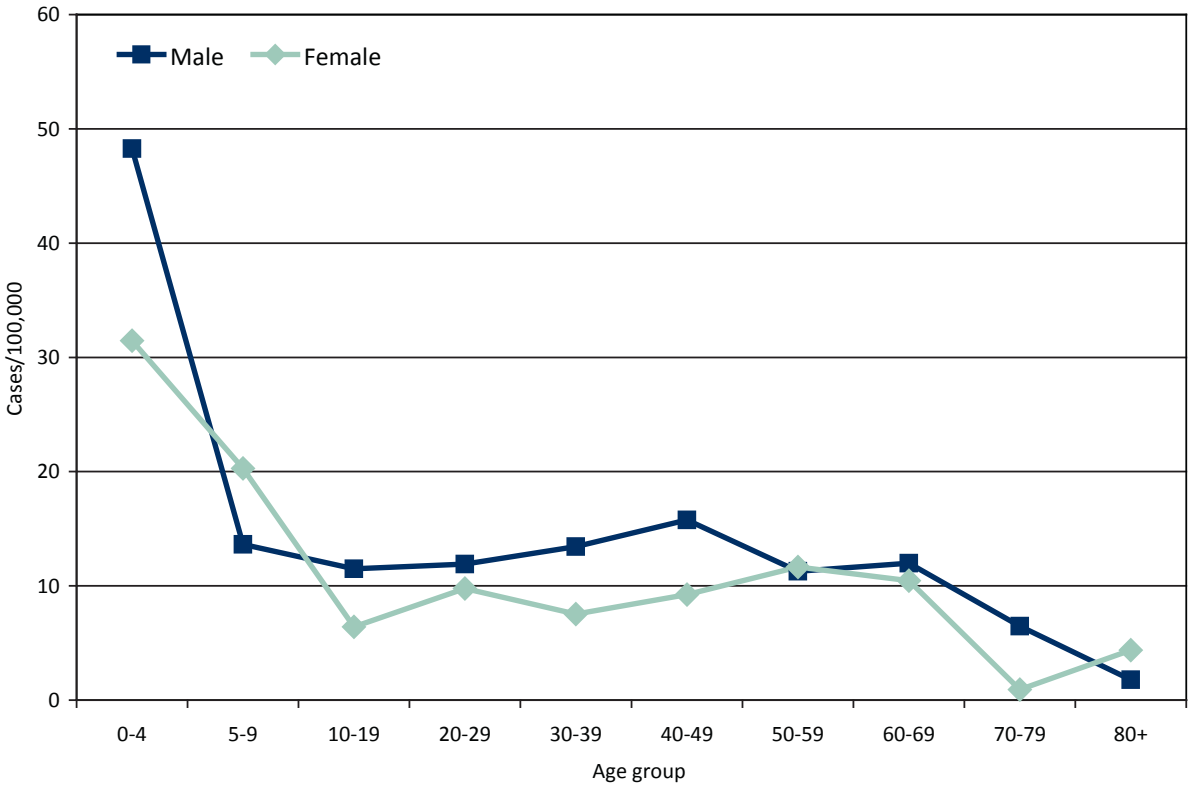
Giardiasis by year: Oregon, 1988–2010



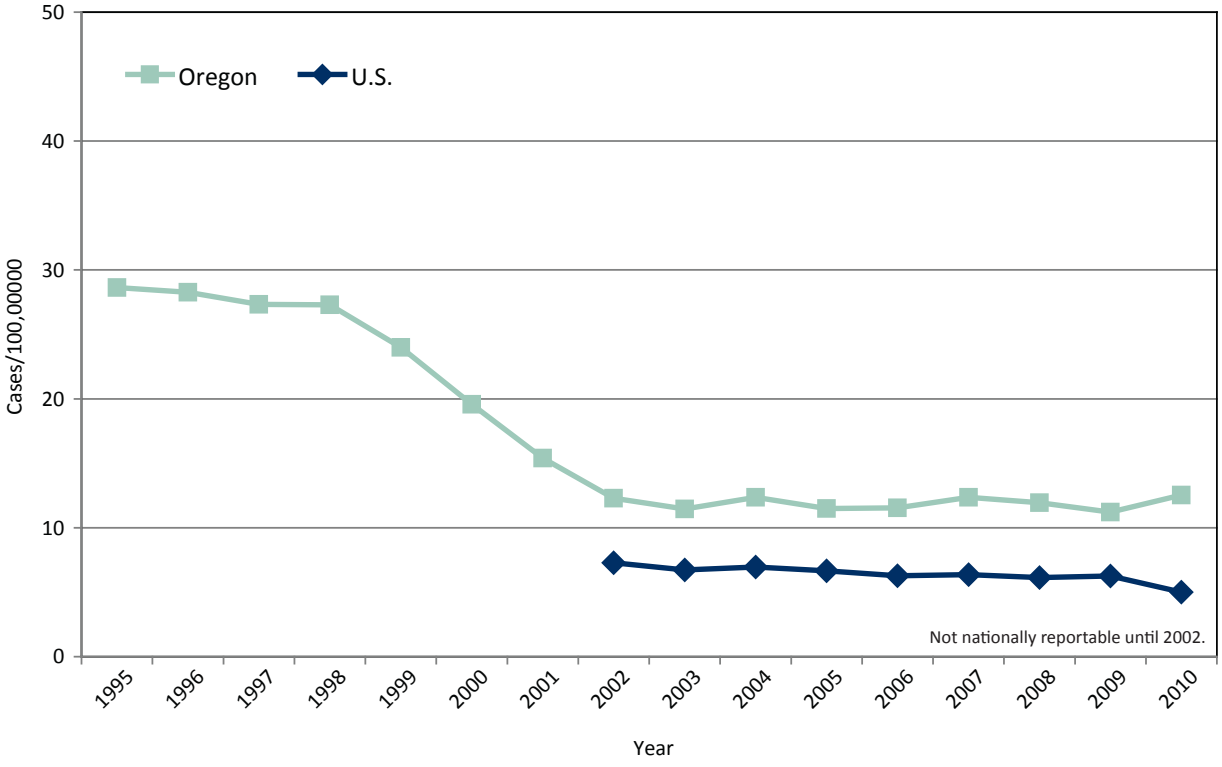
Giardiasis by onset month: Oregon, 2010



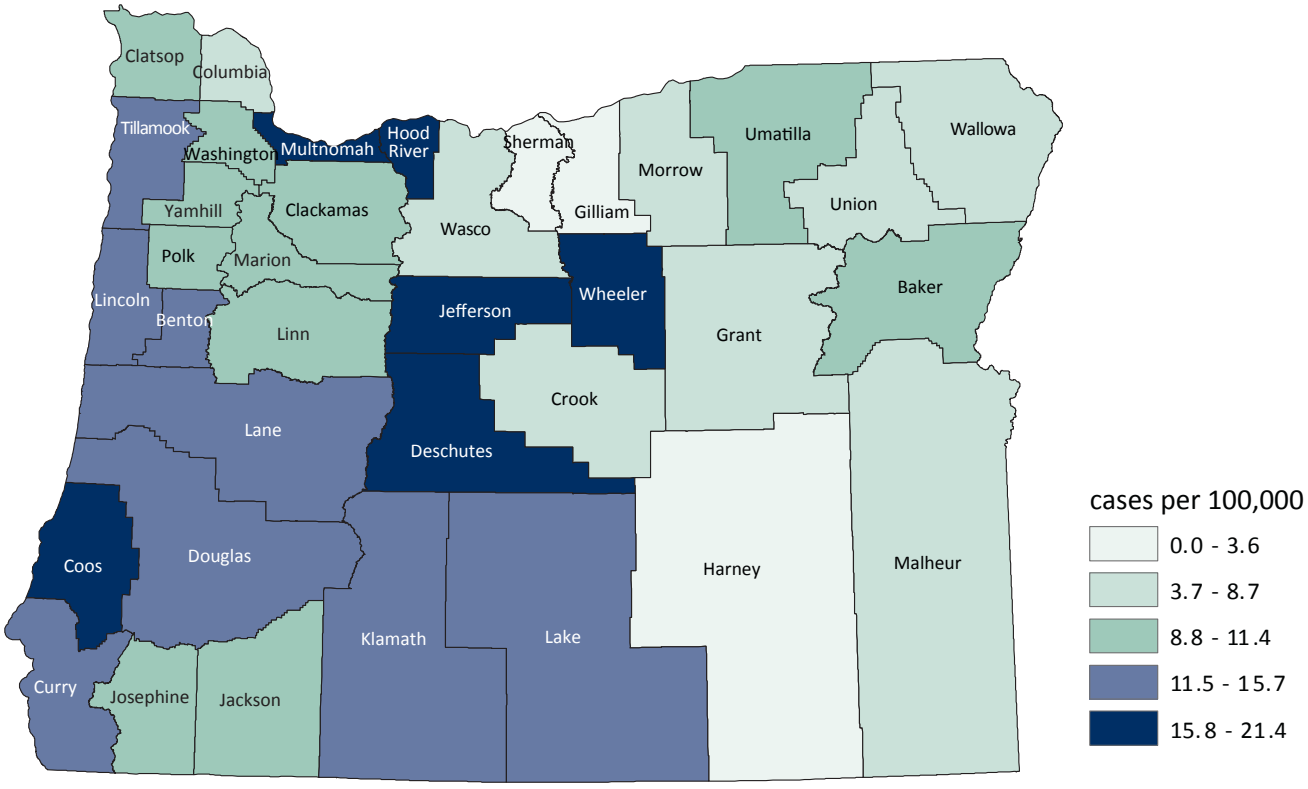
Incidence of giardiasis by age and sex: Oregon, 2010



Incidence of giardiasis: Oregon vs. nationwide, 1995–2010



Incidence of giardiasis by county of residence: Oregon, 2000–2010

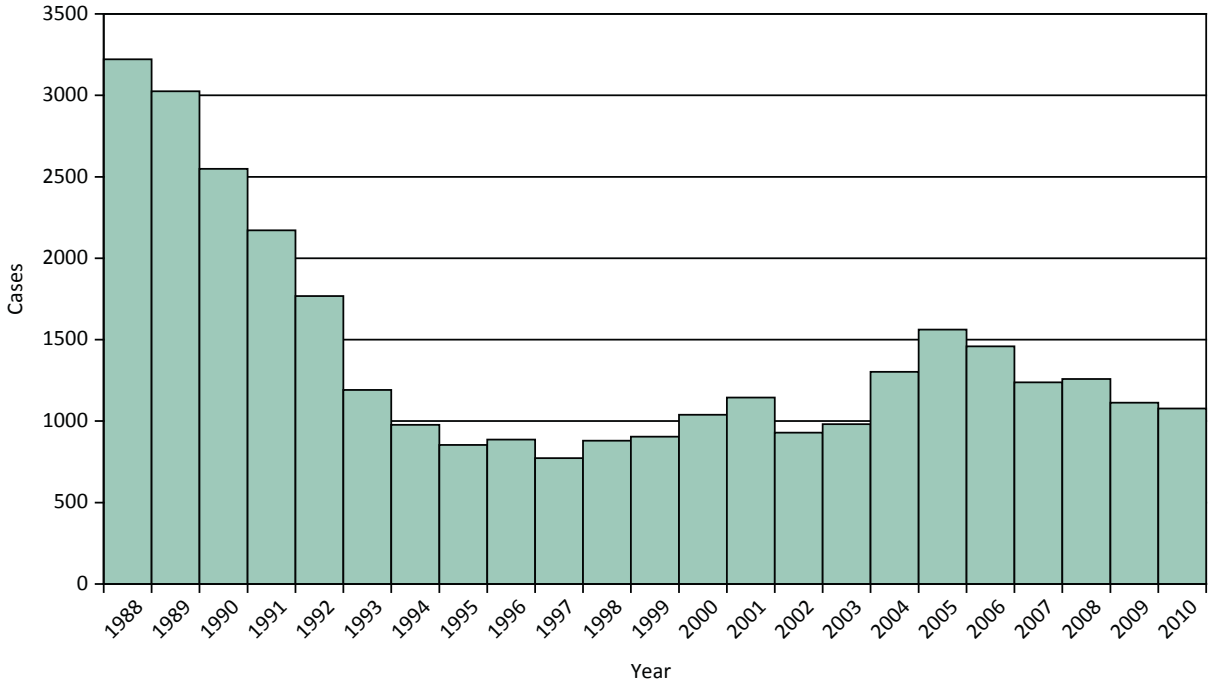


Gonorrhea

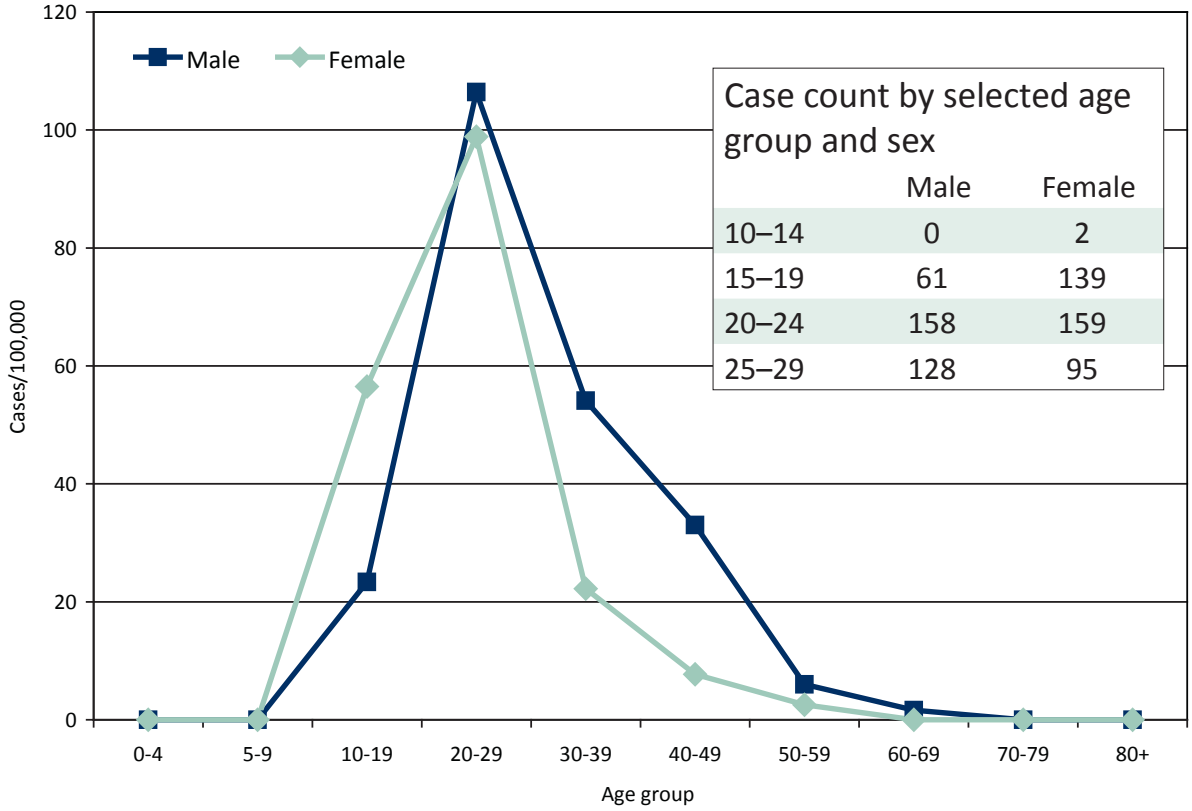
Gonorrhea, caused by the Gram-negative bacterium *Neisseria gonorrhoeae*, is easily transmitted from person to person through vaginal, rectal and oral sexual contact. Gonorrhea can be prevented by abstaining from sexual contact or only having sex with one uninfected sex partner. Those who are sexually active outside of a mutually monogamous relationship can lower their risks of infection by using a condom when engaging in sexual activity.

If untreated, gonococcal infections cause a variety of health problems for men, women and infants. The major complications of gonorrhea are infertility and tubal pregnancies among women. Rates are highest in both males and females aged 20–29. Recent sex partners of persons infected with gonorrhea should be evaluated and treated for gonorrhea. The 1,077 gonorrhea cases reported in 2010 represent a slight decrease from the 1,113 cases reported in 2009.

Gonorrhea by year: Oregon, 1988–2010



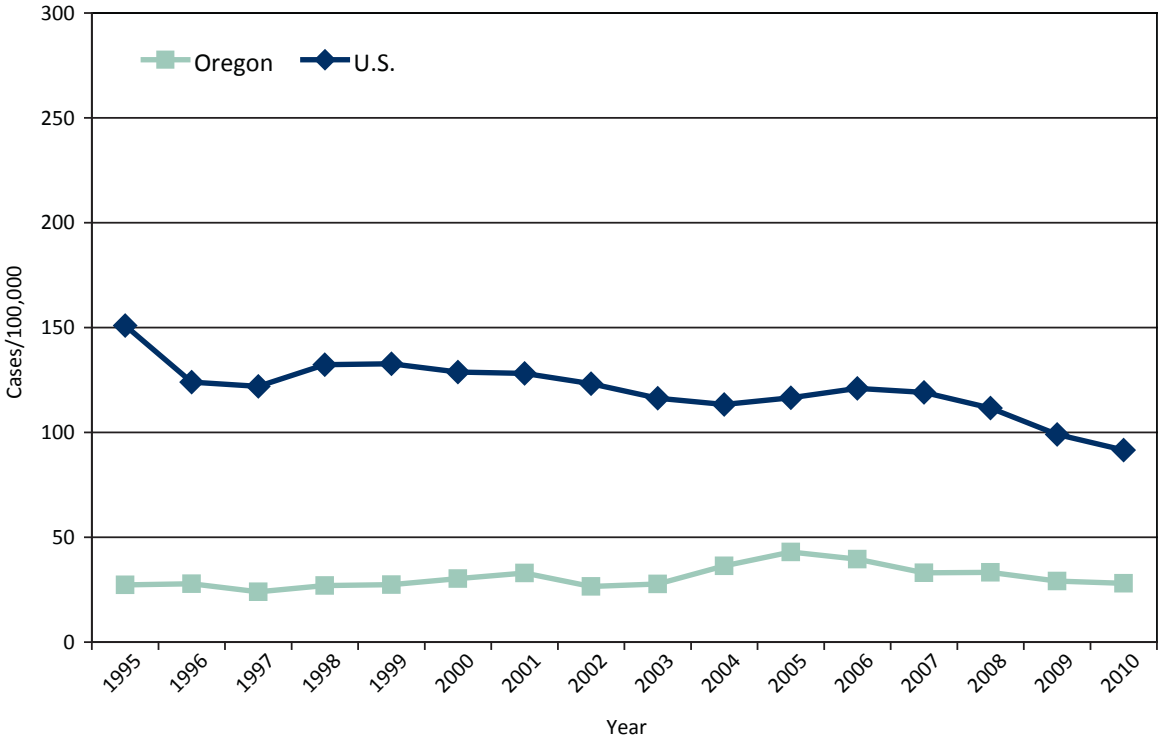
Incidence of gonorrhea by age and sex: Oregon, 2010



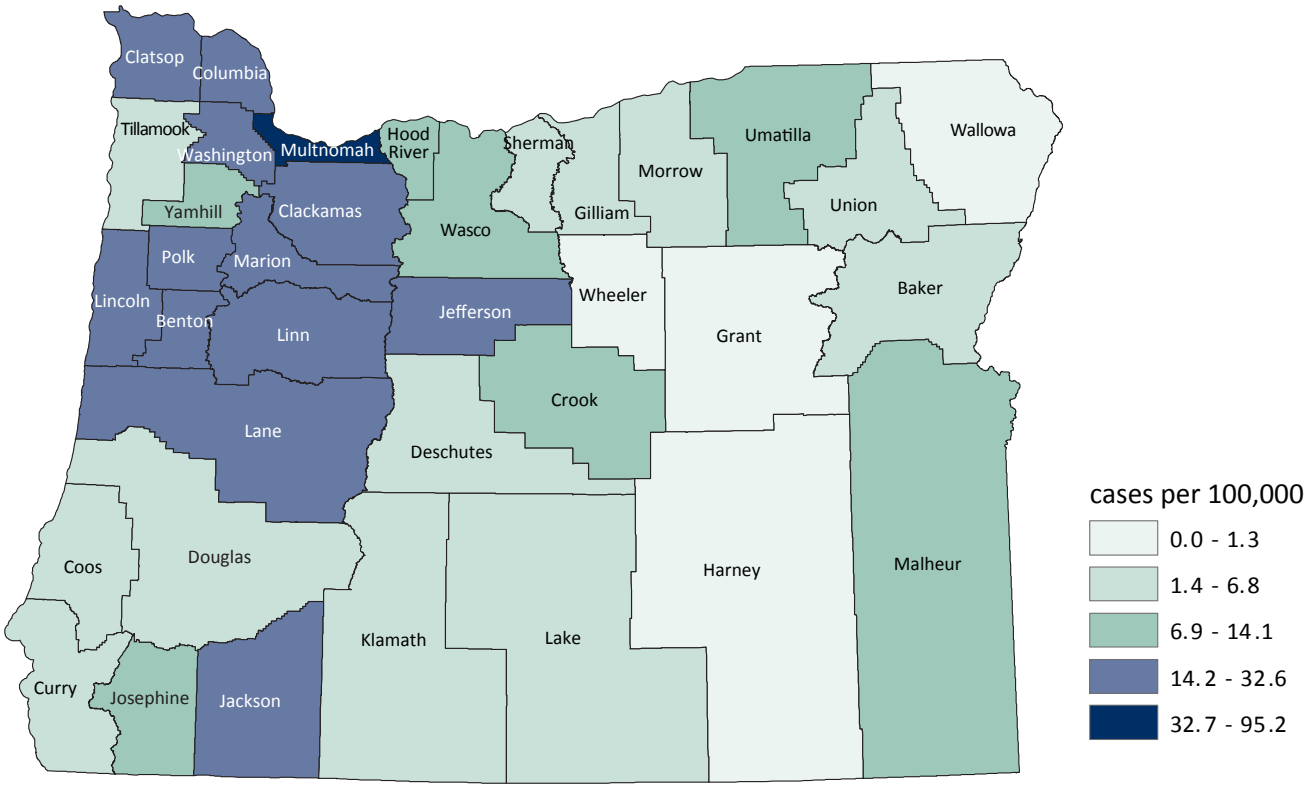
Case count by selected age group and sex

	Male	Female
10–14	0	2
15–19	61	139
20–24	158	159
25–29	128	95

Incidence of gonorrhea: Oregon vs. nationwide, 1995–2010



Incidence of gonorrhea by county of residence: Oregon, 2000–2010



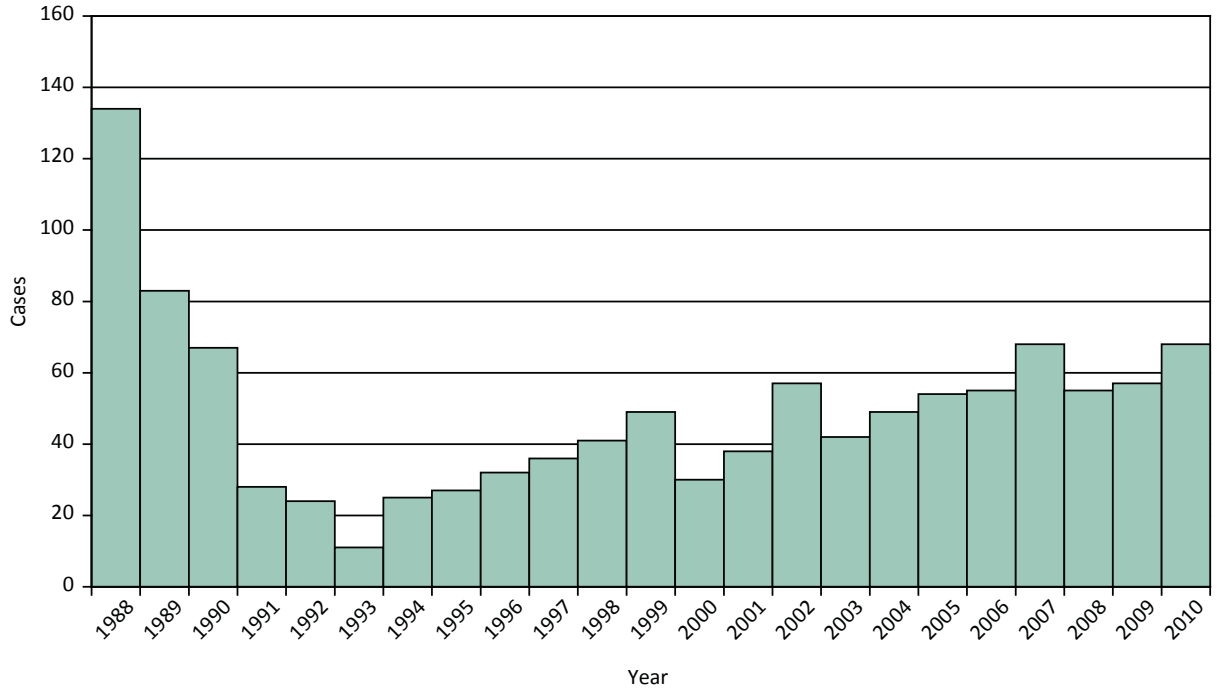
Haemophilus influenzae infection

Until the advent of an effective vaccine against serotype b (Hib) organisms, *Haemophilus influenzae (H. influenzae)* was the leading cause of bacterial meningitis in children under 5 years of age in Oregon and elsewhere. It has dropped down in the rankings, and *Streptococcus pneumoniae* is now in the lead. In 2010, Hib was cultured from sterile body fluids in three persons, two over the age of 50 and one under the age of 5. Until September 2010, there had been no cases of Hib in this young age group since 2004. Appropriate use of conjugate vaccine will help ensure that Hib occurrence remains minimal well into the future. All sterile site *H. influenzae* isolates must be sent to the Oregon State Public Health Laboratory for additional typing.

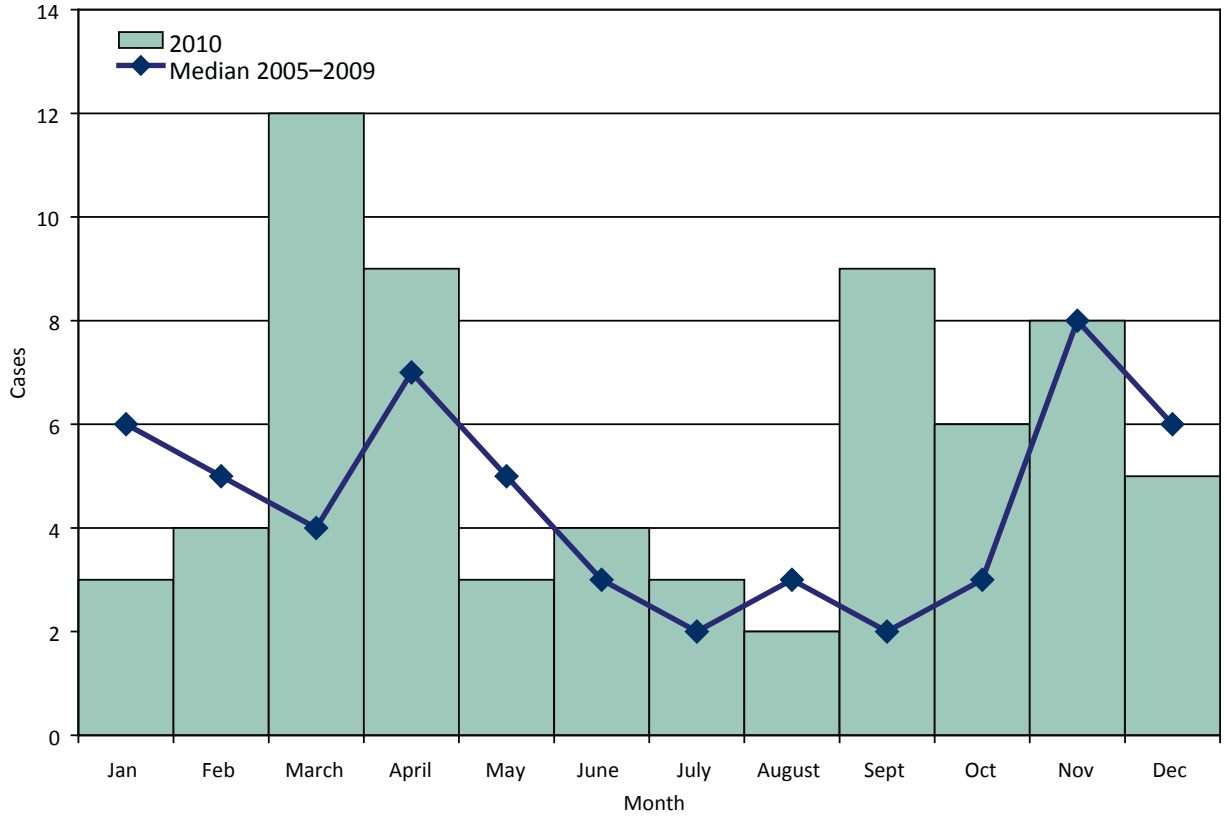
Concurrent with the decline in serotype "b" infections is an increase in other serotypes. In 2010, 70% of cases were non-typeable, 14% were identified as serotype f, and the remainder were other serotypes. This shift in dominant strains changes the clinical manifestations of illness. During the five-year period (2006–2010), clinical manifestations of Oregon cases included pneumonia (58%), followed by bacteremia (28%), and meningitis (7%). Concurrent with the changes in clinical manifestations is a shift in age distribution from infants to older persons. The majority of cases in 2010 continue to be among those aged 50 and over.

Peak incidence occurs in late winter and early spring. Sixty-nine cases were reported in 2010.

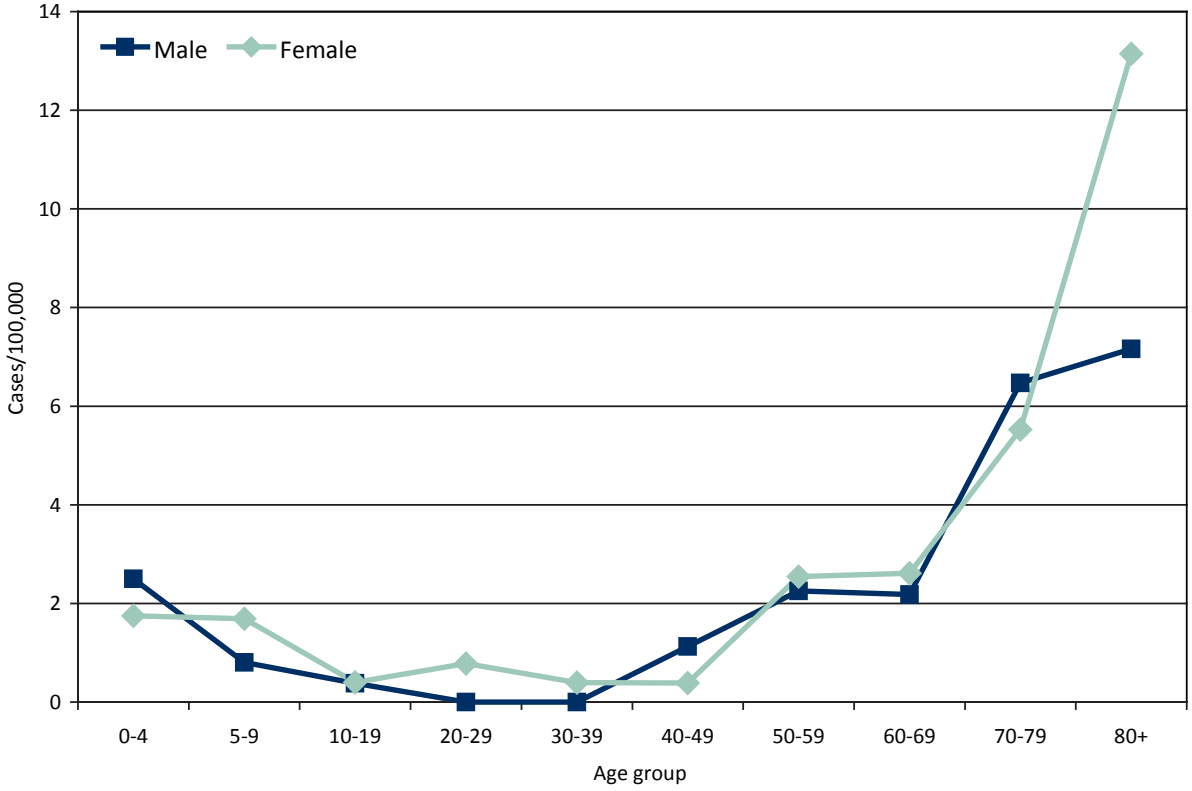
H. influenzae infection by year: Oregon, 1988–2010



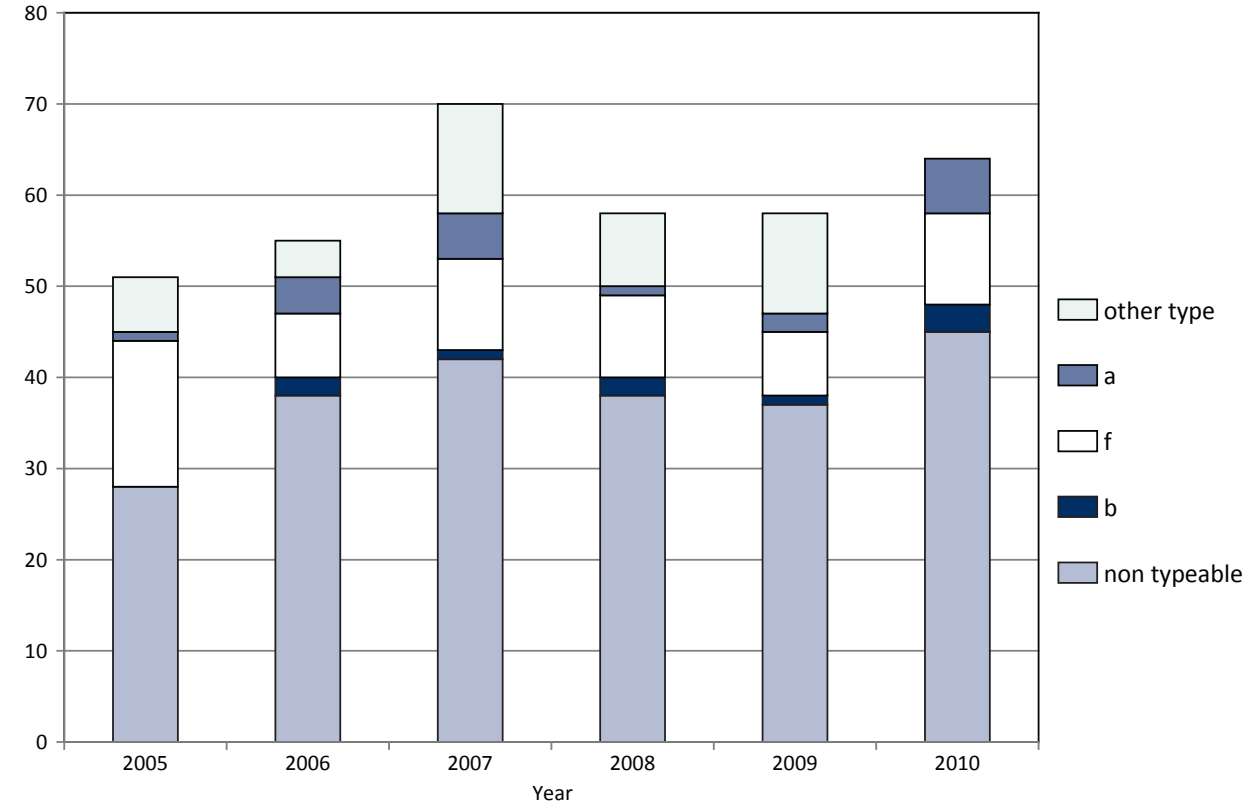
H. influenzae infection by onset month: Oregon, 2010



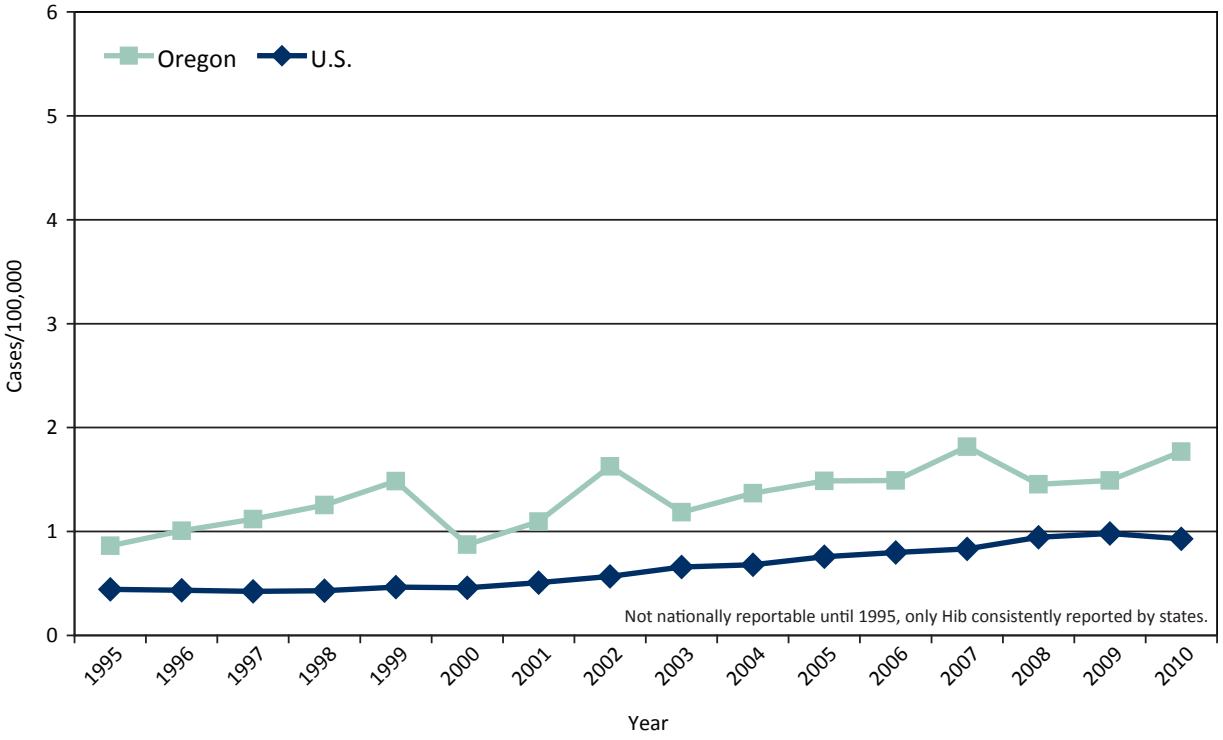
Incidence of *H. influenzae* infection by age and sex: Oregon, 2010



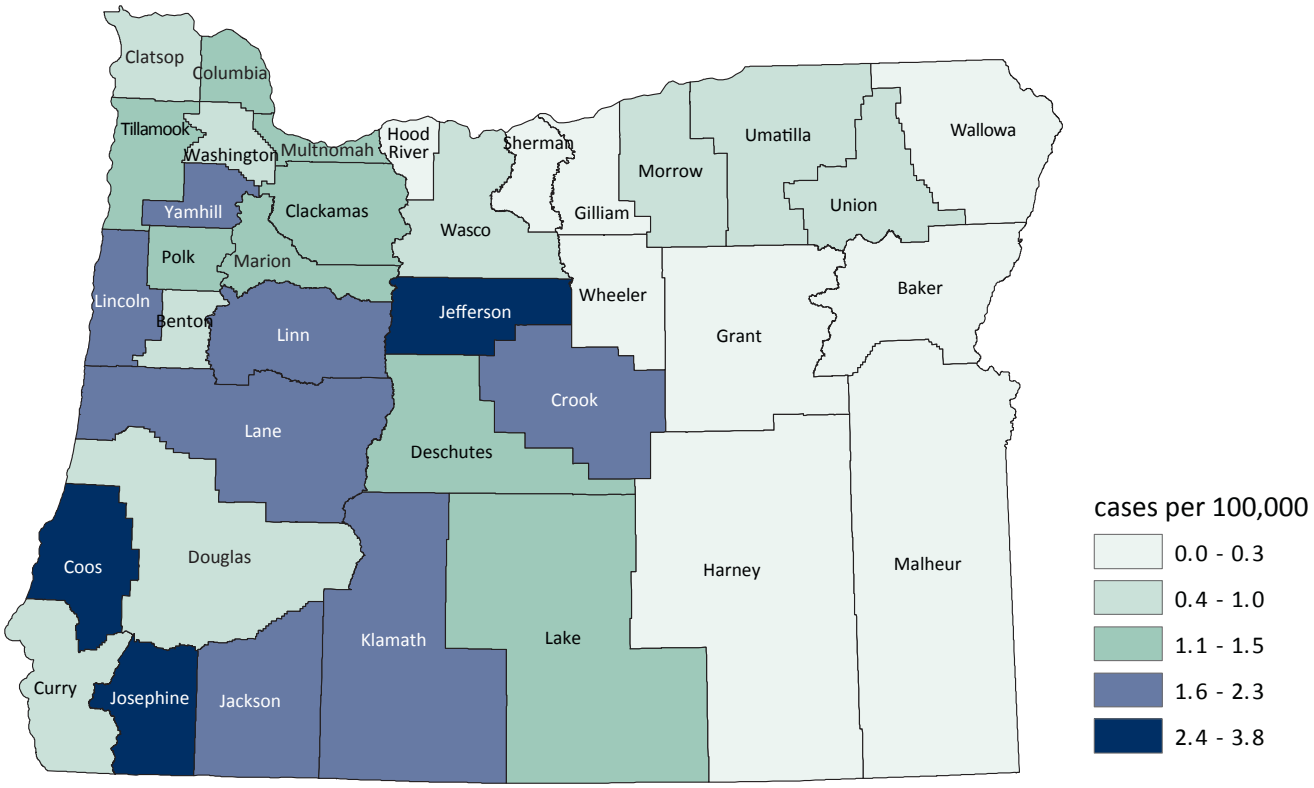
H. influenzae infection by year and serotype: Oregon, 2000–2010



Incidence of *H. influenzae* infection: Oregon vs. nationwide, 1995–2010



Incidence of *H. influenzae* infection by county of residence: Oregon, 2000–2010



Hepatitis A

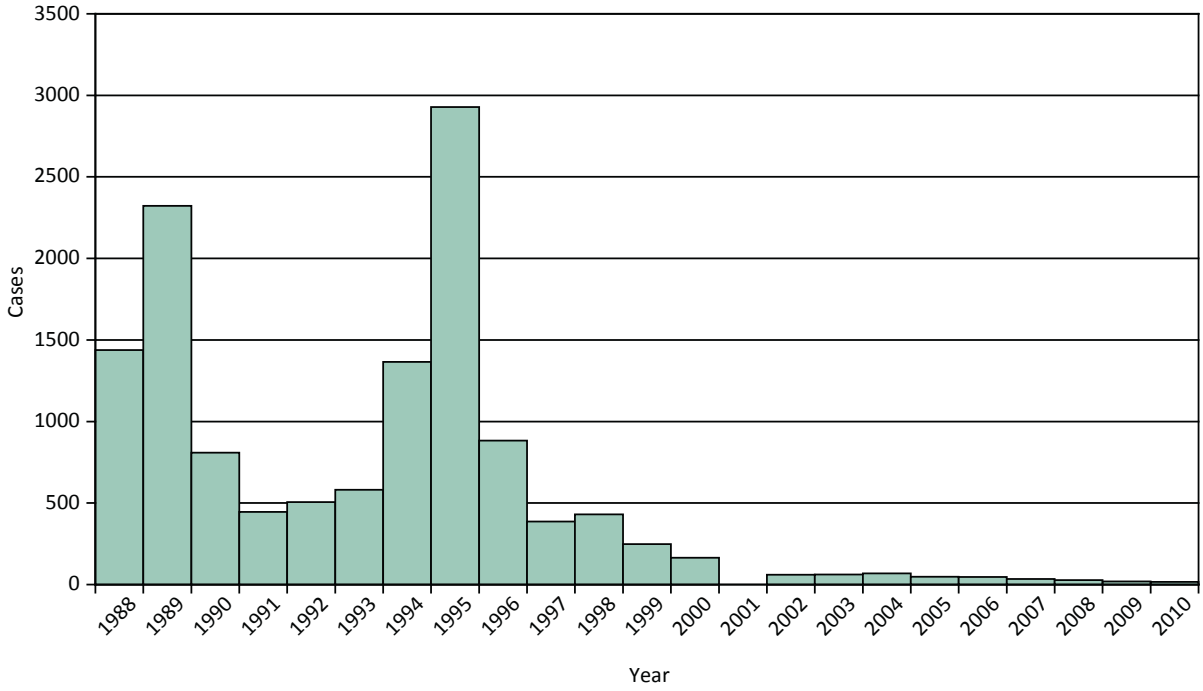
Hepatitis A is a liver disease caused by the hepatitis A virus, which infects humans via fecal-oral transmission. Historically, in Oregon, hepatitis A can occur in situations ranging from isolated cases of disease to statewide outbreaks. However, since the licensure of the hepatitis A vaccine in 1995–1996, rates of infection have declined nationally and in Oregon, one of the higher incidence states. Most cases in Oregon are sporadic and occur mainly in persons who travel outside the U.S. Oregon has seen small clusters of hepatitis A infections among injection drug users and jail inmates. There were no outbreaks of hepatitis A in 2010.

