

## **Lyme Disease**

Agent: *Borrelia burgdorferi* (spirochete bacteria)

Mode of Transmission: Transmitted to humans through the bite of infected nymph or adult blacklegged ticks (formerly known as deer ticks). No other tick species plays a role in Lyme disease transmission in the eastern United States. Infected ticks must bite a person and remain attached for a minimum of 36 hours to be able to transmit the bacteria.

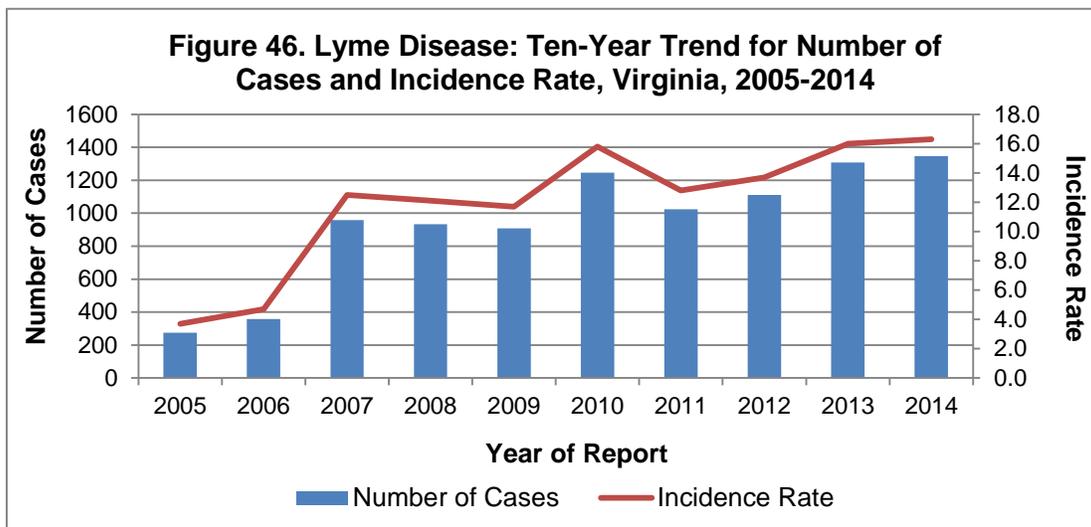
Signs/Symptoms: Initial symptoms include fever, headache, fatigue, joint pains, chills and a characteristic “bulls-eye” skin rash called erythema migrans, or EM rash. If untreated, infection can affect a person’s joints, heart or nervous system.

Prevention: Minimize tick bites by avoiding tick habitats such as humid forest environments with dense undergrowth or heavy forest leaf litter, as well as low vegetative ground cover along forest margins, tree lines, forest trails and forest clearings. Repellents containing DEET, Picaridin, BioUD, IR3535, or oil of lemon eucalyptus as active ingredients are effective against ticks and should be applied to exposed areas of skin before entering tick habitats. When in tick-prone habitats, light-colored clothing should be worn with pants legs tucked into socks, and permethrin-based repellants should be applied to clothing, socks and shoes. After visiting tick-prone habitats, a person should thoroughly check all body surfaces for ticks and, if found, attached ticks should be removed carefully as soon as possible. Pets should also be examined for ticks; pets can bring ticks into the home and are also susceptible to disease.

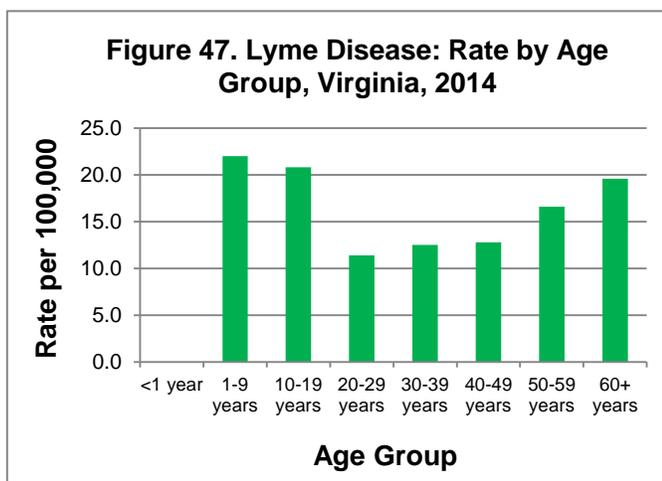
Other Important Information: Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and laboratory evidence of infection. The EM rash is the only physical manifestation/symptom that is distinctive enough to allow a diagnosis in the absence of laboratory testing. The EM rash causes little or no sensation, and may be missed or overlooked in up to 30% of persons with Lyme disease.

