Lyme and Other Tickborne Illnesses 2022 Annual Report

Submitted to the Joint Standing Committee on Health and Human Services

Prepared by:
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Introduction and Background

In 2008, during the first special session of the 123rd Legislature, hearings and discussion over proposed legislation regarding the reporting of Lyme disease led to Public Law 2007 Chapter 561. 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 (Maine CDC) 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 annual report is 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.

22 MRS, chapter 266-B, was further amended by emergency legislation, introduced as LD 1709 in the 124th Legislature, to require the Maine CDC to include information on diagnosis of Lyme disease in its annual report and to publish related information on its public website.

22 MRS §1645, directs Maine CDC to report on:

1. The incidence of Lyme disease and other tickborne illness in Maine;
2. 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;
3. 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;
4. 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;
5. 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
6. 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 fourteenth annual report to the Legislature and includes an update on activities conducted during 2022.

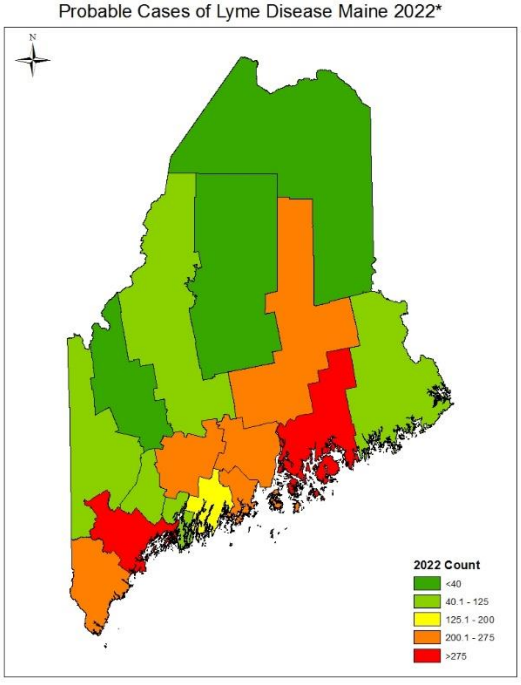
Executive Summary

Lyme disease is a notifiable condition in the State of Maine and, as such, must be reported to the Maine Center for Disease Control and Prevention (Maine CDC), in accordance with 10-144 CMR chapter 258. 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. Effective January 2, 2022, the Council of State and Territorial Epidemiologists (CSTE) modified the Lyme disease surveillance case definition. Under the new definition, Maine CDC no longer collects reports of *erythema migrans* (bull's-eye) rashes or clinical information on positive laboratory results from healthcare providers. As a result, Maine CDC epidemiologists classify reported cases as probable, suspect, and not a case based on laboratory results alone, without the information on clinical symptoms required under the previous surveillance case definition. Maine CDC no longer reports confirmed cases of Lyme disease, in line with the CSTE definition. 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. In 2022, federal CDC estimated that the aggregate cost of diagnosed Lyme disease alone could be $345-968 million to U.S. society.

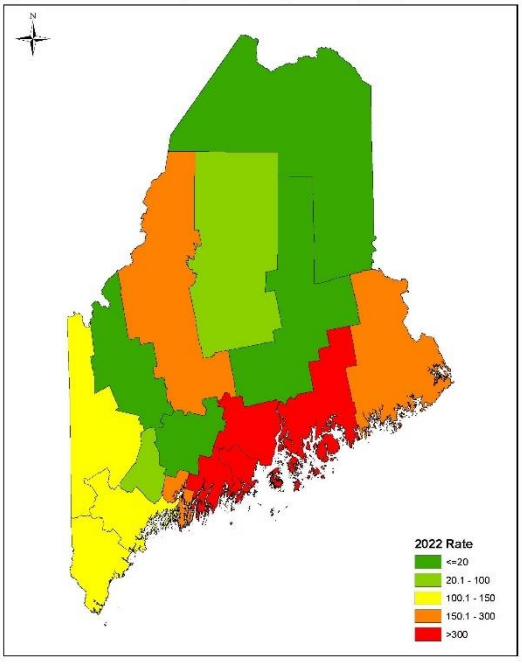
Maine Tickborne Disease Summary, 2022

- 2,617 probable cases of Lyme disease (preliminary data as of March 8, 2023)
- 824 confirmed and probable cases of anaplasmosis (preliminary data as of March 8, 2023)
- 192 confirmed and probable cases of babesiosis (preliminary data as of March 8, 2023)
- 12 confirmed and probable cases of Hard Tick Relapsing Fever (preliminary data as of March 8, 2023)
- 4 confirmed and probable cases of Powassan virus disease (preliminary data as of March 8, 2023)

Probable Cases of Lyme Disease Maine 2022*



Lyme Disease Cases per 100,000 persons (Rate) Maine 2022*



* 2022 data are preliminary as of 03/08/2023

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

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 humans 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 three 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. Instead, they 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, 2020

1 dot placed randomly within county of residence for each confirmed case. High incidence states highlighted in light blue. Due to the COVID-19 pandemic, 2020 data from some jurisdictions may be incomplete.

Source: U.S. CDC (www.cdc.gov/lyme/datasurveillance/index.html)

Through 2021, 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. 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. Reported *erythema migrans* rashes with likely exposure in a state with high Lyme disease incidence were automatically classified as confirmed cases. Under the new surveillance definition, Maine CDC no longer collects reports of *erythema migrans* rashes or clinical information on positive laboratory results from healthcare providers. As a result, Maine CDC reports cases that meet laboratory evidence alone, without needing healthcare providers to report clinical information, and no longer reports 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) (Kugeler et al. 2022). Under the previous case definition, epidemiologists classified Lyme disease lab reports 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, epidemiologists classified lab results lacking this clinical information 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 are 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 Midcoast and Downeast areas have the highest incidence of Lyme disease in the State. Based on 2022 data, seven counties have rates of Lyme disease higher than the State rate (Hancock, Knox, Lincoln, Sagadahoc, Somerset, Waldo, and Washington).

In 2022, (preliminary data as of March 8, 2023) providers reported 2,617 probable cases of Lyme disease among Maine residents, which is a rate of 188.9 cases of Lyme disease per 100,000 persons in Maine. This is a 73% increase from the 1,129 cases in 2021. Twenty-nine percent (29%) of reported cases were from the Midcoast counties (Knox, Lincoln, Sagadahoc, and Waldo) and 17% were from the Downeast counties (Hancock and Washington).

Forty-three percent (43%) of cases were female and 57% of cases were male. The median age of cases in 2022 was 59 years of age (average age of 52 years). The age at diagnosis ranged from less than 1 to 100 years of age. For further Lyme disease statistics in Maine, please see Appendix 1.

Other tickborne diseases in Maine

Anaplasmosis:

Anaplasmosis is a disease caused by the bacterium *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 March 8, 2023, Maine reported 824 confirmed and probable cases of anaplasmosis in 2022, a 2% decrease from the 841 cases in 2022. Cases occurred in every county in Maine. 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 March 8, 2023, Maine reported 192 confirmed and probable cases of babesiosis in 2022, a 4% decrease from the 201 cases in 2022. Cases occurred in every county except Aroostook and Piscataquis. For further babesiosis disease statistics in Maine please see Appendix 2.

Hard Tick Relapsing Fever:

Hard Tick Relapsing Fever (HTRF), previously referred to as *Borrelia miyamotoi* disease, is caused by a species of spiral-shaped bacteria, called *B. miyamotoi*, 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, two species of North American ticks carry *B. miyamotoi*, the deer tick and the western blacklegged tick (*Ixodes pacificus*). Common symptoms include fever, chills, headache, joint pain, and fatigue. Although HTRF is not nationally notifiable, U.S. CDC, in association with endemic states, developed a case classification to standardize reporting and understand the prevalence in the United States. Hard Tick Relapsing Fever (*Borrelia miyamotoi* disease) is a notifiable condition in Maine. As of March 8, 2023, Maine reported 12 probable or confirmed cases of HTRF in 2022 in Maine. Cases occurred in Androscoggin, Cumberland, Hancock, Kennebec, Knox, Lincoln, Penobscot, Sagadahoc, and York counties. For further HTRF 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 this 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. As of March 8, 2023, Maine reported seven probable cases of ehrlichiosis in 2022 from Androscoggin, Kennebec, Knox, and Lincoln counties. Maine had one report of *Ehrlichia/Anaplasma* Undetermined in 2022, 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. As of March 8, 2023, Maine reported four confirmed case of Powassan encephalitis in Maine in 2022. This is a record number of Powassan virus diseases cases in Maine. These cases occurred in Cumberland, Penobscot, Waldo, and York 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 U.S. 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 March 8, 2023, Maine reported one probable case of SFR in 2022. This case occurred in Lincoln County. For further SFR disease statistics in Maine please see Appendix 2.

