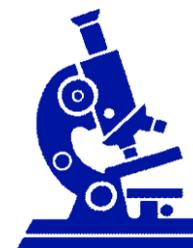


Update: Tick-borne Disease Surveillance in Massachusetts



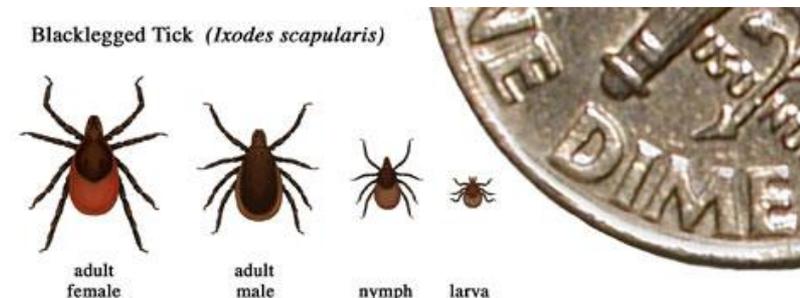
Massachusetts State Public Health Laboratory

Catherine M. Brown, DVM, MSc, MPH
State Epidemiologist and
State Public Health Veterinarian
Department of Public Health
Bureau of Infectious Disease and
Laboratory Sciences

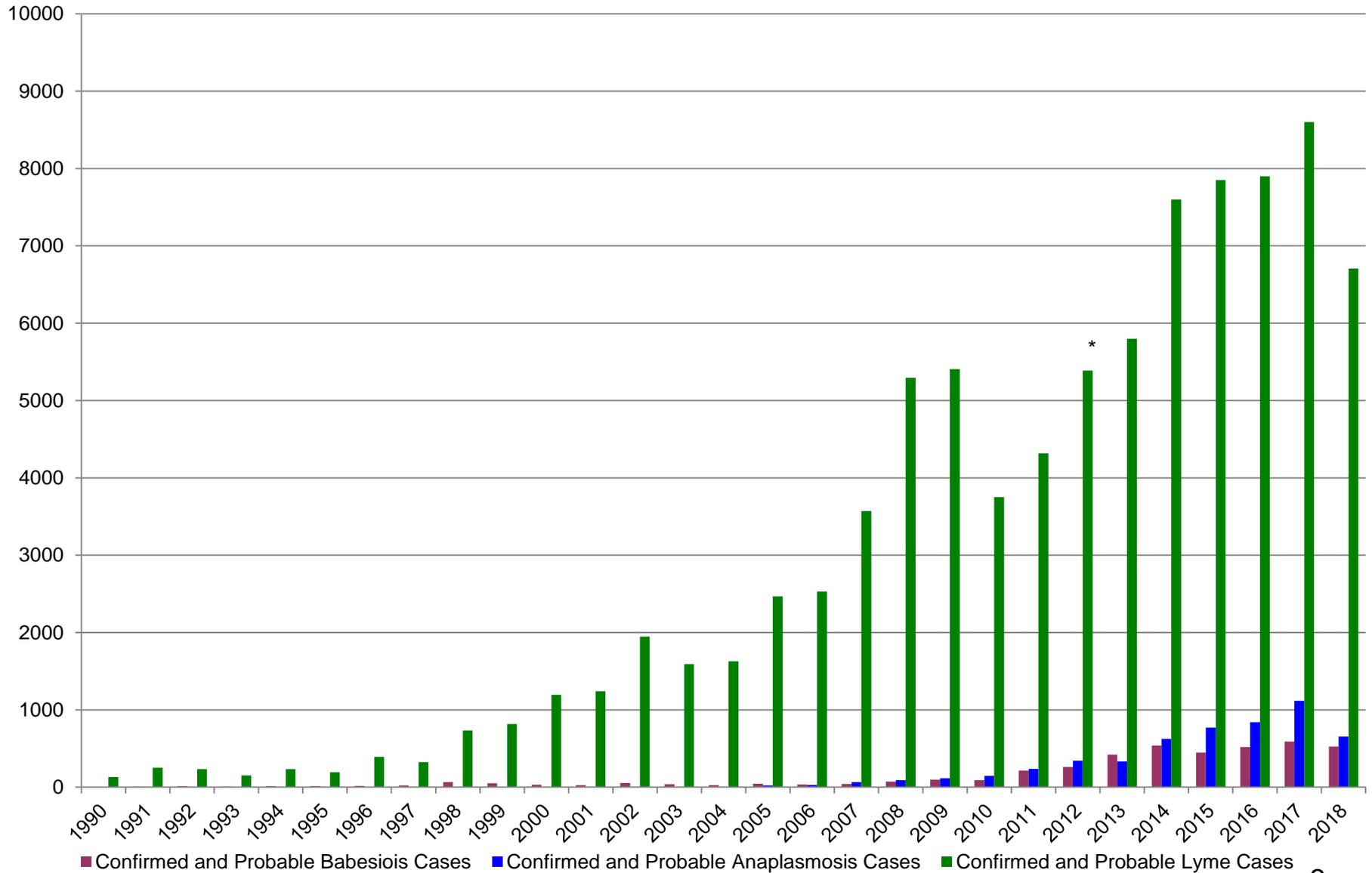


Tick-borne Diseases Transmitted by *Ixodes scapularis*

- Lyme Disease (*Borrelia burgdorferi*)
 - Early and late manifestations, persistent symptoms in some
- Babesiosis (*Babesia microti*)
 - Red blood cell parasite: fever, chills, anemia
- Anaplasmosis (*Anaplasma phagocytophilum*)
 - Bacteria that invades white blood cells: fever, headache, muscle aches, chills, sweating, nausea, and vomiting
- *Borrelia miyamotoi*
