Lyme and Other Tickborne Illnesses Annual Report

July 2022

Submitted to the Joint Standing Committee on Health and Human Services

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Division of Disease Surveillance,
Maine Department of Health and Human Services

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 surveillance, 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 healthcare 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 thirteenth annual report to the Legislature and includes an update on activities conducted during 2021.

Executive Summary

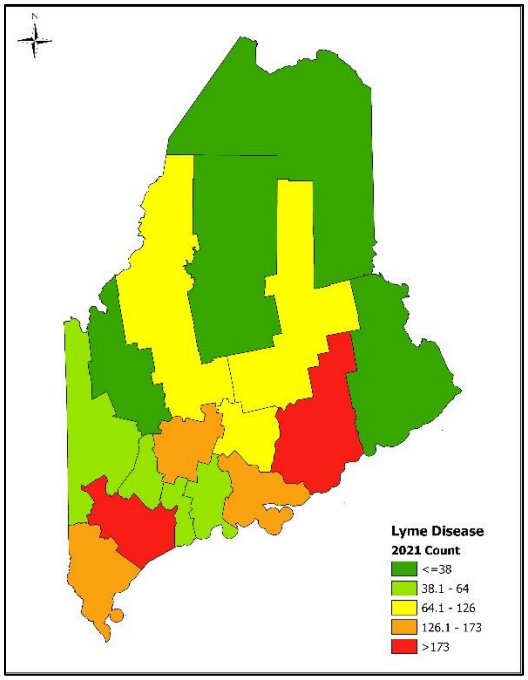
Lyme disease is a notifiable condition in the State of Maine. The goal of Lyme disease surveillance is to help define demographic, geographic, and seasonal distribution; monitor disease trends; identify risk factors for transmission; and promote prevention and education efforts among the public and medical communities. An epidemiologist classifies 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 an updated statement in 2021 that the true burden of Lyme disease may be more than ten times the number of reported cases.

Maine Lyme Disease Summary, 2021 (Preliminary data as of April 19, 2022)

- 1,508 confirmed and probable cases
- Most common symptoms of reported cases[1] of Lyme disease in Maine included:
  - Arthritis (joint swelling): 484 cases (32%)
  - Erythema Migrans (characteristic expanding rash): 705 cases (47%)
  - Neurological (Bell's Palsy or other cranial neuritis): 158 cases (11%)

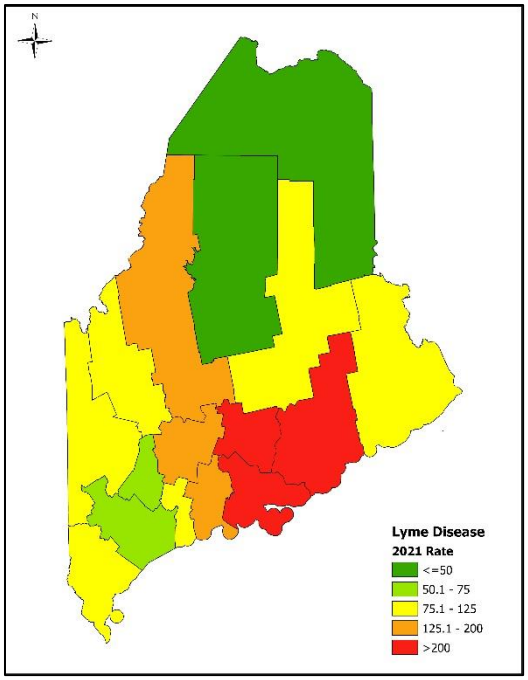
  [1]Cases could report more than one symptom
- Hospitalization occurred in 33 cases (2%).
- Among case patients with a reported date of symptom onset, 61% began experiencing symptoms during June, July, or August. Date of symptom onset is missing for 15% of cases.

Confirmed and Probable Cases of Lyme Disease – Maine 2021*



* 2021 data are preliminary as of 04/19/2022

Lyme Disease Cases per 100,000 persons (Rate) – Maine 2021*



* 2021 data are preliminary as of 04/19/2022

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

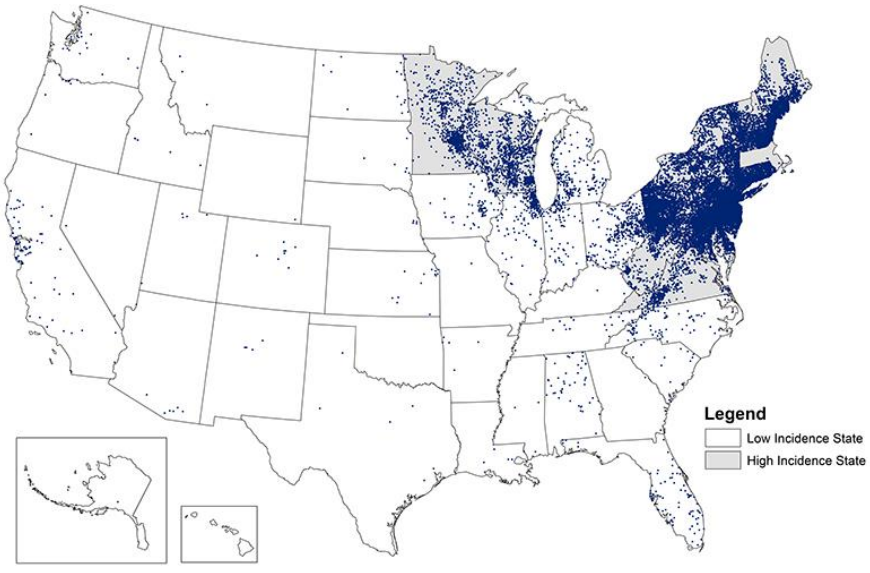
A. Lyme disease

Lyme disease is caused by the spiral-shaped bacteria *Borrelia burgdorferi,* and in rare cases by *Borrelia mayonii*, which are both transmitted to a person through the bite of an infected deer or blacklegged tick *(Ixodes scapularis*). Symptoms of Lyme disease caused by *B. burgdorferi* include the formation of a characteristic expanding rash (*erythema migrans*) that usually appears 3 to 30 days after exposure and may appear on any area of the body. 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), facial palsy, 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 intravenous antibiotics for up to 28 days.

In 2013, scientists at the Mayo Clinic discovered *B. mayonii* while testing blood from patients thought to have Lyme disease with *B. burgdorferi* infection but found a new bacterium that is also transmitted by deer ticks. Currently, *B. mayonii* is only found in the Upper Midwest and is not thought to infect ticks in Maine. *Borrelia mayonii* causes a similar illness to *B. burgdorferi*, but can also cause nausea and vomiting; large, widespread rashes; and a higher concentration of bacteria in the blood. Lyme disease caused by *B. mayonii* can be diagnosed with the same tests used to identify Lyme disease due to *B. burgdorferi* infection and treated with the same antibiotics.

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

Reported Cases of Lyme Disease – United States, 2019



1 dot placed randomly within county of residence for each confirmed case.
Source: federal CDC (www.cdc.gov/lyme/datasurveillance/index.html)

Many endemic states no longer count cases of Lyme disease as the burden is too great on the health department. This affects the national and regional rates as the number of cases appears to drop, though this is really the result of these health departments using a system to estimate the number of cases rather than counting each individual case.

Effective January 2, 2022, the Council of State and Territorial Epidemiologists (CSTE) modified the Lyme disease surveillance case definition. The last time CSTE made a substantial modification to this surveillance case definition was in 2017. Under the previous surveillance definition, Maine CDC followed up with healthcare providers to collect corresponding clinical information for every laboratory report received before the case could be classified as confirmed, probable, suspect, or not a case. Under the new surveillance definition, Maine CDC will no longer collect reports of *erythema migrans* rashes or clinical information on positive laboratory results from healthcare providers. As a result, Maine CDC will report cases that meet laboratory evidence alone, without needing healthcare providers to report clinical information, and will no longer report confirmed cases of Lyme disease, only probable.

Under the new surveillance definition, Lyme disease case counts may increase by 50-100% compared to previous years under the old surveillance definition (including 2021 case data). Under the previous case definition, Lyme disease lab reports were only classified as confirmed or probable if the healthcare provider returned the case report form with clinical information for the patient. As healthcare providers in Maine only returned these reporting forms approximately 50% of the time, lab results lacking this clinical information were classified as suspect cases. The number of confirmed and probable Lyme disease cases reported by Maine CDC likely underrepresented the true number of cases that could be classified as confirmed or probable as a result. Under the new case definition, Lyme disease cases will be classified by lab results alone, without needing corresponding clinical information from healthcare providers, reducing the number of labs that remained uncounted due to failure of healthcare providers to report clinical information.

The first documented case of Maine-acquired Lyme disease was diagnosed in 1986. In the 1990s the great majority of Lyme disease cases occurred among residents of south coastal Maine, principally in York County. Currently the Southern and Midcoast areas have the highest incidence of Lyme disease in the state. Based on 2021 data, eight counties have rates of Lyme disease higher than the State rate (Hancock, Kennebec, Knox, Lincoln, Sagadahoc, Somerset, Waldo, and Washington).

In 2021, (preliminary data as of April 19, 2022) providers reported 1,508 confirmed and probable cases of Lyme disease among Maine residents, which is a rate of 109.9 cases of Lyme disease per 100,000 persons in Maine. This is a 35% increase from the 1,118 cases in 2020. Twenty-six percent (26%) of reported cases were from the southern counties (Cumberland and York), and twenty-four percent (24%) of reported cases were from the Midcoast counties (Knox, Lincoln, Sagadahoc, and Waldo).

Forty-five percent (45%) of cases were female and fifty-five percent (55%) of cases were male. The median age of cases in 2021 was 58 years of age (average age of 51 years). The age at diagnosis ranged from 1-97 years. Sixty-one percent (61%) of the cases with a known onset date had onset during June, July, or August (date of onset is missing for 15% of cases). Providers reported 33 persons (2% 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). Anaplasmosis was previously known as human granulocytic ehrlichiosis (HGE) or human granulocytic anaplasmosis (HGA) but was renamed in 2008 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. Nervous system involvement may occur but is rare. Later features of anaplasmosis can include respiratory failure, bleeding problems, organ failure, and death. Anaplasmosis is transmitted to a person through the bite of an infected deer tick. As of April 19, 2022, preliminary data showed 841 confirmed and probable cases of anaplasmosis reported in 2021, a 90% increase from the 442 cases in 2020. This is a record high for anaplasmosis cases in Maine. Cases occurred in every county in Maine except Piscataquis. 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. Signs of babesiosis range from no symptoms (asymptomatic) to serious disease. Common symptoms include extreme fatigue, aches, fever, chills, sweating, body aches, dark urine, and anemia. People who are infected generally make a full recovery if they have a healthy spleen and do not have other diseases that prevent them from fighting infections. As of April 19, 2022, preliminary data showed 201 confirmed and probable cases of babesiosis reported in 2021, a 200% increase from the 67 cases in 2020. This is a record high for babesiosis cases in Maine. Cases occurred in every county except Aroostook and Piscataquis. For further babesiosis disease statistics in Maine please see Appendix 2.