Other emerging tickborne diseases:

U.S. 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, Heartland virus, and *Ehrlichia muris eauclairensis*. While Maine has no documented cases of any of these diseases, there is serological evidence from whitetail deer 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 U.S. for the first time in 2017, has been spreading. Already documented in 17 states, the Asian Longhorn tick has been found in Connecticut, Rhode Island, New York, and Massachusetts, 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.

2. 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 CDC 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.

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. Either a standardized or modified two-tier testing algorithm (STTT or MTTT, respectively) is recommended for laboratory testing. With STTT, the first tier includes an enzyme immunoassay (EIA) or immunofluorescence assay (IFA). If this first tier is positive or equivocal, an IgM and/or IgG Immunoblot follows. The IgM Immunoblot is only considered reliable if the person is tested within the first 30 days after symptom onset. With MTTT, the first tier uses an EIA, similar to STTT. If positive or equivocal, a second EIA follows. 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." Currently, U.S. CDC recognizes Post-Treatment Lyme Disease Syndrome (PTLDS), defined as symptoms of pain, fatigue, or difficulty thinking that lasts for more than 6 months after completion of Lyme disease treatment (https://www.cdc.gov/lyme/postlds/index.html). There is no proven treatment for PTLDS, but U.S. CDC notes that patients with PTLDS usually get better over time, though this may take many months. The 2015 panel also noted "[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."

3. 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 2022, 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.

4. 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, ehrlichiosis, Hard Tick Relapsing Fever (*B. miyamotoi* disease), 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 2020, 2021, and 2022 syndromic data is included as Appendix 4. Maine CDC performed a spatial analysis of 2022 Lyme disease surveillance data at the county level, showing the 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. 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, though the majority of these efforts were conducted virtually in 2022 due to the ongoing COVID-19 response and staffing shortages. Ongoing educational initiatives are featured on the Maine CDC website: www.maine.gov/lyme.

During 2022, 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 172 copies of this guide in 2022

Maine CDC continues to contribute to **national surveillance and prevention activities,** though these activities were hampered by ongoing staffing shortages. During 2022, Maine CDC epidemiologists represented the State at national and regional meetings:

- CDC Vector Week Conference on Zoom in January 2022
- Connecticut Agricultural Experiment Station Vectorborne Disease Symposium on Zoom in May 2022
- Council of State and Territorial Epidemiologists (CSTE) Annual Conference in Louisville, Kentucky in June 2022

- CDC Lyme Disease High-Incidence States Meeting on Zoom in October 2022
- Northeast Epidemiology Conference on Zoom in November 2022
- Northeast Mosquito Control Association Annual Meeting on Zoom in December 2022
- Northeast Regional Center for Excellence in Vectorborne Diseases Arbovirus Situational Awareness Calls (weekly from summer through fall)
- USDA National Asian Longhorned Tick Stakeholder Calls (monthly throughout year)
- 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* (Hard Tick Relapsing Fever)
- Vectorborne diseases

5. 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 2022, 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:

- Three presentations or displays held for businesses and community members.
- Five media interviews given by Maine CDC employees (Infectious Disease Epidemiology Program Director and Vectorborne Disease Health Educator).

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 2022 included:

- Presentations given on ticks and tickborne diseases
- Presence in radio and television interviews
- Distribution of educational materials including Lyme brochures, tick spoons, fact sheets, etc.
- Formation of a Vector Control District subcommittee to discuss the feasibility and creation of vector control districts in Maine.

In 2014, Maine CDC created an educational curriculum 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 2022, after the end of the grant cycle that had previously funded the above-mentioned curriculum activities, Maine CDC shifted focus to maintaining the tickborne disease curriculum. Maine CDC worked with Maine DOE to distribute the remaining unused stock of physical curriculum materials to interested school nurses and administrators throughout the state. This resulted in an additional 14 schools in Maine receiving all of the materials needed to implement the curriculum. Maine CDC plans to review and update the curriculum on the school curriculum webpage (www.maine.gov/dhhs/schoolcurricula) as needed in 2023.

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 included activities and materials in formats that are useful for distance learning to accommodate a variety of approaches that educators may use for in-person or virtual settings. Maine CDC continues to review and update the educational materials. Maine CDC's interactive workbook called "Take Back Your Yard! A workbook for kids to fight the bite!" is also available with the curriculum. 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. As requested, Maine CDC also makes curriculum materials available for other local, state, and country agencies to use for tickborne disease education. In 2022, New York City Department of Health reached out to Maine CDC for permission to reuse parts of the Maine CDC tickborne disease curriculum in a pilot project planned for 2023.

- The school curriculum webpage (www.maine.gov/dhhs/schoolcurricula) recorded 609 unique pageviews in 2022.

Maine CDC ran a **Social Media Campaign** May through July 2022**.** In previous years, this campaign consisted of advertisements on YouTube and Facebook, however, the grant cycle that funded those efforts ended prior to 2022. In 2022, Maine CDC produced a campaign that consisted of a series of static ads and short videos on Facebook, Instagram, and Twitter. Maine CDC added a total of five new social media static ads produced with a graphic designer to the 2022 social media campaign. These static ads focused on tick identification, recognition of different life stages of the deer tick (especially nymphs and adults), and EM rash (bull's-eye rash) recognition on different anatomical sites and on different skin tones.

Reach and engagement during the campaign include:

- Facebook (20 Total Posts in Campaign)
  - Total Reach for Campaign: 322,108 (range 79-59,140 per post)
  - Total Post Engagements for Campaign (reactions, link clicks, comments, and shares): 5,031 (range 15-1,250 per post)
- Instagram (17 Total Posts in Campaign)
  - Total Reach for Campaign: 8,315 (range 206-1,670 per post)
  - Total Post Engagements for Campaign (reactions, comments, and shares): 198 (range 1-48 per post)
- Twitter (20 Total Posts in Campaign)
  - Total Reach for campaign: 15,342 (range 432-1,348 per post)
  - Total Post Engagements for Campaign (likes, link clicks, retweets, replies, etc.): 579 (range 6-100 per post)

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 29 times in 2022
- Do You Know Who's Most at Risk for Lyme Disease – viewed 6 times in 2022
- How to Choose a Residential Pesticide Applicator – viewed 27 times in 2022
- How to Perform a Tick Check – viewed 1,196 times in 2022
- Know How to do Tick Checks – viewed 190 times in 2022

- Know How to Prevent Tick Bites – viewed 42 times in 2022
- Know How to Remove Ticks – viewed 42 times in 2022
- Reducing Tick Habitat Around Your Home- viewed 120 times in 2022
- Tick Identification – viewed 1,330 times in 2022
- Tickborne Diseases in Maine: Anaplasmosis – viewed 562 times in 2022
- Tickborne Diseases in Maine: Babesiosis – viewed 50 times in 2022
- Tickborne Diseases in Maine: Lyme Disease-viewed 22 times in 2022
- Tickborne Diseases: Powassan Encephalitis– viewed 123 times in 2022

Maine CDC's Lyme disease website is continually updated to provide information to the public and to health professionals about Lyme disease in Maine. As part of an ongoing effort to review and update Maine CDC webpages, Maine CDC reviewed and updated the vectorborne disease homepage (www.maine.gov/dhhs/vectorborne), as well as webpages for seven of the eight endemic vectorborne diseases in Maine. In 2022:

- The Lyme disease homepage (www.maine.gov/lyme) received 2,682 unique pageviews.
- The tick frequently asked questions homepage (www.maine.gov/dhhs/tickfaq) received 1,952 unique pageviews.

