



# Tickborne Disease Update/ COVID-19 Update

*Presented by*

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Medical Director

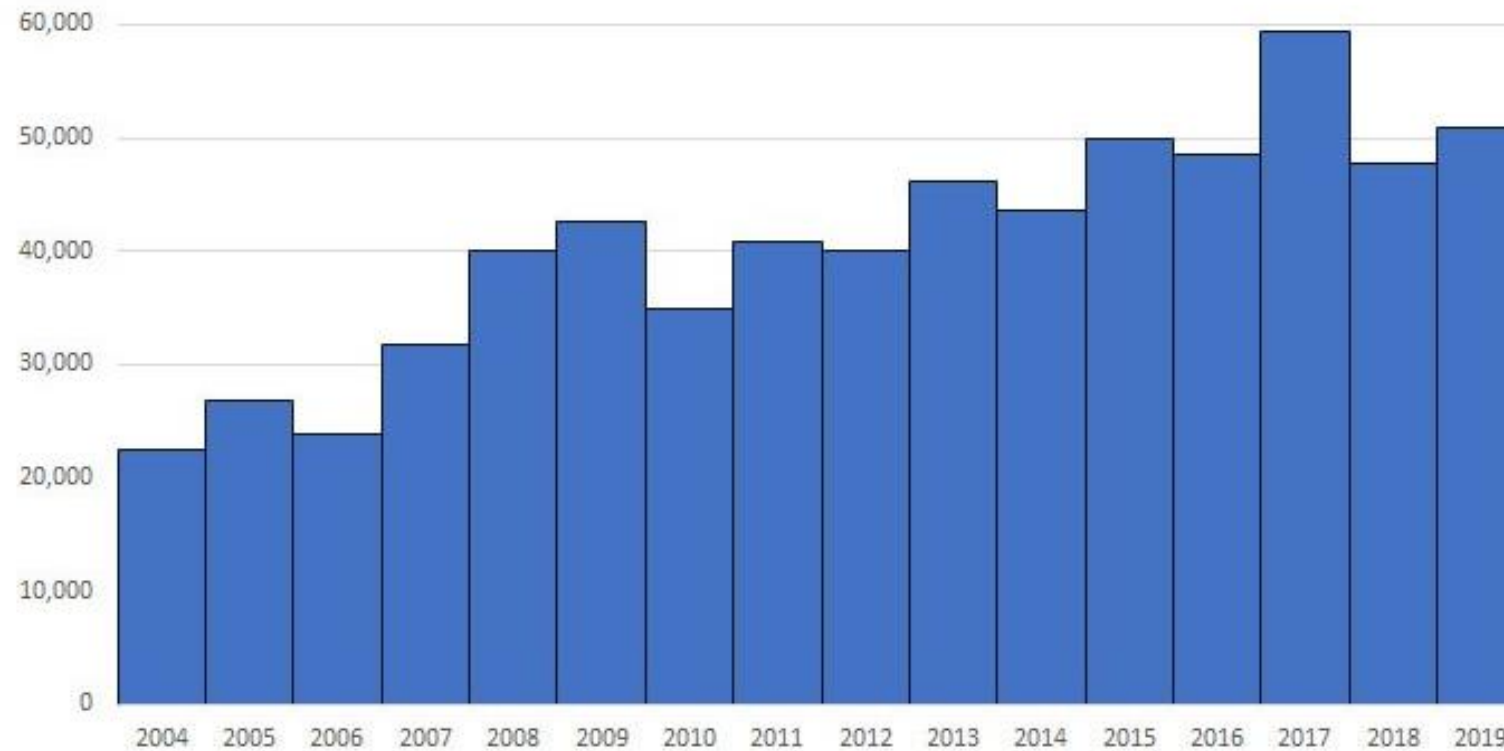
June 30, 2021



# Tickborne Illnesses



# Total Reported Cases of Tickborne Disease, 2004-2019, US



<https://www.cdc.gov/ticks/data-summary/index.html>



| Reported Tickborne Diseases, U.S.        | 2016          | 2017          | 2018          | 2019          |
|--|---------------|---------------|---------------|---------------|
| Lyme Disease (confirmed and probable)    | 36,429        | 42,743        | 33,666        | 34,945        |
| Anaplasmosis/Ehrlichiosis <sup>†</sup>   | 5,750         | 7,718         | 6,123         | 7,976         |
| Spotted Fever Rickettsiosis <sup>§</sup> | 4,269         | 6,248         | 5,544         | 5,207         |
| Babesiosis <sup>§§</sup>                 | 1,910         | 2,368         | 2,160         | 2,420         |
| Tularemia                                | 230           | 239           | 229           | 274           |
| Powassan virus                           | 22            | 33            | 21            | 43            |
| <b>Total</b>                             | <b>48,610</b> | <b>59,349</b> | <b>47,743</b> | <b>50,865</b> |

<https://www.cdc.gov/ticks/data-summary/index.html>



# Selected Tickborne Diseases Reported to CDC, U.S., 2018



**ANAPLASMOSIS**



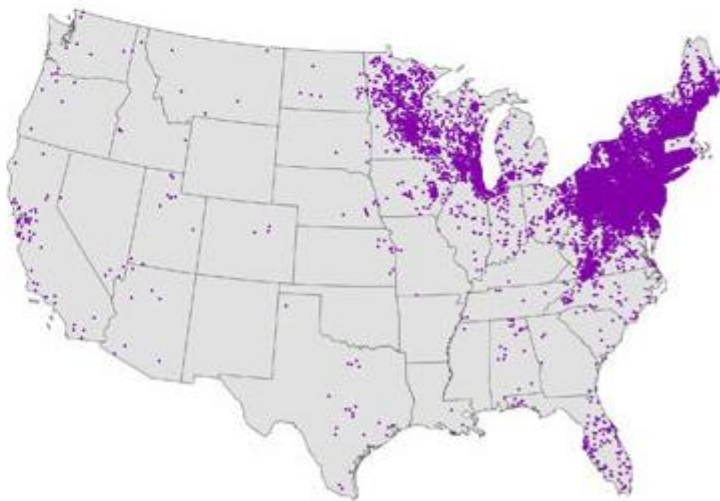
**BABESIOSIS**



**SPOTTED FEVER RICKETTSIOSIS  
(INCLUDING ROCKY MOUNTAIN SPOTTED FEVER)**



**EHRlichiosis**



**LYME DISEASE**



*Ixodes scapularis*

“blacklegged tick”

- Lyme disease
- Anaplasmosis
- Powassan disease
- babesiosis



*Amblyomma americanum*

“lone star tick”

- Ehrlichia chafeensis
- Ehrlichia ewingii
- tularemia
- STARI



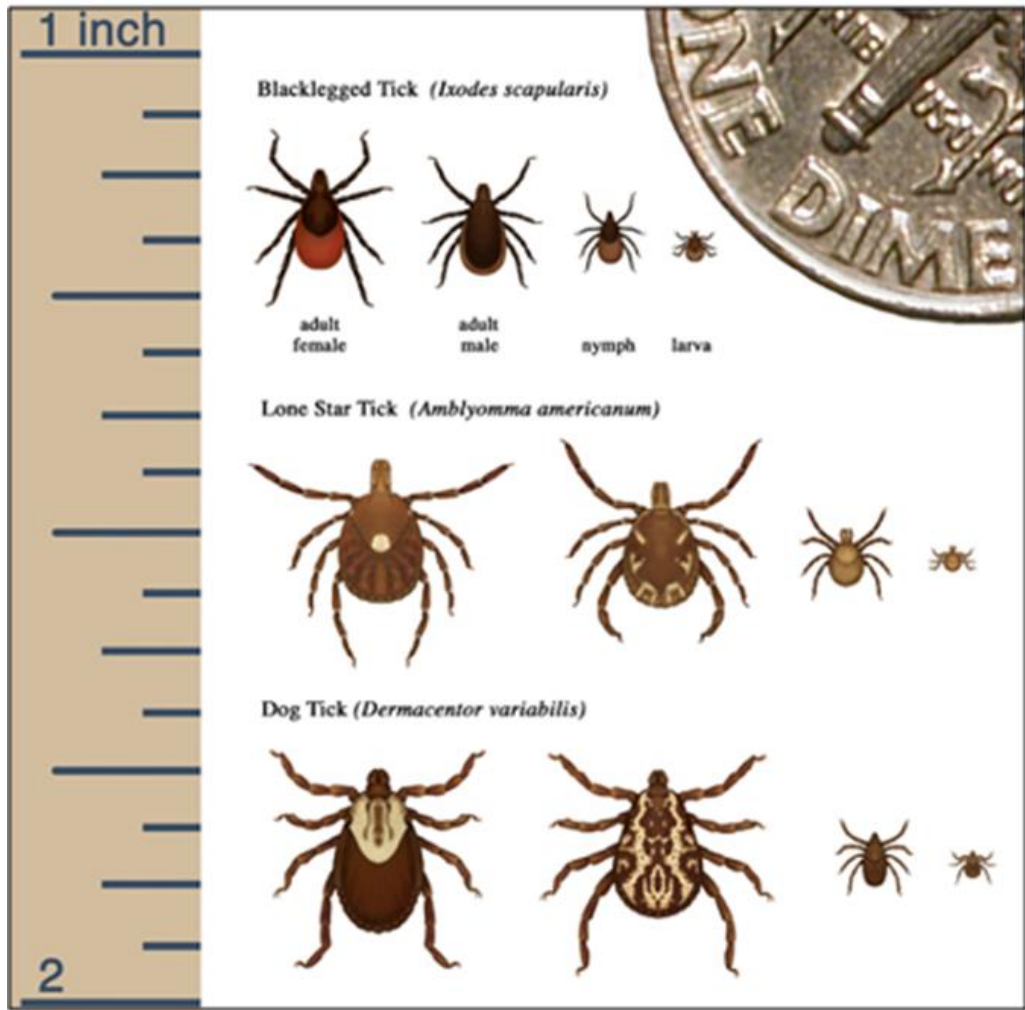
*Dermacentor variabilis*

“American dog tick”

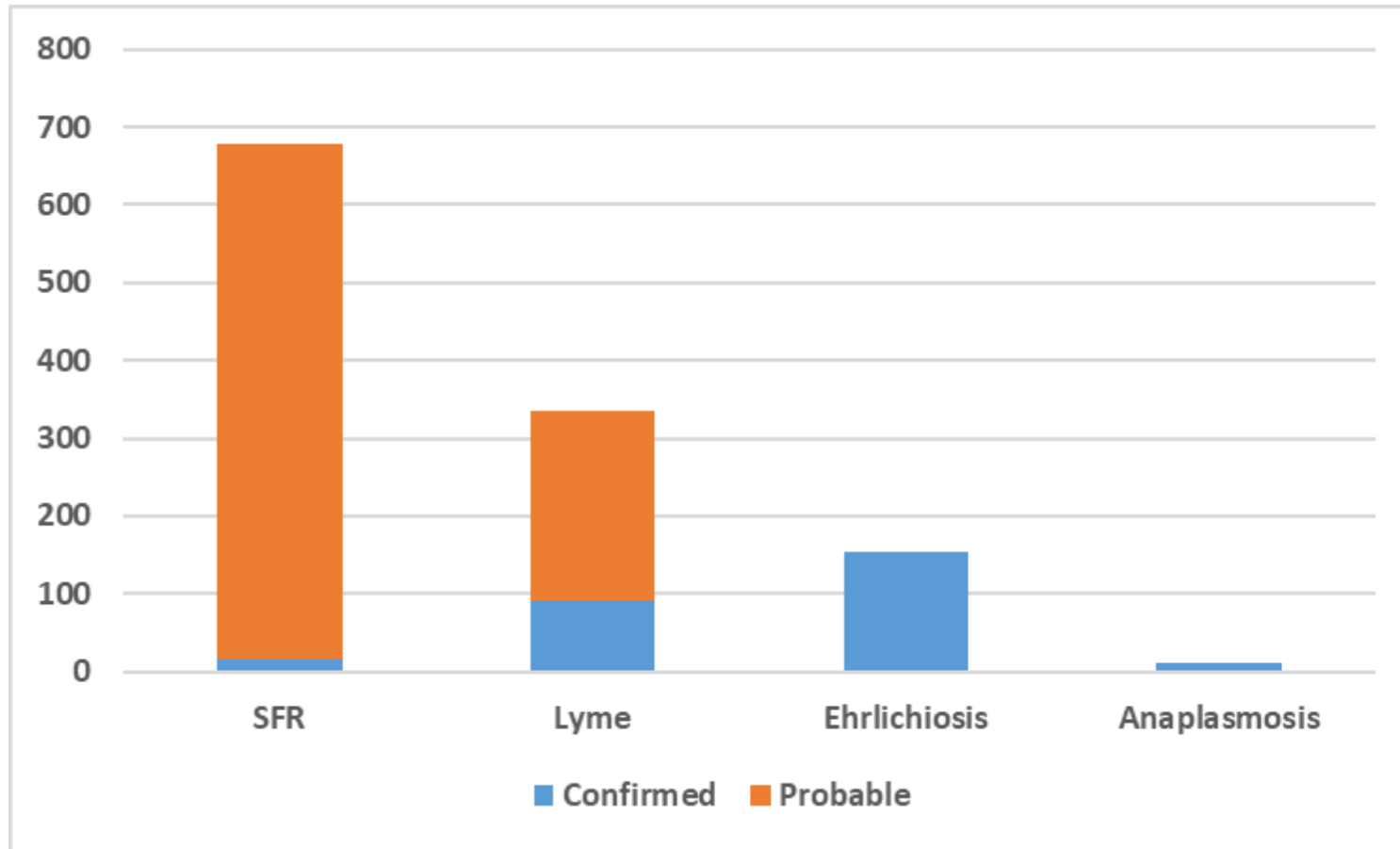
- RMSF/SFGR
- tularemia







# Tickborne Illness, NC, 2019, Probable & Confirmed Cases



<https://www.cdc.gov/nndss/data-statistics/index.html>





# Ehrlichiosis

- *Ehrlichia* bacteria
- *E. chaffeensis* can cause fatal illness
- SE and south-central US
- Most common vector in NC = lone star tick (*Amblyomma americanum*)
- Treated with doxycycline