***Borrelia miyamotoi* disease:**
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 deer tick and the western blacklegged tick (*Ixodes pacificus*). Common symptoms include fever, chills, headache, joint pain, and fatigue. Although *Borrelia miyamotoi* disease is not nationally notifiable, federal CDC, in association with endemic states, developed a case classification to standardize reporting and understand the prevalence in the United States. Effective February 17, 2021, *Borrelia miyamotoi* disease is a notifiable condition in Maine. The updated Notifiable Diseases and Conditions List is found at http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/disease-reporting/documents/notifiable-conditions-2-17-2021.pdf. As of April 22, 2022, preliminary data showed nine probable or confirmed cases of *Borrelia miyamotoi* infections reported in 2021 in Maine. Cases occurred in Cumberland, Kennebec, Lincoln, Oxford, Sagadahoc, Waldo, and York counties. For further *Borrelia miyamotoi* disease statistics in Maine, please see Appendix 2.

Ehrlichiosis:
Ehrlichiosis is a disease caused by the bacteria *Ehrlichia chaffeensis* and *Ehrlichia ewingii* which infect white blood cells (monocytes and granulocytes). In the United States, most cases are caused by *E. chaffeensis*. Ehrlichiosis was previously known as human monocytic ehrlichiosis (HME). Signs and symptoms of ehrlichiosis include fever, headache, nausea, and body aches. A rash may

develop, especially in children. Severe illness, especially when treatment is delayed, may include encephalitis/meningitis, kidney failure, and liver failure. *Ehrlichia chaffeensis* and *E. ewingii* are 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, as lone star tick populations continue to creep northward, this disease may become more common in Maine in the future. At present, most cases detected in Maine are due to exposure to infected ticks during travel to an endemic state. Preliminary data as of April 22, 2022 showed four probable cases of ehrlichiosis reported in 2021 from Kennebec, Oxford, Waldo, and York counties. Maine did not have any reports of *Ehrlichia/Anaplasma* Undetermined in 2021, which occurs when serologic testing results in titers that are the same for both *Ehrlichia* and *Anaplasma*, making it impossible to determine which organism was present. For further ehrlichiosis disease statistics in Maine please see Appendix 2.

Powassan virus disease:
Powassan virus disease is caused by either the Powassan virus or deer tick virus which are transmitted to humans through the bite of an infected woodchuck tick (*Ixodes cookei*) or deer tick, respectively. Signs and symptoms of Powassan virus disease include fever, headache, vomiting, weakness, confusion, seizures, and memory loss. Long-term neurologic problems may occur. Maine had three confirmed case of Powassan encephalitis in Maine in 2021. These cases occurred in Cumberland, Knox, and Waldo counties.

Spotted fever rickettsiosis:
Spotted Fever Rickettsioses (SFR) are a group of bacterial illnesses, the most common of which is Rocky Mountain Spotted Fever (RMSF), caused by the bacterium *Rickettsia rickettsii*. Signs and symptoms of RMSF include fever, chills, headache, gastrointestinal symptoms, and a non-itchy spotted rash (called maculopapular) often on the palms and the soles of the feet. Other spotted fever rickettsioses show similar symptoms, including fever, headache, and rash, and may also feature a dark scab at the site of the tick bite (known as an eschar). Rocky Mountain Spotted Fever is transmitted to a person through the bite of an infected American dog tick (*Dermacentor variabilis*) in most of the US. Rocky Mountain Spotted Fever is not known to be endemic in Maine but could emerge, as American dog ticks are commonly found across the state. As of April 22, 2022, preliminary data showed two probable cases of SFR reported in 2021. These cases occurred in Hancock and Piscataquis 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 diseases. Pathogens emerging in the United States include Bourbon virus, Colorado Tick Fever virus, *Ehrlichia muris eauclairensis,* and Heartland virus. While Maine has no documented cases of any of these diseases, there is serological evidence (from either humans or wild animals) of Heartland virus in Maine. Several of these pathogens are transmitted by ticks that already live in Maine or may move into Maine in the future, so Maine CDC monitors these pathogens.

Additionally, the Asian Longhorn tick, *Haemaphysalis longicornis*, which was reported in the US for the first time in 2017, has been spreading in the US. Already documented in 17 states, the Asian Longhorn tick has been found in Connecticut, Rhode Island, and New York, and may find its way to Maine. Though, compared with other ticks in Maine, the Asian Longhorn tick seems to be less attracted to humans, it has been found on pets, livestock, wildlife, and humans. In other countries,

this tick can spread pathogens that make people and animals very sick. Research is ongoing to find out if and how well these ticks can spread pathogens that cause diseases in the US like Lyme disease, anaplasmosis, and babesiosis. Maine CDC monitors this research and regional surveillance for the Asian Longhorn tick.

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. In 2020, IDSA issued new guidelines for Lyme disease and babesiosis: www.idsociety.org/practice-guideline/lyme-disease/ and www.idsociety.org/practice-guideline/babesiosis/.

Lyme disease is diagnosed clinically with the aid of laboratory testing. An *erythema migrans* (bull's-eye rash) on a person from an endemic area is distinctive enough to allow a clinical diagnosis in the absence of laboratory confirmation. Patients should be treated based on clinical findings. A two-tier testing algorithm is recommended for laboratory testing. The first tier is most often an enzyme immunoassay (EIA) or enzyme-linked immunosorbent assay (ELISA) test. If this first tier is positive or equivocal, it should be followed by either a second EIA or an IgM and/or IgG Immunoblot. The IgM Immunoblot is only considered reliable if the person is tested within the first 30 days after symptom onset. Acute and convalescent testing, or testing run on samples collected during illness and after recovery, is useful to determine final diagnosis. Providers should consider other potential diagnoses for untreated patients who remain seronegative despite having symptoms for 6-8 weeks, as they are unlikely to have Lyme disease. 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: www.idsociety.org/practice-guideline/lyme-disease/.

In 2015, IDSA convened a panel to assess and update guidelines for the treatment and prevention of Lyme disease and other tickborne diseases. The results from this panel were published in the 2020 Lyme disease guidelines found at www.idsociety.org/practice-guideline/lyme-disease/. This panel affirmed "the term 'chronic Lyme disease' as currently used lacks an accepted definition for either clinical use or scientific study…. [Studies] of persistent symptomatology after treatment of verified Lyme disease have found that prolonged antimicrobial therapy is not helpful and may cause harm. From this, one can infer that prolonged antibiotic treatment is unlikely to benefit individuals who lack a verifiable history of Lyme disease while exposing them to significant risk."

III. A Summary or bibliography of peer reviewed medical literature and studies related to the surveillance, 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 2021, as related to surveillance, diagnostics, medical management, treatment, and other topics relevant in Maine for 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 healthcare 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 anaplasmosis, babesiosis, *Borrelia miyamotoi* disease, ehrlichiosis, Lyme disease, Powassan virus disease, and spotted fever rickettsiosis 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 incidences of Lyme and other tickborne diseases. A comparison of 2019, 2020, and 2021 syndromic data is included as Appendix 4. Maine CDC performed a spatial analysis of 2021 Lyme disease surveillance data at the county level, showing the progressive geographic spread of the disease in Maine (Appendix 5).

Outreach and education to clinicians and other healthcare providers is ongoing. Maine CDC epidemiologists provide consultation to the medical community on tickborne diseases, offering educational and preventive information as needed. While 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 during most years, these efforts were hampered by the COVID-19 response in 2021. Ongoing educational initiatives are featured on the Maine CDC website: www.maine.gov/lyme.

During 2021, Maine CDC Infectious Disease Epidemiology Program mailed a **clinical management guide**, “Tickborne Diseases of the United States: A Reference Manual for Healthcare Providers,” to hospitals, urgent care providers, and dermatologists. This guide includes information on ticks found in the US and signs/symptoms, laboratory services, diagnosis, and treatment of twelve tickborne diseases, including Lyme disease.

- Maine CDC distributed 221 copies of this guide in 2021

Maine CDC continues to contribute to **national surveillance and prevention activities,** though these activities were hampered by the ongoing COVID-19 response in 2021. During 2021, Maine CDC epidemiologists represented the State at national and regional meetings:

- Council of State and Territorial Epidemiologists (CSTE) Annual Conference on Zoom in June 2021
- Northeastern Mosquito Control Association Annual Meeting on Zoom in December 2021
- National Association of Vectorborne Disease Control Officials (NAVCO) Board Meetings
- NAVCO Regional Calls (throughout the year)

- NAVCO Membership Calls (throughout the year)

Maine Epidemiologists are active contributors in federal working groups on:
- Alpha-gal allergy
- Anaplasmosis
- *Borrelia miyamotoi*
- *Haemaphysalis longicornis*
- USDA Tick and Forest Project Advisory Board
- Vectorborne diseases

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 2021, Maine CDC epidemiologists provided consultation to the public on tickborne diseases, offering educational and preventive information as needed. Due to the COVID-19 response, many educational and public awareness activities were postponed due to the cancellation of in-person events and redeployment of Maine CDC staff to the COVID-19 response. Maine CDC epidemiologists presented educational outreach activities and seminars on tickborne disease prevention to the general public including:
- 11 presentations or displays held for: students in 3rd-8th grade, school nurses, businesses, municipal governments, and community members.
- Multiple media interviews given by Maine CDC employees (Infectious Disease Epidemiology Program Director, Vectorborne Disease Health Educator, and Communications Director).

Maine CDC's Infectious Disease Epidemiology Program Director chairs the State **Vectorborne Disease Work Group**; a group comprising 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 in 2021 included:
- Presentations given on ticks and tickborne diseases
- Presence in radio interviews
- Distribution of educational materials including Lyme brochures, tick spoons, fact sheets, etc.

In 2021, 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 tickborne disease information; four ten-minute interactive activities; and a take-home packet with games, activities, and information for parents. In 2019, Maine CDC changed the format of this program from presenting in-person to a train-the-trainer style where school nurses or other school representatives attend a half day training and then present the materials in their respective schools. This change in format expands access to the curriculum to include schools that Maine CDC would otherwise not be able to go to in-person and increases the number of schools that the curriculum is

implemented in each year. Schools or districts receive compensation for attending the half-day training as well as additional compensation after showing proof of curriculum implementation in their respective school(s). This endeavor is being undertaken in close partnership with Maine's Department of Education. In 2020 and 2021, due to the statewide COVID-19 response, Maine CDC held trainings via Zoom in both a half day and two-day format. Maine CDC also reviewed and adjusted the program materials to include activities for distance learning, including the addition of Kahoot! trivia activities. Maine CDC trained 14 educators in 2021.