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

- Anaplasmosis, babesiosis, Ehrlichiosis, Hard Tick Relapsing Fever (*Borrelia miyamotoi*), 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 2008-2021
- Vectorborne disease school curricula
- Maine Tracking Network: Tickborne Diseases
- Tickborne Diseases in Maine webinar updated annually

During 2022, Maine CDC distributed **Lyme disease educational materials** to partners and members of the public. After the close of the grant cycle that funded the bulk of educational material production and distribution in 2022, Maine CDC will limit the availability of certain materials for public order. This includes tick remover spoons, which Maine CDC previously offered for order by members of the public and businesses. Going forward, Maine CDC will reserve the remaining stock of tick spoons for distribution at educational events. Maine CDC will continue to make all printed materials available for download. Approximate numbers of materials distributed include:

- 10,417 Wallet-sized laminated tick identification cards
- 16,852 Tick remover spoons
- 953 Lyme disease brochures
- 798 Tick ID posters
- 1,021 What to Do after a Tick Bite posters
- 155 Lyme Disease Awareness Month 2021 posters
- 300 Lyme Disease Awareness Month 2022 posters
- 172 Tickborne Diseases in the United States: A Reference Manual for Healthcare Providers
- 1,754 Prevent Tickborne Diseases bookmark
- 720 Prevent Tickborne Diseases in People and Pets bookmark
- 71 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 2022 included:

- Maine CDC Confirms Fatal Case of Powassan Virus in Waldo County (Press Release) – April 20th
- 2022 Lyme and Other Tickborne Disease Information (Health Alert) – May 9th
- Maine CDC Marks Lyme Disease Awareness Month (Press Release) – May 9th
- Maine CDC Congratulates 2022 Lyme Disease Awareness Month Poster Contest Winners (Press Release) – May 19th
- Arbovirus Update for Healthcare Providers (Health Alert) – August 3rd
- Maine CDC Shares Advice on Home to Avoid Tick Bites This Fall (Press Release) – September 29th

Pursuant to legislation enacted in the second regular session of the 124th Legislature, May 2022 was declared to be **Lyme Disease Awareness Month** (PL 2009, chapter 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 (medical, veterinary, and other general interest)
- Information distributed through multiple media interviews across the State of Maine
- Educational tabling event at LL Bean in Freeport, Maine

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 **"Tick Wise"** 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 2022 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 artworks submitted over the past thirteen years is available for viewing on Maine CDC's Lyme Disease Awareness Month website: www.maine.gov/lyme/month.

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, and 2021-2023 data inquiries at the county and state level. The Tickborne Disease portion of the portal was accessed 6,536 times during 2022. 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 **Data Dashboard** for tickborne diseases on the MTN. This data dashboard is updated weekly 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 bi-monthly as Maine CDC classifies new cases. The data dashboard also includes a trend chart of suspected tick-related emergency department visits by week and compares the counts to the previous year. The 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. This section of the portal received 1,968 visits in 2022. 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. In 2023, the Cooperative Extension Office plans to add Powassan and Heartland virus testing to the *Ixodes* and non-*Ixodes* panels, respectively. 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 2022 can be found in Appendix 12.

6. 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.

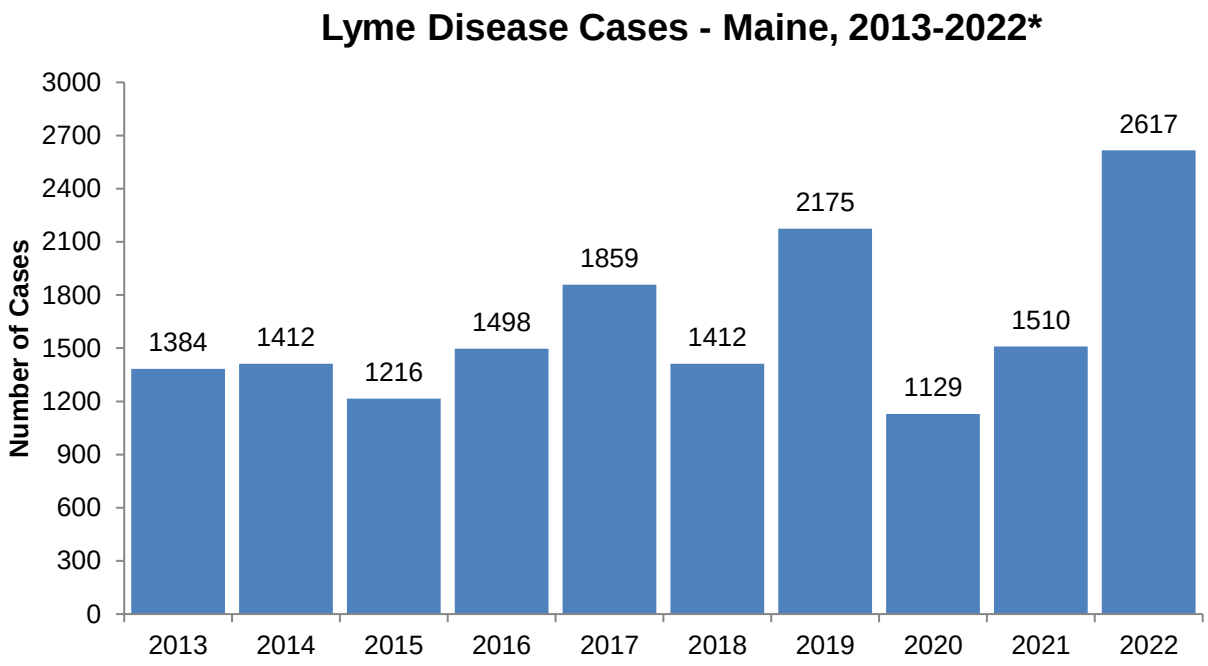
Appendix 1
Maine Lyme disease statistics

Number and Rate per 100,000 persons of Lyme Disease Cases by County of Residence – Maine, 2018-2022*

County	2018 Count	2018 Rate	2019 Count	2019 Rate	2020 Count	2020 Rate	2021 Count	2021 Rate	2022 Count*	2022 Rate*
Androscoggin	68	63.2	98	90.5	40	36.9	64	57.6	76	68.4
Aroostook	4	6.0	2	3.0	4	6.0	3	4.5	12	17.9
Cumberland	288	98.1	354	120.0	178	60.3	226	74.0	350	114.7
Franklin	13	43.5	39	129.1	18	59.6	24	80.8	40	131.3
Hancock	174	317.5	193	351.0	117	212.8	186	331.0	360	640.7
Kennebec	182	149.1	279	228.1	125	102.2	167	134.2	230	183.2
Knox	105	264.0	238	598.4	121	304.2	138	335.9	261	635.3
Lincoln	63	183.4	132	381.1	65	187.7	65	181.4	183	510.8
Oxford	48	83.3	88	151.8	43	74.2	57	97.2	63	107.5
Penobscot	78	51.6	111	73.0	85	55.9	126	82.5	238	154.8
Piscataquis	3	17.9	4	23.8	4	23.8	5	29.1	15	87.4
Sagadahoc	47	131.9	83	231.5	27	75.3	45	121.4	101	272.5
Somerset	45	88.9	68	134.7	37	73.3	80	158.1	125	247.1
Waldo	78	196.5	143	360.1	91	229.1	113	283.1	203	508.6
Washington	15	47.6	31	98.8	33	105.2	38	122.1	93	298.8
York	201	97.5	312	150.3	141	67.9	173	80.6	267	124.4
State	**1412**	**105.0**	**2175**	**161.8**	**1118**	**84.0**	**1510**	**110.0**	**2617**	**188.9**