Good personal hygiene and proper sanitation can help prevent hepatitis A. Vaccines are recommended for long-term prevention of hepatitis A in all Oregon children 1 year of age and older, as well as for adults in high-risk groups.

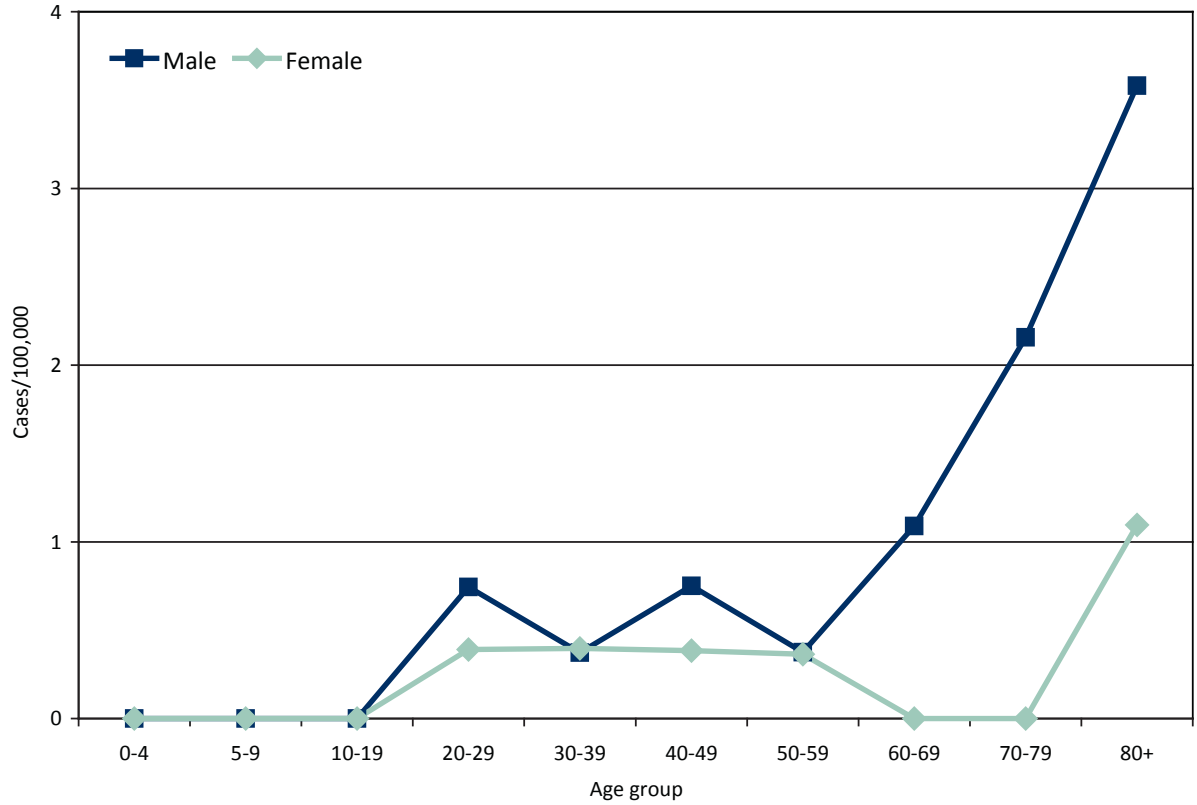
In 2007, Oregon adopted the CDC case definition; laboratory positive, asymptomatic infections are no longer reportable. Recent changes in post-exposure prophylaxis include vaccination instead of immunoglobulin for immune-competent contacts aged 1–40 years. For those over 40 years of age, or with immune-compromising conditions, immune globulin is still recommended.

In 2010, Oregon logged 17 cases of acute hepatitis A. Ten (59%) of the 17 cases in 2010 were acquired by venturing outside of Oregon, often to countries with high rates of hepatitis A, such as Mexico. Such persons placing themselves at elevated risk should receive a dose of hepatitis A vaccine as soon as travel is considered. Completion of the hepatitis A vaccination series (administered according to the licensed schedule) is recommended for long-term protection. Thirty-five percent of cases (n=6) had no identifiable risk factor for acquisition of hepatitis A infection. All cases were over 20 years of age.

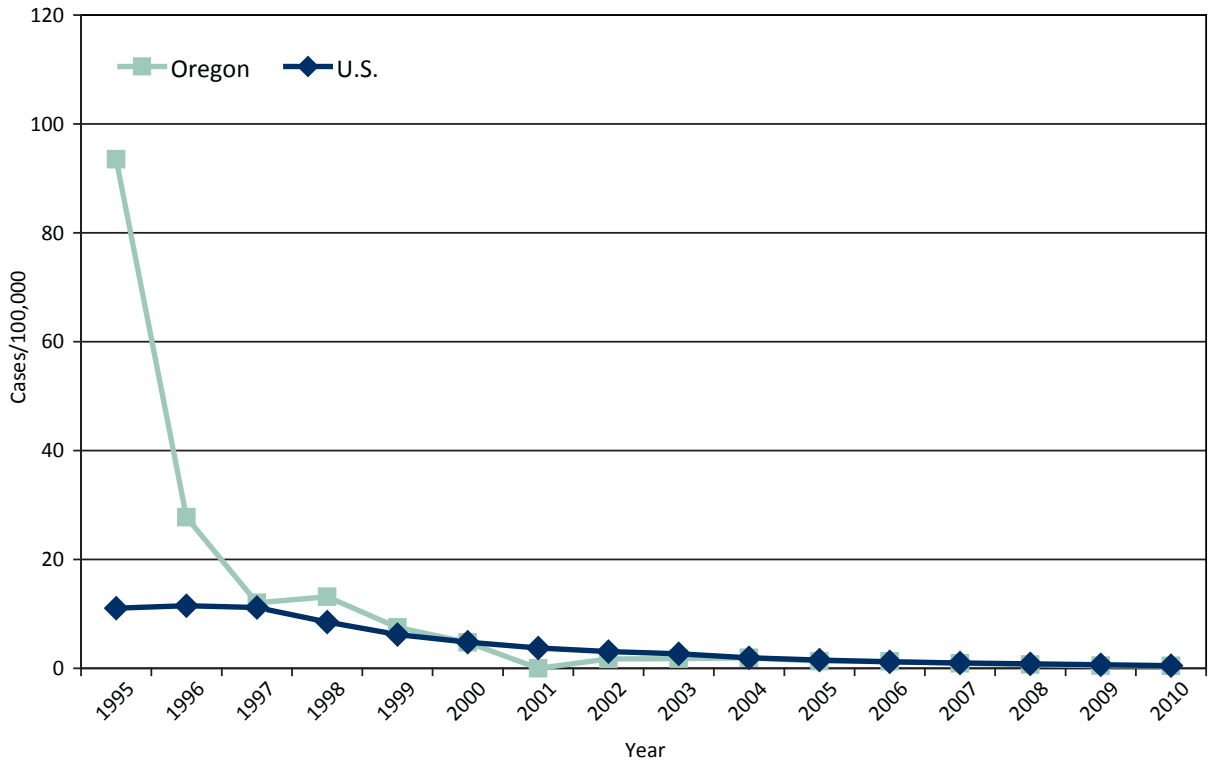
Hepatitis A by year: Oregon, 1988–2010



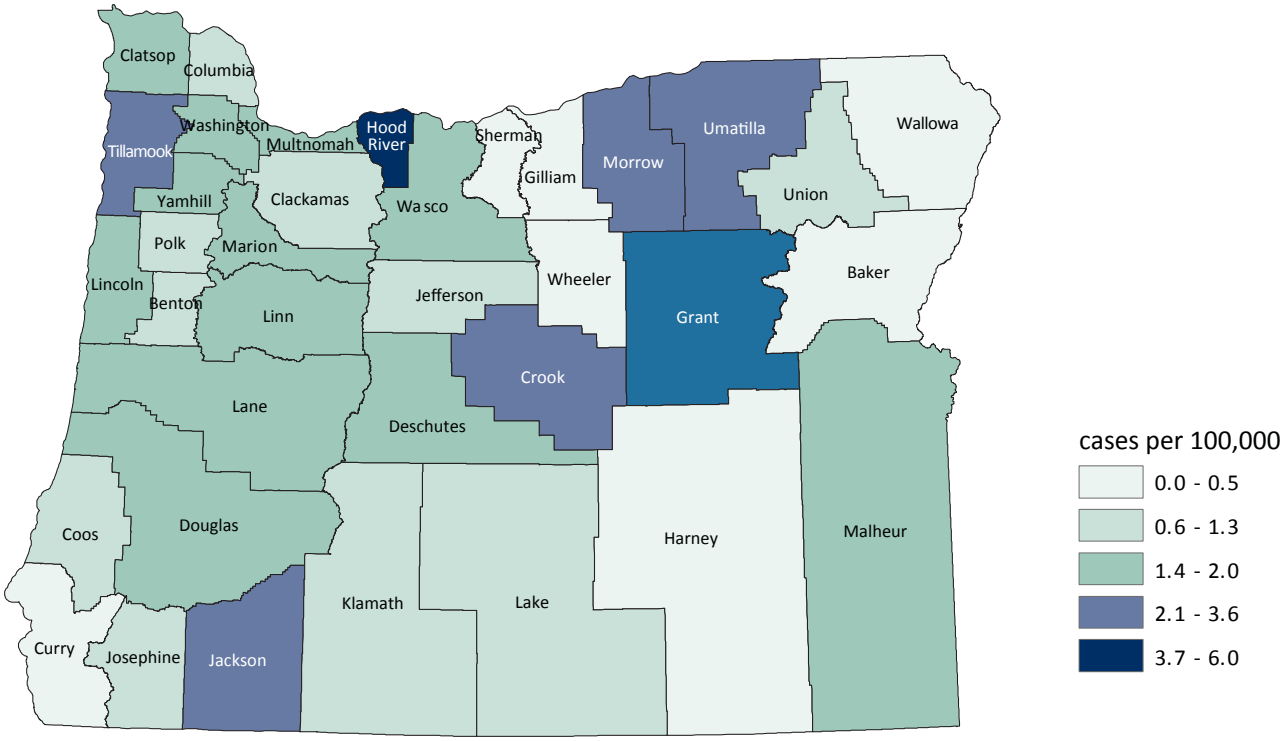
Incidence of hepatitis A by age and sex: Oregon, 2010



Incidence of hepatitis A: Oregon vs. nationwide, 1995–2010



Incidence of hepatitis A by county of residence: Oregon, 2000–2010



Acute hepatitis B

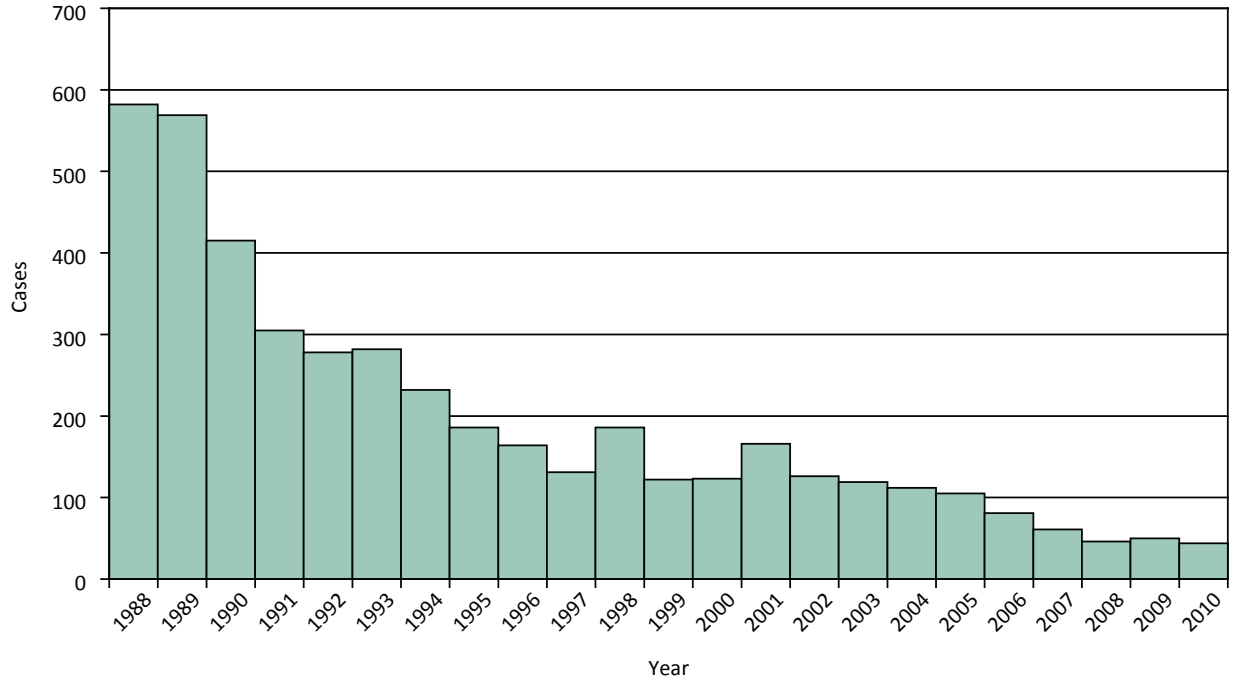
Hepatitis B is a vaccine-preventable viral disease of the liver that occurs when the virus of an infected person passes (through blood, semen, or saliva) into the blood stream of a non-immune person. Percutaneous or permucosal exposures take place when hypodermic needles are shared; when blood splashes into an eye; during sex; by biting; from lapses in hygiene involving glucometer and other fingerstick devices in diabetics; from breaches in infection control in health care settings; and when the baby of a mother who is a hepatitis B carrier is being born.

Acute hepatitis B virus infection (diagnosed by the presence in serum of IgM antibody to the hepatitis B core antigen [IgM anti-HBc]) usually, but not always, causes jaundice. Some infections are mild, even asymptomatic, and may go undetected. Hepatitis B has been vaccine-preventable since 1982 and, to promote universal vaccination and hence protection, was added to the recommended childhood immunization schedule in 1992 with the series starting at birth.

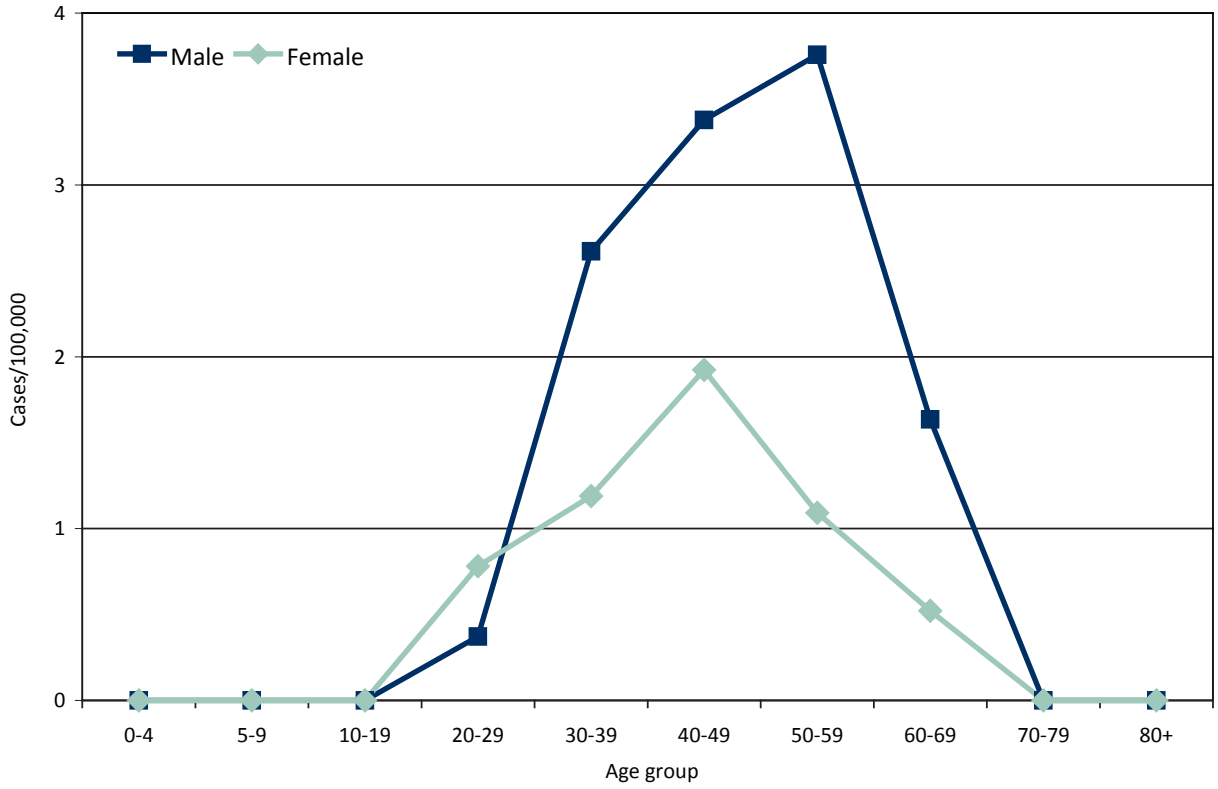
Acute hepatitis B continues to decline in Oregon — a decline that started here after the hepatitis B vaccine was licensed in 1982.

Local health departments investigated and reported 44 acute cases in 2010. Sixty-eight percent of the cases were male. The most commonly reported risk factors include injection drug use (IDU) and sexual risk factors (history of multiple sexual partners; men who have sex with men [MSM]). No risk factor was identified for 17% of cases. There were no outbreaks of hepatitis B in 2010.

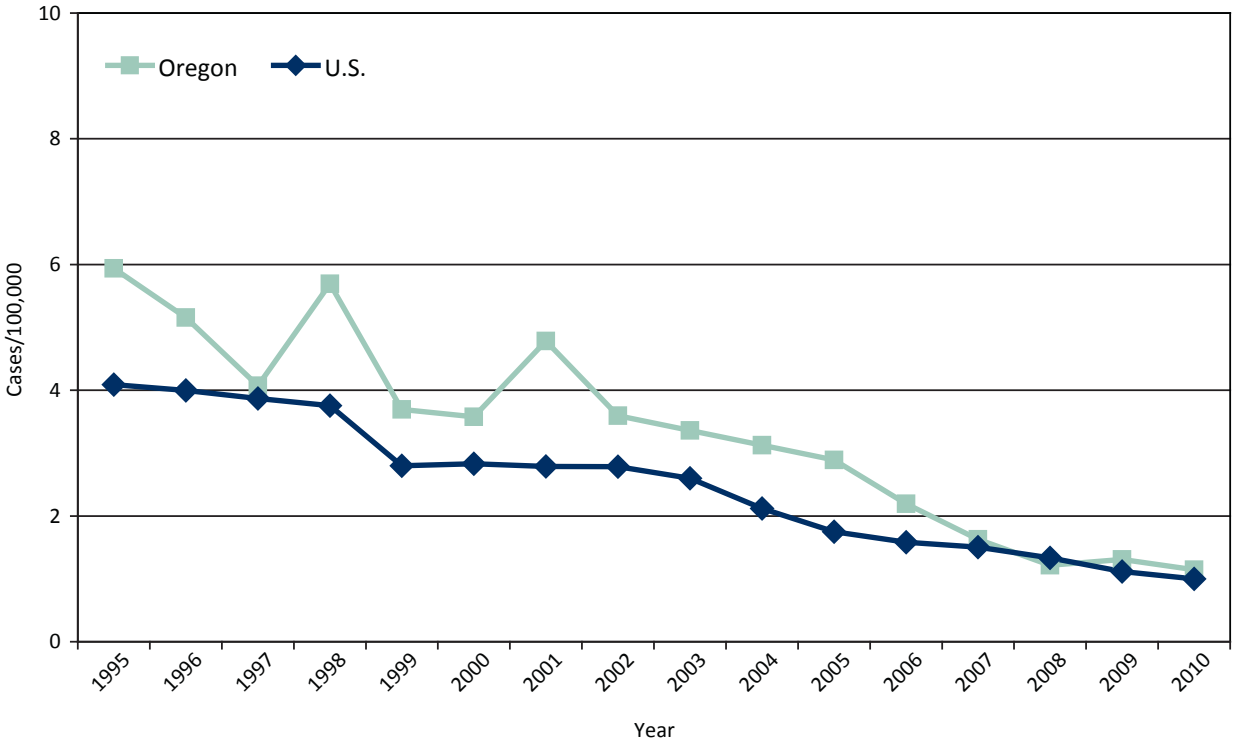
Acute hepatitis B by year: Oregon, 1988–2010



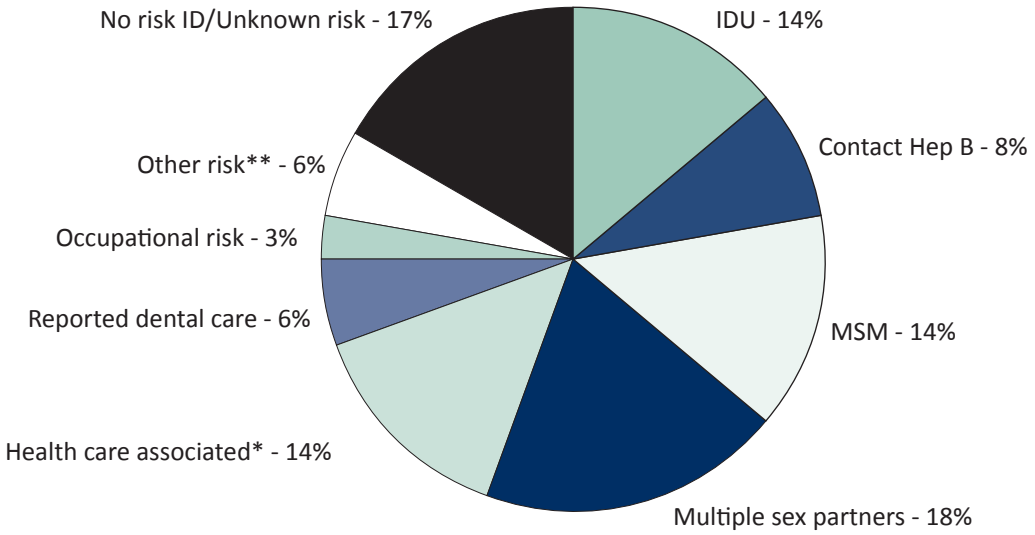
Incidence of acute hepatitis B by age and sex: Oregon, 2010



Incidence of acute hepatitis B: Oregon vs. nationwide, 1995-2010

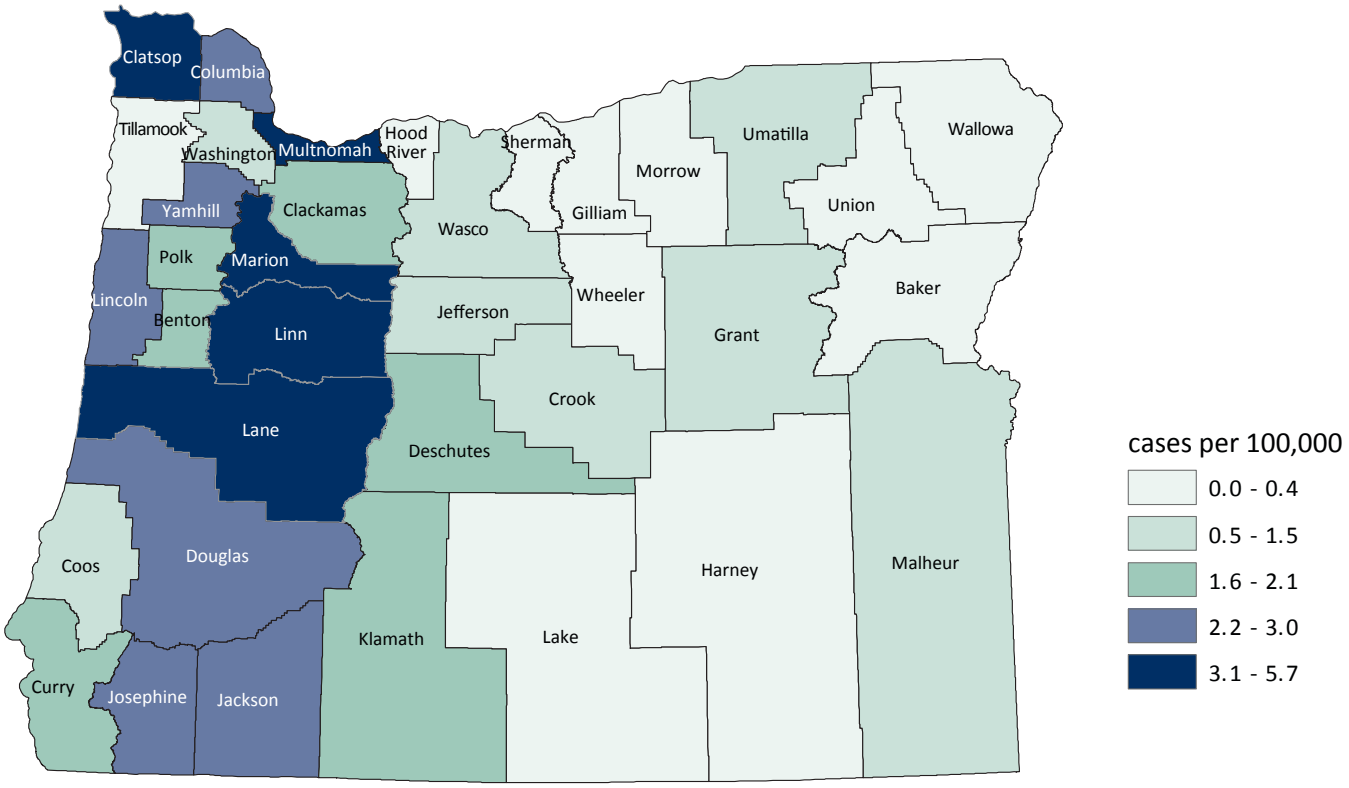


Reported risk factors for acute hepatitis B: Oregon, 2010



*Infusions, transfusions, dialysis or surgery.
**Other risk: Street drugs, pierced, tattoo, accidental needlestick and blood exposure.

Incidence of acute hepatitis B by county of residence: Oregon, 2000–2010



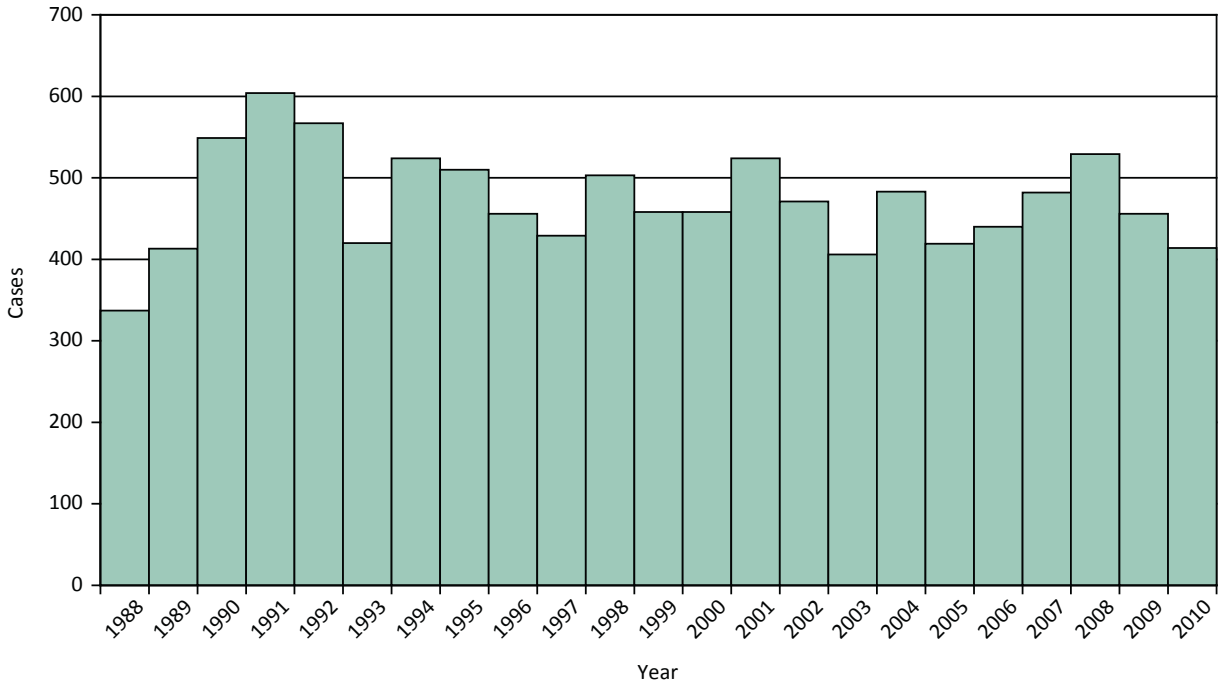
Chronic hepatitis B

Persons with chronic hepatitis B are known as "chronic carriers" — a state of infection defined by the persistence of hepatitis B surface antigen (HBsAg) in the blood for more than six months. The likelihood of becoming a chronic carrier is affected by the age at infection. Fewer than 6% of acutely infected adults in the United States become carriers, compared to 25% (with HBeAg-negative moms) to 90% (with HBeAg-positive moms) of children infected in early childhood or during birth. Perinatal infection can be prevented by prompt administration of hepatitis B immune globulin and initiation of the three-dose hepatitis B vaccination series. This perinatal intervention is widely practiced in the United States — all states have federal funding for perinatal hepatitis B prevention programs — but not in other parts of the world, particularly Asia and sub-Saharan Africa, where the prevalence of chronic hepatitis B is higher to begin with. Forty-four percent of 2010 reports were from foreign born individuals. Chronic carriers are at greater risk of developing life-threatening diseases (e.g., chronic active hepatitis, cirrhosis or liver cancer) decades later. Carriers will sustain transmission of hepatitis B in the United States until vaccine-induced immunity is nearly universal.

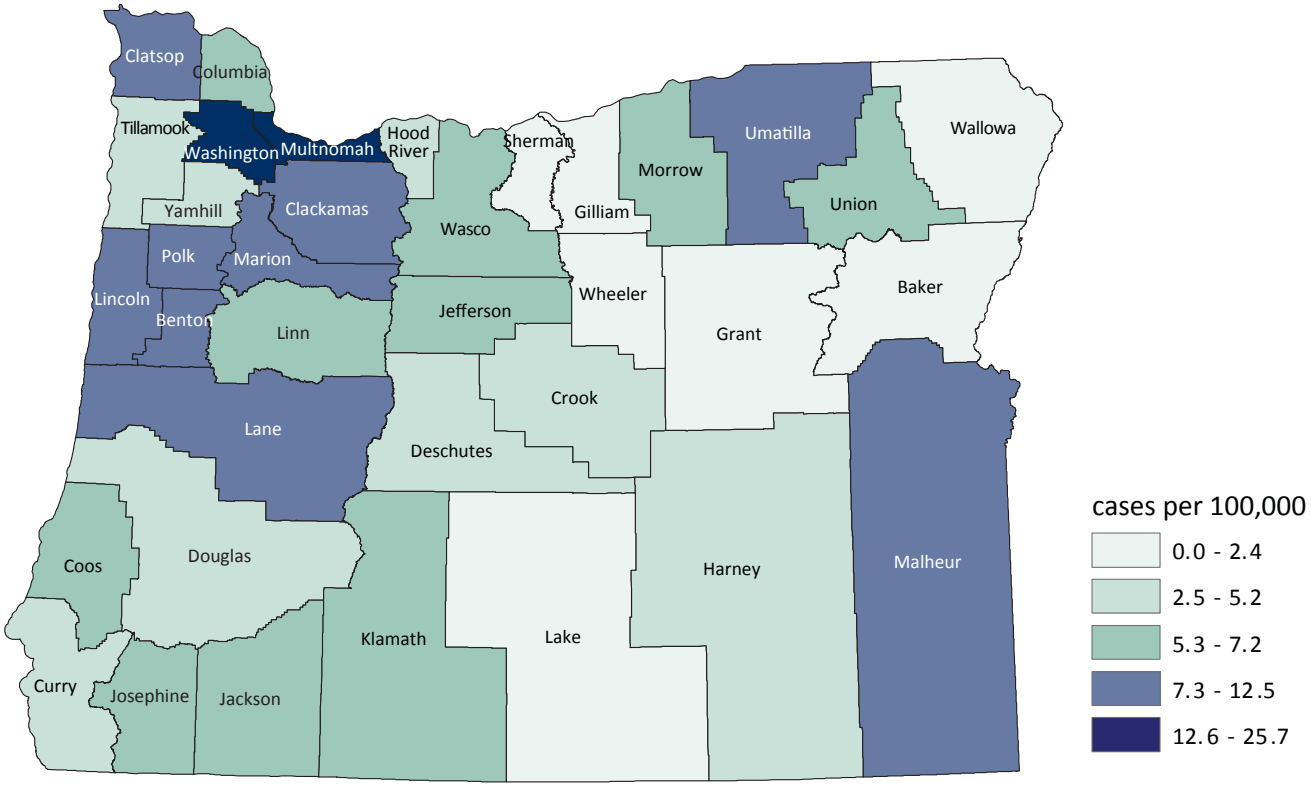
Recommendations and strategies to prevent new cases include the following: routinely vaccinating all infants at birth; screening all pregnant women for hepatitis B; administering hepatitis B immune globulin (HBIG) in addition to hepatitis B vaccine to infants born to HBsAg-positive mothers; and ensuring that all infants complete the hepatitis B vaccine series.

In 2010, there were 414 newly reported carriers and, as in the past, they were older than acute cases and close to evenly distributed between men and women. Women, however, are diagnosed earlier than men, perhaps due to prenatal screening. In 2010, five children ≤ 4 years old were reported as chronic carriers, two were born in countries where prevalence of chronic hepatitis B is high. Chronic carriers are not reportable in many of the U.S. states, so a table comparing Oregon to the rest of the United States is not given.

Chronic hepatitis B by year: Oregon, 1988–2010



Incidence of chronic hepatitis B by county of residence: Oregon 2000–2010



Hepatitis C

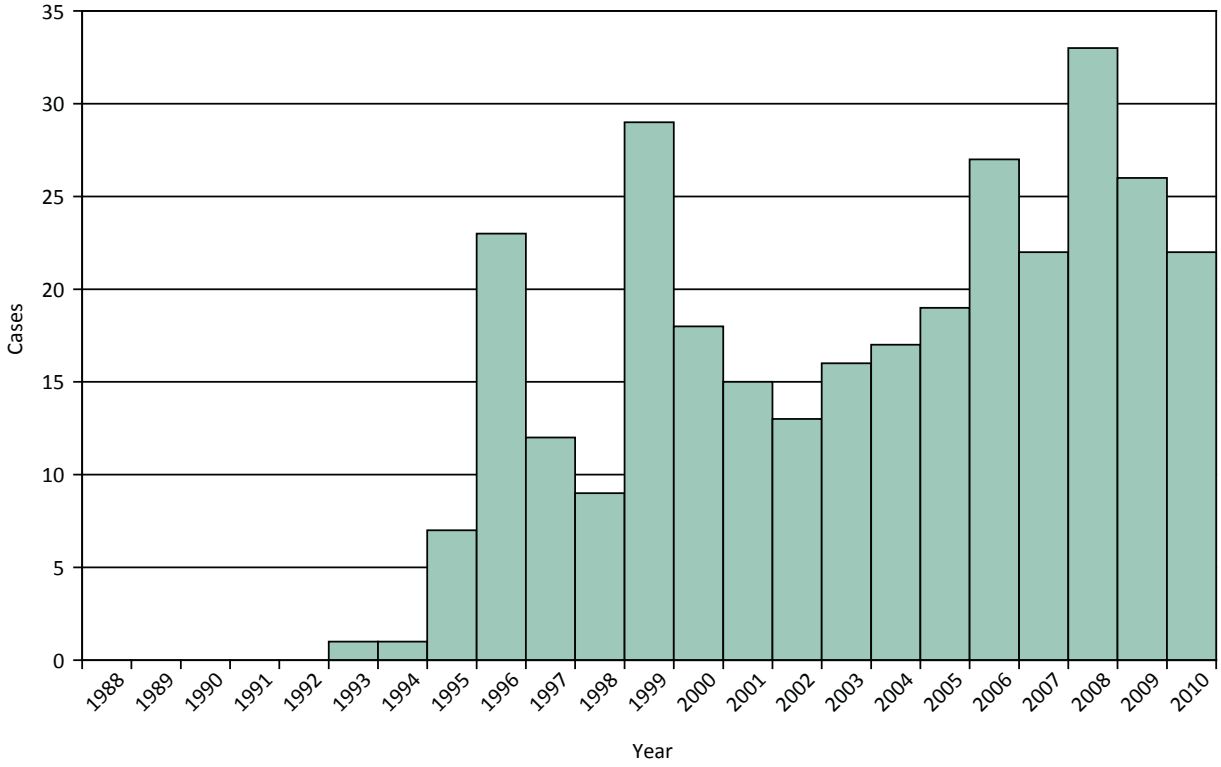
Infection with hepatitis C virus (HCV) causes both acute and chronic hepatitis C disease. HCV is found in the blood of persons who have the disease. The most common signs and symptoms of acute hepatitis C include: jaundice, fatigue, dark urine, abdominal pain, loss of appetite and nausea. However, 80% of persons are asymptomatic. Acute hepatitis C cases are underreported due to the fact that most persons are asymptomatic and that laboratories cannot distinguish between acute and chronic HCV infection. Hepatitis C can lead to liver damage and sometimes death due to liver breakdown. Nearly 4.1 million people in the United States have been infected with hepatitis C, of whom 3.2 million are chronically infected. Chronic liver disease develops in up to 70% of chronically infected persons. Hepatitis C infection is the leading indication for liver transplant. Currently, 8,000 to10,000 people die each year in the United States from hepatitis C. There is no vaccine for hepatitis C.

Hepatitis C is spread from one person to another primarily by direct contact with human blood. Most infections are due to illegal injection drug use. The virus can also be transmitted through sexual contact and from infected mothers to their infants at the time of birth. The risk for perinatal HCV transmission is about 4%. If the mother is coinfected with HIV, the risk for perinatal infection increases to about 19%. Since the adoption of routine blood donor screening in 1992, transfusion-associated cases now occur less than one per 2 million units of blood transfused. Cases can occur in health care settings, most commonly related to improper reuse of syringes or multidose vials.

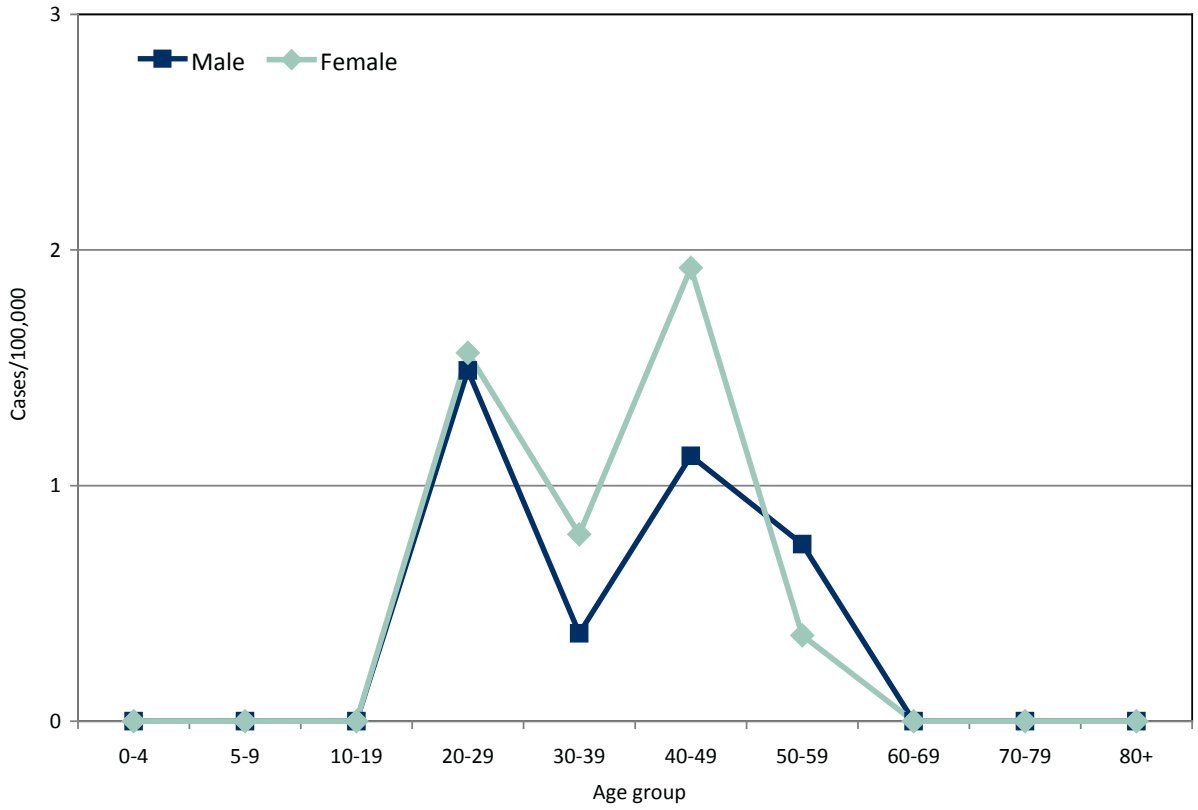
Acute hepatitis C

On average, from 2000–2010, there were 21 acute hepatitis C cases reported per year in Oregon. In 2010, 22 cases were reported. Half of the cases were less than 40 years of age, and 54% were female.

