Commonwealth of Massachusetts
Department of Public Health

Helping People Lead Healthy Lives In Healthy Communities

Update: Tick-borne Disease Surveillance in Massachusetts

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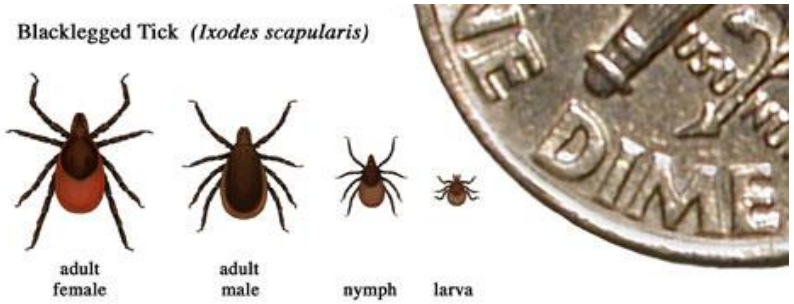
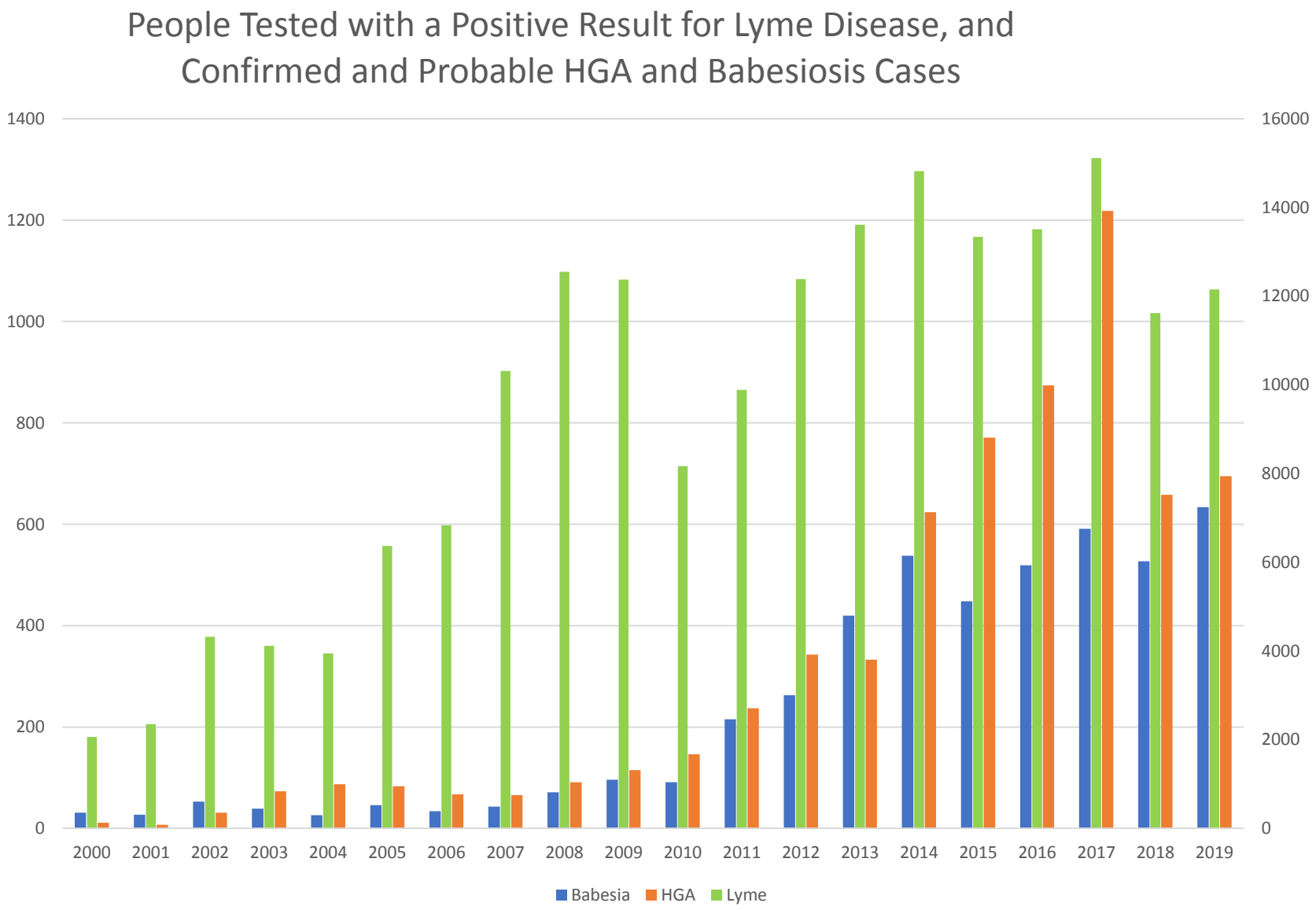
Tick-borne DiseasesTransmitted by *Ixodes scapularis*