*2022 data are preliminary as of 03/08/2023

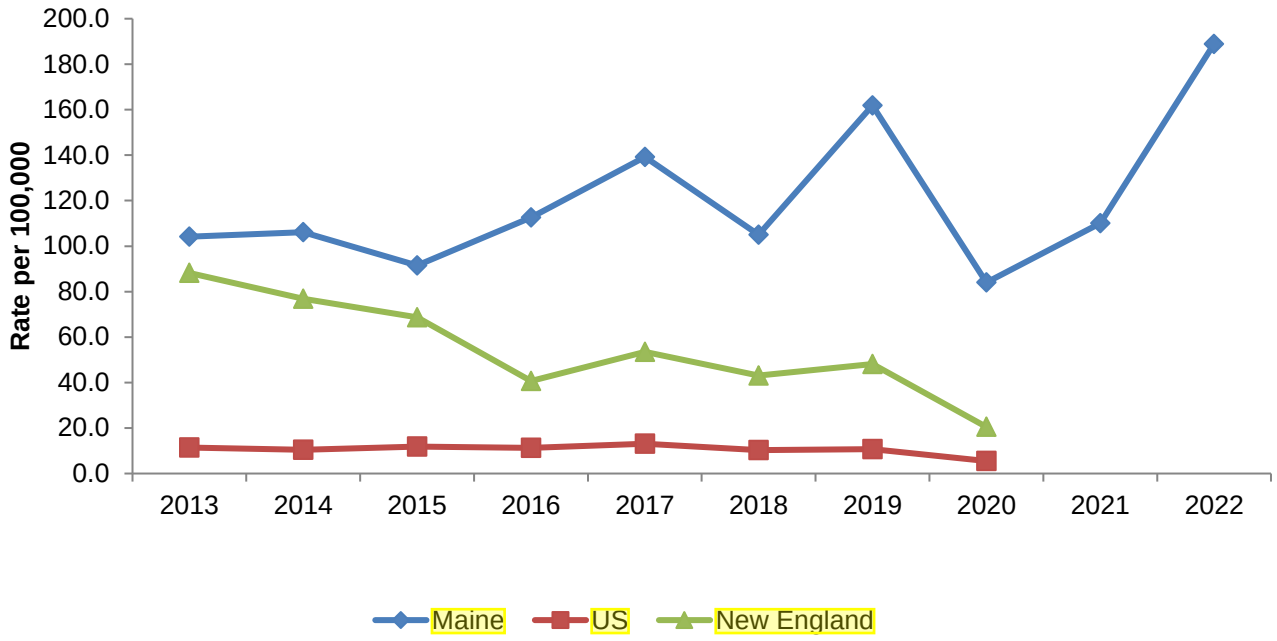
Note about the data: Effective 01/02/2022, CSTE changed the Lyme disease surveillance case definition to a lab-only definition, which includes only probable cases. All data prior to 2022 includes confirmed and probable cases. See section Ia for more information.



*2022 data are preliminary as of 03/08/2023

Note about the data: Effective 01/02/2022, CSTE changed the Lyme disease surveillance case definition to a lab-only definition, which includes only probable cases. All data prior to 2022 includes confirmed and probable cases. See section Ia for more information.

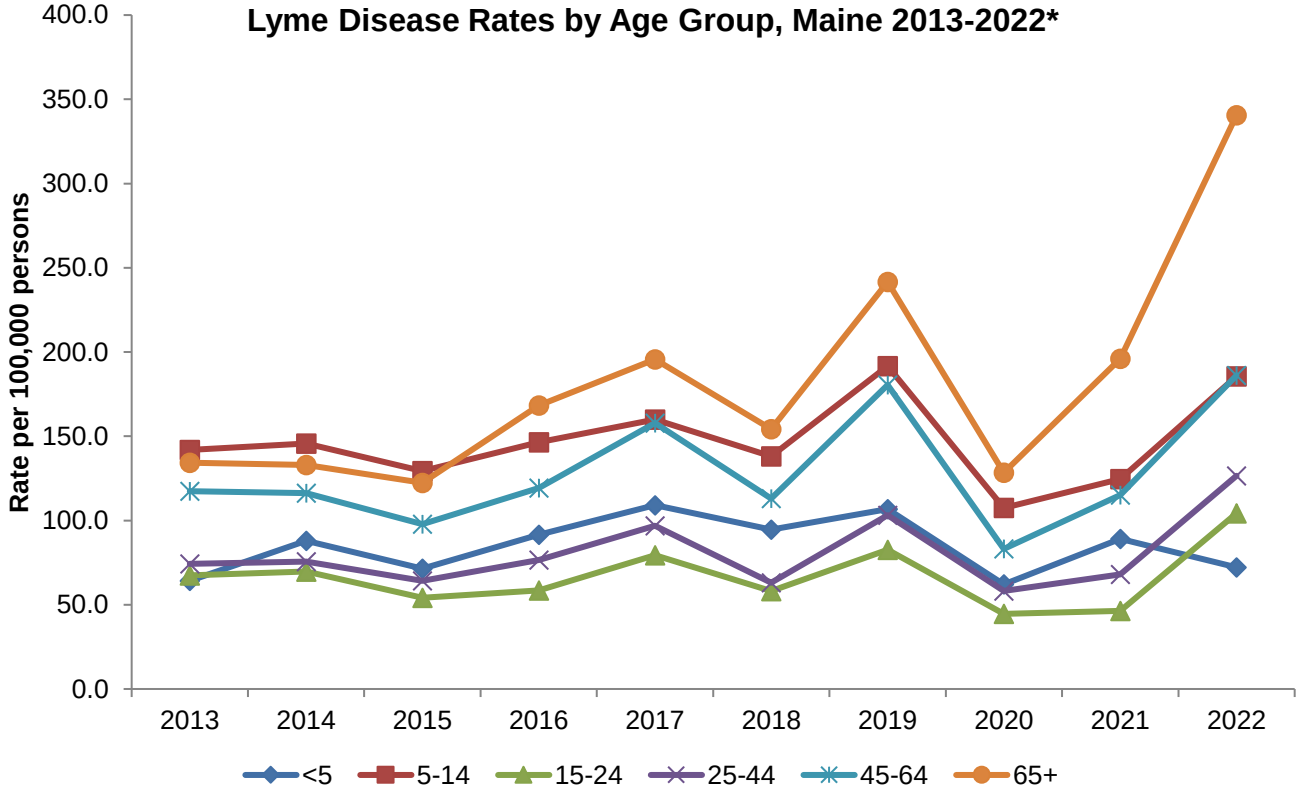
Lyme Disease Incidence - Maine, New England, and US, 2013-2022*



*2022 data are preliminary as of 03/08/2023

Note about the data: Effective 01/02/2022, CSTE changed the Lyme disease surveillance case definition to a lab-only definition, which includes only probable cases. All data prior to 2022 includes confirmed and probable cases. See section Ia for more information.

Lyme Disease Rates by Age Group, Maine 2013-2022*



*2022 data are preliminary as of 03/08/2023

Note about the data: Effective 01/02/2022, CSTE changed the Lyme disease surveillance case definition to a lab-only definition, which includes only probable cases. All data prior to 2022 includes confirmed and probable cases. See section Ia for more information.

Appendix 2
Maine tickborne disease statistics (excluding Lyme disease)