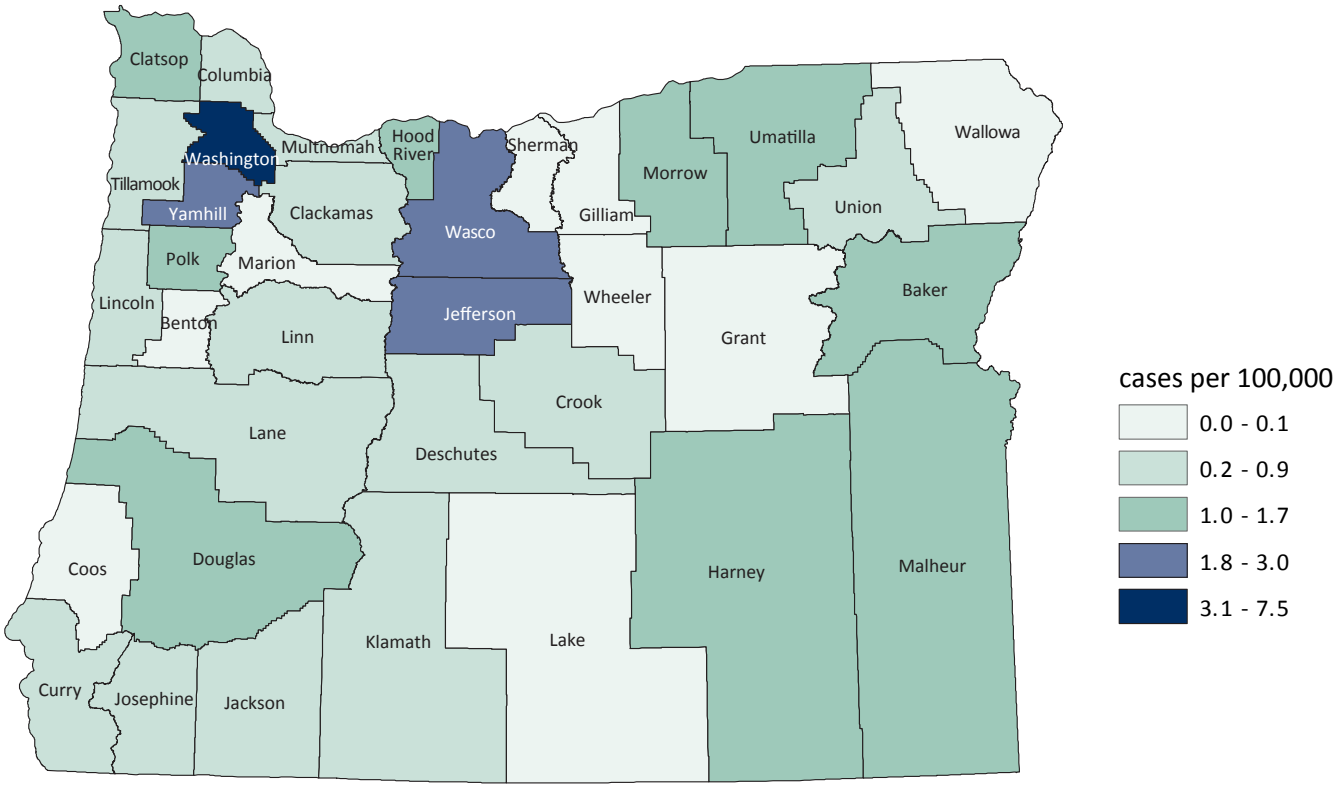
Acute hepatitis C by year: Oregon, 1988–2010



Acute hepatitis C by age and sex: Oregon, 2010



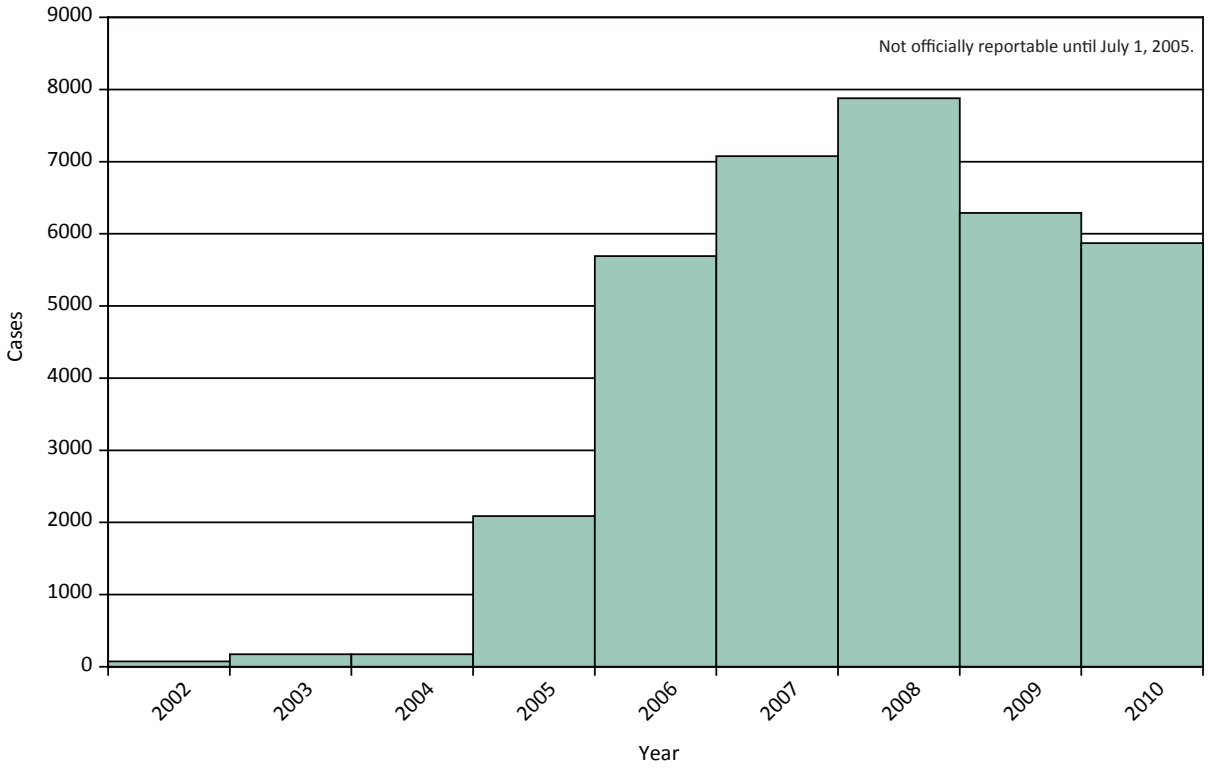
Incidence of acute hepatitis C by county of residence: Oregon, 2000–2010



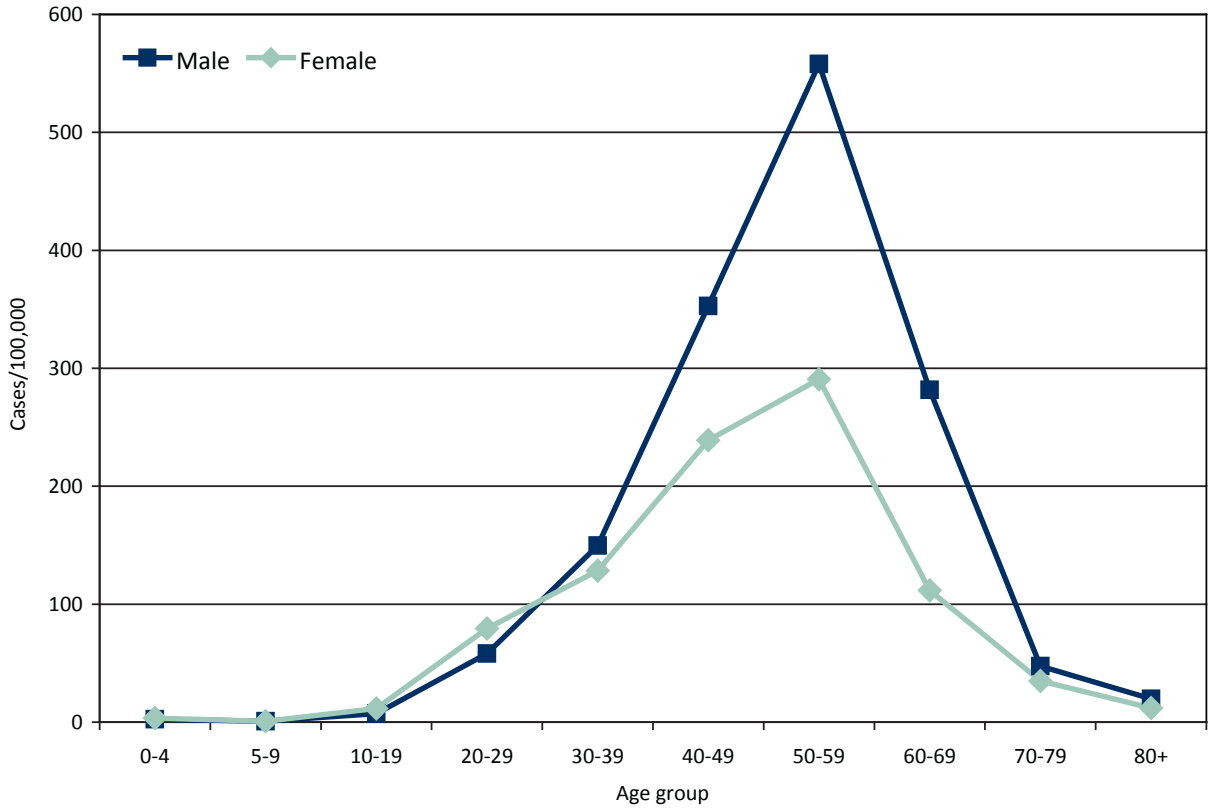
Chronic hepatitis C

Chronic hepatitis C was reportable in Oregon as of July 1, 2005. In 2010, 5,871 chronic hepatitis C cases were reported, down from 6,288 reported in 2009. Infection in males (61%) is more common than females, and in those aged 40–60 years (66%). These numbers are likely an underestimate of the true incidence because most infections are asymptomatic and therefore are not diagnosed or reported to public health.

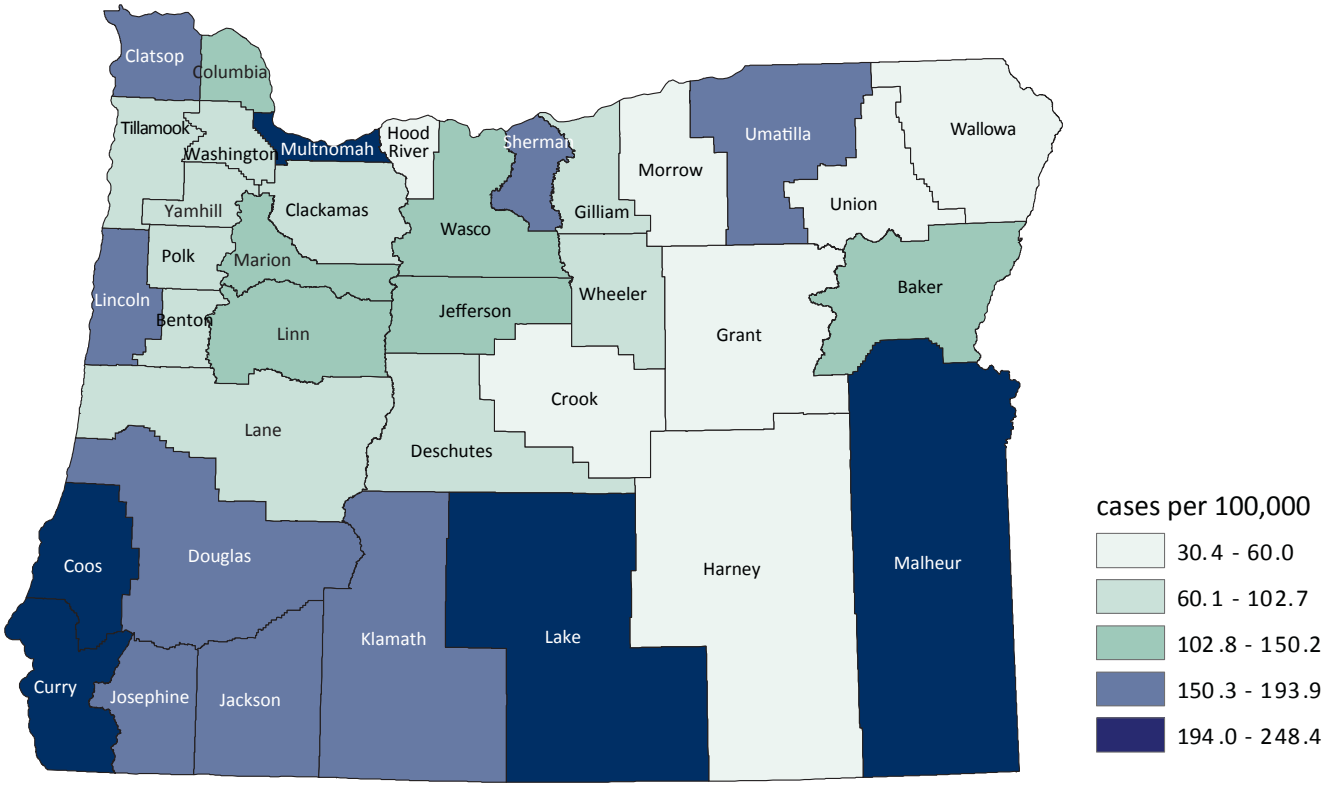
Chronic hepatitis C by year: Oregon, 2002–2010



Chronic hepatitis C by age and sex: Oregon, 2010



Incidence of chronic hepatitis C by county of residence: Oregon, 2005–2010



Influenza

In April of 2009, CDC reported the first cases of infection with a novel strain of influenza A (H1N1) virus in the United States and by June 2009 the World Health Organization declared the first influenza pandemic of the 21st century. The pandemic strain of influenza A (H1N1) caused morbidity and mortality around the world, and had a substantial impact on the public's health in Oregon. Influenza, a respiratory illness caused by the influenza virus, is characterized by fever, cough, sore throat, headache, coryza, muscle aches, headache, and fatigue. Influenza seasons are unpredictable, and can be severe. Pandemics can cause greater than expected mortality, or in the case of the 2009–2010 pandemic, greater mortality among younger persons. Nearly 90% of pandemic deaths in the U.S. during 2009–2010 occurred among persons younger than 65.

The Oregon Public Health Division conducted enhanced surveillance for pandemic H1N1 illnesses in collaboration with local partners. Surveillance activities included outpatient influenza-like illness (ILI) surveillance, statewide hospitalization surveillance among adult and pediatric cases, and statewide mortality surveillance. Laboratory testing and surveillance through the Oregon State Public Health Laboratory supported ILI, hospitalization and morality surveillance.

Influenza-like illness

The peak of ILI activity occurred between October 11–24, 2009. During the week ending October 17, 2009, 10.9% of outpatient visits reported by sentinel providers were associated with ILI. During the week that ended October 24, 2009, 22.3% of outpatient visits reported by Oregon Community Health Information Network providers (OCHIN representing 103 clinics throughout Oregon) were associated with ILI.

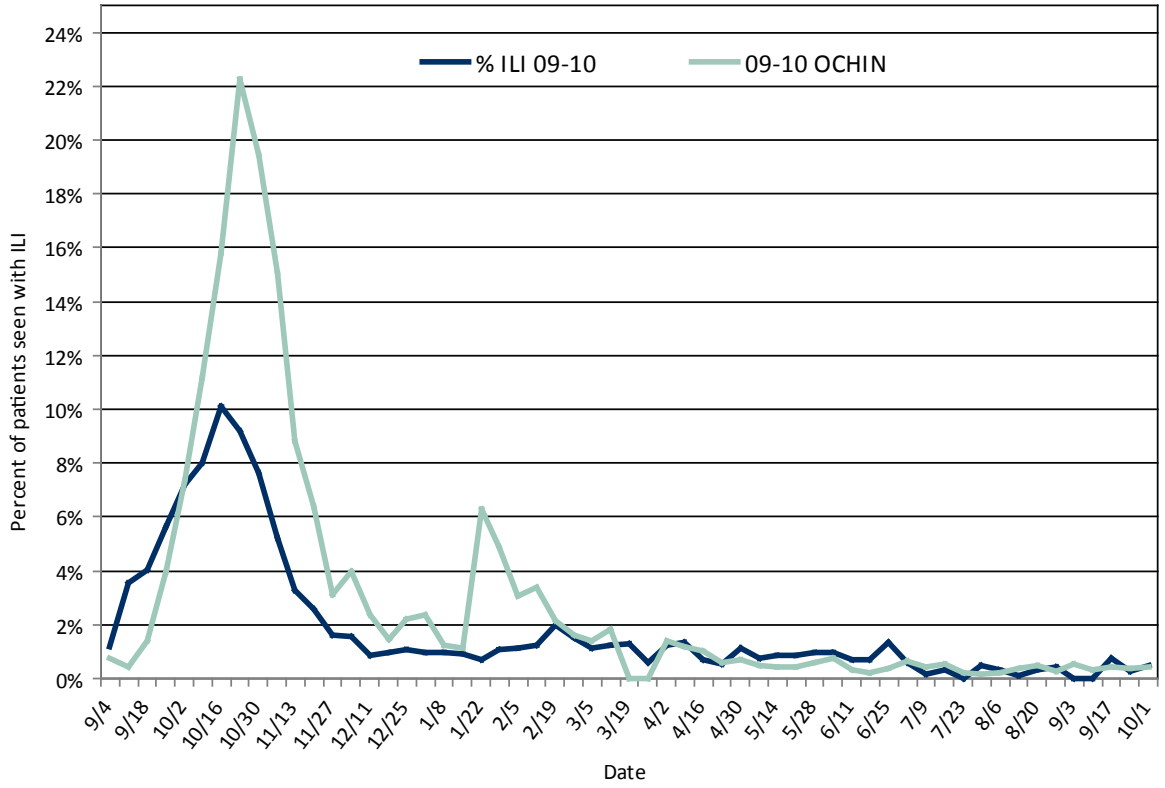
Hospitalizations and deaths

Influenza-associated hospitalizations and deaths were reportable conditions in Oregon from September 1, 2009, to August 31, 2010. Between April 2009 and May 2010, surveillance identified 1,315 influenza hospitalizations and 67 deaths. The rate of hospitalization was highest among persons 0–4 years of age and 50–64 years of age. Fifty-four percent of hospitalized cases were female. Eight percent of hospitalized cases died. Four influenza deaths occurred among children 0–17 years of age.

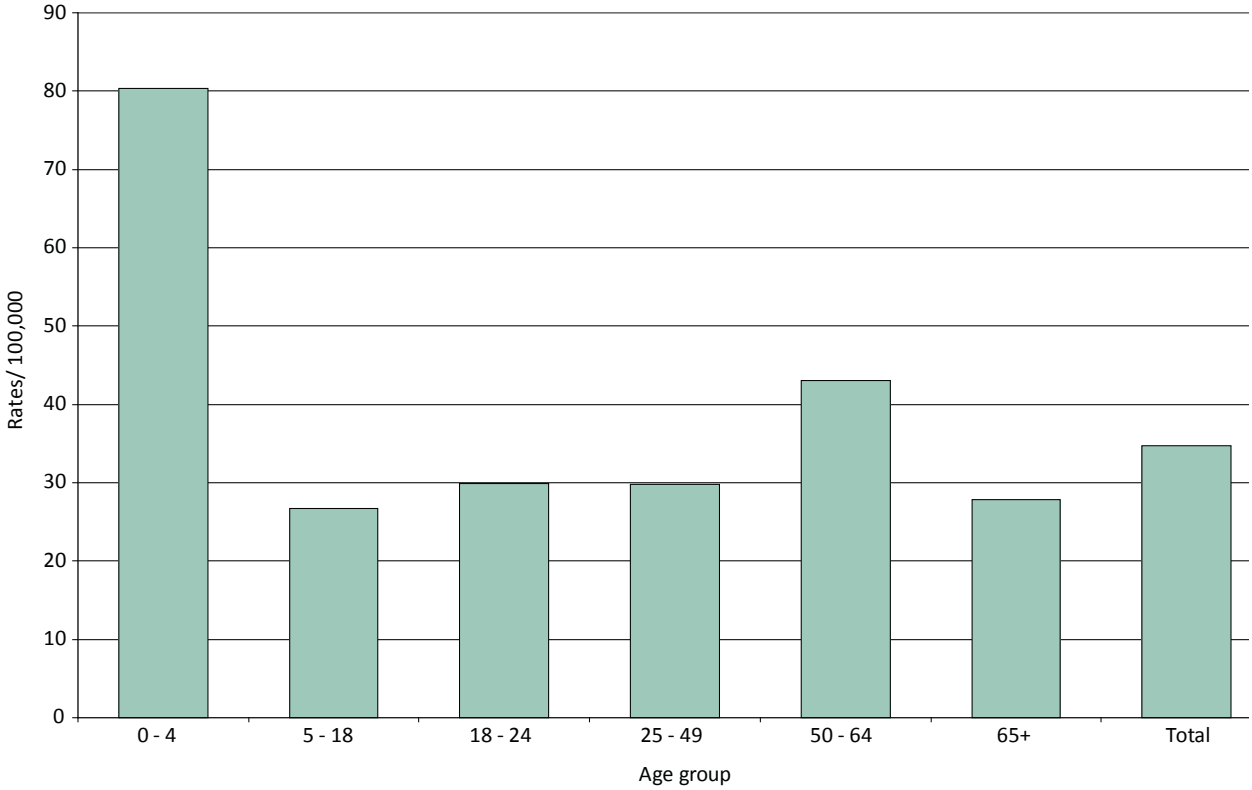
Deaths

The reporting requirements changed after August 2010. Currently, only pediatric influenza deaths and ICU hospitalizations (including six weeks post-partum) among pregnant women are reportable in Oregon.

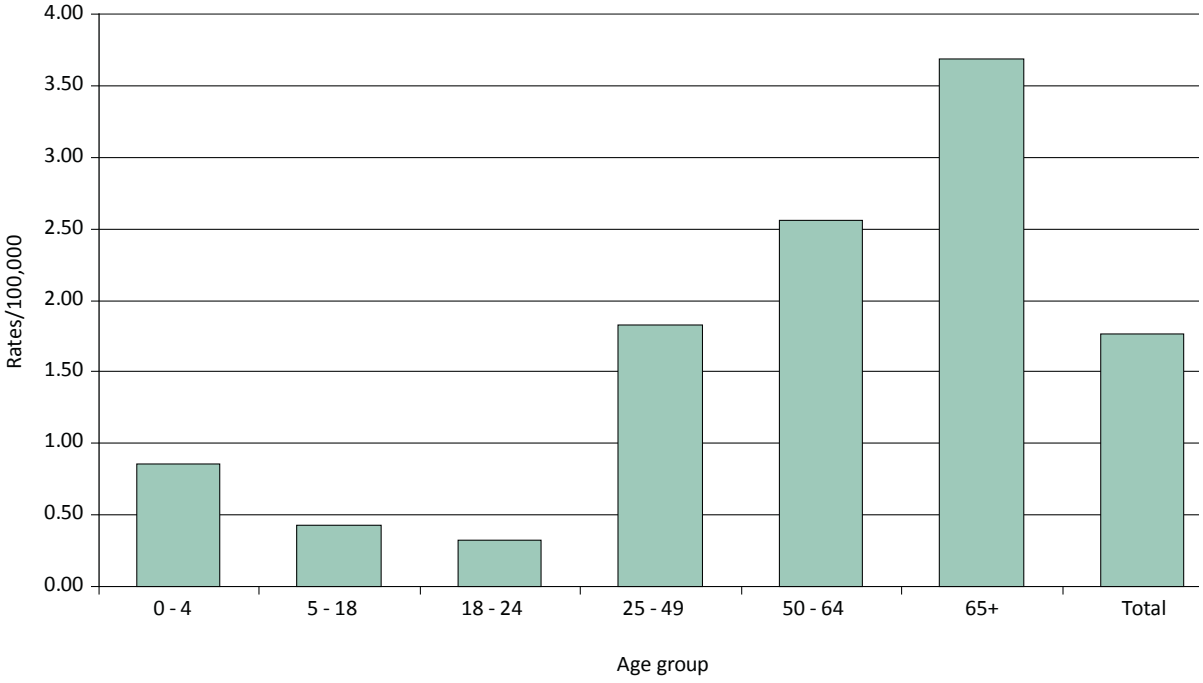
Oregon outpatient influenza-like illness (ILI) surveillance: ILINet and OCHIN, 2009–10



Influenza hospitalizations among Oregon residents: 9/1/2009–5/1/2010



Influenza deaths among Oregon residents: 9/1/2009–5/1/2010



Legionellosis

Legionellosis is usually an acute respiratory tract infection that begins two to 14 days after exposure to *Legionella* spp. Signs of the disease can include a high fever, chills and cough, in addition to head and muscle aches. Since symptoms are similar to those seen in other forms of pneumonia, the diagnosis is rarely obvious and can be difficult to make. Available confirmatory diagnostic tests include urine antigen detection, direct fluorescent antibody staining, and culture.

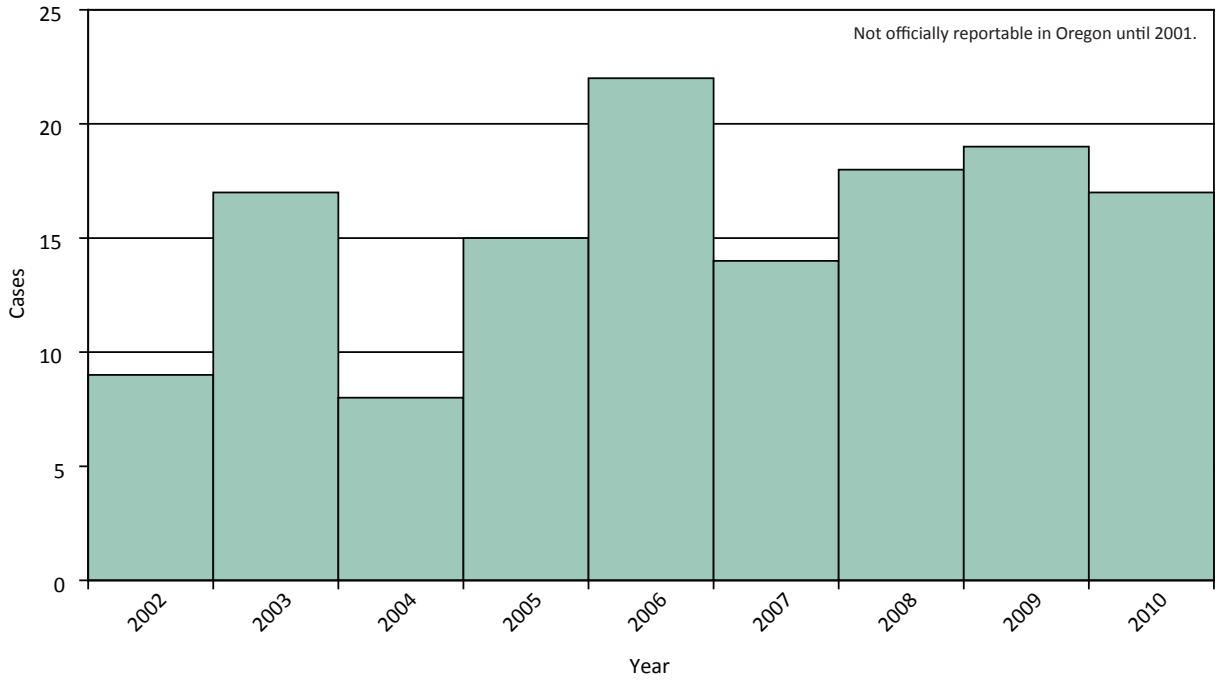
"Pontiac Fever," a milder illness associated with *Legionella* bacteria, is characterized by fever and myalgias without pneumonia. It typically occurs a few hours to two days after exposure.

Legionella bacteria are found naturally in the environment, usually in water, and grow best in warm conditions such as hot tubs, cooling towers, hot water tanks, large plumbing systems, or the air-conditioning systems of large buildings. Person-to-person transmission does not occur.

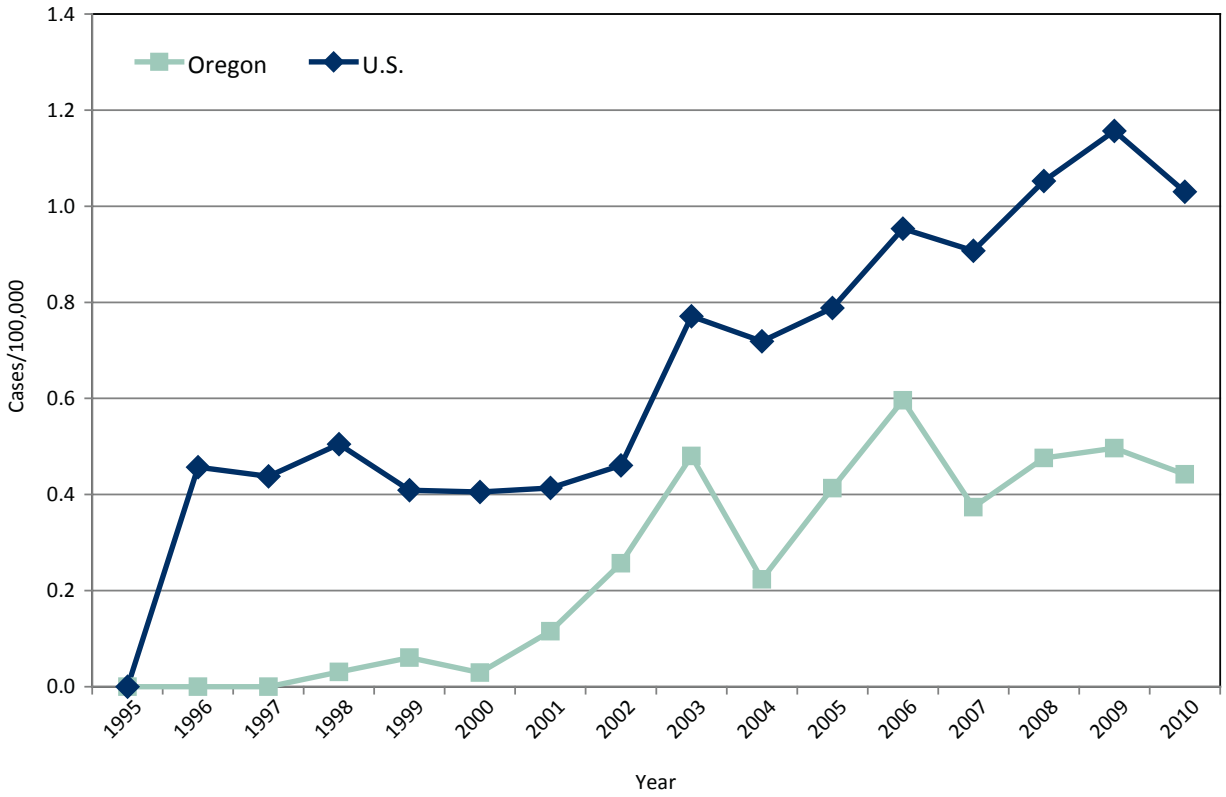
Risks for infection include older age, smoking, chronic lung disease (like emphysema), renal insufficiency, diabetes and immune deficiency. Death occurs in 10% to 15% of cases; a substantially higher proportion of fatal cases occur during nosocomial outbreaks.

Legionellosis became officially reportable in Oregon in 2001. In 2010, 18 cases of legionellosis were reported among Oregonians, the same as the number of cases reported in 2008 and 2009. All 18 cases reported in 2010 were hospitalized. There was one death.

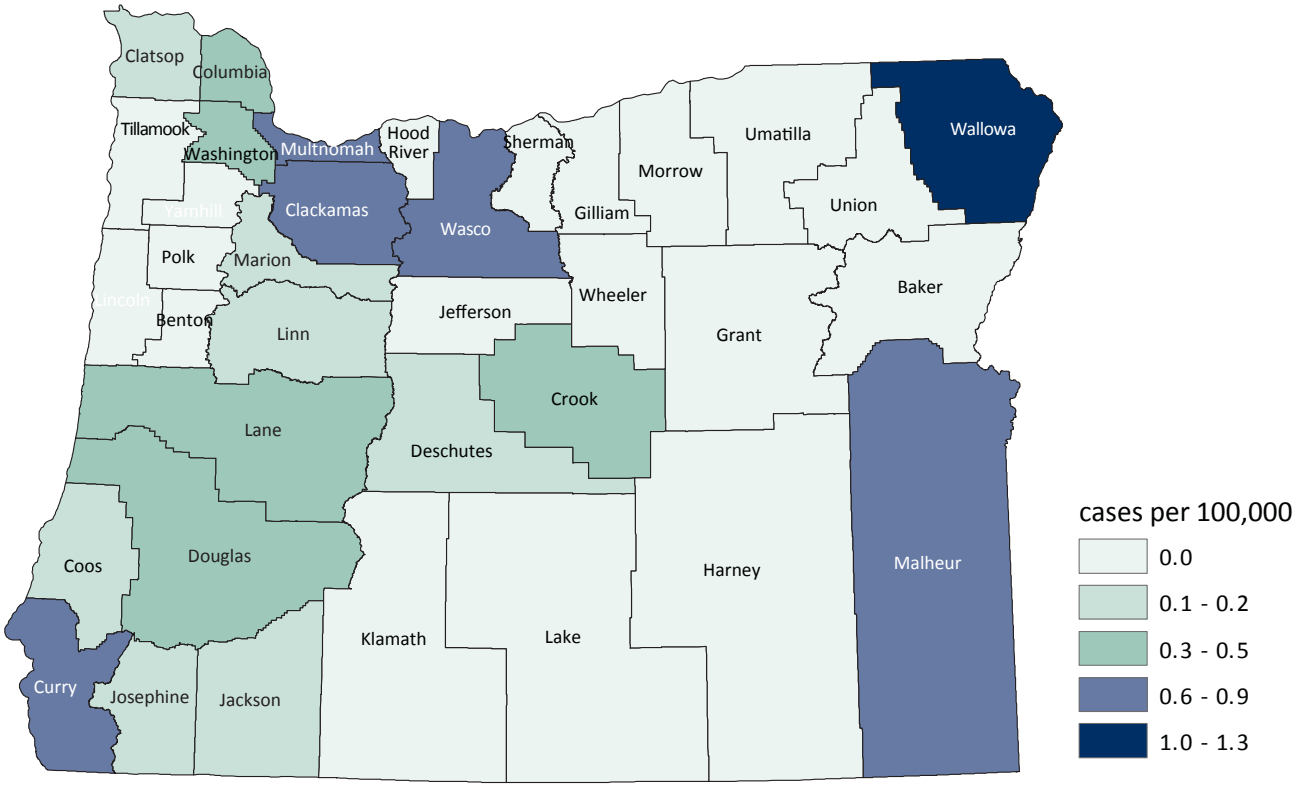
Legionellosis by year: Oregon, 2002–2010



Incidence of legionellosis: Oregon vs. nationwide, 2000–2010



Incidence of legionellosis by county of residence: Oregon, 2000–2010



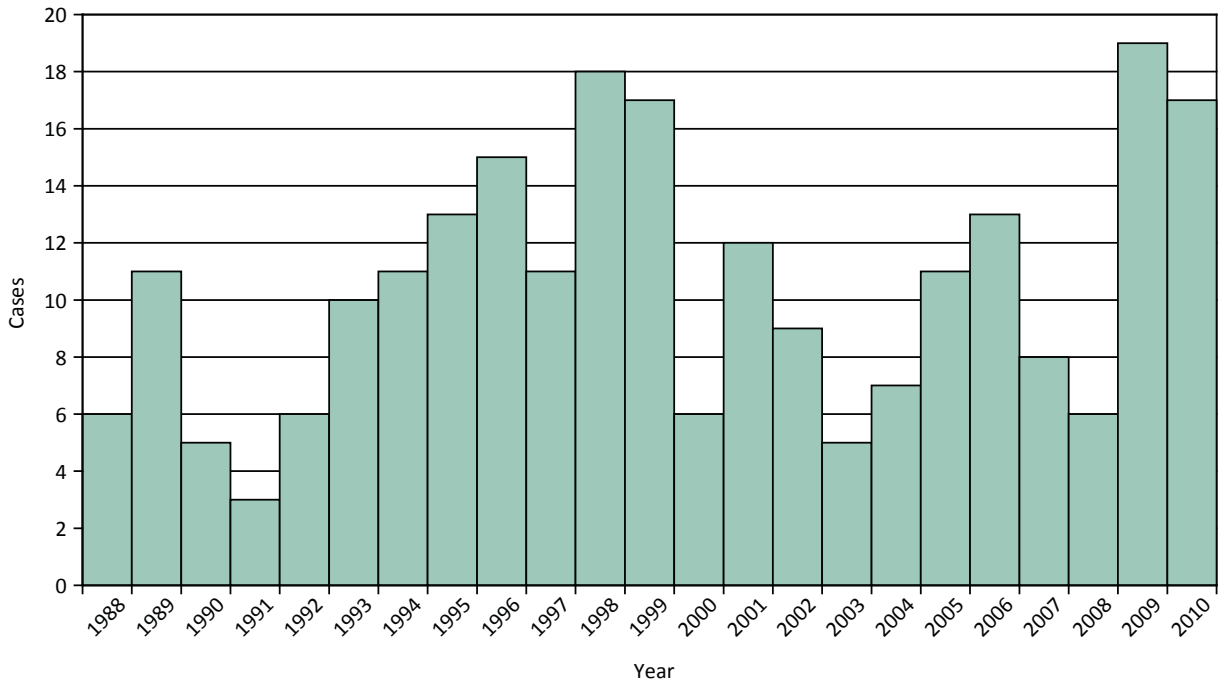
Listeriosis

Listeriosis is a bacterial infection that may present as influenza-like illness with high fever, headache and myalgias; as a gastrointestinal illness; or as an invasive disease with sepsis or meningitis. In pregnant women, listeriosis may cause miscarriages or stillbirths. The case fatality rate of invasive listeriosis is as high as 30% in infants infected prenatally and in non-pregnant adults.

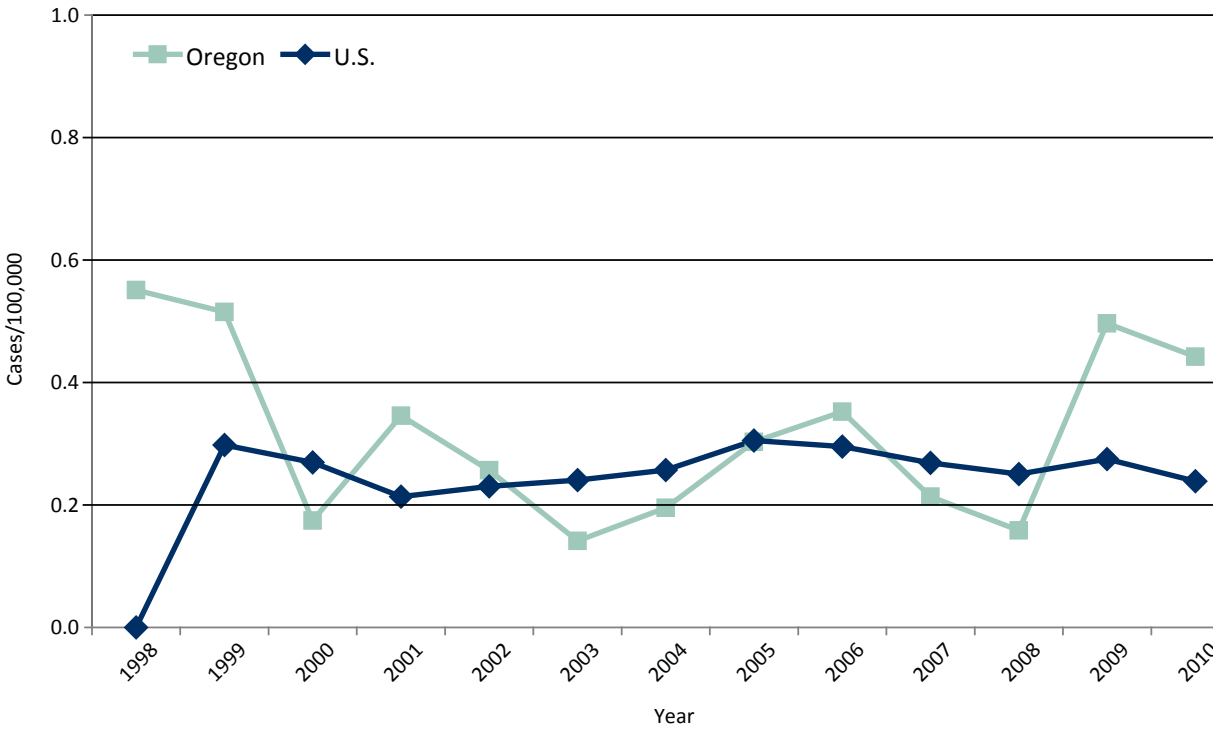
Most cases of listeriosis are sporadic rather than epidemic. However, several large outbreaks have been associated with consumption of contaminated foods. It is important to track the incidence of this disease to identify such outbreaks, as well as to identify high risk groups. The rate is higher among pregnant women, newborns, the elderly and immunocompromised persons. Cooking food properly is the most important means of prevention. When listerosis is diagnosed, treatment with antibiotics should be instituted promptly.

In 2010 there were 17 cases, including four pregnancy-associated. All the four pregnancy-associated cases were part of an outbreak. One person died (5.8%).