 - Newly recognized bacteria as a human pathogen, relapsing fever
- Powassan/Deer Tick Virus
 - Flavivirus related to WNV



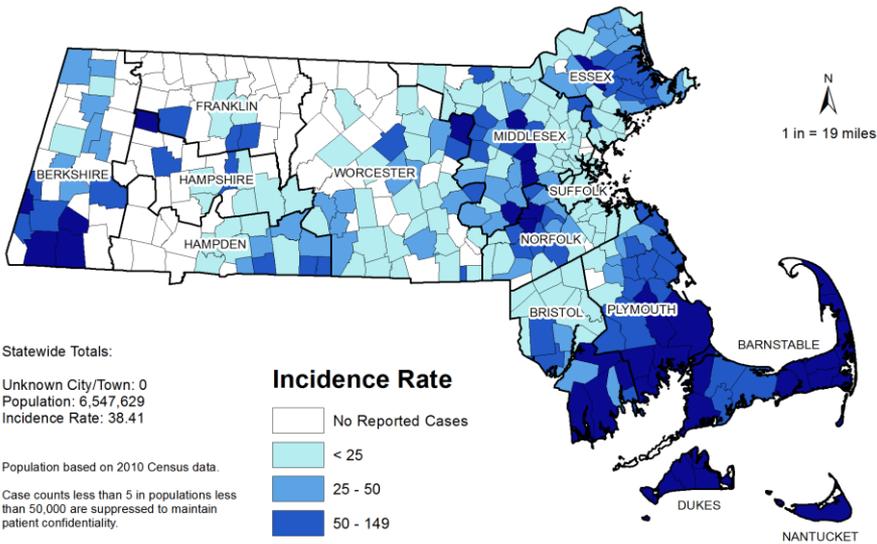
Cases of Lyme Disease, Anaplasmosis and Babesiosis by Year, Reported to MDPH, 1990-2018



*2013: Change to laboratory only reporting for Lyme disease

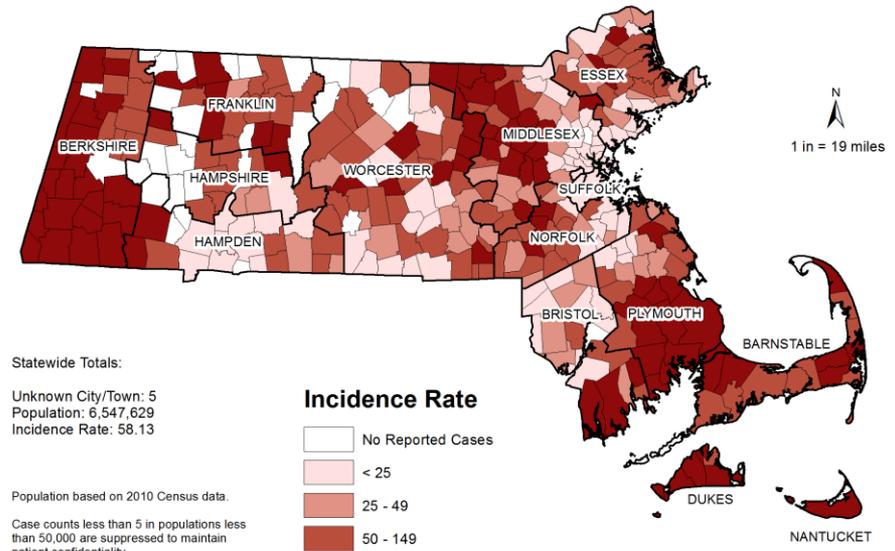
Incidence Rates for Babesiosis and Anaplasmosis in MA 2013-2017

Incidence Rate (per 100,000 Population) of Confirmed and Probable Babesiosis Cases Reported in Massachusetts, 2013-2017



Massachusetts Department of Public Health
 Bureau of Infectious Disease and Laboratory Sciences
 Division of Epidemiology and Immunization

Incidence Rates (per 100,000 Population) of Confirmed and Probable Anaplasmosis Cases Reported in Massachusetts, 2013-2017