Number of Selected Tickborne Disease Cases by County of Residence – Maine, 2022*

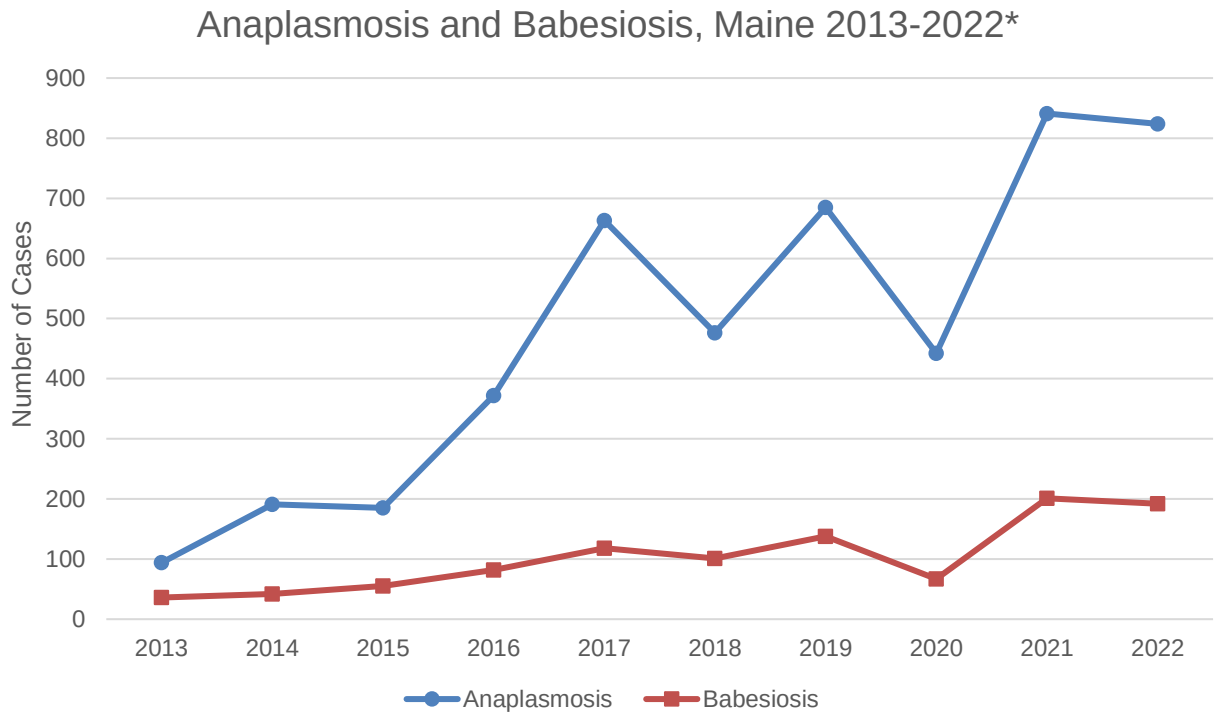
County	Anaplasmosis	Babesiosis	Ehrlichiosis	Ehrlichiosis/ Anaplasmosis Undetermined	Hard Tick Relapsing Fever	Powassan	Spotted Fever Rickettsiosis
Androscoggin	54	11	1	0	2	0	0
Aroostook	1	0	0	0	0	0	0
Cumberland	88	25	0	0	1	1	0
Franklin	18	1	0	0	0	0	0
Hancock	78	23	0	0	2	0	0
Kennebec	87	24	4	1	2	0	0
Knox	94	28	1	0	1	0	0
Lincoln	108	19	1	0	1	0	1
Oxford	31	3	0	0	0	0	0
Penobscot	45	7	0	0	1	1	0
Piscataquis	1	0	0	0	0	0	0
Sagadahoc	38	9	0	0	1	0	0
Somerset	27	3	0	0	0	0	0
Waldo	86	19	0	0	0	1	0
Washington	16	3	0	0	0	0	0
York	52	17	0	0	1	1	0
Total	**824**	**192**	**7**	**1**	**12**	**4**	**1**

* 2022 data are preliminary as of 03/08/2023

Number of Selected Tickborne Disease Cases– Maine, 2013 - 2022*

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Anaplasmosis	94	191	185	372	663	476	685	443	841	824
Babesiosis	36	42	55	82	118	101	138	66	201	192
Ehrlichia chaffeensis	3	8	5	7	10	19	13	2	4	7
Ehr/Ana undetermined	2	6	1	4	10	9	2	2	0	1
Hard Tick Relapsing Fever	0	0	0	0	6	8	13	12	9	12
Powassan	1	0	1	1	3	0	2	1	3	4
SFR	2	3	1	4	3	10	5	0	2	1

* 2022 data are preliminary as of 03/08/2023



* 2022 data are preliminary as of 03/08/2023

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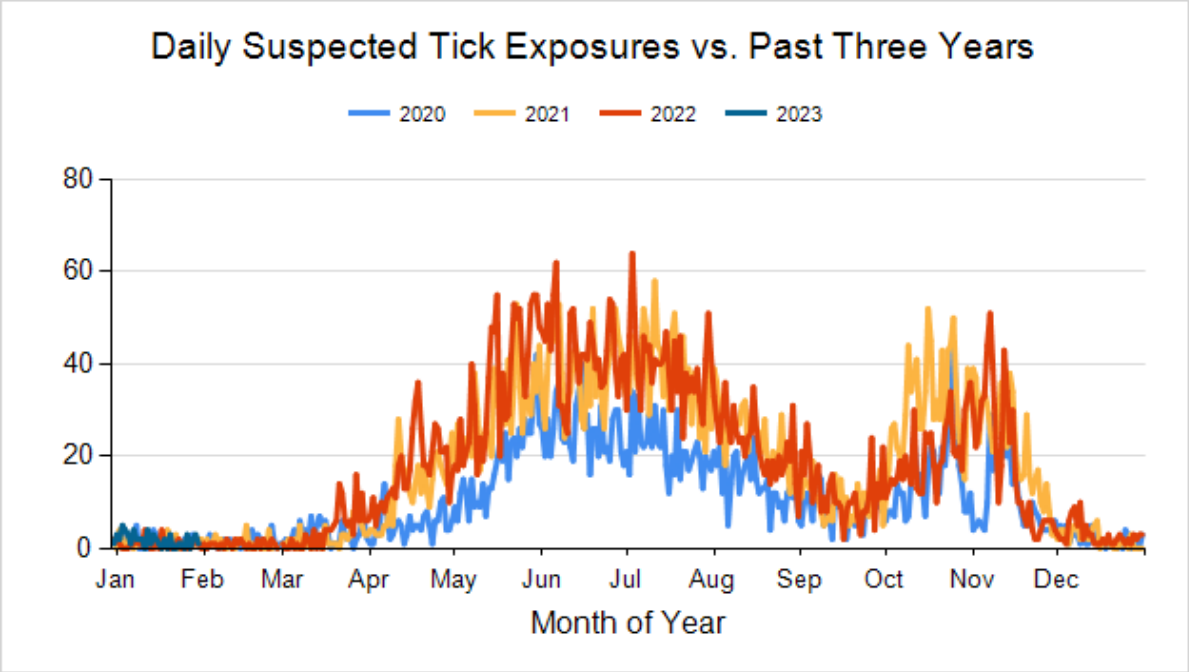
Appendix 4

