NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Ehrlichiosis Surveillance from 2017—2022

Background

Ehrlichiosis is a general name to describe several bacterial infections caused by *Ehrlichia spp.* including *E. chaffeensis*, *E. ewingii,* or *E. muris eauclairensis*. 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 2019, four states accounted for 50% of all reported cases of Ehrlichiosis: Missouri, Arkansas, North Carolina, and New York.[1] 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 of confirmed and probable cases in 2019 was 0.65 cases per 100,000.[2]

North Carolina

The number of reported confirmed and probable cases of ehrlichiosis has gradually increased between 2017 and 2022. The highest incidence of ehrlichiosis typically occurs during the months of June to August. The 5-year average incidence rate of ehrlichiosis in North Carolina between 2017—2021 was 1.09 confirmed and probable cases per 100,000 residents, which is higher than the national average. The incidence rate of ehrlichiosis in North Carolina in 2022 was 0.81 cases per 100,000 (based on 2021 population data).

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 to 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:

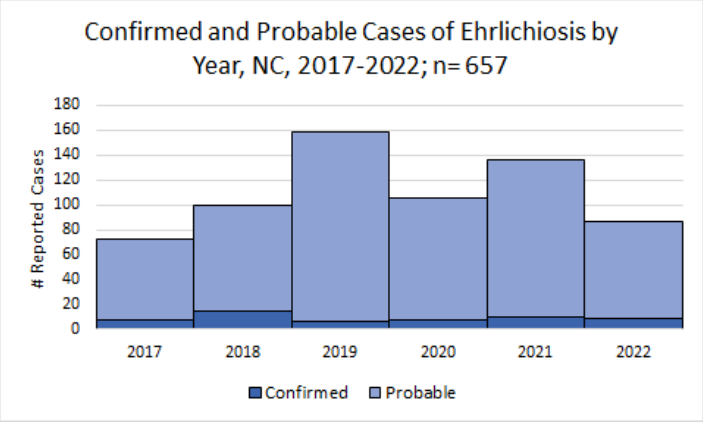
- Wear permethrin treated clothing (0.5%) when exploring the outdoors.
- Use Environmental Protection Agency (EPA) registered insect repellents containing DEET or picaridin to deter ticks.
- Avoid contact with ticks by avoiding wooded and brushy areas with high grasses and leaf litter and walking in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

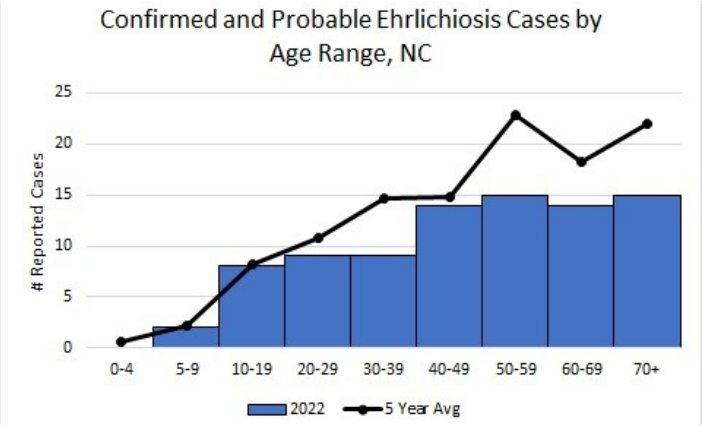
Case Demographics (Confirmed & Probable)

Sex	5 Year Avg (2017-21)		2022	
	No. of Cases	*% of total*	No. of Cases	*% of total*
Male	*61*	*53.2%*	*45*	*52.3%*
Female	53	*46.8%*	41	*47.7%*

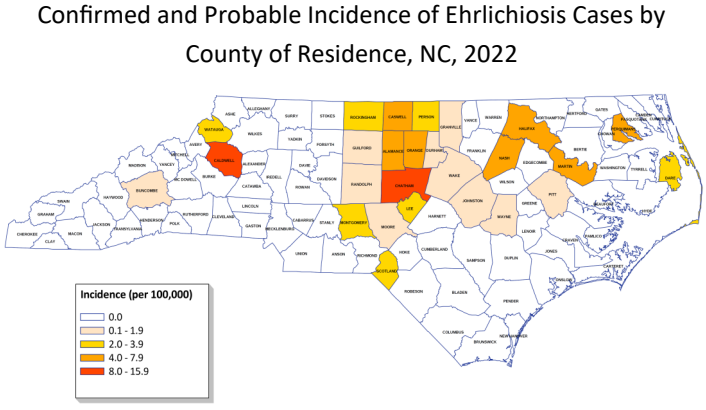
Race	5 Year Avg (2017-21)		2022	
	No. of Cases	*% of total*	No. of Cases	*% of total*
White	77	67.4%	71	82.6%
Black or African Amer.	12.4	10.9%	7	8.1%
Asian or Pac. Islander	2.2	1.9%	2	2.3%
Amer. Indian or Alaskan	0	0.0%	2	2.3%
Other	<1	0.0%	2	2.3%
Unknown	18	15.8%	2	2.3%
Unknown	19.2	17.7%	10.3	10.3%

Hispanic Ethnicity	5 Year Avg (2017-21)		2022	
	No. of Cases	*% of total*	No. of Cases	*% of total*
Yes	5	4.4%	2	2.3%
No	83	72.5%	77	89.5%
Unknown	26	23.1%	7	8.1%

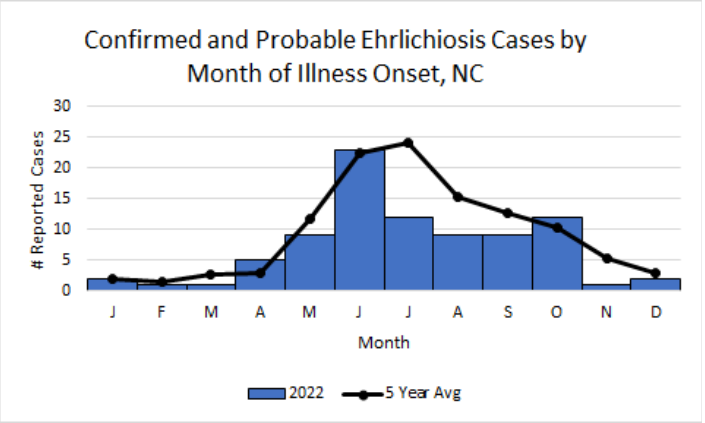




Geographic Distribution



Cases by Age



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

[2]Data are based on a national surveillance data found at: https://wonder.cdc.gov/nndss/static/2019/annual/2019-table2f.html