Symptoms typically appear within 1-2 weeks after tick bite & may include:

- Fever
- Headache
- Fatigue
- Chills
- Malaise
- Muscle aches
- Nausea
- Vomiting
- Diarrhea
- Confusion
- Red eyes
- Rash



# Anaplasmosis

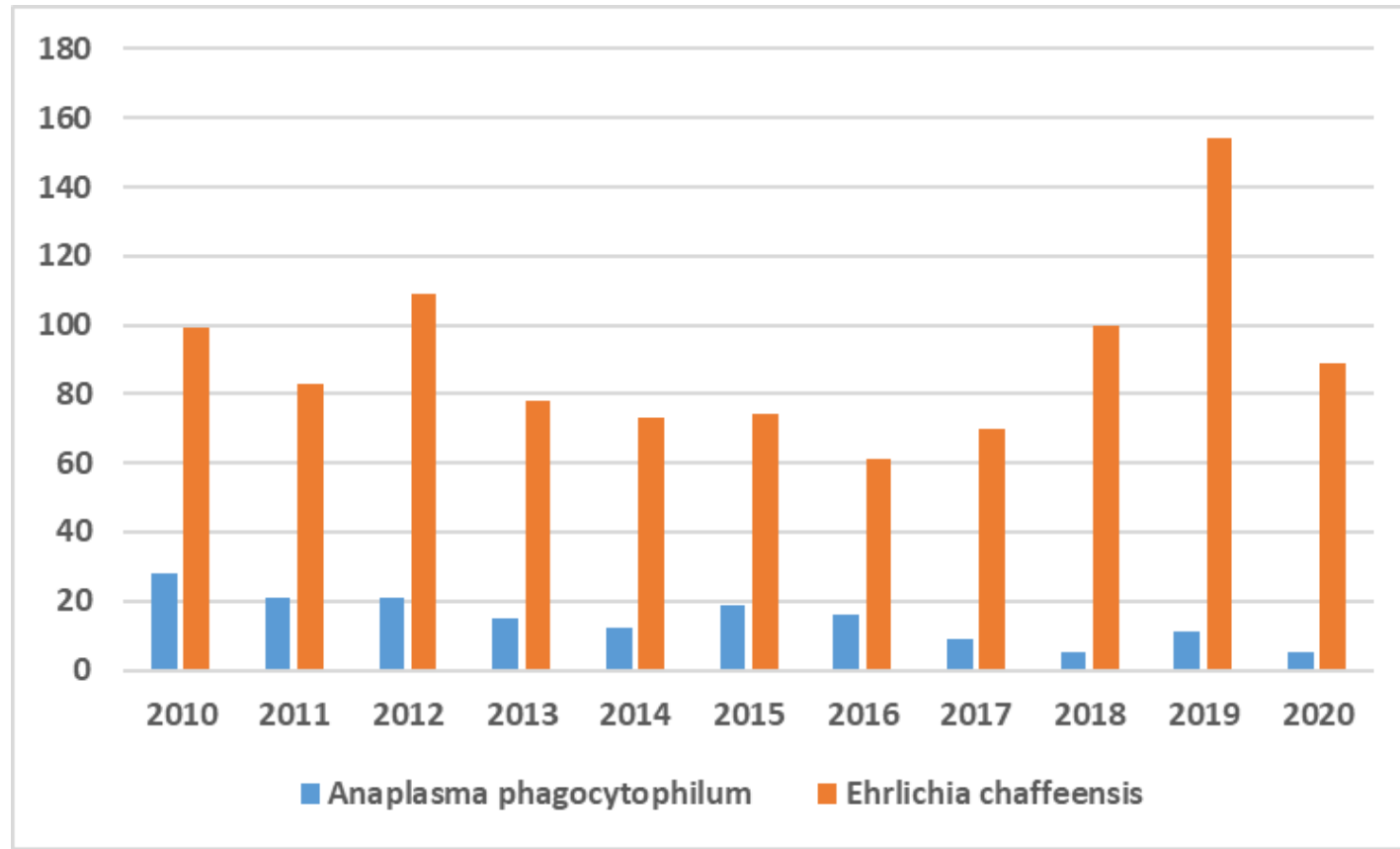
- *Anaplasma phagocytophilum*
- Less common to cause severe and fatal illness than other tickborne infections
- Upper Midwest & NE US
- Vector = *Ixodes scapularis*
- Coinfection possible
- Treated with doxycycline

Symptoms typically appear within 1-2 weeks after tick bite & may include:

- Fever
- Chills, rigors
- Severe headache
- Malaise
- Nausea, vomiting, diarrhea
- Rash (<10%)



# Anaplasmosis & Ehrlichiosis, NC, Probable & Confirmed Cases



<https://www.cdc.gov/nndss/data-statistics/index.html>



# Rocky Mountain Spotted Fever (RMSF)

- *Rickettsia rickettsii*
- >60% of cases occur in NC, OK, AR, TN, MO
- Most common vector in NC = *American dog tick*
- Can be rapidly fatal if not treated w/in 1<sup>st</sup> 5 days of symptoms
- Incubation period = 3-12 days
- Treated with doxycycline



# Signs & Symptoms of RMSF

## Early (1-4 days)

- High fever
- Severe headache
- Malaise
- Muscle aches
- Swelling around eyes and on back of hands
- Nausea, vomiting, loss of appetite, stomach pain

## Late (5 days and beyond)

- Altered mental status, coma, brain swelling
- Respiratory issues (fluid in lungs, acute respiratory distress)
- Necrosis, requiring amputation
- Multi-organ system damage (brain, kidneys)



# RMSF Rash

Typically 2-5 days after symptom onset; ~10% do not get a rash

## Early

- Small, flat, pink, spots
- Not itchy
- Starts on wrists, forearms and ankles
- Spreads to trunk
- Sometimes spreads to palms and soles

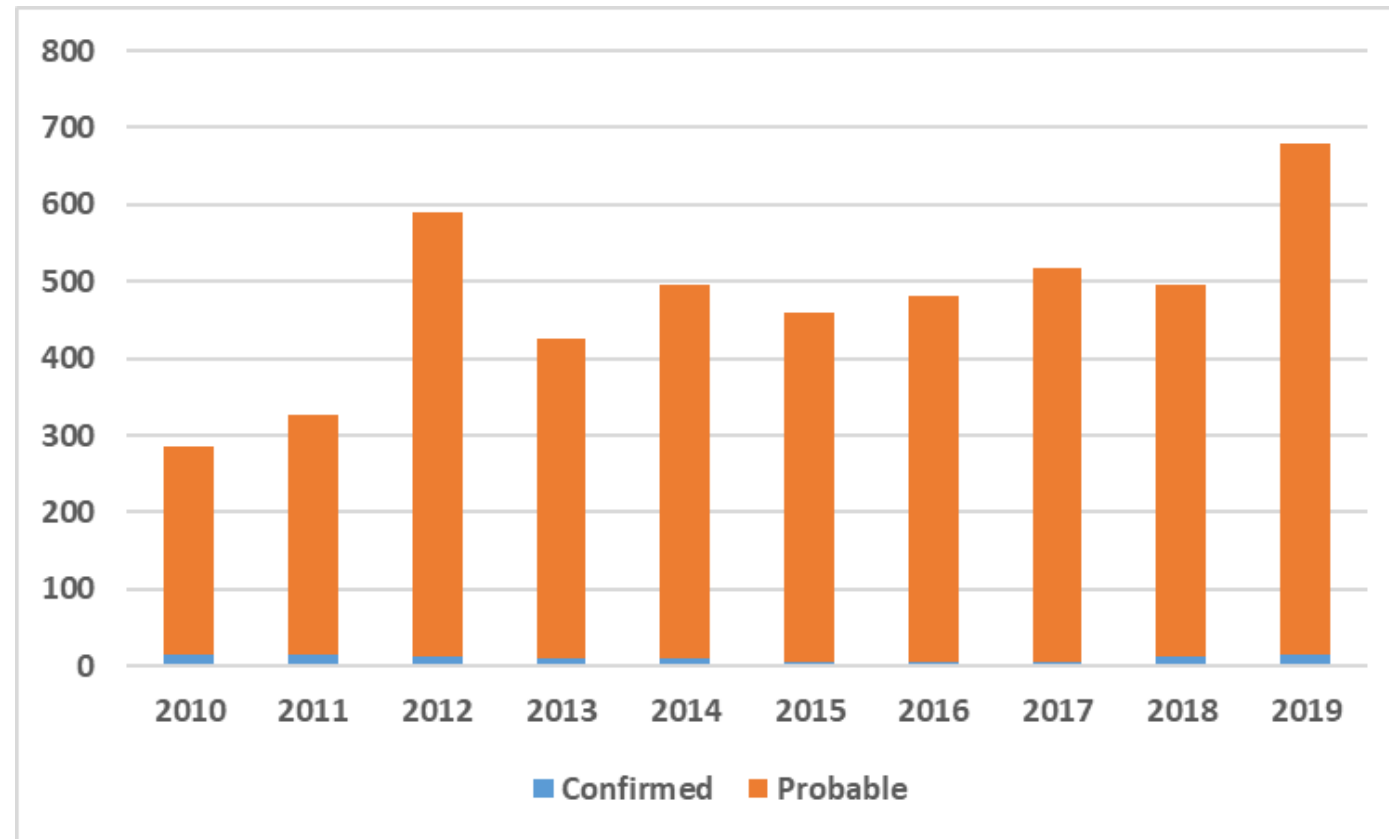
## Late

- Red to purple spots (petechiae) usually not seen until 6 or more days after symptoms start
- Considered a sign of severe disease
- Want to start treatment before petechiae develop





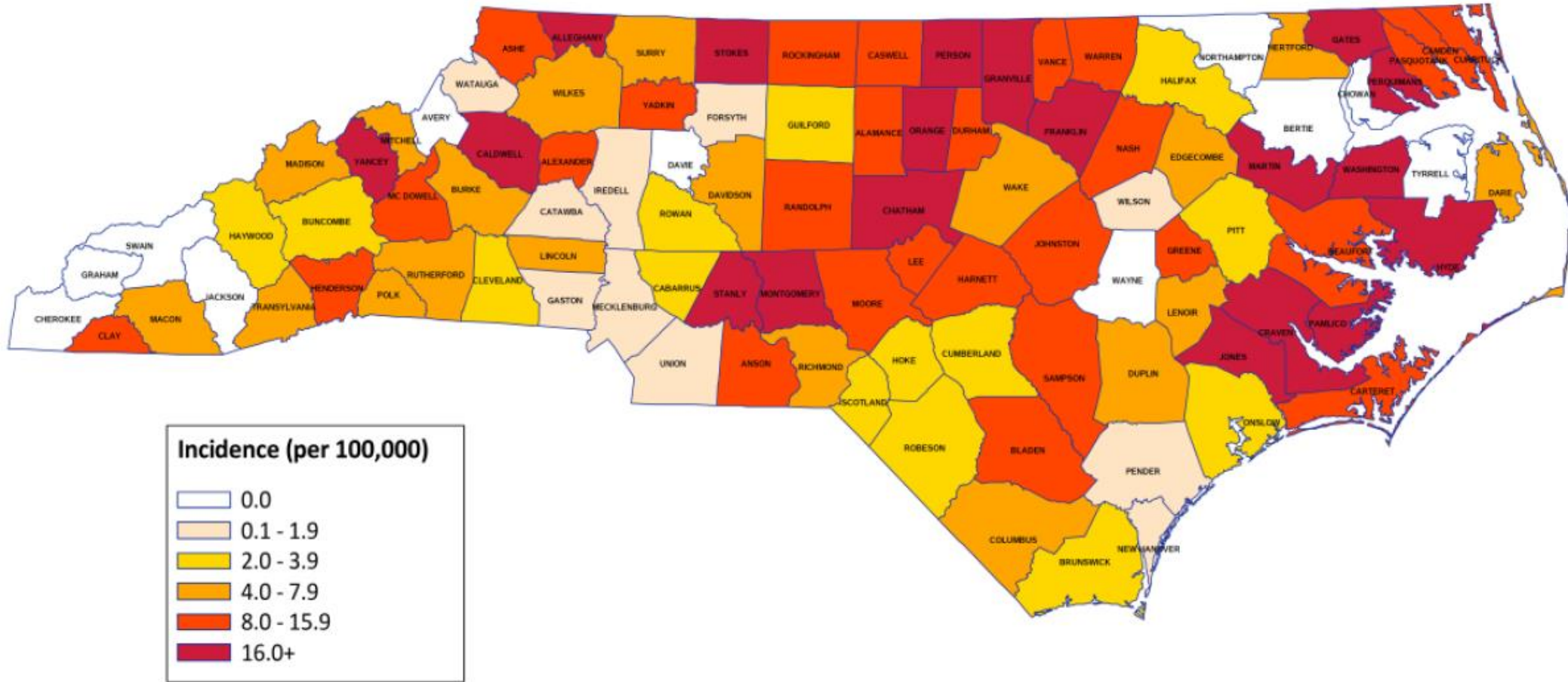
# Spotted Fever Rickettsiosis, NC, Probable & Confirmed Cases



