

## **Spotted Fever Rickettsiosis, including Rocky Mountain Spotted Fever**

**Agent:** Tick-borne species of *Rickettsia* (bacteria). Spotted fever rickettsiosis may be caused by several different tick-borne disease agents, including *Rickettsia rickettsii*, the cause of Rocky Mountain spotted fever (RMSF), and *Rickettsia parkeri*, the cause of *Tidewater* spotted fever. Cases may also be caused by exposure to other tick-borne species of *Rickettsia*.

**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.

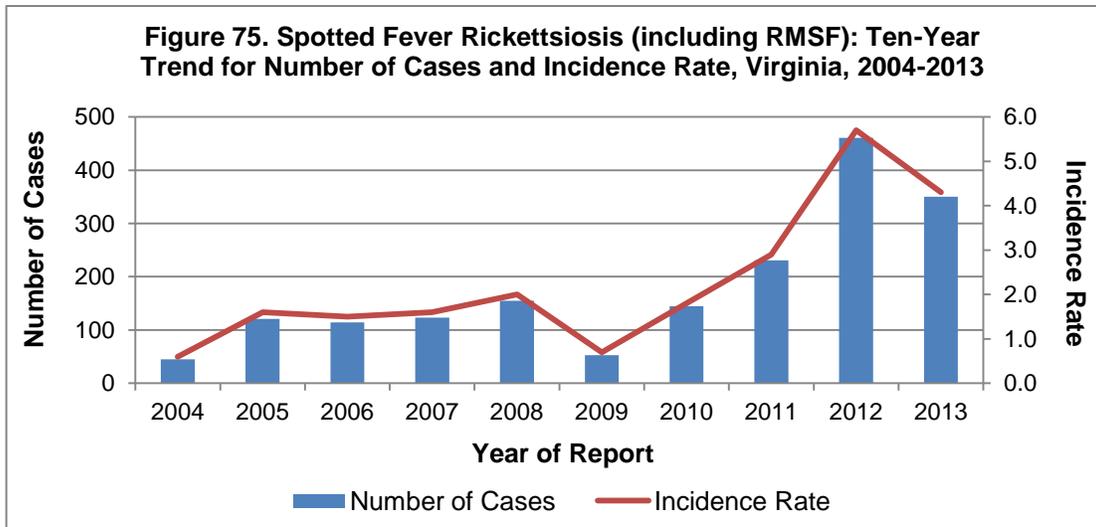
**Signs/Symptoms:** Persons with spotted fever rickettsiosis may have a sudden onset of fever, severe headache, muscle pain, nausea and vomiting and a rash. In the case of RMSF, a rash may develop three to five days after onset of illness. This rash starts on the wrists and ankles, and spreads to the rest of the body, and is seen in about 90% of RMSF 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 and in forests. 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.

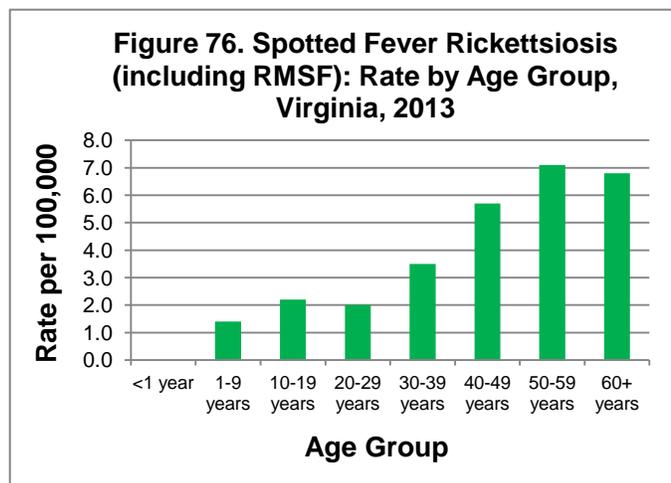
**Other Important Information:** Although the severity of infections attributable to spotted fever rickettsiosis varies greatly depending on the causative agent, all suspect patients should be treated as if they have RMSF. RMSF can be a serious illness, particularly in untreated patients and patients treated late in the course of illness. About one-third of all untreated RMSF 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. While case numbers have increased substantially in recent years, case-fatality rates have declined to less than 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 many reported RMSF cases in recent years are actually due to exposure to non-pathogenic or mildly pathogenic SFGR, and/or to other 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, and tick surveys have shown that the majority of lone star ticks in Virginia carry a non-pathogenic SFGR, as well as several agents of ehrlichiosis, but do not carry RMSF.

<b>Spotted Fever Rickettsiosis: 2013 Data Summary</b>	
Number of Cases:	350
5-Year Average Number of Cases:	209.0
% Change from 5-Year Average:	+67%
Incidence Rate per 100,000:	4.3

In 2013, 350 cases of spotted fever rickettsiosis were reported in Virginia. This represents a 24% decrease from the 461 cases reported in 2012, but is 67% higher than the five-year average of 209.0 cases per year (Figure 75).



In 2013, spotted fever rickettsiosis incidence rates generally increased with age from no cases in the less than 1 year age group to a rate of 7.1 cases per 100,000 in the 50-59 year age group and 6.8 per 100,000 in the 60 year and older 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 being among adults aged older than 40 years. This is the general pattern observed in Virginia since 2004, and is consistent with the age distribution of Rickettsial diseases other than RMSF, such as ehrlichiosis or anaplasmosis.

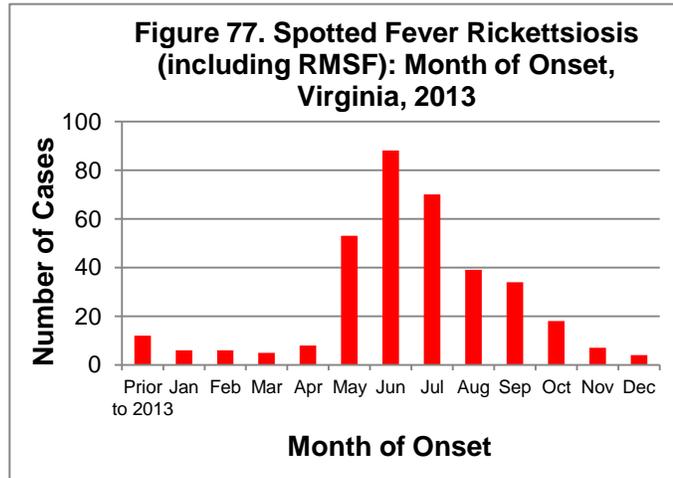


Information on race was missing for 59% of reported cases. Among cases for which race information was reported, the rate for the white population (2.1 cases per 100,000) was more than twice the rate in the black population (1.0 cases per 100,000). The lowest rate was seen in the “other” race population (0.2 per 100,000). The incidence rate among males was higher than the rate among females (5.4 and 3.1 per 100,000, respectively).

The southwest region had the highest incidence rate at 7.6 per 100,000. This was followed by the northwest and central regions at 6.7 and 6.4 cases per 100,000, respectively. Rates in the eastern and northern regions were substantially lower (2.0 and 1.6 per 100,000, respectively).

The northwest and central regions have had high rates since 2009, but the rate in the southwest region increased substantially during 2012 and remained high in 2013. Rates by locality can be viewed in the map below.

Spotted fever rickettsiosis displays a distinctly seasonal pattern. For 84% 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 350 cases reported in 2013.



## Spotted Fever Rickettsiosis, including RMSF Incidence Rate by Locality, Virginia, 2013

