



Report to Maine Legislature

Lyme and other Tickborne Illnesses

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Report to Maine Legislature – Lyme Disease

During the first special session of the 123rd Legislature in 2008, hearings and discussion over proposed legislation regarding the reporting of Lyme disease led to Chapter 561 of the Session Laws. This law, An Act to Implement the Recommendations of the Joint Standing Committee on Insurance and Financial Services Regarding Reporting on Lyme Disease and Other Tickborne Illnesses, directed Maine Center for Disease Control and Prevention to submit an annual report to the joint standing committee of the Legislature having jurisdiction over health and human services matters and the joint standing committee of the Legislature having jurisdiction over health insurance matters. This report was to include recommendations for legislation to address public health programs for the prevention and treatment of Lyme disease and other tickborne illnesses in the state, as well as to address a review and evaluation of Lyme disease and other tickborne illnesses in Maine.

A bill in the second session of the 124th Legislature in 2010 amended these laws to include information on diagnosis of Lyme disease.

Title 22, Chapter 266-B, Subsection 1645 in Maine statutes, directs Maine CDC to report on:

- I. The incidence of Lyme disease and other tickborne illness in Maine
- II. The Diagnosis and Treatment Guidelines for Lyme disease recommended by Maine Center for Disease Control and Prevention and the United States Department of Health and Human Services, Centers for Disease Control and Prevention
- III. A summary or bibliography of peer-reviewed medical literature and studies related to the diagnosis, medical management, and treatment of Lyme disease and other tickborne illnesses, including, but not limited to, the recognition of chronic Lyme disease and the use of long-term antibiotic treatment
- IV. The education, training, and guidance provided by Maine Center for Disease Control and Prevention to health care professionals on the current methods of diagnosing and treating Lyme disease and other tickborne illnesses
- V. The education and public awareness activities conducted by Maine Center for Disease Control and Prevention for the prevention of Lyme disease and other tickborne illnesses; and
- VI. A summary of the laws of other states enacted during the last year related to the diagnosis, treatment, and insurance coverage for Lyme disease and other tickborne illnesses based on resources made available by the federal Centers for Disease Control and Prevention or other organizations.

This is the eleventh annual report to the Legislature and includes an update on activities conducted during 2018.

Executive Summary

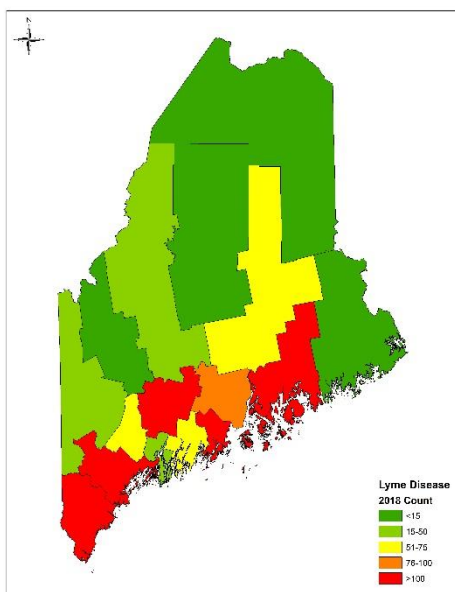
Lyme disease is a notifiable condition in the State of Maine. The goal of Lyme disease surveillance is to help define demographic, geographic, and seasonal distribution; monitor disease trends; identify risk factors for transmission; and promote prevention and education efforts among the public and medical communities. Epidemiologists classify reported cases as confirmed, probable, suspect, and not a case based on clinical symptoms and laboratory testing interpreted using criteria established by the Council of State and Territorial Epidemiologists. The surveillance case definition is not intended to be used in clinical diagnosis. Lyme disease surveillance is passive, dependent upon reporting, and therefore likely to be an under-representation of the true burden of Lyme disease in Maine. Federal CDC released a statement in 2013 that the true burden of Lyme disease may be up to ten times the number of reported cases.

Maine Lyme Disease Summary, 2018 (Preliminary data as of January 15, 2019)

- 1,373 confirmed and probable cases
- Most common symptoms of reported cases* of Lyme disease in Maine included:
 - Erythema Migrans (characteristic expanding rash): 630 cases (46%)
 - Arthritis (joint swelling): 463 cases (34%)
 - Neurological (Bell's Palsy or other cranial neuritis): 122 cases (9%)

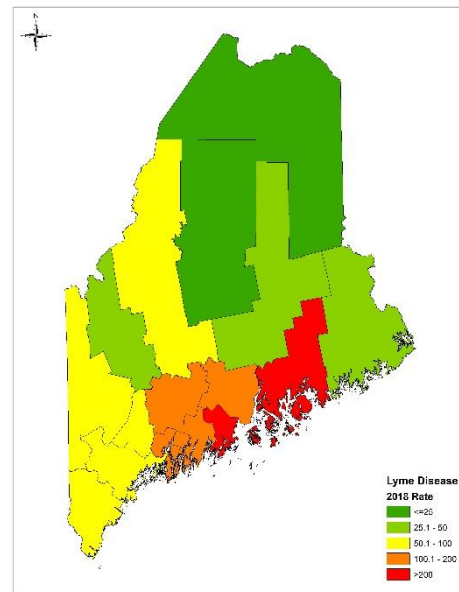
* Cases could report more than one symptom
- Hospitalization occurred in 40 cases (3%).
- Among case patients with a reported date of symptom onset, 57% began experiencing symptoms during June, July, or August. Date of symptom onset is missing for 27% of cases.

Confirmed and Probable Cases of Lyme Disease – Maine 2018*



* 2018 data are preliminary as of 01/15/2019

Lyme Disease Cases per 100,000 persons (Rate) – Maine 2018*



* 2018 data are preliminary as of 01/15/2019

I. The Incidence of Lyme disease and other tickborne illness in Maine

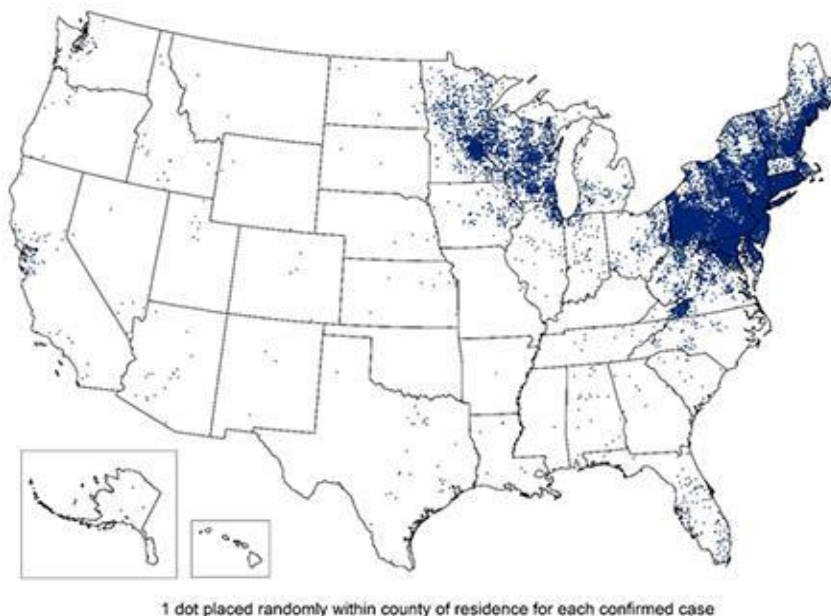
A. Lyme disease

Lyme disease is caused by the bacteria *Borrelia burgdorferi* which is transmitted to a person through the bite of an infected deer tick (*Ixodes scapularis*). Symptoms of Lyme disease include the formation of a characteristic expanding rash (erythema migrans) at the site of a tick bite 3-30 days after exposure. Fever, headache, joint and muscle pains, and fatigue are also common during the first several weeks. Later features of Lyme disease can include arthritis in one or more joints (often the knee), Bell's palsy and other cranial nerve palsies, meningitis, and carditis (AV block). Lyme disease is rarely fatal. The great majority of Lyme disease cases can be treated very effectively with oral antibiotics for ten days to a few weeks. Some cases of Lyme disease which affect the nervous system, joints, or heart may need four antibiotics for up to 28 days.

In the United States, the highest rates of Lyme disease occur across the eastern seaboard (Maryland to Maine) and in the upper Midwest (northern Wisconsin and southern Minnesota), with the onset of most cases occurring during the summer months. Where they are endemic, deer ticks are most abundant in wooded, grassy, and brushy areas ("tick habitat"), especially where deer populations are large.

Many endemic states are no longer counting cases of Lyme disease as the burden is too high on the health department. This affects the national and regional rates as the number of cases appears to drop, but in reality this is because these health departments are using a system to estimate the number of cases rather than trying to count each individual case. As of 2018, Maine is still counting individual cases but as the burden continues to increase and funding remains limited, Maine will likely transition to an estimation system in the future.

Reported Cases of Lyme Disease -- United States, 2017



Source: federal CDC (<https://www.cdc.gov/lyme/images/maps/2017-dot-map-title.jpg>)

The first documented case of Maine-acquired Lyme disease was diagnosed in 1986. In the 1990's the great majority of Lyme disease cases occurred among residents of south coastal Maine, principally in York County. Currently the Mid Coast area has the highest incidence of Lyme disease in the state. Based on 2018 data, seven counties have rates of Lyme disease higher than the State rate (Hancock, Kennebec, Knox, Lincoln, Sagadahoc, Somerset, and Waldo).

In 2018 (preliminary data as of January 15, 2019) providers reported 1,373 confirmed and probable cases of Lyme disease among Maine residents, which is a rate of 102.6 cases of Lyme disease per 100,000 persons in Maine. This is a decrease from 2017 which is likely attributable to the hot, dry summer of 2018. Thirty-five percent (35%) of reported cases were from the southern counties (Cumberland and York), and twenty-one (21%) of reported cases were from the Midcoast counties (Knox, Lincoln, Sagadahoc, and Waldo).

