Lyme Disease in Oregon

Lyme disease is caused by a bacterium, *Borrelia burgdorferi*, spread through an infected tick's bite. The most common ticks to spread the infection are:

- The blacklegged tick (or deer tick, *Ixodes scapularis*) in the Northeastern, Mid-Atlantic and North-Central United States; and
- The western blacklegged tick (*Ixodes pacificus*) on the West Coast.

Ticks can attach to any part of the human body. However, they are often found in hard-to-see areas such as the groin, armpits and scalp. The tick usually must be attached for 36 to 48 hours or more before the Lyme disease bacterium can be transmitted.

Most humans are infected through the bites of immature ticks called nymphs. Nymphs are tiny (less than 2 mm) and hard to see. They feed during the spring and summer months. Adult ticks can also transmit the Lyme disease bacterium; however, they are much larger and easier to find and remove before they can transmit it. Adult *Ixodes* ticks are most active during the cooler months of the year.

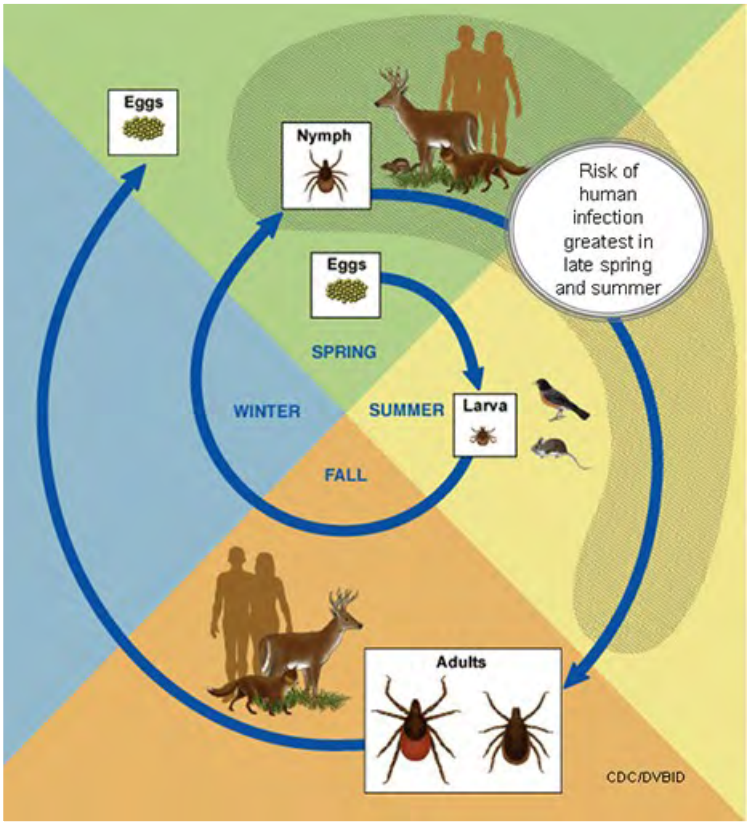


Figure 1. Life cycle of ticks related to Lyme disease (1)

Epidemiology

Most U.S. Lyme disease cases have been reported in the Northeast and Upper Midwestern United States (see Figure 2).

Figure 2. Reported cases of Lyme disease, United States, 2014 (2)

Note: One dot is randomly placed within the county of residence for each confirmed case.

Lyme disease in Oregon

Oregon facts

- *Ixodes pacificus* (or deer tick) is present in Western Oregon and along the Columbia River in lower elevations. It can transmit Lyme disease bacterium.
- During the past six years, 40–50 human cases of Lyme disease have been reported each year.
- In 2015, 120 cases of Lyme disease were reported in dogs.

The number of Oregon Lyme disease cases has increased in recent years. Between 40 and 50 human cases a year of Lyme disease have been reported each of the past six years. Most cases occur in the summer months (see figures 3, 4 and 5).