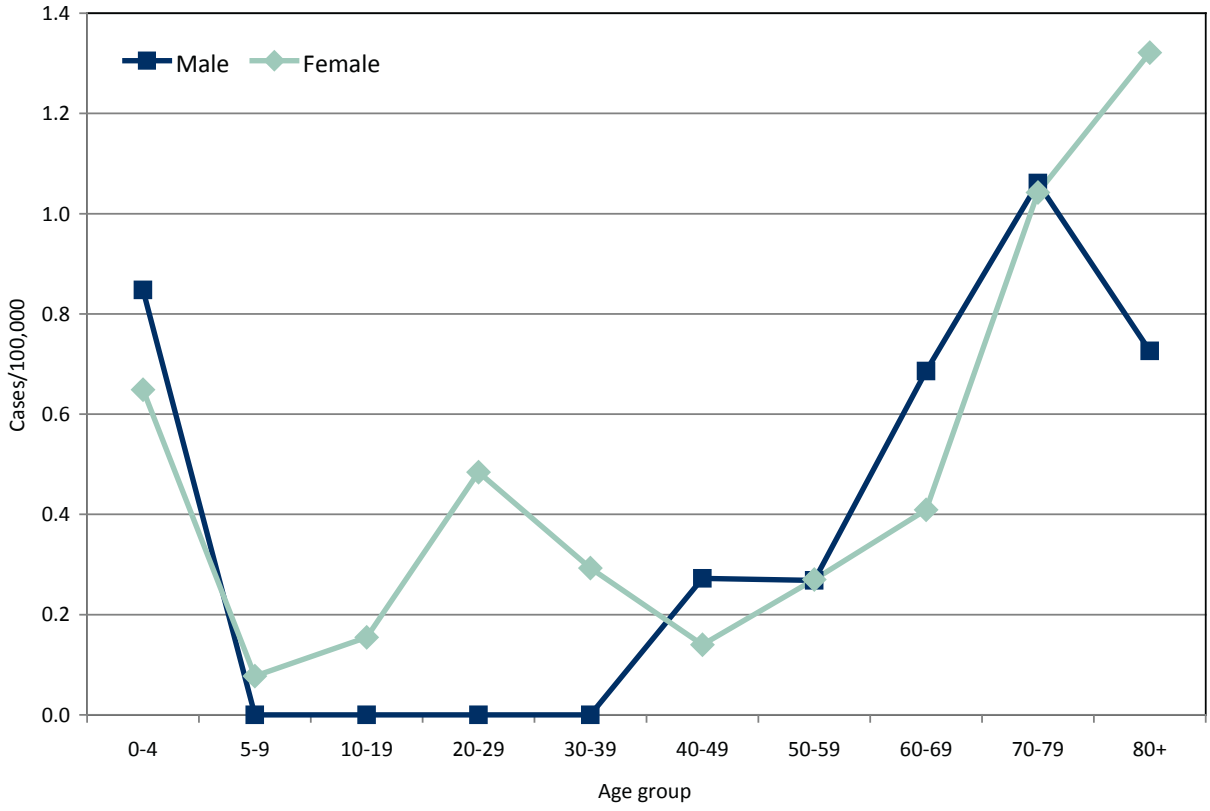
Listeriosis by year: Oregon, 1988–2010



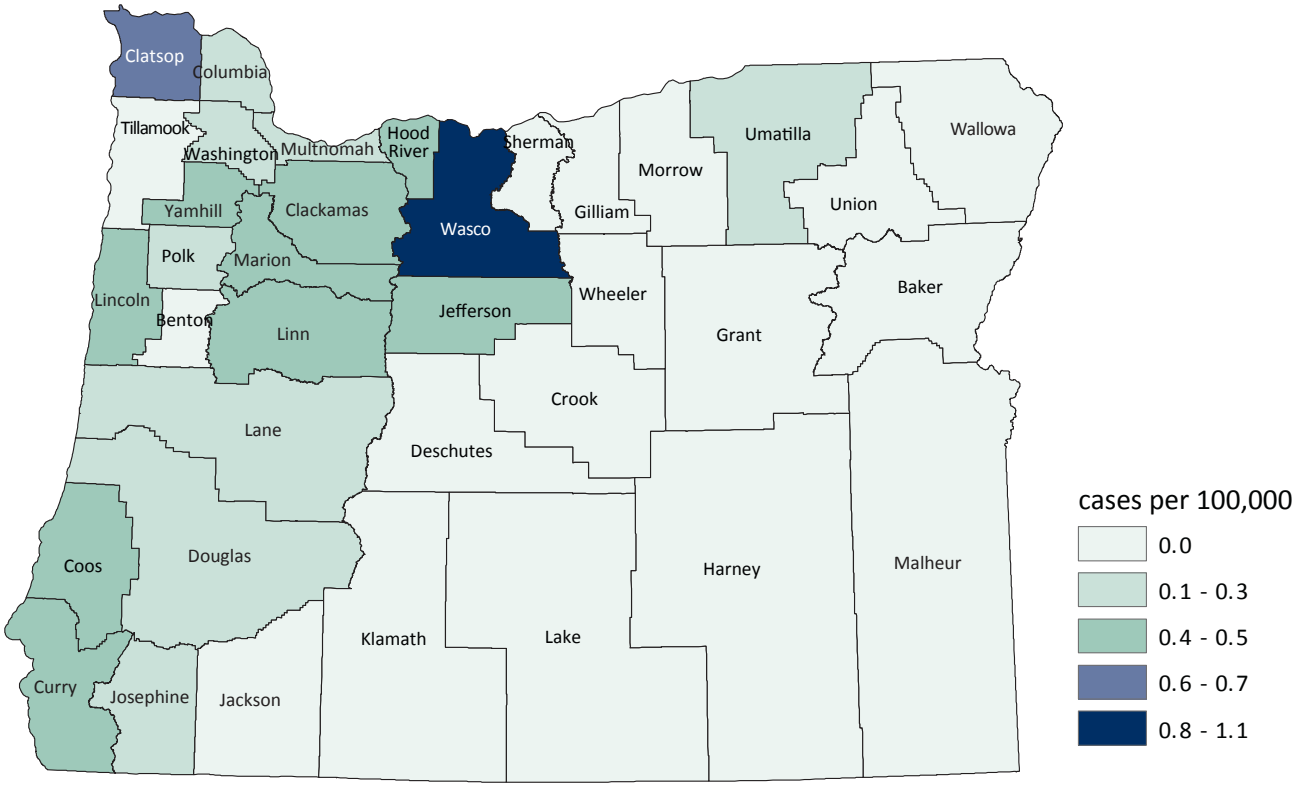
Incidence of listeriosis: Oregon vs. nationwide, 1998–2010



Listeriosis by age and sex: Oregon, 2000–2010



Incidence of listeriosis by county of residence: Oregon, 2000–2010



Lyme disease

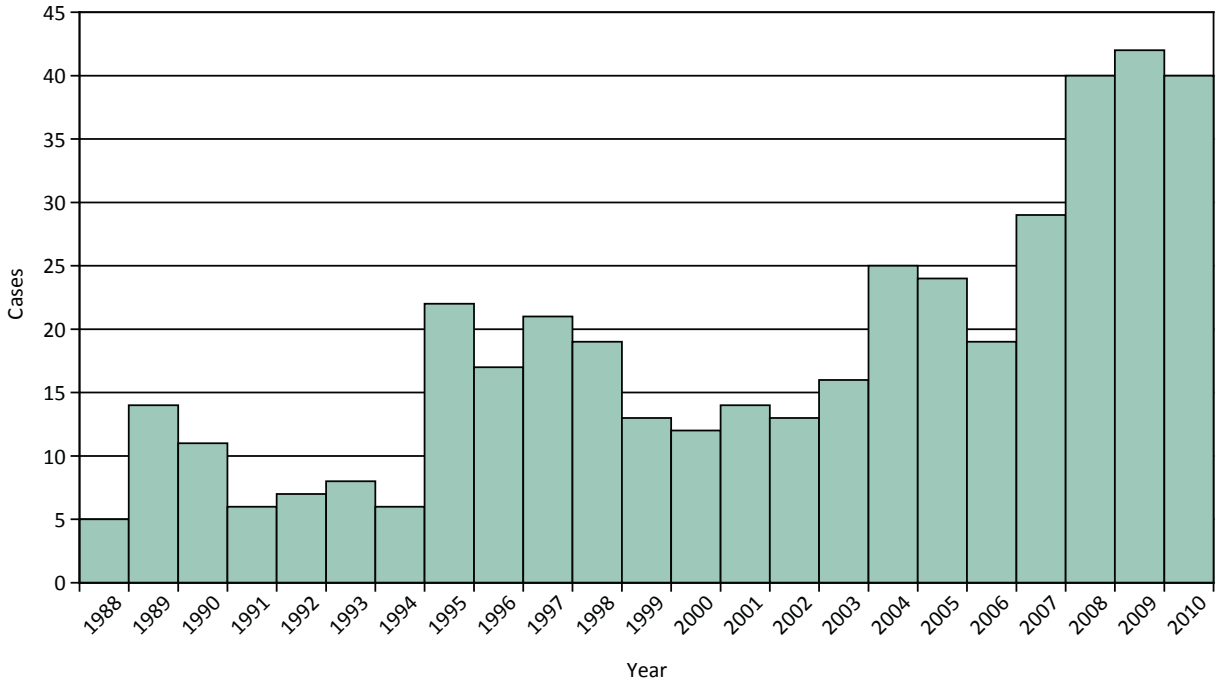
Lyme disease is a tick-borne zoonotic disease caused by the spirochete *Borrelia burgdorferi*. The first manifestation in about 60% of patients appears as a red macule or papule (bull's eye) that expands slowly in an annular manner, sometimes with multiple similar lesions. This distinctive skin lesion is called erythema migrans. The incubation period for Lyme disease ranges from three to 32 days after tick exposure; however, the early stages of the illness may be asymptomatic, and the patient may later develop systemic symptoms and rheumatologic, neurologic or cardiac involvement in varying combinations over a period of months to years.

Currently, increasing recognition of the disease is redefining enzootic areas for *B. burgdorferi*; Lyme disease cases have been reported in 47 states, and in Ontario and British Columbia, Canada. Elsewhere, related borrelioses have been found in Europe, the former Soviet Union, China and Japan.

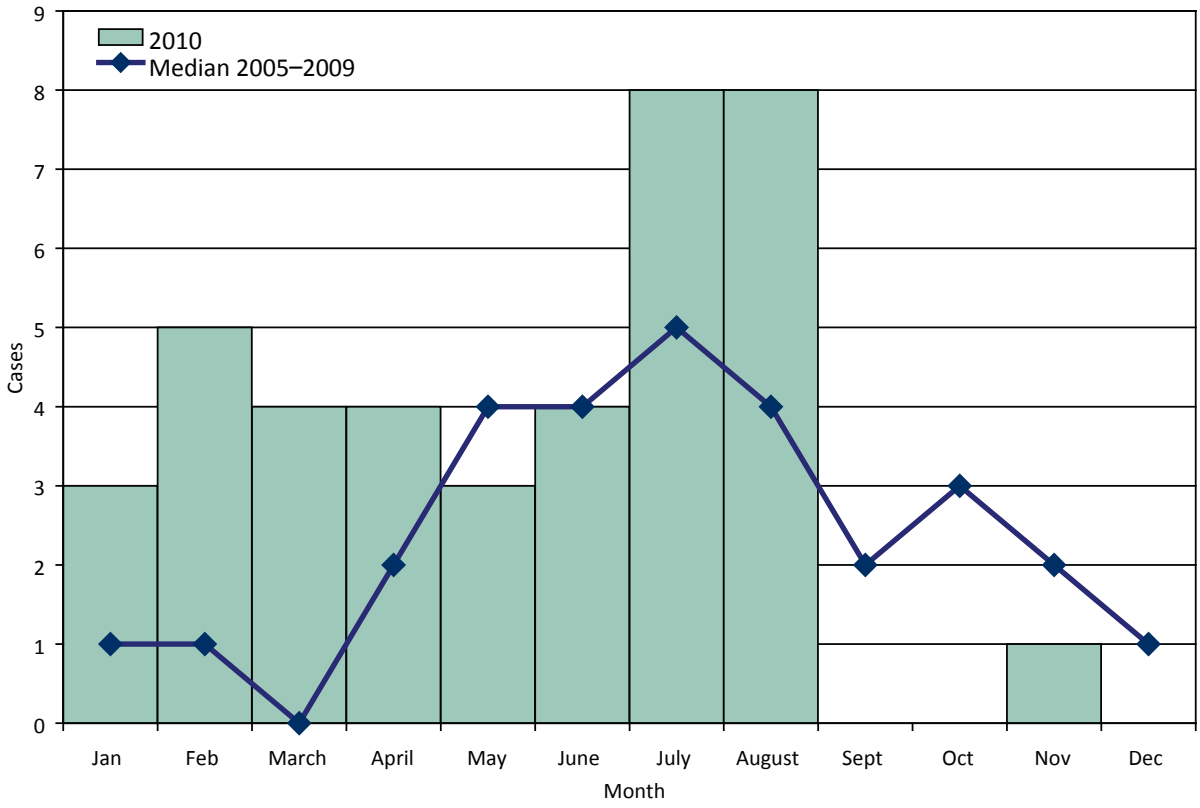
In 1997–1998, a tick identification and *Borrelia* isolation study was conducted by the CDC and the Oregon Department of Human Services in Deschutes, Josephine and Jackson counties. No ticks from Deschutes County were identified as carrying *Borrelia* in this study. The organism was isolated in 3.5% of *Ixodes pacificus* ticks tested.

During 2010, 32 presumptive and eight confirmed cases were reported in Oregon. The median age was 36 years. Twenty-eight (70%) cases were female.

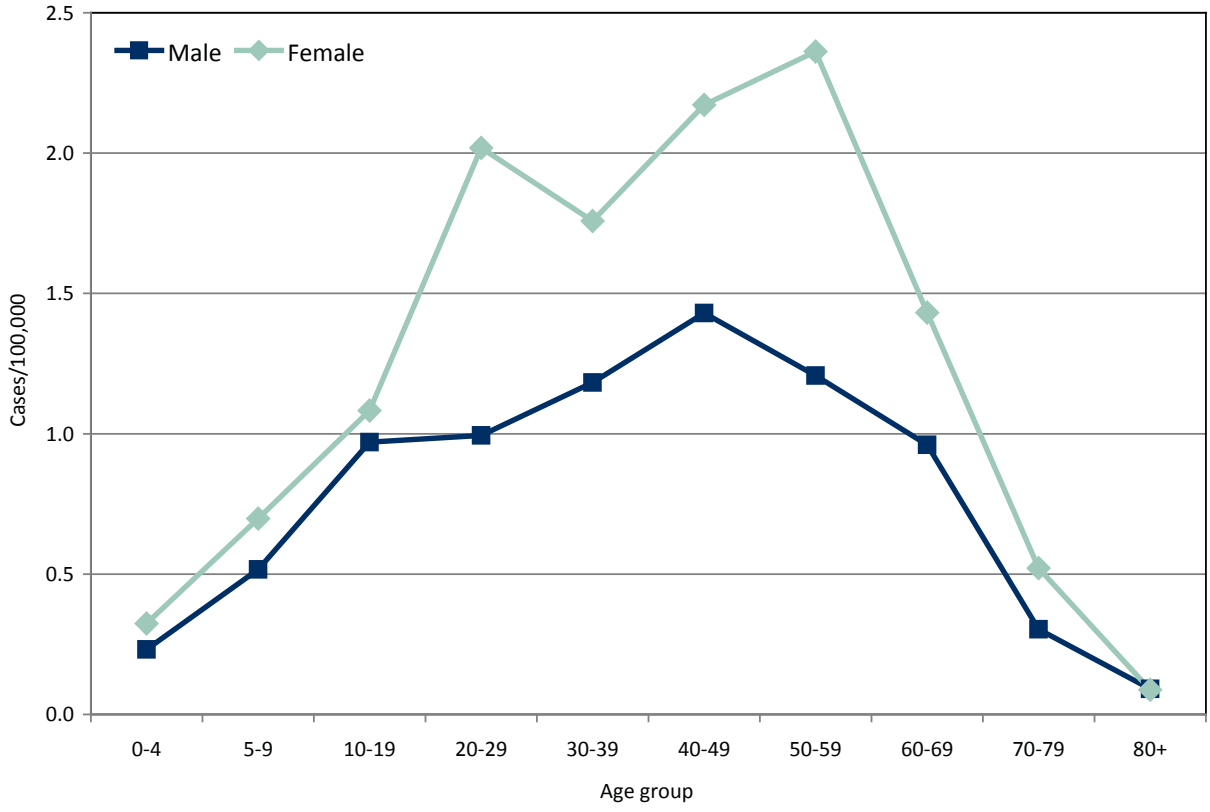
Lyme disease by year: Oregon, 1988–2010



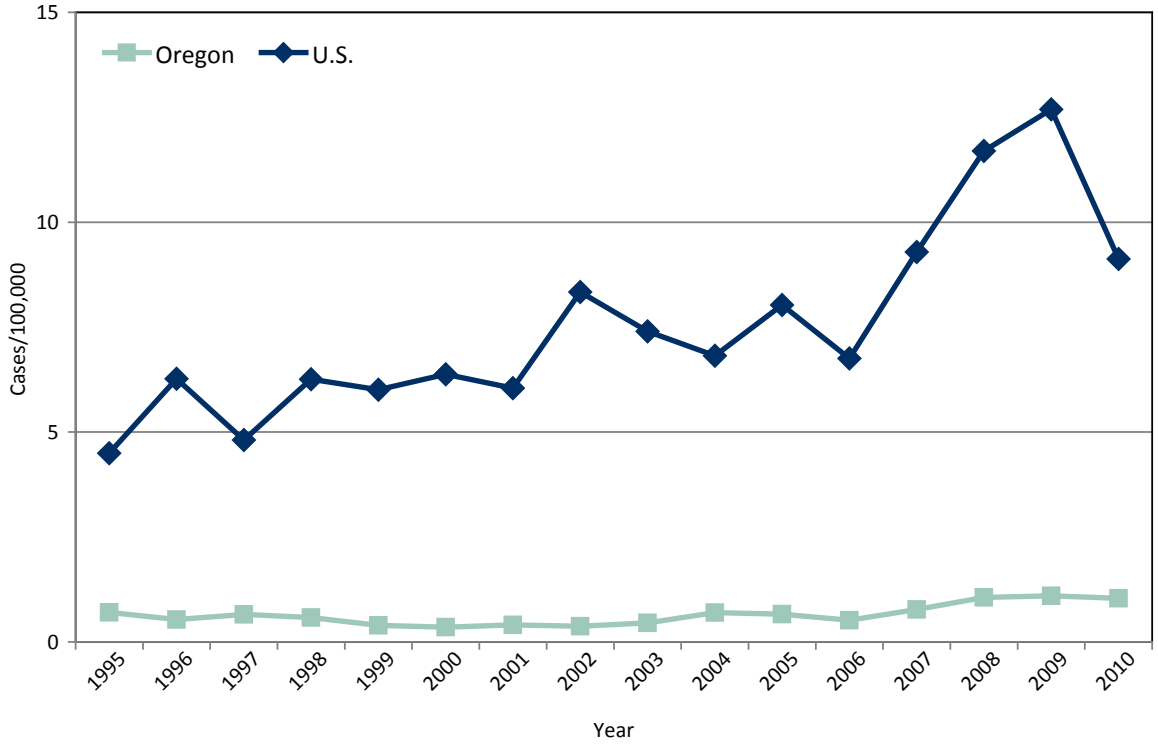
Lyme disease by onset month: Oregon, 2010



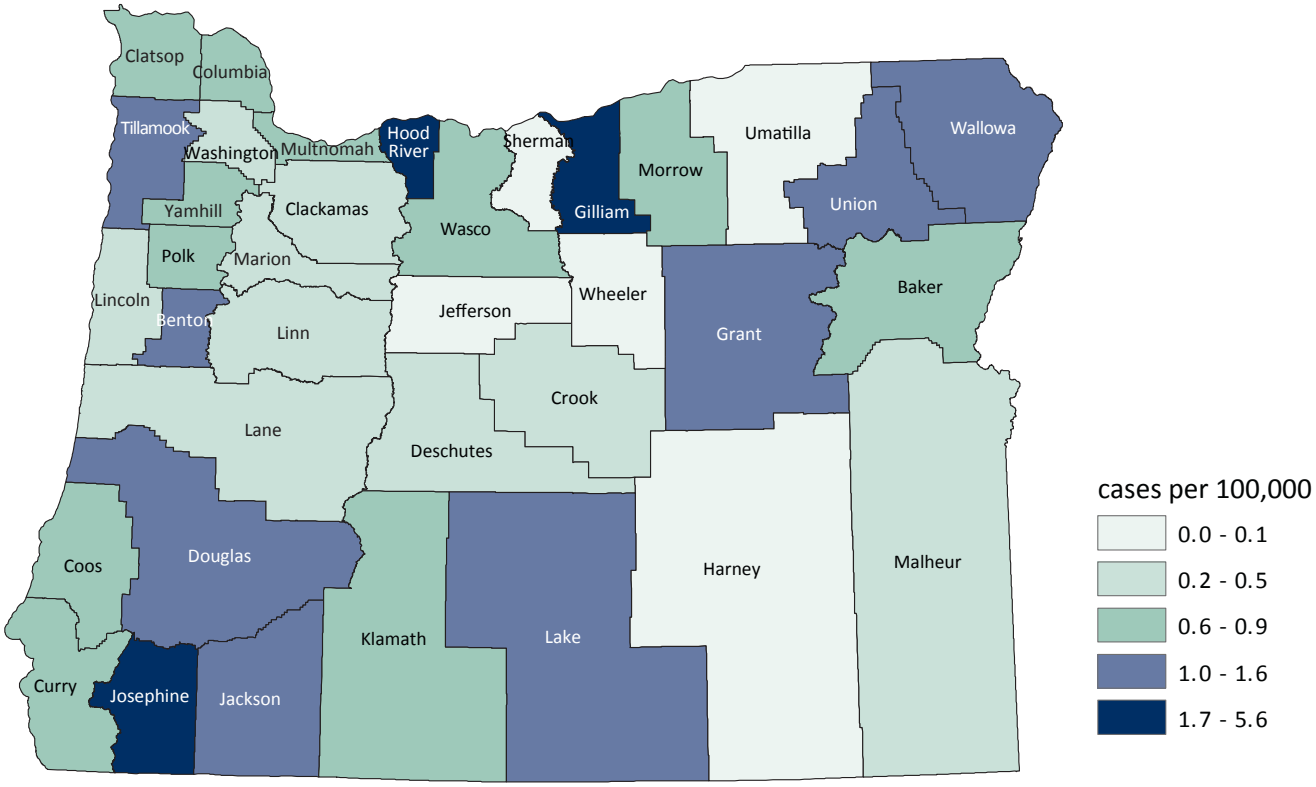
Incidence of Lyme disease by age and sex: Oregon, 2000–2010



Incidence of Lyme disease: Oregon vs. nationwide, 1995–2010



Incidence of Lyme disease by county of residence*: Oregon, 2000–2010

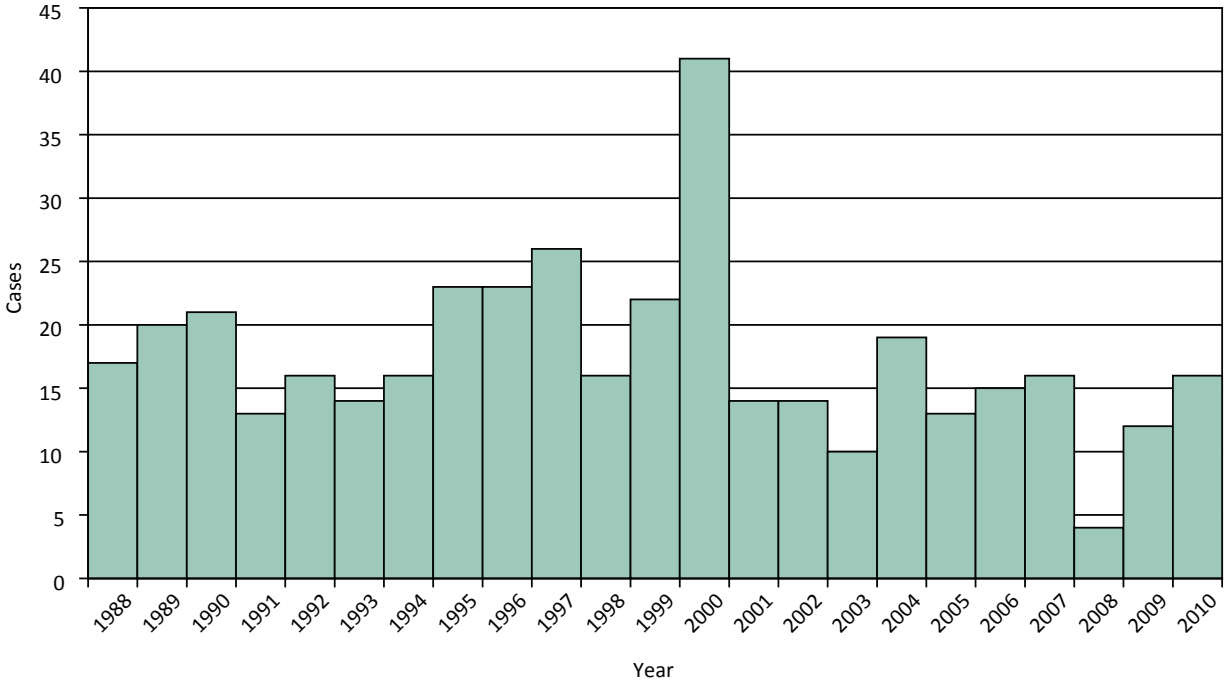


*Not necessarily county of acquisition

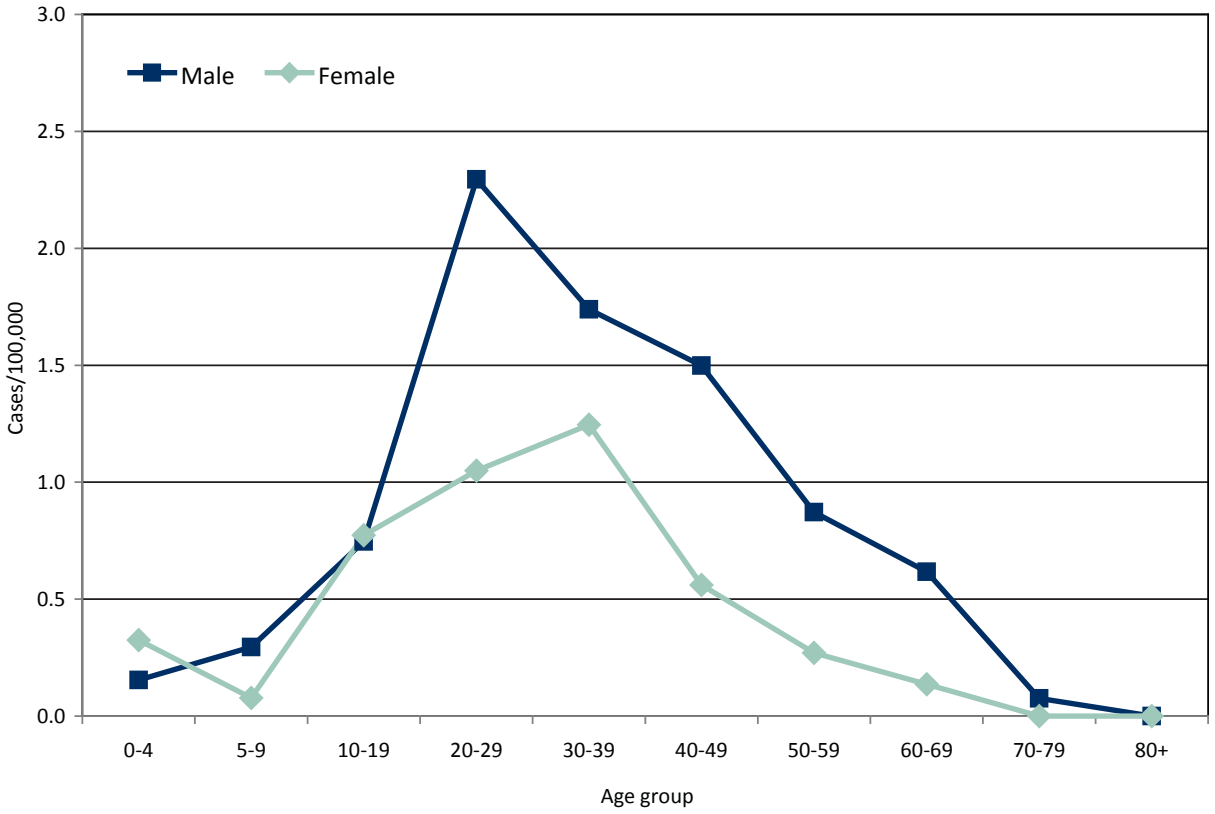
Malaria

Worldwide, malaria is one of the most devastating of the communicable diseases, causing perhaps 1 million to 2 million deaths annually, not to mention an enormous burden of disability and medical costs. While transmission has not been documented in Oregon for decades, malaria is reported every year in our state; all cases have resulted from exposures outside the United States. Competent anopheline mosquitoes are resident in Oregon, so limited local transmission remains a remote possibility. Oregon rates are similar to the national average. Oregon surveillance data contribute to the national database, which is used to tailor recommendations for prophylaxis and treatment. In 2010, 16 cases were reported, up from four in 2009. Eleven were *Plasmodium falciparum* (the worst kind to have, and the most common worldwide).

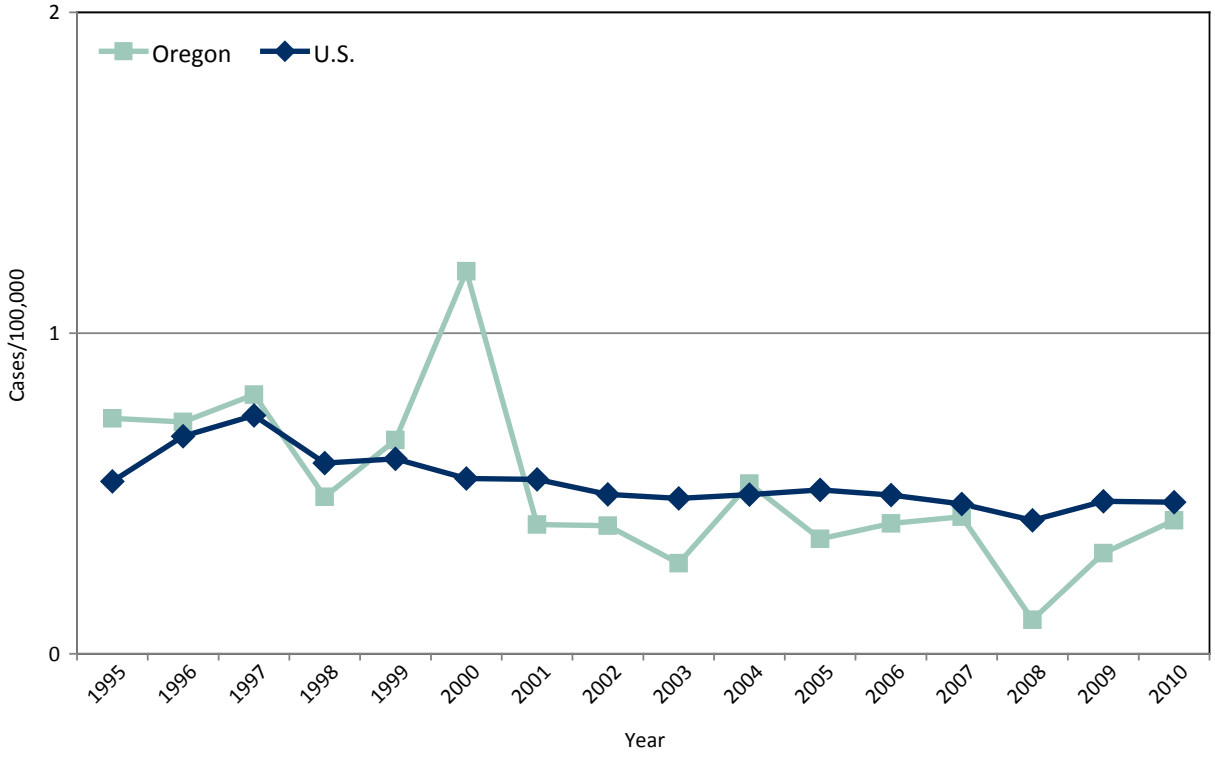
Malaria by year: Oregon, 1988–2010



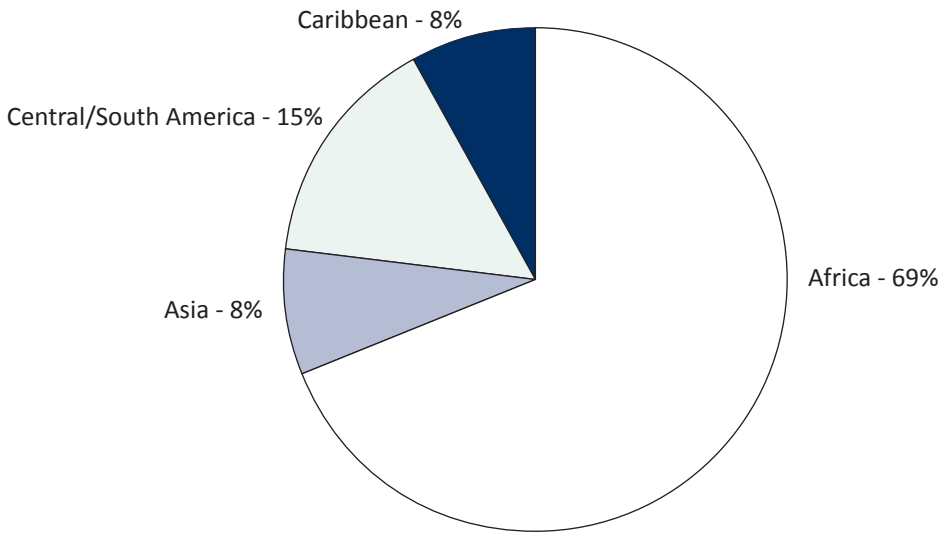
Incidence of malaria by age and sex: Oregon, 2000–2010



Incidence of malaria: Oregon vs. nationwide, 1995–2010



Malaria cases by continent of acquisition: Oregon, 2010



Measles

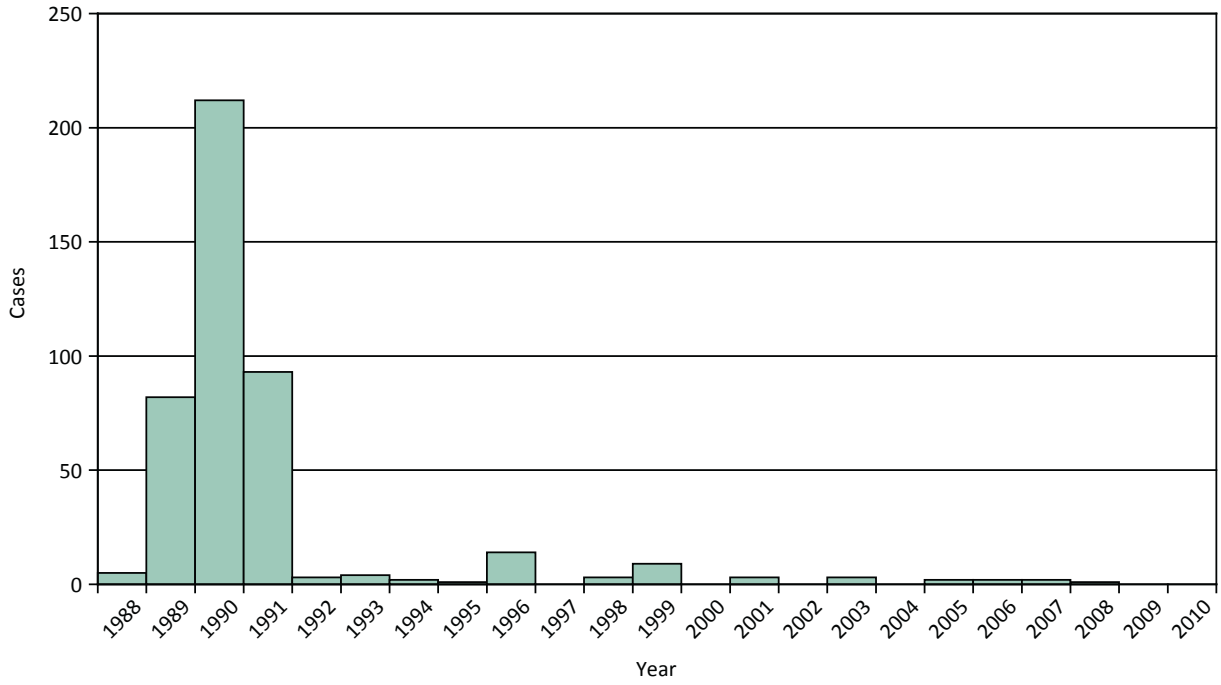
Measles is an acute, highly communicable viral illness known for its red, blotchy rash that starts on the face and then becomes generalized. The rash is preceded by a febrile prodrome that includes cough, coryza and conjunctivitis, and sometimes photophobia and Koplik spots. Diagnosis is confirmed by the presence of serum IgM antibodies (in a patient who has not recently been immunized).

During 1989–1991, a major resurgence of measles occurred in the United States, with more than 55,000 cases and 120 deaths reported. The resurgence was characterized by an increasing proportion of cases among unvaccinated preschool-aged children. A focus on increasing vaccination among preschool children by following the 1989 recommendation for two doses of MMR vaccine resulted in a dramatic reduction in illness. Endemic measles has been eliminated from the United States, but cases are occasionally imported.

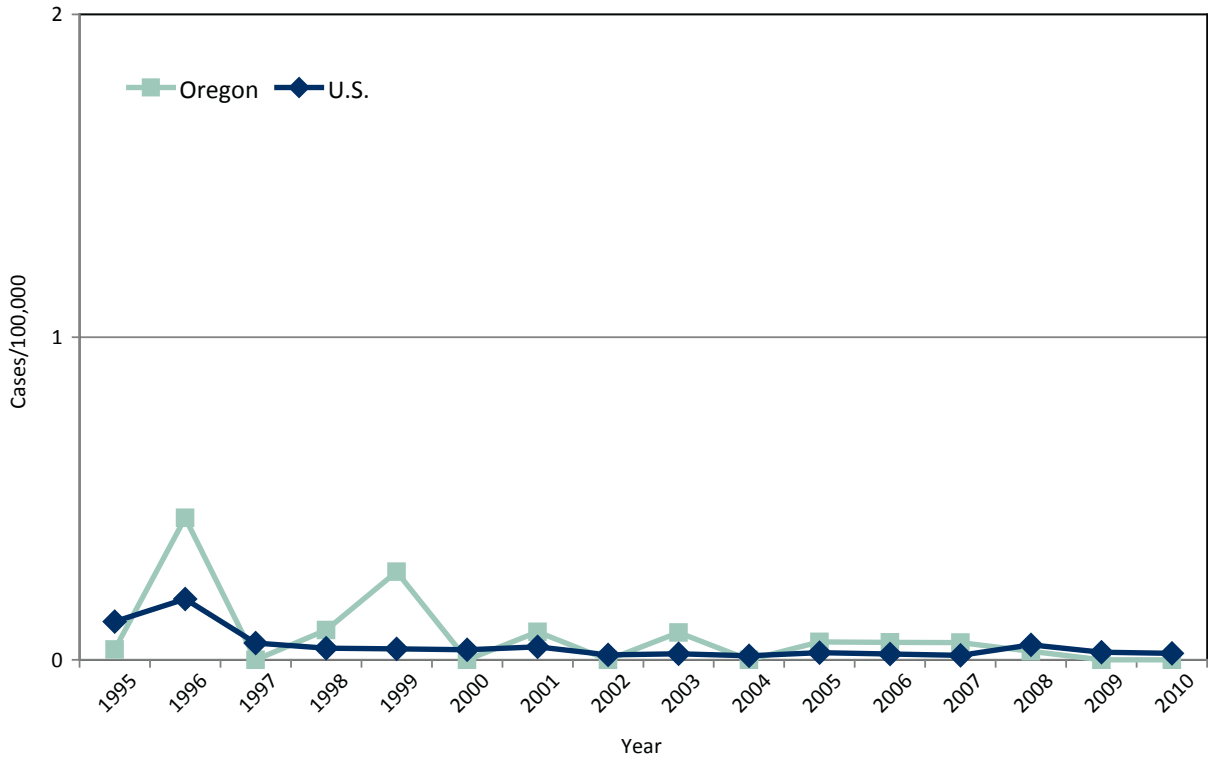
In Oregon, two doses of measles vaccination have been required since 1998. In 2010, >94% of kindergartners had received two doses of measles-containing vaccine. Since 2002, 10 cases have been reported in Oregon; eight of these were imported, and two were linked to imported cases. Most imported cases originated in Asia and Europe and occurred both among Oregon citizens traveling abroad and persons visiting Oregon from other countries. The median age of cases has been 29 (range, 19–49) years. Cases were either unvaccinated (9) or had undocumented vaccination status (1).

Though measles is highly infectious, the risk of exposure to measles in Oregon remains low. Sustaining high levels of vaccination is important to limit the spread of measles from imported cases and to prevent it from becoming re-established as an endemic disease in the United States.