Forty-three percent (43%) of cases were female and fifty-seven percent (57%) of cases were male. The median age of cases in 2018 was 55 years of age (average age of 47 years). The age at diagnosis ranged from 0-92 years. Fifty-seven percent (57%) of the cases with a known onset date had onset during June, July, or August (date of onset is missing for 27% of cases). Providers reported 40 persons (3% of all cases) were hospitalized with Lyme disease. For further Lyme disease statistics in Maine please see [Appendix 1](#).

B. Other Tickborne Diseases in Maine

Anaplasmosis:

Anaplasmosis is a disease caused by the bacteria *Anaplasma phagocytophilum* which infects white blood cells (neutrophils). Anaplasma was previously known as human granulocytic ehrlichiosis (HGE) or human granulocytic anaplasmosis (HGA) but was renamed in 2001 to differentiate between two different organisms that cause similar diseases (Anaplasmosis and Ehrlichiosis). Signs and symptoms of anaplasmosis include: fever, headache, malaise, and body aches. Encephalitis/meningitis may occur but is rare. Anaplasmosis is transmitted to a person through the bite of an infected deer tick (*Ixodes scapularis*). Preliminary data as of January 15, 2019 showed 477 cases of anaplasmosis reported in 2018, a 72% decrease from the 663 cases in 2017. This decrease is likely attributable to the hot, dry summer of 2018. Cases occurred in Androscoggin, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Sagadahoc, Somerset, Waldo, Washington, and York counties. For further anaplasmosis disease statistics in Maine please see [Appendix 2](#).

Babesiosis:

Babesiosis is a potentially severe tickborne disease transmitted through the bite of an infected deer tick (*Ixodes scapularis*). Signs of babesiosis range from no symptoms (asymptomatic) to serious disease. Common symptoms include extreme fatigue, aches, fever, chills, sweating, dark urine, and possibly anemia. People who are infected generally make a full recovery as long as they have a healthy spleen and do not have other diseases that prevent them from fighting off infections. Preliminary data as of January 15, 2019 showed 101 cases of babesiosis reported in 2018, a slight decrease from the 118 cases in 2017. Cases occurred in Androscoggin, Cumberland, Hancock,

Kennebec, Knox, Lincoln, Oxford, Penobscot, Sagadahoc, Somerset, Waldo, Washington, and York counties. For further babesiosis disease statistics in Maine please see [Appendix 2](#).

***Borrelia miyamotoi*:**

Borrelia miyamotoi is a species of spiral-shaped bacteria that is closely related to the bacteria that causes tickborne relapsing fever (TBRF). It is more distantly related to the bacteria that causes Lyme disease. First identified in 1995 in ticks from Japan, *B. miyamotoi* has now been detected in two species of North American ticks, the black-legged or “deer” tick (*Ixodes scapularis*) and the western black-legged tick (*Ixodes pacificus*). Individuals with this infection are likely to have fever, chills, and headache. Other common symptoms include joint pain and fatigue. Unlike Lyme disease, rash is uncommon. Although *Borrelia miyamotoi* is not nationally notifiable, federal CDC in association with endemic states developed a standardized case classification to help standardize reporting and understand the prevalence in the United States. Preliminary data as of January 15, 2019 showed eight probable or confirmed cases with *Borrelia miyamotoi* infections in Maine. Cases occurred in Cumberland, Kennebec, Knox, Lincoln, and Sagadahoc counties.

Ehrlichiosis:

Ehrlichiosis is a disease caused by the bacteria *Ehrlichia chaffeensis* which infects white blood cells (monocytes). Ehrlichia was previously known as human monocytic ehrlichiosis (HME). Signs and symptoms of ehrlichiosis include: fever, headache, nausea, and body aches. Encephalitis/ meningitis may occur. Ehrlichiosis is transmitted to a person through the bite of an infected lone star tick (*Amblyomma americanum*). Ehrlichiosis is uncommon in Maine as the tick is not commonly found here. However, this may be a disease to watch for as the tick appears to be moving north. Preliminary data as of January 15, 2019 showed 19 probable cases of *Ehrlichia chaffeensis* reported in 2018 from Androscoggin, Cumberland, Kennebec, Somerset, Penobscot, and York counties. Maine had nine probable cases of Ehrlichia/Anaplasma Undetermined in 2018, which occurs when serologies are done, but titers are the same for both Ehrlichia and Anaplasma so we cannot tell which organism was present. For further ehrlichiosis disease statistics in Maine please see [Appendix 2](#).

Powassan:

Powassan is a disease caused by the Powassan virus or deer tick virus which is transmitted to humans through the bite of an infected woodchuck tick (*Ixodes cookei*) or deer tick (*Ixodes scapularis*). It is the only tickborne arbovirus occurring in the United States and Canada. Signs and symptoms of Powassan include fever, headache, vomiting, weakness, confusion, seizures, and memory loss. Long-term neurologic problems may occur. Maine had no reported cases of Powassan in Maine in 2018.

Spotted Fever Rickettsiosis:

Spotted Fever Rickettsioses (SFR) are a group of bacterial illnesses, the most common of which is Rocky Mountain Spotted Fever (RMSF). Signs and symptoms of RMSF include fever, chills, headache, gastrointestinal symptoms, and a maculopapular rash often on the palms and the soles. RMSF is transmitted to a person through the bite of an infected dog tick (*Dermacentor variabilis*). RMSF is not known to be endemic in Maine, but could become an emerging disease. Preliminary data as of January 15, 2019 showed ten probable cases of SFR reported in 2018. Probable cases occurred in Androscoggin, Cumberland, Hancock, Kennebec, Knox, and Washington counties. For further SFR disease statistics in Maine please see [Appendix 2](#).

Other Emerging Tickborne Diseases:

Federal CDC and other researchers are continually on the watch for new or emerging tickborne disease. Pathogens identified in the last few years include Heartland virus, and Bourbon virus. Maine has no documented cases of any of these diseases, but there is serological evidence (from either humans or wild animals) of Heartland virus in Maine, so these are diseases to watch.

II. The Diagnosis and Treatment Guidelines for Lyme disease recommended by Maine Center for Disease Control and Prevention and the United States Department of Health and Human Services, Centers for Disease Control and Prevention

Maine Center for Disease Control and Prevention continues to adhere to the strongest science-based source of information for the diagnosis and treatment of any infectious disease of public health significance. Nationally, the Infectious Disease Society of America (IDSA) is the leader in setting the standard for clinical practice guidelines on Lyme disease and other tickborne illnesses: (<https://academic.oup.com/cid/article/43/9/1089/422463>)

Lyme disease is diagnosed clinically with the aid of laboratory testing. An erythema migrans in an endemic area is sufficiently distinctive to allow clinical diagnosis in the absence of laboratory confirmation. Patients should be treated on the basis of clinical findings. A two-tier testing algorithm is recommended for laboratory testing. First-tier testing is most often an enzyme-linked immunosorbent assay (ELISA) test which, if positive or equivocal, should be followed by an IgM and IgG Immunoblot. IgM is only considered reliable if tested within the first 30 days after symptom onset. Acute and convalescent testing is useful to determine final diagnosis. Untreated patients who remain seronegative despite having symptoms for 6-8 weeks are unlikely to have Lyme disease, and other potential diagnoses should be actively pursued. A diagnosis of Lyme disease made by a clinician may or may not meet the federal surveillance case definition, and therefore may not always be counted as a case. Maine CDC refers physicians with questions about diagnosis to the IDSA guidelines. <https://academic.oup.com/cid/article/43/9/1089/422463>

During 2009 and 2010, IDSA convened a special review of the clinical practice guidelines on Lyme disease to determine whether the 2006 guidelines should be revised and updated. A central question explored at the Review Panel hearing held during July 2009 was whether Lyme disease can persist as a chronic infection that can be successfully treated with an extended course of antibiotics.

The special panel reviewed the medical and scientific literature as well as material submitted by the 18 individuals who testified at the hearing and about 150 other comments submitted by the public. The panel also heard from several representatives of the International Lyme and Associated Diseases Society (ILADS), who argued for more extensive treatment for what ILADS identifies as chronic Lyme disease. The panel met 16 times and the review took more than a year to complete. On April 22, 2010 the special Review Panel “unanimously agreed that no changes need be made to the 2006 Lyme disease treatment guidelines developed by the Infectious Diseases Society of America (IDSA)” (<https://www.idsociety.org/globalassets/idsa/topics-of-interest/lyme/idsalymediseasefinalreport.pdf>)

“The Review Panel concurred that all of the recommendations from the 2006 guidelines are medically

and scientifically justified in light of the evidence and information provided, including the recommendations that are most contentious: that there is no convincing evidence for the existence of chronic Lyme infection; and that long-term antibiotic treatment of “chronic Lyme disease” is unproven and unwarranted. This recommendation is also supported by federal CDC. Inappropriate use of antibiotics (especially given intravenously) has been shown to lead to deadly blood infections, serious drug reactions and *C. difficile* diarrhea, as well as the creation of antibiotic-resistant bacteria or “superbugs.” (<https://www.idsociety.org/globalassets/idsa/topics-of-interest/lyme/idsalymediseasefinalreport.pdf>)

Another Panel convened in 2015 to again assess and update guidelines for the treatment and prevention of Lyme disease and other tickborne diseases. Results from this panel have yet to be published. (<https://www.idsociety.org/globalassets/idsa/topics-of-interest/lyme/project-plan-march-2015.pdf>)

III. A Summary or bibliography of peer reviewed medical literature and studies related to the diagnosis, medical management and the treatment of Lyme disease and other tickborne illnesses, including, but not limited to, the recognition of chronic Lyme disease and the use of long term antibiotic treatment.

A bibliography of peer reviewed journal articles published in 2018, as related to Lyme and other tickborne illnesses is included in [Appendix 3](#). Maine CDC reviews these journal articles to maintain an understanding of the current research and literature available on Lyme and other tickborne diseases.