Figure 3. Lyme disease by year, Oregon, 1988–2014 (3)

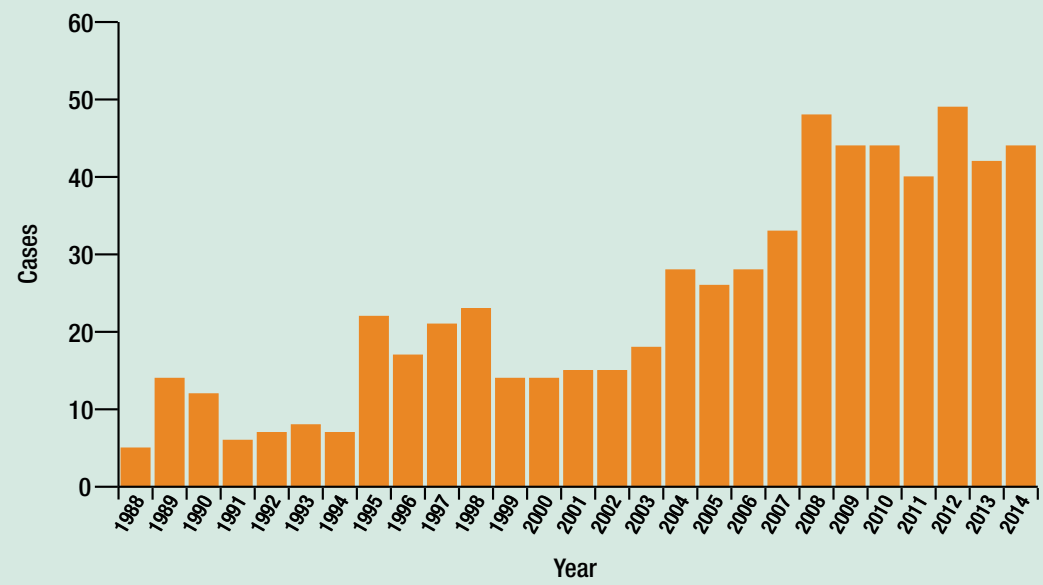
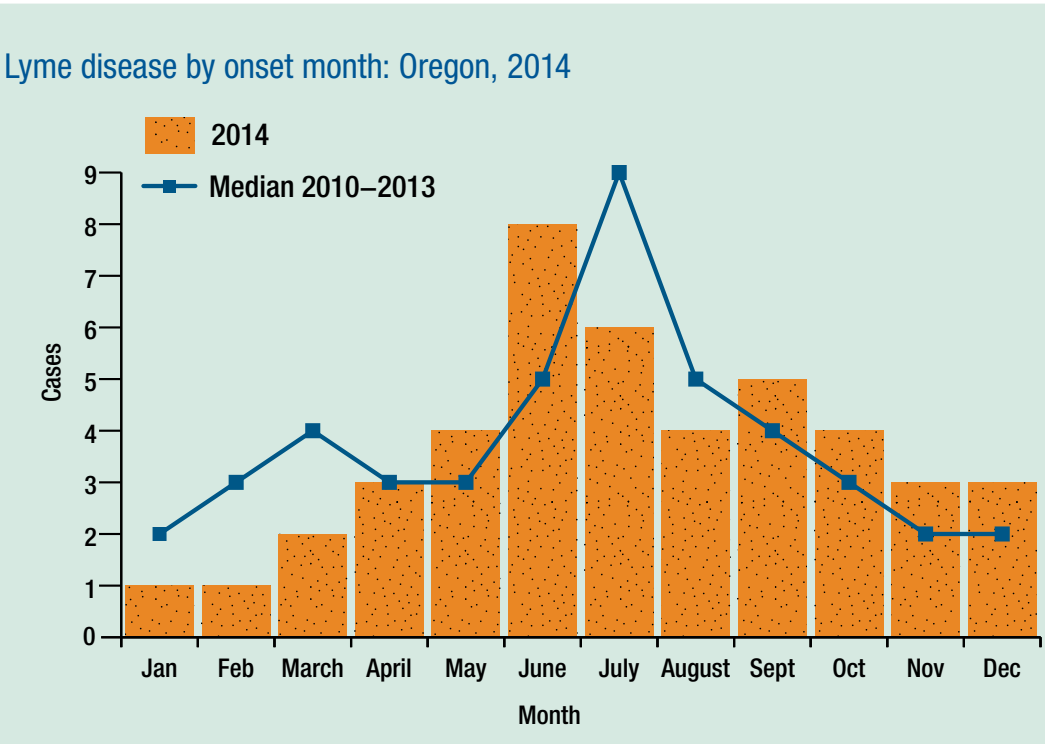