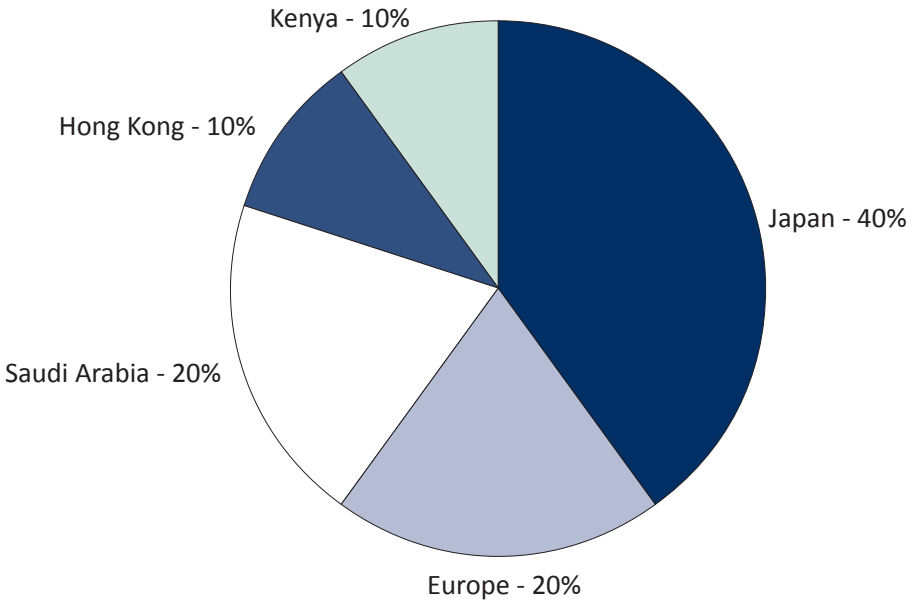
Measles by year: Oregon, 1988–2010



Incidence of measles: Oregon vs. nationwide, 1995–2010



Measles by country of importation: 1997–2010

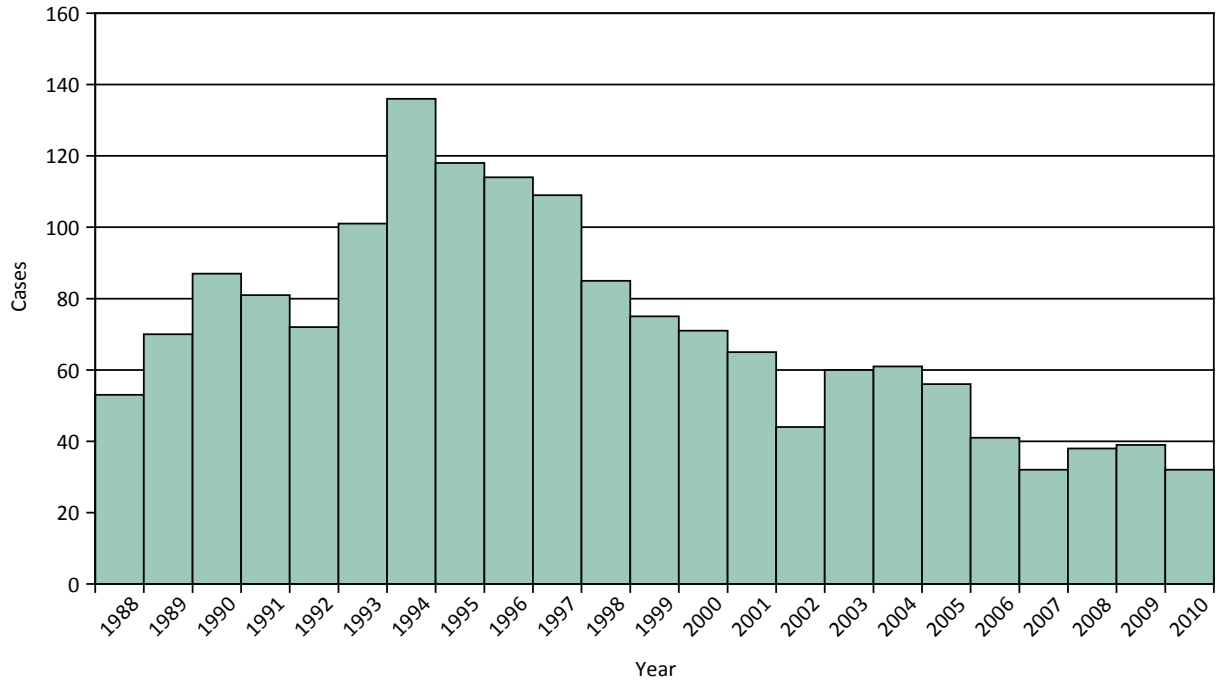


Meningococcal disease

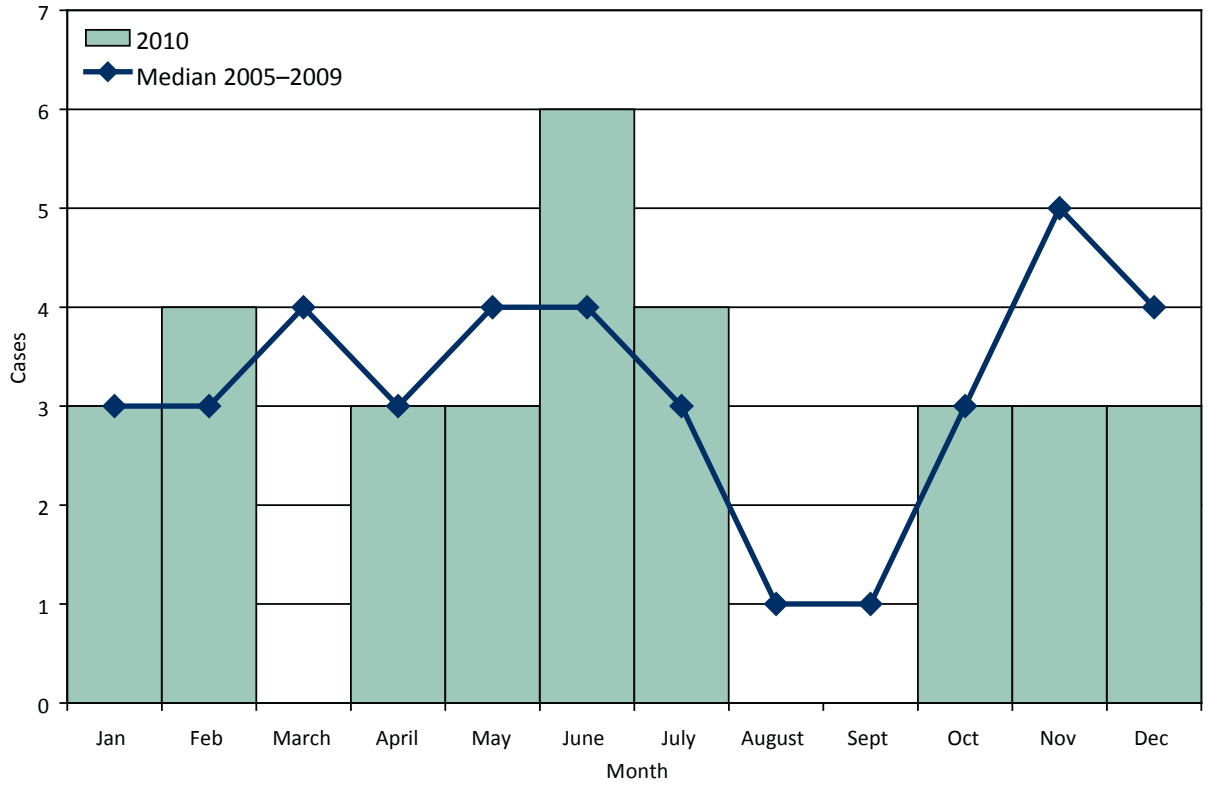
Reported cases of invasive meningococcal infections, including sepsis and meningitis, have declined from the hyperendemic levels seen in 1993–1997 attributable to a clonal strain of serogroup B. Respiratory secretions and droplets continue to be shared among Oregonians and predispose secondary cases.

In 2010, there were 32 reports of meningococcal disease in Oregon. This continues the overall decline in cases throughout the state. The highest majority (45%) of illness in Oregon was once again caused by serogroup B organisms, followed by serogroups Y (26%), C (19%), and W135 (10%). The burden of meningococcal disease is highest in the very young (those 0–4 years of age), with a second, lower peak in incidence in young adults, followed by those over the age of 65. Though a new conjugate vaccine (Menactra™) for adolescents and young adults was licensed in 2006, this vaccine does not protect against serogroup B disease.

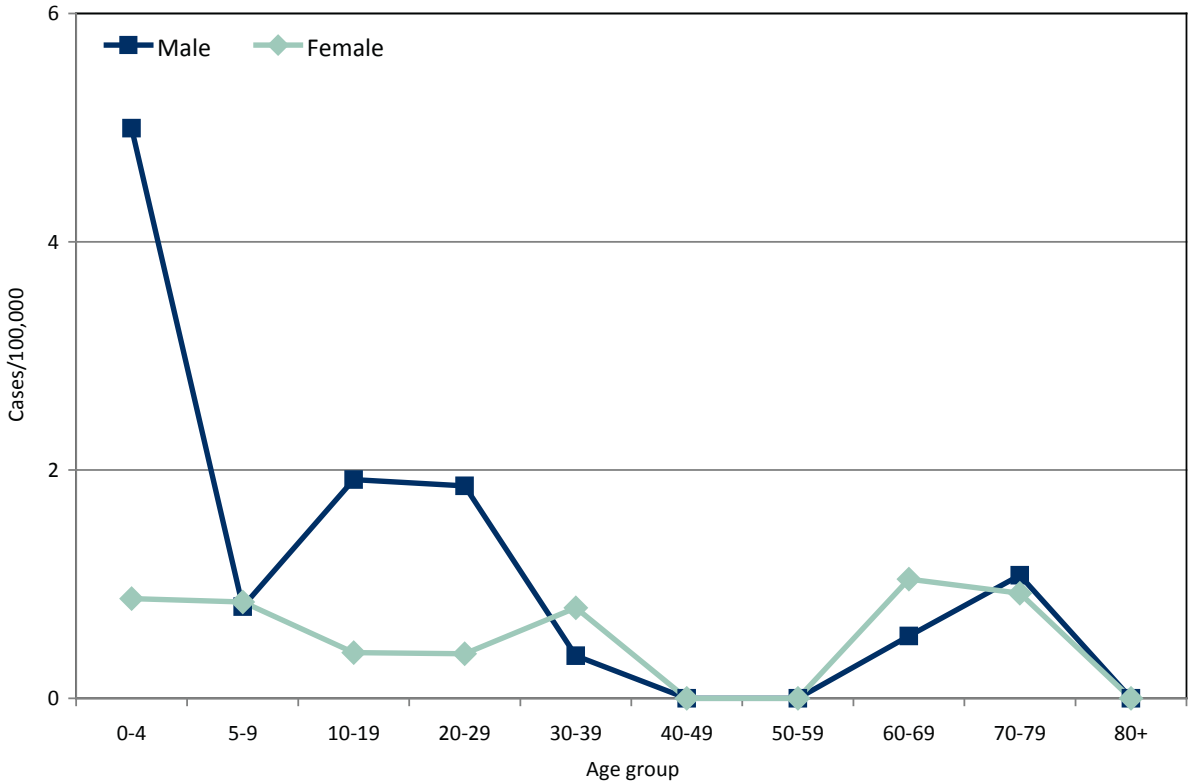
Meningococcal disease by year: Oregon, 1988–2010



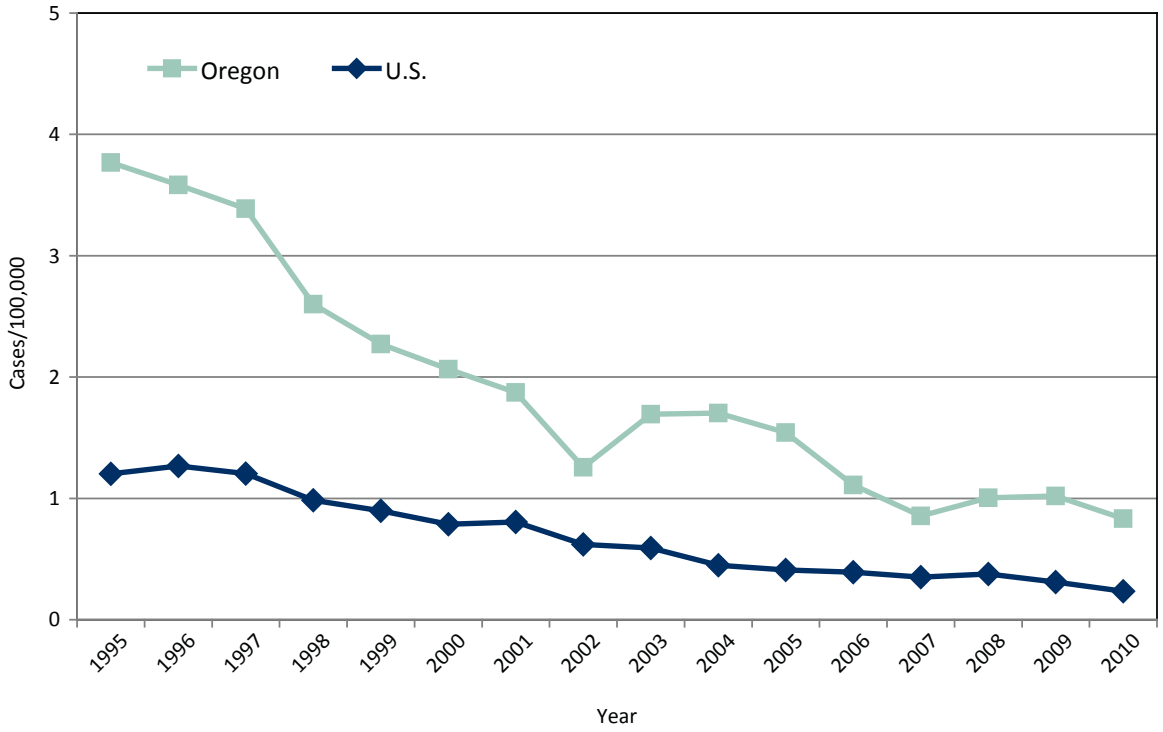
Meningococcal disease by onset month: Oregon, 2010



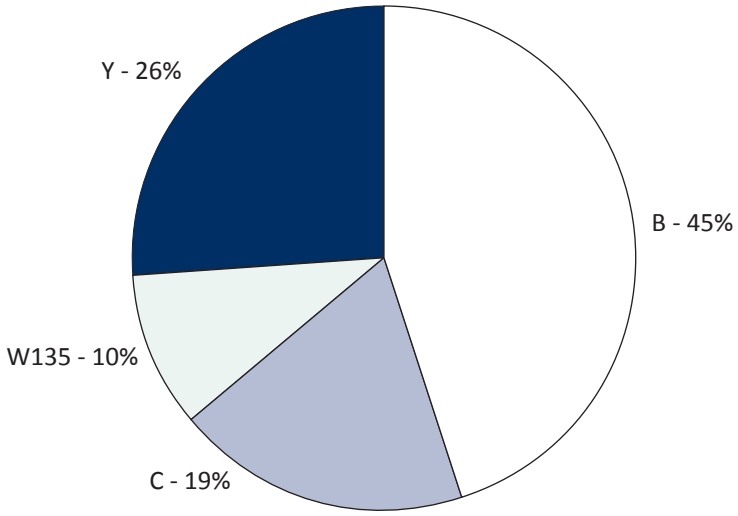
Incidence of meningococcal disease by age and sex: Oregon, 2010



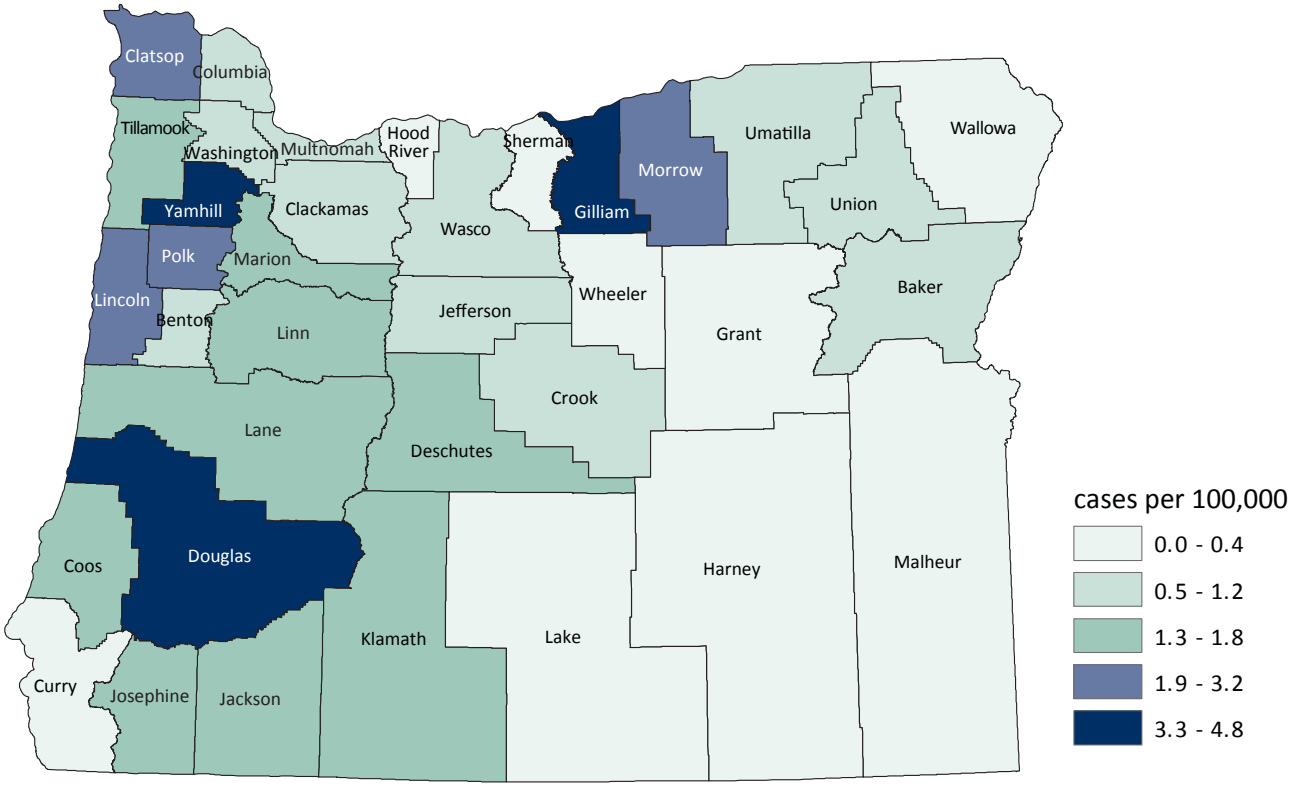
Incidence of meningococcal disease: Oregon vs. nationwide, 1995–2010



Meningococcal disease by serogroup: Oregon, 2010



Incidence of meningococcal disease by county of residence: Oregon, 2000–2010



Mumps

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

Reporting of this vaccine-preventable viral infection was discontinued in Oregon in 1981. Once an almost universal childhood infection, mumps incidence decreased in the United States with routine childhood vaccination. Mumps reporting was re-established in Oregon July 1, 2006, prompted by outbreaks of illness among both vaccinated and unvaccinated persons. Three cases were reported in 2010.

Because as many as 20% of mumps infections are asymptomatic, and nearly 50% are associated with non-specific or primarily respiratory symptoms (with or without parotitis), mumps infections are significantly underreported.

In response to the 2006 nationwide mumps outbreak, the Advisory Committee on Immunization Practices (ACIP) updated its recommendations for prevention and control of mumps, with vaccination remaining the cornerstone of prevention.

Pertussis

Pertussis is a highly contagious acute bacterial infection of the respiratory tract attributable to *Bordetella pertussis*. It is transmitted from person to person through contact with respiratory secretions (droplet transmission). The disease is most severe in infants and young children, many of whom suffer the intense paroxysmal coughing that usually terminates in an inspiratory "whoop." Although the disease may be milder in older persons, those who are infected may transmit the disease to other susceptible persons, including unimmunized or incompletely immunized infants.

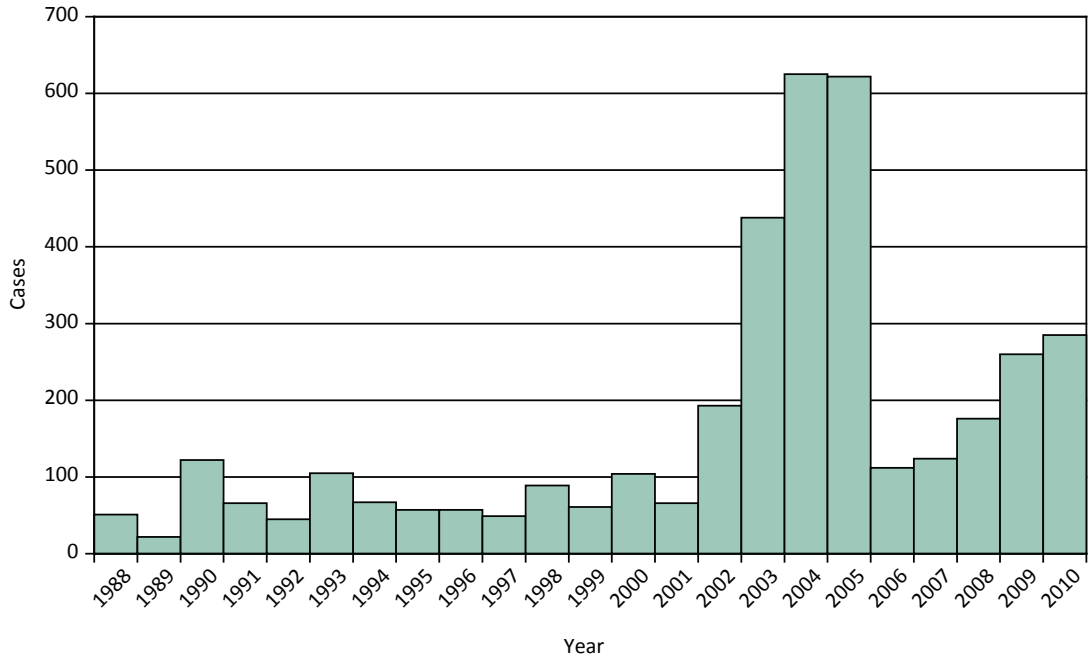
Despite high childhood immunization rates, pertussis remains endemic in the U.S., with epidemics every three to five years. California reported >9,200 cases in 2010; with 285 cases, Oregon's incidence was lower, but still the highest since 2005. Because pertussis often goes undiagnosed in adolescents and adults, it is likely that the actual number of cases greatly exceeds the number reported.

Infants have the highest risk of pertussis-related complications and death and have had the highest reported incidence rate in Oregon. Since 2000, 217 (44.7%) of the 485 infants diagnosed with pertussis in Oregon have been hospitalized, and four have died. In 2010, forty-six (16%) of Oregon's cases were infants, one-third were hospitalized, and none died.

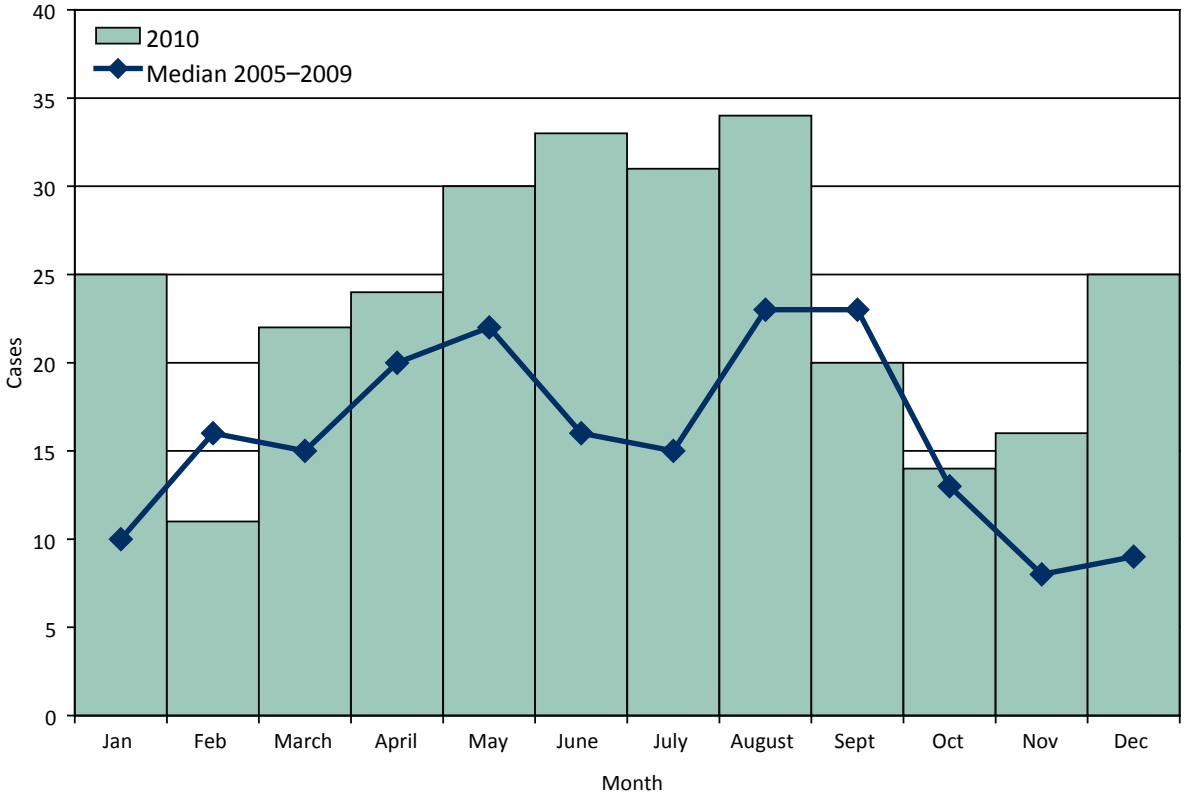
The greatest increase in incidence in recent years has been in adolescents and adults. Since 2000, approximately 60% of the pertussis cases have been >10 years of age. Tdap vaccine should provide some immunity to the disease for all of us older kids. Health care workers in particular are encouraged to get a dose.

In 2010, with funding from the federal Centers for Disease Control and Prevention, Oregon launched the Metropolitan Area Pertussis Surveillance (MAPS), enhancing surveillance in Clackamas, Multnomah and Washington counties to delineate better the epidemiology of pertussis. Each reported case is investigated extensively, and standardized data are collected. It is hoped that these data will guide future developments in regional and national areas of public health policy.

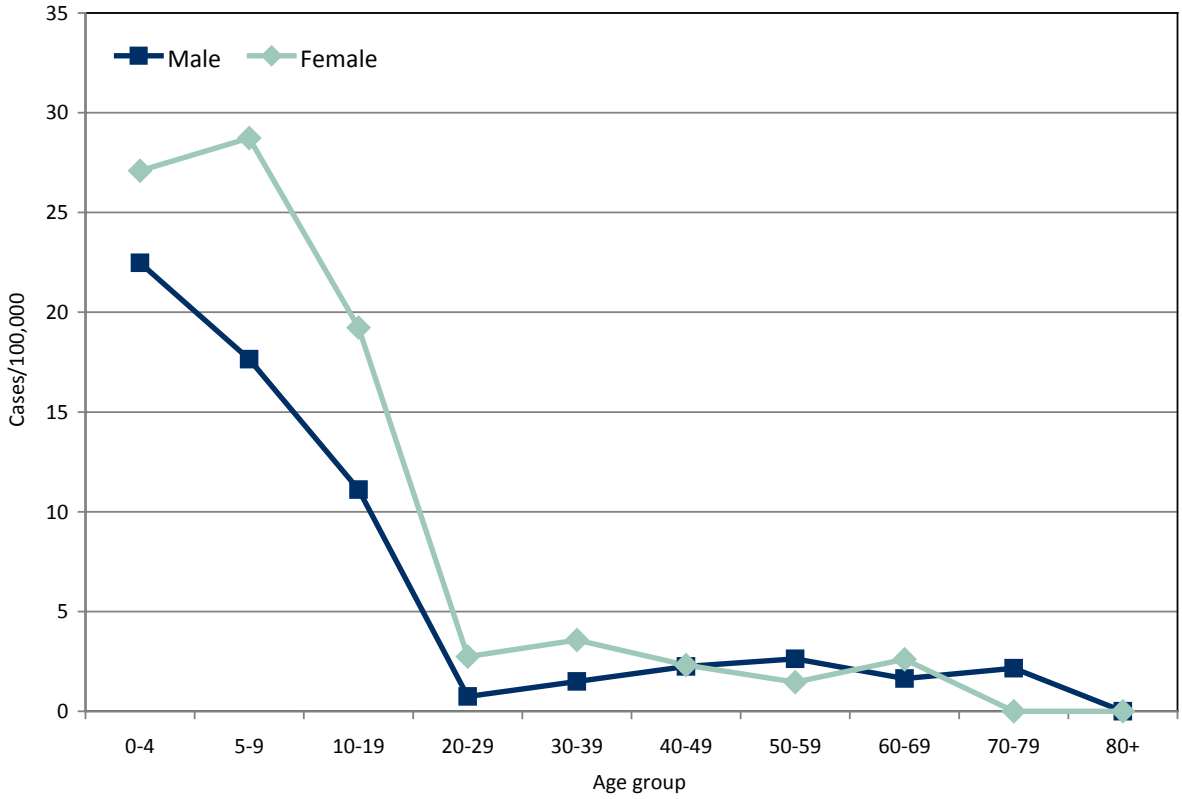
Pertussis by year: Oregon, 1988–2010



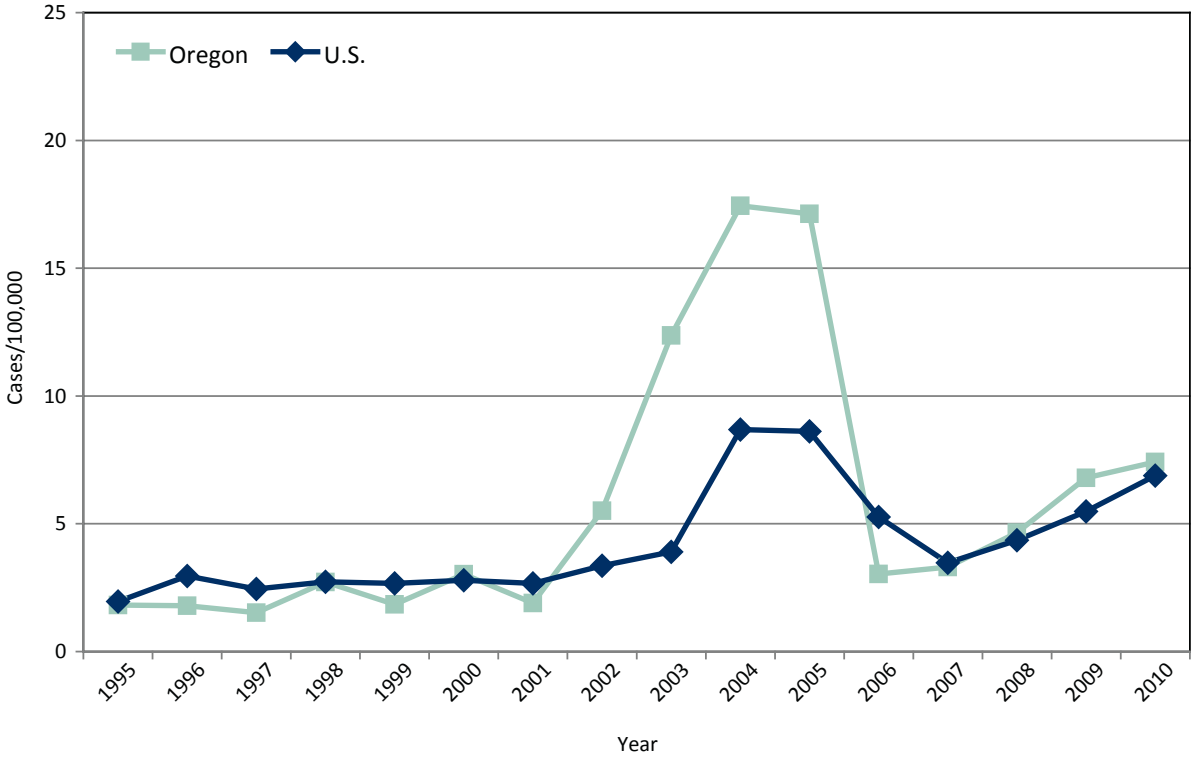
Pertussis by onset month: Oregon, 2010



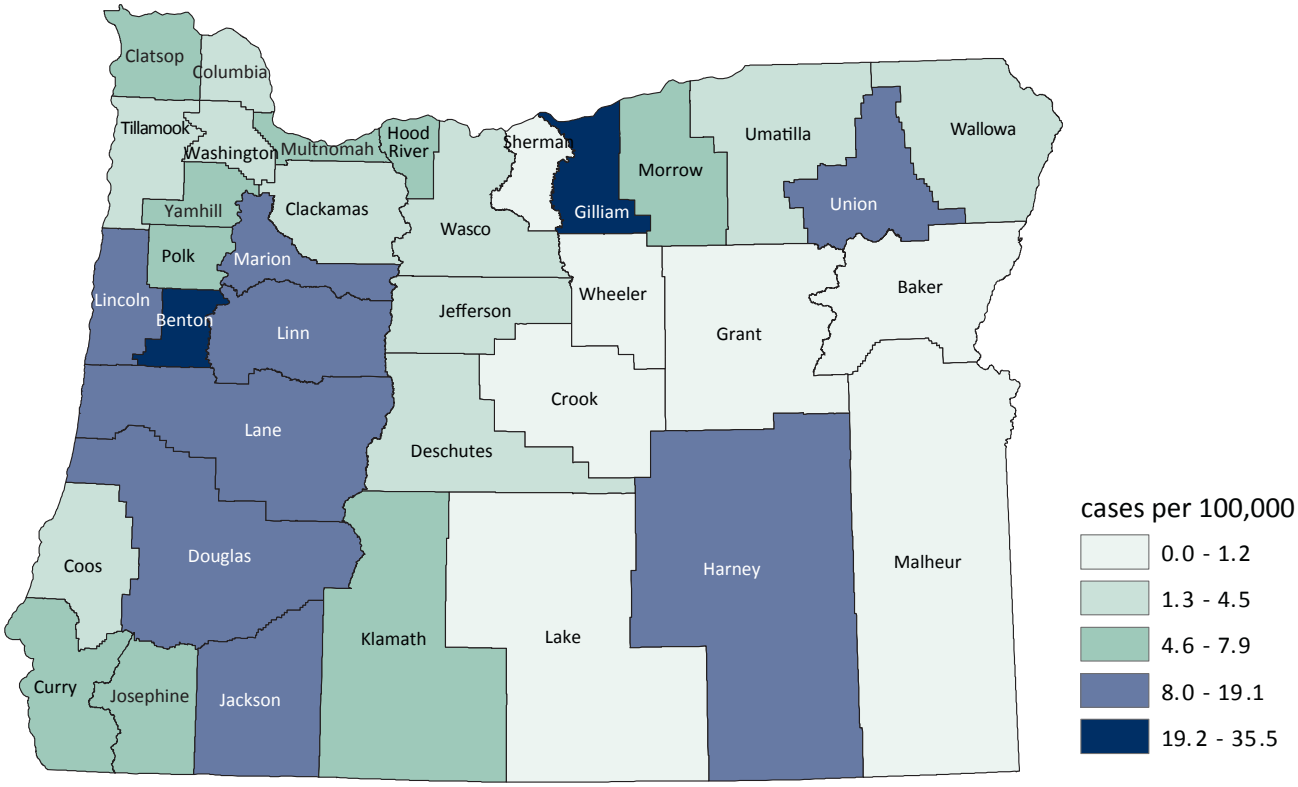
Incidence of pertussis by age and sex: Oregon, 2010



Incidence of pertussis: Oregon vs. nationwide, 1995–2010



Incidence of pertussis by county of residence: Oregon, 2000–2010



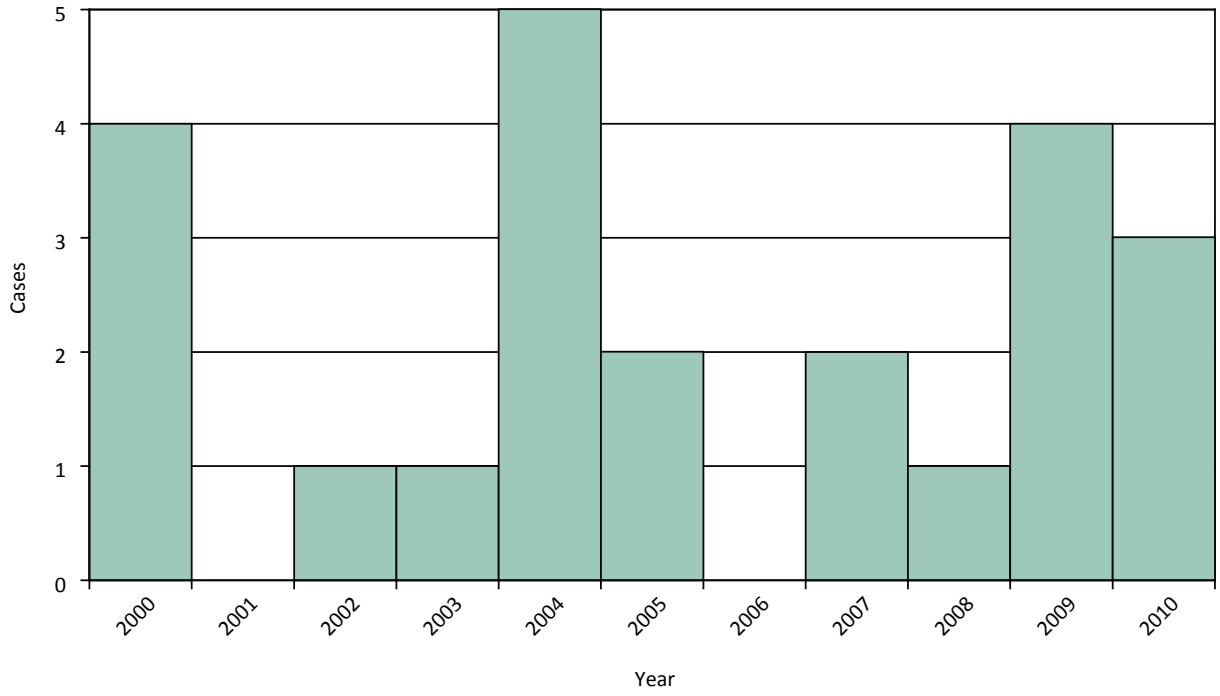
Q fever

Q fever is a bacterial infection caused by *Coxiella burnetii*. It can result in acute or chronic illness in humans, and is usually acquired after contact with infected animals or exposure to contaminated environments. The primary reservoirs are cattle, sheep and goats. Infections result from breathing contaminated droplets from infected animals or consumption of products (raw milk). Acute Q fever can be accompanied by a host of symptoms, including high fevers, severe headache, malaise, myalgia, chills, sweats, nausea, vomiting, non-productive cough, diarrhea, abdominal pain and chest pain. Most people recover from acute Q fever infection, but some (<5%) develop chronic illness, which often manifests as endocarditis. Infection can be treated with antibiotics.

Up to 3% or 4% of the general population and 10% of people with a history of extensive livestock handling will test positive for Q fever at any given time, due to past lifetime exposure.

Q fever reports are rare in Oregon; in 2010 there were three incident cases. Elsewhere in the world, over 200 cases of acute Q fever have been reported among U.S. military personnel deployed to Iraq since 2003. A Q fever outbreak in the Netherlands is well into its fifth year, with more than 4,000 cases reported since 2007. More than 35,000 sheep and goats have been culled as part of the eradication efforts.

Q fever by year: Oregon, 2000–2010



Rabies

Rabies is an acute infection of the central nervous system caused by a neurotropic rhabdovirus of the genus *Lyssavirus*. All mammals, including humans, are susceptible to rabies. In humans, rabies causes a rapidly progressive and fatal encephalomyelitis. The incubation period in humans is usually two to 12 weeks, but there have been documented incubation periods as long as seven years. Bites from infected animals constitute the primary route of transmission. Transplanted organs, including corneas from patients with undiagnosed rabies, have also caused infection in recipients.

The Pacific Northwest is considered to be free of terrestrial rabies. In Oregon, the main reservoirs of rabies are bats and animals, such as foxes and cats that may come in contact with rabid bats. An average of 10% of the bats tested in Oregon are positive for rabies. This is a targeted sample of bats that have bitten humans and animals. Bat contact and bat bites should be carefully evaluated in a timely manner. All potential human exposures should result in a call to a local public health department office. Oregon State Public Health Laboratory will test most human exposures and Oregon State University, Veterinary Diagnostic Laboratory should test for animal-to-animal exposures.

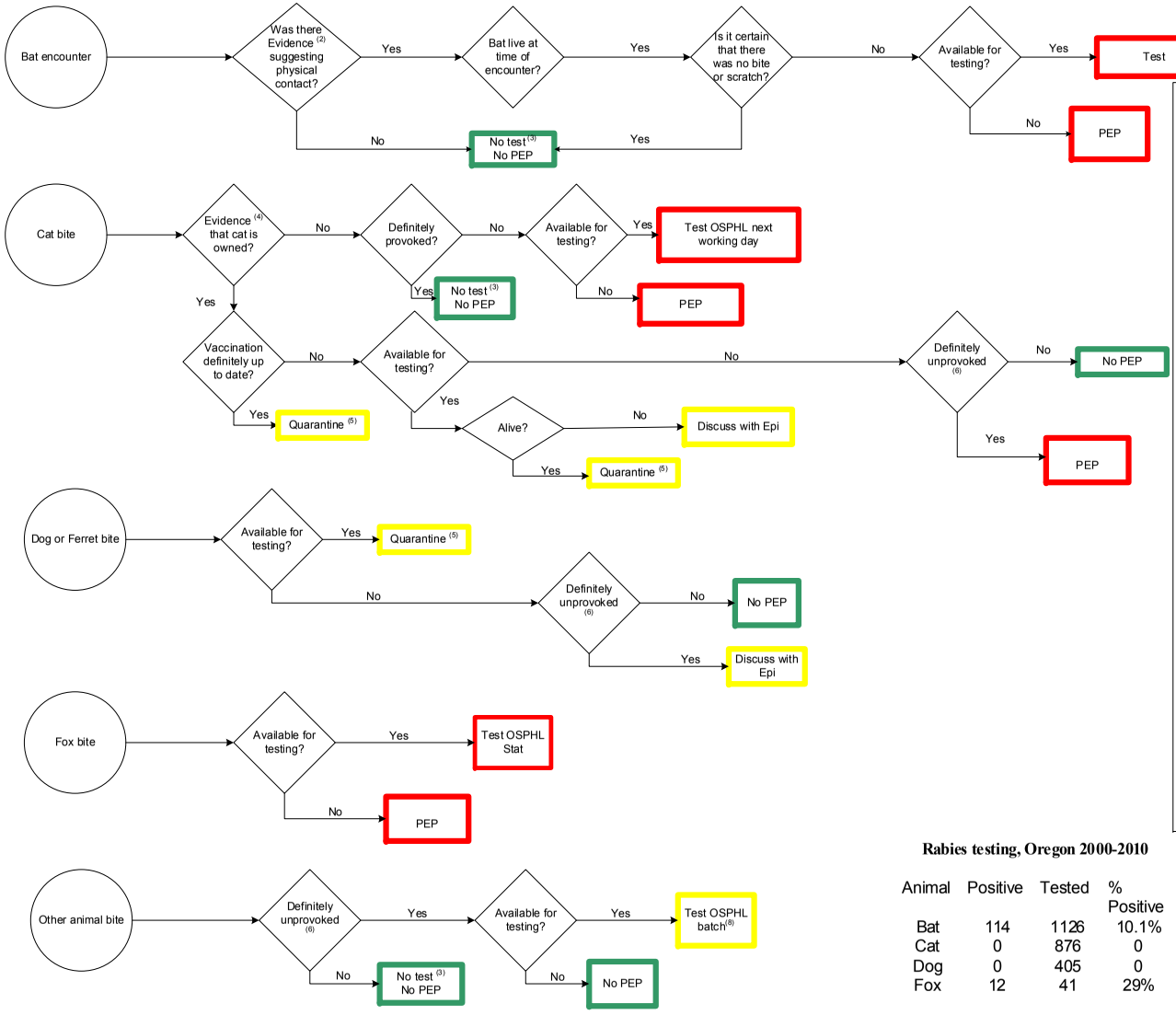
Ten bats, six foxes and a goat tested positive in 2010. All foxes and the goat were residents of Josephine County.

Persons not previously immunized for rabies who are exposed to a rabid animal should obtain human rabies immune globulin (HRIG) infiltrated at the site of the bite and four doses of rabies vaccine, one each on days 0, 3, 7, 14. Prior to 2008, a five-dose regimen was recommended, however, studies indicated that four doses of vaccination in combination with HRIG elicited an immune response and an additional dose was not associated with more favorable outcomes.