- Lyme Disease (*Borrelia burgodorferi*)
  - 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




People Tested with a Positive Result for Lyme Disease, and Confirmed and Probable HGA and Babesiosis Cases
1400
1200
1000
800
600
400
200
0
16000
14000
12000
10000
8000
6000
4000
2000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
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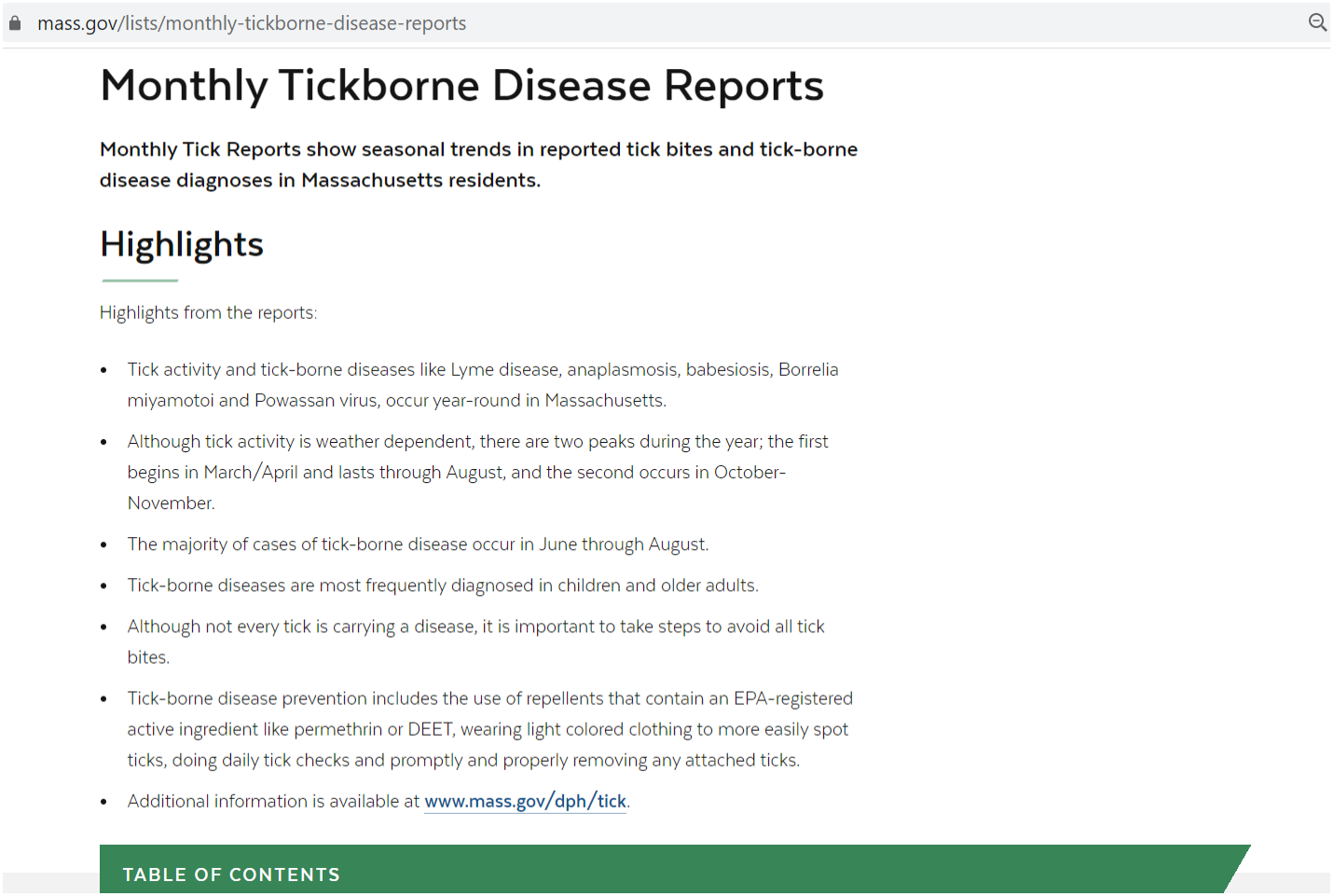
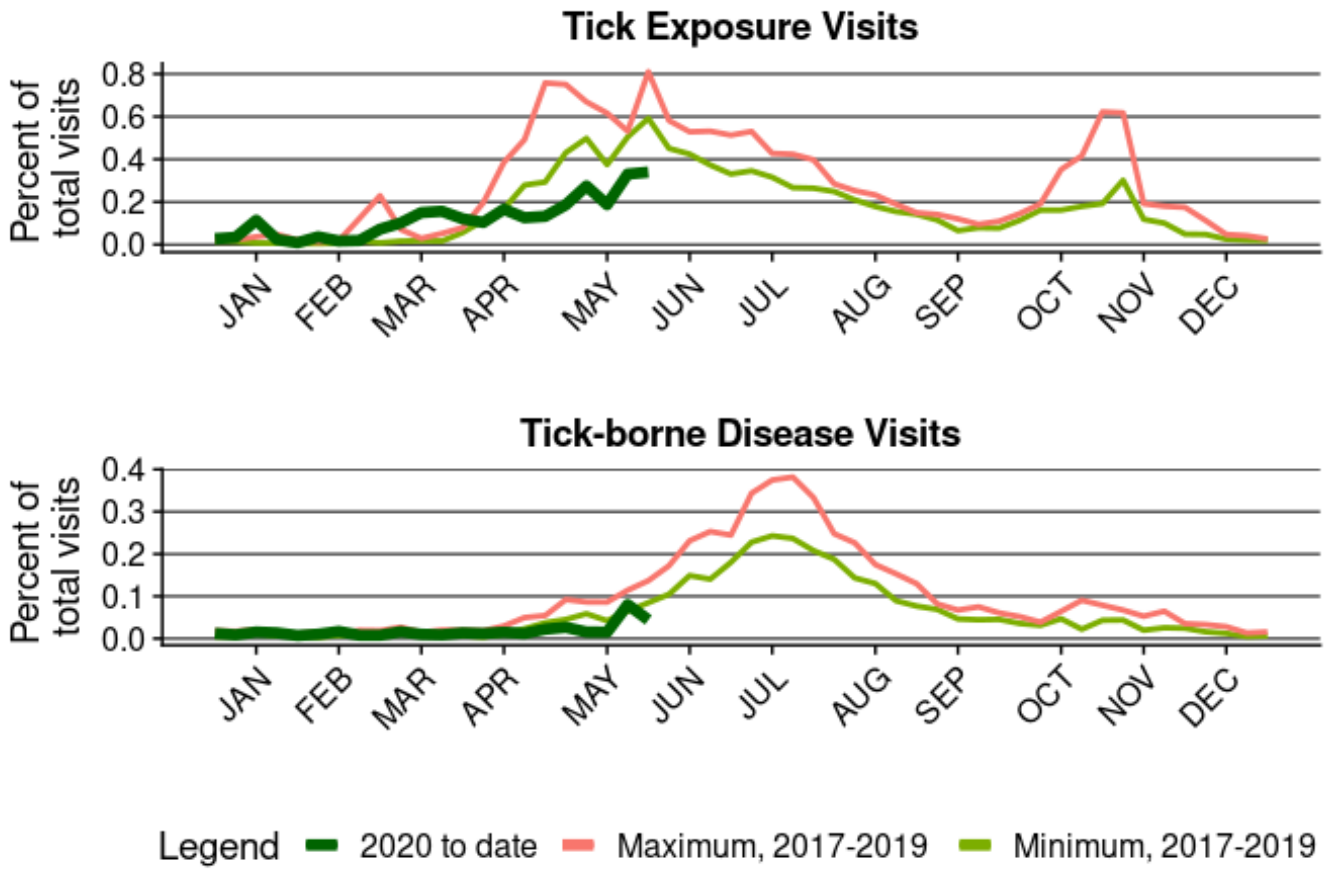
2012
2013
2014
2015
2016
2017
2018
2019
Babesia
HGA
Lyme