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 and 2019 Maine CDC administered the test to students across 3rd, 4th, and 5th grade at a single school where Maine CDC conducted the educational program in-person. Though Maine CDC presented the curriculum only to the 4th grade classes, students in the grades above and below the participating students also took the test. The goal of implementing this annual competency was to better gauge long-term knowledge retention among students who participated in the tickborne disease curriculum. In previous years, 5th graders generally scored higher than 3rd graders, but lower than 4th graders. Since Maine public schools closed for the remainder of the 2019-2020 school year due to the COVID-19 response, Maine CDC could not administer the curriculum presentations or evaluations in 2020. Without the evaluation data from 2020, Maine CDC also could not make annual competency comparisons in 2021 as in previous years. In response, Maine CDC health educators crafted a new set of pre and posttest evaluations to compare knowledge retention on the day of curriculum presentation and two weeks after presentation. Maine CDC health educators administered these tests after presenting the curriculum in a local school, while other educators who had been trained to deliver the curriculum across the state also administered the tests with their students in an effort to compare curriculum delivery across instructors. Both immediately after presentation and two weeks after presentation, all students met learning objectives, regardless of instructor, indicating that the train-the-trainer approach for the vectorborne disease curriculum is an effective means to deliver quality tickborne disease education to students across the state.

Educational materials for the 3rd-8th graders are available online, including an educator's guide, group activities, and activity book for both ticks and mosquitoes. Maine CDC updated the existing in-classroom activities to include formats that are useful for distance learning, as many Maine schools adopted distance-learning approaches during the COVID-19 response. Maine CDC continues to review and update the educational materials. As part of the school curriculum, Maine CDC worked with a graphic designer to create a new interactive workbook called "Take Back Your Yard! A workbook for kids to fight the bite!" This workbook is designed for students in 3rd-5th grades to work with an adult parent/guardian to identify and remove tick and mosquito habitat around their homes to prevent vectorborne diseases. Educational materials are available at the following link: www.maine.gov/dhhs/schoolcurricula.

- The school curriculum webpage (www.maine.gov/dhhs/schoolcurricula) recorded 882 unique pageviews in 2021.

In June and July 2021, Maine CDC ran a **Social Media Campaign** aimed at adults age 45 and older. The campaign consisted of short, targeted advertisements on YouTube and Facebook with relevant tickborne disease prevention information. This included five Facebook boosted posts (one static

advertisement and four video advertisements) and four YouTube paid instream ads. Advertisements and subsequent views during the campaign include:

- Facebook Boosted Posts
    - Do You Know Who's Most at Risk for Lyme Disease – viewed 49,200 times
    - Know How to Prevent Tick Bites – viewed 34,637 times
    - Know How to do Tick Checks - viewed 16,109 times
    - Know How to Remove Ticks - viewed 47,048 times
- YouTube Paid Instream Ads
    - Do You Know Who's Most at Risk for Lyme Disease – viewed 54,895 times
    - Know How to Prevent Tick Bites – viewed 41,900 times
    - Know How to do Tick Checks – viewed 30,300 times
    - Know How to Remove Ticks - viewed 50,400 times

Maine CDC maintains a series of **short instructional videos** to educate the Maine community in tick prevention and tickborne diseases. All of the instructional videos are available at www.youtube.com/MainePublicHealth. These videos include:

- Choosing and Applying Personal Repellents – viewed 13 times in 2021
- Do You Know Who's Most at Risk for Lyme Disease – viewed 55,213 times in 2021
- How to Choose a Residential Pesticide Applicator – viewed 9 times in 2021
- How to Perform a Tick Check – viewed 739 times in 2021
- Know How to do Tick Checks – viewed 31,535 times in 2021
- Know How to Prevent Tick Bites – viewed 42,764 times in 2021
- Know How to Remove Ticks – viewed 51,155 times in 2021
- Reducing Tick Habitat Around Your Home- viewed 235 times in 2021
- Tick Identification – viewed 1,793 times in 2021
- Tickborne Diseases in Maine: Anaplasmosis – viewed 558 times in 2021
- Tickborne Diseases in Maine: Babesiosis – viewed 205 times in 2021
- Tickborne Diseases in Maine: Lyme Disease-viewed 41 times in 2021
- Tickborne Diseases: Powassan Encephalitis– viewed 136 times in 2021

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 2021:

- The Lyme disease homepage (www.maine.gov/lyme) received 2,826 unique pageviews.
- The tick frequently asked questions homepage (www.maine.gov/dhhs/tickfaq) received 1,247 unique pageviews.

Ongoing educational initiatives featured on Maine CDC's website include:

- Anaplasmosis, babesiosis, *Borrelia miyamotoi*, Ehrlichiosis, Lyme disease, Powassan virus disease, and Rocky Mountain Spotted Fever fact sheets
- Tickborne frequently asked questions with peer-reviewed citations
- Tick identification resources
- Tick bite and tickborne disease prevention methods
- Lyme disease, anaplasmosis, ehrlichiosis, and babesiosis Surveillance Reports, selected years from 2008-2020
- Vectorborne disease school curricula
- Maine Tracking Network: Tickborne Diseases
- Tickborne Diseases in Maine webinar updated annually

During 2021, Maine CDC distributed **Lyme disease educational materials** to partners and members of the public. Approximate numbers of materials distributed include:

- 11,811 Wallet-sized laminated tick identification cards
- 17,583 Tick remover spoons
- 1,157 Lyme disease brochures
- 1,557 Tick ID posters
- 1,454 What to Do after a Tick Bite brochures
- 119 Lyme Disease Awareness Month 2020 posters
- 298 Lyme Disease Awareness Month 2021 posters
- 221 Tickborne Diseases in the United States: A Reference Manual for Healthcare Providers
- 1,941 Prevent Tickborne Diseases bookmark
- 633 Prevent Tickborne Diseases in People and Pets bookmark
- 30 Prevent Tick Bites trail sign

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** (www.maine.gov/dhhs/mecdc/all-health-advisories.shtml)**, 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. Official releases in 2021 included:

- Maine CDC marks Lyme disease awareness month with “Stop. Check. Prevent.” Campaign (Press Release) – May 3rd
- 2021 Lyme and other tickborne disease information (Health Alert) – May 3rd
- Maine CDC announces winners of 2021 Lyme Disease Awareness poster contest (Press Release) – June 2nd
- Maine CDC reports case of Powassan virus (Press Release) – June 29th
- Human Powassan case and arbovirus update for healthcare providers in Maine (Health Alert) – June 29th
- Maine CDC reports second case of Powassan virus (Press Release) – July 26th
- Maine CDC urges precautions against ticks during outdoor activities this fall (Press Release) – October 15th
- Tickborne illness risk remains high amid record numbers of reported anaplasmosis and babesiosis cases (Health Alert) – November 23rd

Pursuant to legislation enacted in the second regular session of the 126th Legislature, May 2021 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 7)
- Information distributed through social media (Facebook, Instagram, and Twitter)
- Information distributed through multiple newsletters throughout the state
- Information distributed through multiple media interviews across the State of Maine
- Provided materials for informational display tables at LL Bean in Freeport, Kittery Trading Post in Kittery, and Cabela’s in Scarborough throughout May

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 "**Stop. Check. Prevent."** 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 four winning posters and one honorable mention poster are available for viewing at the Lyme disease website: www.maine.gov/lyme. Maine CDC used one of the winning posters for our 2021 statewide educational campaign (Appendix 8). Maine CDC distributed this poster to schools, state parks, the board of tourism, and historical sites. An online poster gallery of all artwork submitted over the past twelve years is available for viewing on Maine CDC's Lyme Disease Awareness Month website: www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/lyme/month/index.shtml.

In 2012, Maine CDC updated Lyme disease data on the **Maine Tracking Network (MTN) Portal**, a web-based portal that allows users to access environmental and health data. In 2018, the Maine Tracking Network added anaplasmosis and babesiosis data to the Lyme disease portion of the portal. This data portal allows users to customize their data inquiries from 2001-2020 at the town, county, and state level. The Tickborne Disease portion of the portal was accessed 7,482 times during 2021. The MTN Tickborne Disease Data is available on Maine CDC's website at www.maine.gov/idepi. Please see Appendix 9 for a sample table and Appendix 10 for sample maps. Data can be broken down by:

- Town
- County
- Gender
- Age Group

In 2018, Maine CDC also launched a **Near Real-Time (NRT)** data dashboard for tickborne diseases on the MTN. This NRT data 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 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. New in 2021, the NRT dashboard also includes suspected tick-related emergency visits as a percent of all emergency visits, allowing for comparison with previous years. Maine CDC obtains suspected tick-related emergency department visits from hospitals in Maine. The NRT section of the portal received 1,781 visits in 2021. Please see Appendix 11 for a sample trend chart.

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, using 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.

Maine CDC partners with the University of Maine Cooperative Extension Office to monitor the identification of deer ticks (*Ixodes scapularis*) in Maine through a passive submission system.

Beginning in April 2019, the University of Maine Cooperative Extension Office offers the testing of deer ticks for the pathogens that cause Lyme disease, anaplasmosis, and babesiosis. In 2020, the Cooperative Extension Office added a panel to test non-*Ixodes* tick species, including the American dog tick and lone star tick for the pathogens that cause Rocky Mountain Spotted Fever, ehrlichiosis, and tularemia. While the testing of ticks should not be used for clinical diagnosis or medical treatment decisions, this service provides surveillance information on ticks and tickborne diseases in Maine. For more information on this service, please visit www.ticks.umaine.edu. Data on the tick submission and tick testing results for 2021 can be found in Appendix 12.