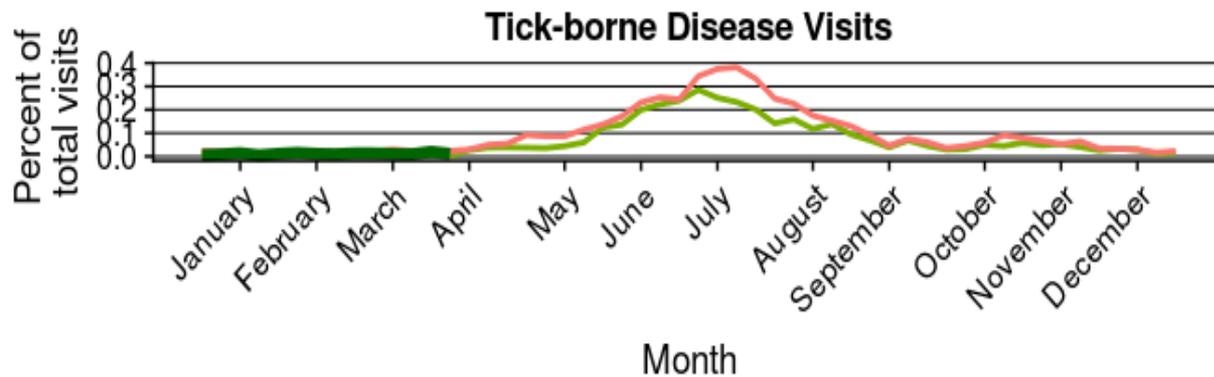
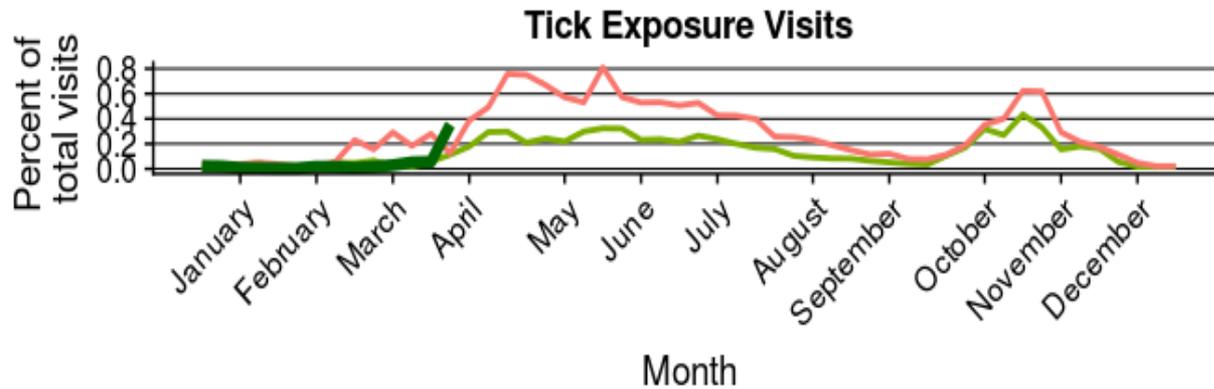
Massachusetts Department of Public Health
 Bureau of Infectious Disease and Laboratory Sciences
 Division of Epidemiology and Immunization

New Monthly Tick Report

The screenshot shows a web browser window with the URL <https://www.mass.gov/info-details/monthly-tick-report-march-2019>. The page header features the Mass.gov logo, a search bar, and navigation links for 'LIVING', 'WORKING', 'LEARNING', 'VISITING & EXPLORING', and 'YOUR GOVERNMENT'. Below the header, the page is offered by the 'Bureau of Infectious Disease and Laboratory Sciences' and the 'Department of Public Health'. A section titled 'THIS IS A PART OF:' includes a link to '2019 Monthly Tick Reports'. The main heading is 'Monthly Tick Report, March 2019', followed by the subtitle 'Massachusetts Department of Public Health monthly tick update'. A green 'TABLE OF CONTENTS' button is visible, with a list of items: 'This month's report' (selected) and 'Highlights'. At the bottom, there is a section for 'This month's report' with a link to 'View the March 2019 Tick Exposure and Tick-borne Disease Report.' A vertical 'Feedback' button is located on the right side of the page.