Monthly Tickborne DIsease Report

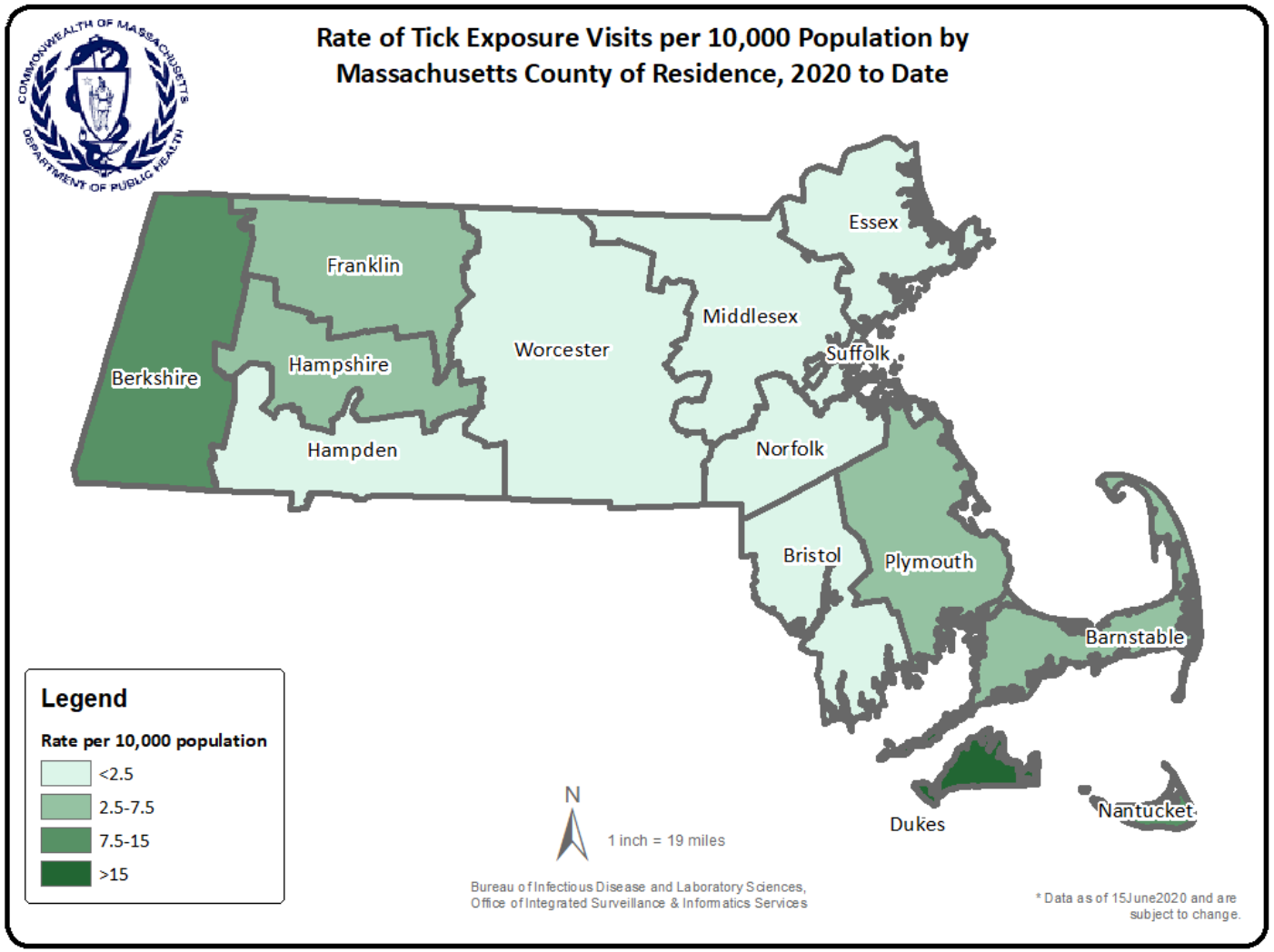


https://www.mass.gov/lists/monthly-tickborne-disease-reports

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



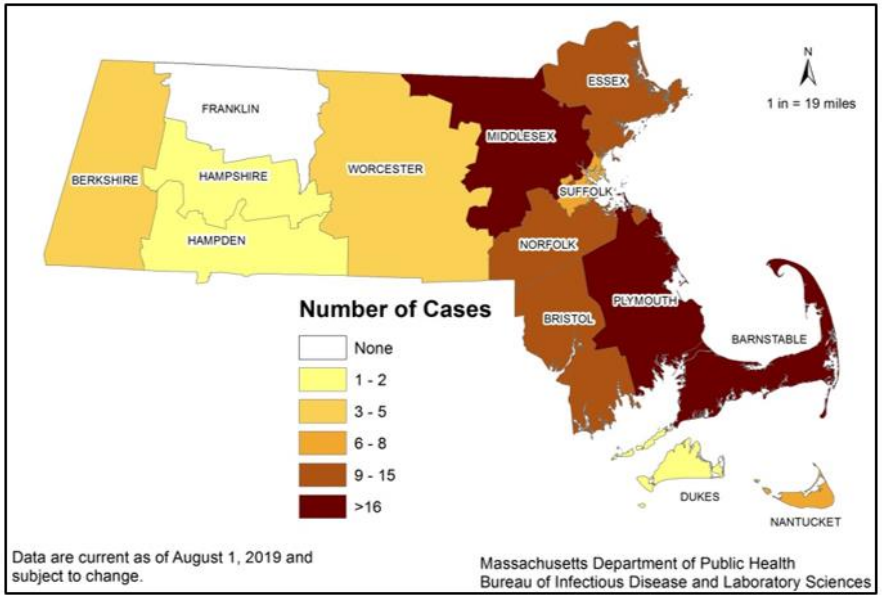
Map: Cumulative



Surveillance Highlights – *B. miyamotoi*

- 136 confirmed and probable cases of Borrelia miyamotoi were reported between 2014 and 2018. Overall, 306 suspect cases of Borrelia miyamotoi were investigated.
- Middlesex County led the state with 31 confirmed or probable cases, followed by Plymouth County (28) and Barnstable County (16).
- The majority of cases occurred in June July, August and September, only 35% of cases reported awareness of a recent tick bite.