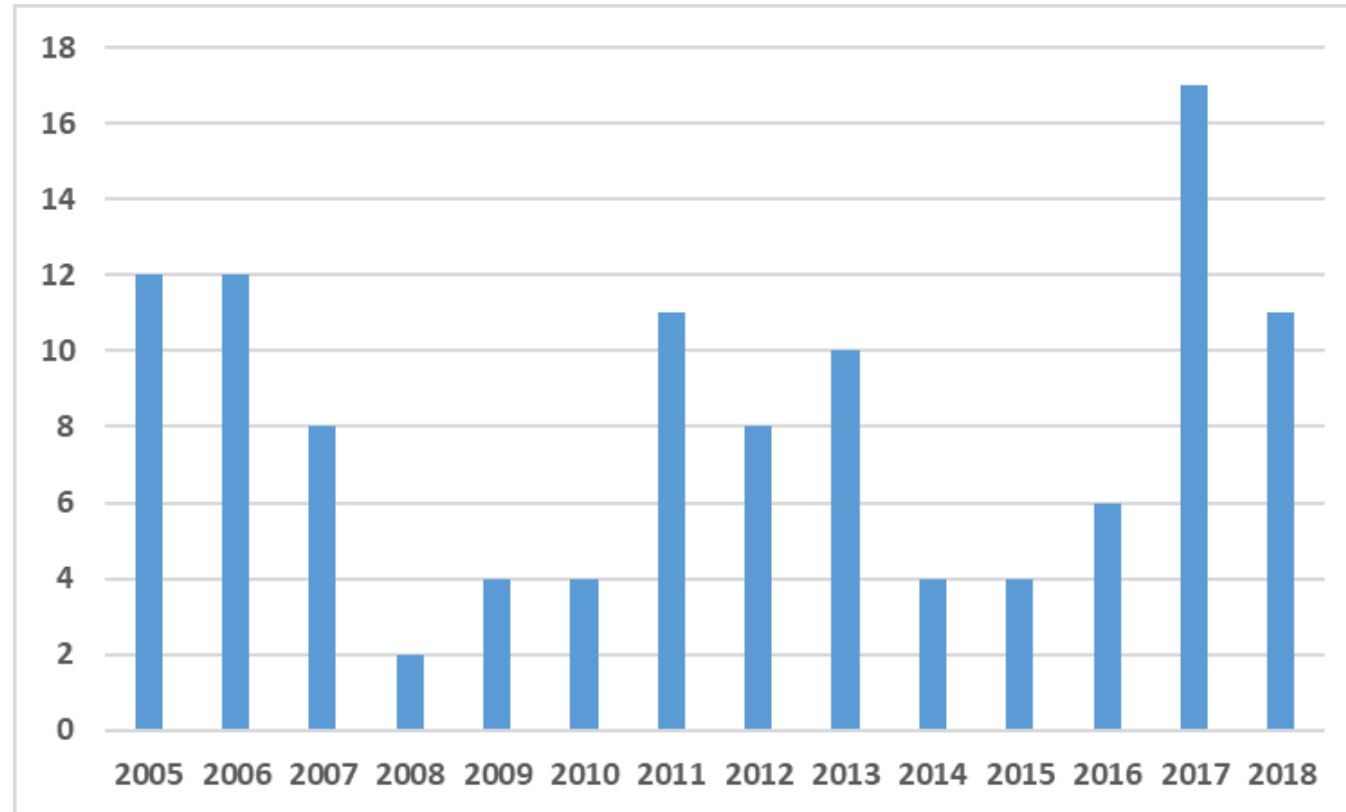
<https://www.cdc.gov/nndss/data-statistics/index.html>



# Incidence of SFGR Cases, Confirmed & Probable, by County of Residence, NC, 2019



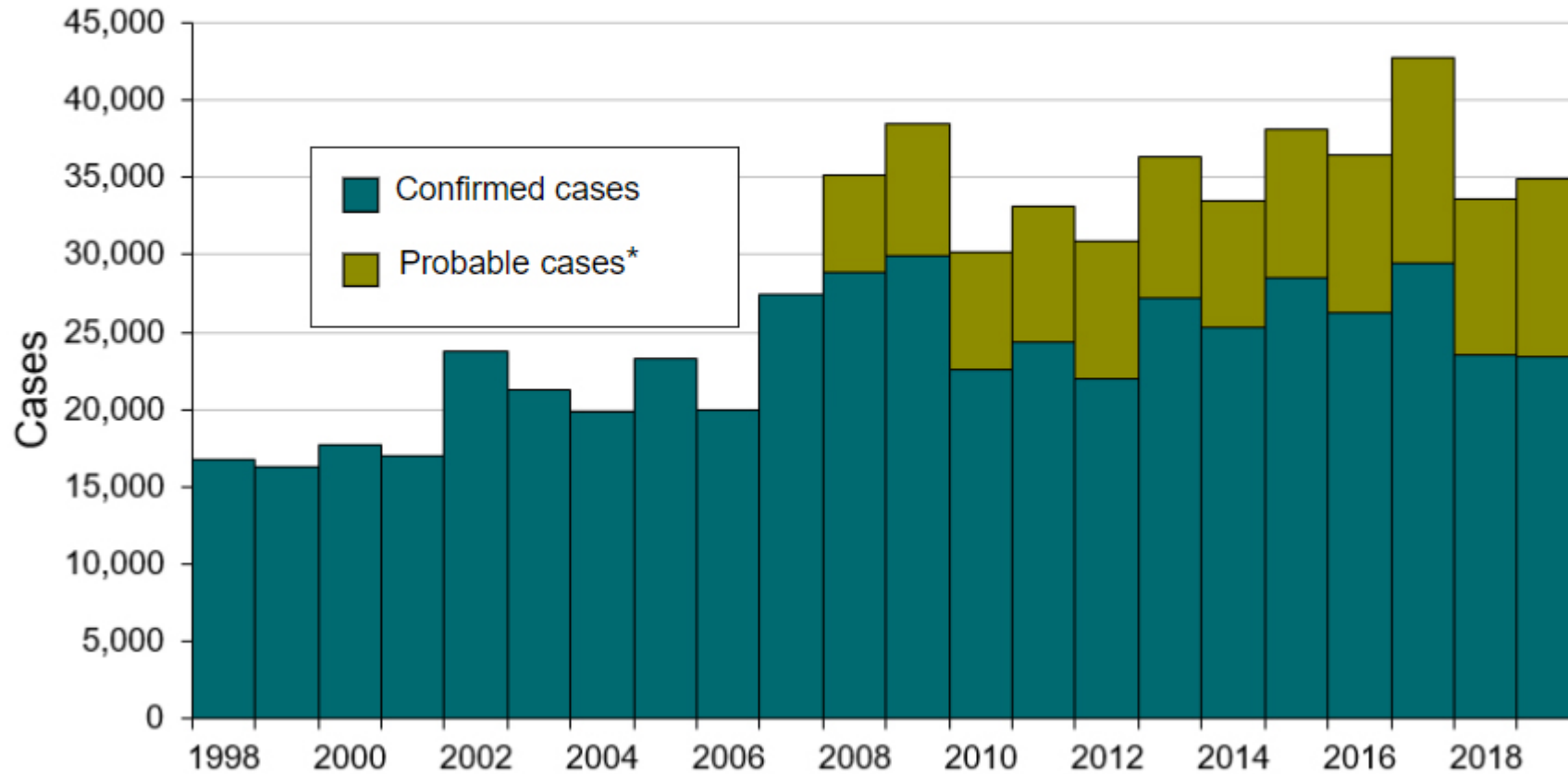
# Spotted Fever Rickettsiosis, Buncombe, Probable & Confirmed Cases



<https://public.tableau.com/app/profile/nc.cdb/viz/NCD3NorthCarolinaDiseaseDataDashboard/DiseaseMapsandTrends>



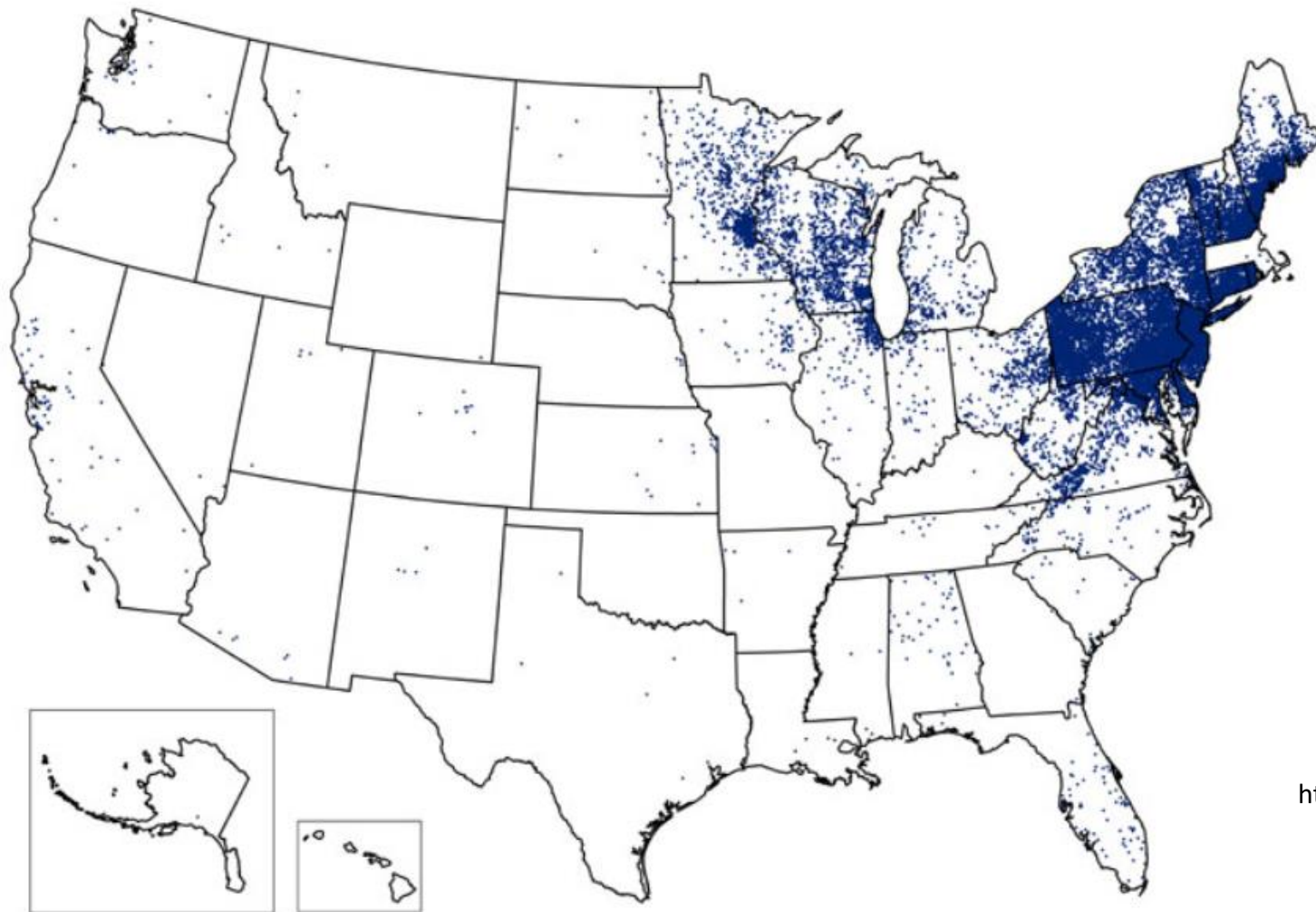
# Reported Cases of Lyme Disease by Year, United States, 1998-2019