Though bats are the reservoir in Oregon, canine rabies still accounts for the majority of human rabies cases worldwide. Travelers to rabies-enzootic countries should be warned to seek immediate medical care if they are bitten by any mammal.

Additional information and an algorithm to follow for assessment of rabies risk are provided here. For a larger copy of this algorithm visit: http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/rabies/Documents/rabalg.pdf

Algorithm for Prevention of Rabies After Animal Encounters in Oregon [1]



Notes

1. Oregon law mandates reporting of any bite of a human being by any other mammal (Oregon Administrative Rule 333-018-0015[5] [c]); such reports should be made to the local public health authority for the jurisdiction in which the patient resides. Decisions about rabies PEP are the purview of the clinician attending the patient; although these recommendations regarding the need for rabies PEP represent the best judgment of state public-health officials, they are not binding on clinicians. Clinicians should be advised that, aside from concern about rabies, prophylaxis against tetanus or bacterial infection might be warranted, depending on the nature of the wound and the animal involved. Local health department personnel are advised to call Acute and Communicable Disease Prevention at 971-673-1111 with specific questions regarding application of these guidelines.

2. Such evidence might include, e.g., a young child's waking up, crying, with a bat found in the room.

3. "No Test" means that the animal will not be tested at OSPHL, at state expense. In such cases, the animal may be tested at the Oregon State University Veterinary Diagnostics Laboratory (541-737-3261) at private expense.

4. Evidence of ownership might include, e.g., presence of collar or previous appearances of the animal in a neighborhood.

5. "Quarantine" means confining a dog, cat or ferret for 10 days to observe for signs of illness after biting a human being. The nature of the confinement is determined by the local public health authority. If the animal develops neurological illness during the period of quarantine, it should be euthanized and its head shipped to OSPHL for testing within one working day.

6. "Unprovoked" implies that in the context of the situation there was no obvious alternative motivation for the animal to bite. A good history is essential .In practice, unprovoked bites are quite rare. Examples of provocation would include being hit by a car, being handled, fed. or caged; being cornered in a garage, having a jogger run past your yard or crowding animal's space, etc.

7. For purposes of determining need for rabies PEP, wolf-hybrids are considered wild animals and not dogs. Wolf-dog hybrids that bite or otherwise expose persons, pets, or livestock should be considered for euthanasia and rabies examination. Whether an animal is a dog or a wolf-dog hybrid must be determined by a licensed veterinarian, subject to review by the State Public Health Veterinarian or designee (OR 333-019-0022).

8. Batch testing for rabies is generally done at OSPHL on Mondays and Wednesdays. Results are available the following day.

Abbreviations

OSPHL: Oregon State Public Health Laboratory (503-229-5882)
PEP: Post-Exposure Prophylaxis against rabies
Epi: Epidemiologists at the Oregon Department of Human Services; Weekdays, nights and weekends 971-673-1111

Rabies testing, Oregon 2000-2010

Animal	Positive	Tested	% Positive
Bat	114	1126	10.1%
Cat	0	876	0
Dog	0	405	0
Fox	12	41	29%

Oregon Health Authority

Office of Disease Prevention and Epidemiology

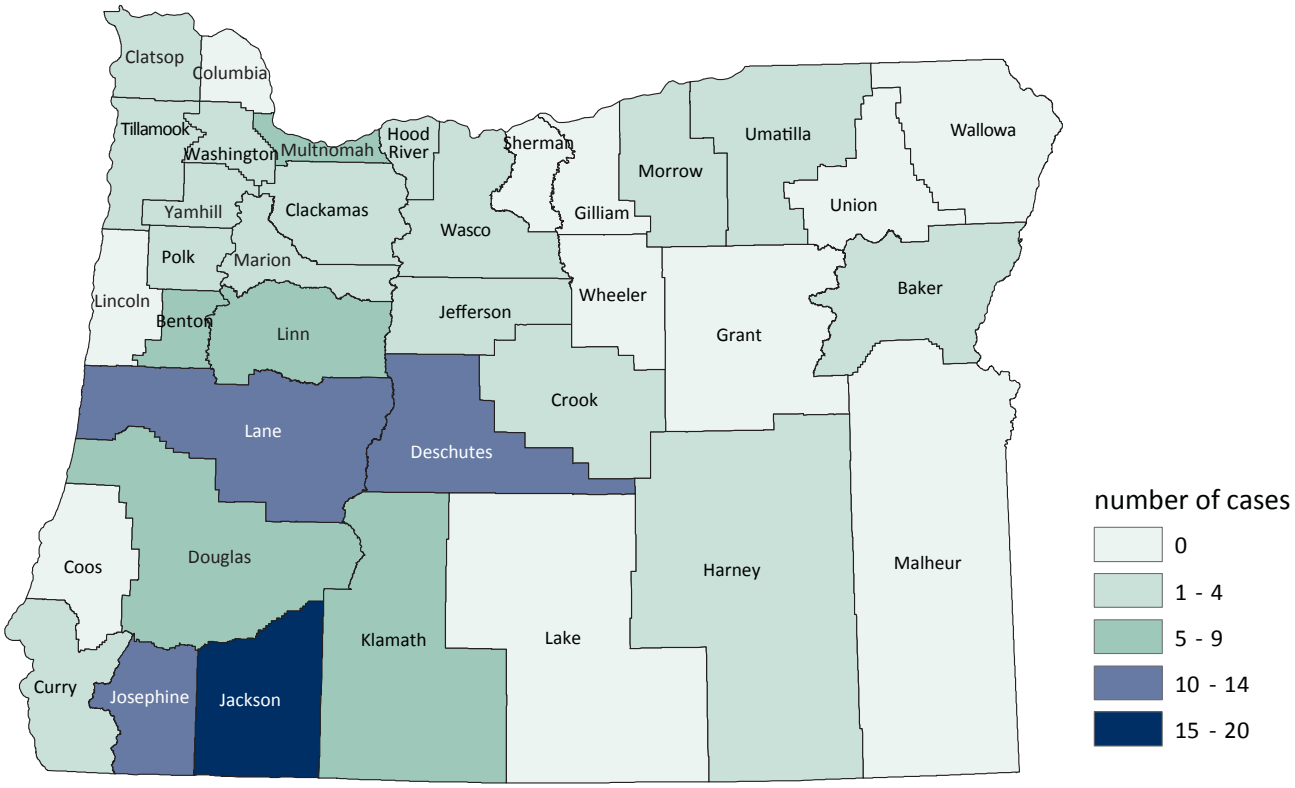
Acute and Communicable Disease Prevention

I:\Diseases\Rabies\2011

Rabies tests in Oregon, 2000–2010
(Number of positive/total tested)

Year	Bat	Cat	Dog	Fox	Other
2000	8/73	0/79	0/56	1/4	0/4
2001	4/59	0/67	0/46	0/1	0/41
2002	12/134	0/102	0/27	2/4	0/29
2003	6/61	0/75	0/36	1/5	0/39
2004	7/88	0/105	0/42	0/2	0/27
2005	8/83	0/100	0/48	0/1	0/23
2006	23/126	0/72	0/26	2/4	0/41
2007	12/153	0/80	0/33	0/1	0/26
2008	13/128	0/58	0/23	0/3	0/53
2009	11/117	0/73	0/27	0/1	0/42
2010	10/104	0/67	0/41	6/15	1/48 (goat)
Totals 2000–2010	114/1126 10.1%	0/878	0/405	12/41 29.3%	1/373 (0.27%)

Animal rabies cases by county: Oregon, 2000–2010



Salmonellosis

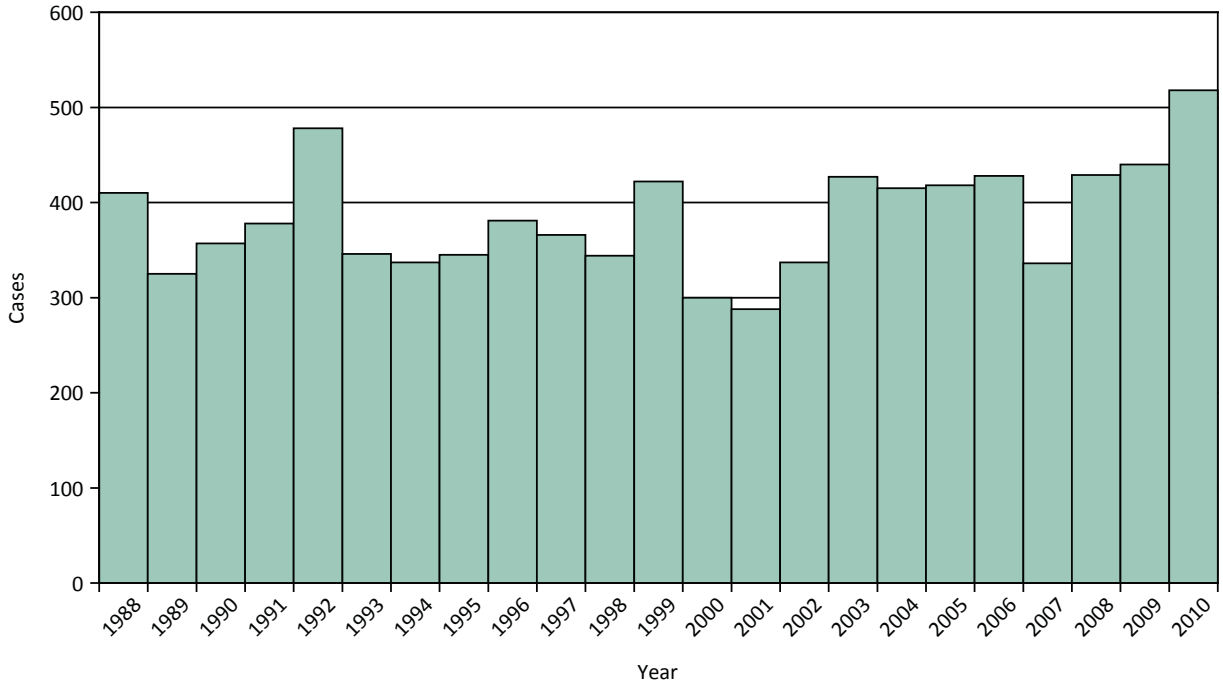
Salmonellosis is a bacterial illness characterized by acute abdominal pain, diarrhea, and often fever that usually begins one to five days after infection. Excretion of *Salmonella* may persist for several days or even months beyond the acute phase of illness. Antibiotics are contraindicated for most patients (the exceptions being those at high risk of invasive infection) and they may increase the duration of excretion.

A wide range of domestic and wild animals are carriers of *Salmonella*, including poultry, swine, cattle, rodents, iguanas, tortoises, turtles, young poultry, dogs and cats. Most human infections are thought to come from consumption of fecally contaminated food or water, but other environmental exposures may be hard to document and may be underappreciated. Raw or undercooked produce and products of animal origin, such as eggs, milk, meat and poultry, have been implicated as common sources of animal and human salmonellosis. Though not as common as with, say, *Echerichia coli* O157, person-to-person transmission is well documented. The incidence of infection is highest among young children.

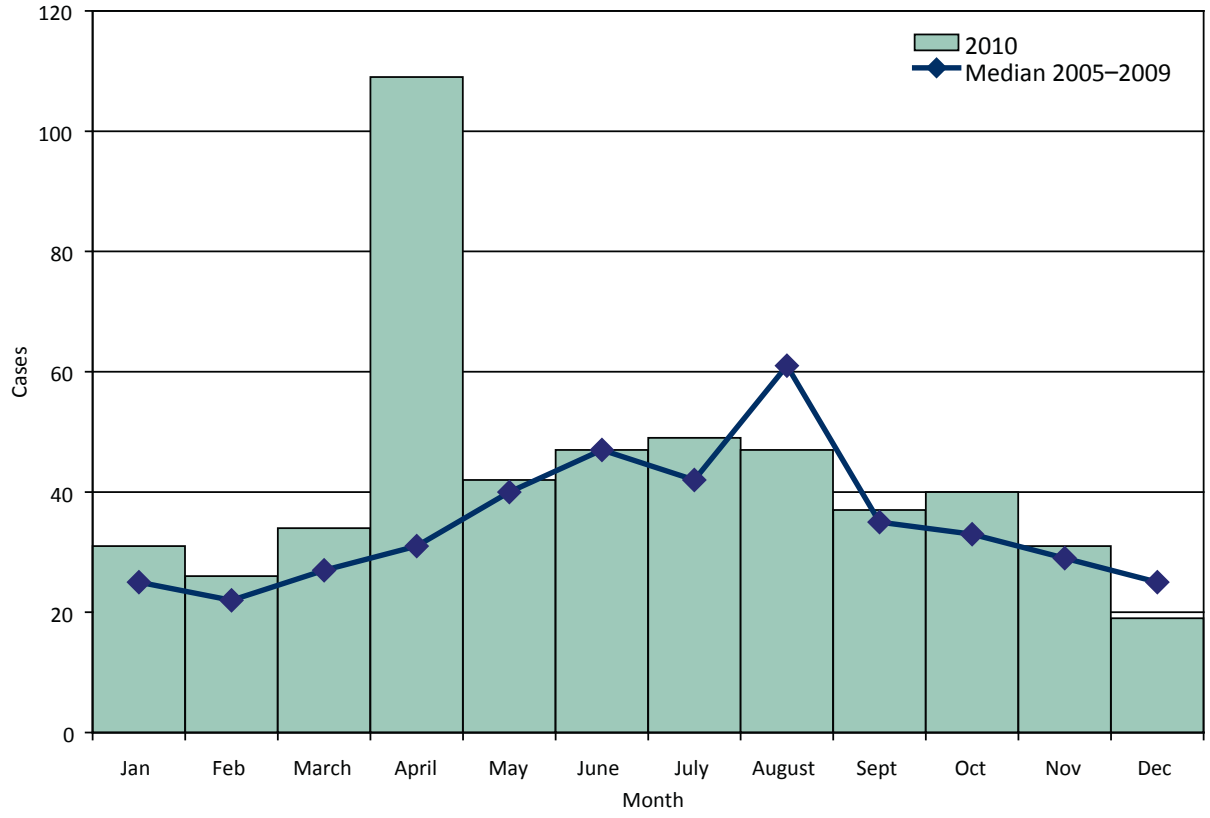
Of approximately 2,500 known serotypes, only about 200 are detected in the United States in any given year. In Oregon, *S.* Typhimurium and *S.* Enteritidis are the two most commonly reported serotypes.

In 2010, 518 cases of *Salmonella* were reported, up from 441 in 2009. A whopping 21 salmonellosis clusters were investigated in 2010. Most of these were very small; only four involved more than five Oregon cases. The largest outbreak (73 cases) involved a Roseburg restaurant, and the most interesting involved a Roseburg dairy (25 cases). After a long and frustrating investigation, a seven-month long trickle of *Salmonella* Braenderup infections was pinned on an environmental reservoir of *Salmonella* (viz., the plumbing of an outdoor crate washing machine) that was causing intermittent, low-level contamination of the external surfaces of milk cartons and jugs. This contamination led to about one confirmed illness for every million containers that came from the plant. Other noteworthy outbreak sources in 2010 included African dwarf frogs, baby chicks, Marie Callender frozen entrees, sprouts, Taco Bell, ground turkey, chicken, and sprouts (again). Several outbreaks were never solved.

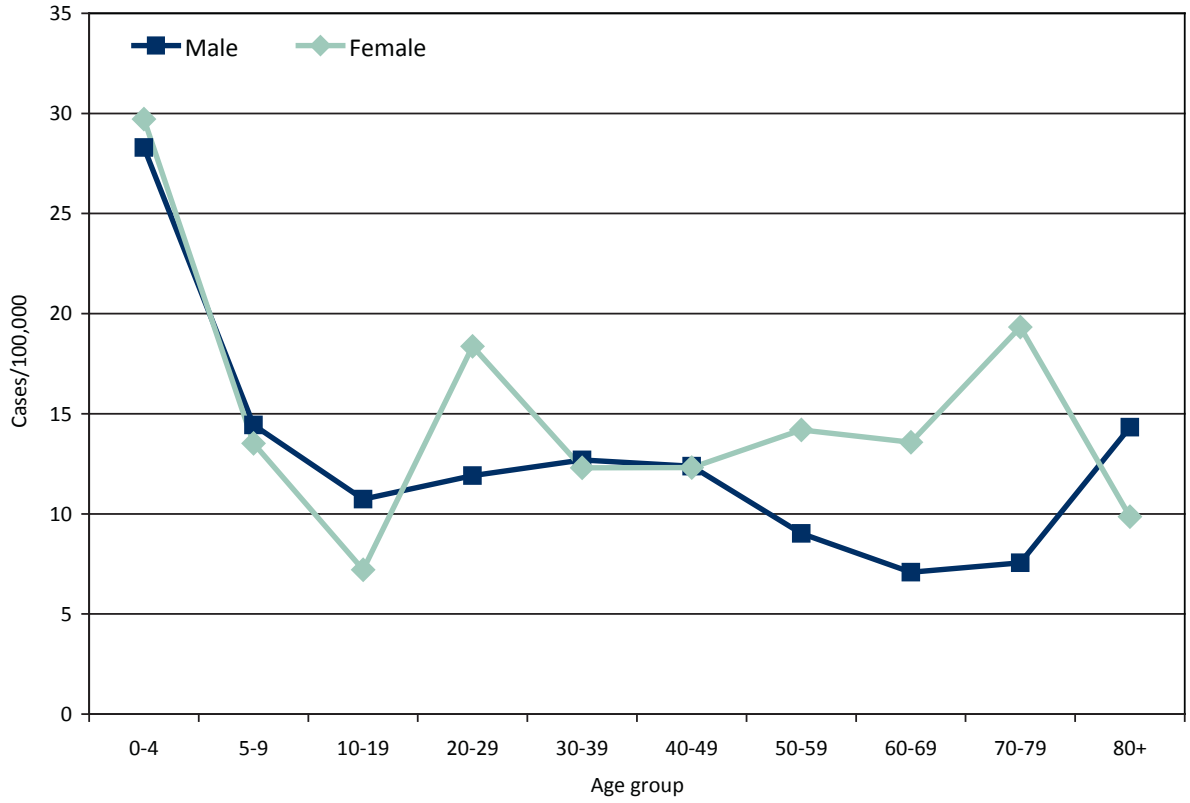
Salmonellosis by year: Oregon, 1988–2010



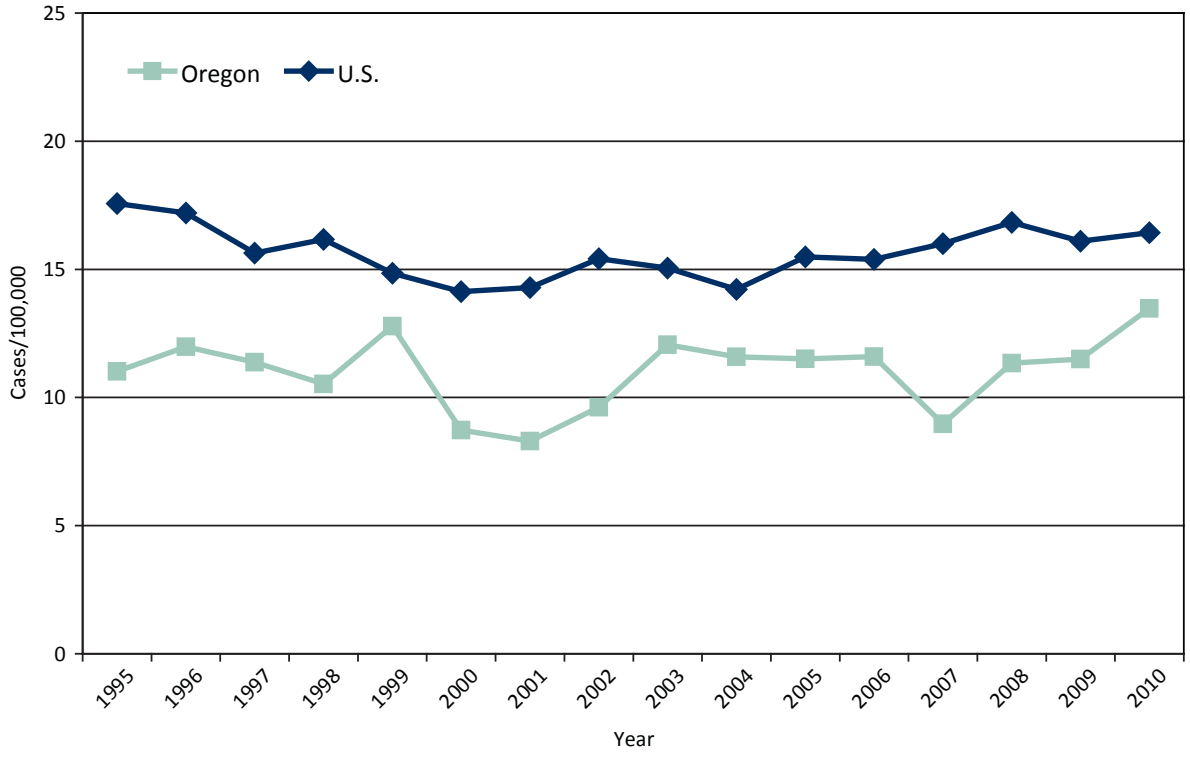
Salmonellosis by onset month: Oregon, 2010



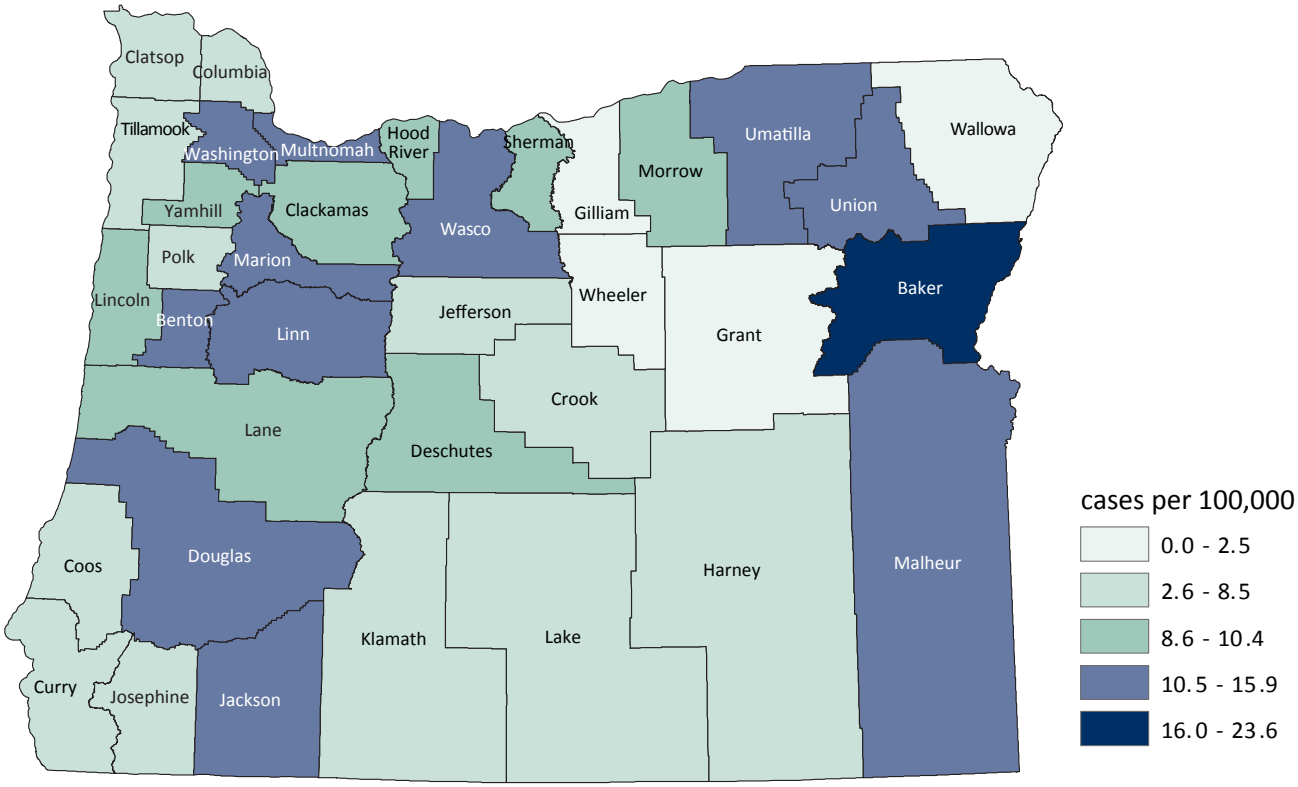
Incidence of salmonellosis by age and sex: Oregon, 2010



Incidence of salmonellosis: Oregon vs. nationwide, 1995–2010



Incidence of salmonellosis by county of residence: Oregon, 2000–2010



Selected* *Salmonella* by serotype, Oregon, 2001–2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Braenderup	7	4	1	2	1	11	8	1	21	36
Enteritidis	34	43	78	64	86	74	54	76	61	123
Heidelberg	26	27	12	42	51	19	26	23	44	28
Montevideo	13	17	16	15	15	13	12	15	22	12
Muenchen	8	10	5	7	8	8	9	9	10	10
Newport	16	31	38	14	17	16	17	15	15	24
Oranienburg	10	12	13	6	8	5	8	8	6	8
Saintpaul	4	18	36	16	7	10	3	23	10	13
Typhimurium	86	67	83	86	84	90	52	65	81	40

*Selected because at least one case was reported in 2010 and it is a more common serotype.

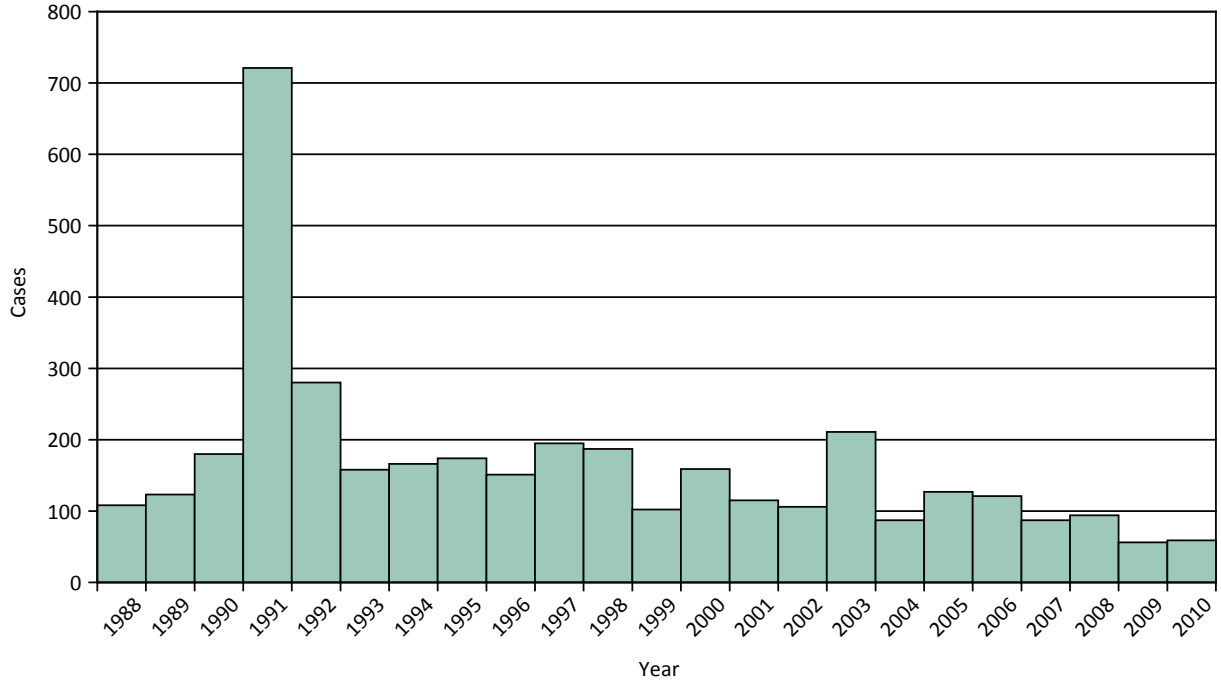
Shigellosis

Shigellosis is an acute bacterial infection characterized by (sometimes bloody) diarrhea, vomiting, abdominal cramps and, often, fever. Humans are the only known reservoir. Shigellosis is transmitted from person to person, and just a few organisms can cause illness. It is important to track the incidence of this disease to see trends and to detect outbreaks. The rate is higher among children 1–4 years of age. The incidence of shigellosis usually increases in late summer and fall. A large community-wide outbreak in 1991 resulted in hundreds of cases in multiple Portland metropolitan area daycare centers from April onward. At the tail end of that summer, in August, additional cases were associated with a dual pathogen outbreak (*E. coli* and *Shigella*) at Blue Lake Park in Fairview.

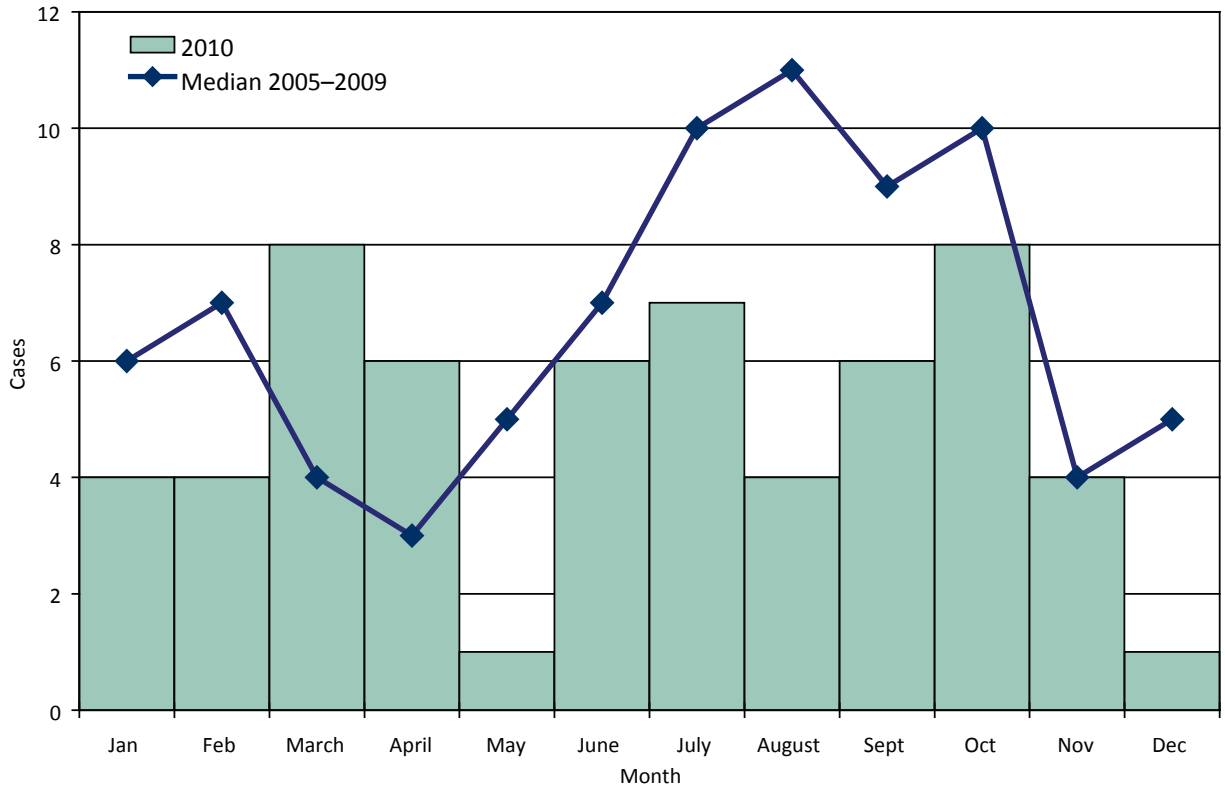
Outbreaks in daycare centers are common, mainly due to the poor hygienic practices of small children. Hand washing is the most important means of prevention. Treatment reduces duration of illness, but the organism has become resistant to many antibiotics used for empiric therapy. Testing for antibiotic susceptibility is important for treatment.

In 2010 there were 57 cases. Forty were sporadic cases, nine were household transmission and eight were outbreak-related cases.

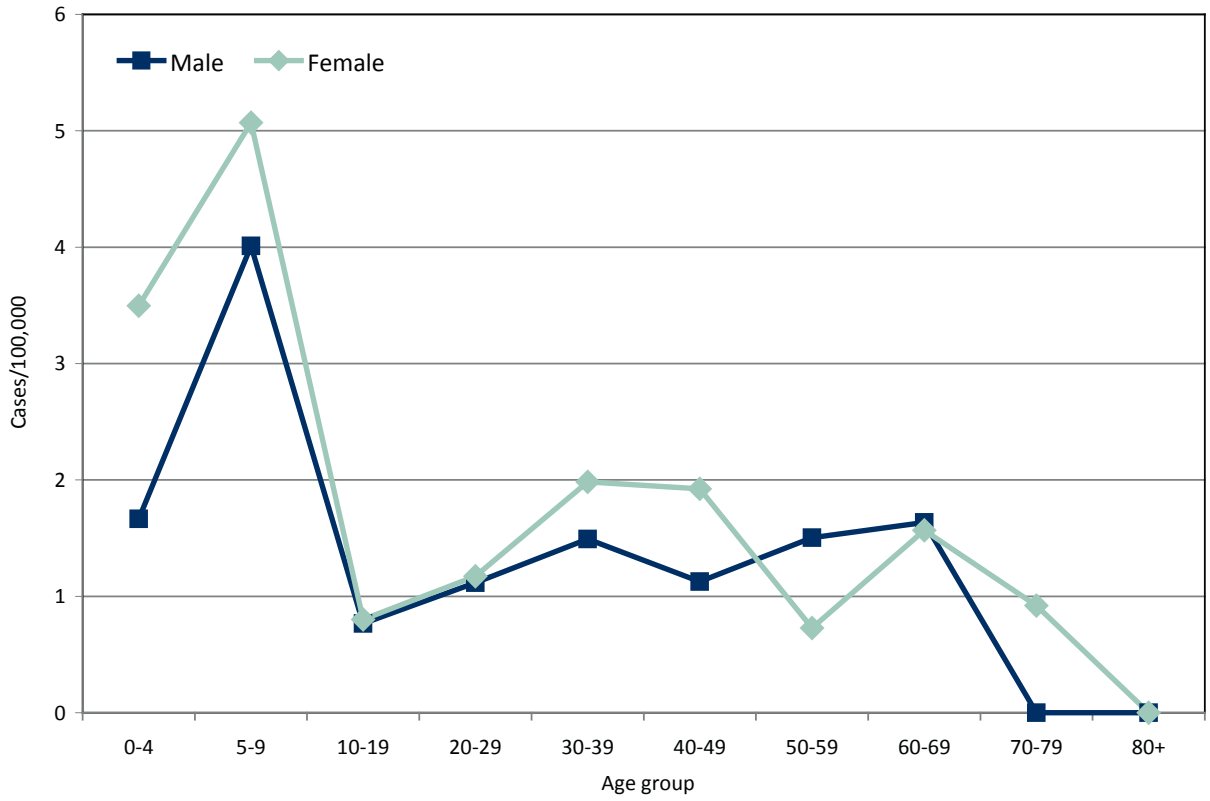
Shigellosis by year: Oregon, 1988–2010



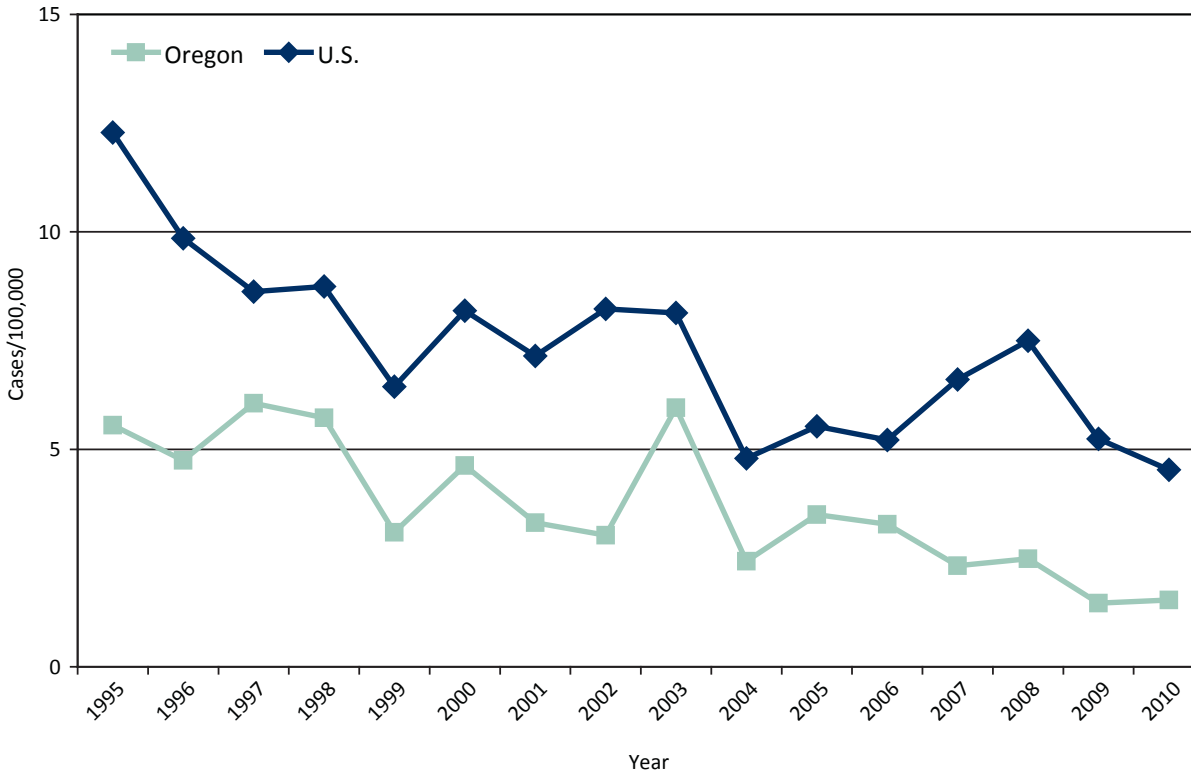
Shigellosis by onset month: Oregon, 2010



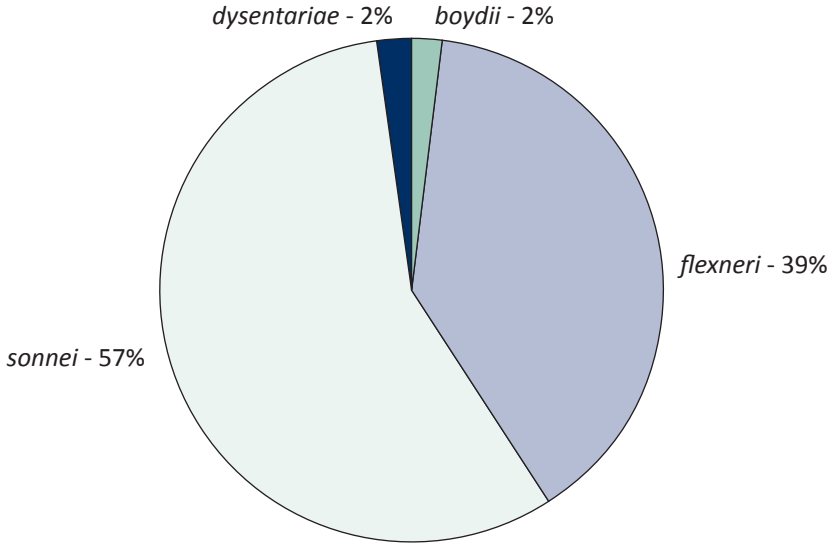
Incidence of shigellosis by age and sex: Oregon, 2010



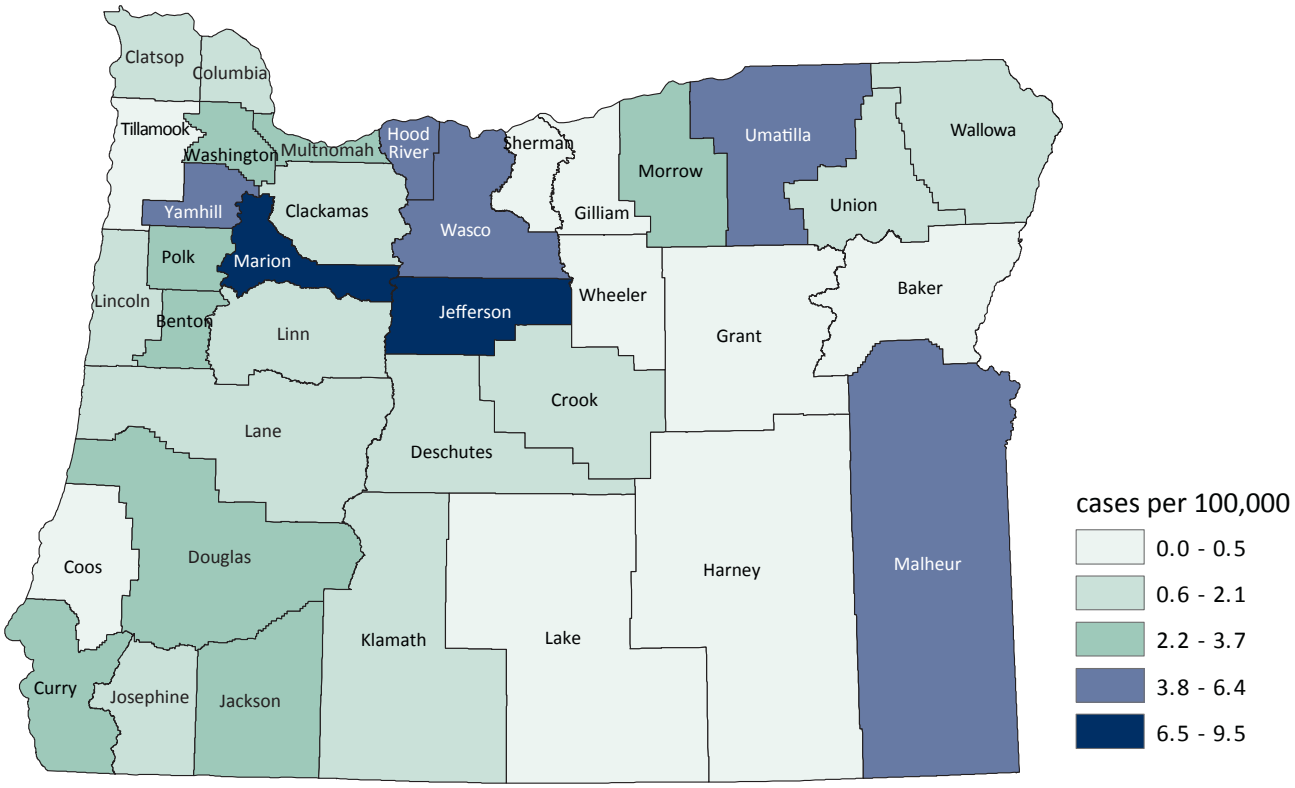
Incidence of shigellosis: Oregon vs. nationwide, 1995–2010



Shigellosis by species: Oregon, 2010



Incidence of shigellosis by county of residence: Oregon, 2000–2010



Early syphilis

Syphilis is a sexually transmitted disease of protean manifestation caused by the spirochete *Treponema pallidum*. Early syphilis cases represent an aggregate of primary, secondary and early latent cases of less than one year's duration.