- The most commonly reported symptoms include: fever (91%), fatigue (87%), muscle aches/pain (85%), headache (82%), chills (82%), joint aches/pains (78%), and sweats (57%). There were no known fatalities.
- People age 50 years and older continue to be at greatest risk for clinical disease (57% of patients identified with Borrelia miyamotoi were 50 or older) and 51% of the cases were male.

Borrelia miyamotoi



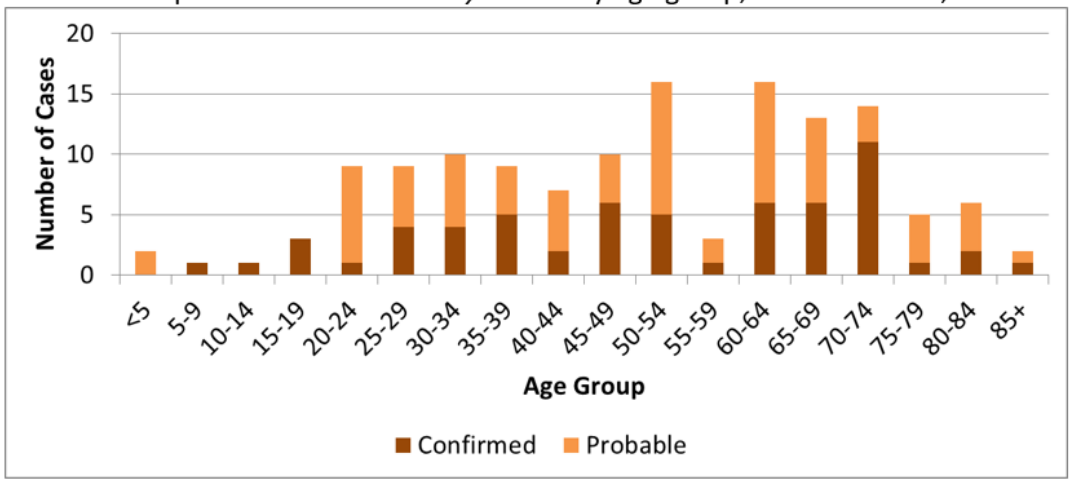
County	2018 Cases Confirmed and Probable	Frequency (%)
Barnstable	3	5%
Berkshire	1	2%
Bristol	9	15%
Dukes	0	0%
Essex	2	3%
Franklin	0	0%
Hampden	1	2%
Hampshire	1	2%
Middlesex	17	28%
Nantucket	0	0%
Norfolk	8	13%
Plymouth	9	15%
Suffolk	6	10%
Worcester	3	5%
State Total	**60**	**100%**

Table 1: *B. miyamotoi* case counts and proportions by county of residence, Massachusetts, 2018.

Data as of August 1, 2019 and are subject to change.