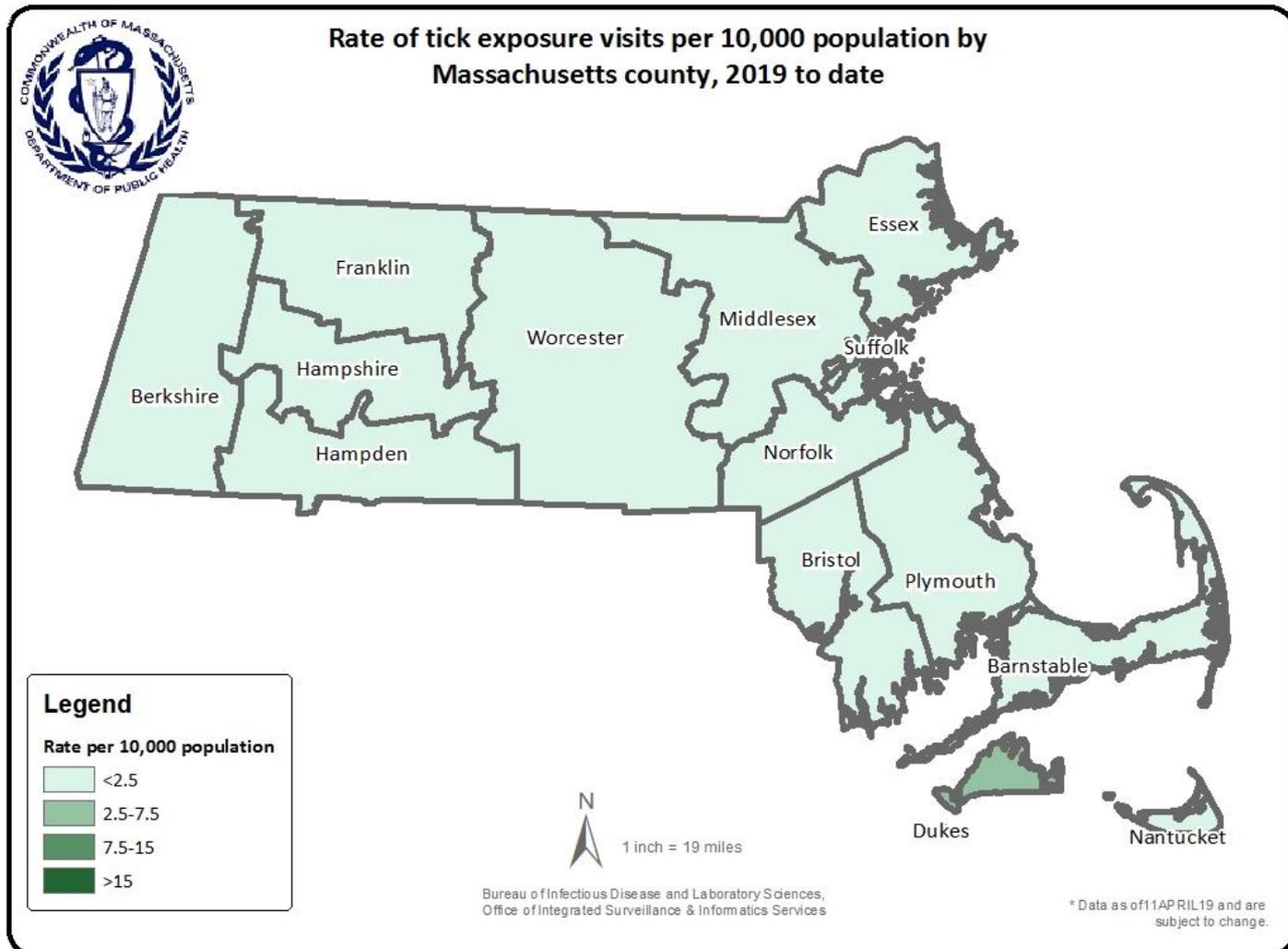
<https://www.mass.gov/report/2019-monthly-tick-reports>

Tick Exposure Syndrome: Percent of total ED visits captured by MDPH SyS with tick exposure syndrome by week and year

