Update: Tick-borne Disease Surveillance in Massachusetts
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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, 1990-2017

*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

Statewide Totals:
Unknown City/Town: 0
Population: 6,547,629
Incidence Rate: 38.41

Population based on 2010 Census data.
Case counts less than 5 in populations less than 50,000 are suppressed to maintain patient confidentiality.
Data are current as of June 4, 2016 and subject to change.

Incidence Rate
- No Reported Cases
- < 25
- 25 - 50
- 50 - 149
- >= 150

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

Statewide Totals:
Unknown City/Town: 5
Population: 6,547,629
Incidence Rate: 58.13

Population based on 2010 Census data.
Case counts less than 5 in populations less than 50,000 are suppressed to maintain patient confidentiality.
Data are current as of June 4, 2016 and subject to change.
The national conversation around how to conduct Lyme disease surveillance has been going on for over a decade with little progress.

Massachusetts has been an leader in being the first state to take the step of changing to a laboratory only surveillance system.

This has several benefits:
- 1) relying on laboratory reporting is a more sustainable surveillance methodology long-term;
- 2) reduces clinician reporting burden; and
- 3) has re-invigorated the national conversation around developing a more useful and sustainable Lyme disease surveillance system.
Standard Surveillance and Laboratory Only Comparison
Tick Exposure Syndrome:
Percent of total ED visits captured by MDPH SyS with tick exposure syndrome by week and year

Year
- 2015, n= 1158599
- 2016, n= 2345292
- 2017, n= 2824962
- 2018, n= 1013857
Powassan Virus Massachusetts, 2013-2017

• Made reportable in 2013
  – 2013 – 1 case
  – 2014 – 4 cases
  – 2015 – 3 cases
  – 2016 – 5 cases
  – 2017 – 3 cases

• All encephalitis/meningoencephalitis
  – At least 3 fatalities

• Male 15/female 1

• Ages 21-82 years (mean 64)

• Month of onset
  – Early summer and fall

MA SPHL screening of clinical samples submitted for WNV/EEE testing. Case identification raised provider awareness and increased requests for testing.
Cases by County

Powassan
**Borrelia miyamotoi** Massachusetts, 2013-2017

- Newly reportable, limited data
- Relapsing fever, chills, myalgia
- 78 cases (48 confirmed, 30 probable)
- 52% male
- Age range: 12-86, median 54 y/o
- Month of onset
  - June, July, August, September
- At least one hospitalization
  - No fatalities
Cases by County, 2013-2017

B. miyamotoi

Boundaries as of January 1, 1990

SCALE

0 10 20 30 40 50 Kilometers

0 10 20 30 40 50 Miles
Massachusetts *Ixodes scapularis* Ticks Tested in the Laboratory of Medical Zoology, 2015-2017, Percent Positive by PCR

(N=7192 ticks tested, except Powassan=1554)