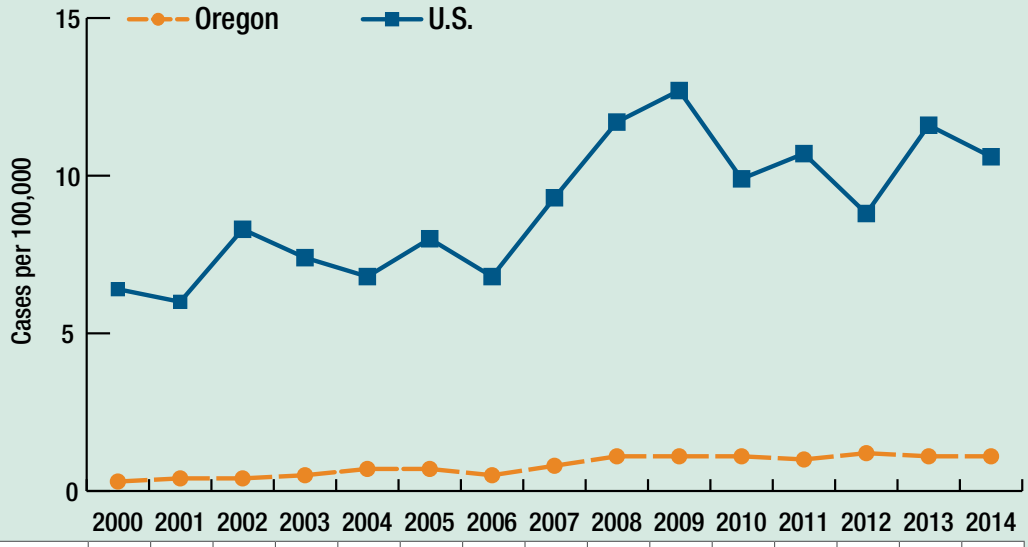
Figure 4. Lyme disease by onset month, Oregon, 2014 (3)



The incidence of Lyme disease in Oregon is much lower than the United States as a whole.

Figure 5. Incident of Lyme disease, Oregon vs. nationwide, 2000–2014 (3)

Incidence of Lyme disease: Oregon vs. nationwide, 2000–2014



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Oregon	0.3	0.4	0.4	0.5	0.7	0.7	0.5	0.8	1.1	1.1	1.1	1.0	1.2	1.1	1.1
U.S.	6.4	6.0	8.3	7.4	6.8	8.0	6.8	9.3	11.7	12.7	9.9	10.7	8.8	11.6	10.6

Infected ticks

The risk of clinical disease correlates with the percentage of infected ticks. Oregon has a relatively low percent of infected ticks.

In Westchester County New York, 52 percent of adult ticks and 26 percent of nymphs were reported infected with *B. burgdorferi*. This is in sharp contrast to the roughly 2 to 4 percent of infected ticks in Oregon. (4)

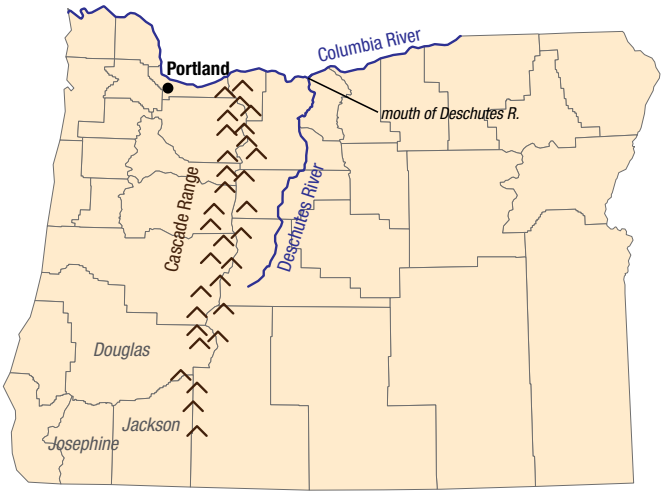
In Oregon, rodent and tick surveys were undertaken in 1997 to isolate and characterize strains of *B. burgdorferi* and to identify native animals (e.g., rodents) infected with the Lyme bacteria and the ticks that spread that bacteria in Oregon. Viable Lyme bacteria were successfully isolated from 3 percent of adult *I. pacificus* ticks; rodent's ear biopsy specimens yielded 15 percent positive *B. burgdorferi* cultures. (5)

Geographic distribution of ticks and Lyme disease cases, Oregon

The maps below summarize the geographic distribution of ticks and Lyme disease in Oregon. The data come from a special study done by the infection disease groups at Providence Portland Medical Center's Earle A. Chiles Research Institute and at the Department of Medicine at Oregon Health & Science University.