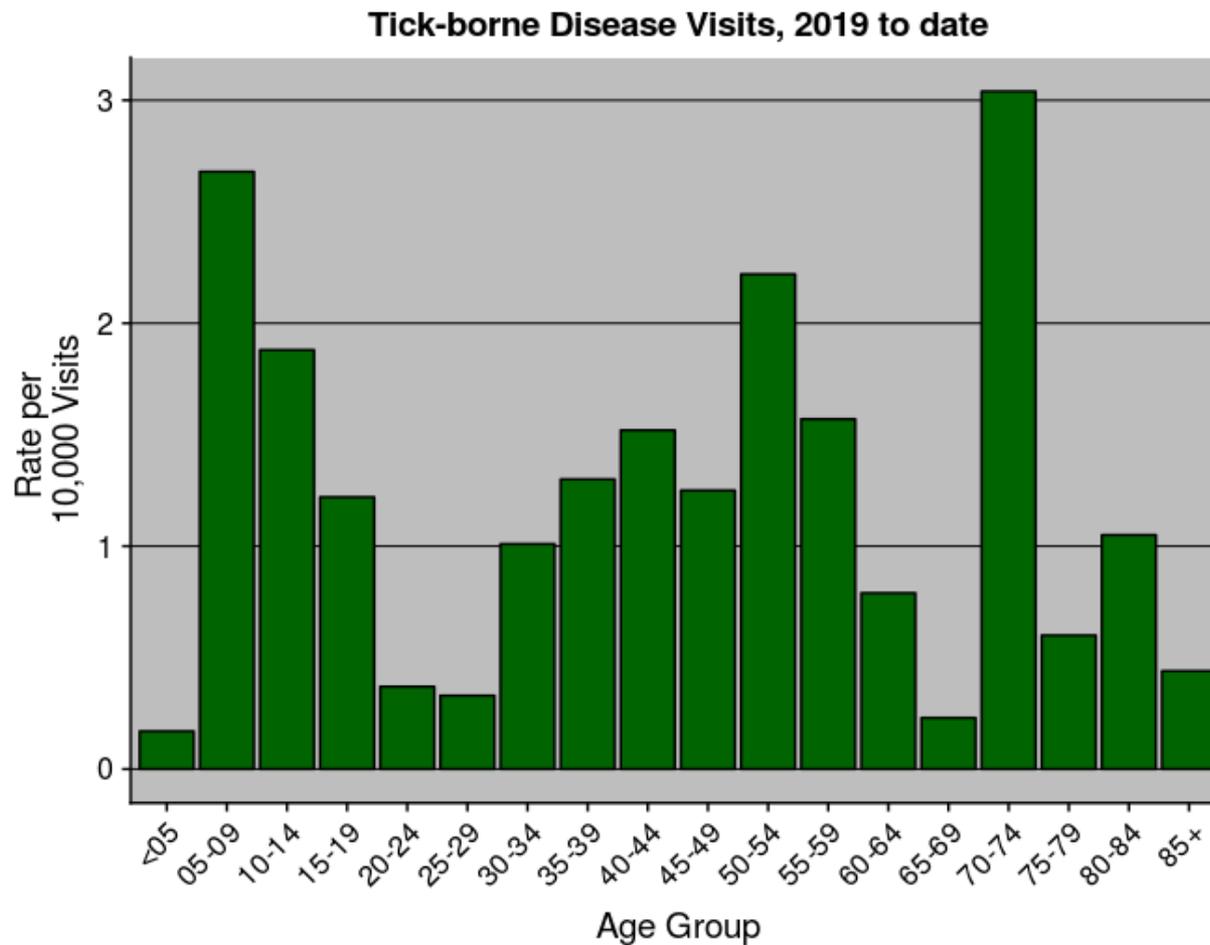


Legend ■ 2019 to date ■ Maximum, 2016-2018 ■ Minimum, 2016-2018

Map: Cumulative



Age Distribution

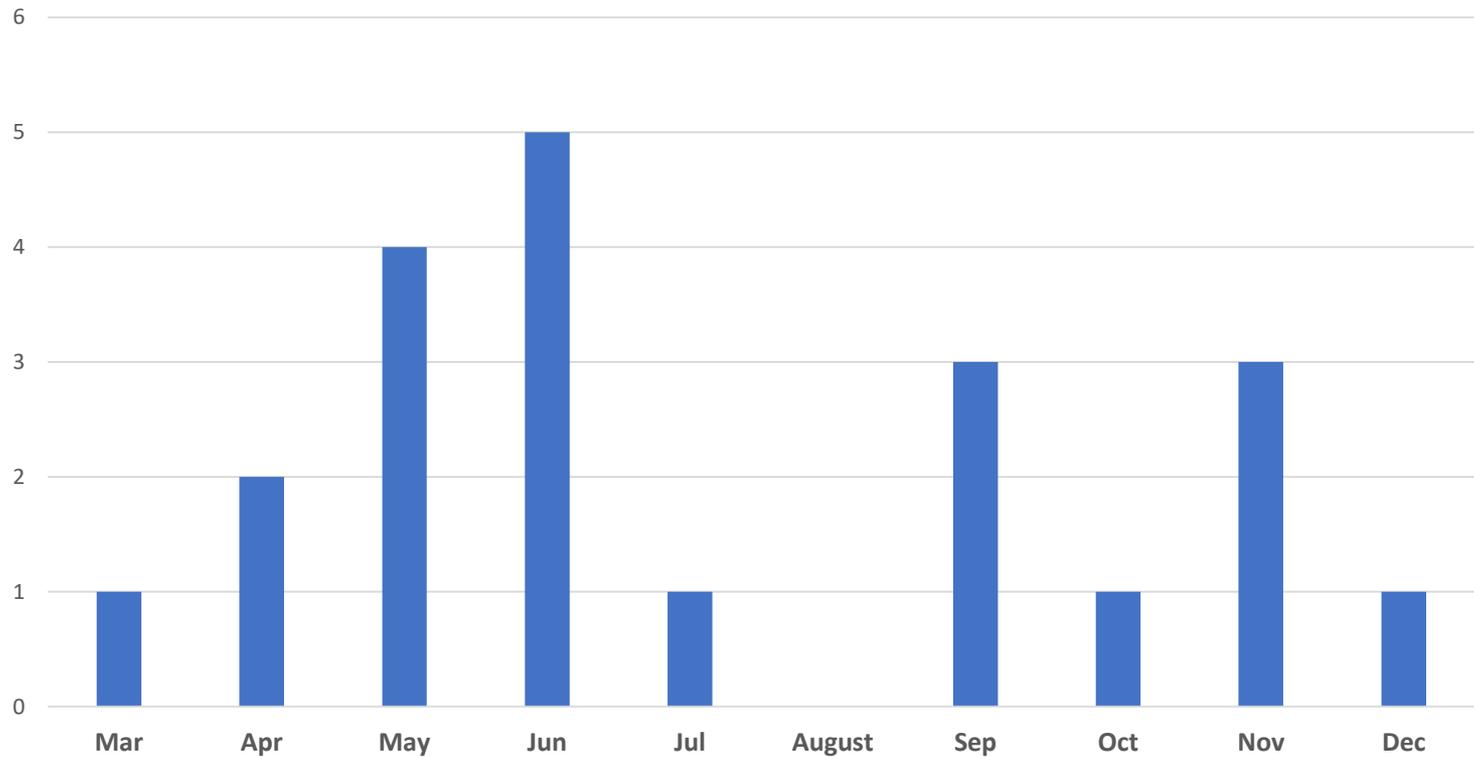


Powassan Virus Massachusetts, 2013-2018

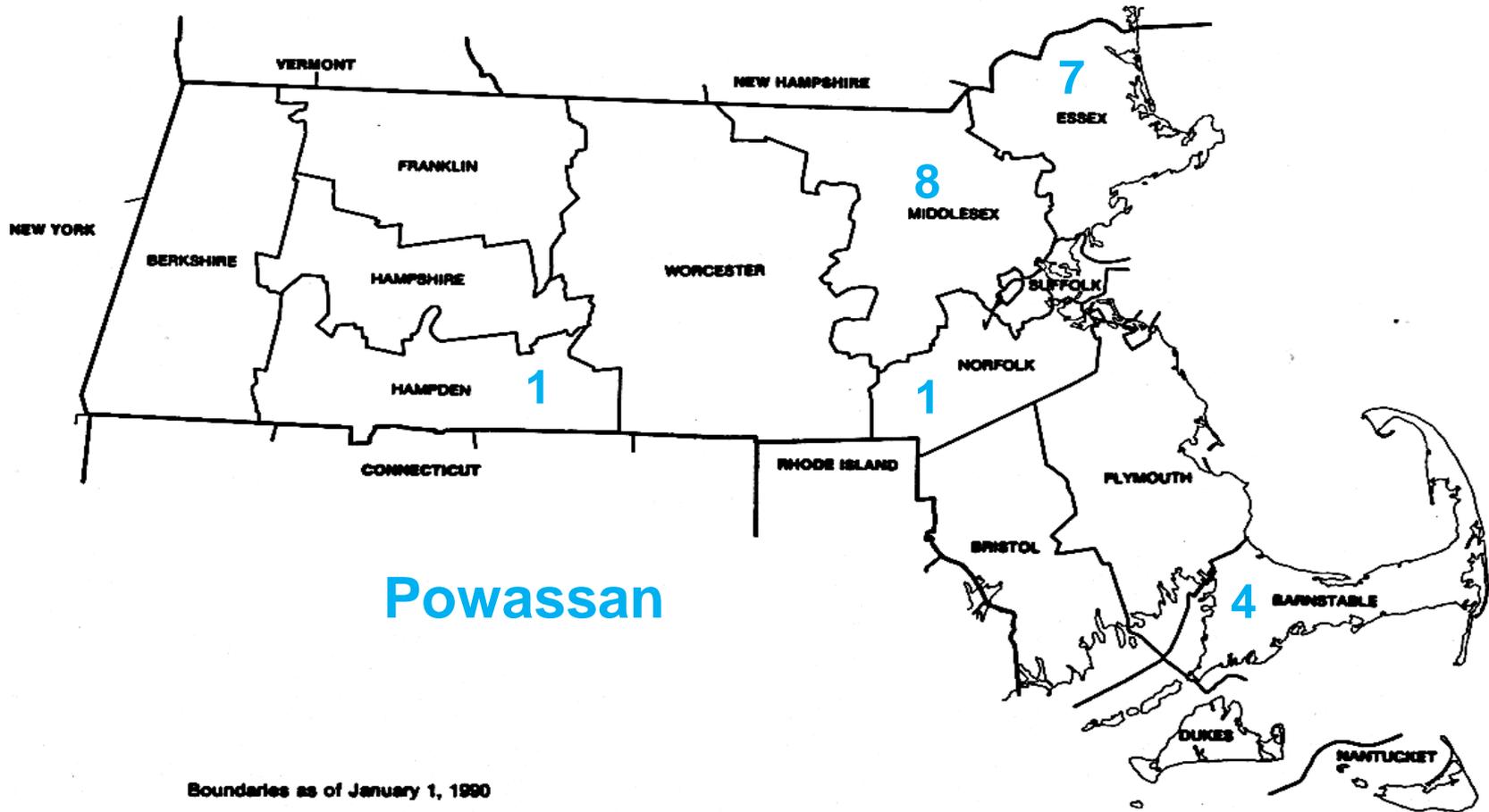
- Made reportable in 2013
 - 2013 – 1 case
 - 2014 – 4 cases
 - 2015 – 3 cases
 - 2016 – 5 cases
 - 2017 – 3 cases
 - 2018 - 5 cases
 - All encephalitis/meningoencephalitis
 - At least 3 fatalities
 - Male 18/female 3
 - Ages 5-82 years (mean 62)
- MA SPHL screening of clinical samples submitted for WNV/EEE testing. Case identification raised provider awareness and increased requests for testing.