Maine CDC *Syndromic Surveillance Report*

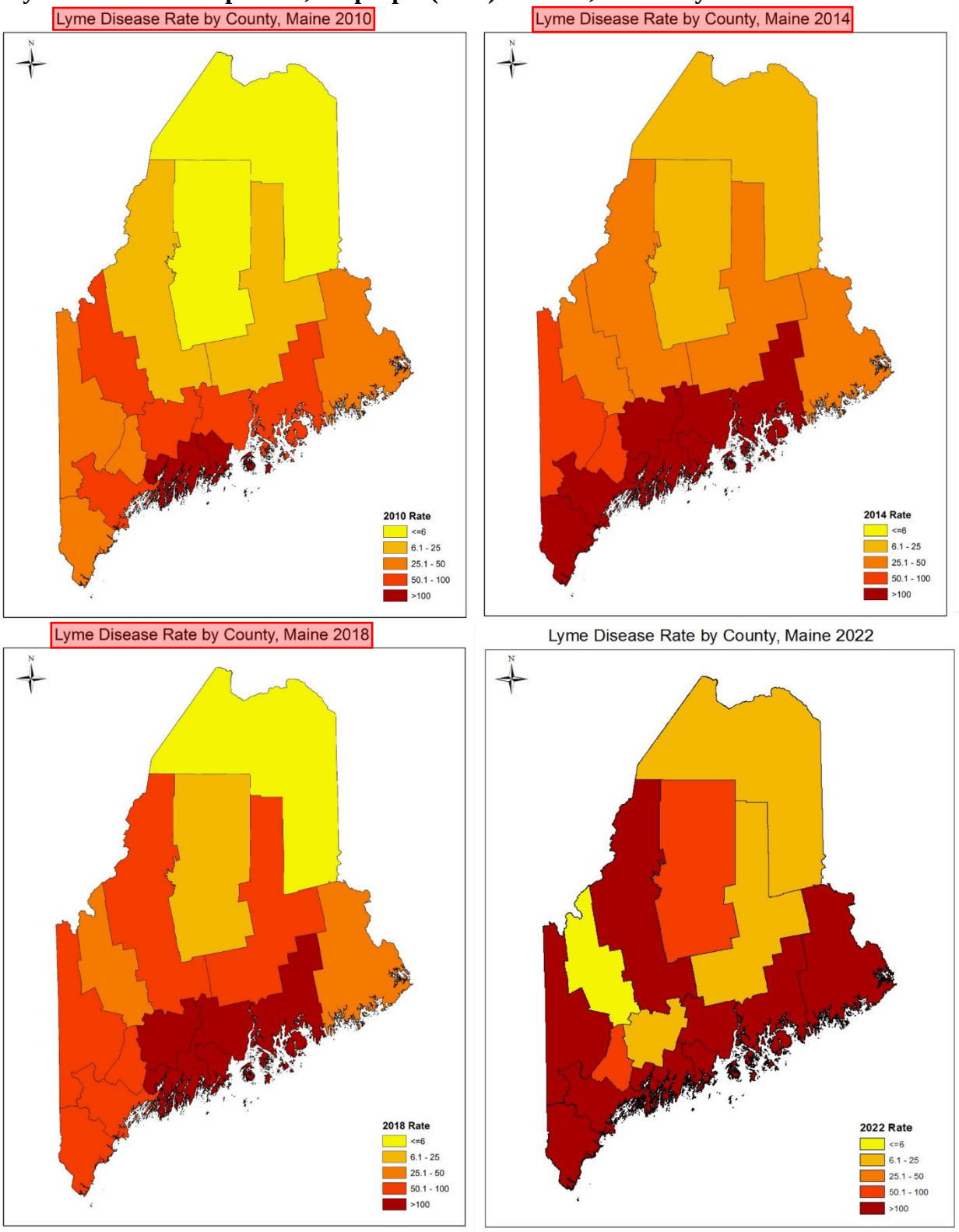
Report run: 1/31/2023 11:19:47 AM



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 2010-2022*



*2022 data are preliminary as of 03/08/2023

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
Cosenza, Danielle	MaineHealth Institute for Research
Dill, Griffin	Maine Cooperative Extensio
Elias, Susan	MaineHealth Institute for Research, 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
Henderson, Elizabeth	MaineHealth Institute for Research
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
Lichtenwalner, Anne	University of Maine, Animal Health Laboratory
Lubelczyk, Charles	MaineHealth Institute for Research
Matluk, Nick	Maine CDC
Meagher, Molly	MaineHealth Institute for Research
Meak, Sim	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
Robich, Rebecca	MaineHealth Institute for Research
Schmeelk, Thomas	Maine Forest Service
Smith, Rob	MaineHealth Institute for Research
Sohail, Haris	Maine CDC
Staples, Joe	University of Maine, Department of Environmental Science and Policy
Szantyr, Beatrice	Physician, Lincoln Maine
Taylor, Tegwin	Maine Department of Inland Fisheries and Wildlife
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
2022 Governor's Proclamation

WHEREAS, the Maine Center for Disease Control and Prevention reported more than 1,500 confirmed and probable cases of Lyme disease in 2021; and

WHEREAS, the actual incidence of Lyme disease in Maine is likely much higher than reported, disproportionately affecting children between 5 and 15 years old and adults older than 65 years old; 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 2022 theme "Tick Wise"; 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 2022 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.

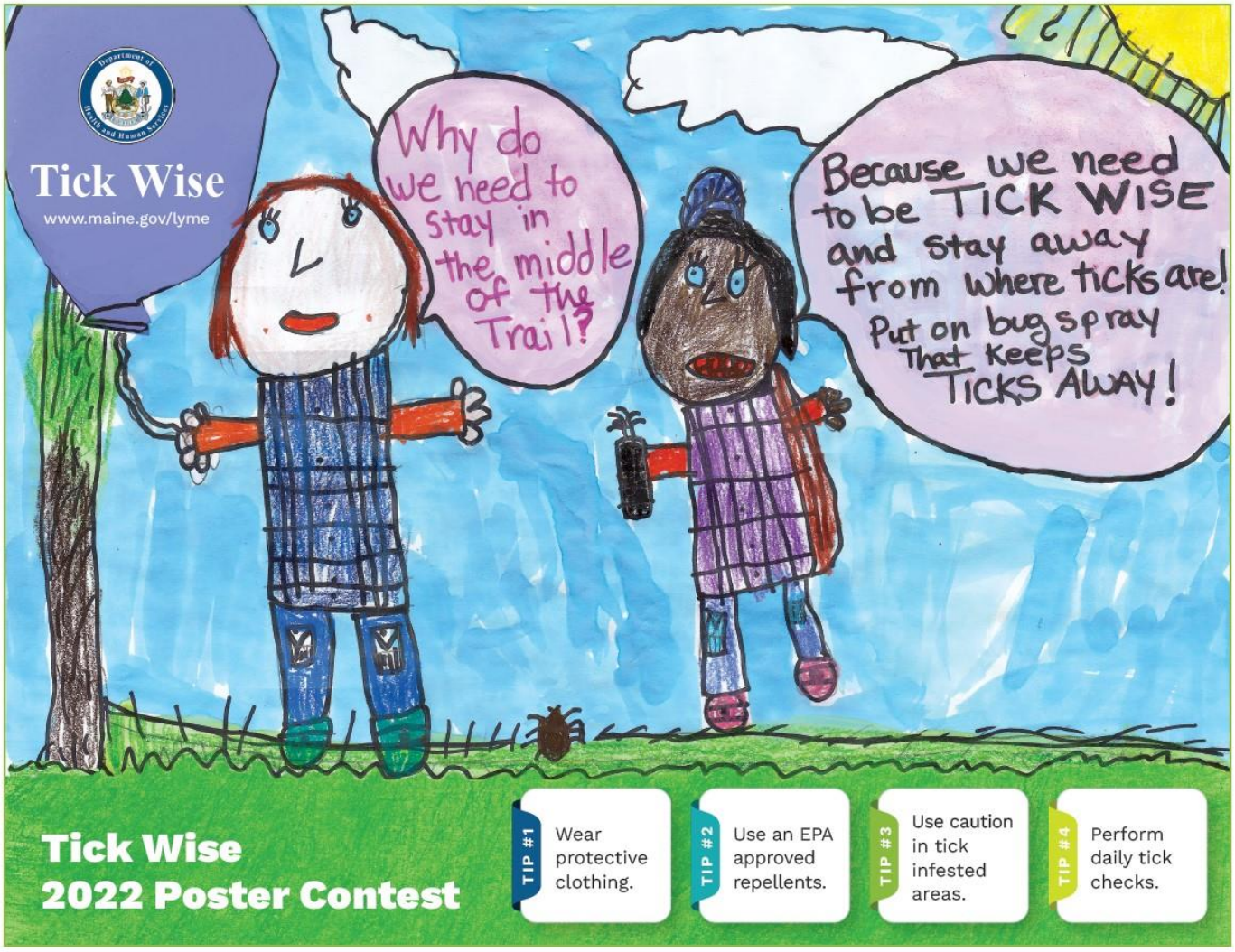
In testimony whereof, I have caused the Great Seal of the State to be hereunto affixed GIVEN under my hand at Augusta this twentieth day of April Two Thousand Twenty-Two

Janet T. Mills
Governor

Shenna Bellows
Secretary of State

Appendix 8

Maine CDC Lyme Disease Awareness Month Poster 2022



Artwork submitted by Maisy Emery 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.

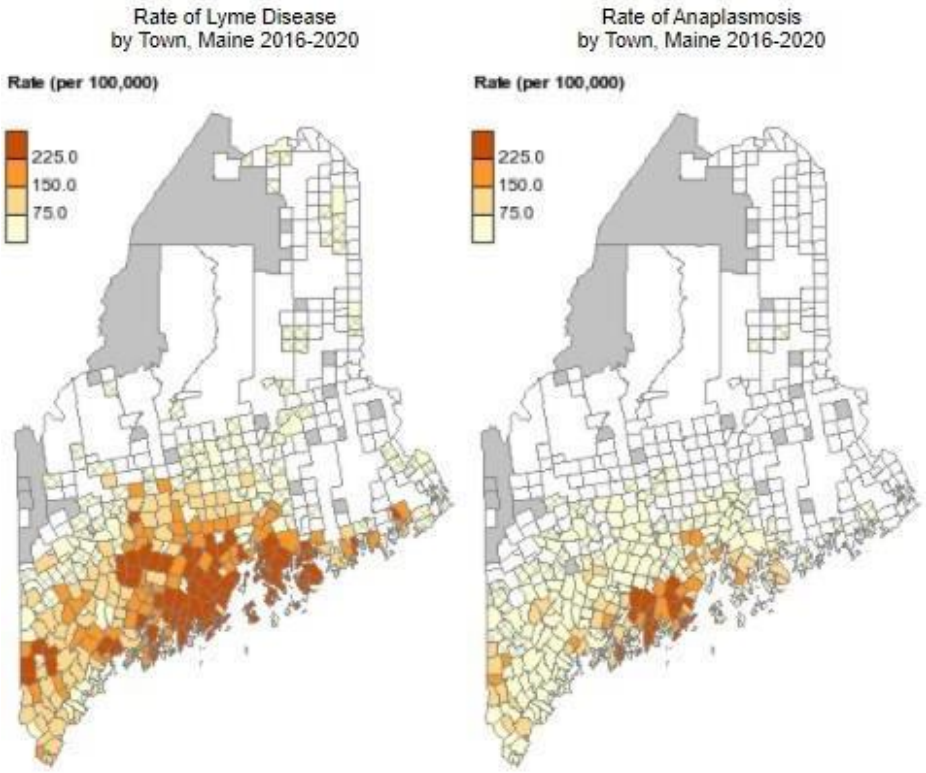
To protect privacy as per Maine CDC's Privacy Policy, data may be suppressed. For locations where data are suppressed, a range ('<6') is provided for the number of events and an asterisk (*) for the rate. Data may also be secondarily suppressed to protect against indirect identification and are displayed 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.

