

## NC DEPARTMENT OF **HEALTH AND HUMAN SERVICES**

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Developed by the North Carolina Division of Public Health, Communicable Disease Branch

### ***Ehrlichiosis Surveillance from 2018—2023***

#### **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. From 2017—2021, five states accounted for nearly half of all reported cases of ehrlichiosis: Missouri, Arkansas, North Carolina, New York, and Tennessee.<sup>1</sup> 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 2020 was 0.36 cases per 100,000.<sup>2</sup>

##### North Carolina

The number of reported confirmed and probable cases of ehrlichiosis has fluctuated between 2018 and 2023. 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 2018—2022 was 1.11 confirmed and probable cases per 100,000 residents, which is higher than the national average. The incidence rate of ehrlichiosis in North Carolina in 2023 was 1.42 cases per 100,000 (based on 2023 population data), nearly four times 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 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:

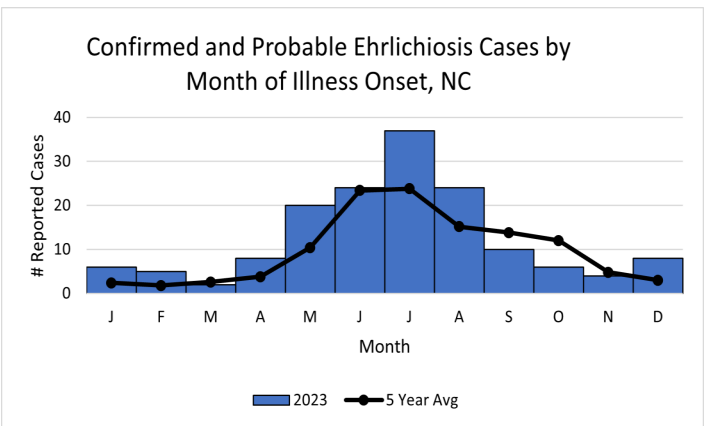
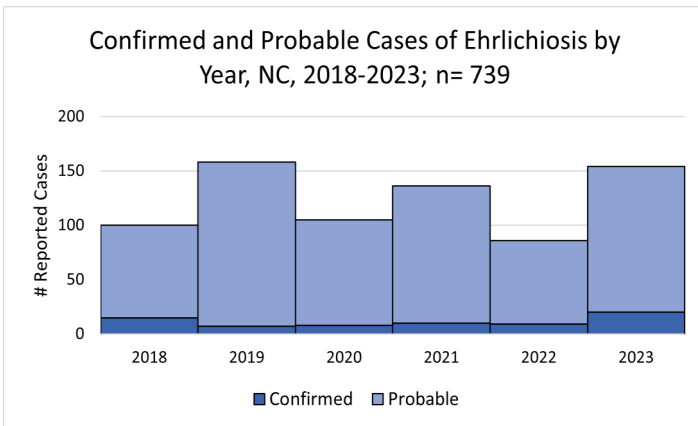
- Wear permethrin treated clothing (0.5%) when exploring the outdoors.
- Use Environmental Protection Agency (EPA) registered insect repellents containing DEET or picaridin to deter ticks.
- Avoid contact with ticks by avoiding wooded and brushy areas with high grasses and leaf litter and walking in 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)

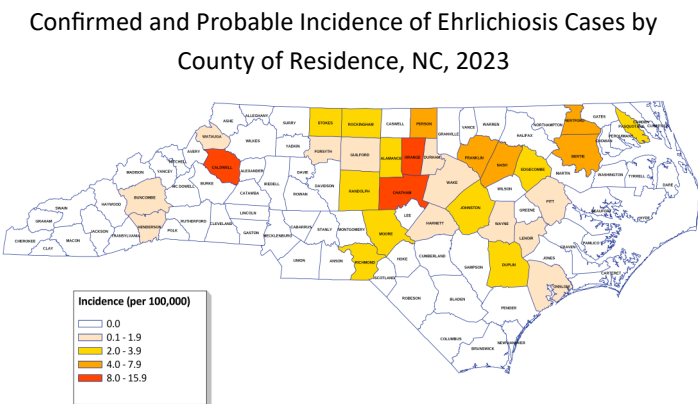
Sex	5 Year Avg (2018-22)		2023	
	No. of Cases	% of total	No. of Cases	% of total
Male	61	52.5%	89	57.8%
Female	56	47.5%	65	42.2%

Race	5 Year Avg (2018-22)		2023	
	No. of Cases	% of total	No. of Cases	% of total
White	84	71.8%	118	76.6%
Black or African Amer.	12.2	10.4%	15	9.7%
Asian or Pac. Islander	2.4	2.1%	0	0.0%
Amer. Indian or Alaskan	<1	<1%	0	0.0%
Other	<1	<1%	8	5.2%
Unknown	13.4	11.5%	7	4.5%

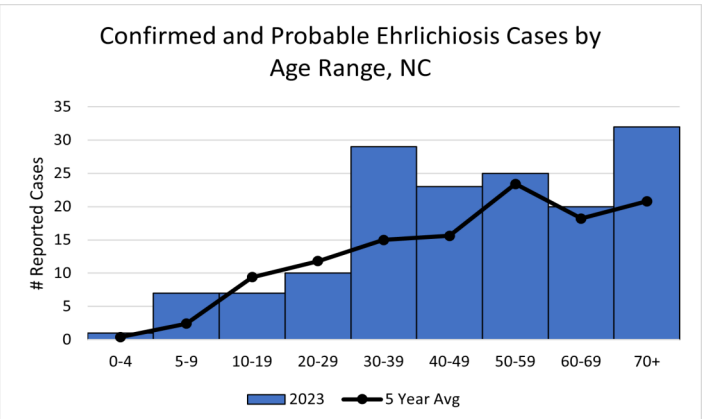
Hispanic Ethnicity	5 Year Avg (2018-22)		2023	
	No. of Cases	% of total	No. of Cases	% of total
Yes	5	3.9%	8	5.2%
No	91	77.8%	130	84.4%
Unknown	21	18.3%	16	10.4%



### Geographic Distribution



### Cases by Age



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

<sup>2</sup>Data are based on a national surveillance data found at: <https://wonder.cdc.gov/nndss/static/2020/annual/2020-table2f.html>