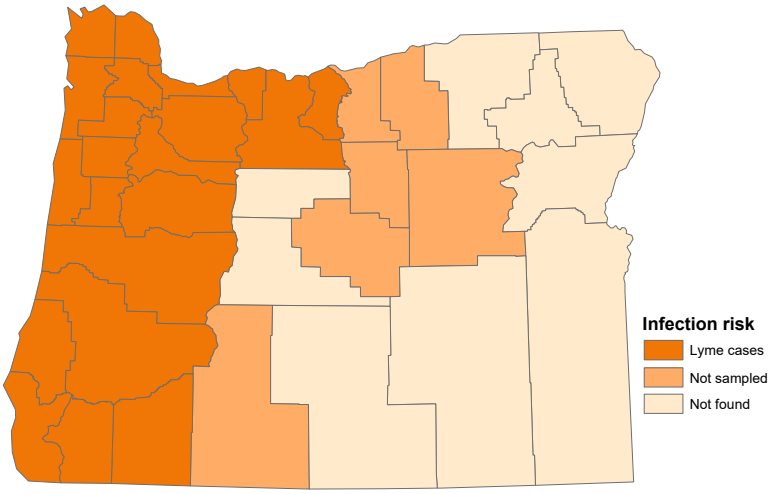
Figure 6. The epidemiology of Lyme disease in Oregon (4)

Geography



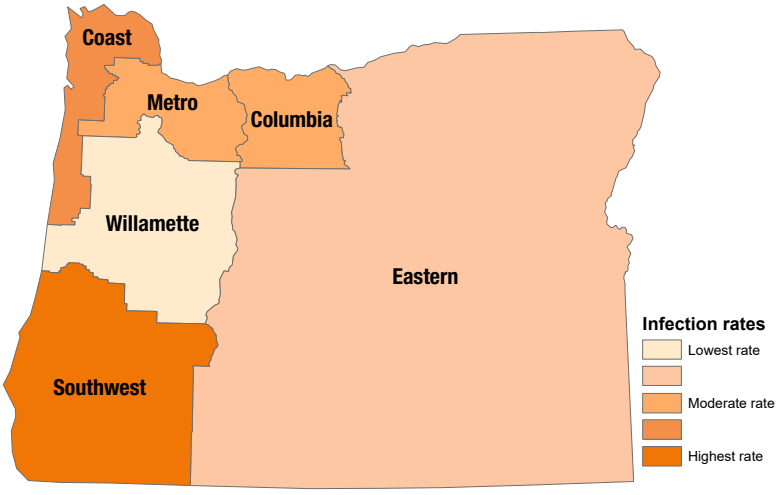
The top map highlights the pertinent geography of Oregon. Note the location of Portland, the Columbia River and the three southwestern Oregon counties. Southwestern Oregon has the highest density of *I. pacificus* ticks (see bottom map).

The known distribution of *Ixodes pacificus* ticks



The middle map displays the known distribution of *Ixodes pacificus* ticks.

Rate of Lyme cases



The bottom map summarizes the Oregon adjusted annual case rate. The highest rate of 1.28/100,000 population is found in the southwestern portion of the state (darkest orange). The lowest rate of 0.23/100,000 runs north to south through the Willamette Valley (lightest orange).

Reporting Lyme disease in Oregon

Physician and laboratories are required to report cases of Lyme disease to the local public health authority. The local health department interviews the patients following the state investigative guideline to gather more information.