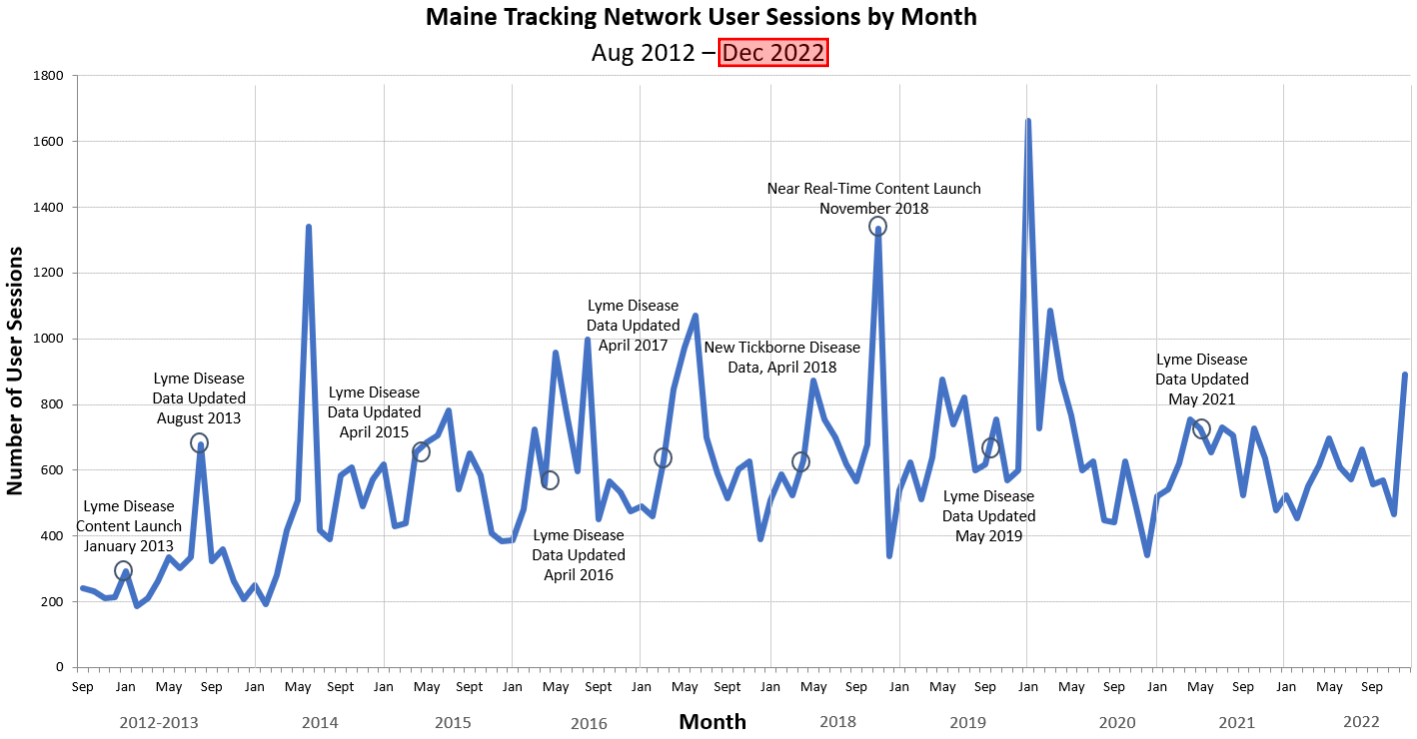
Different map colors are not based on statistical tests of difference.

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 – Dec 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 Sept Jan May Sep Jan May Sep Jan May Sep Jan May Sep Jan May Sep
2012-2013
2014
2015
2016
Month
2018
2019
2020
2021
2022

Appendix 12
University of Maine Tick Submission and Tick Testing Data for 2022

Tick Species Submitted to the UMaine Extension Tick Lab in 2022

Tick Species	Common Name	Total
Ixodes scapularis	Blacklegged tick (also known as deer tick)	3513
Dermacentor variabilis	American dog tick	1683
Amblyomma americanum	Lone star tick	28
Ixodes cookei	Woodchuck tick	36
Dermacentor albipictus	Winter Tick	6*
Ixodes marxi	Squirrel tick	3
Amblyomma maculatum	Gulf Coast tick	1
Unknown	Specimens damaged during removal/delivery	4

* Three winter tick samples arrived as lint roller sheets with several hundred larval winter ticks on each sheet. These ticks were not counted individually and instead each sheet was treated as one individual sample.

Source: University of Maine Cooperative Extension Tick Laboratory 2022 Annual Report

Infection Prevalence in Submitted Blacklegged (Deer) Ticks (*Ixodes scapularis*) in 2022

Pathogen	% of nymphs infected	% of adults infected	% of ticks infected
Positive for at least 1 pathogen	33.2%	56.5%	51.2%
Borrelia burgdorferi	28.0%	48.1%	43.5%
Anaplasma phagocytophilum	5.6%	12.1%	10.7%
Babesia microti	6.4%	11.7%	10.5%
Borrelia miyamotoi	0.7%	1.6%	1.4%
Borrelia + Anaplasma	3.0%	4.9%	4.5%
Borrelia + Babesia	3.0%	6.4%	5.6%
Anaplasma + Babesia	0.2%	0.5%	0.4%
Borrelia + Anaplasma + Babesia	0.3%	1.8%	1.5%

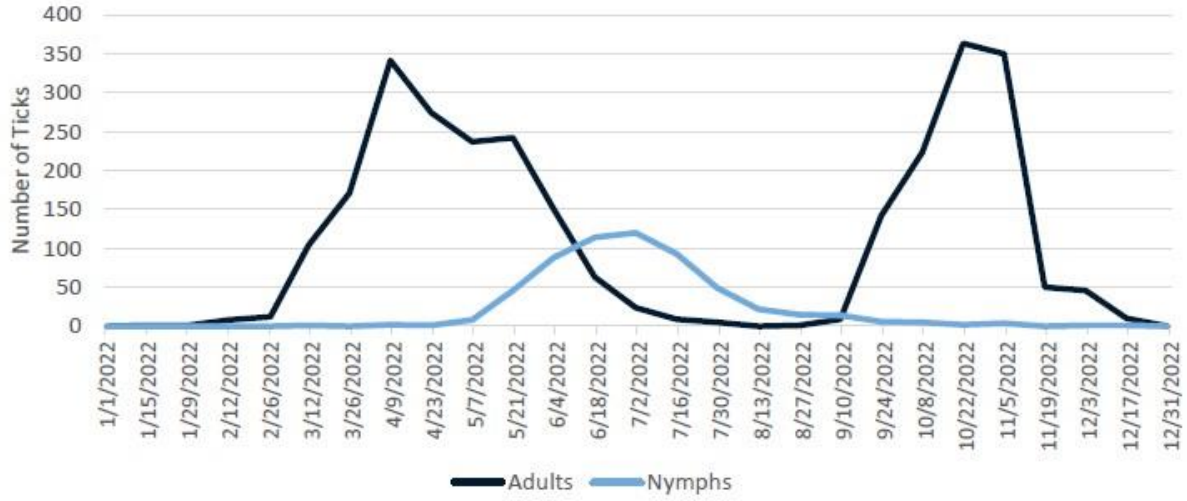
Source: University of Maine Cooperative Extension Tick Laboratory 2022 Annual Report