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

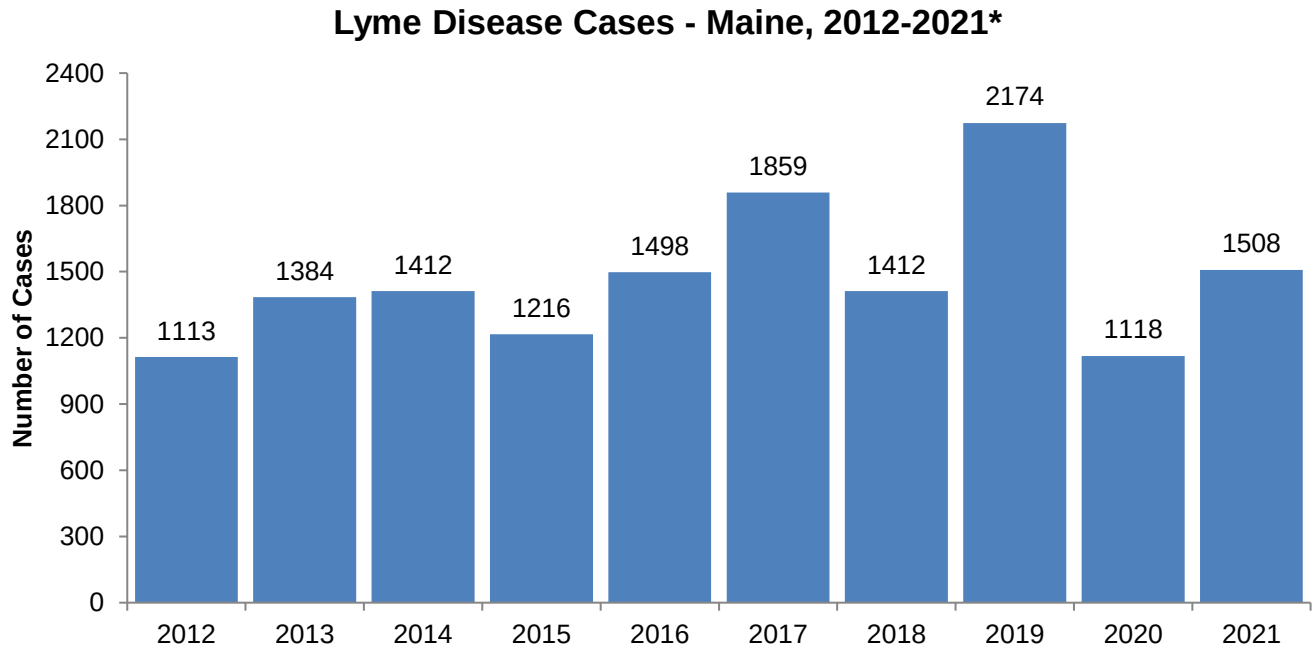
Maine CDC performed a search of state and federal legislation. A state-by-state listing of legislation relating to Lyme and other tickborne diseases can be found in Appendix 13.

Appendix 1
Maine Lyme disease statistics

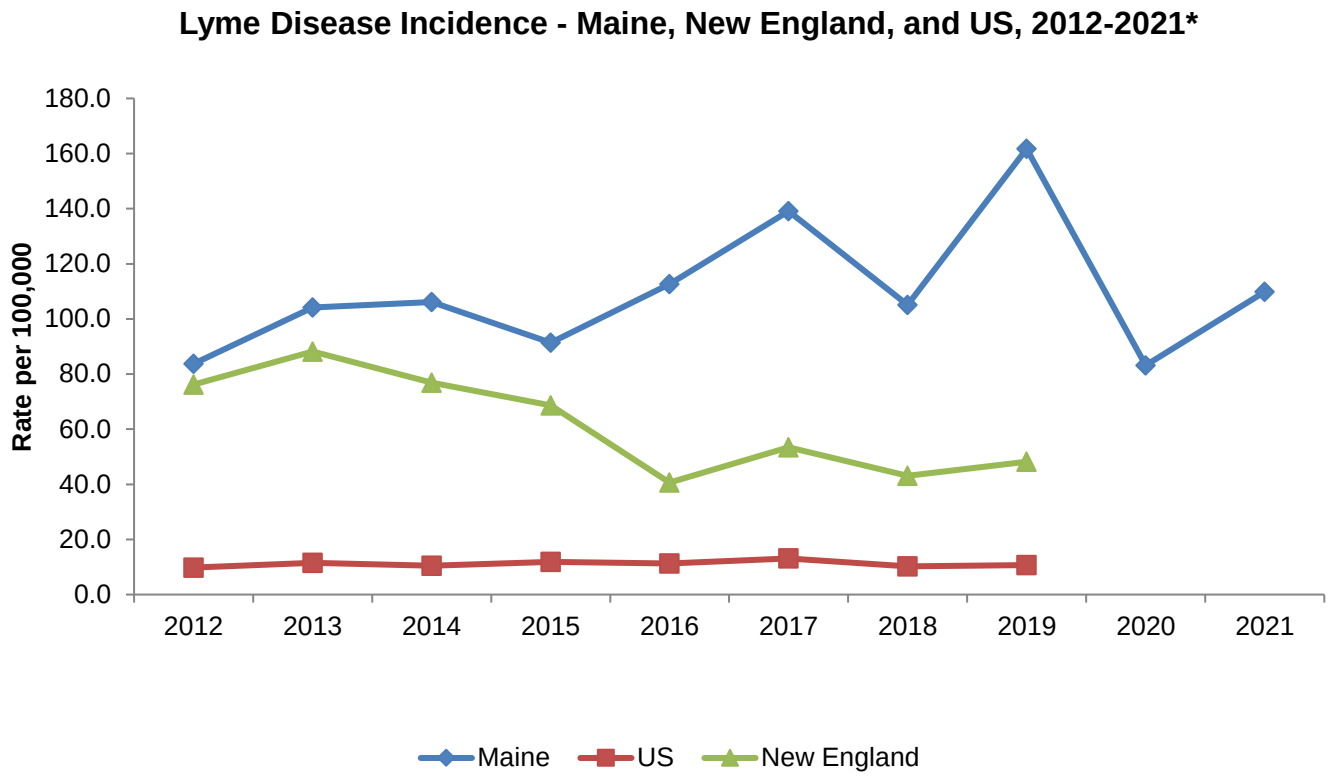
Number and Rate per 100,000 persons of Lyme Disease Cases by County of Residence – Maine, 2017-2021*

County	2017 Count	2017 Rate	2018 Count	2018 Rate	2019 Count	2019 Rate	2020 Count	2020 Rate	2021* Count	2021* Rate
Androscoggin	97	90.4	68	63.2	98	90.5	40	36.9	64	57.6
Aroostook	8	11.8	4	6.0	2	3.0	4	6.0	3	4.5
Cumberland	321	109.9	288	98.1	354	120.0	178	60.3	225	73.7
Franklin	24	80.0	13	43.5	39	129.1	18	59.6	24	80.8
Hancock	206	378.5	174	317.5	193	351.0	115	209.1	186	331.0
Kennebec	267	221.4	182	149.1	278	227.3	123	100.6	166	133.3
Knox	146	367.4	105	264.0	238	598.4	120	301.7	139	338.3
Lincoln	74	216.3	63	183.4	132	381.1	64	184.8	64	178.6
Oxford	58	101.4	48	83.3	88	151.8	42	72.4	57	97.2
Penobscot	129	85.0	78	51.6	111	73.0	85	55.9	126	82.5
Piscataquis	8	47.5	3	17.9	4	23.8	4	23.8	5	29.1
Sagadahoc	61	172.9	47	131.9	83	231.5	27	75.3	45	121.4
Somerset	90	176.8	45	88.9	68	134.7	38	75.3	80	158.1
Waldo	143	363.3	78	196.5	143	360.1	91	229.1	113	283.1
Washington	32	101.7	15	47.6	31	98.8	33	105.2	38	122.1
York	195	96.4	201	97.5	312	150.3	136	65.5	173	80.6
State	**1859**	**139.2**	**1412**	**105.0**	**2174**	**161.7**	**1118**	**83.2**	**1508**	**109.9**

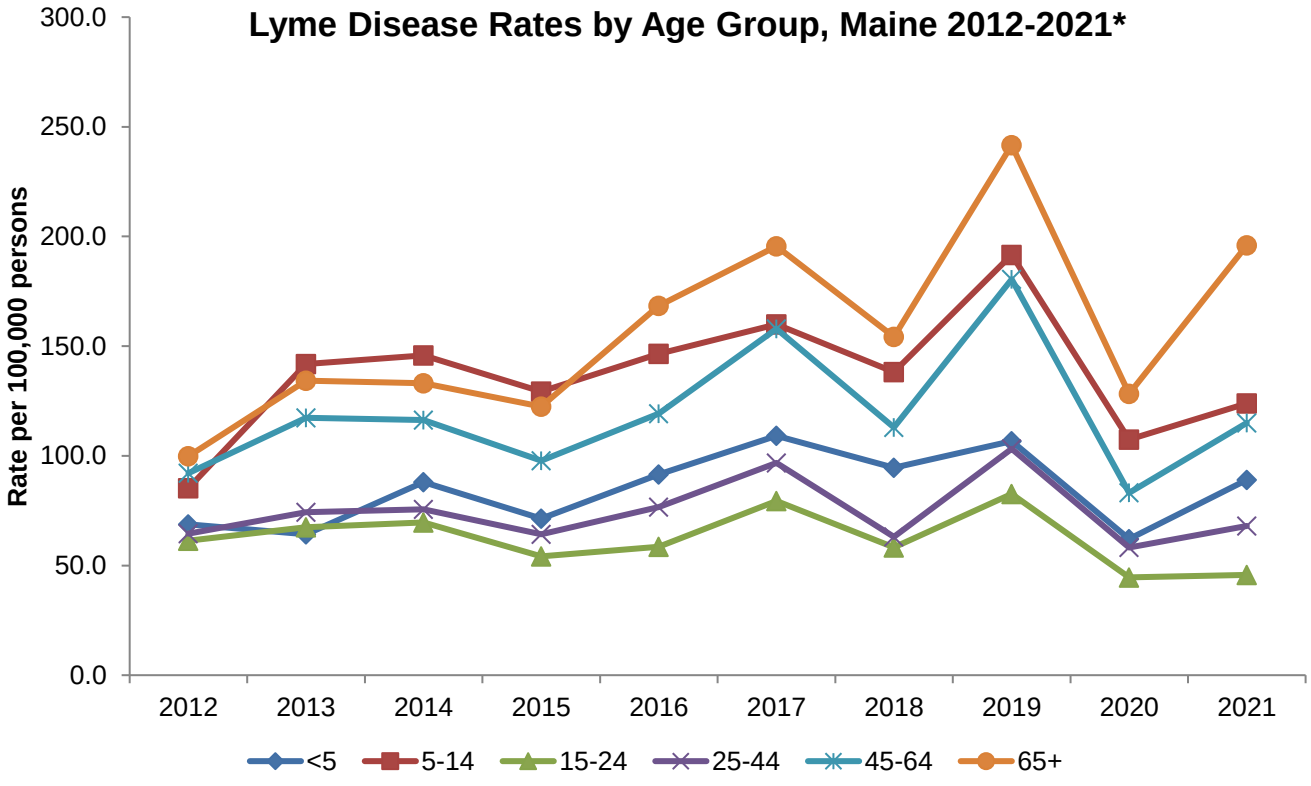
All data include both confirmed and probable cases
*2021 data are preliminary as of 04/19/2022