IV. The education, training, and guidance provided by Maine Center for Disease Control and Prevention to health care professionals on the current methods of diagnosing and treating Lyme disease and other tickborne illnesses

Maine CDC continues to emphasize prevention and control of Lyme disease and other tickborne diseases. Surveillance for tickborne diseases, including Lyme disease, is performed by the Division of Disease Surveillance, Infectious Disease Epidemiology Program, as Lyme disease, Anaplasmosis, Babesiosis, Ehrlichiosis, Spotted Fever Rickettsiosis, and Powassan are notifiable diseases by both medical practitioners and clinical laboratories. Reporting clinicians must submit subsequent clinical and laboratory information following the initial report. Maine CDC also monitors tickborne diseases through syndromic surveillance. By querying participating hospital emergency department (ED) patient visit data, patients that complain of a tick bite are identified. An increase in ED visits for tick bites is usually a precursor for the typical seasonal increase in Lyme and other tickborne diseases incidence. A comparison of 2017 and 2018 syndromic data is included as [Appendix 4](#). Maine CDC partners with the University of Maine Cooperative Extension Office to monitor the identification of deer ticks in Maine through a passive submission system.

Maine CDC performed a spatial analysis of 2018 Lyme disease surveillance data at the county level, showing the continual disease progression ([Appendix 5](#)). Outreach and education to clinicians and other healthcare providers to increase provider response to required supplemental clinical and laboratory information is ongoing.

Maine CDC epidemiologists provide consultation to the medical community on tickborne diseases, offering educational and preventive information as needed. Maine CDC epidemiologists present educational outreach activities and seminars on tickborne disease prevention targeting the medical community at statewide meetings of school nurses and others. Ongoing educational initiatives are featured on the Maine CDC web site: <http://www.maine.gov/lyme>

During 2018, a **clinical management guide**, “Tickborne Diseases of the United States: A Reference Manual for Healthcare Providers” was mailed to hospitals, urgent care providers, and pediatric practices. This guide includes information on ticks found in the US and signs/symptoms, laboratory services, diagnosis, and treatment of six tickborne diseases, including Lyme disease.

- Maine CDC distributed 533 copies of this guide in 2018

Maine CDC continues to contribute to **national surveillance and prevention activities**. During 2018, Maine CDC epidemiologists represented the State at both local and national meetings including:

- Council of State and Territorial Epidemiologist (CSTE) annual conference held in West Palm Beach, FL in June 2018
- Northeast Epidemiology annual conference held in Manchester, VT in the Fall of 2018

V. The education and public awareness activities conducted by Maine Center for Disease Control and Prevention for the prevention of Lyme disease and other tickborne illnesses

Maine CDC promotes ongoing **educational outreach activities** targeting the public and Maine municipalities. During 2018, Maine CDC epidemiologists provided consultation to the public on tickborne diseases, offering educational and preventive information as needed. Maine CDC epidemiologists presented educational outreach activities and seminars on tickborne disease prevention to the general public including:

- 49 presentations or displays held for: students in 3rd-8th grade, Boy Scouts of America, gardeners, runners, and community members
- Numerous media interviews given by Maine CDC employees (vectorborne epidemiologist and state epidemiologist).

Maine CDC’s Infectious Disease Epidemiology Program Director chairs the State **Vectorborne Disease Work Group**; a group comprised of both State agencies and private entities, which meets on a bimonthly basis to proactively address surveillance, prevention and control strategies. Members of this group include: Maine Department of Health and Human Services, Maine Department of Agriculture, Conservation, and Forestry, Maine Department of Inland Fisheries and Wildlife, Maine Department of Education, Maine Department of Environmental Protection, Maine Forest Service, University of Maine Cooperative Extension Services, and the United States Department of Agriculture. A full list of members can be found in [Appendix 6](#). **Educational efforts** by the Vectorborne Work Group included:

- Presentations given on ticks and tickborne diseases
- Presence at vendor shows, television and radio interviews
- Distribution of educational materials including Lyme brochures, tick spoons, fact sheets, etc.

In 2018 Maine CDC continued an educational program started in 2014 aimed at **teaching students in 3rd to 8th grade about tick biology and ecology, tickborne diseases, and tick prevention**. The program consists of a twenty-minute PowerPoint presentation on tick biology and ecology, and disease information; four ten-minute interactive activities; and a take-home packet with games, activities, and information for parents. In 2018 Maine CDC presented the curriculum at seven schools. An epidemiologist or Public Health Corps (PHC) member presented the disease and biology/ecology information and PHC students assisted with the activities. Participating educators evaluated the program highly in all schools. This endeavor is being undertaken in close partnership with the Maine Department of Education.

Prior to 2018 this program included pre and post curriculum evaluations distributed to all participating students, administered shortly before and two weeks after presentation of the material. Since Maine CDC demonstrated knowledge retention after two weeks with this method, in 2018 Maine CDC administered the test to 104 students across 3rd, 4th, and 5th grade at a single school. Though Maine CDC presented the curriculum only to 4th grade classes, students in the grades above and below the participating students also took the test. The goal of implementing this annual competency is to better gauge long term knowledge retention among students who participated in the tickborne disease curriculum.

Educational materials for the 3rd-5th and 6th-8th graders are available online, including our educator's guide, group activities, and activity book for both ticks and mosquitoes. PHC continues to review and update the education materials. Educational materials are available at the following link: <http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/school-curriculum/index.shtml>.

- The web resource for educators recorded 1,068 visits in 2018

In 2018, Maine CDC developed a **Social Media Campaign** aimed at adults aged 45 and over. The campaign consisted of short, targeted advertisements on YouTube and Facebook with relevant tickborne disease prevention information. This included two Facebook boosted posts, two Facebook sponsored ads, and four YouTube paid instream ads. Individuals in the target audience viewed the videos tens of thousands of times. See [Appendix 7](#) for an example advertisement. These advertisements include:

- Facebook Boosted Posts
 - Know How to Remove Ticks - viewed 47,930 times
 - Do You Know Who's Most at Risk for Lyme Disease – viewed 55,774 times
- Facebook Sponsored Ads
 - Know How to do Tick Checks - viewed 17,753 times
 - Know How to Prevent Tick Bites – viewed 14,393 times
- YouTube Paid Instream Ads
 - Know How to Remove Ticks - viewed 57,100 times
 - Know How to do Tick Checks – viewed 217,700 times
 - Know How to Prevent Tick Bites – viewed 35,100 times
 - Do You Know Who's Most at Risk for Lyme Disease – viewed 102,900 times

Also in 2018, Maine CDC launched a **Near Real-Time (NRT)** data dashboard for tickborne diseases on the **Maine Tracking Network (MTN)**, a web-based portal that allows users to access environmental and health data. The MTN already displayed annual tickborne disease data available

down to the town level (See [Appendix 8](#) for an example map), but this dashboard marks the first time that current year data is publicly available. This NRT dashboard is updated daily with the rates (per 100,000) and number of cases of Lyme disease, anaplasmosis, and babesiosis at both the state and county level. This is available as tables, charts, and customizable maps. Case counts include confirmed and probable cases and data updates occur daily as Maine CDC classifies new cases. The NRT data dashboard also includes a trend chart of suspected tick-related emergency department visits by week and compares the counts to the previous year. Maine CDC obtains suspected tick-related emergency department visit data through the syndromic surveillance program, which compiles and analyzes daily emergency department visits from all hospitals in Maine.

Cases of Lyme disease, anaplasmosis, and babesiosis steadily increased in recent years, making the Near Real-Time data dashboard relevant to everyone visiting and living in Maine. This allows the public to gain a better understanding of their risk for tickborne diseases. The portal can be used as a tool to show the importance of practicing prevention efforts not only in the summer, but also year-round in Maine. The Near Real-Time section of the portal went live in September 2018 and received 858 visits in 2018. A press-release following the new Near Real-Time data dashboard launch led to the second highest number of user sessions in a month since the Maine Tracking Network Launched in 2012. This was the highest peak over the last four years. This peak at the end of 2018 can be seen in [Appendix 9](#). In 2018, the tickborne disease portion of the portal, which includes Lyme disease, anaplasmosis, babesiosis, and Near Real-Time, received the most pageviews on the portal (13,571 pageviews). This is nearly double the pageviews of the second-most popular content area.

During 2018, Maine CDC updated tickborne disease fact sheets to be more health literate. An example of the updated anaplasmosis fact sheet is included as [Appendix 10](#).

Maine CDC and PHC maintain a series of **short instructional videos** to educate the Maine community in tick prevention and tickborne diseases. These videos include:

- How to Perform a Tick Check – viewed 683 times in 2018
- Tickborne Diseases in Maine: Anaplasmosis – viewed 320 times in 2018
- Tickborne Diseases: Powassan Encephalitis– viewed 84 times in 2018
- Tickborne Diseases in Maine: Lyme Disease-viewed 74 times in 2018
- Reducing Tick Habitat Around Your Home- viewed 331 times in 2018
- Tickborne Diseases in Maine: Babesiosis – viewed 168 times in 2018
- How to Choose a Residential Pesticide Applicator – viewed 13 times in 2018
- Tick Identification – viewed 6,000 times in 2018
- Choosing and Applying Personal Repellents – viewed 40 times in 2018

Maine’s PHC team conducts Tick and Mosquito “**Train the Trainer**” events to help educate individuals on these topics and empower them to be a resource in their local community. During 2018 PHC held six workshops in Portland, South Portland, Wiscasset, Belfast, Springvale, and Topsham and provided training and materials to 80 participants.

Maine CDC’s Lyme disease website is continually updated to provide information to the public and to health professionals about Lyme disease in Maine. In 2018:

- The Lyme disease homepage was visited 2,107 times
- The tick identification page was visited 2,801 times
- The FAQ section was visited 7,970 times

Ongoing educational initiatives featured on the Maine CDC website include:

- Lyme, Anaplasmosis, Ehrlichiosis, Babesiosis, and Powassan disease fact sheets
- Tick Identification
- Prevention of Tickborne Diseases
- Lyme, Anaplasmosis, Ehrlichiosis, Babesiosis, and Powassan Surveillance Reports from 2008-2017
- Lyme disease awareness and prevention movie

During 2018 Maine CDC distributed **Lyme disease educational materials** to partners and members of the public. Approximate numbers of materials distributed include:

- ~11,752 Wallet-sized laminated tick identification cards
- ~7,878 Tick remover spoons
- ~1,286 Lyme disease brochures
- ~1,243 Tick ID posters
- ~745 What to do After a Tick Bite
- ~261 Lyme Disease Awareness Month 2018 Posters
- ~496 Lyme Disease Awareness Month 2017 Posters

Members of the Vectorborne Disease Working Group assist Maine CDC in distributing educational materials as widely as possible throughout the State.