The 106 reported early syphilis cases in Oregon are the highest since 1993. The current surge of early syphilis cases started in 2009, and infection rates have doubled since 2008. The majority (90%) of the early syphilis cases reported during 2010 were among men who have sex with other men. The infection may be transmitted among sex partners during the primary and secondary stages.

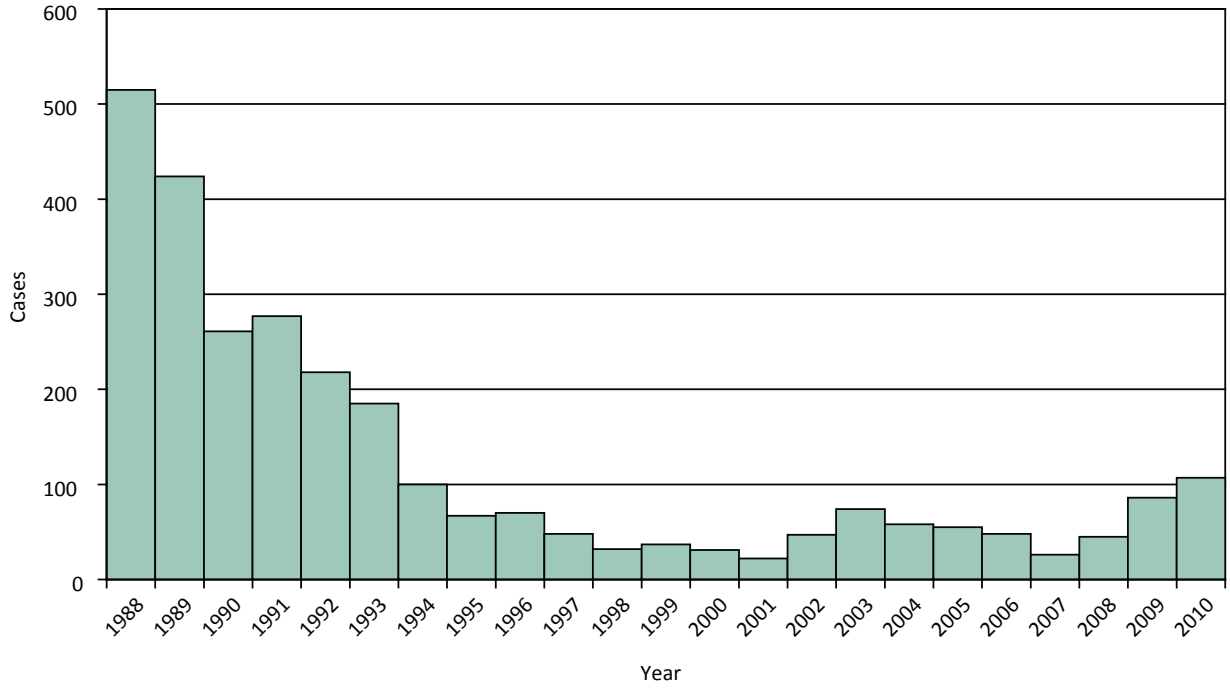
Syphilis is transmitted via vaginal, rectal or oral sexual contact. Syphilis can be prevented by abstaining from sex or only having sex with one uninfected sex partner. Those who are sexually active outside of a mutually monogamous relationship can lower their risks of infection by using a condom when engaging in sexual activity.

It is important to identify and treat persons with early syphilis to prevent late complications, such as brain and heart damage, and to prevent congenital infections. Moreover, persons with primary or secondary syphilis more easily acquire and transmit HIV. An effective way to limit the spread of syphilis is to evaluate and treat recent sex partners of persons with early syphilis.

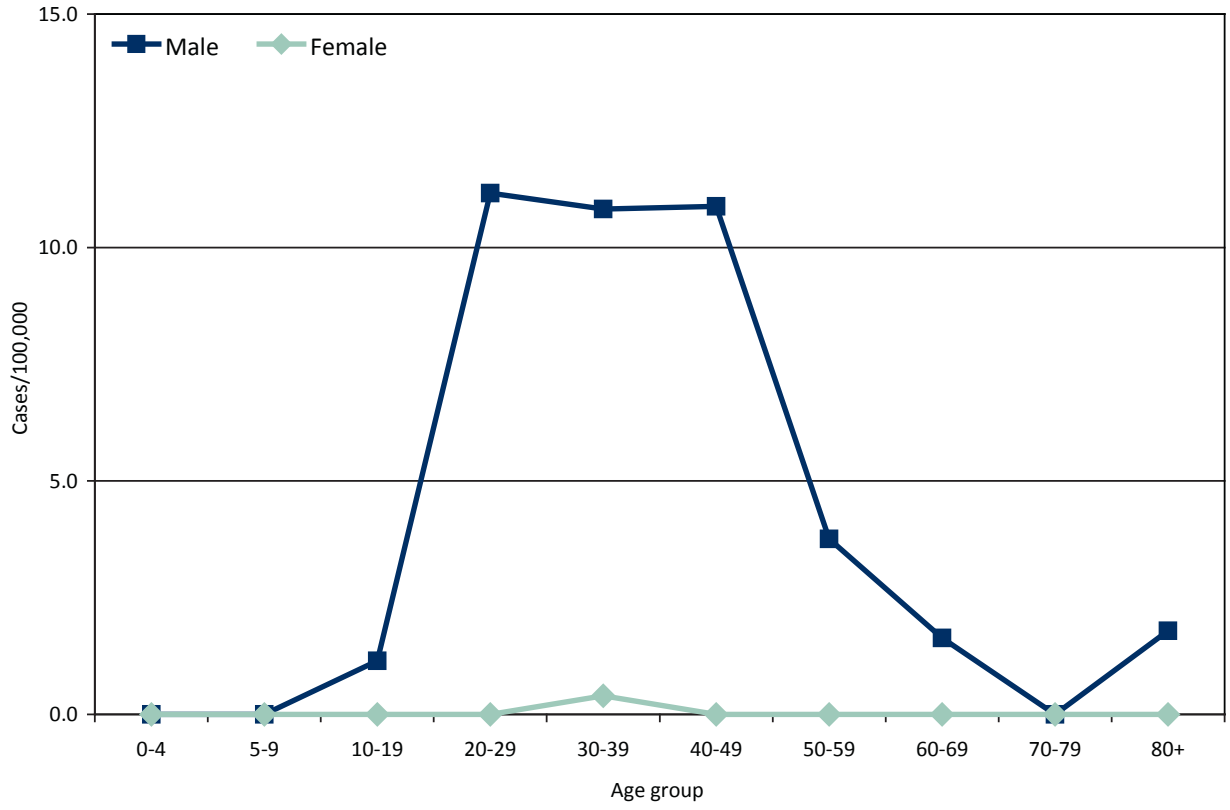
Reported Oregon early syphilis 2008–2010

	2008	2009	2010
Primary and secondary cases	27	57	74
Early latent cases	18	29	32
Total early syphilis cases	45	86	106

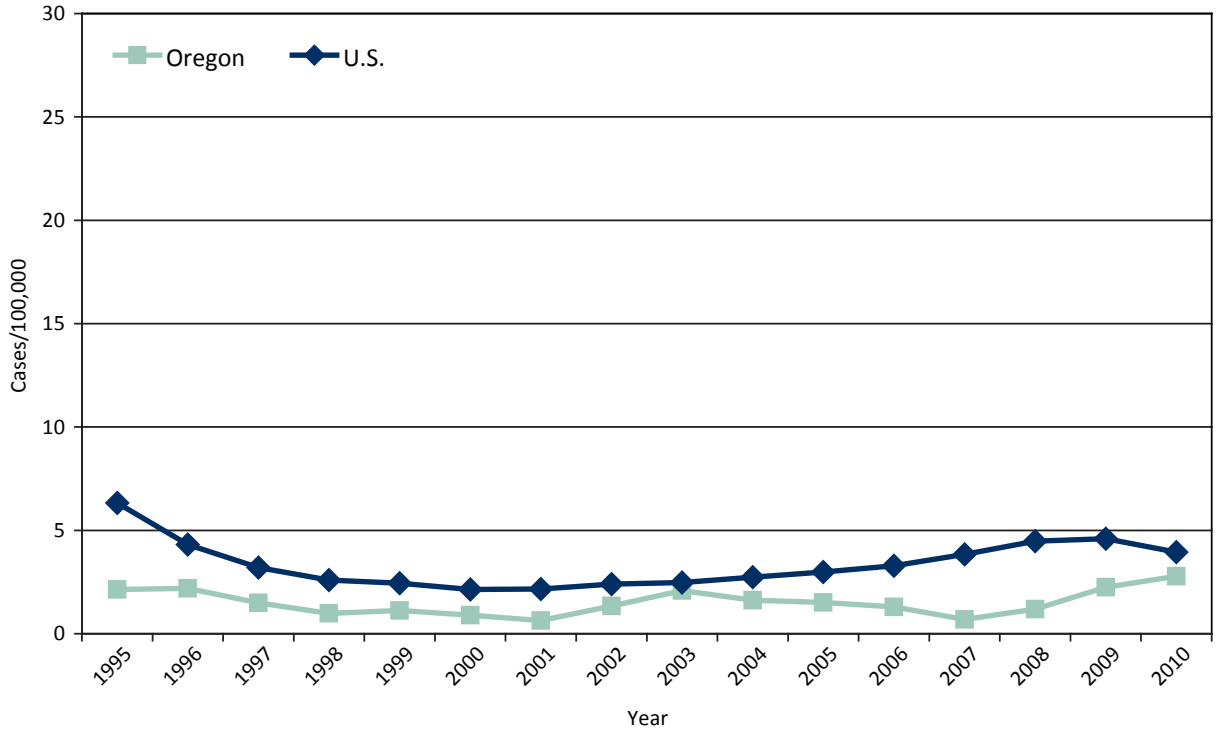
Early syphilis by year: Oregon, 1988–2010



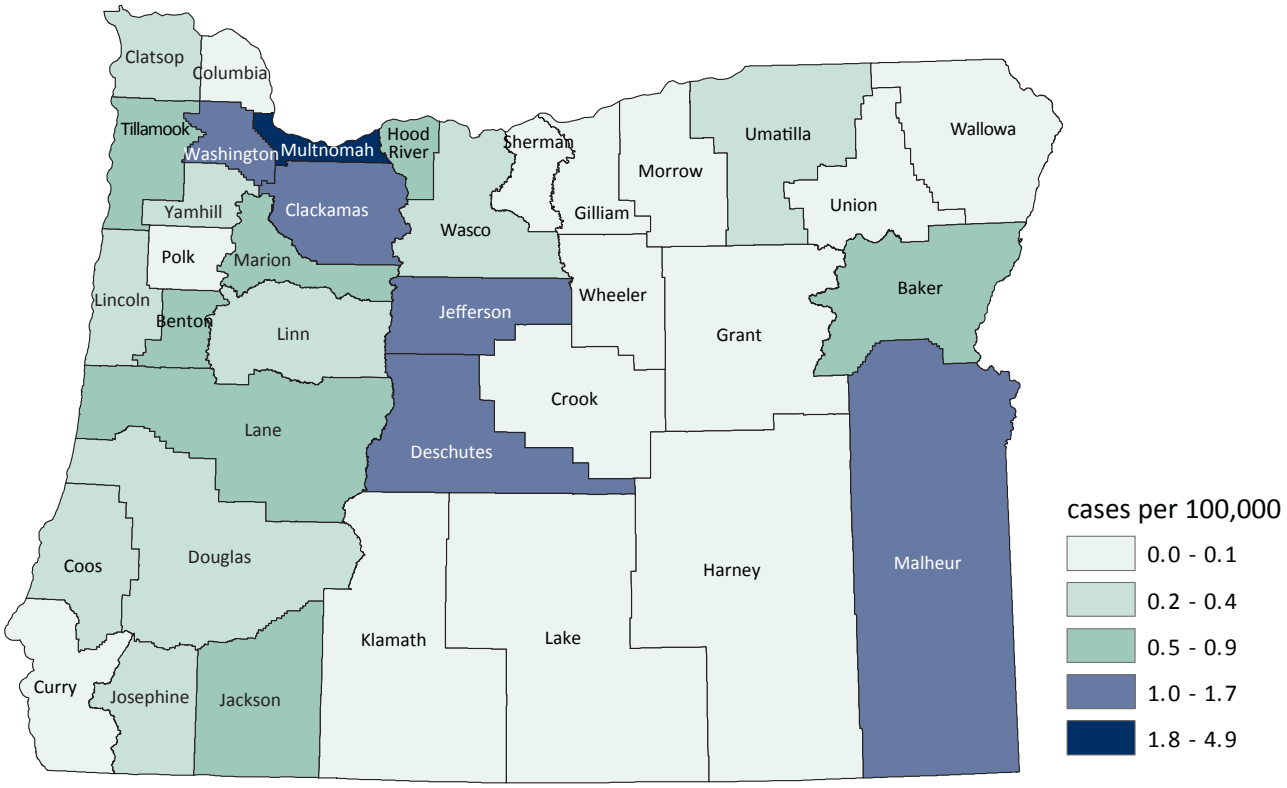
Incidence of early syphilis by age and sex: Oregon, 2010



Incidence of primary and secondary syphilis: Oregon vs. nationwide, 1995–2010



Incidence of early syphilis by county of residence: Oregon, 2000–2010



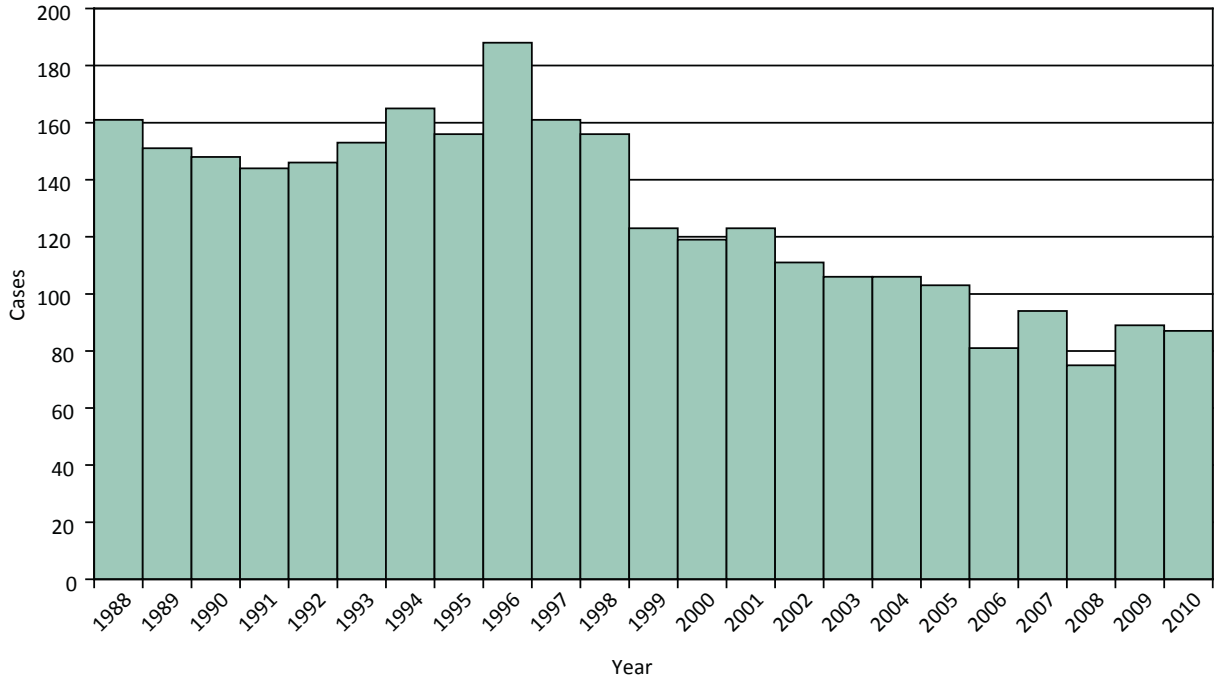
Tuberculosis

Tuberculosis (TB) is a communicable disease caused by *Mycobacterium tuberculosis*. The most common site for active TB disease is the lung; however, TB can occur in any organ in the body. TB is spread when persons with active pulmonary or laryngeal TB cough the bacteria into the air, and other persons inhale the bacteria into their lungs.

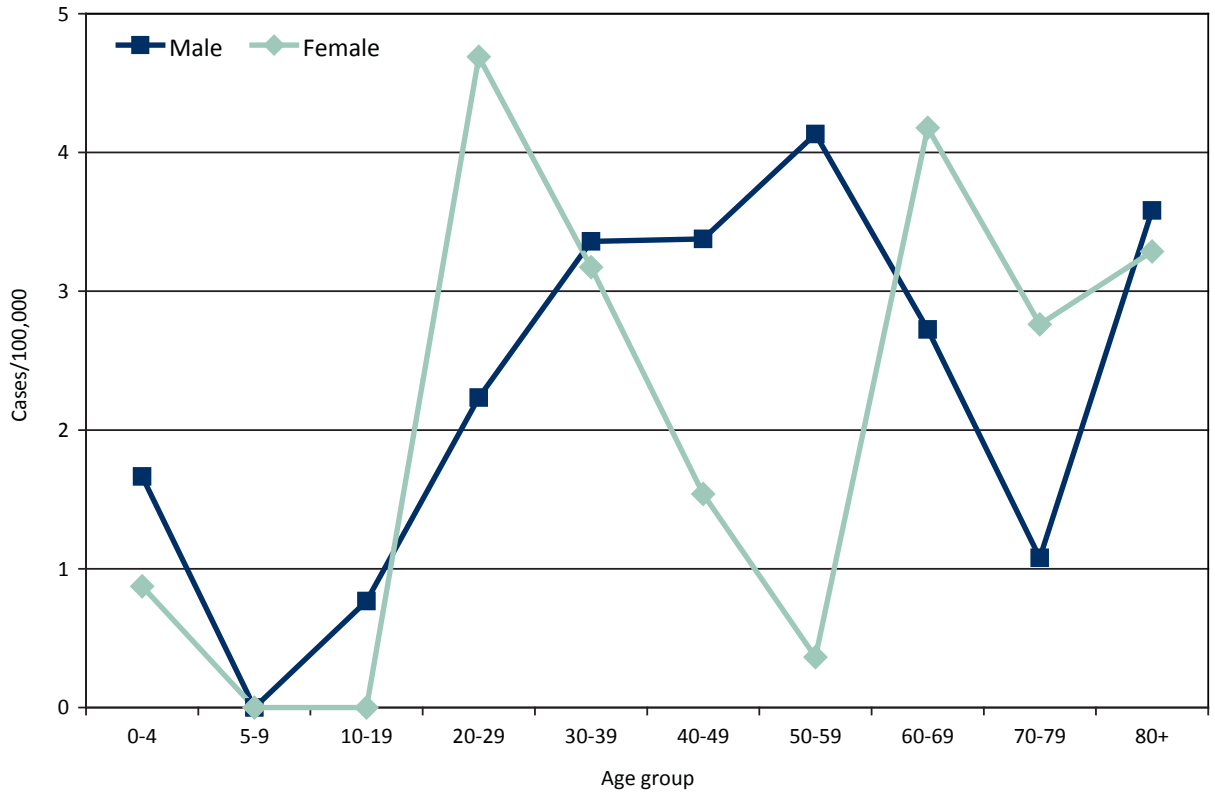
TB is preventable, treatable and curable. TB can be prevented by diagnosing and treating persons with active TB disease. It can also be prevented by identifying and treating persons with latent TB infection who, if untreated, are likely to develop active TB disease. Reporting of TB ensures that cases are treated and that contacts are identified and offered preventive antibiotics. The standard initial treatment for active TB in Oregon includes four drugs: INH, rifampin, pyrazinamide, and ethambutol pending susceptibility testing. Multidrug-resistant tuberculosis (MDR TB) is resistant to two or more of the standard TB drugs and requires treatment with second-line drugs.

The incidence rate of TB has been declining over the past decade. In 2010, a total of 87 cases of active TB disease were verified in Oregon, for a rate of 2.3 cases per 100,000 residents. Oregon's TB rate continues to meet the Healthy People 2000 goal of less than 3.5/100,000.

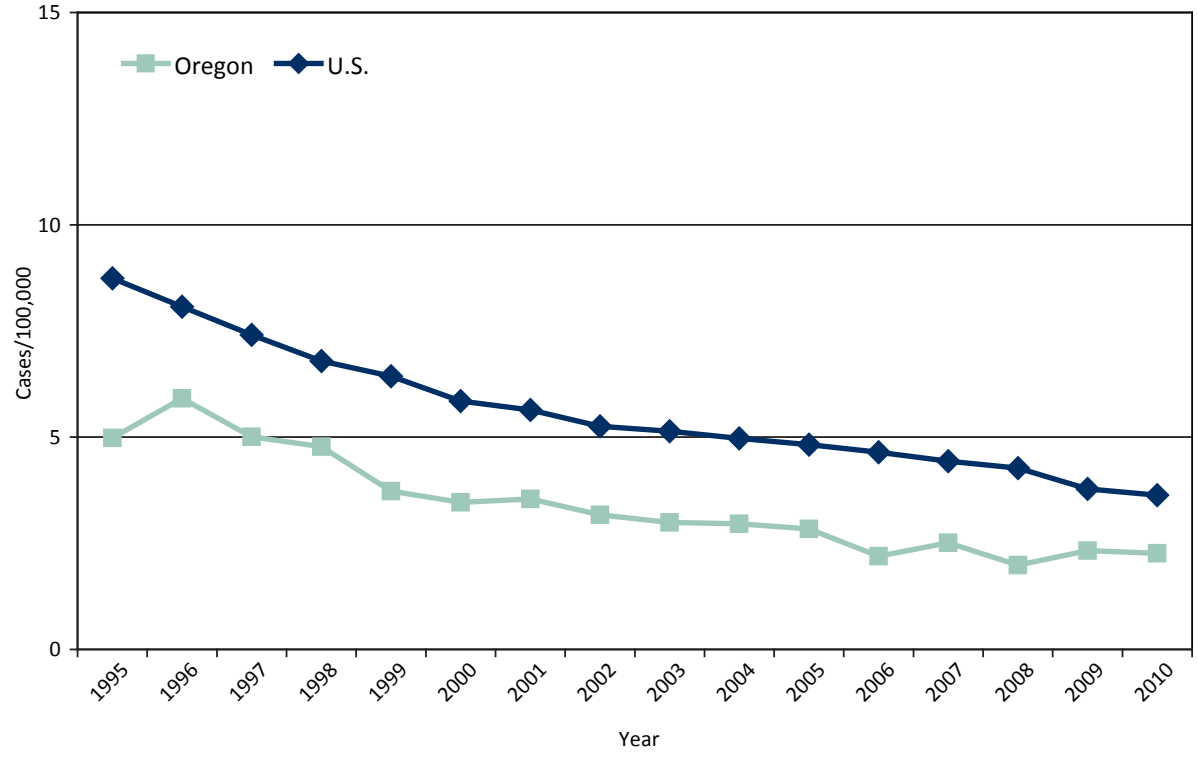
Tuberculosis by year: Oregon, 1988–2010



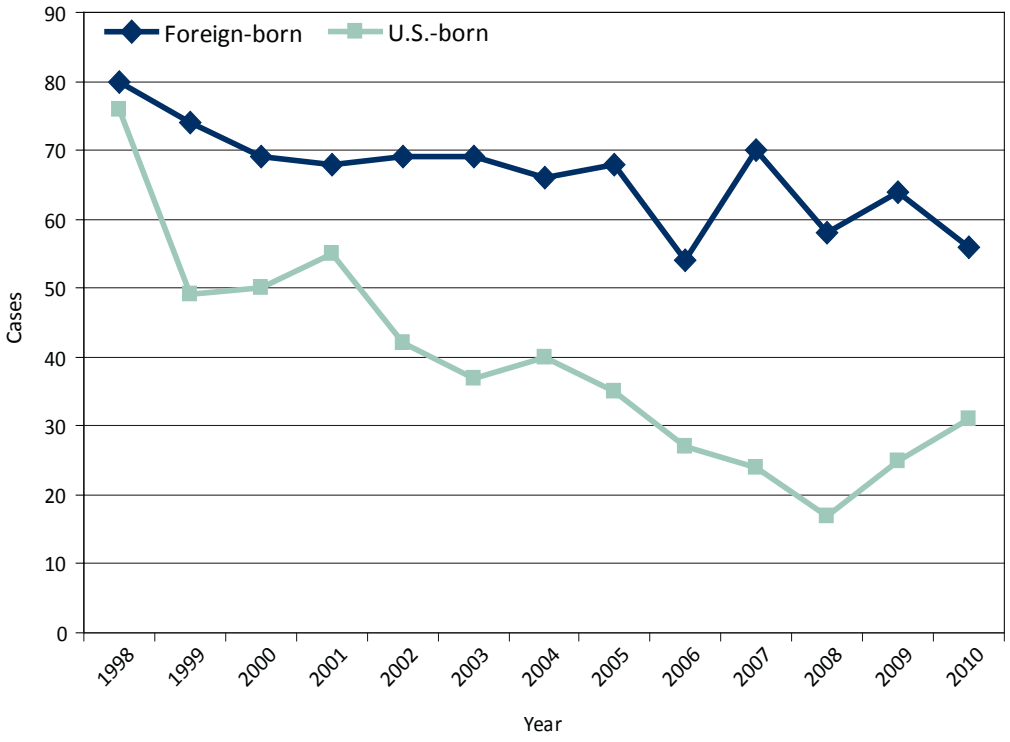
Incidence of tuberculosis by age and sex: Oregon, 2010



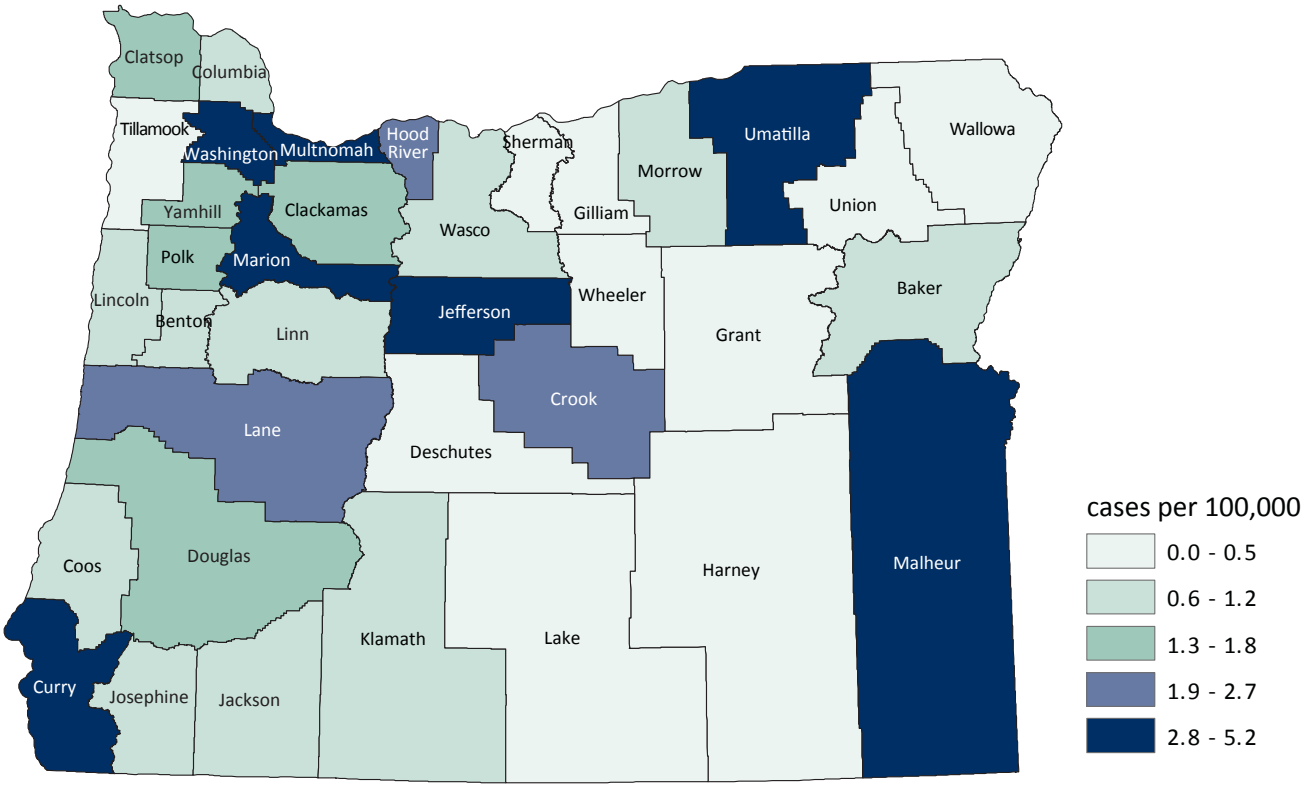
Incidence of tuberculosis: Oregon vs. nationwide, 1995–2010



Tuberculosis cases by country of birth, foreign-born vs. U.S.-born: Oregon, 2000–2010



Incidence of tuberculosis by county of residence: Oregon, 2000–2010



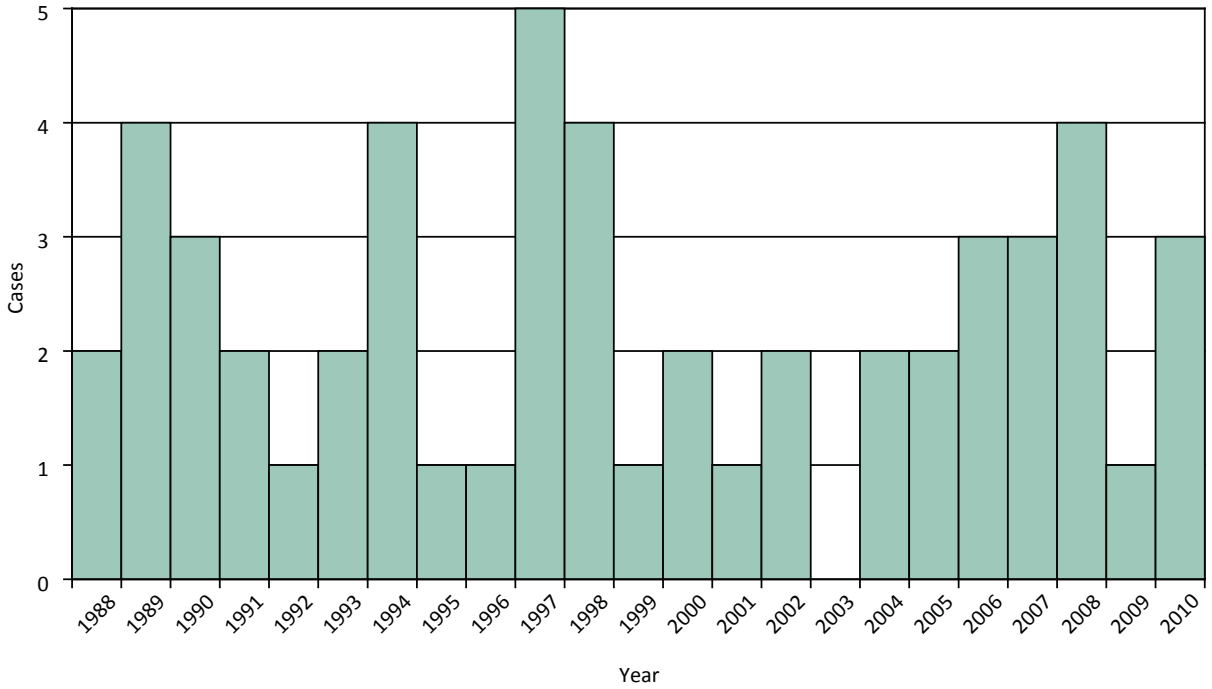
Tularemia

Tularemia, also known as rabbit or deer-fly fever, has recently gained notoriety as a possible "category A" agent of bioterrorism. Tularemia is caused by *Francisella tularensis*, a hardy organism found in rodents, rabbits and squirrels; in ticks, deer flies and mosquitoes; and in contaminated soil, water and animal carcasses. Biovar type A, the most common type in North America, is highly virulent; as few as 10–50 organisms can cause disease.

Disease onset is usually sudden and symptoms are influenza-like; general symptoms of tularemia include fever, malaise, myalgias, headache, chills, rigors and sore throat. Tularemia has six clinical forms, depending on portal of entry. Ulceroglandular tularemia is the most common form of the disease, accounting for 75% to 85% of naturally occurring cases. Other clinical forms include: pneumonic (pulmonary symptoms); typhoidal (gastrointestinal symptoms and sepsis); glandular (regional adenopathy without skin lesion); oculoglandular (painful, purulent conjunctivitis with adenopathy); and oropharyngeal (pharyngitis with adenopathy).

Tularemia occurs throughout the United States. Persons become infected primarily through handling contaminated animals; the bite of infective deer flies, mosquitoes or ticks; direct contact with or ingestion of contaminated food, water or soil; or inhalation of infective aerosols. From 2000 to 2010, 23 cases of tularemia were reported in Oregon. Cases occurred in residents of 13 counties and were evenly spread across age groups. In 2009, there was one case, and in 2010, there were three cases.

Tularemia by year: Oregon, 1988–2010



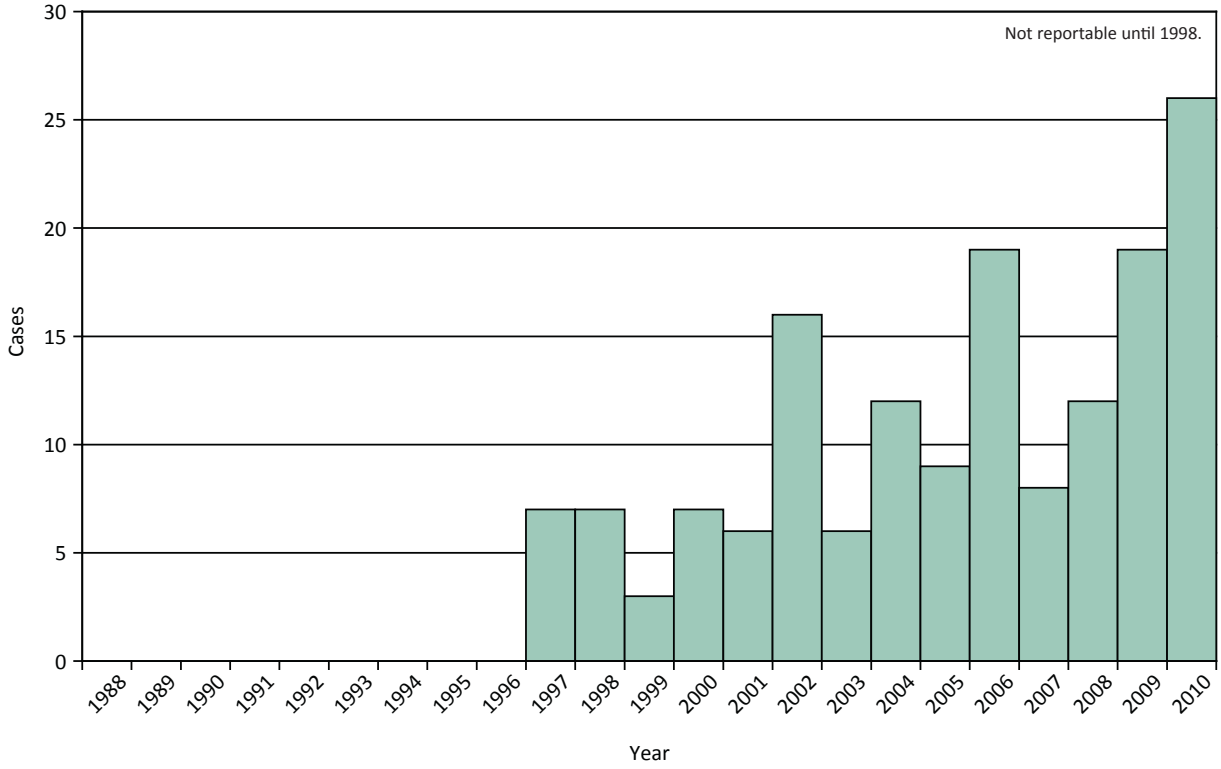
Vibriosis

Vibriosis is caused by infection with *Vibrio* bacteria. *Vibrio* is a species of bacteria that cause watery diarrhea, abdominal cramps, and fever. They are commonly found in coastal marine waters and, therefore, in filter-feeding shellfish, such as oysters (which, for this reason, should be eaten only when fully cooked). Some *Vibrio* species are more likely to cause wound infections (e.g., *V. alginolyticus*) after the skin is lacerated (for example, after shucking an oyster).

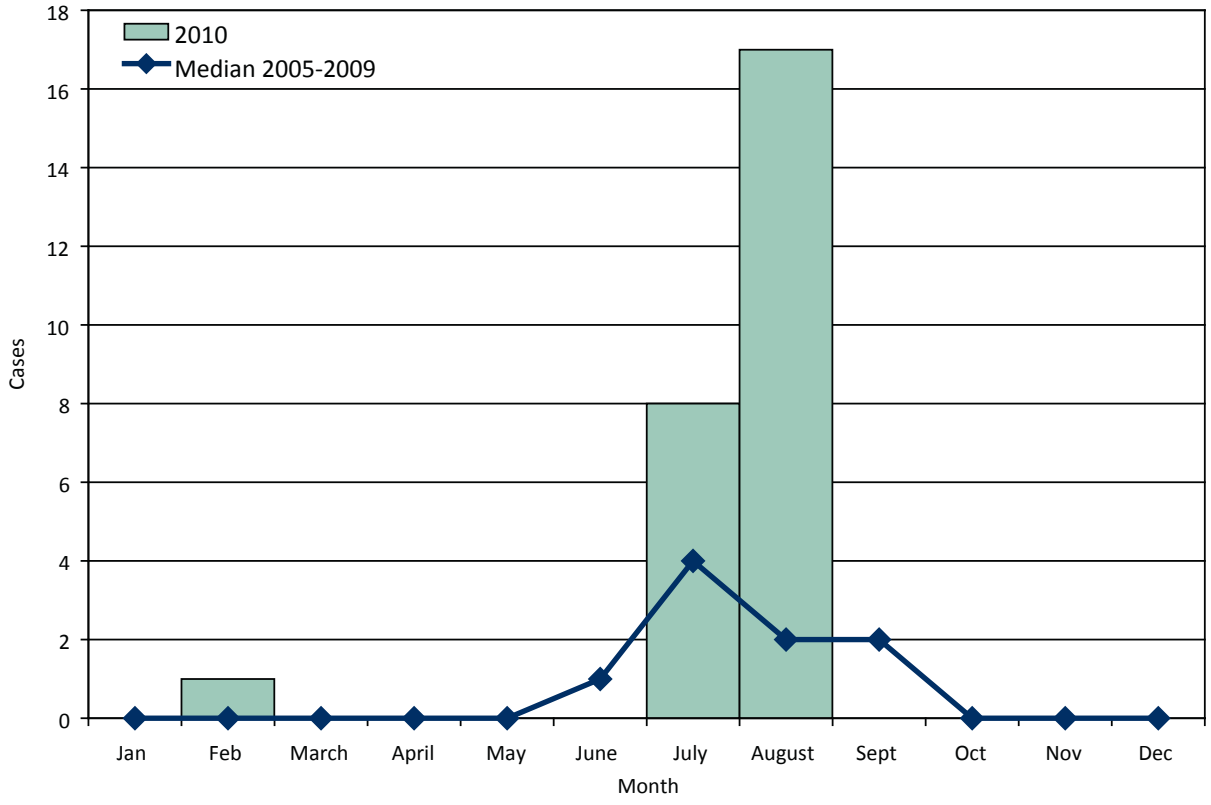
Non-cholera *Vibrio* infections were not nationally reportable until 2007 and not reportable in Oregon until 1998. Today, all *Vibrio* infections are nationally notifiable, and in addition to Oregon's reporting forms, additional CDC supplements need to be completed for each case. *V. parahaemolyticus*, which occurs naturally in Pacific coastal waters, especially during warmer months, is by far the most common species diagnosed in Oregon. Case reporting is essential to the identification of contaminated shellfish beds and removal of these shellfish from the raw seafood market.

In the past several years, *Vibrio* infections have increased across the nation, and Oregon is following the same trend. It could be that we're getting better at identifying cases or it could be that with warmer temperatures there are just more opportunities for exposure. Oregon saw 24 laboratory confirmed and two presumptive cases in 2010. While the majority of cases in Oregon are attributed to *V. parahaemolyticus*, in 2010 there were two cases of *V. fluvialis*. The majority (77%) of cases occurred in males.

Vibrio infections: Oregon, 1988–2010



Vibriosis by onset month: Oregon, 2010



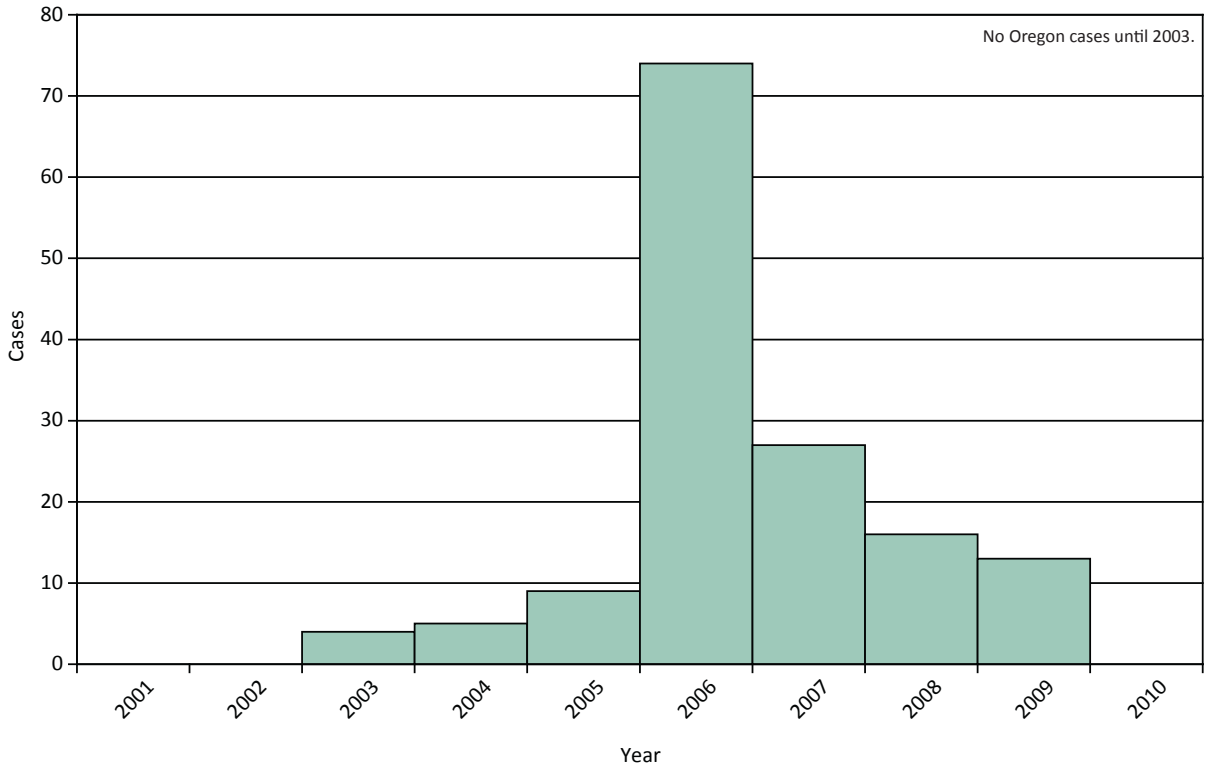
West Nile virus

West Nile virus (WNv) first appeared in the United States in 1999, and has moved westward across the country. In Oregon, the first case was reported in 2004. West Nile virus is a mosquito-borne virus that affects both animals and humans. Birds are the reservoir; humans and other animals are considered "dead-end" hosts.

