NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Spotted Fever Group Rickettsiosis Surveillance Summary from 2012—2017

Background

Spotted fever group rickettsioses (SFGR), including Rocky Mountain spotted fever, are a group of bacterial infections caused by *Rickettsia spp.* including *R. rickettsia* and *R. parkeri*. Spotted fevers are transmitted to humans through the bite of an infected tick. In North Carolina the most common vectors of spotted fevers include the American dog tick, *Dermacentor variabilis,* the Rocky Mountain wood tick, *D. andersoni*, and the Lone star tick, *Amblyomma americanum*. The brown dog tick, *Rhipicephalus sanguineus* has been implicated in transmission in other parts of the US. If left untreated, illness can become serious, even leading to death.

Symptomology

Early signs of SFGR are non-specific, including fever and headache. Symptoms may appear 3 –12 days following a tick bite. Other signs and symptoms can include nausea, vomiting, stomach pain, muscle pain, lack of appetite, and rash. Rash is a common sign among those infected with *R. rickettsii*, the causative agent of Rocky Mountain spotted fever (RMSF), and usually develops 2-4 days following fever onset. Rashes can look like red splotches or pinpoint dots. While almost all patients with RMSF will develop a rash, it is not always visible depending on the skin tone of the patient.

Epidemiology

National

Incidence varies considerably by geographic area. Between 2008-2012, 63% of reported SFGR cases originated from five states: Arkansas, Missouri, North Carolina, Oklahoma, and Tennessee. Thousands of cases of SFGR occur every year, but it is unknown how any cases are RMSF. Case fatality rates vary annually, but have decreased overall from a 28% in 1944 to < 1% in 2001. The national average incidence of SFGR in 2015 was 1.31 cases per 100,000.*

North Carolina

The number of confirmed and probable cases of spotted fever rickettsiosis has remained stable in North Carolina over the past five years. The highest incidence of SFGR is clustered around central and eastern North Carolina. The 5 -year average incidence rate of SFGR in North Carolina between 2012-2016 is 4.95 confirmed and probable cases per 100,000 residents, which is higher than the national average.

Diagnosis

Delay in diagnosis and treatment is the most important factor associated with poor outcomes, and early treatment based on clinical impression is the best way to prevent RMSF progression. Signs and symptoms of SFGR are similar to those of many other diseases. Both acute and convalescent serum specimens are needed to confirm the rickettsial infection. Serological tests are often negative during the acute phase of illness, however, physicians may diagnose patients based on the symptoms outlined above.

Prevention

Reducing exposure to ticks is the best defense against SFGR. There are a number of methods that can be used to prevent tickborne illness:

- Wear permethrin treated clothing (0.5%) when exploring the outdoors.
- Use Environmental Protection Agency (EPA) registered insect repellents containing DEET or picaridin to deter ticks.
- Avoid ticks in wooded/brushy areas with high grasses and leaf litter by walking in the center of trails.
- Check clothing for ticks you may have encountered while outdoors; shower soon after returning indoors.

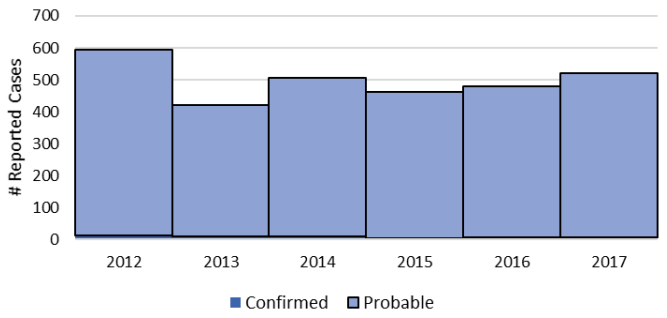
Case Demographics

Sex	5 Year Avg (2012-16)		2017	
	No. of Cases	*% of total*	No. of Cases	*% of total*
Male	*341*	*69%*	*362*	*69%*
Female	152	*31%*	159	*31%*

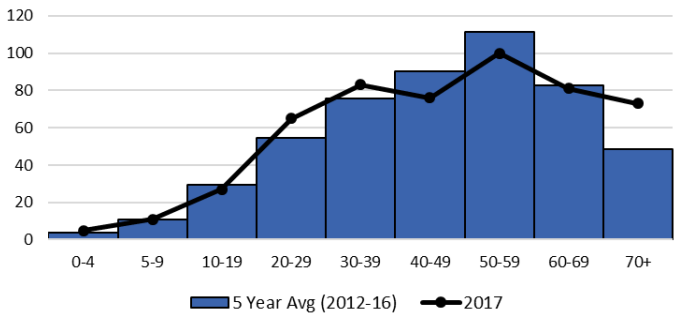
Race	5 Year Avg (2012-16)		2017	
	No. of Cases	*% of total*	No. of Cases	*% of total*
White	287	59%	288	55%
Black or African American	34	7%	30	6%
Native Hawaiian or Pac. Islander	1	< 1%	0	0%
Amer. Indian or Alaskan	1	< 1%	2	< 1%
Asian	1	< 1%	2	< 1%
Other	4	2%	4	1%
Unknown	159	33%	195	37%

Hispanic Ethnicity	5 Year Avg (2012-16)		2017	
	No. of Cases	*% of total*	No. of Cases	*% of total*
Yes	10	2%	7	1%
No	245	55%	283	58%
Unknown	190	43%	198	41%

Confirmed and Probable Spotted Fever Group Rickettsiosis by Year, NC, 2017; n= 2984

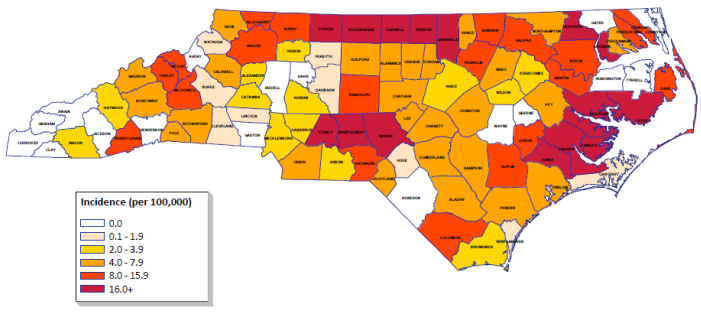


Confirmed and Probable Spotted Fever Group Rickettsiosis by Age Range, NC



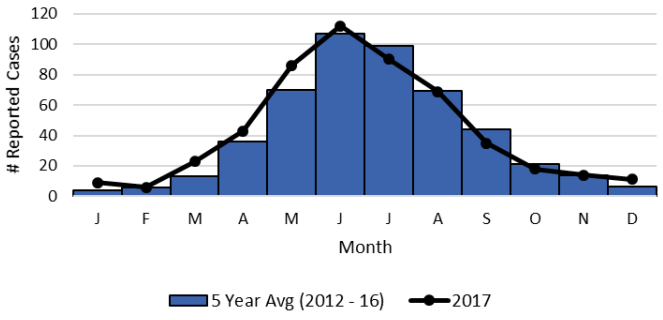
Geographic Distribution

Confirmed and Probable Incidence of Spotted Fever Group Rickettsiosis Cases by County of Residence, NC, 2017



Cases by Age

Confirmed and Probable Spotted Fever Group Rickettsiosis cases by Month of Illness Onset, NC



*These data are based on a national surveillance data found at: https://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s_cid=mm6453a1_w

View NC Disease Statistics here: https://public.tableau.com/profile/nc.cdb#!/vizhome/NorthCarolinaDiseaseStatistics/DiseaseMapsandTrends