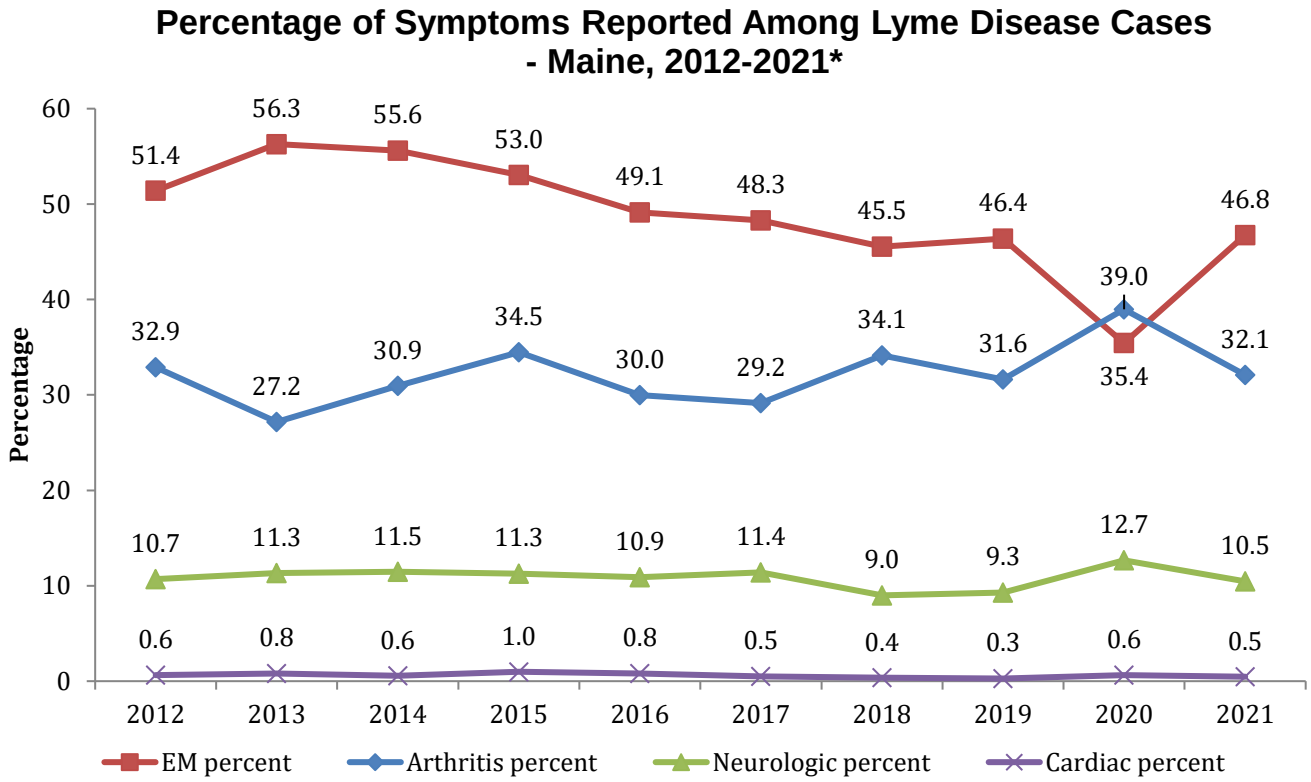
*2021 data are preliminary as of 04/19/2022



* 2021 data are preliminary as of 04/19/2022



* 2021 data are preliminary as of 04/19/2022



* 2021 data are preliminary as of 04/19/2022

Appendix 2
Maine tickborne disease statistics (excluding Lyme disease)

Number of Selected Tickborne Disease Cases by County of Residence – Maine, 2021*

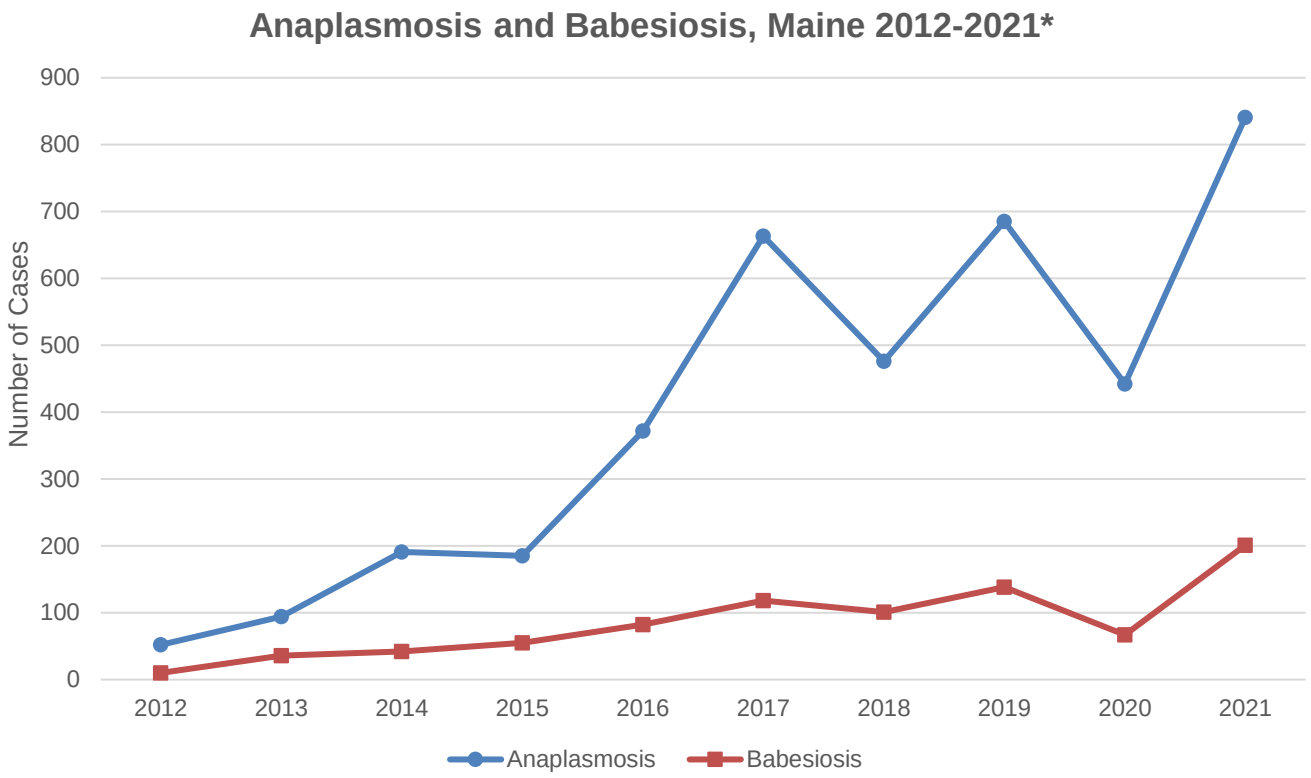
County	Anaplasmosis	Babesiosis	*Borrelia miyamotoi*	Ehrlichiosis	Ehrlichiosis/ Anaplasmosis Undetermined	Powassan	Spotted Fever Rickettsiosis
Androscoggin	38	11	0	0	0	0	0
Aroostook	3	0	0	0	0	0	0
Cumberland	116	33	1	0	0	1	0
Franklin	8	2	0	0	0	0	0
Hancock	63	18	0	0	0	0	1
Kennebec	87	19	2	1	0	0	0
Knox	88	36	0	0	0	1	0
Lincoln	108	28	2	0	0	0	0
Oxford	43	4	1	1	0	0	0
Penobscot	32	5	0	0	0	0	0
Piscataquis	0	0	0	0	0	0	1
Sagadahoc	60	10	1	0	0	0	0
Somerset	17	2	0	0	0	0	0
Waldo	82	9	1	1	0	1	0
Washington	15	2	0	1	0	0	0
York	81	22	1	0	0	0	0
Total	**841**	**201**	**9**	**4**	**0**	**3**	**2**

* 2021 data are preliminary as of 04/22/2022

Number of Selected Tickborne Disease Cases– Maine, 2012 - 2021*

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021*
Anaplasmosis	52	94	191	185	372	663	476	685	442	841
Babesiosis	10	36	42	55	82	118	101	138	67	201
Borrelia miyamotoi	0	0	0	0	0	6	8	13	10	9
Ehrlichia chaffeensis	3	3	8	5	7	10	19	13	2	4
Ehr/Ana undetermined	0	2	6	1	4	10	9	2	2	0
Powassan	0	1	0	1	1	3	0	2	1	3
SFR	3	2	3	1	4	3	10	5	0	2

* 2021 data are preliminary as of 04/22/2022



* 2021 data are preliminary as of 04/22/2022

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Peer-reviewed medical literature related to tickborne diseases – bibliography: 2021

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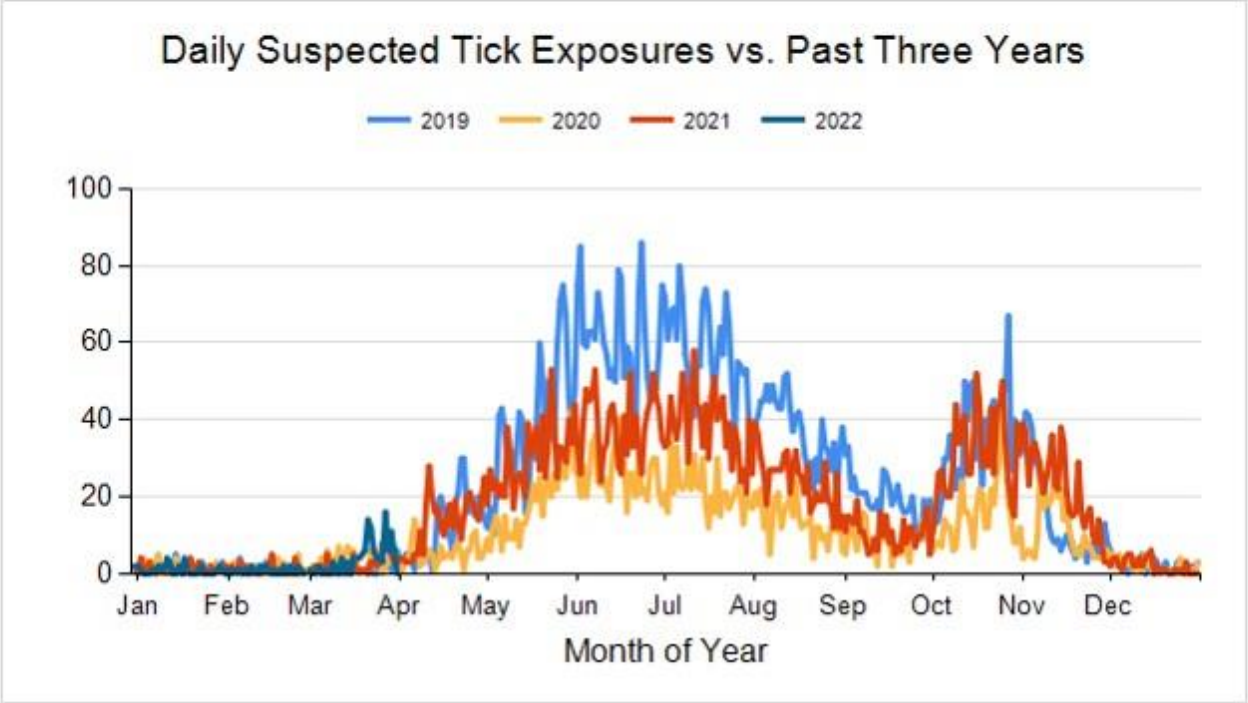
Appendix 4