<https://www.cdc.gov/lyme/stats/graphs.html>



## Reported Cases of Lyme Disease -- United States, 2019



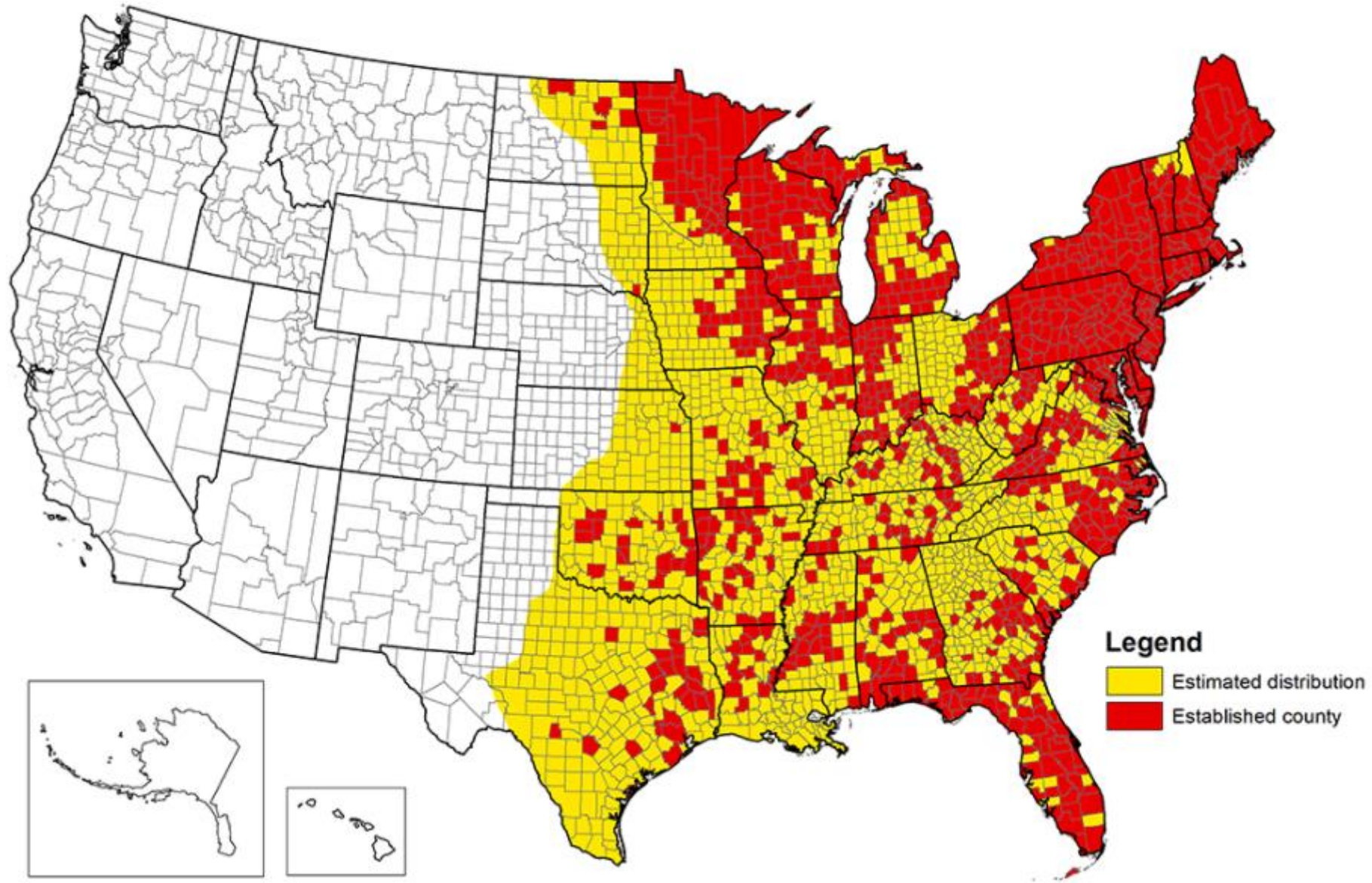
<https://www.cdc.gov/lyme/stats/maps.html>

1 dot placed randomly within county of residence for each confirmed case



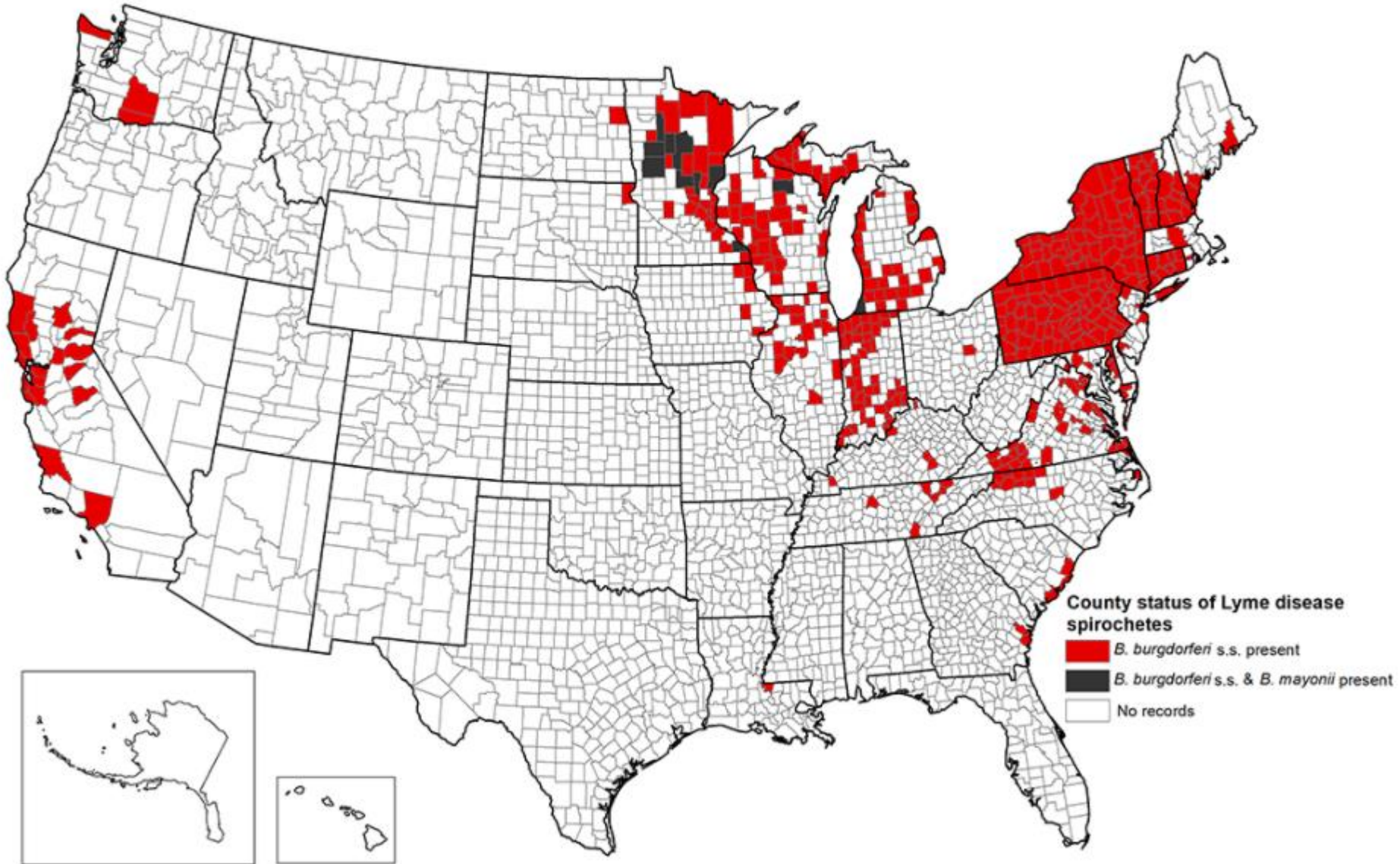


# *Ixodes scapularis* - Estimated and established distribution, 2020

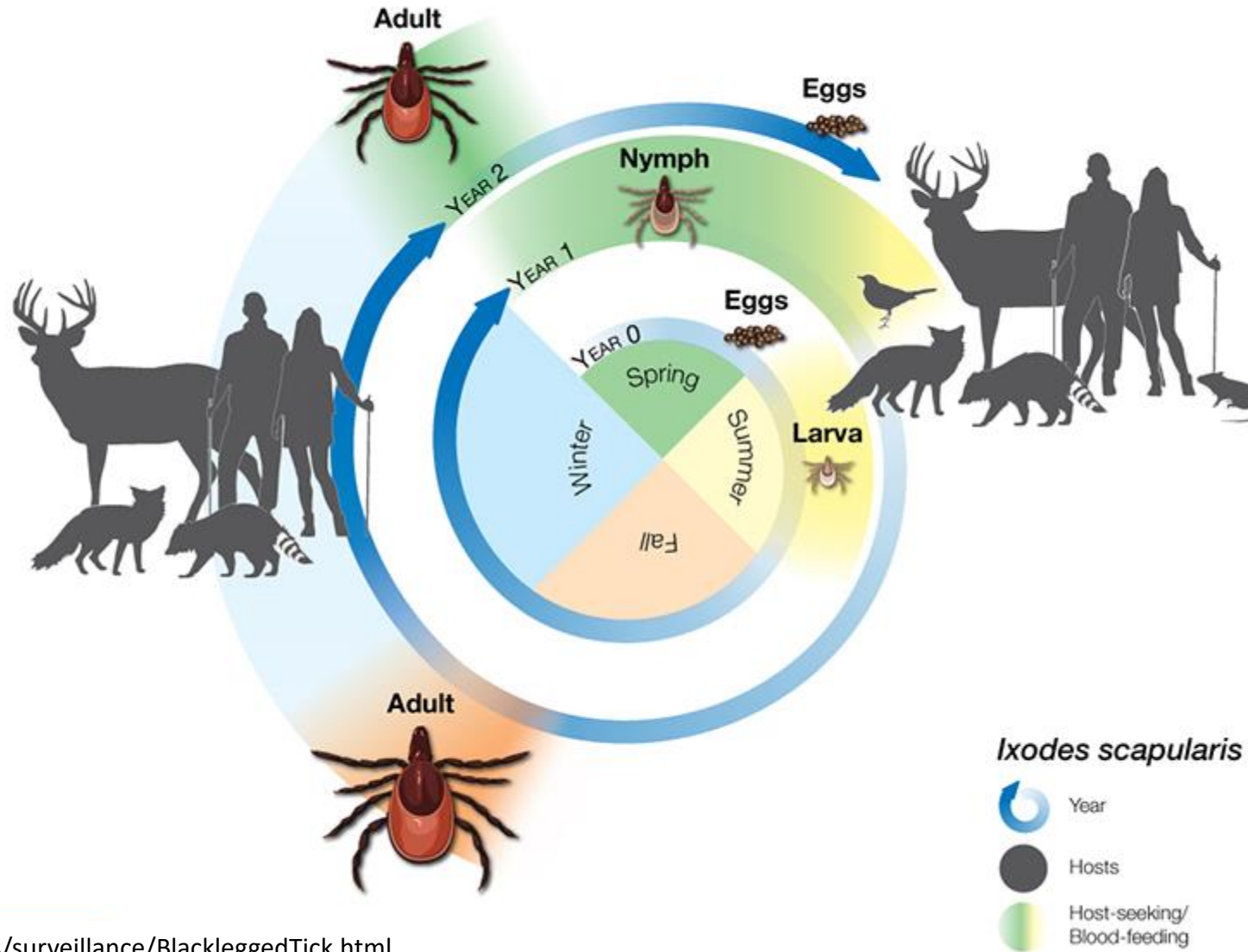




# Distribution of Lyme disease spirochetes in host-seeking *Ixodes scapularis* and *Ixodes pacificus* ticks



# Lifecycle of Blacklegged Tick



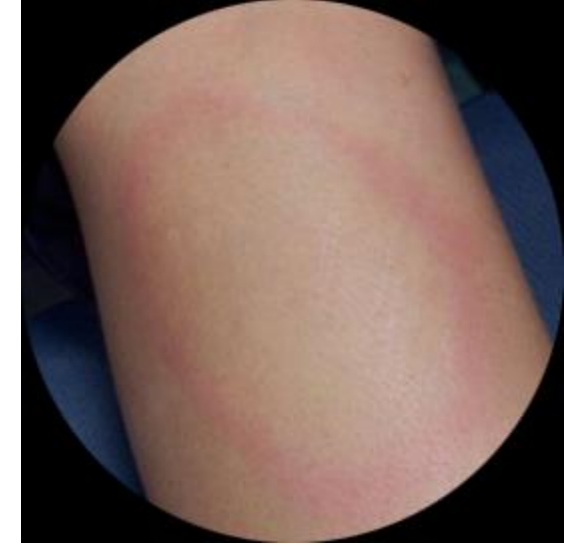
<https://www.cdc.gov/ticks/surveillance/BlackleggedTick.html>



**BUNCOMBE COUNTY**



# Lyme Disease



- *Borrelia burgdorferi*
- Most common in Upper Midwest and NE US
- Vector = *Ixodes scapularis*
- Incubation period = 3-30 days
- Treated with doxycycline

## Early (localized) Stage:

- Erythema migrans (EM)
  - In 70-80% of cases
- Flu-like symptoms
  - Malaise, headache, fever, muscle & joint aches
- Swollen lymph nodes