Please visit our website for more information:

https://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/Pages/disease.aspx?did=54

For our investigative guidelines, please see:

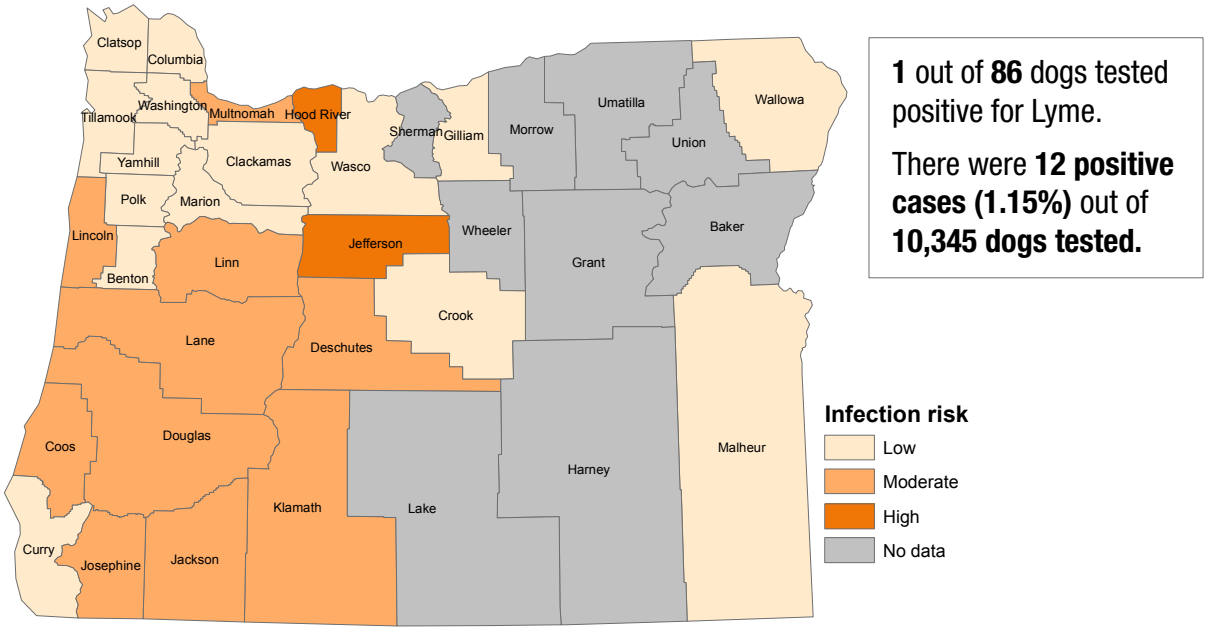
https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/ReportingGuidelines/Documents/lyme.pdf

Cases of Lyme disease in domestic animals

Dogs and cats can become infected with the Lyme disease bacterium when infected ticks bite them.

See map below for cases in Oregon dogs.

Figure 7. Incidence of Lyme disease in dogs, Oregon (6)



0.04% of all positive cases of Lyme in the United States are in Oregon.

For a comparison of Lyme disease in domestic animals between Oregon and other states, see www.capcvet.org/parasite-prevalence-maps/.

Sources

1. Centers for Disease Control and Prevention. Lyme disease [cited 2016 Aug 23]. Available from: www.cdc.gov/lyme/.
2. Centers for Disease Control and Prevention. Lyme disease data and statistics [cited 2016 Aug 23]. Available from: www.cdc.gov/lyme/stats/.
3. Oregon Health Authority Public Health Division. Lyme disease. State of Oregon Selected Reportable Communicable Disease 2014 [cited 2016 Aug 23]. Available from: https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/DiseaseSurveillanceData/AnnualReports/Documents/2014/2014-LymeDisease.pdf.
4. Doggett JS, Kohlhepp S, Gresbrink R, Metz P, Gleaves C, Gilbert D. Lyme disease in Oregon 2008 April [cited 2016 Aug 22]; 46; 2115–18. Available from: http://jcm.asm.org/content/46/6/2115.full.
5. Burkot TR, Clover JR, Happ CM, DeBess E, Maupin GO. Isolation of Borrelia burgdorferi from Neotoma fiscipes, Peromyscus maniculatus, Peromyscus boylii, and Ixopdes pacificus in Oregon 1999 [cited 2016 Aug 23]. The American Journal of Tropical Medicine and Hygiene 60(3), 453–57. Available from: www.ajtmh.org/content/60/3/453.full.pdf.
6. Companion Animal Parasite Council. State of Oregon Lyme disease parasite prevalence map [cited 2016 Aug 23]. Available from: www.capcvet.org/parasite-prevalence-maps/.

Oregon Health Authority
PUBLIC HEALTH DIVISION

Acute and Communicable Disease Prevention Section:
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