Maine CDC *Syndromic Surveillance Report*

Report run: 3/31/2022 9:14:20 AM

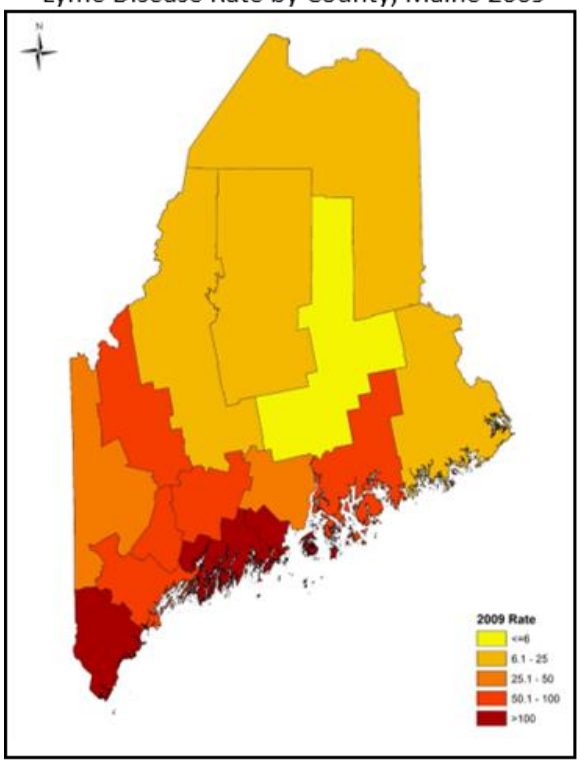


Data Notes:

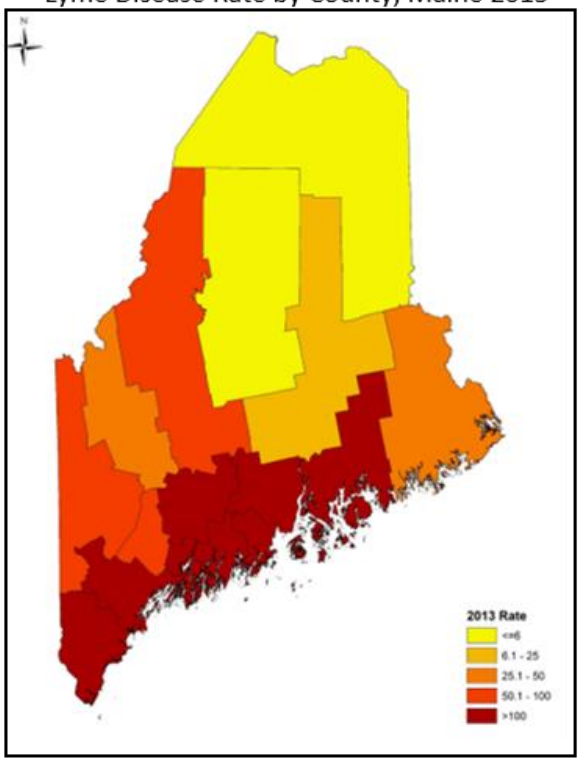
The number of suspected tick exposures is based on automated processing of chief complaint text and diagnosis codes from patient encounters at Maine emergency departments and affiliated urgent care facilities. For more information about Maine's syndromic surveillance data and methods, please contact syndromic@maine.gov.

Appendix 5
Lyme Disease Cases per 100,000 people (Rate) – Maine, Selected years 2009-2021*

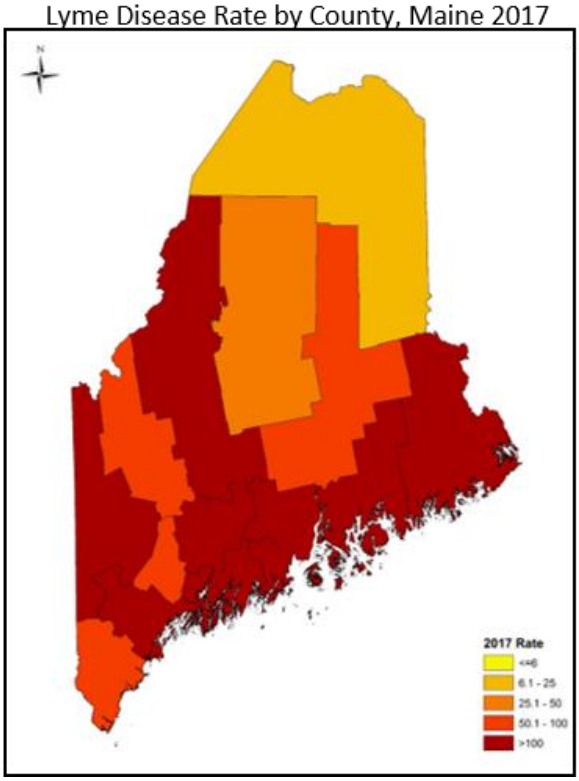
Lyme Disease Rate by County, Maine 2009



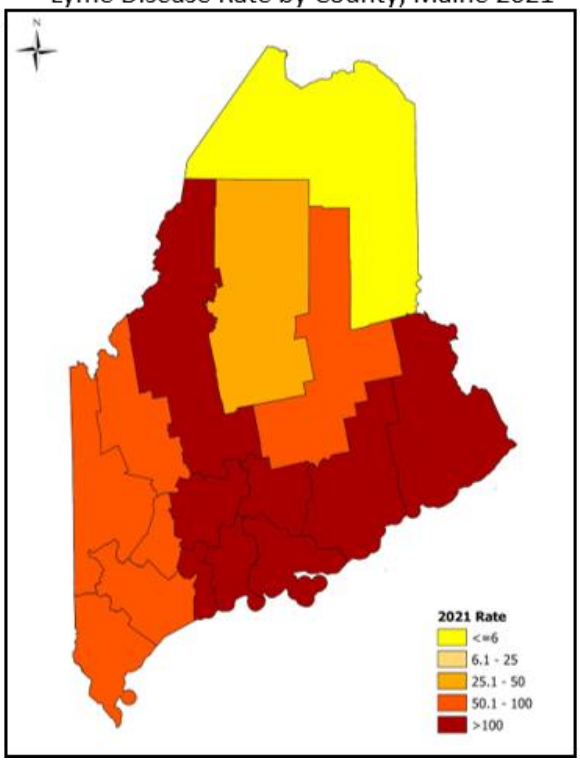
Lyme Disease Rate by County, Maine 2013



Lyme Disease Rate by County, Maine 2017



Lyme Disease Rate by County, Maine 2021



* 2021 data are preliminary as of 04/19/2022

Appendix 6
Maine Vectorborne Work Group

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

Bonthius, Jessica	Maine CDC
Boyd, Karla	Maine Board of Pesticide Control
Bryer, Pam	Maine Board of Pesticide Control
Camuso, Judy	Maine Department of Inland Fisheries and Wildlife
Dill, Griffin	Maine Cooperative Extension
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
Hurwitz, Carolyn	Maine Department of Agriculture, Conservation, and Forestry
Jensen, Gary	Swamp, Inc.
Jensen, Rose	Swamp, Inc.
Kanoti, Allison	Maine Forest Service
Kantar, Lee	Maine Department of Inland Fisheries and Wildlife
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, Michael	Swamp, Inc.
Patterson, Megan	Maine Board of Pesticides Control
Peterson, Hillary	Maine Department of Agriculture, Conservation, and Forestry
Poland, Emily	Maine Department of Education
Porter, Megan	Maine CDC
Rand, Peter	Maine Medical Center Research Institute
Schattman, Rachel	University of Maine, School of Food and Agriculture
Robich, Rebecca	Maine Medical Center Research Institute
Schmeelk, Thomas	Maine Forest Service
Shelley, Steven	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
Urcuqui, Andres	University of Maine, School of Forest Resources
Walsh, Michele	Maine Department of Agriculture, Conservation, and Forestry
Webb, Nathan	Maine Department of Inland Fisheries and Wildlife
Webber, Lori	Maine CDC

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

Appendix 7
2021 Governor's Proclamation

State of Maine

Proclamation

WHEREAS, the Maine Center for Disease Control and Prevention reported at least 1,118 confirmed and probable cases of Lyme disease in 2020, disproportionately affecting children between five and fifteen and adults over sixty-five years; and

WHEREAS, the actual incidence of Lyme disease in Maine is likely much higher than reported; and

WHEREAS, tickborne illnesses can be prevented by staying in the center of wooded paths, wearing light-colored long-sleeved clothing, using an EPA-approved insect repellent, performing daily tick checks, and properly removing ticks; and

WHEREAS, public awareness and education are necessary to help reduce tickborne illnesses in Maine by promoting awareness of Lyme disease, other tickborne illnesses, and the regular use of prevention measures, as illustrated by the theme "Stop. Check. Prevent."; 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, be it resolved that I, Janet T. Mills, Governor of the State of Maine, do hereby proclaim the month of May 2021 as