Maine CDC releases **Health Alerts, press releases**, and other information on disease concerns of public health significance, including tickborne diseases. Maine CDC also responds to numerous press inquiries and releases press statements as appropriate (www.mainepublichealth.gov). Official releases in 2018 included:

- 2018 Lyme and other Tickborne Disease Information (Health Alert) – May 1st
- Maine CDC Promotes Tick-borne Disease Awareness Press Release – May 1st
- Lone Star Ticks and Maine (Health Alert) - July 9th
- Tracking Network Press Release - Maine CDC Releases Near Real-Time Data for Tickborne Diseases - November 8th

Pursuant to Legislation enacted in the second regular session of the 126th Legislature, May 2018 was declared to be **Lyme Disease Awareness Month** (PL 494). Educational activities took place the entire month including:

- Governor's Proclamation of Lyme Disease Awareness Month ([Appendix 11](#))
- Information distributed through social media (Facebook, Twitter, Blog)
- Information distributed through multiple newsletters throughout the state
- Lyme Disease Public Awareness Events held in Freeport, Kennebunk, New Gloucester, and Portland

Another major Lyme Disease Awareness month activity was the **statewide poster contest** for students in grades K-8. Maine CDC asked students to create a poster with the theme "**No Ticks for ME**" demonstrating at least one of the four Lyme disease prevention methods (wear protective clothing, use repellent, use caution in tick infested areas, and perform daily tick checks). The six winning posters are available for viewing at the Lyme disease website www.maine.gov/lyme. Maine

CDC used one of the winning posters for our 2018 statewide educational campaign ([Appendix 12](#)). Maine CDC distributed this poster to schools, state parks, the board of tourism, and historical sites.

Maine CDC's main **prevention message** is encouraging Maine residents and visitors to use personal protective measures to prevent tick exposures. Personal protective measures include avoiding tick habitat, use of EPA approved repellents, wearing long sleeves and pants, and daily tick checks and tick removal after being in tick habitats (ticks must be attached >24 hours to transmit Lyme disease). Persons who spent time in tick habitats should consult a medical provider if they have unexplained rashes, fever, or other unusual illnesses during the first several months after exposure. Possible community approaches to prevent Lyme disease include landscape management and control of deer herd populations.

VI. A summary of laws of other states enacted during the past year related to the diagnosis, treatment, and insurance coverage for Lyme disease and other tickborne illnesses based on resources made available by federal Centers for Disease Control and Prevention or Other Organizations

Maine CDC performed a search of state and federal legislation. A state by state listing of legislation relating to Lyme and other tickborne diseases can be found in [Appendix 13](#).

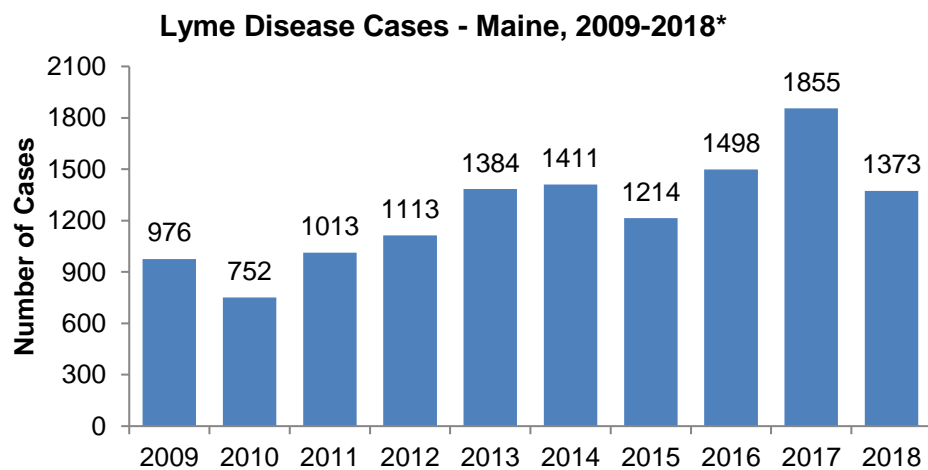
Appendix 1

Maine Lyme disease statistics

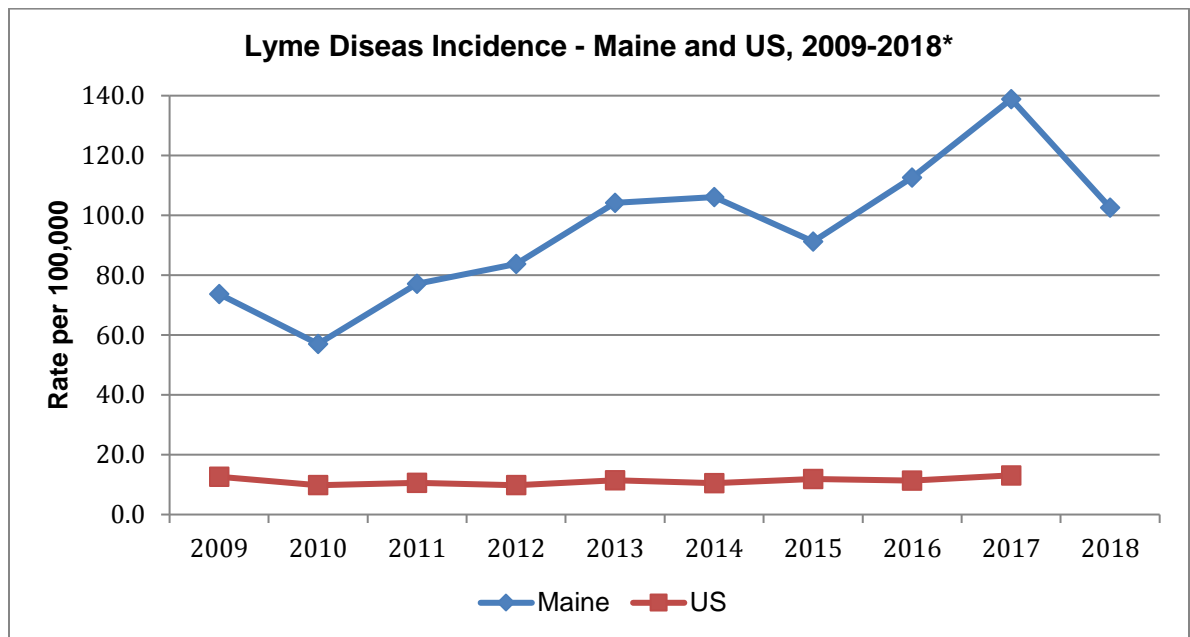
Number and Rate per 100,000 persons of Lyme Disease Cases by County of Residence – Maine, 2014-2018*

County	2014 Count	2014 Rate	2015 Count	2015 Rate	2016 Count	2016 Rate	2017 Count	2017 Rate	2018* Count	2018* Rate
Androscoggin	95	88.4	51	47.6	92	85.8	97	90.4	62	57.6
Aroostook	5	7.2	2	2.9	1	1.5	8	11.8	4	5.9
Cumberland	339	117.8	258	89.0	311	107.2	319	109.2	280	95.7
Franklin	10	33	10	33.3	3	10.0	24	80.0	13	43.4
Hancock	121	221.2	121	221.4	152	278.1	206	378.5	173	317.4
Kennebec	139	114.8	154	128.4	204	170.0	267	221.4	178	146.1
Knox	106	267.2	119	298.6	107	268.5	146	367.4	103	258.9
Lincoln	83	242.9	74	217.8	99	291.4	74	216.3	59	172.5
Oxford	43	75.1	26	45.5	43	75.2	58	101.4	46	80.1
Penobscot	50	32.6	51	33.4	90	58.9	128	84.3	72	47.4
Piscataquis	2	11.7	1	5.9	3	17.7	8	47.5	3	17.9
Sagadahoc	65	185.5	48	136.6	91	258.9	61	172.9	46	130.0
Somerset	17	33.2	28	54.8	21	41.1	90	176.8	46	90.9
Waldo	49	125.5	63	160.9	71	181.3	143	363.3	78	195.8
Washington	14	44	20	63.2	20	63.2	32	101.7	15	47.5
York	272	135.5	184	91.5	188	93.5	194	95.9	195	95.5
State	1410	106	1210	91.0	1496	112.5	1855	138.9	1373	102.6

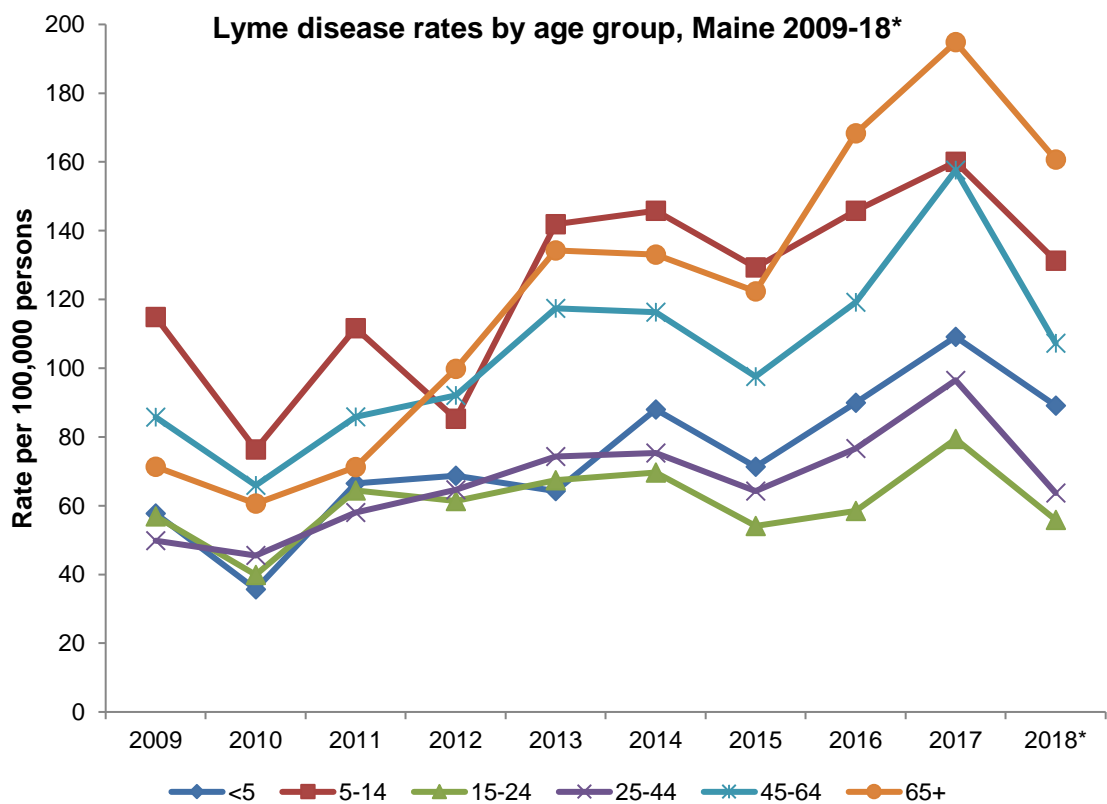
All data includes both confirmed and probable cases



