

Spotted Fever Rickettsiosis, including Rocky Mountain Spotted Fever

Agent: Tick-borne species of *Rickettsia* (bacteria). Spotted fever rickettsiosis includes a number of different diseases, including Rocky Mountain spotted fever (RMSF), caused by *Rickettsia rickettsii*, and Tidewater spotted fever, caused by *Rickettsia parkeri*.

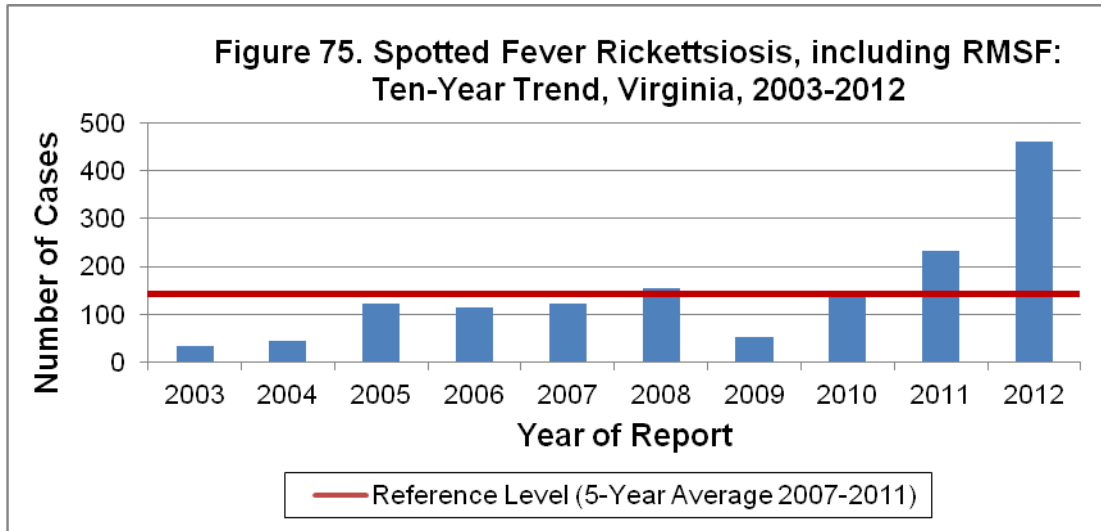
Mode of Transmission: Transmitted to humans by the bite of an infected tick. Ticks must be attached for at least 10 to 20 hours to transmit the bacterium.

Signs/Symptoms: Persons with spotted fever rickettsiosis may have a sudden onset of fever, severe headache, muscle pain, nausea and vomiting. Three to five days after onset of illness, a rash may develop that starts on the wrists and ankles, and spreads to the rest of the body. The rash is seen in about 80% of cases.

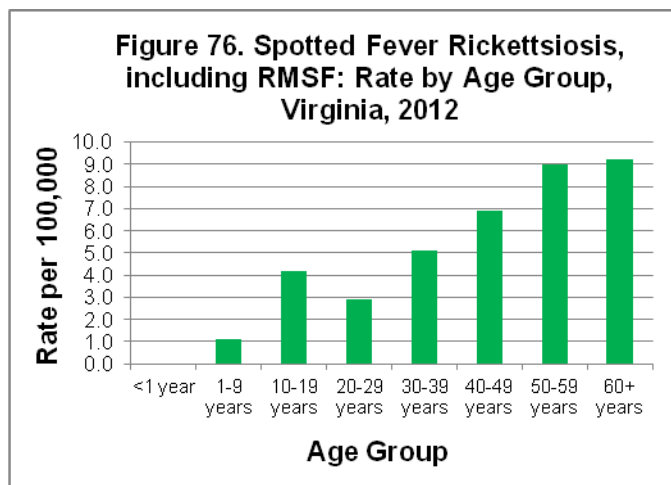
Prevention: Tick bites can be minimized by avoiding likely tick-prone habitats such as open fields with tall brush and weeds, old fields with early succession forest growth, or brushy vegetation along trails. Repellents containing DEET, Picaridin, BioUD, IR3535, or oil of lemon eucalyptus as active ingredients 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 shirts tucked into pants. Permethrin-based repellants should be applied to clothing, socks and shoes. After visiting tick habitats, a person should thoroughly check all body surfaces for ticks and, if found, attached ticks should be removed as soon as possible.

Other Important Information: Although the severity of infections attributable to spotted fever rickettsiosis varies greatly depending on the causative agent, all suspect patients should be treated as if they have RMSF. RMSF can be serious, particularly in untreated patients and patients treated late in the course of illness. About one-third of all untreated cases are fatal and up to 3% of patients die because treatment was provided too late in the course of illness. If tick exposure is noted or RMSF is suspected, treatment should be started based on suspicion of infection and not delayed pending the outcome of diagnostic tests. Case-fatality rates have declined in recent years to <1% of reported cases. One possible explanation is prompt disease recognition and increased availability and appropriate use of effective antibiotics. Another explanation is the increasing prevalence of other spotted fever group *Rickettsiae* (SFGR) species in Virginia's ticks. These other SFGR species may not cause illness in people, or may cause only a mild illness, but exposure to other SFGR causes cross-reactive positive results on blood tests for RMSF. Therefore, it is possible that some reported RMSF cases in recent years are actually due to non-pathogenic or mildly pathogenic SFGR, and/or to Rickettsial illnesses such as ehrlichiosis which cause symptoms similar to those of RMSF. Lone star ticks are the most common cause of tick bites in Virginia. Tick surveys have shown that the majority of lone star ticks in Virginia carry a non-pathogenic SFGR and do not carry RMSF.

In 2012, 461 cases of spotted fever rickettsiosis were reported in Virginia. This represents nearly a two-fold increase from the 231 cases reported in 2011, and is more than three times the five-year average of 141.4 cases per year (Figure 75).



In 2012, spotted fever rickettsiosis incidence rates increased with age from no cases in the less than one year age group to a rate of 9.2 cases per 100,000 in the 60 year and older age group. The exception to this pattern was a higher incidence rate in the 10-19 year age group than in the 20-29 year age group (Figure 76). Although older national studies showed a higher incidence for RMSF in children under age 10, more recent national data indicate a shift in the age distribution, with the highest rates among adults aged older than 40 years. This is consistent with what has been observed in Virginia since 2010.



Information on race was missing for 64% of reported cases. Among cases for which race information was reported, the rate for the white population (2.4 cases per 100,000) was more than twice the rate in the black population (0.9 cases per 100,000). The lowest rate was seen in the “other” race population (0.4 per 100,000). Incidence among males was almost twice the rate among females (7.4 and 4.0 per 100,000, respectively).

The central, southwest and northwest regions had the highest incidence rates in 2012 (11.1, 8.9 and 7.8 cases per 100,000, respectively). Rates in the eastern and northern regions were substantially lower (1.6 and 2.9 per 100,000, respectively). The northwest and central regions have had high rates since 2009, but the rate in the southwest region increased during 2012.

Spotted fever rickettsiosis displays a distinctly seasonal pattern. For 88% of cases, symptom onset occurred from May through August, with a peak in June (Figure 77). This is consistent with the peak activity periods for the most common human-biting tick species in Virginia. No deaths attributed to spotted fever rickettsiosis occurred among the 461 cases reported in 2012.