<b>Lyme Disease: 2014 Data Summary</b>	
Number of Cases:	1,346
5-Year Average Number of Cases:	1,118.6
% Change from 5-Year Average:	+20%
Incidence Rate per 100,000:	16.3

During 2014 in Virginia, 1,346 cases of Lyme disease were reported, which represented a 3% increase from the 1,307 cases reported in 2013, and a 20% increase from the five-year average of 1,118.6 cases per year (Figure 46). The dramatic increase in the number of reported Lyme disease cases since 2006 is attributable to an increase in Lyme disease occurrence, increased case follow-up by local health departments, and a change from voluntary to mandatory reporting of Lyme-positive findings by laboratories. The increase in incidence beginning in 2007 appears to be linked mainly to suburbanized areas around towns and cities. Suburbanization can enhance the environment for white-tailed deer, which are crucial for tick reproduction, and suburban forests appear to favor populations of white-footed mice, which play an important role in transmission of the Lyme disease agent to ticks. As land becomes suburbanized, deer hunting activities decrease and deer populations increase. Suburban developments may also bring the human population into more frequent contact with forested tick habitats.

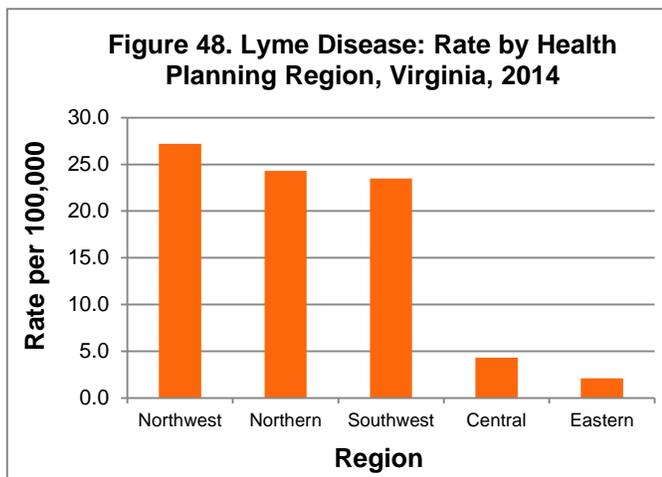


In 2014, there was a bimodal distribution of cases by age group, with the highest incidence rate in the 1-9 and 10-19 age groups (22.0 and 20.8 per 100,000, respectively), followed by the 60 year and older age group (19.6 per 100,000) (Figure 47). This bimodal age distribution for Lyme disease is typical of what has been observed in other Lyme-endemic regions of the United States.



Race was provided for 56% of cases. Among those with a known race, the white population had the highest incidence rate (11.7 cases per 100,000), followed by the “other” race population (5.5 per 100,000), and the black population (1.4 per 100,000). Racial differences may be related in part to differences in access to healthcare for diagnosis, variation in exposure to suburban and rural tick habitats, and potentially easier detection of the EM rash in individuals with lighter skin pigmentation. Incidence was higher in males than females (17.8 and 14.7 per 100,000, respectively).

Cases were reported from all regions of the state; however, the highest incidence rate occurred in the northwest region (27.2 per 100,000), followed by the northern region (24.3 per 100,000) and the southwest region (23.5 per 100,000) (Figure 48). Incidence rates in the eastern and central regions were much lower with the eastern region having the lowest



incidence of Lyme disease in Virginia. A comparison of incidence rates by locality can be viewed in the map below. Although Lyme disease cases were reported in every quarter during 2014, there was a seasonal pattern, with 76% of cases occurring in the warmer months of April through September. In 2014, the peak in occurrence was in June and is correlated with the period when the majority of nymph stage blacklegged ticks, the primary vectors of Lyme disease, are actively feeding.

## Lyme Disease Incidence Rate by Locality Virginia, 2014