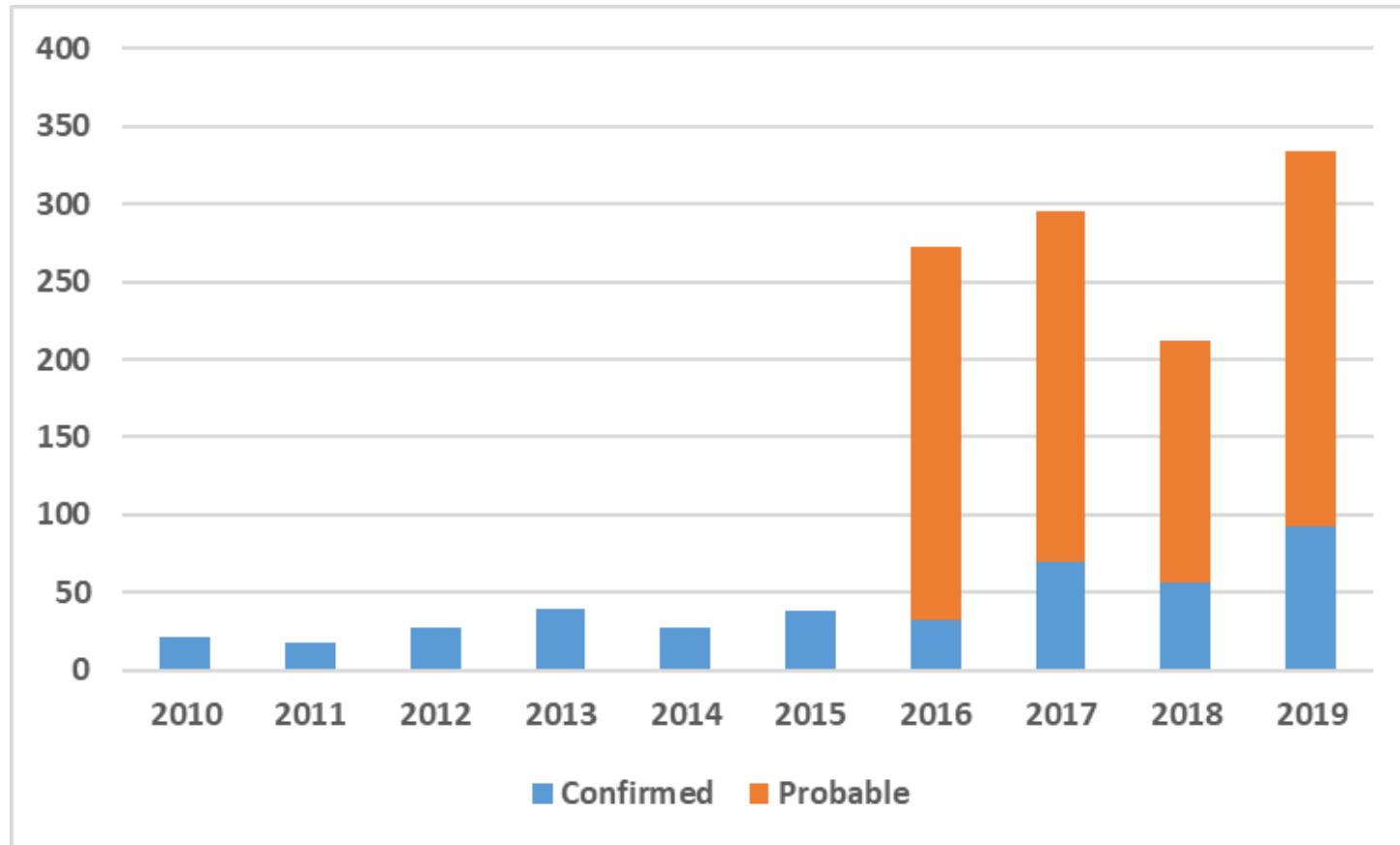


# Lyme Disease

- Disseminated Stage
  - Multiple circular rashes
  - Rheumatologic manifestations
    - Arthritis, swelling in joints
  - Cardiac manifestations
    - Conduction abnormalities, myocarditis, pericarditis
  - Neurologic manifestations
    - Bell's palsy, meningitis, radiculoneuropathy, encephalitis



# Lyme Disease, NC, Probable & Confirmed Cases

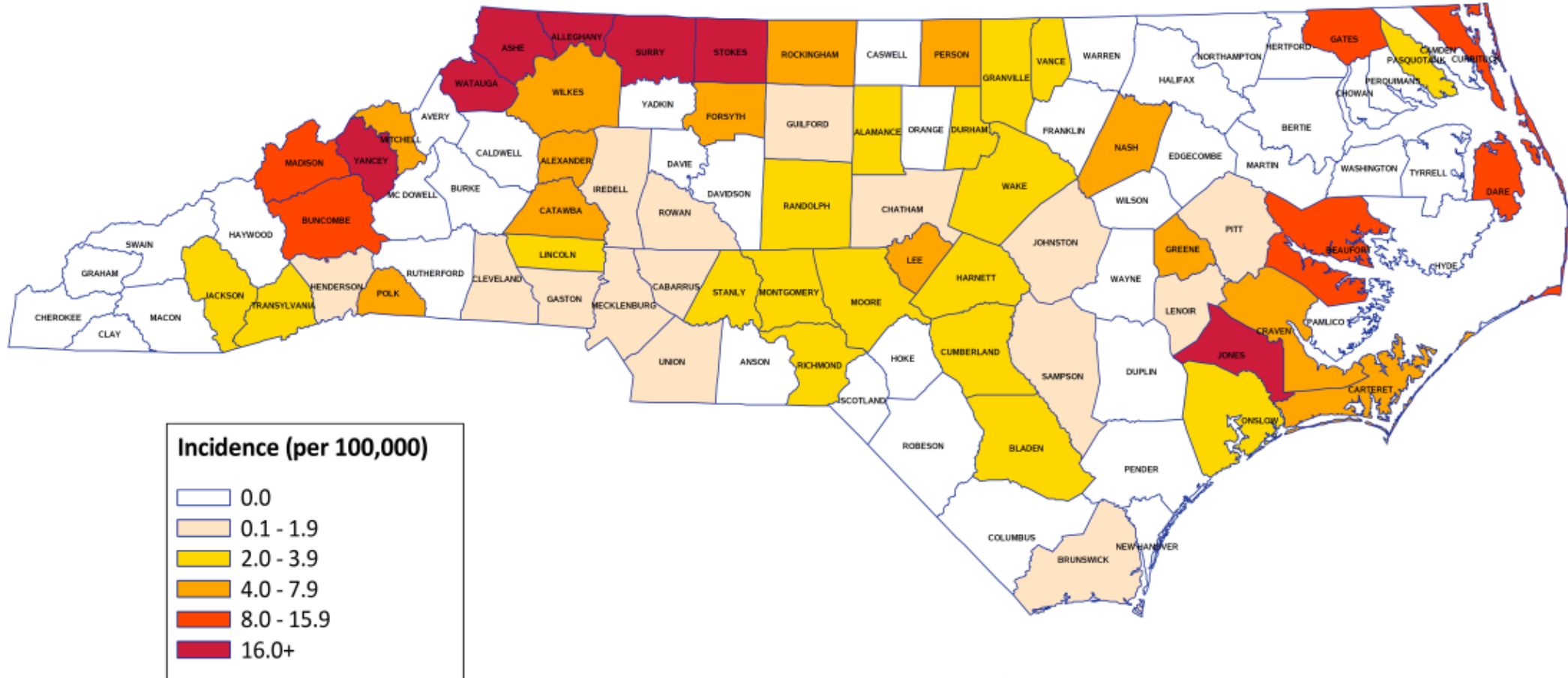


<https://www.cdc.gov/lyme/stats/tables.html>; <https://www.cdc.gov/nndss/data-statistics/index.html>





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

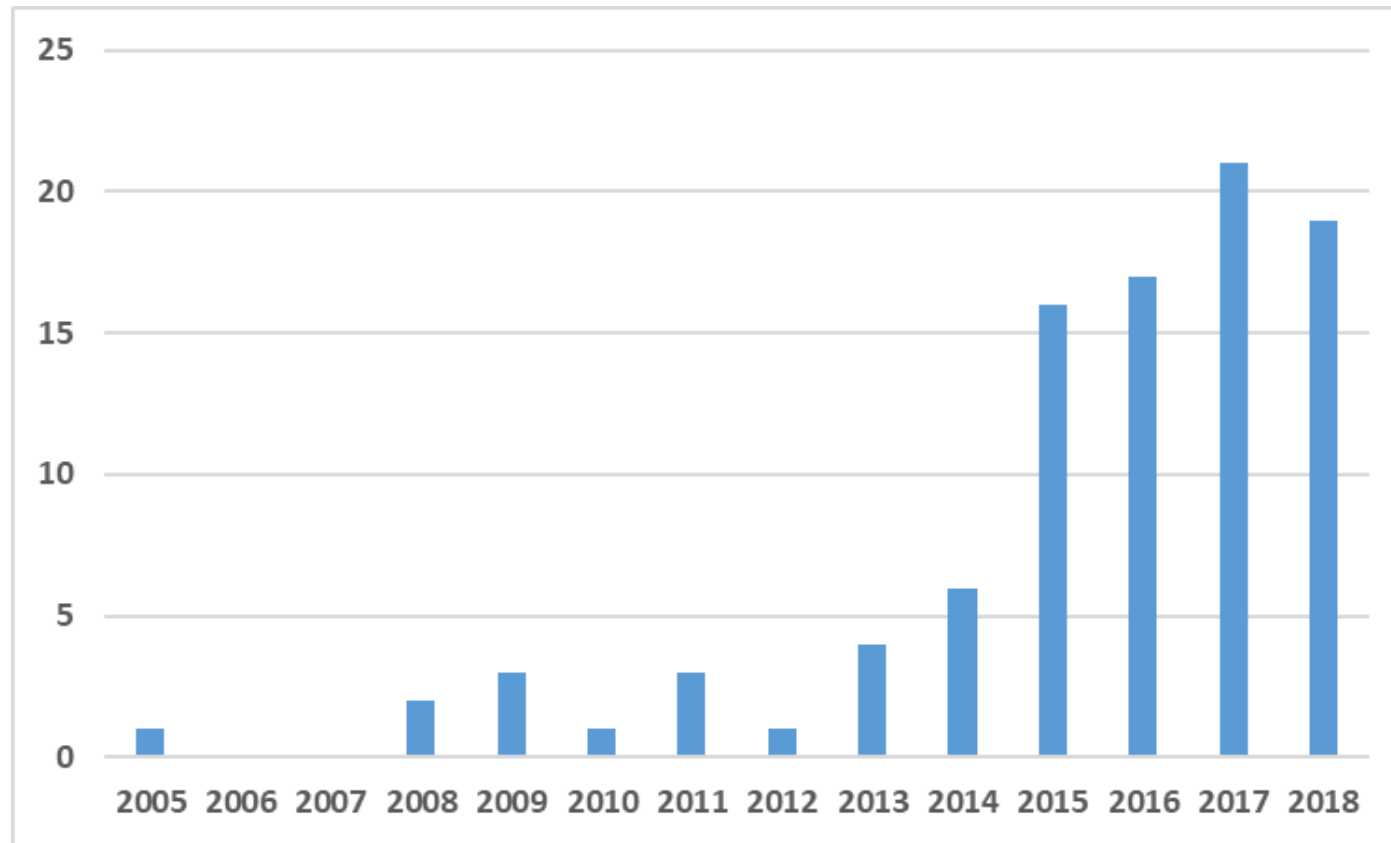


<https://epi.dph.ncdhs.gov/cd/lyme/LymeSurveillanceSummary2019.pdf>





# Lyme Disease, Buncombe County, Probable & Confirmed Cases



<https://public.tableau.com/app/profile/nc.cdb/viz/NCD3NorthCarolinaDiseaseDataDashboard/DiseaseMapsandTrends>



# Prevention of Tickborne Illness


- Reduce exposure to ticks
- 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.



# EPA Tool: Repellents

How much time will you need to be protected from biting insects? ⓘ  
Any

Do you need protection from mosquitoes, ticks or both ?  
Mosquitoes and ticks



All products work against mosquitoes, and not all against ticks.