Lyme Disease Awareness Month

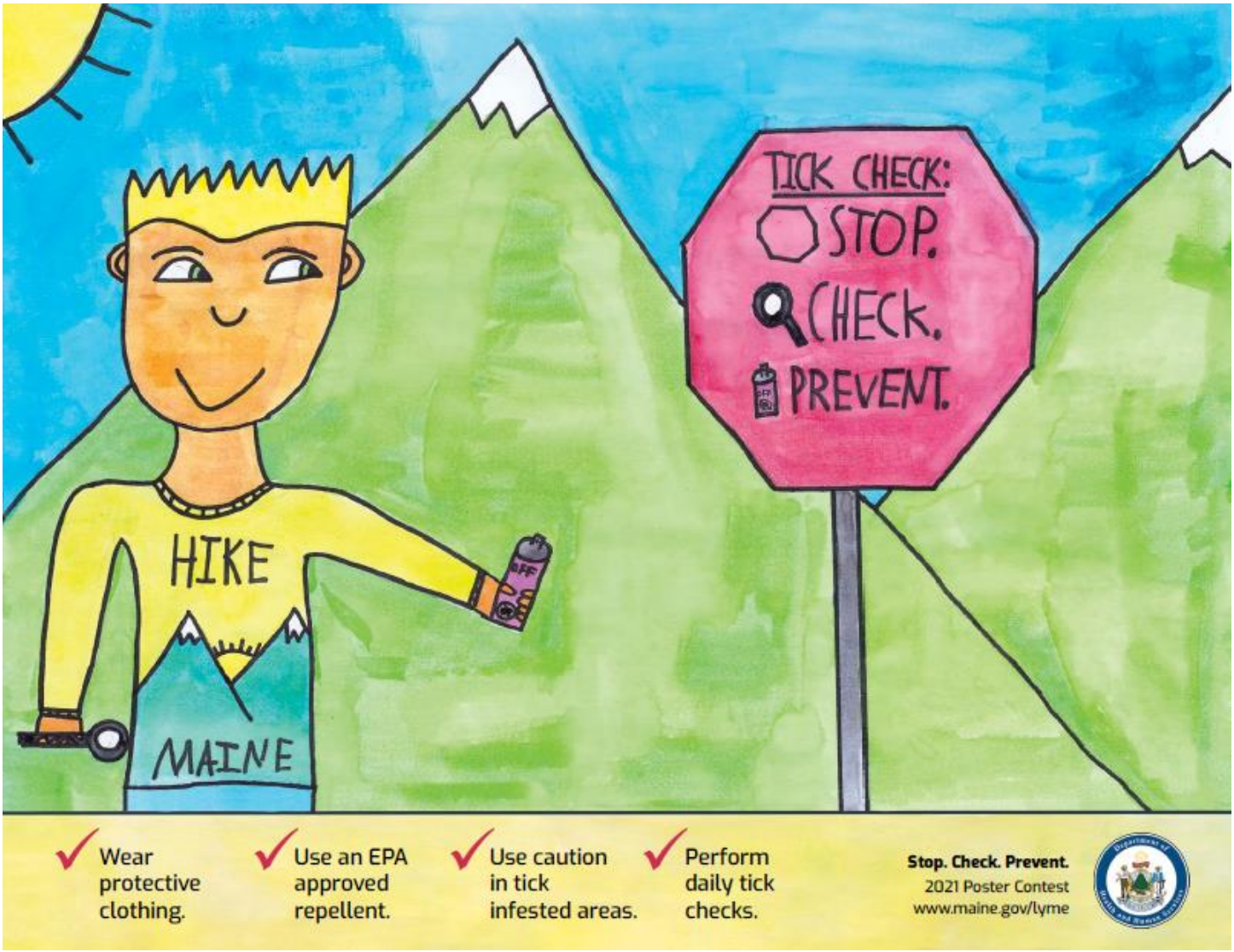
in Maine, and I urge all the citizens of Maine to become aware of the steps that can be taken to reduce the risk of tickborne illnesses.

In testimony whereof, I have caused the Great Seal of the State to be hereunto affixed GIVEN under my hand at Augusta this fourteenth day of April Two Thousand Twenty-One

Janet T. Mills
Governor

Shenna Bellows
Secretary of State

Appendix 8
Maine CDC Lyme Disease Awareness Month Poster 2021



Artwork submitted by Avery Cook from Spruce Mountain Elementary School

Appendix 9
Maine Tracking Network

Number of Tickborne Disease Cases by Town, Maine 2016-2020 Showing: First 20 Towns

Location	Number			Population
	Anaplasmosis	Babesiosis	Lyme	
Portland	37	7	155	337,965
Windham	34	9	134	91,401
Augusta	31	7	123	92,328
Islesboro	<6	0	118	2,760
Gorham	24	8	114	87,421
Brunswick	48	8	102	104,208
Bar Harbor	23	6	95	26,596
Freeport	39	5	94	41,507
Deer Isle	<6	<6	86	9,553
Sanford	58	3	81	104,789
York	21	11	79	64,141
Saint George	49	7	76	13,043
Ellsworth	3	1	75	39,636
Yarmouth	8	3	71	42,256
Kittery	20	17	69	48,357
Auburn	44	4	68	114,438
Bangor	6	1	68	160,360
Gray	17	7	68	41,090
Winthrop	11	4	68	29,817
Warren	65	16	67	24,172

About this table

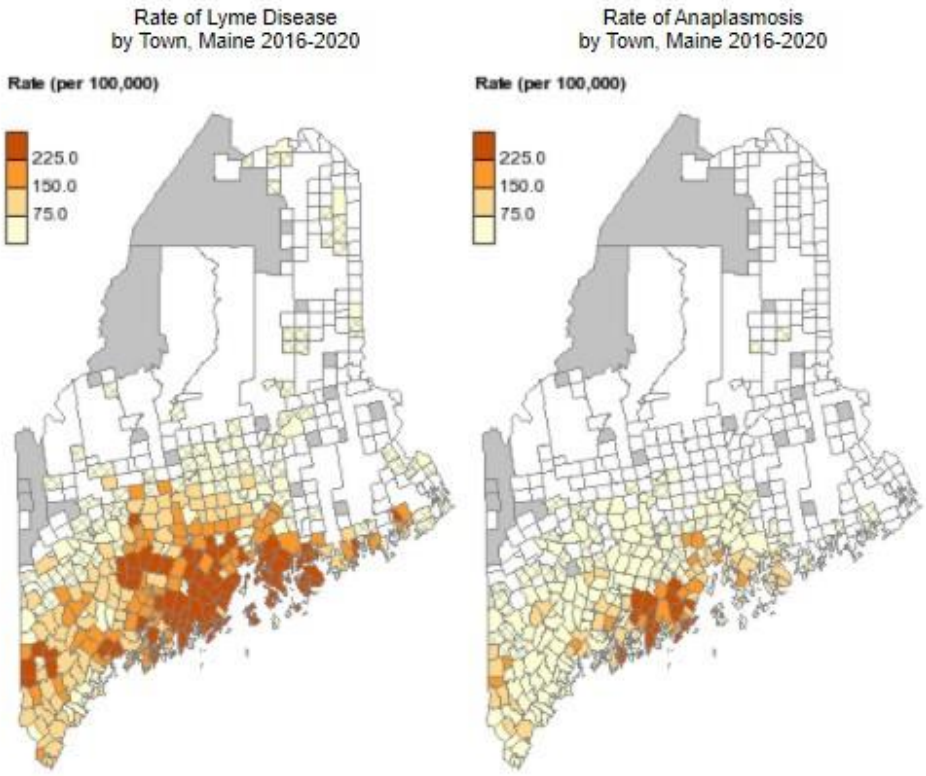
This table shows the number of confirmed and probable cases of tickborne disease in the population. Combined year population data are the sum of individual years (e.g. 2010-14 is the sum of populations in 2010, 2011, 2012, 2013, and 2014). Combined year rates are annualized across all included years. Maine CDC's Infectious Disease Program obtained these data through notifiable conditions surveillance based upon reports from healthcare providers, laboratories, and other healthcare partners.

To protect privacy as per Maine CDC's Privacy Policy, data may be suppressed. For locations where data are suppressed, a range ('<6') is provided for the number of events and an asterisk (*) for the rate. Data may also be secondarily suppressed to protect against indirect identification and are displayed as a number range (such as '6-10' or '11-15') when possible, or Not Releasable (NR). Geographical locations with populations less than 50 individuals are also displayed as Not Releasable (NR).

Source of these data

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 Maine CDC Data, Research, and Vital Statistics (DRVS) to calculate town-level rates of tickborne disease. The Maine Environmental Public Health Tracking Program prepared the data display. Data updated: 05/2021. Display updated: 05/2021.

Appendix 10
Maine Tracking Network



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

Figure A Figure B

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 incidence rate (per 100,000 people) of confirmed and probable cases of anaplasmosis in the population. Maine CDC's Infectious Disease Program obtained these data through notifiable conditions surveillance based upon reports from healthcare providers, laboratories, and other healthcare partners.

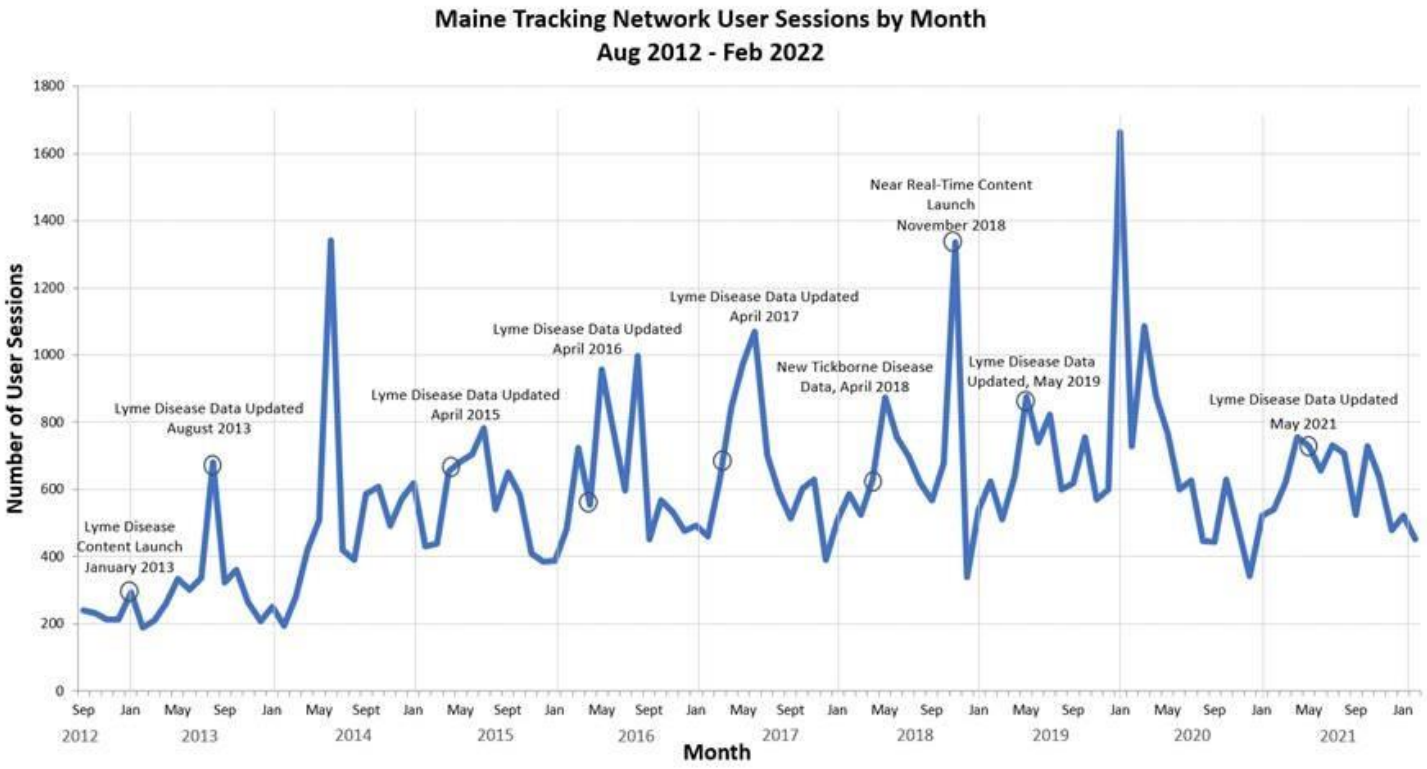
Different map colors are not based on statistical tests of difference.