Infection Prevalence in Submitted American Dog Ticks (*Dermacentor variabilis*) and Lone Star Ticks (*Amblyomma americanum)* in 2022

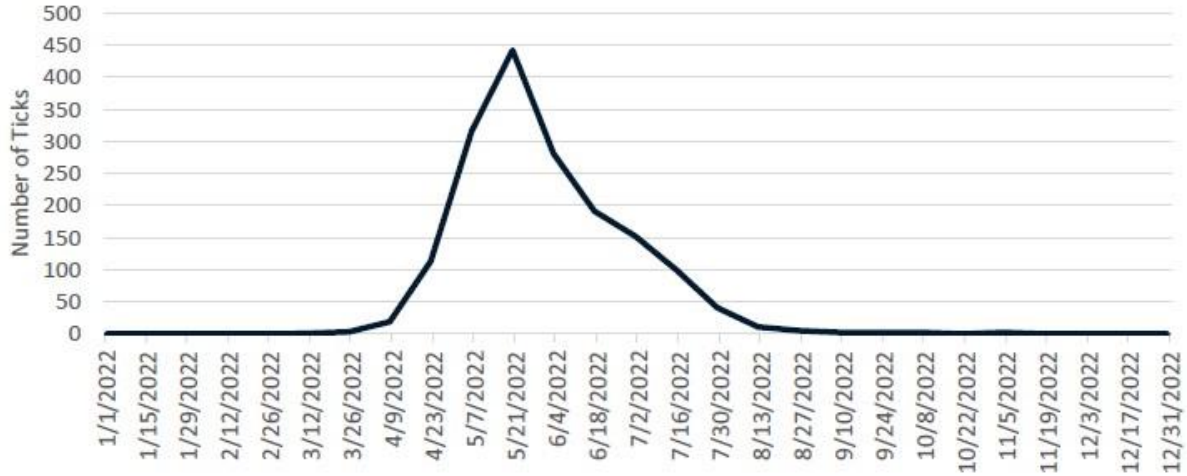
Pathogen	American Dog Ticks (*Dermacentor variabilis*)	Lone Star Ticks (*Amblyomma americanum*)
Rickettsia rickettsii	0/888 (0%)	0/25 (0%)
Ehrlichia spp.	0/888 (0%)	0/25 (0%)
Francisella tularensis	0/888 (0%)	0/25 (0%)

Source: University of Maine Cooperative Extension Tick Laboratory 2022 Annual Report

Blacklegged Ticks (*Ixodes scapularis*) Collected by Week - 2022 (Fig. 1)



American Dog Ticks (*Dermacentor variabilis*) Collected by Week – 2022 (Fig. 2)



Source: University of Maine Cooperative Extension Tick Laboratory 2022 Annual Report

Appendix 13
2022 Tickborne Disease Legislation
Tickborne legislation and status recorded from LegiScan

Alabama
Title: Tickborne Illness, Commission on, extended, Act 2016-356, 2016 Reg. Sess., am'd. (HB94)
Status: Passed

Delaware
Title: Designating the Month of May 2022 as "Lyme Disease Awareness Month" in the State of Delaware (SCR99)
Status: Failed

Illinois
Title: DNR – Tick Warning Signs (HB5791)
Status: Failed

Title: Lyme Disease Awareness Month (HR0780)
Status: Passed

Massachusetts
Title: Relative to the Control of Tickborne Illness (H899)
Status: Failed

Title: Establishing a Special Commission to Find the Best Practices to Promote Education, Awareness, and Prevention of Lyme Disease (S1500)
Status: Failed

Maryland
Title: Health Insurance – Lyme Disease and Related TickBorne Illnesses – Long–Term Antibiotic Treatment (HB1244)
Status: Failed

Maine
Title: An Act to Repeal the Pesticide Container Fee and the Tick Laboratory and Pest Management Fund (LD808)
Status: Failed

New Jersey
Title: Requires School Districts to Provide Instruction on Prevention of Lyme Disease and Other Tickborne Diseases and to Develop Policy Concerning Removal of Ticks (A4820, S2463)
Status: Failed

Title: Requires Health Insurers to Provide Coverage for Treatment of Tickborne Diseases (S1260)
Status: Failed

New York

Title: Provides for Taxpayer Gifts for Lyme and Tickborne Diseases Education, Research and Prevention; Establishes the Lyme and Tickborne Diseases Education, Research and Prevention Fund (S06871)
Status: Passed

Title: Provides for Taxpayer Gifts for Lyme and Tickborne Diseases Education, Research and Prevention; Establishes the Lyme and Tickborne Diseases Education, Research and Prevention Fund (A07400)
Status: Failed

Title: Commending Delaney Dixon for Her Innovative Approach to Addressing the Lyme and Tickborne Disease Crisis (J02633)
Status: Passed

Title: Memorializing Governor Kathy Hochul to proclaim May 2022, as Lyme Disease Awareness Month in the State of New York (J02468, K00719)
Status: Passed

Title: Directs the Commissioner of Health to Establish a Standard Protocol for the Diagnosis and Treatment of Lyme Disease and Other Tickborne Diseases Identified by Such Commissioner; Such Protocol Shall Require the Provision of Written Notification to Each Patient Being Treated for Lyme Disease or Other Tickborne Diseases Relating to Symptoms, Risk Factors, Diagnosis and Other Information Relating to Such Diseases; Enacts the "Demos Ford Act" (S05297)
Status: Failed

Title: Includes Lyme Disease and Other Tickborne Diseases as Occupational Diseases for Purposes of Workers' Compensation; Clarifies that Disability Includes Disability Caused by Lyme Disease or Other Tickborne Diseases (A08614, S08867)
Status: Failed

Title: Relates to the Reporting of Lyme and Tickborne Disease Infection after Death (A04621, S00677)
Status: Failed

Title: Requires Health Insurers to Provide Coverage for Long-Term Medical Care for Lyme Disease and Other Tickborne Related Pathogens; Provides for Taxpayer Gifts for Tickborne Illness Research, Detection and Education; Establishes the Tickborne Illness Research, Detection and Education Fund (A01183, S00998)
Status: Failed

Title: Relates to Lyme Disease and Tickborne Infection Awareness and Prevention for Children's Overnight, Summer Day and Traveling Summer Day Camps; Provides Guidelines for Treatment and Notification; Provides for the Development of Materials (A07271, S03937)
Status: Failed

Title: Authorizes the Commissioner of Health to Award Grants for Graduate Medical Education in Lyme and Tickborne Disease and to Designate Organizations as Centers for Lyme and Tickborne Disease Excellence (S02825)
Status: Failed

Title: Establishes a Pilot Program for Lyme and Tickborne Disease Testing in Children (S02148)
Status: Failed

Title: Directs Promulgation of Rules and Regulations Concerning Removal of Ticks from Pupils and Notification to Parents (S02826)
Status: Failed

Title: 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 (S02822)
Status: Failed

Title: Requires Health Insurers to Provide Coverage for Long-Term Medical Care for Lyme Disease and Other Tickborne Related Pathogen (A07495, S03896)
Status: Failed

Title: 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 Tickborne Illnesses (S02217)
Status: Failed

Title: Relates to Guidelines for Best Practices in Treating Residential Properties for Integrated Pest Management to Assist in the Prevention of Ticks (S02946)
Status: Failed

Title: Requires the New York State Health Care Quality and Cost Containment Commission to Issue a Report Considering the Impact on Health Insurance Costs and Quality of Legislation Requiring Coverage of Long-Term and Chronic Lyme Disease and Other Tickborne Diseases (S03753)
Status: Failed

Pennsylvania

Title: Providing for Patient Access to Diagnostics and Treatments for Lyme Disease and Related Tickborne Illnesses; and Requiring Health Care Policies to Provide Certain Coverage (SB1188)
Status: Failed

Title: Designating the Month of May 2022 as "Lyme Disease and Tickborne Illness Awareness Month" in Pennsylvania (SR301)
Status: Failed

Virginia

Title: Lyme Disease; Signage in State Parks, Instructional Resources and Materials, Report (HB850)
Status: Passed