

## NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

ROY COOPER • Governor  
MANDY COHEN, MD, MPH • Secretary  
MARK T. BENTON • Assistant Secretary for Public Health  
Division of Public Health

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

### ***Lyme Disease Surveillance Summary from 2014—2019***

#### **Background**

Lyme disease is a bacterial infection caused by *Borrelia burgdorferi*, and is transmitted to humans and animals through the bite of infected *Ixodes scapularis* (blacklegged) ticks. Symptoms of Lyme disease include fever, headache, fatigue, and a characteristic bull's-eye rash called erythema migrans (EM). If left untreated, infection can spread to the joints, heart, and nervous system. Diagnosis is based on the presence of symptoms, clinical findings (like an EM rash), exposure to ticks, and serological testing. Most cases of Lyme disease are effectively treated with antibiotics. The best way to mitigate Lyme disease is prevention.

#### **Symptomology**

Early signs of Lyme disease include fever, chills, headache, fatigue, muscle and joint aches, swollen lymph nodes, and EM rash. It is important to note that an EM rash only occurs in 70-80% of patients, and can take up to 30 days to appear. Untreated Lyme disease can cause a variety of symptoms including severe headaches and neck stiffness, additional EM rashes, arthritis with severe joint pain and swelling, particularly in the knees and other large joints, facial palsy and heart conditions associated with Lyme carditis.

#### **Epidemiology**

##### National

Reported cases of Lyme disease are centered in the Northeast and upper Midwest of the United States, with 96% of cases reported from 14 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and Wisconsin. The average incidence rate of Lyme disease between 2013-2016 was 8.1 cases per 100,000 residents, with incidence rates of the highest states reaching >50 cases per 100,000.\* The national incidence rate in 2018 was 7.2 cases per 100,000 residents.

##### North Carolina

In North Carolina, the reported number of confirmed and probable cases of Lyme disease has increased over the past five years. The highest incidence of Lyme disease in 2019 is clustered to the northwestern portion of the state, particularly in Ashe, Alleghany, Surry, Stokes, Watauga, and Yancey counties.\*\* The 5-year average incidence rate of Lyme disease in North Carolina from 2014-2018 was 2.41 confirmed and probable cases per 100,000 residents. The incidence of Lyme disease in 2019 was 3.30 cases per 100,000 residents (using 2018 population data).

#### **Diagnosis**

Lyme disease can be physician diagnosed based on the symptoms outlined above, a history of tick exposure and serological testing. Serological blood tests are effective when used correctly and performed with validated methods. Lab tests are not recommended for patients who do not have symptoms of typical Lyme disease to avoid both misdiagnosis and the treatment of Lyme disease when the true cause of illness may be something else.

