

## 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 2014—2019***

#### **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 fewer 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 2018, four states accounted for 50% of all reported cases of Ehrlichiosis: Missouri, Arkansas, New York, and Virginia.<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 in 2015 was 0.42 cases per 100,000.<sup>2</sup>

##### North Carolina

The number of reported confirmed and probable cases of ehrlichiosis has gradually increased from 2015 to 2019. 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 from 2014-2018 was 0.66 confirmed and probable cases per 100,000 residents, which is marginally higher than the national average. The incidence rate of ehrlichiosis in North Carolina in 2019 was 1.52 cases per 100,000 (based on 2018 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, 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:

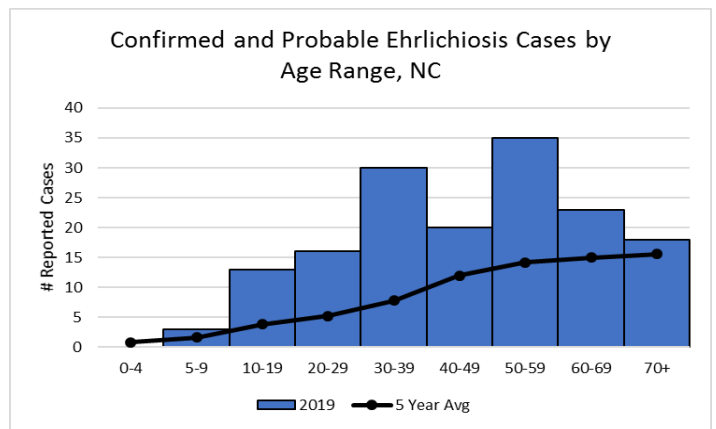
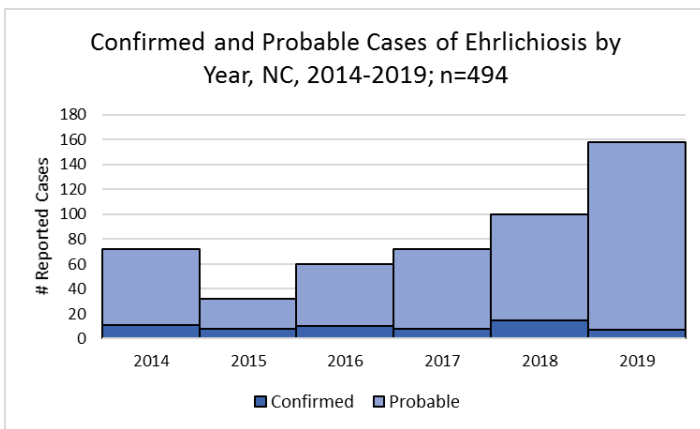
- Wear permethrin treated clothing (0.5%) when exploring the outdoors.
- Use Environmental Protection Agency (EPA) registered insect repellents containing DEET or picaridin to deter ticks.
- Avoid contact with ticks by avoiding wooded and brushy areas with high grasses and leaf litter; instead, walk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

Gender	5 Year Avg (2014-18)		2019	
	No. of Cases	% of total	No. of Cases	% of total
Male	55	66%	87	55%
Female	29	34%	71	45%

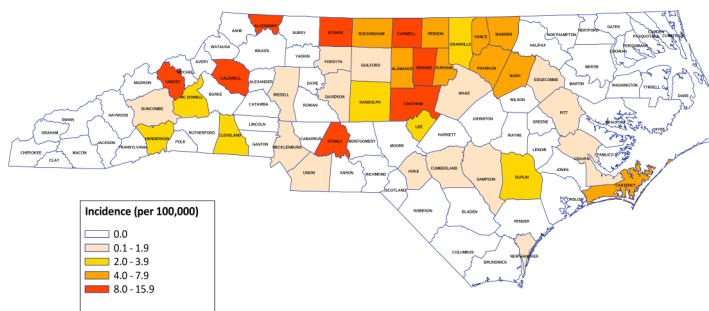
Race	5 Year Avg (2014-18)		2019	
	No. of Cases	% of total	No. of Cases	% of total
White	45	59%	68	43%
Black or African American	11	15%	14	9%
Native Hawaiian or Pac. Islander	0	0%	0	0%
Amer. Indian or Alaskan	<1	< 1%	0	0%
Asian	<1	1%	1	<1%
Other	1	2%	2	1%
Unknown	19	23%	73	46%

Hispanic Ethnicity	5 Year Avg (2014-18)		2019	
	No. of Cases	% of total	No. of Cases	% of total
Yes	2	3%	10	6%
No	42	56%	113	72%
Unknown	31	41%	35	22%



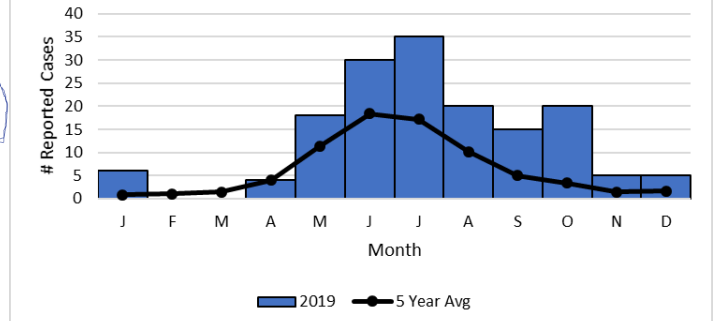
### Geographic Distribution

Confirmed and Probable Incidence of Ehrlichiosis Cases by County of Residence, NC, 2019



### Cases by Age

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



<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://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s\\_cid=mm6453a1\\_w](https://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s_cid=mm6453a1_w)

<sup>3</sup>View NC Disease Statistics here: <https://public.tableau.com/profile/nc.cdb#1/vizhome/NCD3NorthCarolinaDiseaseDataDashboard/DiseaseMapsandTrends>