Powassan Virus Disease

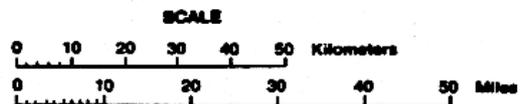
Symptom Onset



Cases by County, 2013-2018



Boundaries as of January 1, 1990



Borrelia miyamotoi

Any acute onset of fever or chills and one or more of the following symptoms or signs:

- headache
- sweats/chills
- myalgia/arthralgia
- malaise/fatigue
- rash
- abdominal cramps, nausea, vomiting, diarrhea dizziness
- confusion/altered mental status
- photophobia
- leukopenia, thrombocytopenia, or elevated amino-transferase levels

Borrelia miyamotoi

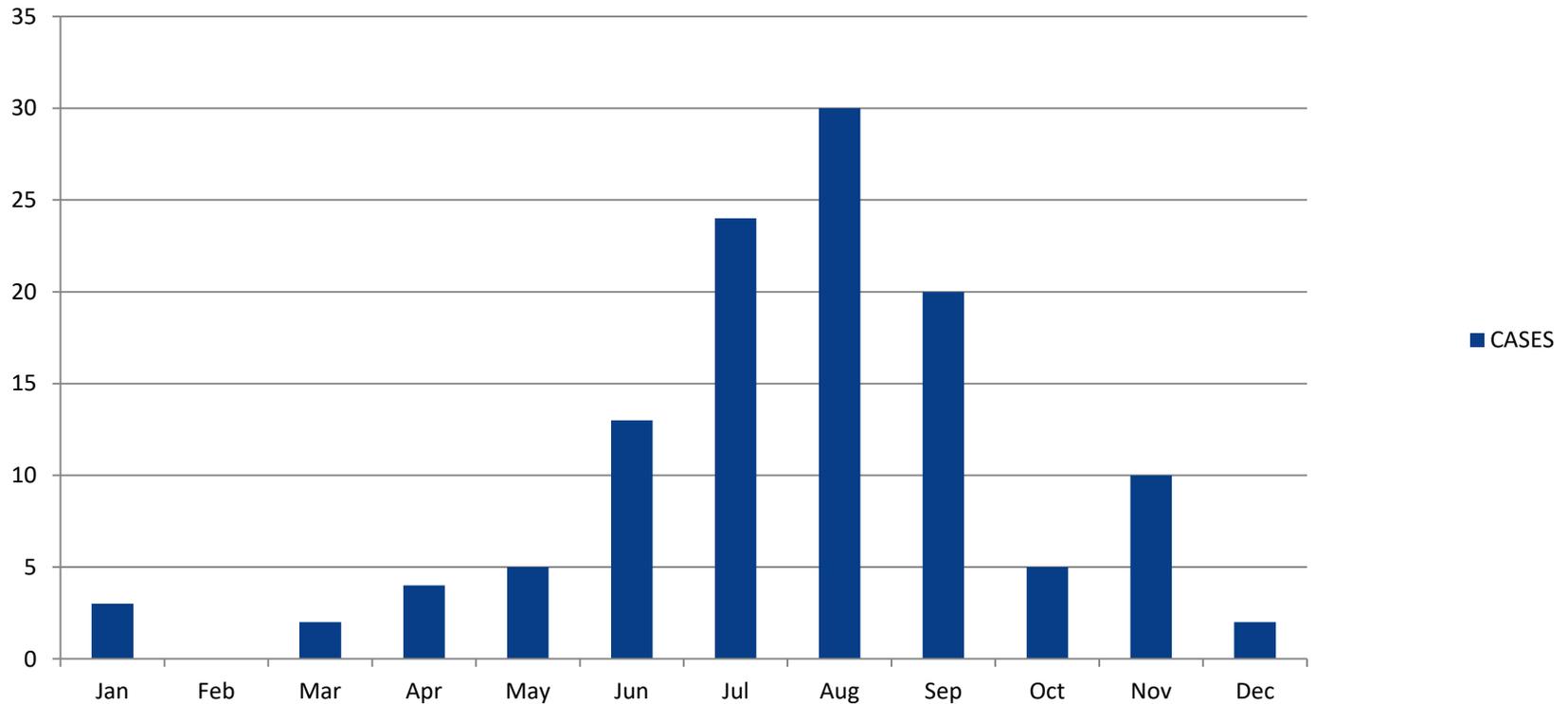
- Newly reportable, limited data
- Working with other jurisdictions on a descriptive case summary
 - NJ, NYC, NY, ME, MN, WI