* 2018 data are preliminary as of 01/15/2019

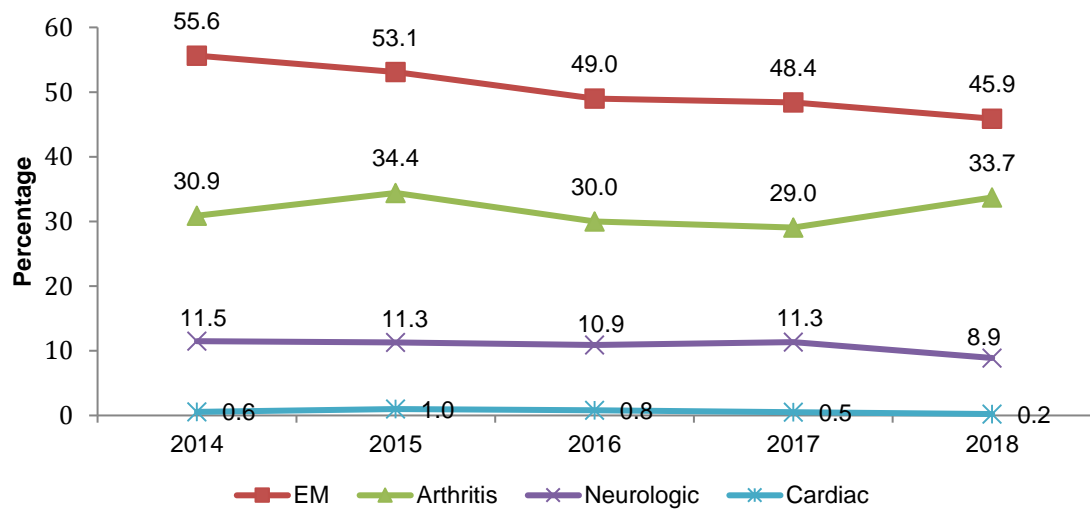


* 2018 data are preliminary as of 01/15/2019



* 2018 data are preliminary as of 01/15/2019

Percentage of Symptoms Reported Among Lyme Disease Cases - Maine, 2014-2018*



* 2018 data are preliminary as of 01/15/2019

Appendix 2
Maine tickborne disease statistics (excluding Lyme disease)

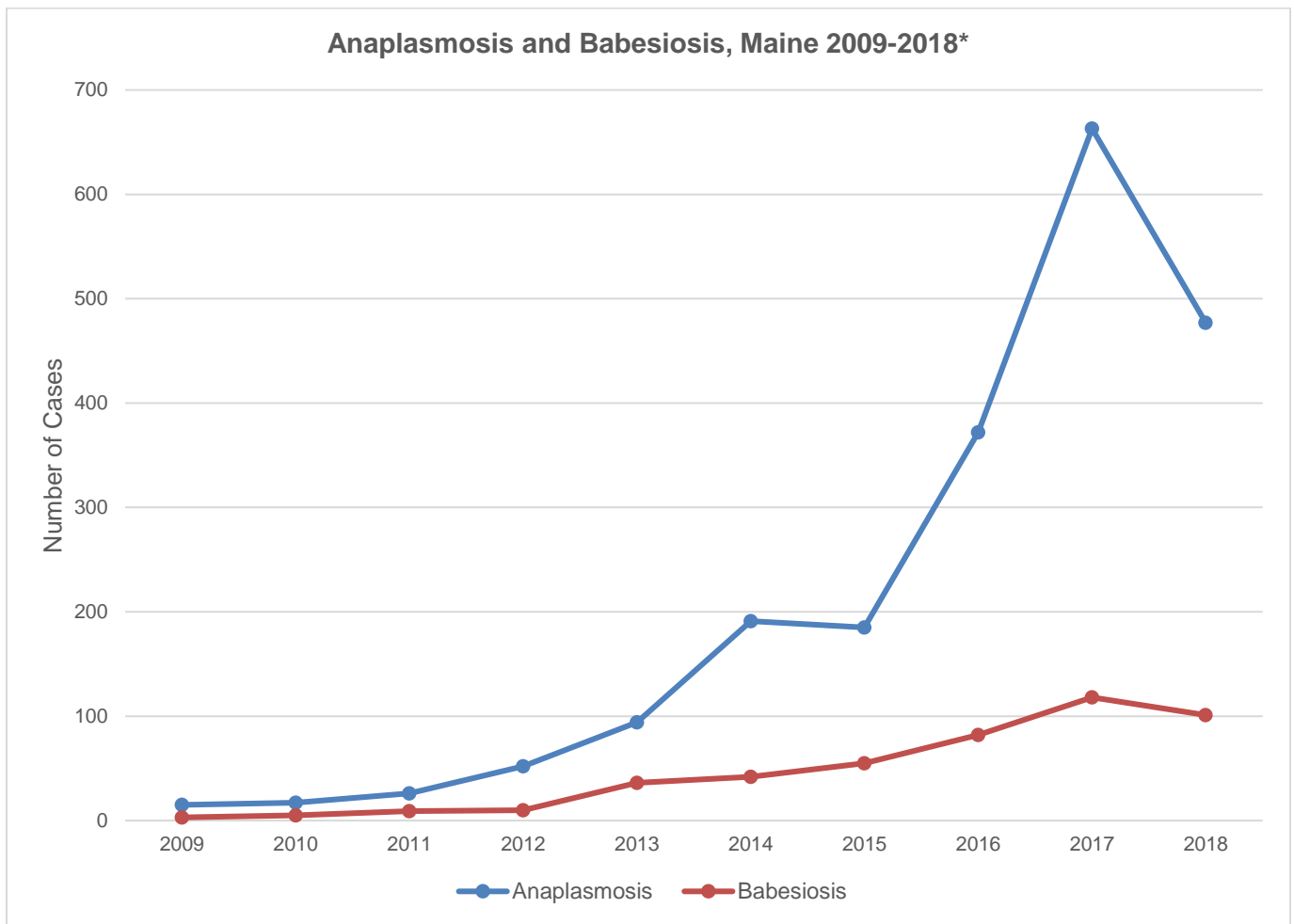
Number of Selected Tickborne Disease Cases by County of Residence – Maine, 2018*

County	Anaplasmosis	Babesiosis	Ehrlichiosis	Ehrlichiosis/ Anaplasmosis Undetermined	Powassan	Spotted Fever Rickettsiosis
Androscoggin	31	9	3	1	0	1
Aroostook	0	0	0	0	0	0
Cumberland	71	20	7	0	0	1
Franklin	3	0	0	0	0	0
Hancock	15	5	0	0	0	1
Kennebec	57	5	6	4	0	3
Knox	88	17	0	0	0	3
Lincoln	44	5	0	1	0	0
Oxford	14	2	0	1	0	0
Penobscot	8	2	2	0	0	0
Piscataquis	0	0	0	0	0	0
Sagadahoc	27	2	0	1	0	0
Somerset	10	0	0	0	0	0
Waldo	23	6	0	0	0	0
Washington	1	1	0	0	0	1
York	85	27	1	1	0	0
Total	477	101	19	9	0	10

Number of Selected Tickborne Disease Cases– Maine, 2009 - 2018*

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Anaplasmosis	15	17	26	52	94	191	186	372	663	477
Babesiosis	3	5	9	10	36	42	55	82	118	101
Ehrlichia chaffeensis	1	4	1	3	3	8	5	7	10	19
Ehr/Ana undetermined	0	0	0	0	2	6	1	4	10	9
SFR	5	2	1	3	2	3	1	4	3	10
Powassan	0	0	0	0	1	0	0	1	3	0

* 2018 data are preliminary as of 01/15/2019



* 2018 data are preliminary as of 01/15/2019

Appendix 3

Peer-reviewed medical literature related to medical management and treatment of Lyme disease – bibliography: 2018

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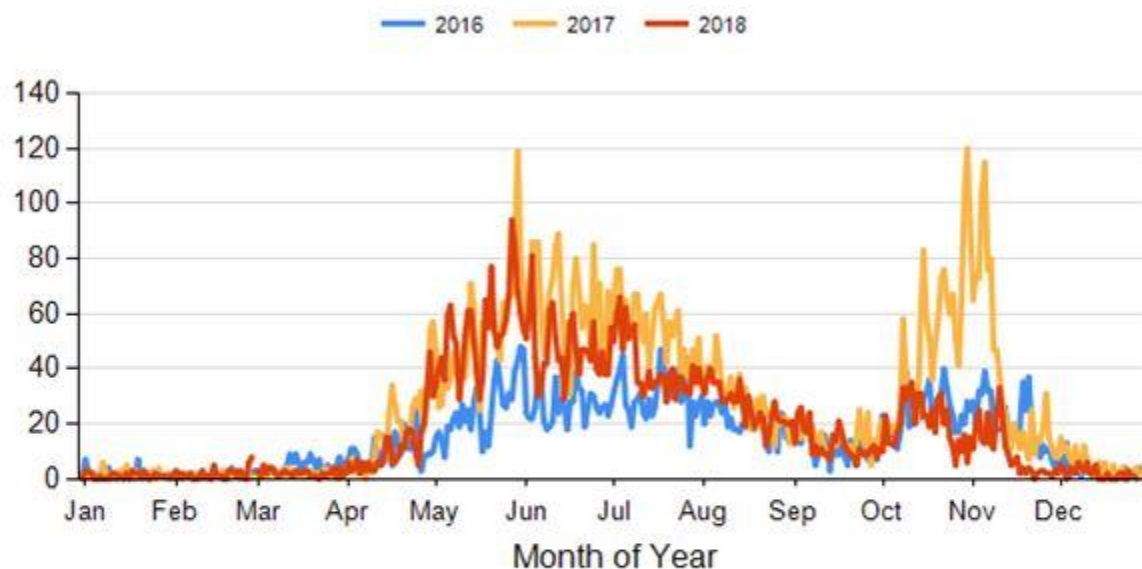
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Appendix 4