Borrelia miyamotoi

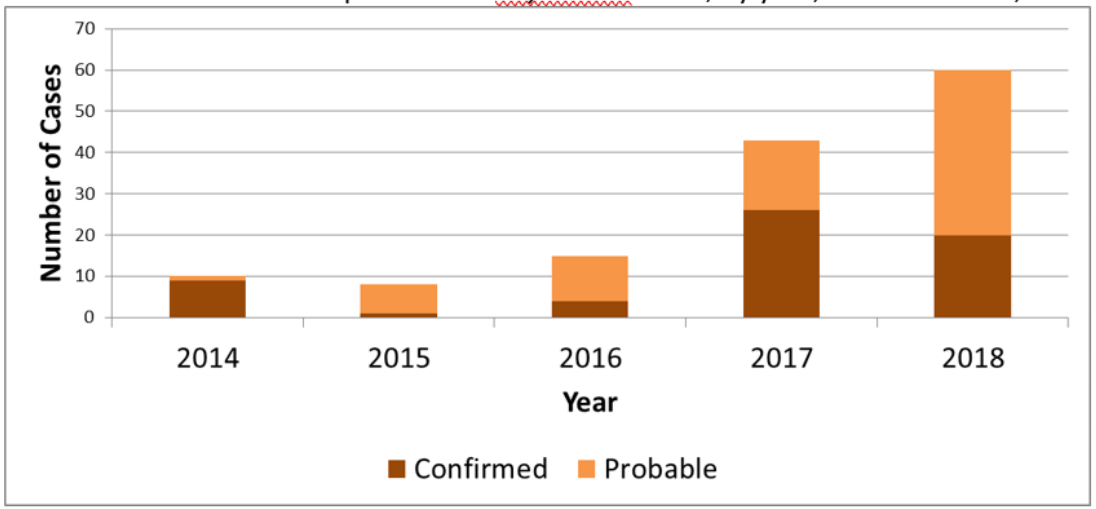
Figure 2.
Number of confirmed and probable cases of *B. miyamotoi* by age group, Massachusetts, 2014-2018



2019:
33 confirmed and probable cases

88 suspect cases not investigated

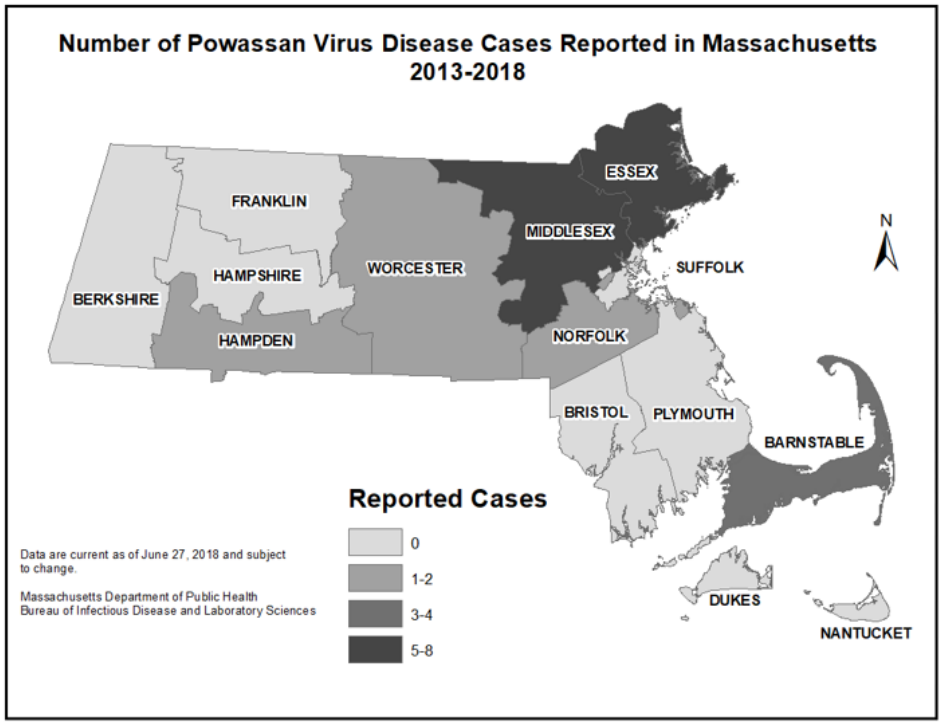
Figure 3. Number of confirmed and probable *B. miyamotoi* cases, by year, Massachusetts, 2014-2018



Surveillance Highlights - POWV

- Although at least one case of Powassan virus was identified in Massachusetts before 2013, testing for the disease became more common in 2013.
- Between 2013 and 2018, 23 cases of Powassan virus infection were detected in Massachusetts residents.
- Twenty-one of those cases (91%) were between the ages of 51 and 82. Twenty (87.0%) of cases were male.
- Fifteen (65%) cases were diagnosed with encephalitis, six (26%) with meningoencephalitis and 2 (9%) cases with meningitis.
- Sixteen (69.0%) cases reported known tick-bites before the onset of symptoms. This is in contrast to other tick-borne diseases where tick bites are not usually recognized.
- All 23 cases required hospitalization and there were 6 deaths.