Borrelia miyamotoi, 2013-2018

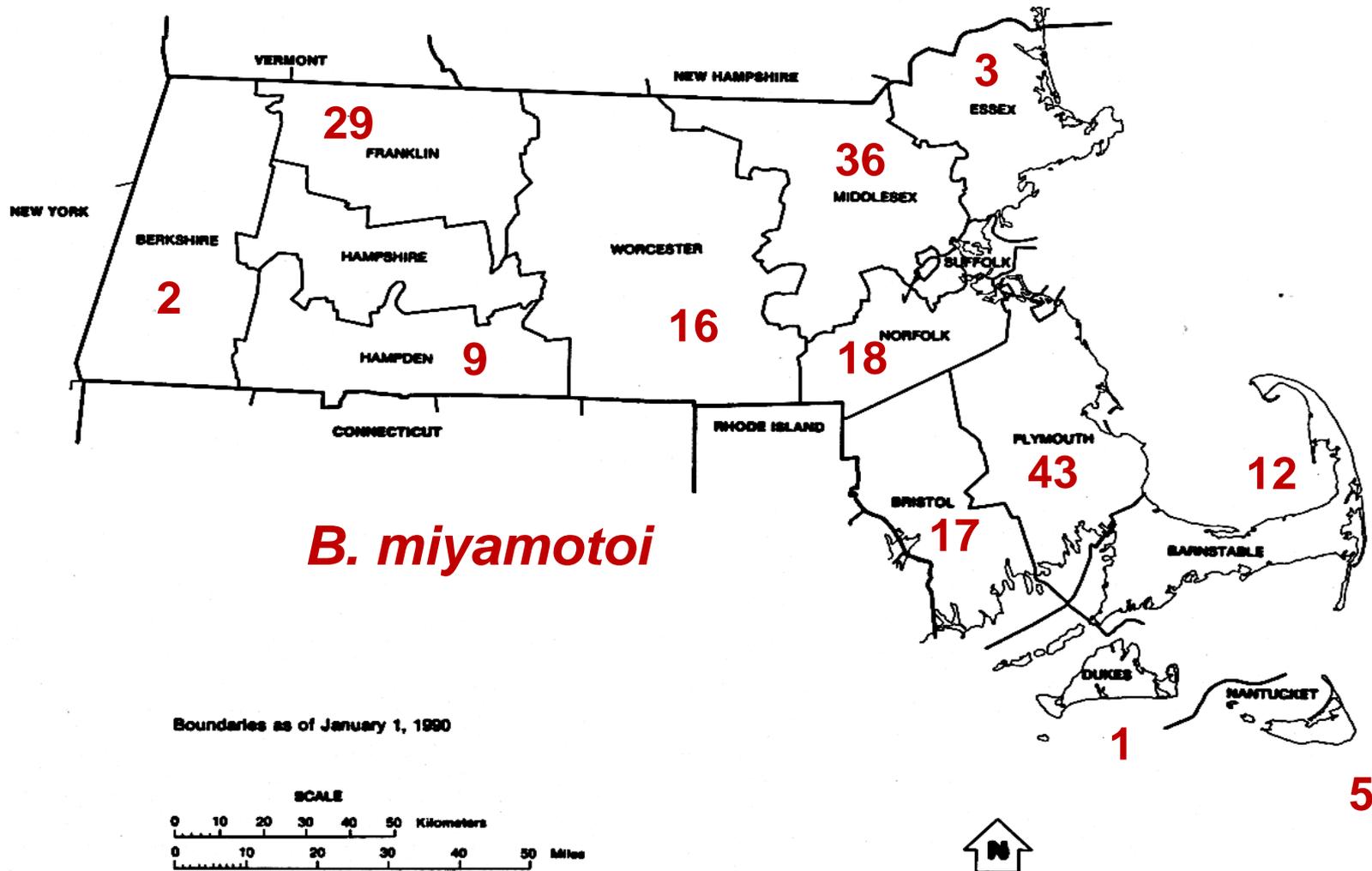
- 217 cases
- 50% male
- Age range: 12-86, median 54 y/o
- At least 14 hospitalizations
 - Average stay = 3 days, range 1-7
 - No fatalities

Symptom Onset

Cases by Month of Symptom Onset



Cases by County, 2013-2018



Massachusetts *Ixodes scapularis* Ticks Tested in the Laboratory of Medical Zoology, 2015-2018, Percent Positive by PCR

(N=10,471 ticks tested, except Powassan=2,772)