You can refine your search by specifying one or more of the following options:

Which product are you interested in?  
*You can leave blank to get a list of all products which fall under your criteria*

Are you interested in a particular **active ingredient**?  
All Ingredients

Are you looking for a specific company name?  
All Companies

Do you know the EPA registration number of the product you are looking for?  
*You can leave blank to get a list of all products which fall under your criteria.*

[Export the entire insect repellent dataset to PDF format](#) Search Reset

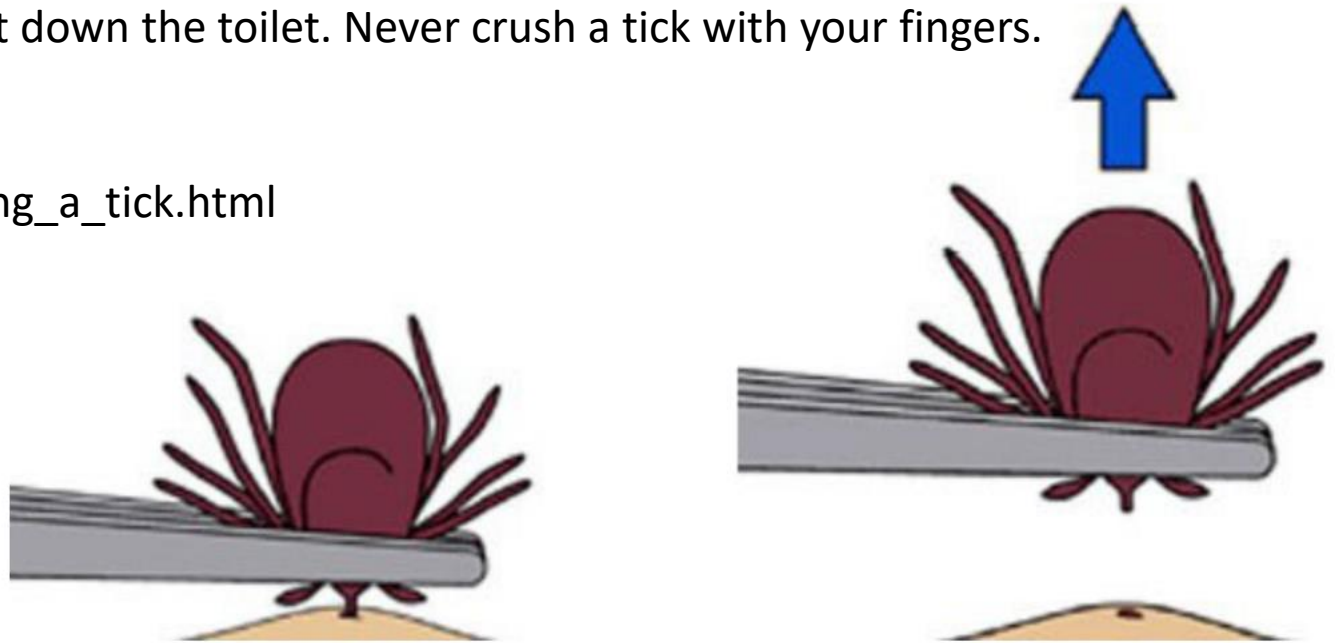
<https://www.epa.gov/insect-repellents/find-repellent-right-you>



## How to remove a tick

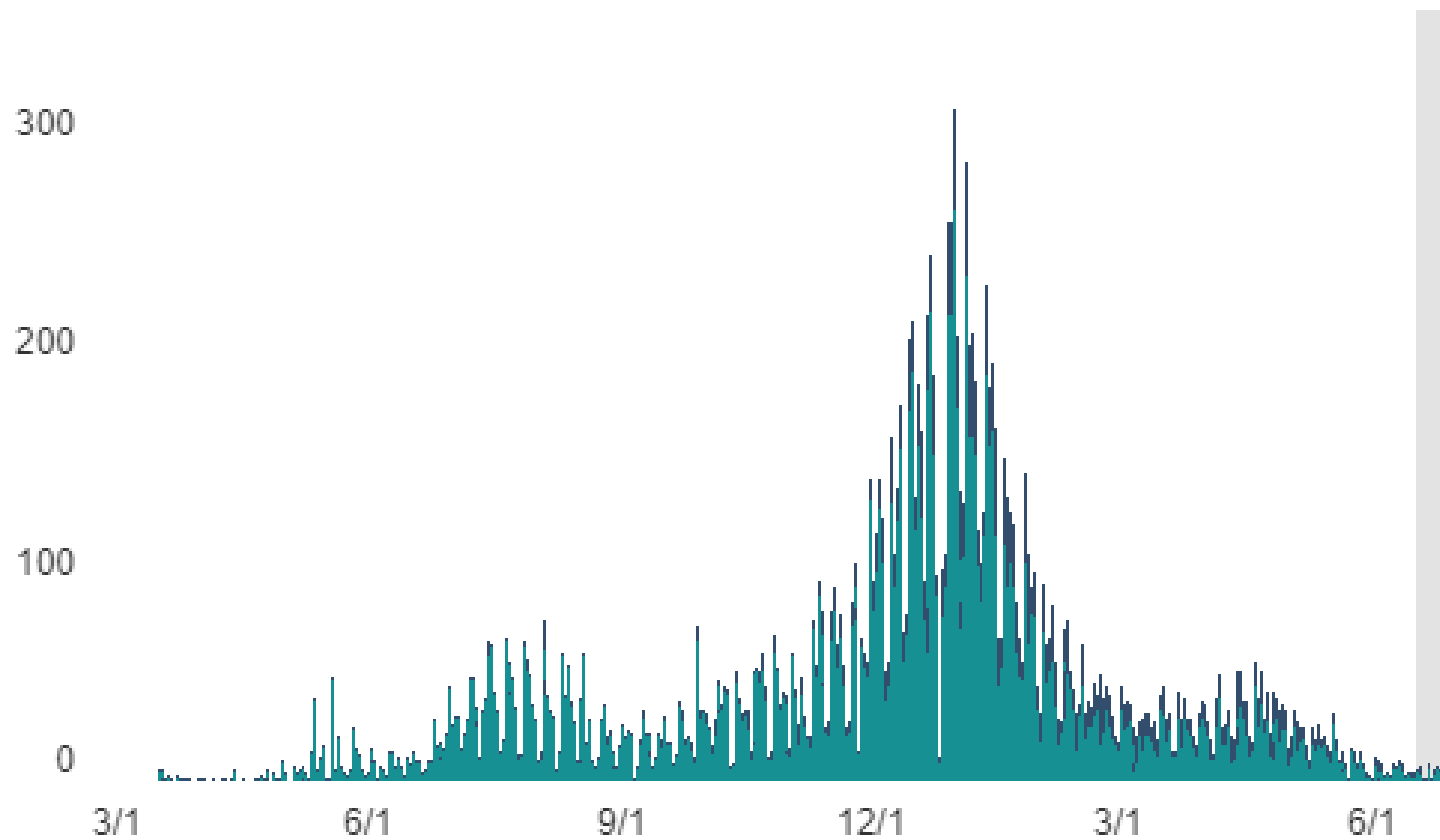
1. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
2. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.
4. Dispose of a live tick by submersing it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet. Never crush a tick with your fingers.

[https://www.cdc.gov/ticks/removing\\_a\\_tick.html](https://www.cdc.gov/ticks/removing_a_tick.html)



# COVID-19 Update





**TOTAL CASES  
Buncombe County**

**18,090**

**MOLECULAR (PCR)  
POSITIVE CASES**

**14,953**

**ANTIGEN POSITIVE  
CASES**

**3,137**

Specimen collection date  
missing for 0 cases.

**325 deaths**





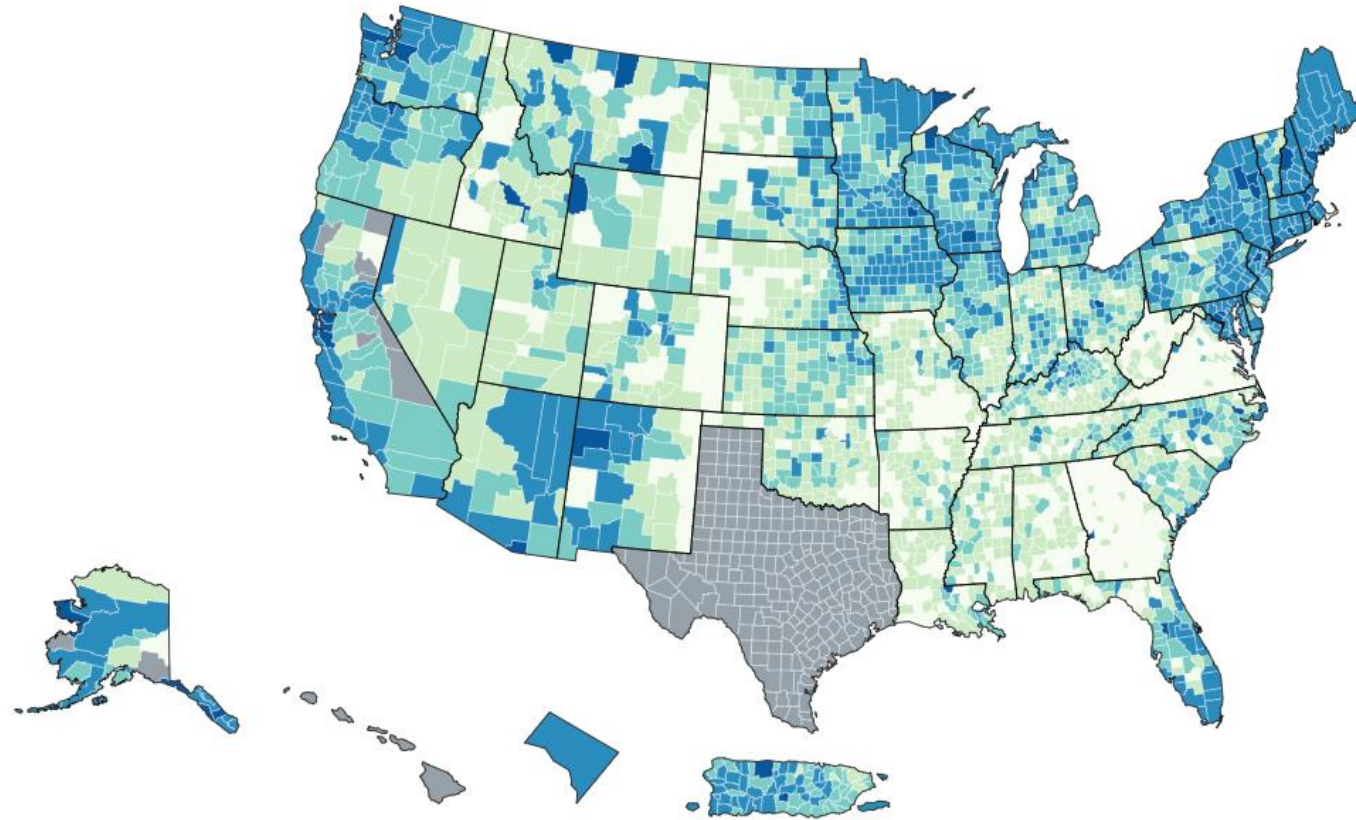
# COVID-19 Vaccinations in the US

| People Vaccinated                 | At Least One Dose | Fully Vaccinated |
|-----------------------------------|-------------------|------------------|
| Total                             | 180,674,739       | 154,884,686      |
| % of Total Population             | 54.4%             | 46.7%            |
| Population ≥ 12 Years of Age      | 180,460,119       | 154,764,916      |
| % of Population ≥ 12 Years of Age | 63.6%             | 54.6%            |
| Population ≥ 18 Years of Age      | 171,722,777       | 148,256,556      |
| % of Population ≥ 18 Years of Age | 66.5%             | 57.4%            |
| Population ≥ 65 Years of Age      | 48,074,073        | 42,661,789       |
| % of Population ≥ 65 Years of Age | 87.9%             | 78%              |