Maine CDC *Syndromic Surveillance Report*

Report run: 12/27/2018 9:46:45 AM

Daily Suspected Tick Exposures vs. Past Two Years



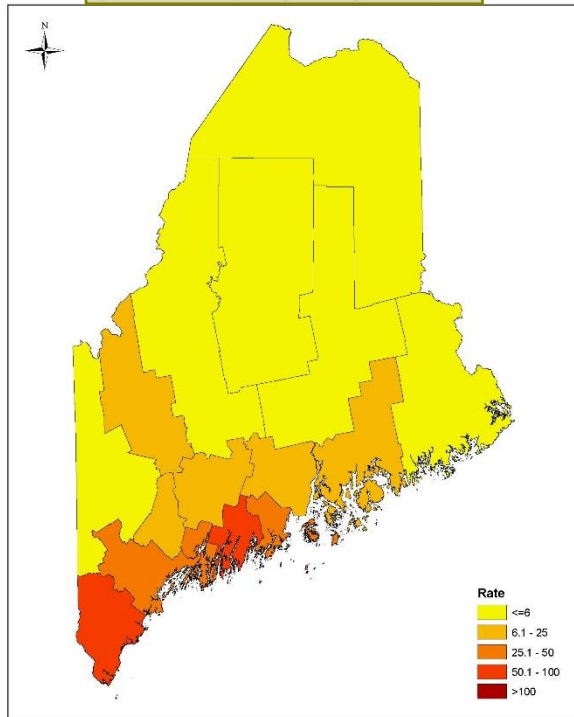
Data Notes:

The number of suspected tick exposures is based on automated processing of chief complaint text and diagnosis codes from patient encounters at Maine emergency departments and affiliated urgent care facilities. New hospitals are added to the syndromic surveillance system every year, increasing the universe of patient encounters and confounding year-over-year comparisons. For more information about Maine's syndromic surveillance data and methods, please contact syndromic@maine.gov.

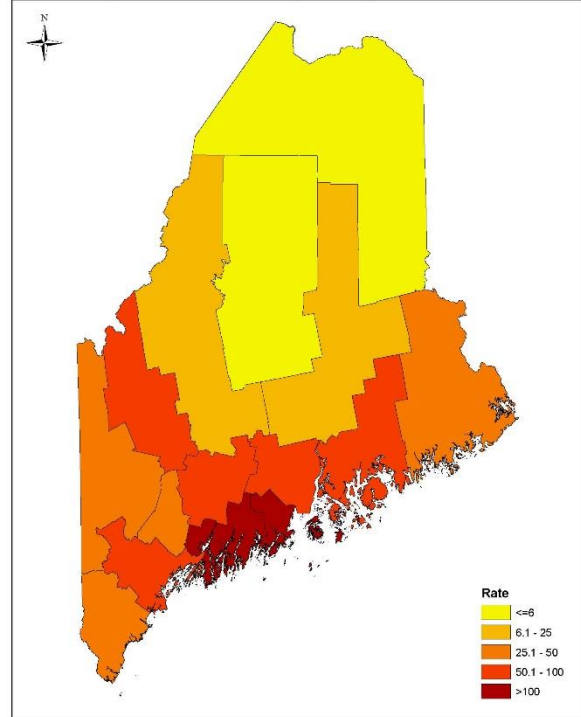
Appendix 5

Lyme Disease Cases per 100,000 people (Rate) – Maine, Selected years 2006-2018*

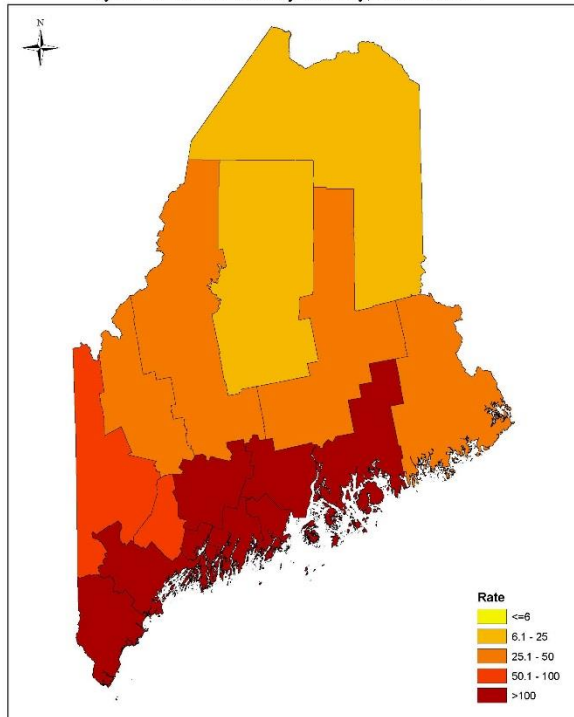
Lyme Disease Rate by County, Maine 2006



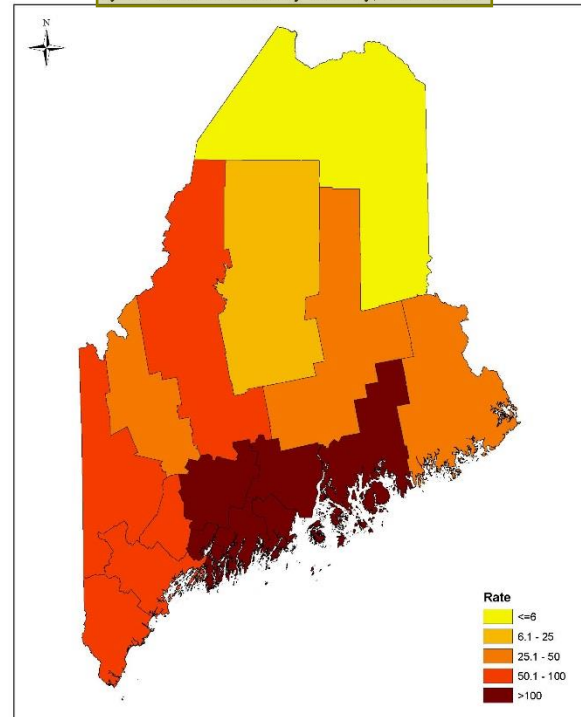
Lyme Disease Rate by County, Maine 2010



Lyme Disease Rate by County, Maine 2014



Lyme Disease Rate by County, Maine 2018



* 2018 data are preliminary as of 01/15/2019

Appendix 6

Maine Vectorborne Work Group

Chair: Sara Robinson, Maine Center for Disease Control and Prevention (Maine CDC)

Adams, Justin	Municipal Pest Management
Bennett, Siiri	Maine CDC
Bonthius, Jessica	Maine CDC
Bryer, Pam	Maine Board of Pesticide Control
Camuso, Judy	Maine Department of Inland Fisheries and Wildlife
Chamberlain, Anne	Maine Board of Pesticide Control
Colby, Kate	Maine CDC
Dill, Griffin	Maine Cooperative Extension
Dill, Jim	Maine Cooperative Extension
Dyer, Robin	US Department of Agriculture
Elias, Susan	Maine Medical Center Research Institute, University of Maine Orono
Fish, Gary	Maine Department of Agriculture, Conservation, and Forestry
Fiske, Rachael	Maine Department of Agriculture, Conservation, and Forestry
Gardner, Allison	University of Maine, School of Biology and Ecology
Hicks, Lebelle	Private citizen, toxicologist
Jackson-Jones, Paula	Midcoast Lyme Disease Support Group
Kanoti, Alison	Maine Forest Service
Keenan, Patrick	Biodiversity Research Institute
Lacombe, Eleanor	Maine Medical Center Research Institute
Lichtenwalner, Anne	University of Maine, Animal Health Laboratory
Lubelczyk, Charles	Maine Medical Center Research Institute
Matluk, Nick	Maine CDC
Morris, Jesse	US Department of Agriculture
Morrison, Mike	Municipal Pest Management
Murray, Kathy	Maine Department of Agriculture, Conservation, and Forestry
Patterson, Megan	Maine Board of Pesticides Control
Peranzi, Catie	Maine CDC
Poland, Emily	Maine Department of Education
Rand, Peter	Maine Medical Center Research Institute
Robinson, Sara	Maine CDC
Smith, Rob	Maine Medical Center Research Institute
Sohail, Haris	Maine CDC
Staples, Joe	University of Maine, Department of Environmental Science and Policy
Szantyr, Beatrice	Physician, Lincoln Maine
Walsh, Michele	Maine Department of Agriculture, Conservation, and Forestry
Webber, Lori	Maine CDC
Welch, Maggie	Maine Medical Center Research Institute

To reach a member of the VBWG or to express interest in joining this workgroup contact disease.reporting@maine.gov.