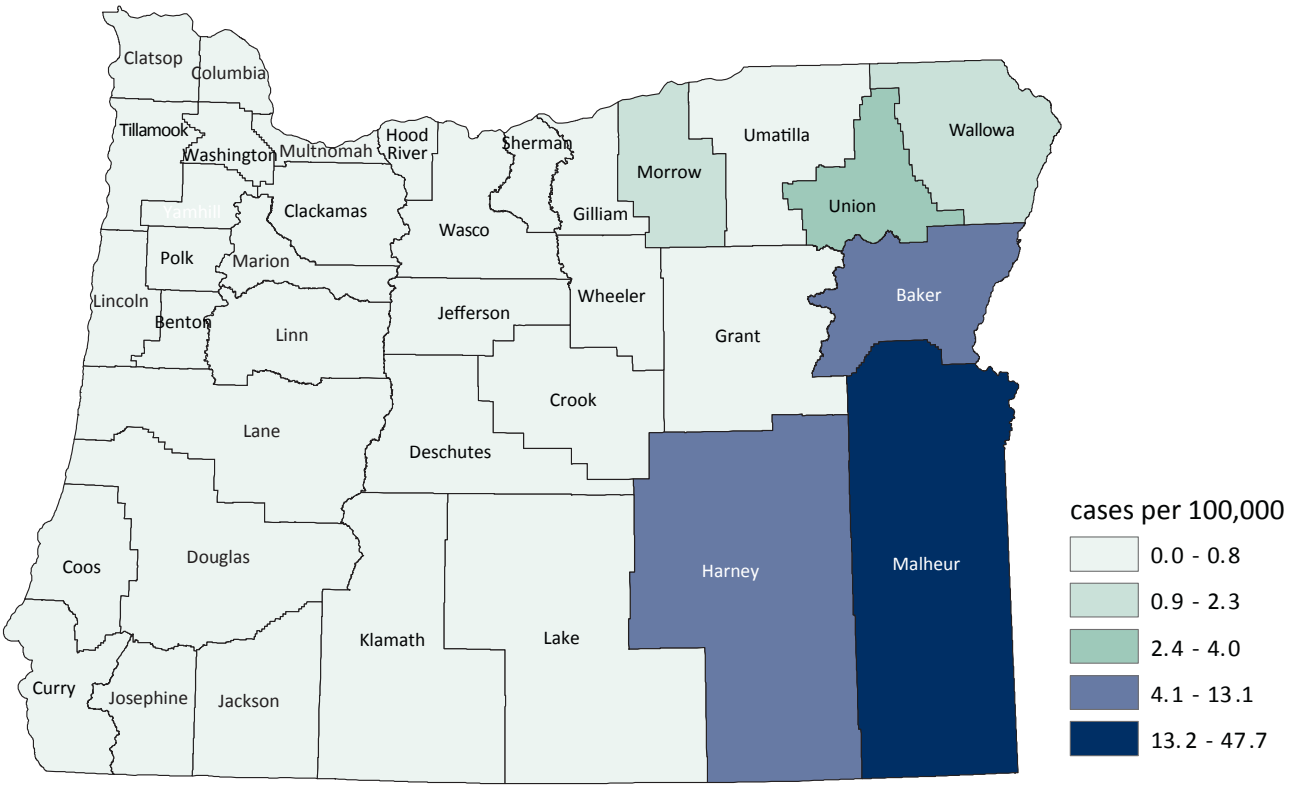
Of those infected, one in five will have mild symptoms such as fever, headache and muscle aches; fewer people, about one in 150, will have more severe symptoms that may include neck stiffness, stupor, disorientation, tremors, convulsions, muscle weakness, paralysis and coma. The risk of getting West Nile virus in Oregon has been very low. Though most cases were in those aged 20–50 years, those over 50 years of age have the highest risk of developing serious illness. The incidence in summer months is higher.

No human cases of West Nile virus were reported in 2010, however, mosquito pools continue to test positive.

West Nile virus by year: Oregon, 2001–2010



Incidence of West Nile virus by county of residence: Oregon, 2005–2010

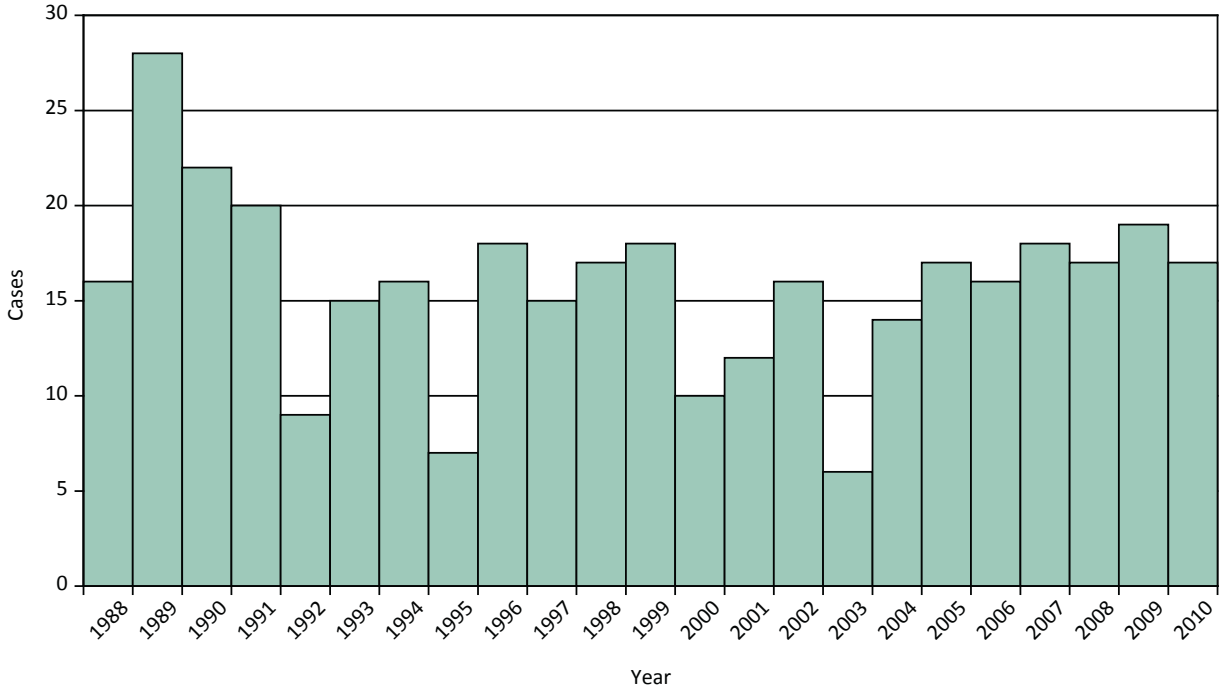


Yersiniosis

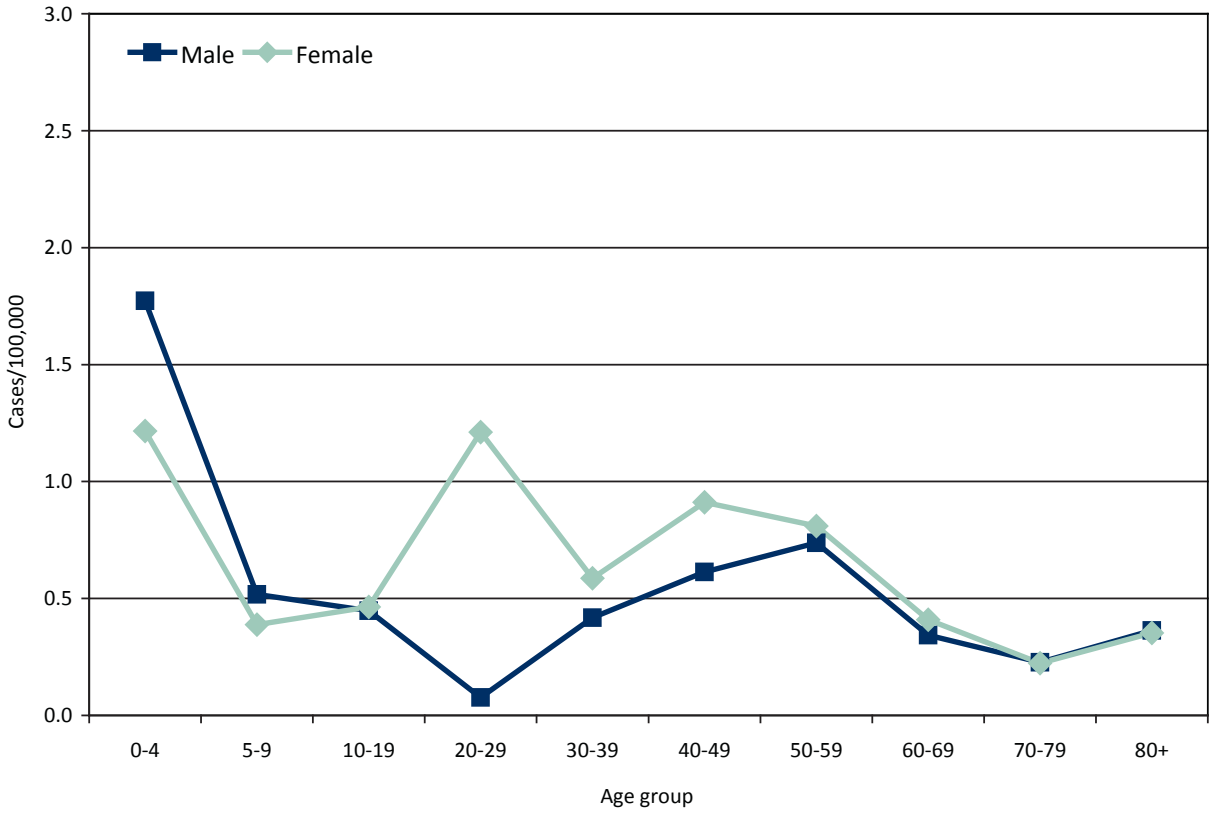
Yersiniosis is a bacterial infection characterized by (sometimes bloody) diarrhea, vomiting and abdominal pain. The main reservoir for *Yersinia* is the pig. Transmission occurs via the fecal-oral route through contaminated food and water, or through contact with infected people or animals. Preventive measures include cooking food thoroughly, avoiding cross-contamination with raw food of animal origin, and washing hands after handling food.

The incidence of yersiniosis in Oregon has been fairly stable over the years. In 2003, the number of cases dropped to six, the lowest reported incidence since 1995. Yersiniosis occurs throughout the year with no seasonality. The most common species is *Y. enterocolitica*. In 2010, there were 17 cases, similar to 2009. No outbreaks were reported.

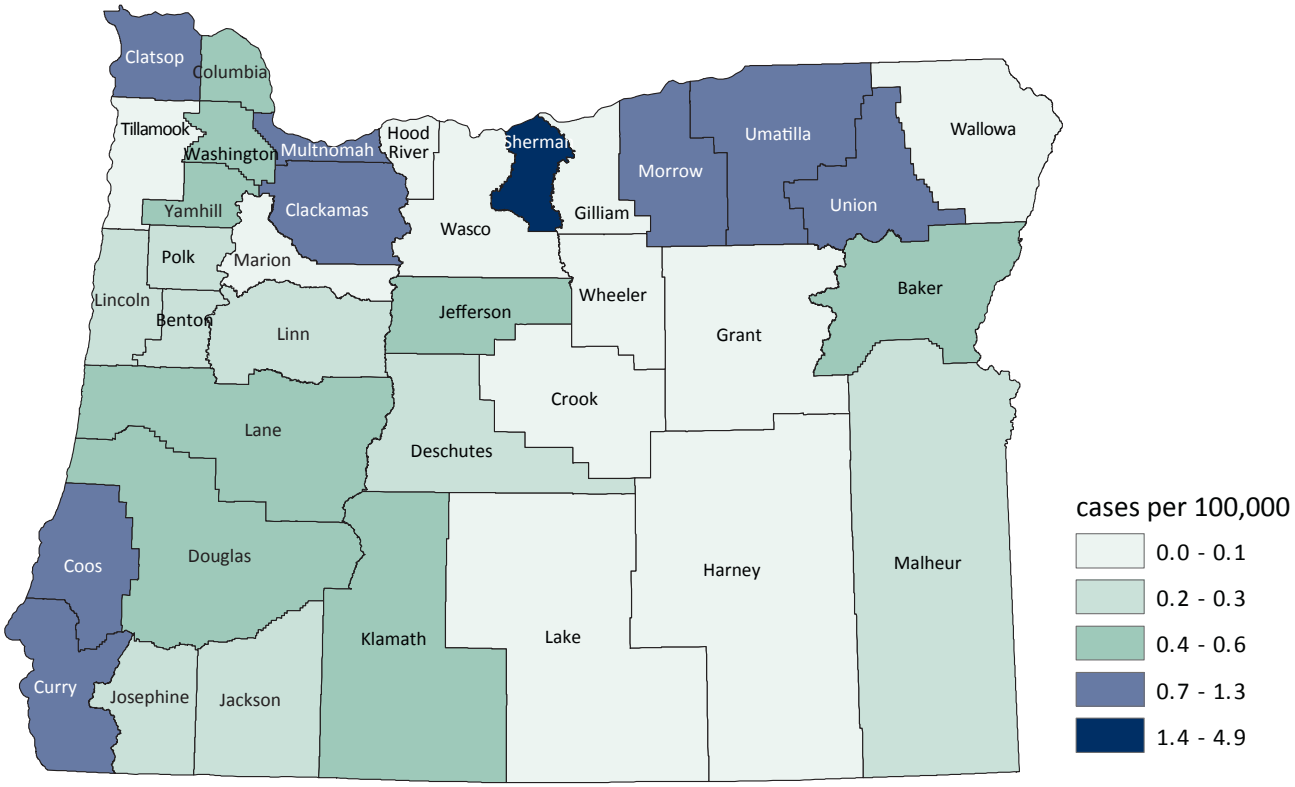
Yersiniosis by year: Oregon, 1988–2010



Yersiniosis by age and sex: Oregon, 2000–2010

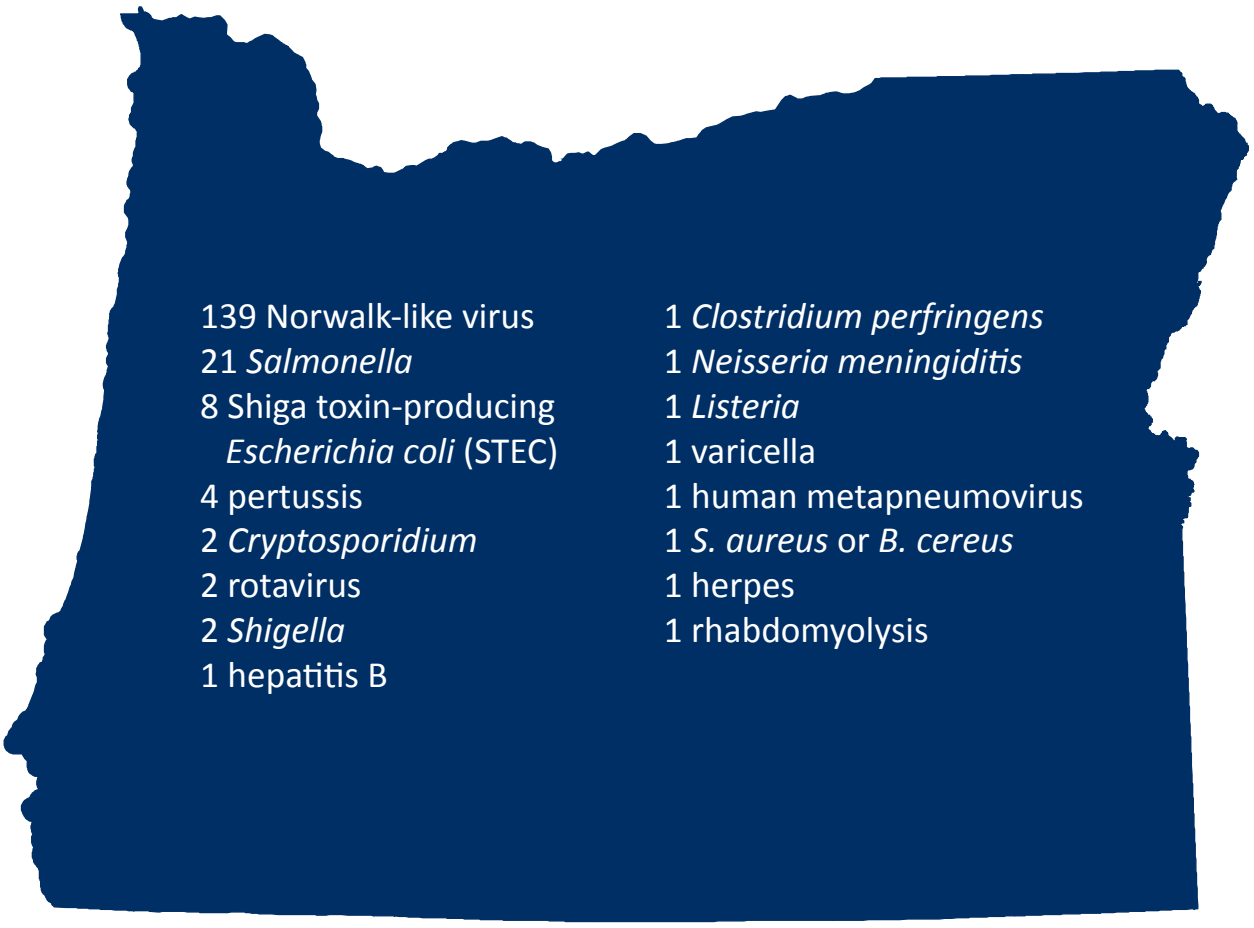


Incidence of yersiniosis by county of residence: Oregon, 2000–2010



Disease outbreaks

Oregon state and local health departments investigated 229 communicable disease outbreaks in 2010. The majority (106) of these were person-to-person transmissions of norovirus causing gastroenteritis in the elder inhabitants of Oregon's assisted and long-term care facilities, or younger populations in restricted environments such as the state hospital or prison. Forty were foodborne, seven respiratory, three due to animal contact, and two waterborne. In many (71) outbreak investigations the mode of transmission was undetermined. However, there were a number of outbreaks of other bacterial and viral pathogens. Sharing of respiratory secretions caused clusters of pertussis (4), varicella (2), and meningococcal disease (1). Foods contaminated with a garden variety of *Salmonella* made folks ill at a variety of venues including restaurants, markets and fairs. Every outbreak reinforces the age-old public health mantras — "wash your hands" and "cover your cough."

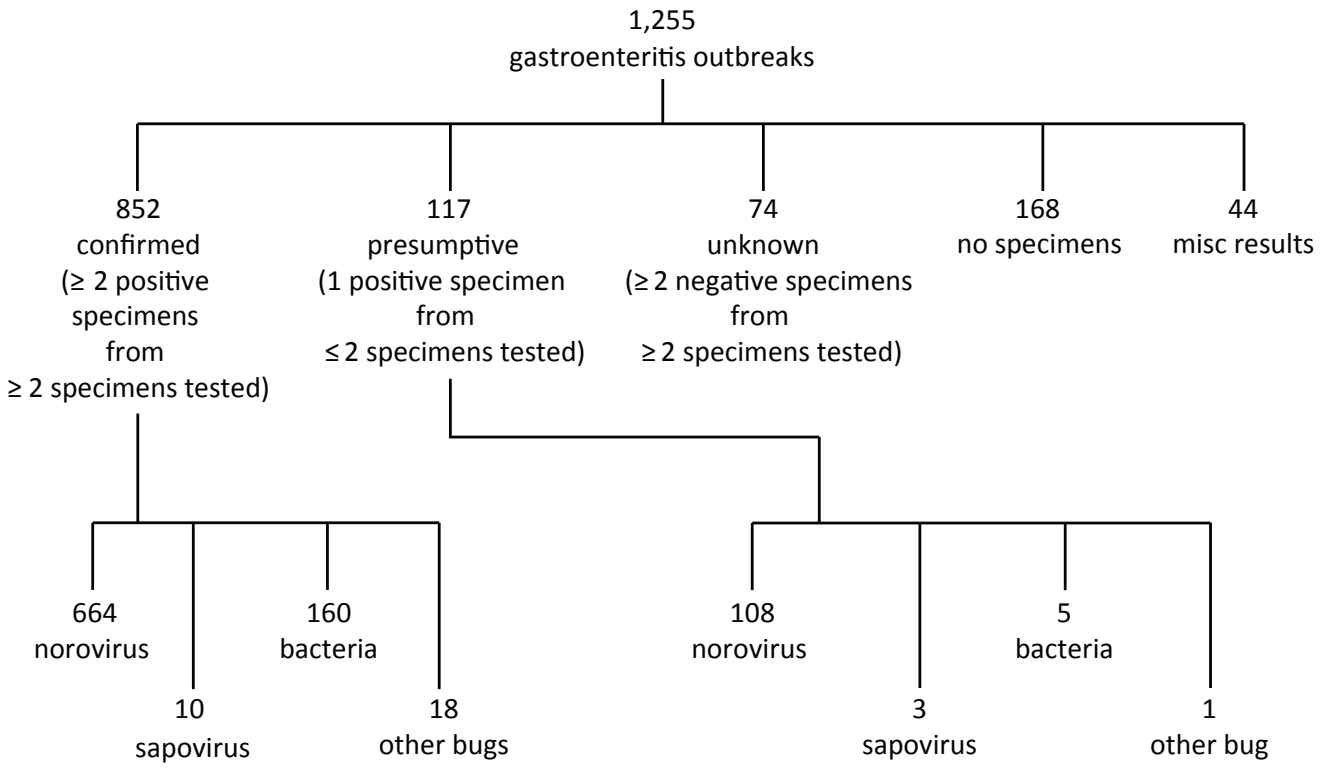


In 2002, a dramatic increase in the number of outbreaks of gastroenterititis in institutions, long-term care facilities, cruise ships and other similar settings resulted in beefed-up investigation and reporting of such outbreaks in Oregon. A summary of Oregon's enhanced data collection follows.

Gastroenterititis outbreaks, Oregon, 2003–2010

Gastroenteritis outbreaks are by far the most commonly reported outbreaks in Oregon, accounting for 84% of the 1,500 outbreaks investigated from 2003–2010.

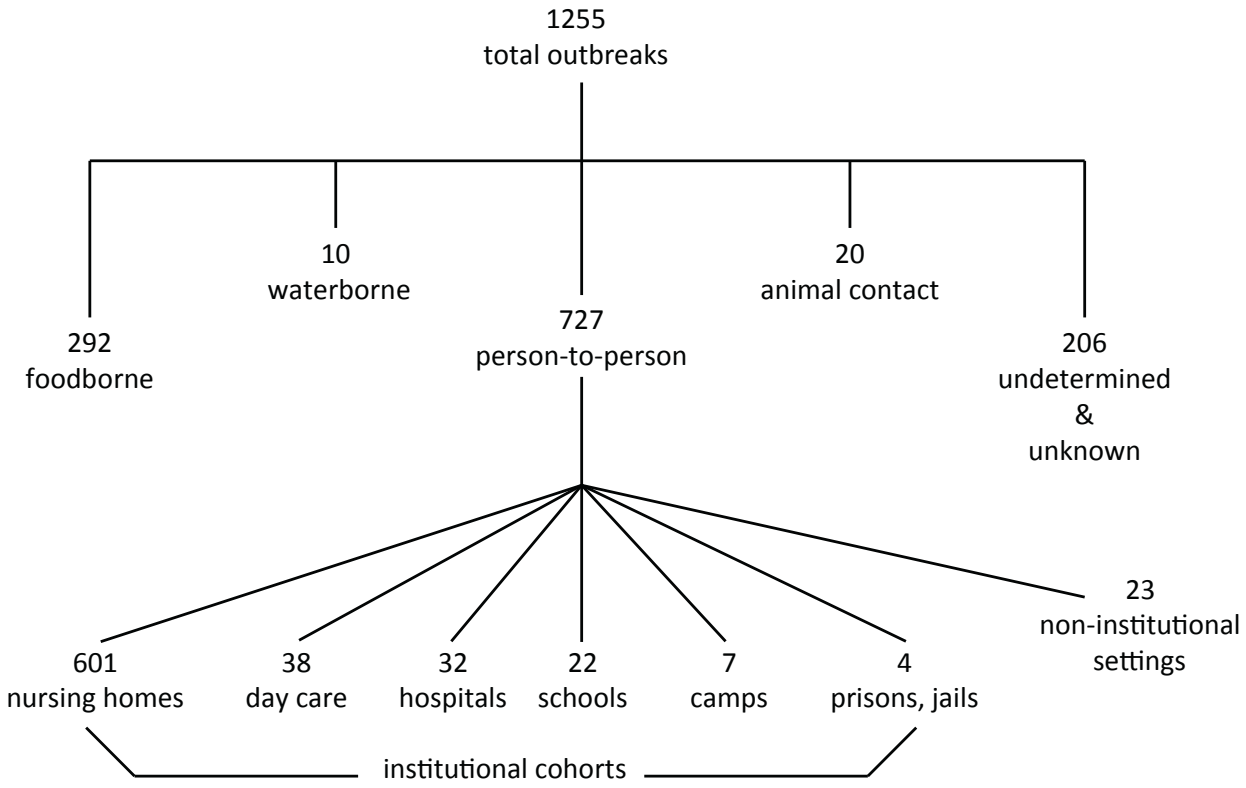
Thanks to rigorous stool specimen collection by local health investigators, 77% of gastroenteritis outbreaks had disease-causing agents identified, mostly caliciviruses (norovirus and sapovirus). OSPHL will routinely test for sapovirus when stool specimens are norovirus-negative.



Finalized June 9, 2011

Gastroenteritis outbreaks by transmission modes and settings: Oregon, 2003–2010

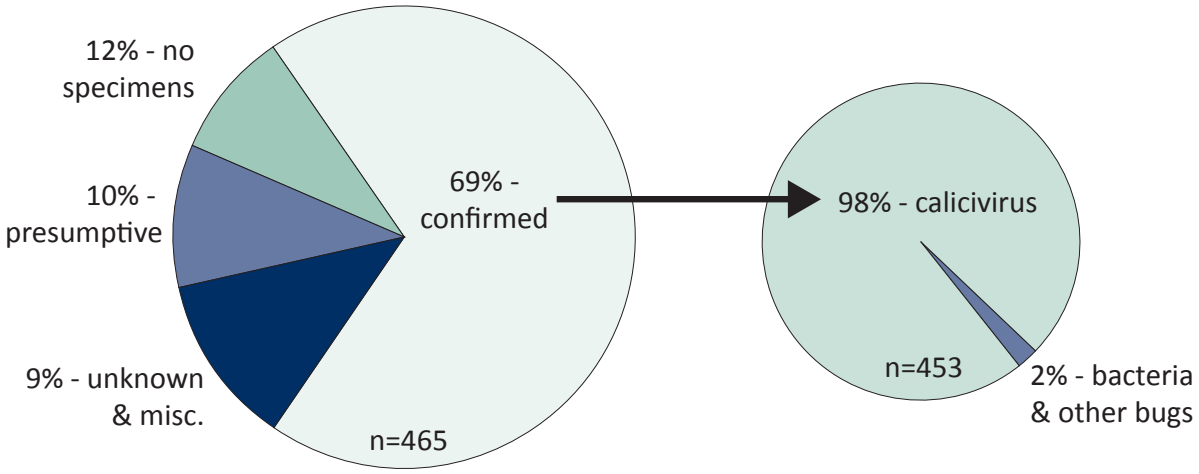
Person-to-person transmission was responsible for 58% of outbreaks and foodborne transmission for 23%. Transmission was undetermined (we couldn't figure it out) or unknown (we didn't have enough data to figure it out) in 16% of the outbreaks. More than 50% of the outbreaks happened in institutional cohorts, especially in long-term care.



Finalized June 9, 2011

Gastroenteritis outbreaks in long-term care: Oregon, 2003–2010

Slightly less than one half of reported gastroenteritis outbreaks occurred in long-term care facilities for the elderly. Seventy-nine percent had confirmed or presumptive etiologies, and 98% of etiologically-confirmed outbreaks were caused by caliciviruses.



Finalized June 9, 2011

Gastroenteritis outbreaks in long term care by county of occurrence and year of investigation: Oregon, 2003–2010

	Year								Total
County	2003	2004	2005	2006	2007	2008	2009	2010	
Baker	0	0	1	2	0	0	1	1	5
Benton	2	1	2	3	3	3	1	1	16
Clackamas	3	4	5	13	12	11	6	17	71
Clatsop	1	2	0	1	4	1	2	5	16
Columbia	1	0	0	0	1	1	1	1	5
Coos	1	0	1	1	2	2	2	2	11
Crook	0	0	0	0	0	1	0	0	1
Curry	0	1	0	1	0	0	0	0	2
Deschutes	2	0	1	8	5	9	6	5	36
Douglas	0	3	1	3	4	4	0	4	19
Grant	0	0	0	2	0	1	0	0	3
Harney	0	0	0	0	1	1	0	0	2
HoodRiver	4	0	0	2	1	1	2	1	11
Jackson	6	8	5	7	8	5	7	4	50
Jefferson	0	0	0	1	0	0	0	0	1
Josephine	0	1	1	5	2	3	0	1	13
Klamath	0	1	0	3	2	2	0	2	10
Lake	1	0	1	0	0	0	0	0	2
Lane	6	8	5	9	13	11	8	14	74
Lincoln	0	0	3	0	0	1	1	2	7
Linn	0	1	1	4	2	7	0	5	20
Malheur	0	1	0	0	1	1	0	0	3
Marion	4	6	7	15	18	20	6	10	86
Morrow	0	0	0	0	1	0	0	0	1
multi-state	1	0	0	0	0	0	0	0	1
Multnomah	1	5	2	6	14	12	20	14	74
Polk	2	1	1	3	3	3	5	2	20
Tillamook	0	0	0	0	0	1	1	1	3
Umatilla	0	2	0	2	2	1	0	2	9
Union	0	0	1	0	2	1	0	0	4
Wasco	2	0	1	3	0	1	2	2	11
Washington	1	0	0	12	11	9	11	9	53
Yamhill	3	3	0	6	6	6	2	8	34
Total	41	48	39	112	118	119	84	113	674

Infections, diseases and conditions reportable by clinicians: 2010

REPORT IMMEDIATELY

- Anthrax
- Botulism
- Diphtheria
- Marine intoxication[3]
- Plague
- SARS-coronavirus
- Any outbreak of disease[4]
- Any uncommon illness of potential public health significance[5]

REPORT WITHIN 24 HOURS

- *Haemophilus influenzae*
- Measles (rubeola)
- Meningococcal disease
- Pesticide poisoning
- Polio
- Rabies
- Rubella
- *Vibrio* infection

REPORT WITHIN ONE WORKING DAY

- Animal bites
- Any arthropod-borne infection[6]
- Brucellosis
- Campylobacteriosis
- Chancroid
- *Chlamydia* infection[7]
- Cruetzfeld-Jakob disease (CJD) and other prion diseases
- Cryptosporidiosis
- *Cyclospora* infection
- *Escherichia coli* (Shiga-toxigenic)[8]
- Giardiasis
- Gonorrhea
- Hantavirus infection
- Hepatitis A
- Hepatitis B
- Hepatitis C
- Hepatitis D (delta)
- HIV infection and AIDS
- Hemolytic-uremic syndrome (HUS)
- Legionellosis
- Leptospirosis
- Listeriosis
- Lyme disease
- Lymphogranuloma venereum (LGV)
- Malaria
- Mumps
- Pelvic inflammatory disease (acute, non-gonococcal)
- Pertussis
- Psittacosis
- Q fever
- Rocky Mountain spotted fever
- Salmonellosis (including typhoid)
- Shigellosis
- Syphilis
- *Taenia solium* infection/Cysticercosis
- Tetanus
- Trichinosis
- Tuberculosis
- Tularemia
- West Nile virus
- Yersiniosis

REPORT WITHIN ONE WEEK

- Lead poisoning
- Diabetes in person ≤ 18 years old[9]

Diseases, infections, microorganisms and conditions reportable by laboratories: 2010

BACTERIA

- *Bacillus anthracis*
- *Bordetella pertussis*
- *Borrelia*
- *Brucella*
- *Campylobacter*
- *Chlamydia psittaci*
- *Chlamydia trachomatis*
- *Clostridium botulinum*
- *Clostridium tetani*
- *Corynebacterium diphtheriae*
- *Coxiella burnetii*
- *Ehrlichia*
- *Escherichia coli* -- Shiga-toxigenic[3,4]
- *Francisella tularensis*
- *Haemophilus influenzae*[3,5]
- *Haemophilus ducreyi*
- *Legionella*
- *Leptospira*
- *Listeria monocytogenes*[3]
- *Mycobacterium tuberculosis*[3]
- *Mycobacterium bovis*
- *Neisseria gonorrhoeae*
- *Neisseria meningitidis*[3,5]
- *Rickettsia*
- *Salmonella*[3]
- *Shigella*[3]
- *Treponema pallidum*
- *Vibrio*[3]
- *Yersinia*[3]

PARASITES

- *Cryptosporidium*
- *Cyclospora*
- *Giardia*
- *Plasmodium*
- *Taenia solium*[6]
- *Trichinella*

VIRUSES

- Hantavirus
- Hepatitis A[7]
- Hepatitis B[7]
- Hepatitis C
- Hepatitis D (Delta)
- HIV infection and AIDS
- Measles (Rubeola)
- Mumps
- Polio
- Rabies
- Rubella
- SARS-coronavirus
- West Nile
- Yellow Fever

OTHER IMPORTANT REPORTABLES

- Any "uncommon illness of potential public health significance"[2]
- Any outbreak of disease[2]
- Any other typically arthropod vector-borne infection[2]
- All blood lead testing results
- All CD4 cell counts and HIV viral loads
- Creutzfeldt-Jakob disease (CJD) and other prion illnesses

Selected cases of notifiable diseases by year*: Oregon 1990–2010

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Campylobacteriosis	951	966	850	712	656	626	702	736	698	599	568	598	575	597	656	647	652	729	703	733	862
Chlamydiosis*	7,387	7,327	5,885	5,539	5,494	5,468	5,442	5,254	5,857	6,131	7,110	7,504	7,200	7,498	8,690	9,018	9,578	9,867	10861	11497	12,337
***E. coli* (STEC)**	56	114	154	253	111	94	102	92	107	68	134	91	210	105	70	158	107	85	68	84	118
Giardiasis	1359	1301	1178	1000	937	897	899	879	892	792	673	535	431	406	445	419	428	463	452	429	482
Gonorrhea*	2549	2172	1768	1191	977	854	886	773	880	905	1039	1145	929	982	1302	1562	1459	1238	1258	1113	1,077
***H. influenzae* infection**	67	28	24	11	25	27	32	36	41	49	30	38	57	42	49	54	55	68	55	57	68
Hepatitis A	809	446	506	581	1366	2929	883	387	430	248	164	109	61	62	69	48	47	34	27	19	17
Acute hepatitis B	415	305	278	282	232	186	164	131	186	122	123	170	128	120	129	108	82	61	46	50	44
Acute hepatitis C	0	0	0	1	1	7	23	12	9	29	18	15	13	16	17	19	27	22	33	26	22
Legionellosis	0	0	0	1	0	0	0	0	1	2	1	4	9	17	8	15	22	14	18	19	17
Listeria	5	3	6	10	11	13	15	11	18	17	6	12	9	5	7	11	13	8	6	19	17
Malaria	21	13	16	14	16	23	23	26	16	22	41	14	14	10	19	13	15	16	4	12	16
Measles	212	93	3	4	2	1	14	0	3	9	0	3	0	3	0	2	2	2	1	0	0
Meningococcal disease	87	81	72	101	136	118	114	109	85	75	71	65	44	60	61	56	41	32	38	39	32
Pertussis	122	66	45	105	67	57	57	49	89	61	104	66	192	439	616	622	112	129	174	260	285
Rubella	75	5	2	0	4	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Salmonellosis	357	378	478	346	337	345	381	366	344	422	300	288	337	427	415	418	428	336	429	440	512
Shigellosis	180	721	280	158	166	174	151	195	187	102	159	115	106	211	87	127	121	87	94	56	59
Early syphilis*	261	277	218	185	100	67	70	48	32	37	31	22	47	74	58	55	48	26	45	86	106
Tuberculosis*	148	144	146	153	165	156	188	161	156	123	119	123	111	106	106	103	81	94	75	89	87
Tularemia	3	2	1	2	4	1	1	5	4	1	2	1	2	0	2	2	3	3	4	1	3
Typhoid fever	5	6	2	3	5	3	4	3	1	7	4	8	2	3	1	4	4	0	0	1	6
Vibrio parahaemolyticus	0	0	0	0	0	0	0	7	7	3	7	6	16	6	12	9	19	8	12	19	26
Yersiniosis	22	20	9	15	16	7	18	15	17	18	10	12	16	6	14	17	16	18	17	19	17

* Case counts by onset year except for where noted with * indicating counts by date of report Blank cells = not reportable

Data as of 5/25/2011

Selected Oregon communicable disease case counts by county of residence, 2010

	AIDS/HIV living**	Campylobacteriosis	Chlamydiosis	Cryptosporidiosis	*E. coli* (STEC)	Giardiasis	Gonorrhea	*Haemophilus influenzae*	Hepatitis A	Hepatitis B (acute)	Hepatitis B (chronic)	Hepatitis C (acute)	Legionellosis	Listeriosis	Lyme disease	Malaria	Meningococcal Disease	Pertussis	Rabies, animal	Salmonellosis	Shigellosis	Early Syphillis	*Taeniasis*	Tuberculosis	West Nile	Total
Baker	2	5	23	0	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	34
Benton	43	37	249	1	2	13	23	0	0	0	5	0	0	0	5	0	1	4	0	11	3	2	0	0	0	399
Clackamas	320	75	954	40	11	27	69	4	3	6	30	2	2	4	0	2	0	16	0	39	2	13	0	6	0	1,625
Clatsop	24	6	114	1	0	2	2	2	0	0	1	0	0	0	1	0	0	6	0	3	0	0	0	0	0	162
Columbia	27	13	144	8	0	3	3	1	0	0	7	0	0	0	1	0	0	3	0	0	0	0	0	0	0	210
Coos	39	14	188	1	0	9	4	4	0	1	4	0	0	0	2	0	1	3	0	5	0	0	0	0	0	275
Crook	6	11	51	0	2	2	8	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82
Curry	12	6	22	1	0	4	0	0	0	0	3	0	1	0	0	0	0	4	0	3	0	0	0	0	0	56
Deschutes	81	61	458	0	4	36	9	1	2	3	5	1	1	0	0	0	3	8	2	18	1	4	0	0	0	698
Douglas	67	20	257	5	9	8	4	2	1	1	9	5	0	0	3	0	9	4	0	90	1	1	0	2	0	498
Gilliam	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Grant	3	1	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Harney	2	1	16	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Hood River	17	3	46	0	0	0	1	0	0	0	0	2	0	0	1	0	0	0	0	4	1	0	0	2	0	77
Jackson	147	28	517	10	9	12	35	3	1	1	13	0	1	1	1	0	3	41	2	26	1	0	0	1	0	853
Jefferson	12	2	114	1	0	2	2	2	0	0	3	0	0	0	0	0	0	1	1	3	6	0	0	0	0	149
Josephine	57	13	182	1	0	6	11	2	0	0	4	0	0	0	2	0	2	22	7	12	0	1	0	0	0	322
Klamath	23	8	182	1	3	6	9	1	0	0	8	0	0	0	0	0	1	1	1	13	0	0	0	1	0	258
Lake	2	3	16	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	24
Lane	283	94	1276	17	6	49	43	7	3	4	13	4	4	2	1	0	2	51	1	37	7	2	0	8	0	1,914
Lincoln	36	7	75	3	0	7	12	0	0	0	5	0	0	0	0	0	0	7	0	2	3	0	0	0	0	157
Linn	60	25	358	16	14	9	34	2	0	3	6	0	0	0	2	0	1	12	0	10	0	0	0	1	0	553
Malheur	20	9	108	0	2	2	1	0	0	0	1	0	1	0	0	0	0	0	0	4	0	0	0	1	0	149
Marion	356	48	1389	12	10	22	86	4	1	4	29	3	0	3	1	2	3	26	0	37	14	4	0	6	0	2,060
Morrow	6	2	29	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
Multnomah	2,890	199	3286	55	13	178	578	12	2	8	158	2	2	3	13	6	3	52	0	111	11	63	2	36	0	7,683
Polk	33	15	233	0	2	5	19	4	1	2	7	0	0	0	1	0	2	5	1	3	1	0	1	1	0	336
Sherman	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6
Tillamook	13	0	33	2	1	1	1	2	0	1	1	1	0	0	0	0	0	2	0	3	0	0	0	0	0	61
Umatilla	43	14	197	0	0	10	11	1	0	0	3	1	0	0	0	0	0	0	0	7	0	0	0	5	0	292
Union	10	4	81	1	0	2	0	0	0	0	1	0	0	0	2	0	0	0	0	1	1	0	0	0	0	103
Wallowa	3	3	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Wasco	16	5	62	1	2	1	5	1	0	3	4	0	1	0	0	0	0	0	0	4	0	0	0	1	0	106
Washington	527	111	1388	38	22	56	96	8	3	5	89	0	4	4	3	5	1	11	2	57	6	17	0	15	0	2,468
Wheeler	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Yamhill	46	18	256	1	4	6	9	3	0	1	2	0	0	0	0	1	0	6	0	7	1	0	0	1	0	362
Total	5,226	862	12,337	218	118	482	1,077	68	17	44	414	22	17	17	40	16	32	285	17	512	59	107	3	87	0	22,077

Oregon Health Authority

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