

Lyme Disease

Agent: *Borrelia burgdorferi* (spirochete bacteria)

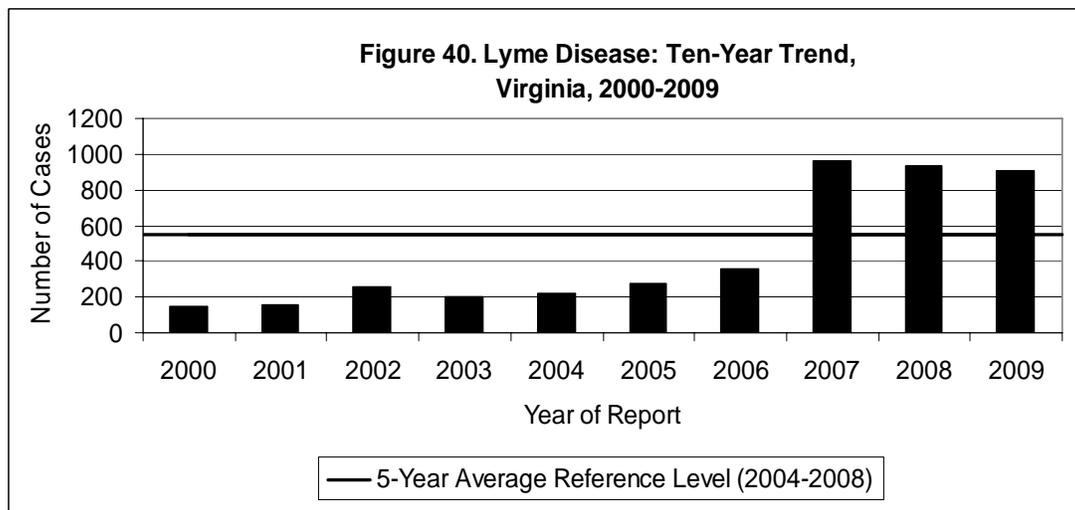
Mode of Transmission: Transmitted to humans through the bite of infected nymphal or adult blacklegged ticks (formerly known as deer ticks). No other tick species plays a role in Lyme disease transmission to people in the eastern U.S. Infected ticks must bite a human and remain attached while feeding 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 “bull’s-eye” skin rash called erythema migrans, or EM rash. If untreated, infection can affect a person’s joints, heart, and nervous system.

Prevention: Minimizing tick bites by avoiding likely tick habitats such as humid forest environments with dense undergrowth or heavy leaf litter, and tall weeds along forest margins, tree lines, forest trails and forest clearings. DEET, Picaridin, or Oil of Lemon Eucalyptus-based repellents 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 habitats, body surfaces and pets should be checked thoroughly for ticks and, if found, attached ticks should be removed as soon as possible.

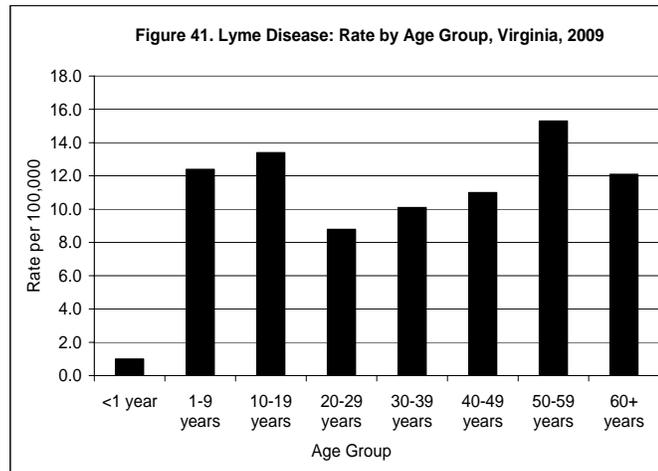
Other Important Information: Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and laboratory evidence of infection. The EM rash is the only physical manifestation that is distinctive enough to allow a definitive diagnosis without laboratory testing. The EM rash causes little or no sensation, and may be overlooked or absent in up to 30% of persons with Lyme disease.

The 908 cases reported in 2009 was similar to the number of cases reported in 2008 (933 cases) and in 2007 (959 cases), and represent a 65% increase from the five-year average of 547.8 cases per year (Figure 40). The dramatic increase in the number of reported cases of Lyme disease since 2007 is likely due to both an actual increase in Lyme disease occurrence and increased case follow-up by local health departments, aided by voluntary reporting of Lyme-positive findings by laboratories. The increase in disease incidence



since 2007 has occurred primarily in places where new suburban areas have formed on land that was previously farmland and forests. Suburbanization can enhance the environment for white-tailed deer which are crucial for tick reproduction and white-footed mice, which play an important role in transmission of the Lyme disease agent to ticks. Deer hunting activity declines substantially as forest and farm land becomes suburbanized, and suburban development brings the human population into more frequent contact with the tick vector's natural habitat.

In 2009, there was a bimodal distribution of cases by age group, with the highest incidence in adults aged 50 to 59 years (15.3 cases per 100,000) (Figure 41), followed by adolescents age 10-19 years (13.4 cases per 100,000). This bimodal age distribution for Lyme disease is typical of what is observed in Lyme-endemic regions of the United States.



Among the 40% of cases for which race was recorded, the white population had the highest incidence (6.1 cases per 100,000), followed by the “other” race population (1.1 per 100,000), and the black population (0.5 per 100,000). Racial differences may in part be related to differences in access to healthcare for diagnosis, varying exposure to suburban and rural tick habitats and possibly easier detection of the EM rash in individuals with lighter skin pigmentation. The incidence rate was higher in males than in females (12.5 and 10.7 per 100,000, respectively).

Cases were reported from all regions of the state; however, the incidence of Lyme disease was highest in the northern region (26.4 cases per 100,000) followed by the northwest region (17.5 per 100,000) (Figure 42). Rates in other regions ranged from 2.9 to 3.7 per 100,000. Although Lyme disease cases were reported in every quarter during 2009, there was a seasonal pattern, with the majority of cases (70%) reported from April to September and a peak in occurrence during June and July. The seasonality of Lyme disease is strongly correlated with the period when the nymphal stage black-legged ticks, which serve as the primary vectors of Lyme disease, are actively feeding. This period occurs from April through mid-July.