Appendix 7 Know How to Prevent Tick Bites Advertisement



Slide 1



Slide 2



Slide 3



Slide 4



Slide 5

Appendix 8

Maine Tracking Network: Lyme Disease Data Portal

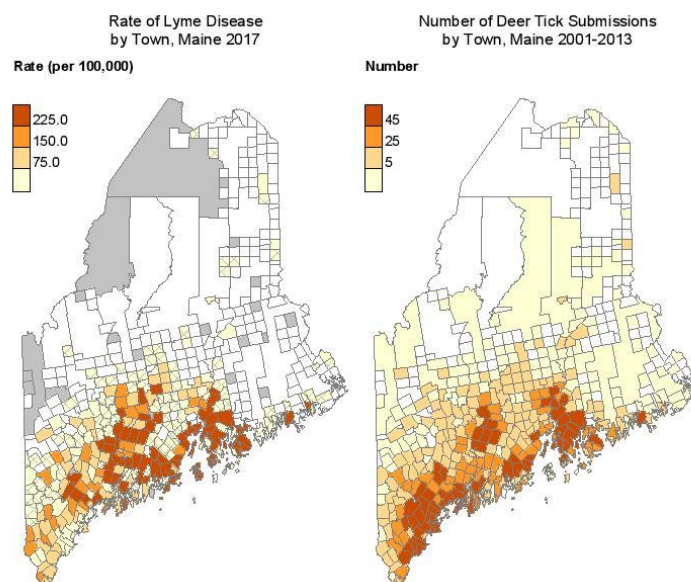


Figure A

Figure B

Cross-hatched areas show where data were suppressed.
White indicates a value of zero (0).
Gray indicates that data are not releasable.

About these figures

Figure A shows the incidence rate (per 100,000 people) of confirmed and probable cases of Lyme disease in the population. Beginning in 2008, the case definition was expanded to include the classification of probable cases. Maine CDC's Infectious Disease Program obtained these data through notifiable conditions surveillance based upon reports from healthcare providers, laboratories, and other healthcare partners.

Figure B shows the number of deer ticks (*Ixodes scapularis*) submitted to the Maine Medical Center Research Institute (MMCRI). From 1988-2013, MMCRI's Vector-borne Disease Laboratory (in cooperation with the State of Maine) offered free tick identification to Maine residents and physicians. Data represent only ticks that were attached to human hosts.

Different map colors are not based on statistical tests of difference.

To protect privacy as per Maine CDC Privacy Policy, data may be suppressed. Locations where data must be suppressed are represented by cross-hatching. Locations where data are not releasable (NR) are shaded gray.

Sources of these data

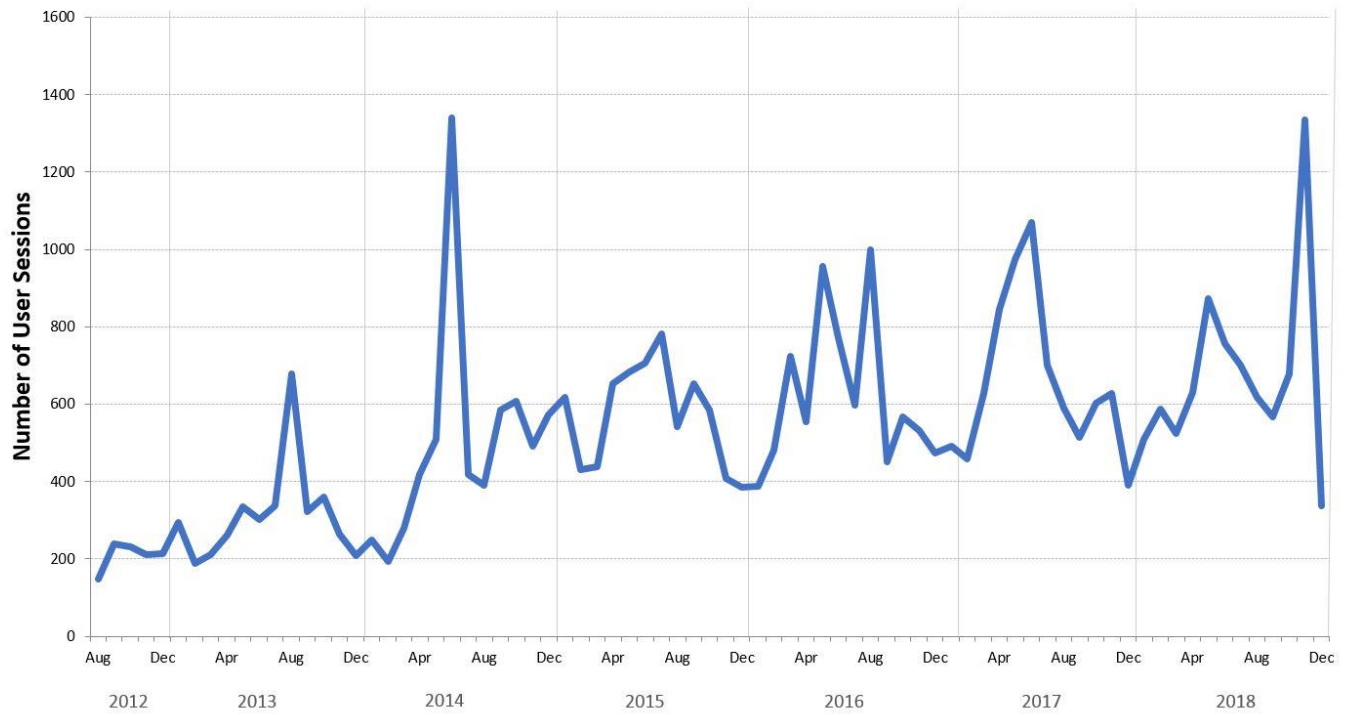
Figure A: Maine CDC's Infectious Disease Program collected and analyzed the data. Maine CDC used population data from the U.S. Census Bureau to calculate state and county rates of tickborne disease. Maine CDC used population data from the Maine Office of Data, Research, and Vital Statistics (ODRVS) to calculate town-level rates of tickborne disease. The Maine Environmental Public Health Tracking Program prepared the data display. Data updated: 04/21/2018. Display updated: 05/2018.

Figure B: MMCRI provided the data for this display. The data were analyzed by the Maine Environmental Public Health Tracking Program. Data updated: 04/2016. Display updated: 04/2016.

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Appendix 9

**Maine Tracking Network User Sessions by Month
Aug 2012 - Dec 2018**





Anaplasmosis

Fact Sheet



Anaplasmosis is an illness caused by the bacteria *Anaplasma phagocytophilum*. It is spread by the bite of an infected *Ixodes scapularis* tick (also called the deer tick).



Anyone can get anaplasmosis, but people who spend time outdoors are at the highest risk.

Common Signs and Symptoms



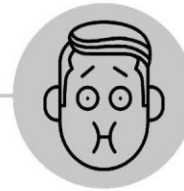
Fever and Chills



Headache



Muscle Pain



Nausea and Abdominal Pain

More Severe Signs and Symptoms



Difficulty Breathing



Kidney Failure



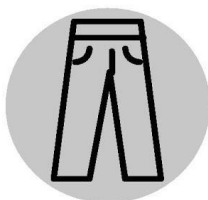
Neurologic Problems

Symptoms range from mild to severe. Very few people experience **ALL** of these symptoms.



Talk to your doctor if you have any of these signs or symptoms after being bit by a tick. Anaplasmosis is diagnosed based on signs and symptoms and confirmed through blood tests. It is treated with antibiotics.

Preventing Tick Bites



Wear light colored, long-sleeved clothing. Tuck your pants into your socks.



Use an EPA approved bug spray.

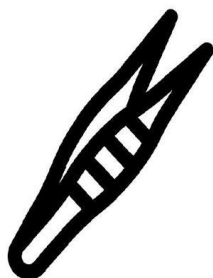


Rake your leaves and keep your lawn mowed.



Do daily tick checks and check your pets too.

Safe Tick Removal



Use a tick spoon or fine-tipped tweezers to remove a tick.

-Using tweezers, grab the tick by its mouth and use firm, steady pressure to pull the tick out. Do not use twisting motions.

-Using a tick spoon, line the notch of the spoon up with the head of the tick and gently scoop.

Do not use nail polish, matches, or petroleum jelly to remove the tick. These methods increase the risk of localized skin infection.

Where are Deer Ticks Found in Maine?

Deer ticks, which can carry the bacteria that cause anaplasmosis, are found everywhere in Maine. Areas where deer ticks live include:

-Wooded or forested areas

-Wild, unmaintained landscapes with high grass

-Brush or leaf piles

Ticks are active at any temperature above freezing.



For More Information, Visit:



1. www.maine.gov/dhhs/anaplasmosis

2. www.maine.gov/dhhs/tickfaq (For frequently asked tick questions)

3. www.cdc.gov/anaplasmosis

4. www.extension.umaine.edu/ipm/tickid/ (To submit a tick for identification)

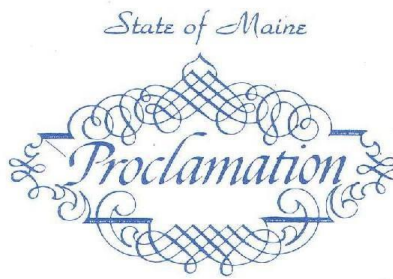
5. www.epa.gov/insect-repellents/find-repellent-right-you (For EPA approved repellents)

You can also call Maine CDC at 1-800-821-5821.

Updated June 2018

Icons from www.flaticon.com

Appendix 11 2018 Governor's Proclamation



WHEREAS, the Maine Center for Disease Control and Prevention reported over 1,800 confirmed and probable cases of Lyme disease in 2017; and

WHEREAS, the actual incidence of Lyme disease is likely much higher than reported; including disproportionately affecting children between five and fifteen years and mature adults over sixty-five years; and

WHEREAS, public awareness and education are necessary for the public to ensure fewer incidences of tickborne illnesses in Maine by promoting awareness of Lyme disease and other tick-borne illnesses, as illustrated by the them 'No Ticks 4 ME'; and

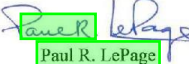
WHEREAS, the 124th Maine Legislature enacted Public Law Chapter 494, L.D. 1709, Item 1, *An Act to Enhance Public Awareness of Lyme Disease*.

NOW, THEREFORE, I, PAUL R. LEPAGE, Governor of the State of Maine, do hereby proclaim the month of May as


LYME DISEASE AWARENESS MONTH

throughout the State of Maine, and urge the public to become aware of the steps that can be taken to reduce the risk of tick-borne illnesses.