Powassan virus



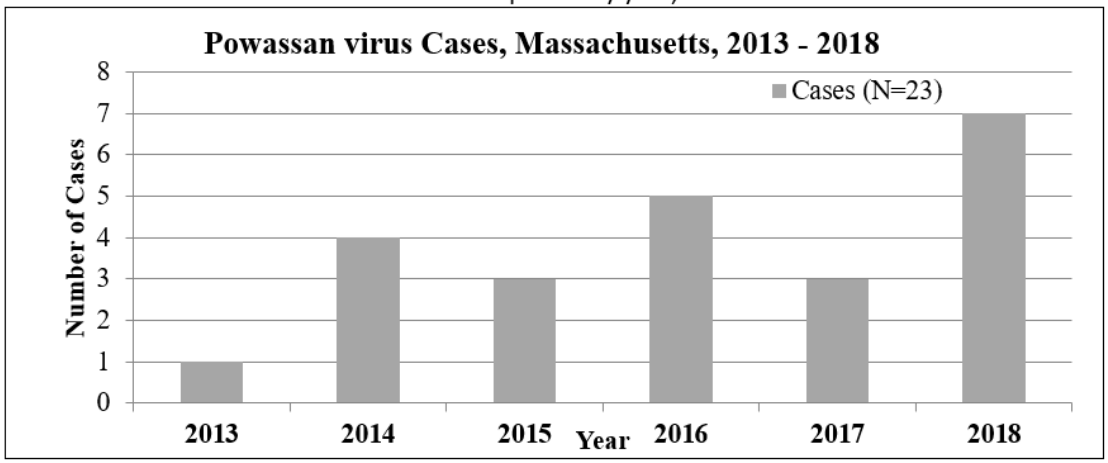
County	Confirmed Cases (2013-2018)
Middlesex	8
Essex	7
Barnstable	4
Hampden	2
Norfolk	1
Worcester	1
Berkshire	0
Hampshire	0
Franklin	0
Suffolk	0
Bristol	0
Plymouth	0
Dukes	0
Nantucket	0

Map 1 and Table 1: Number of Powassan virus disease cases in Massachusetts residents reported between 2013 and 2018 by county of residence.

Data as of May 16, 2019 and are subject to change.

Powassan virus

Figure 2: Number of Powassan virus disease cases reported by year, Massachusetts 2013-2018.



2019:
8 confirmed cases

Figure 3: Number of Powassan virus disease cases by month of diagnosis, Massachusetts 2013-2018

