

## Lyme Disease

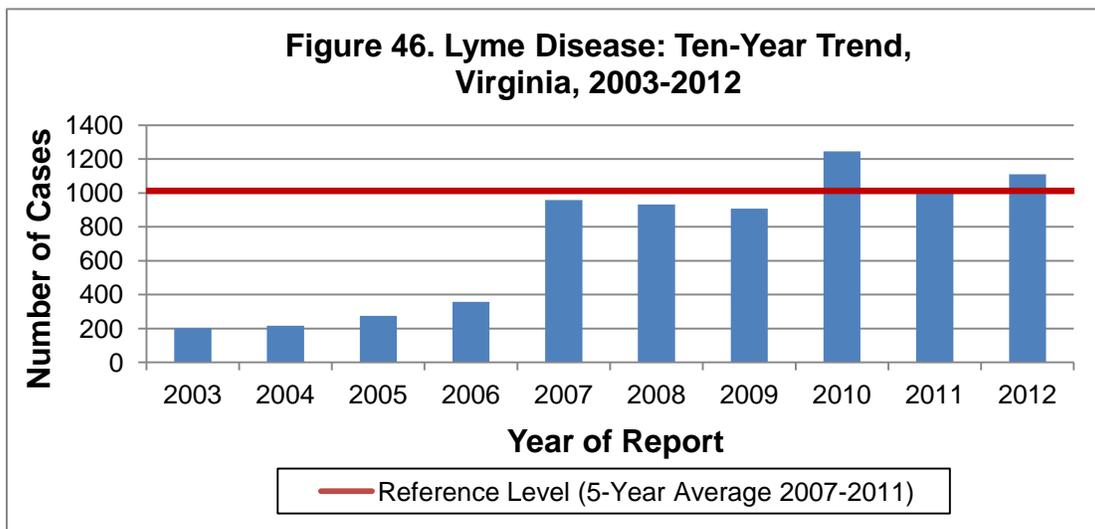
Agent: *Borrelia burgdorferi* (spirochete bacteria)

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 tall weeds and 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 carefully removed as soon as possible.

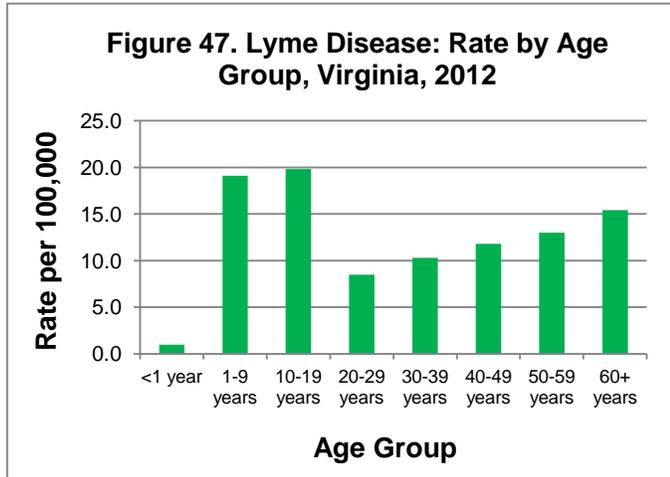
Other Important Information: Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and laboratory evidence of infection. The EM rash is the only physical manifestation that is distinctive enough to allow a definitive diagnosis in the absence of laboratory testing. The EM rash causes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



The 1,110 cases reported in 2012 are an 8% increase from the 1,023 cases reported in 2011, and a 9% increase from the five-year average of 1,013.6 cases per year (Figure 46). The dramatic increase in the number of reported Lyme disease cases since 2006 is attributable to an actual 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 has occurred primarily in places where new suburban developments have been established on land that was previously

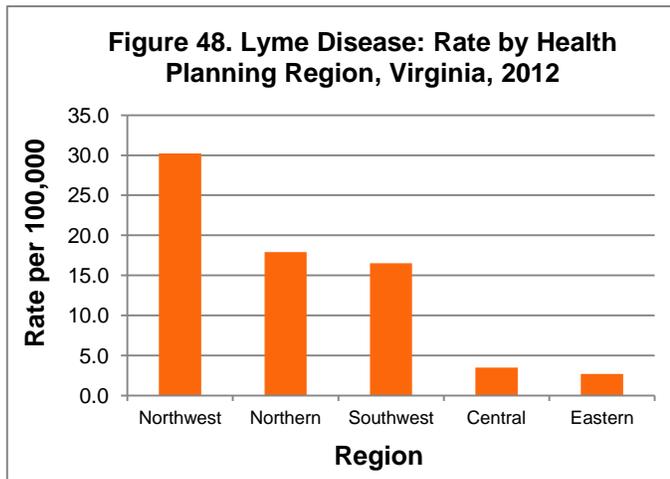
farmland or forest. Suburbanization can enhance the environment for white-tailed deer, which are crucial for tick reproduction, and for white-footed mice, which play an important role in transmission of the Lyme disease agent to ticks. Deer populations increase when deer hunting activities decrease, as forest and farm lands become suburbanized. Suburban development may also bring the human population into more frequent contact with tick habitats.

In 2012, there was a bimodal distribution of cases by age group, with the highest incidence in children in the 10-19 and 1-9 year age groups (19.8 and 19.1 per 100,000, respectively), followed by adults aged 60 years and older (15.4 per 100,000) (Figure 47). This bimodal age distribution for Lyme disease is typical of what is observed in other Lyme-endemic regions of the United States.



Among the 60% of cases for which race was recorded, the white population had the highest incidence (10.6 cases per 100,000), followed by the “other” race population (4.3 per 100,000), and the black population (1.5 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. The incidence rate was somewhat higher in males than in females (14.4 and 12.9 per 100,000, respectively).

Cases were reported from all regions of the state; however, the incidence of Lyme disease was highest in the northwest region (30.2 cases per 100,000), followed by the northern region (17.9 per 100,000) and the southwest region (16.5 per 100,000) (Figure 48). Rates in the remaining two regions were much lower and ranged from 2.7 to 3.5 per 100,000, with the eastern region typically having the lowest incidence rate in Virginia. Although Lyme disease cases were reported in every quarter



during 2012, there was a seasonal pattern, with 55% of cases occurring in the warmer months of May through August. In 2012, the peak in occurrence was in June and is correlated with the period when the majority of nymph stage black-legged ticks, the primary vectors of Lyme disease, are actively feeding.