In testimony whereof, I have caused the Great Seal of the State to be hereunto affixed GIVEN under my hand at Augusta this first day of May, Two Thousand Eighteen


Paul R. LePage
Governor

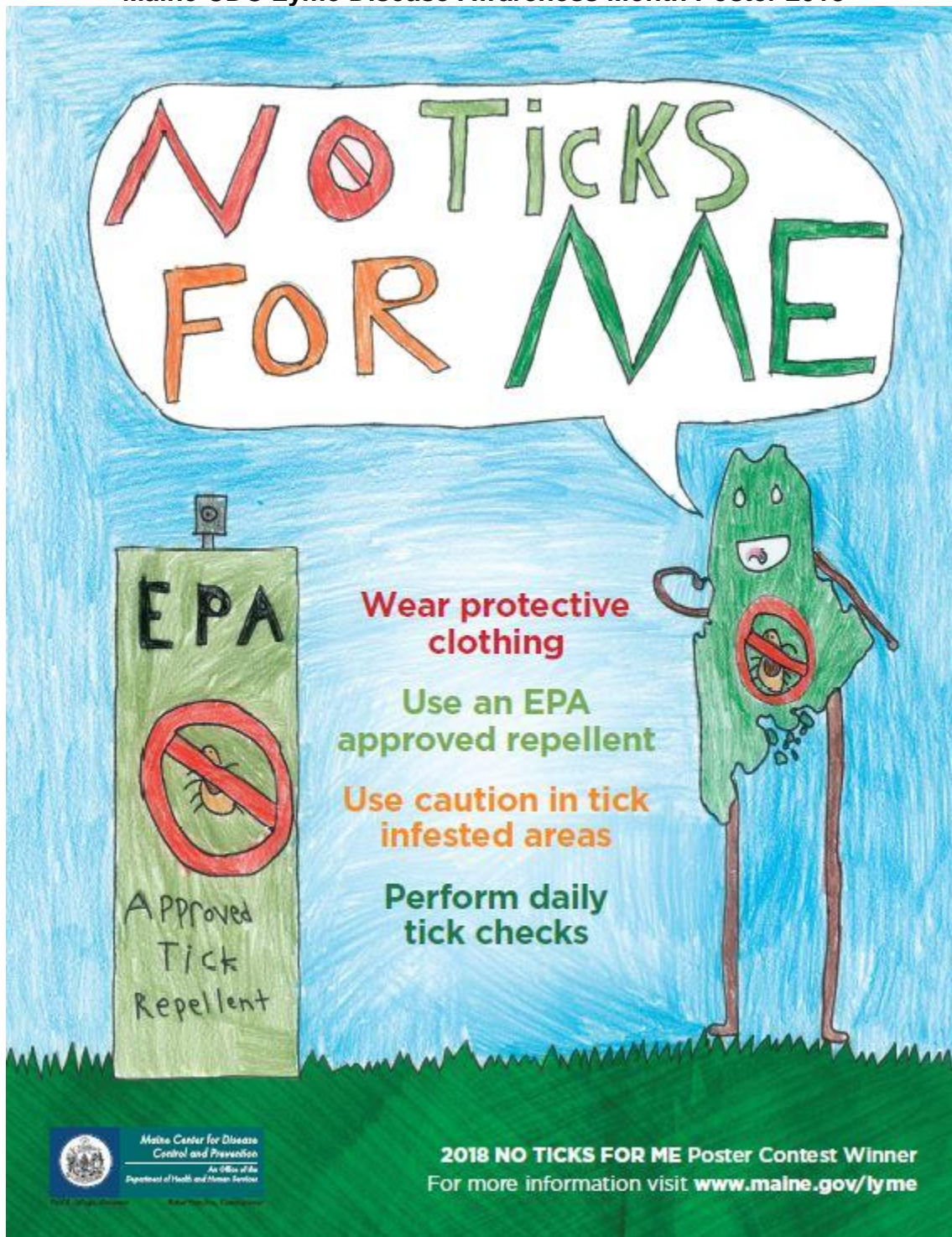



Matthew Dunlap

Secretary of State
TRUE ATTESTED COPY

Appendix 12

Maine CDC Lyme Disease Awareness Month Poster 2018



Artwork submitted by Eben Michaud from Winthrop Middle School

Appendix 13

2018 Tickborne Disease Legislation

California

Title: Lyme Disease Awareness Month (ACR 218)

Status: Passed

Connecticut

Title: An Act Requiring Lyme Disease Testing in Certain Circumstances (TOB 200)

Status: Failed

Delaware

Title: An Act to Amend Title 16 of the Delaware Code Relating to the Provision of Information About Lyme Disease (SB 249)

Status: Failed

Georgia

Title: A Resolution Recognizing May, 2018 as Lyme Disease Awareness Month (SR 771)

Status: Passed

Illinois

Title: Lyme Disease Awareness Funding (SR 1153)

Status: Passed

Title: Lyme Disease Awareness Day (SR 1301)

Status: Passed

Title: Lyme Disease Prevention and Protection Act (HB 4515)

Status: Failed

Indiana

Title: Treatment of Lyme Disease (SB 284)

Status: Failed

Iowa

Title: An Act Relating to Exemptions from Disciplinary Action for Persons Licensed to Practice Health-Related Professions Based on Their Treatment of Lyme Disease or Other Tick-Borne Disease, and Including Effective Date Provisions (SF 480; HF 577)

Status: Failed

Kentucky

Title: An Act Relating to Lyme Disease (SB 170)

Status: Failed

Maine

Title: An Act to Require Insurance Coverage for the Diagnosis and Treatment of Lyme Disease (LD 1417; HP 975)

Status: Failed

Maryland

Title: Treatment of Lyme Disease and Other Tick-Borne Diseases – Disciplinary Actions (HB 1266; SB 0950)

Status: Failed

Massachusetts

Title: An Act Establishing a Special Commission to Find the Best Practices to Promote Education, Awareness, and Prevention of Lyme Disease (S.1255)

Status: Passed

Mississippi

Title: An Act to Designate the Month of May of Each Year as “Lyme Disease Awareness Month” (HB 318)

Status: Failed

New Hampshire

Title: Bill to Require Health Care Providers to Provide Certain Information to Persons Being Tested for Lyme Disease for 5 Years (SB 475)

Status: Passed

New Jersey

Title: Act Requiring Health Insurers to Cover Lyme Disease (A678; S326)

Status: Failed

Title: Act to Codify Lyme Disease Reporting Requirements (S1747)

Status: Failed

New York

Title: Act requiring health insurers to provide coverage for long term medical care for Lyme disease and other tick borne related pathogens (A00114; S04713)

Status: Failed

Title: Act relating to grants for graduate medical education in Lyme and tick-borne disease (A05501; S02621)

Status: Failed

Title: Act relating to directing the study and report on providing coverage for Lyme disease treatment (A06927)

Status: Failed

Title: Act relating to invasive species (A08366; S06084)

Status: Failed

Title: Act relating to installing Lyme and tick-borne disease warning signs at all state-managed parks (A08829; S07242)

Status: Failed

Title: Act that establishes a Lyme and tick-borne disease working group to review current best practices for the diagnosis, treatment and prevention of Lyme and tick-borne diseases (A08900; S07170a)

Status: Failed

Title: Act that requires the department to issue a report examining the mental health impacts of tick-borne diseases and blood-borne pathogens on mental illness rates in endemic areas of the state (A09019; S07171a)

Status: Failed

Title: Act relating to reporting Lyme and tick-borne disease infection after death to the department of health (A09535; S07168)

Status: Failed

Title: Act relating to the biological control of Lyme disease vectors (A09612)

Status: Failed

Title: Act that establishes that the council on human blood and transfusion services shall review all current medical research and guidance regarding the donation of blood by patients with a history of Lyme or tick-borne illnesses (A09830; S07208)

Status: Failed

Title: Act that establishes a pilot program for Lyme and tick-borne disease testing in children (A10186; S07169)

Status: Failed

Title: Act that requires health insurers to provide coverage for long term medical care for Lyme disease and other tick borne related pathogens (A10621; S00670a)

Status: Failed

Title: Act that relates to professional misconduct by health care professionals in relation to the treatment or diagnosis of Lyme disease (A10930)

Status: Failed

Title: Act that establishes a special fund to examine and evaluate current research and progress in the development of a Lyme disease vaccine (A11132)

Status: Failed

Title: Act that directs promulgation of rules and regulations concerning removal of ticks from pupils and notification to parents (A11141; S08534)

Status: Failed

Title: Act that directs the commissioner of health to establish a standard protocol for the diagnosis and treatment of Lyme disease and other tick borne diseases (S06926)

Status: Failed

Title: Act that requires that whenever laboratory tests shall be required to be covered, such tests shall include testing for Lyme disease including at a minimum both the enzyme-linked immunosorbent assay and Western blot tests (S07753)

Status: Failed

Title: Act that directs the superintendent of financial services, in consultation with the commissioner of health, to study the relationship between patient access to care and treatment of Lyme disease and health insurance coverage (S08539)

Status: Failed

Pennsylvania

Title: A Resolution Designating the Month of May 2018 as "Lyme and Tick-borne Disease Awareness Month" in Pennsylvania (SR 349)

Status: Passed

Title: A Resolution Urging the USFDA to Promptly Consider Candidates for Lyme Disease Vaccinations Currently Seeking Approval Under the Drug Approval Process. (HR 943)

Status: Failed

Title: An Act Providing for Continuing Education in Lyme Disease and Related Tick-borne Diseases for Health Care Professionals (HB 2301)

Status: Failed

Title: An Act Providing for School Entity Procedures for Tick Removal, for Notification and Duties of the Department of Health and the Department of Education (HB 2288)

Status: Failed

Title: A Resolution Urging the Federal Government to Allocate Significant Funds to Pennsylvania to be Used for Lyme Disease Research and Data Surveillance (HR 761)

Status: Failed

Rhode Island

Title: A Resolution Supporting the Rhode Island Department of Health's "Tick Free Rhode Island Campaign" (HR 8296)

Status: Passed

Virginia

Title: A Bill Extending the Sunset Provision of the Lyme Disease Information Disclosure Requirement (HB 169)

Status: Failed

West Virginia

Title: A Bill Related to Requiring Health Insurance Providers to Provide Coverage for Long Term Antibiotic Therapy for a Patient with Lyme Disease (SB 242)

Status: Passed

Federal Legislation

Title: National Lyme and Tick-Borne Diseases Control and Accountability Act of 2018 (H.R. 5878)

Status: Failed