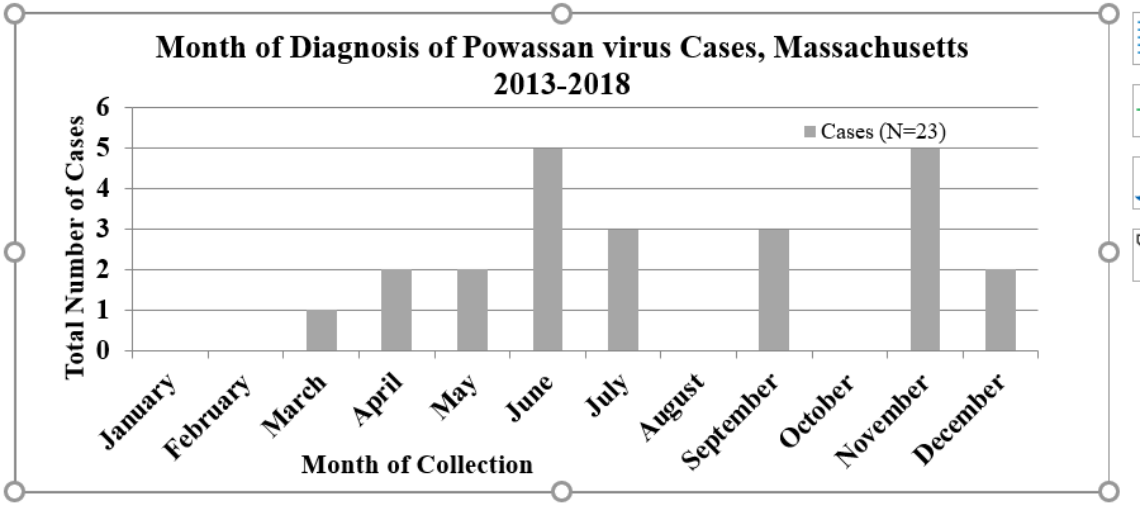
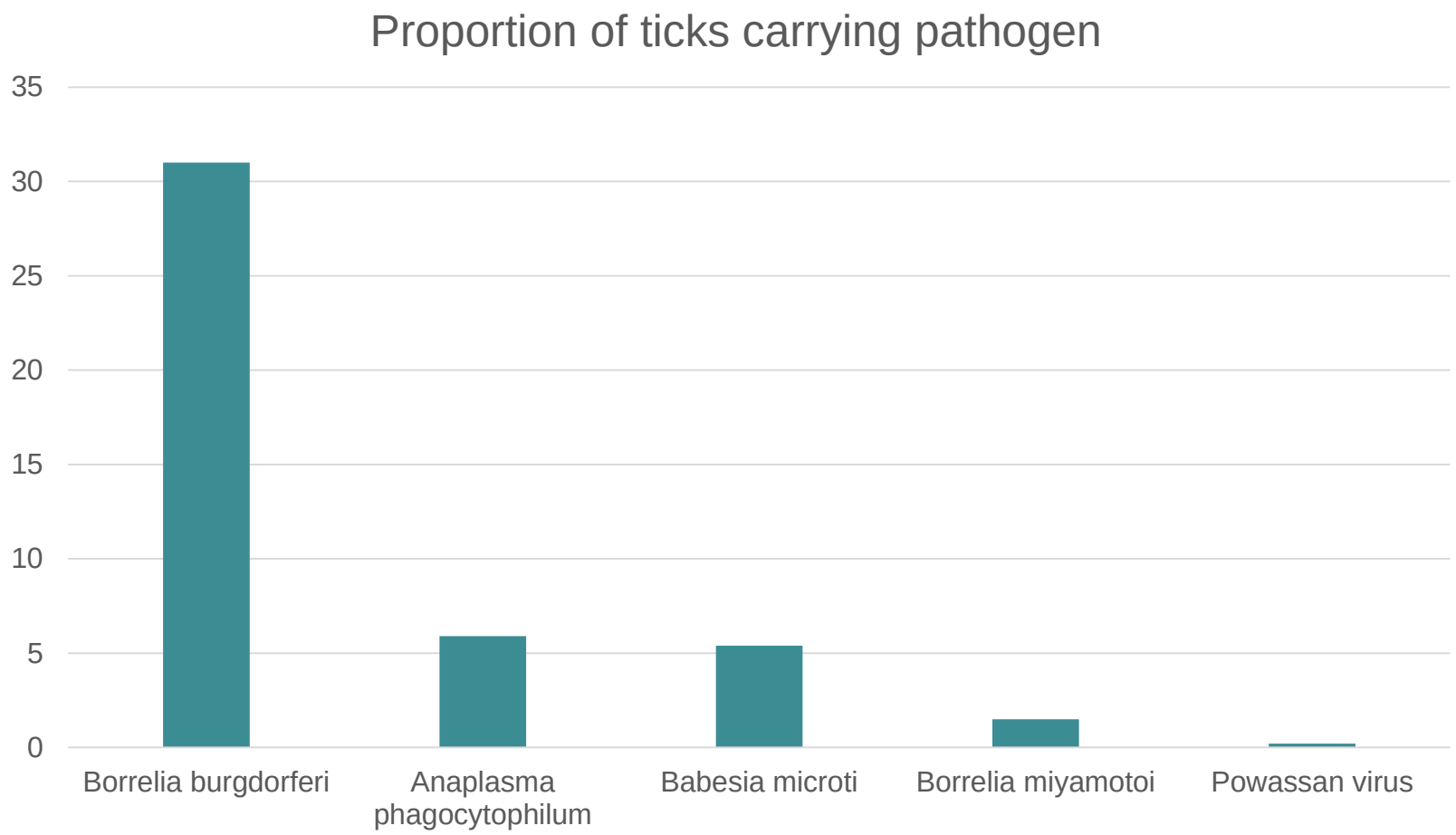


Table 2: Frequency of symptoms reported among Powassan virus disease cases, Massachusetts 2013-2018

Umass Amherst – Tick Reports



https://www.tickreport.com/stats