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

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 Maine CDC Data, Research, and Vital Statistics (DRVS) to calculate town-level rates of tickborne disease. The Maine Environmental Public Health Tracking Program prepared the data display. Data updated: 05/2021. Display updated: 05/2021.

Appendix 11


Maine Tracking Network User Sessions by Month
Aug 2012 - Feb 2022
Number of User Sessions
1800
1600
1400
1200
1000
800
600
400
200
0
Lyme Disease Content Launch January 2013
Lyme Disease Data Updated August 2013
Lyme Disease Data Updated April 2015
Lyme Disease Data Updated April 2016
Lyme Disease Data Updated April 2017
New Tickborne Disease Data, April 2018
Near Real-Time Content Launch November 2018
Lyme Disease Data Updated, May 2019
Lyme Disease Data Updated May 2021
Sep Jan May Sep Jan May Sept Jan May Sept Jan May Sept Jan May Sept Jan May Sep Jan May Sep Jan May Sep Jan May Sep Jan May Sep Jan
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Month

Appendix 12
University of Maine Tick Submission and Tick Testing Data for 2021

Tick Species Submitted to the UMaine Extension Tick Lab in 2021

Tick Species	Common Name	Total
Ixodes scapularis	Blacklegged tick (formerly known as deer tick)	3598
Dermacentor variabilis	American dog tick	2839
Amblyomma americanum	Lone star tick	29
Ixodes cookei	Woodchuck tick	21
Ixodes marxi	Squirrel tick	5
Dermacentor albipictus	Winter tick	3
Amblyomma maculatum	Gulf Coast tick	1
Unknown	Specimens damaged during removal/delivery	3

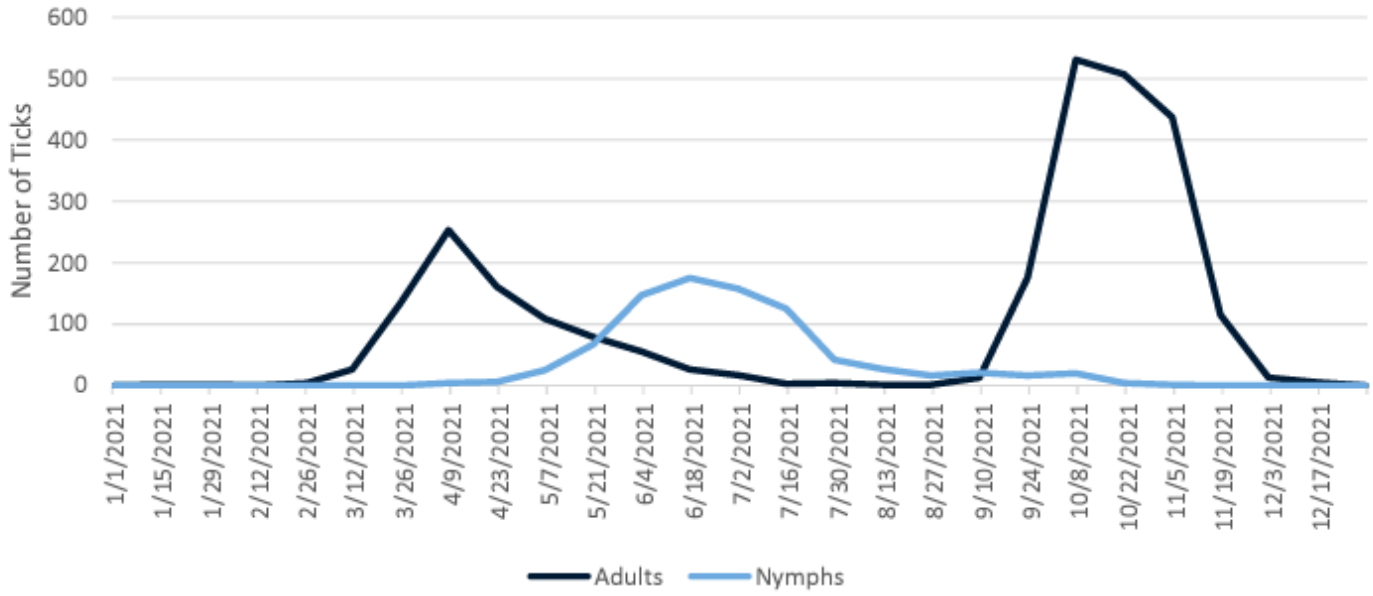
Source: University of Maine Cooperative Extension Tick Laboratory 2021 Annual Report

Infection Prevalence in Submitted Blacklegged (Deer) Ticks (*Ixodes scapularis*) in 2021

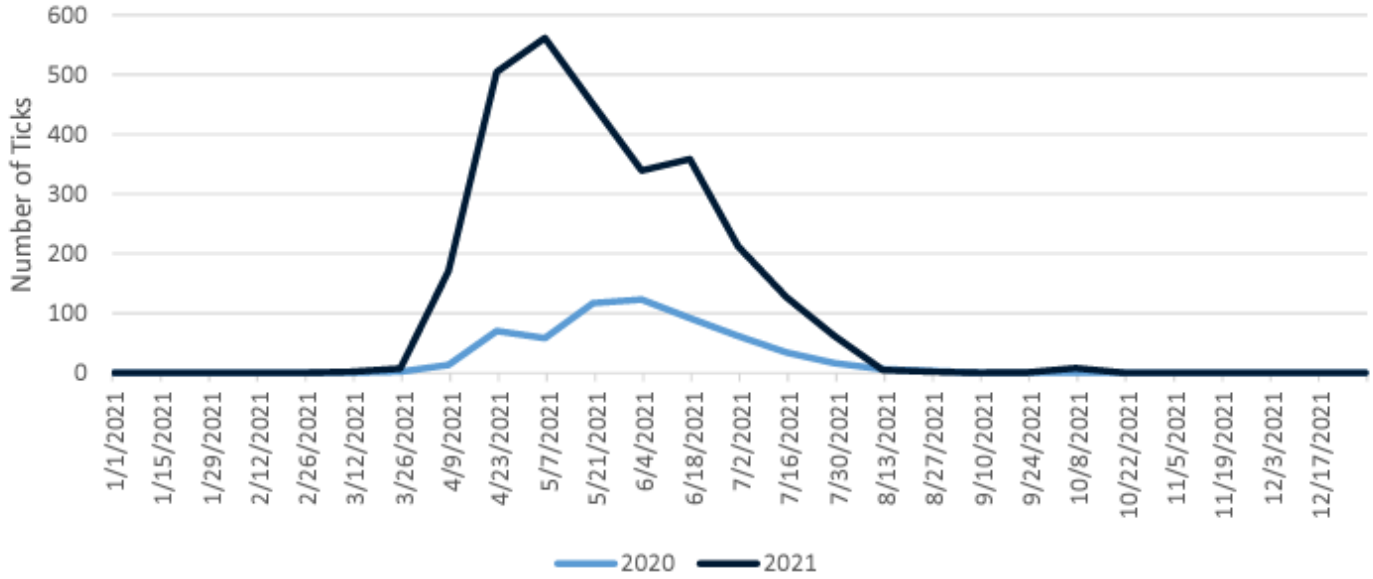
Pathogen	% of nymphs infected	% of adults infected	% of ticks infected
Positive for at least 1 pathogen	30.8%	56.7%	49.6%
Borrelia burgdorferi	26.0%	48.4%	42.3%
Anaplasma phagocytophilum	6.5%	14.1%	12.1%
Babesia microti	5.3%	11.9%	10.1%
Borrelia + Anaplasma	2.9%	5.9%	5.1%
Borrelia + Babesia	2.2%	6.8%	5.6%
Anaplasma + Babesia	0.1%	0.6%	0.5%
Borrelia + Anaplasma + Babesia	0.8%	2.1%	1.8%

Source: University of Maine Cooperative Extension Tick Laboratory 2021 Annual Report

Blacklegged Ticks (*Ixodes scapularis*) Collected by Week - 2021 (Fig. 1)



American Dog Ticks (*Dermacentor variabilis*) Collected by Week – 2020 & 2021 (Fig. 2)



Source: University of Maine Cooperative Extension Tick Laboratory 2021 Annual Report

Appendix 13
2021 Tickborne Disease Legislation
Tickborne legislation and status recorded from LegiScan

Connecticut
Title: An Act Concerning Climate Change Adaptation (HB06441)
Status: Passed

Title: An Act Concerning Physician Assistants' Scope of Practice (SB01028)
Status: Failed

Title: An Act Concerning Physician Assistants (SB01070)
Status: Passed

Title: An Act Concerning Various Revisions to the Public Health Statutes (SB01083)
Status: Passed

Title: An Act Establishing a Task Force to Study Tick-Borne Illnesses (SB00383)
Status: Failed

Federal
Title: Tick Identification Pilot Program Act of 2021 (HB4566)
Status: Failed

Title: Supporting the designation of May as "National Lyme and Tick-Borne Disease and Conditions Awareness Month" (HR425)
Status: Failed

Title: CHILD Act of 2021 Children Inflicted by Lyme Disabilities Act of 2021 (HB3636)
Status: Failed

Title: Stamp Out Lyme Disease Act (HB3491)
Status: Failed

Title: LymeX Authorization Act (HB3637)
Status: Failed

Illinois
Title: Medical Practice Act-Board (SB3126)
Status: Failed

Title: Naturopathic Physicians (SB1220)
Status: Failed

Maryland
Title: Health Insurance – Lyme Disease and Related Tick-Borne Illnesses – Long-Term Antibiotic Treatment (HB1319)

Status: Failed

Minnesota
Title: Board of Animal Health Assessment of Possible Flea and Tick Collar Threat to Pets and People Funding Provided, Recommendations Required, and Money Appropriated (HF2137)
Status: Failed

Title: Threats Posed to Pets and People by Flea and Tick Collars Assessment Appropriation (SF2297)
Status: Failed

New Jersey
Title: Makes Supplemental Appropriation of $250,000 from General Fund to NJ Agricultural Experiment Station for Tick Research and Control (A3574)
Status: Failed

Rhode Island
Title: Lyme Disease Diagnosis and Treatment (H5897)
Status: Failed

Title: Senate Resolution Respectfully Requesting That the Rhode Island Department of Health Increase Public Awareness of Activities That Expose People to Ticks, Better Educate the Public about the Symptoms of Lyme Disease and the Importance of Early Detection, and Update Their Findings, Data, and Physician Protocols with Regards to the Early Detection and Treatment of Lyme Disease (S0711)
Status: Failed