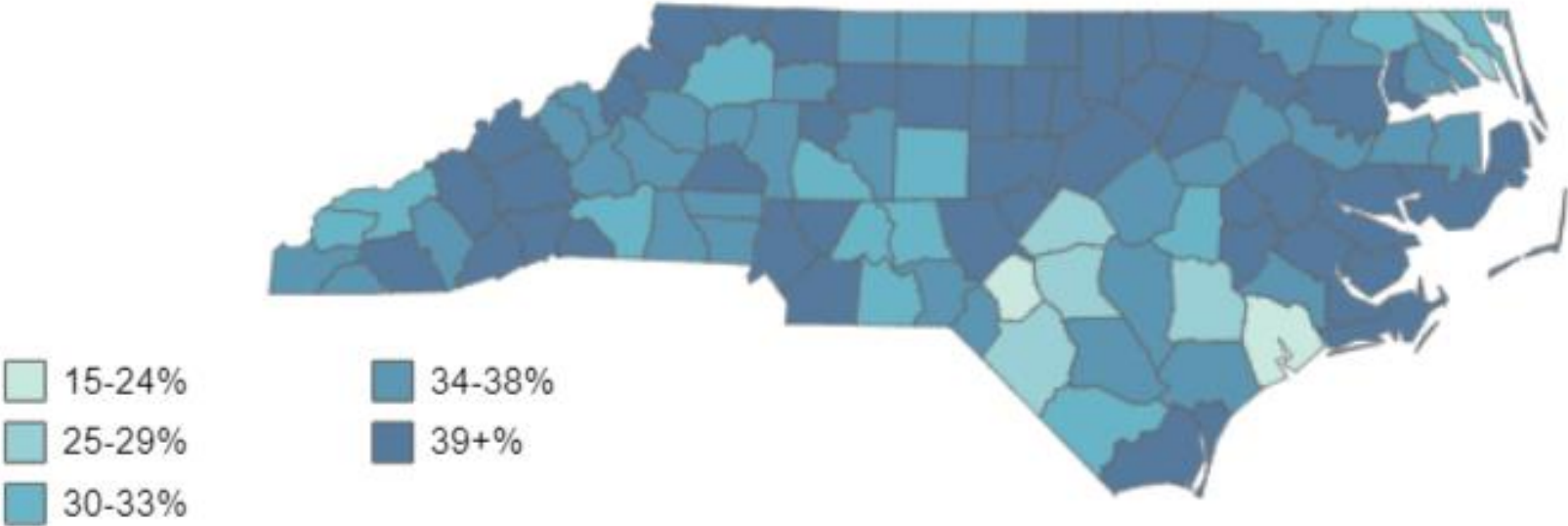


# % of Total Population Fully Vaccinated

0-29.9% 30-39.9% 40-49.9% 50-69.9% 70%+ No Data



# % of Population Fully Vaccinated



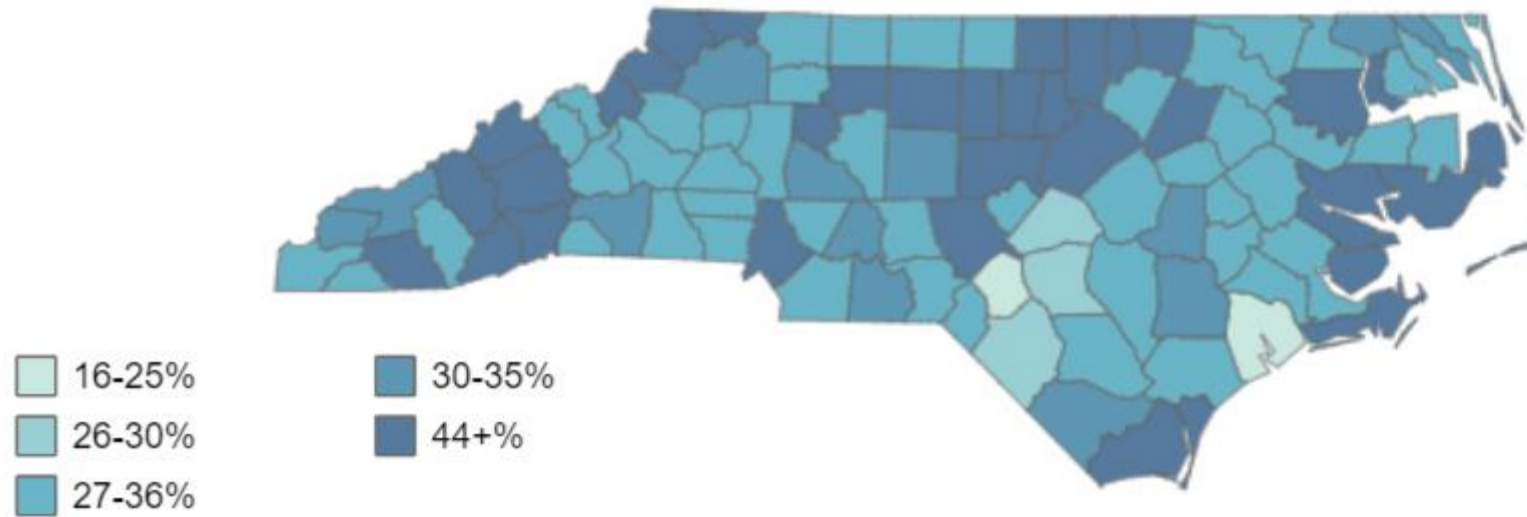
June 30, 2021

43% for NC  
&  
50% for Buncombe County

<https://covid19.ncdhhs.gov/dashboard/vaccinations>



# % of Population Partially Vaccinated



June 30, 2021

45% for NC  
&  
53% for Buncombe County

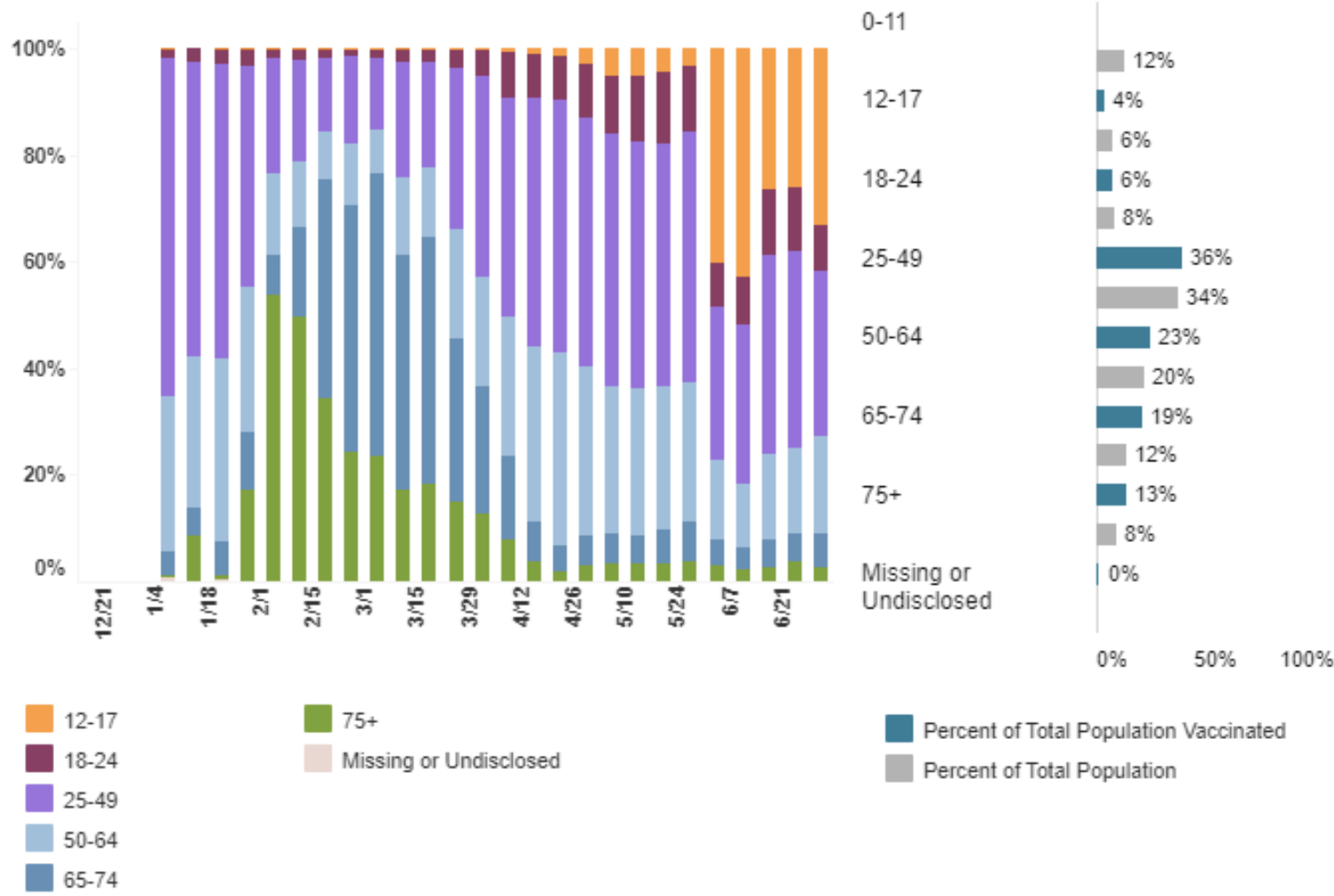
<https://covid19.ncdhhs.gov/dashboard/vaccinations>



# Percent of People Fully Vaccinated by Age - Buncombe County



Weekly Trend      Cumulative Total



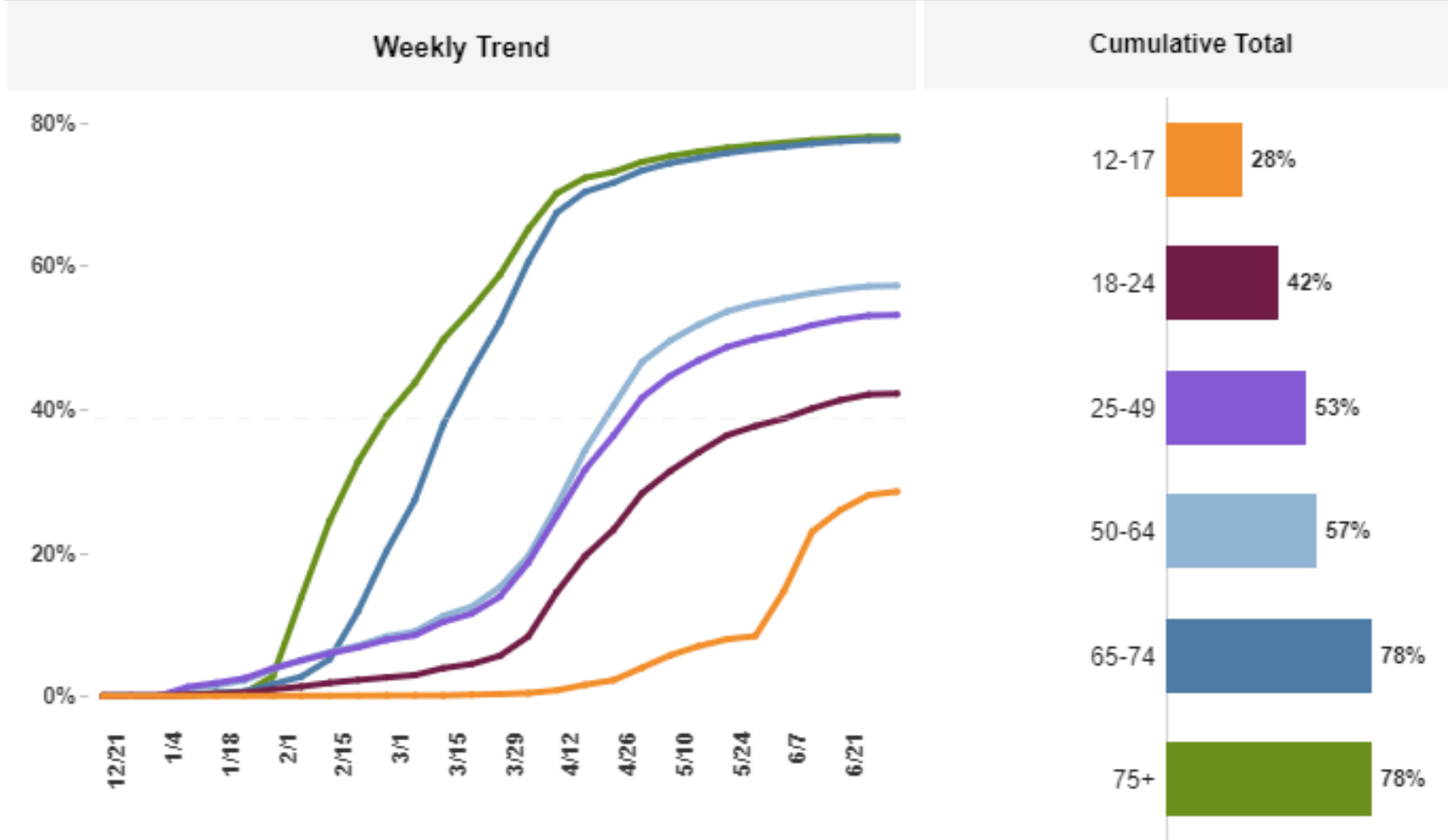
Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21



**BUNCOMBE COUNTY**



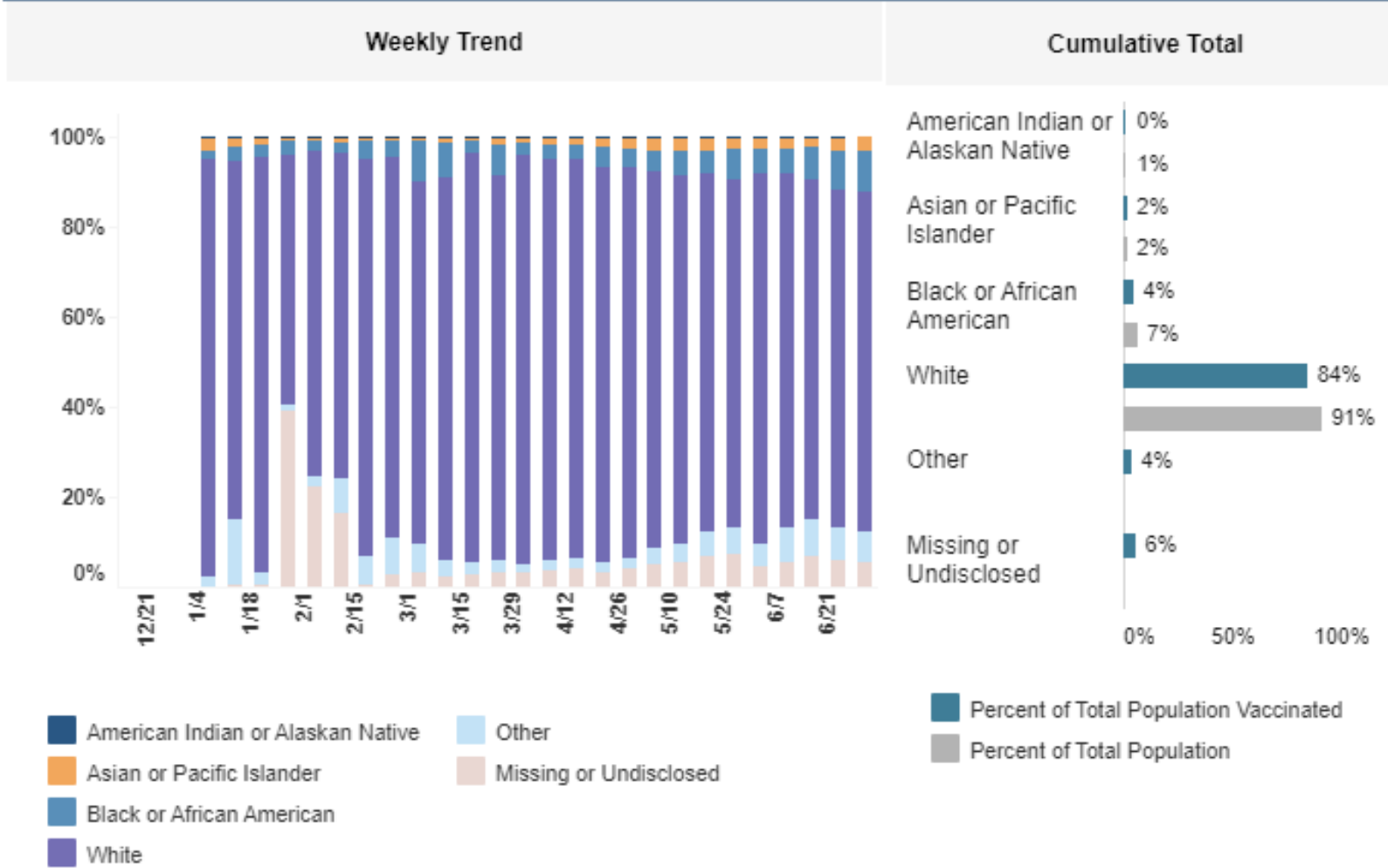
## Percent of Population Fully Vaccinated by Age - Buncombe County



Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21



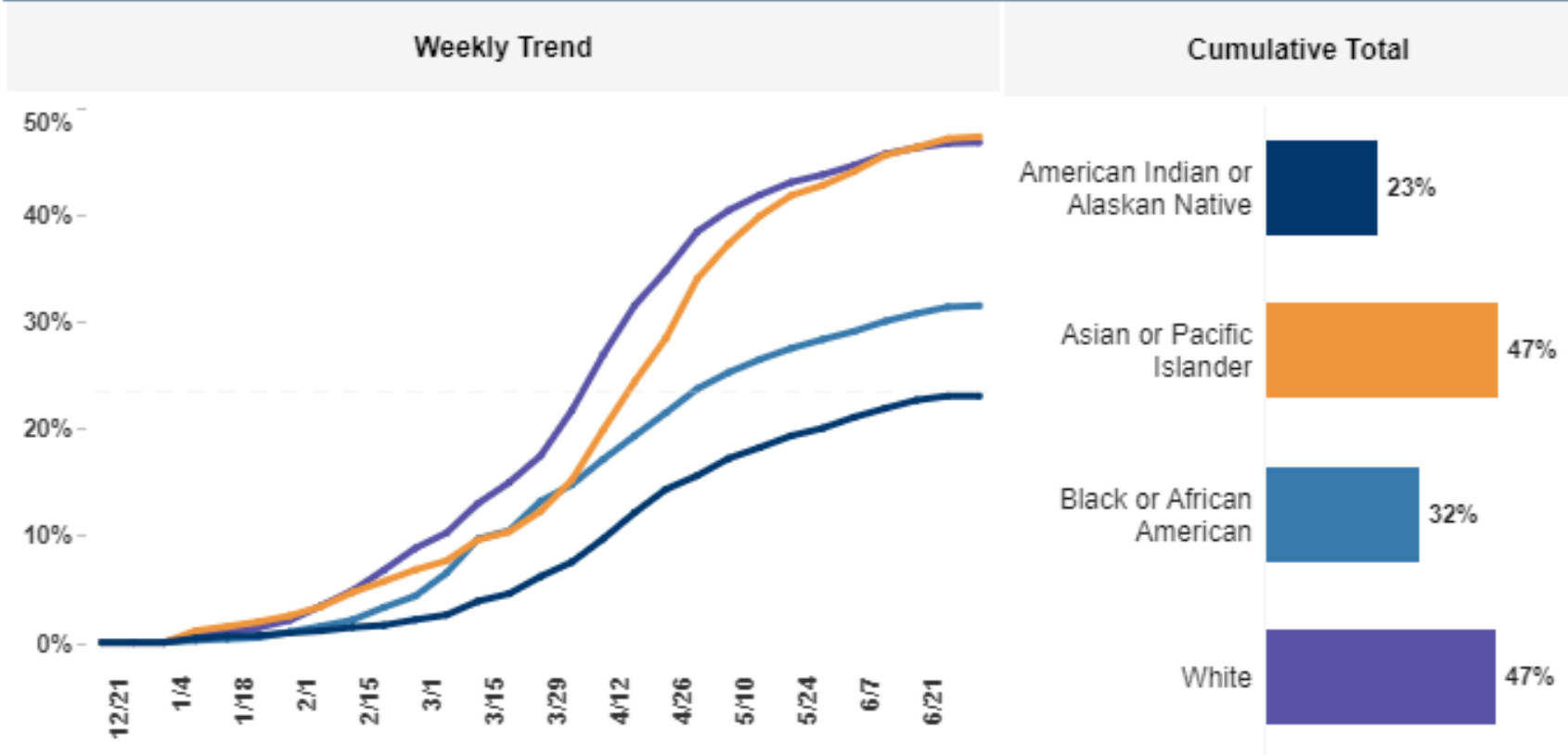
## Percent of People Fully Vaccinated by Race - Buncombe County



Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21



## Percent of Population Fully Vaccinated by Race - Buncombe County

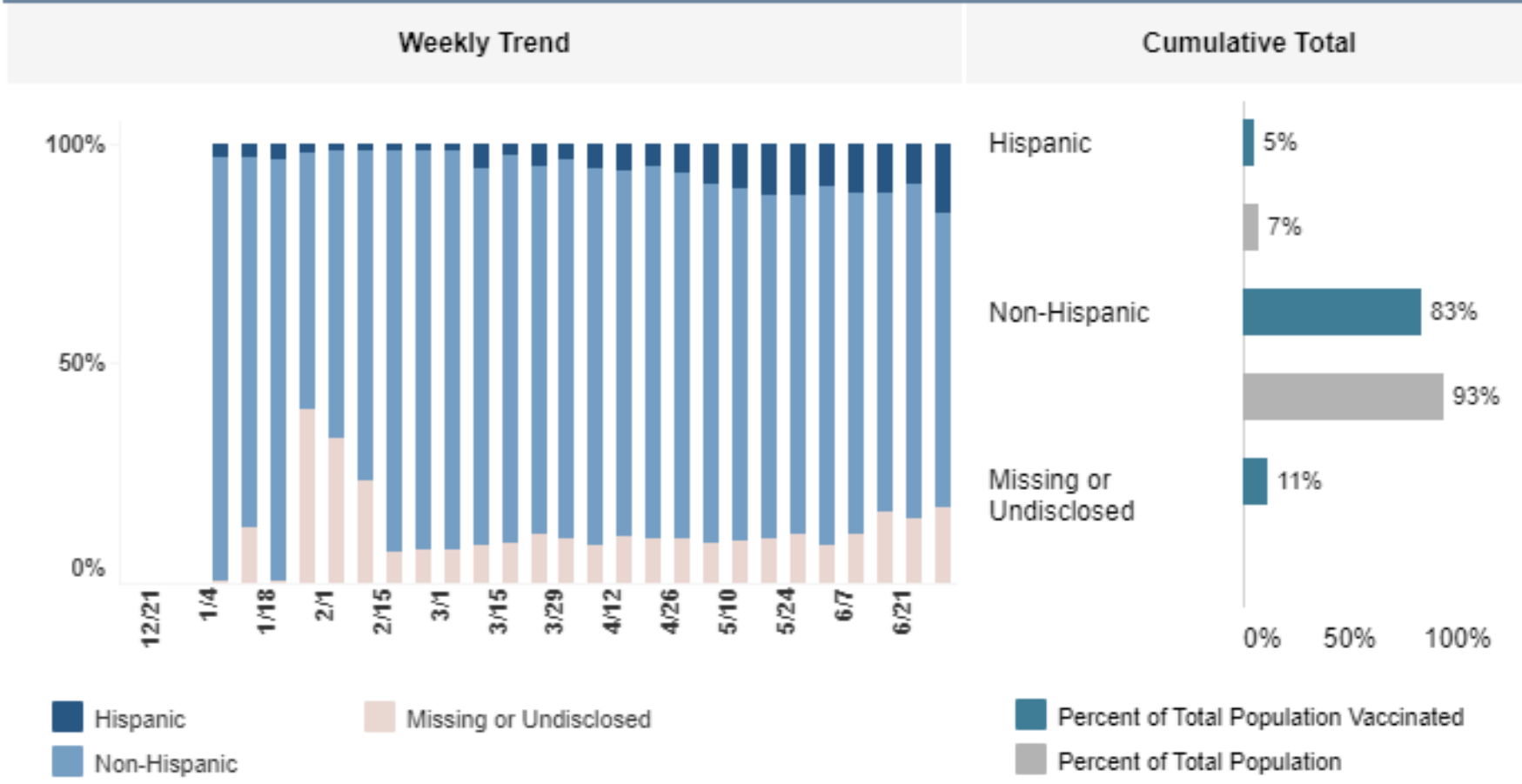


Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21





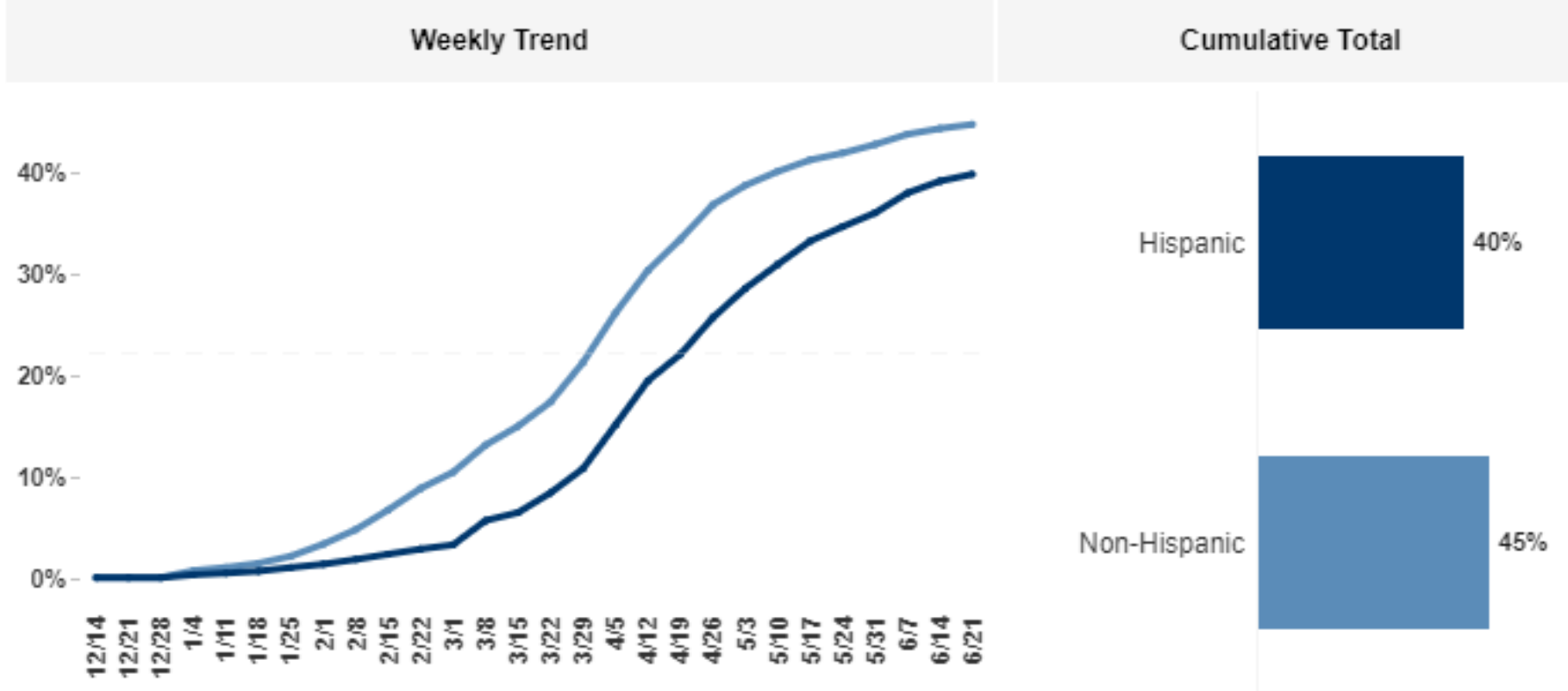
# Percent of People Fully Vaccinated by Ethnicity - Buncombe County



Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21



# Percent of Population Fully Vaccinated by Ethnicity - Buncombe County



Source: <https://covid19.ncdhhs.gov/dashboard/vaccinations>; 6/30/21

