

NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

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Ehrlichiosis Surveillance from 2013—2018

Background

Ehrlichiosis is a general name to describe several bacterial infections caused by *Ehrlichia spp.* including *E. chaffeensis* and *E. ewingii*. Ehrlichiae are transmitted to humans through the bite of an infected tick. In North Carolina, the most common vector of ehrlichiosis is the lone star tick, *Amblyomma americanum*. Like other tickborne illnesses, Ehrlichiosis can be prevented; it is a serious illness that can be fatal if not promptly treated.

Symptomology

Symptoms of ehrlichiosis typically appear within 1-2 weeks following a tick bite. While there are a number of symptoms, the combination of symptoms can vary from person to person. Symptoms may include fever, headache, fatigue, chills, malaise, muscle aches, nausea, vomiting, diarrhea, confusion, conjunctivitis (red eyes), and a rash. Rashes can be present in up to 60% of children and less than 30% of adults.

Epidemiology

National

Incidence varies considerably by geographic area. Ehrlichiosis is most frequently reported in the southeastern and south-central US. In 2017, four states accounted for 50% of all reported cases of Ehrlichiosis: Missouri, Arkansas, New York, and Virginia.¹ Although the number of reported ehrlichiosis cases has increased since it was added to the National Notifiable Conditions list in 1998 the case fatality rate continues to hover around 1% annually. The national average incidence of ehrlichiosis in 2015 was 0.42 cases per 100,000.²

North Carolina

The number of confirmed and probable cases of ehrlichiosis has varied over the past five years, with numbers similar to those of 2014 in 2017. The highest incidence of ehrlichiosis typically occurs during the months of June and July. The 5-year average incidence rate of ehrlichiosis in North Carolina between 2013-2017 is 0.62 confirmed and probable cases per 100,000 residents, which is marginally higher than the national average.

Diagnosis

Diagnosis of ehrlichiosis is often difficult because symptoms vary from patient to patient and are non-specific, making it difficult to distinguish from other illnesses. Serological and Polymerase Chain Reaction (PCR) tests can be used to confirm clinical diagnosis. However, serological tests are often negative during the acute phase of illness; healthcare providers should use their judgement, and can treat patients empirically based on the symptoms above.

Prevention

Reducing exposure to ticks is the best defense against ehrlichiosis. 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 contact with ticks by avoiding wooded and brushy areas with high grasses and leaf litter and walking in the center of trails.
- Check your clothing for ticks that may have climbed on you while outdoors, and shower soon after being outdoors.

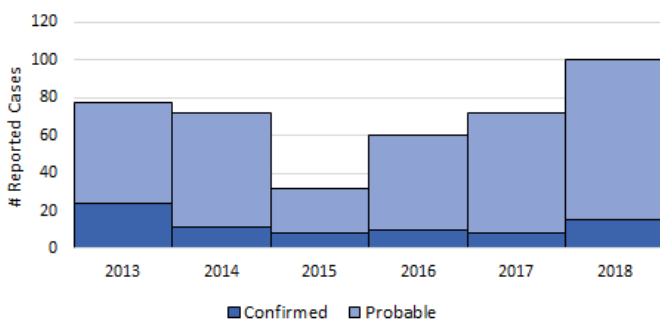
Case Demographics (Confirmed and Probable)

| Gender | 5 Year Avg (2013-17) | | 2018 | |
|--------|----------------------|------------|--------------|------------|
| | No. of Cases | % of total | No. of Cases | % of total |
| Male | 52 | 66% | 54 | 54% |
| Female | 27 | 34% | 46 | 46% |

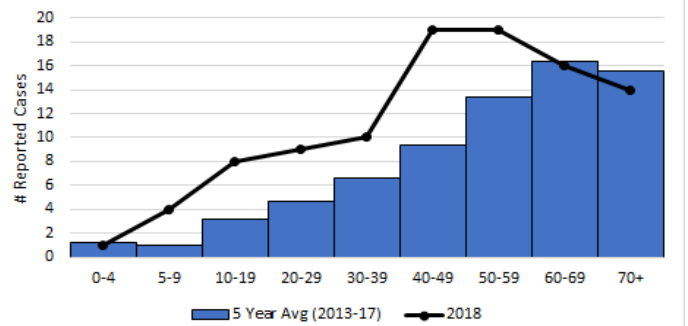
| Race | 5 Year Avg (2013-17) | | 2018 | |
|----------------------------------|----------------------|------------|--------------|------------|
| | No. of Cases | % of total | No. of Cases | % of total |
| White | 42 | 58% | 68 | 68% |
| Black or African American | 10 | 14% | 14 | 14% |
| Native Hawaiian or Pac. Islander | 0 | 0% | 0 | 0% |
| Amer. Indian or Alaskan | <1 | < 1% | 0 | 0% |
| Asian | <1 | < 1% | 1 | 1% |
| Other | 1 | 1% | 2 | 2% |
| Unknown | 18 | 25% | 15 | 15% |

| Hispanic Ethnicity | 5 Year Avg (2013-17) | | 2018 | |
|--------------------|----------------------|------------|--------------|------------|
| | No. of Cases | % of total | No. of Cases | % of total |
| Yes | 2 | 3% | 3 | 3% |
| No | 35 | 49% | 69 | 69% |
| Unknown | 34 | 47% | 28 | 28% |

Confirmed and Probable Cases of Ehrlichiosis by Year, NC, 2013-2018; n=413

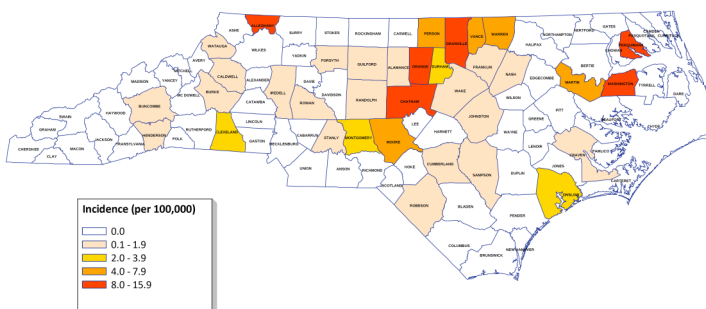


Confirmed and Probable Ehrlichiosis Cases by Age Range, NC



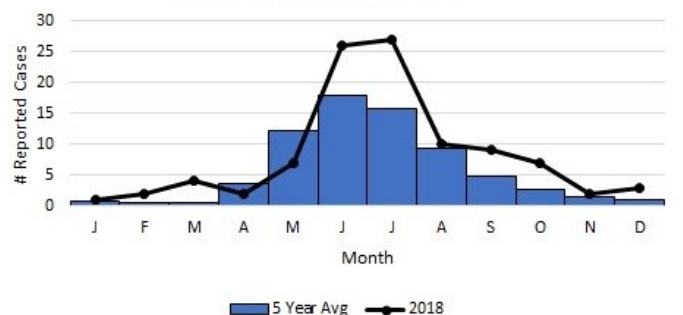
Geographic Distribution

Confirmed and Probable Incidence of Ehrlichiosis Cases by County of Residence, NC, 2018



Cases by Age

Confirmed and Probable Ehrlichiosis Cases by Month of Illness Onset, NC



¹Data are based on a national surveillance data found at: <https://www.cdc.gov/ehrlichiosis/stats/index.html>

²Data are based on a national surveillance data found at: https://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s_cid=mm6453a1_w

³View NC Disease Statistics here: <https://public.tableau.com/profile/nc.cdb#1/vizhome/NorthCarolinaDiseaseStatistics/DiseaseMapsandTrends>