#### **Prevention**

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

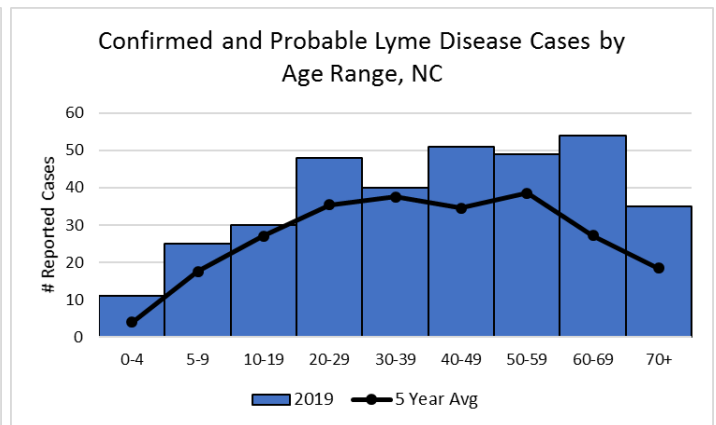
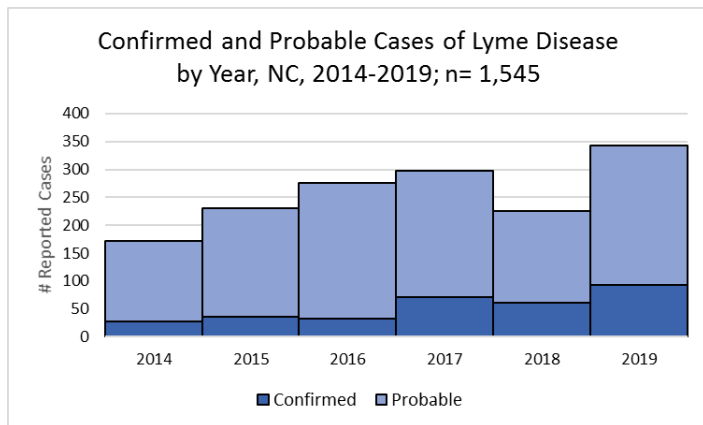
- Wear permethrin treated clothing (0.5%) when exploring the outdoors.
- Use Environmental Protection Agency (EPA) registered insect repellents containing DEET or picaridin to deter ticks.
- Avoid ticks in wooded/brushy areas with high grasses and leaf litter by walking in the center of trails.
- Check clothing 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	114	48%	173	50%
Female	126	52%	170	50%

Race	5 Year Avg (2014-18)		2019	
	No. of Cases	% of total	No. of Cases	% of total
White	119	53%	170	50%
Black or African American	8	4%	16	5%
Asian or Pac. Islander	1	< 1%	1	< 1%
American Indian or Alaskan	0	< 1%	0	0%
Other	2	< 1%	2	< 1%
Unknown	92	41%	154	44%

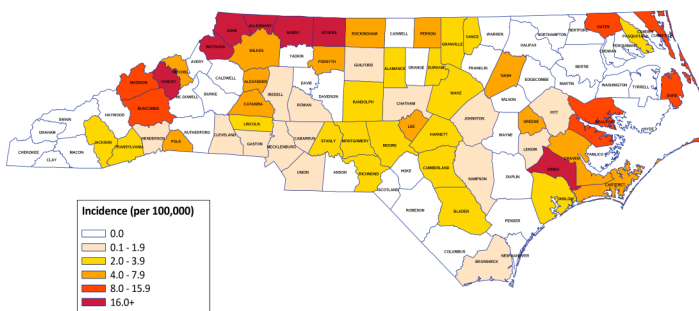
Hispanic Ethnicity	5 Year Avg (2014-18)		2019	
	No. of Cases	% of total	No. of Cases	% of total
Yes	5	2%	7	2%
No	119	51%	162	47%
Unknown	109	47%	174	51%



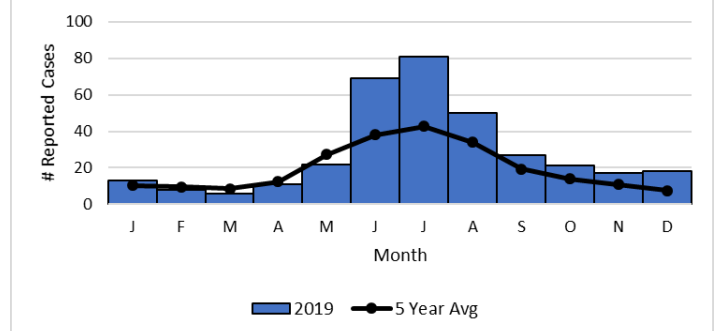
### Geographic Distribution

### Cases by Age

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



Confirmed and Probable Lyme diseases 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](https://www.cdc.gov/mmwr/volumes/64/wr/mm6453a1.htm?s_cid=mm6453a1_w)

\*\* CDC Case Definition for Lyme Disease: <https://wwwn.cdc.gov/nndss/conditions/lyme-disease/case-definition/2017/>

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