



**Department
of Health**

**Testimony of Howard A. Zucker, M.D., J.D.
Commissioner of Health**

**Legislative Public Hearing
Senate Task Force on Lyme and Tick Borne Disease
and
Senate Standing Committee on Health**

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Good morning, Chairpersons Hannon and Serino, and other members here today from the Senate's Task Force on Lyme and Tick-borne Disease and the Senate's Committee on Health. I am Dr. Howard Zucker, Commissioner of the Department of Health, and I am joined by Bryon Backenson, an epidemiologist and Deputy Director of the Department's Bureau of Communicable Disease Control, and Dr. Ron Limberger, Director of the Division of Infectious Diseases at the Wadsworth Center. I would like to thank the Senate for the invitation to discuss Lyme and tick-borne diseases in New York State. I appreciate your commitment to the thousands of New Yorkers impacted by these diseases and I look forward to our continued work together on these issues.

Overview

The Department has a long history of working with tick-borne diseases that first began in the 1970s in response to the presence of Rocky Mountain Spotted Fever. Since that time, at least nine additional tick-borne diseases have been identified in New York State, including Lyme, anaplasmosis, babesiosis, ehrlichiosis, and Powassan. Other recently discovered diseases have been found in other parts of the country, and may eventually be found in this state at some point in the future.

These diseases cause a significant burden to New Yorkers every year. Approximately 8,000 cases of Lyme disease, 700 cases of anaplasmosis, 400 cases of babesiosis, 100 cases of ehrlichiosis, and 30 cases of other tick-borne illnesses are reported to the Department annually. There are undoubtedly many more cases, particularly of Lyme disease, that are treated by community physicians and not reported, or do not meet the case definition.

The geographic distribution of these diseases has changed over the years, as well. Where Lyme was once a disease of Long Island and the lower Hudson Valley, it is now found all over

the state, with increasing numbers in the Adirondack region and areas west of Syracuse.

Diseases like anaplasmosis and babesiosis are following that same geographic pattern, with a 10 to 15-year lag behind Lyme disease.

Tick distributions are also changing. For most of the past 40 years, the deer tick (or black-legged tick) has been the most common tick in the state. The spread of many of the diseases previously mentioned is directly related to its increase in population and distribution across New York. However, in recent years, the lone star tick population has been rapidly increasing across Long Island, seemingly overtaking the deer tick population. While the lone star tick populations have gone up, the deer tick populations have gone down. This should result in a decrease in the number of cases of Lyme disease, anaplasmosis, and babesiosis in areas where deer tick populations are decreasing, and an increase in the number of ehrlichiosis cases where the numbers of lone star ticks is increasing. This pattern is already beginning on Long Island, and it remains to be seen if it will expand to other parts of the state, as well.

Relatedly, a new health condition, an allergy to red meat, has been reported in the news and attributed to lone star tick bites. The allergy is caused by a sugar called alpha-gal, and the body's response to it. In most people, alpha-gal in red meat is broken down in the body easily. It is hypothesized that lone star tick saliva contains alpha-gal as well, and when the body is exposed to alpha-gal in tick saliva, the body may develop an antibody reaction to it. The presence of these antibodies is thought to result in a reaction when the body next encounters alpha-gal, often in red meat. There have been several reports of this allergy on the eastern end of Long Island, where lone star ticks are currently most common. The Department will continue to monitor the medical research on this unique allergy.

The Role of the Department of Health

As you know, tick-borne illnesses pose a number of challenges on multiple fronts. From a clinical perspective, some of these challenges include appropriate and timely diagnosis, laboratory testing and clinical management. The public health challenges involve several areas, including effective prevention efforts, such as tick management, public messaging, and human and insect surveillance. We face both entomological and clinical research challenges, as well. At the Department, we focus our efforts on three key fronts: human disease surveillance, tick surveillance, and public education.

Human disease surveillance

Human disease surveillance is the backbone of all the Department's communicable disease activities, and all the tick-borne diseases I have mentioned are required to be reported to the Department by health care providers and testing laboratories. The Department works closely with local health departments to assist with case investigations and reports those confirmed cases to the federal Centers for Disease Control and Prevention (CDC). This surveillance allows for monitoring of disease trends over time, including changes in case numbers, geographic distribution, symptoms and other information.

The vast majority of laboratory testing for tick-borne diseases is performed by commercial laboratories but some testing is performed at the Wadsworth Center, the Department's public health laboratory. Wadsworth is the primary testing lab for Powassan virus and *Borrelia miyamotoi* infection, and can perform primary testing for other tick-borne diseases. All laboratory tests positive for babesiosis must get confirmed at Wadsworth.

Clinical laboratory testing for tick-borne agents is challenging. For tick-borne agents other than Lyme disease, there are very few FDA-approved methods; therefore, laboratories have

developed their own testing methods. The laboratory can test blood directly for the tick-borne agent using molecular methods or can test for antibodies that indicate exposure to a tick-borne agent. In general, these tests are effective. However, with Lyme disease, a patient's blood harbors very few bacteria and is therefore very difficult to detect directly. Most Lyme disease cases are instead, diagnosed by testing for antibodies to *Borrelia* and there are a number of FDA-approved serology, or blood, tests. However, because each patient has a unique immune response to *Borrelia*, it can be a challenge to interpret these tests in some cases. There clearly is a need for more sensitive and specific testing methods for Lyme disease.

Tick surveillance

The Department is one of only three or four states in the country routinely performing tick surveillance. The Department has collected ticks statewide since 2008, at over 100 state, county, and municipal parks and preserves, collecting twice a year to capture both nymphal and adult ticks (primarily deer ticks), and bringing those ticks back to the laboratory to test them for pathogens. Collecting ticks in a standardized way also allows for year-to-year comparisons. Ticks are tested for the pathogens that cause Lyme disease, anaplasmosis, babesiosis, Powassan virus, and *Borrelia miyamotoi*, a bacterium recently recognized as a potential pathogen. Test results are relayed to local health departments and park managers to be used for awareness, education, and park maintenance.

The information gathered from human disease surveillance can influence tick surveillance, and vice versa. In the past, human cases of babesiosis in persons with no travel history led to tick collections and testing. The results of that tick testing showed unexpected levels of infectivity with the pathogen causing anaplasmosis, which in turn led to advisories to medical practitioners, making them aware of symptoms and laboratory testing for anaplasmosis.

A similar situation happened earlier this summer, with the finding of three cases of Powassan virus infection in residents of Saratoga County. Powassan virus is a rare viral infection transmitted by tick bite, either by a deer tick or a woodchuck tick. While rare, it had been seen in the state 23 times prior to 2017, and in some instances, there were multiple cases in one county in a single year. But the finding of three cases in Saratoga County in a relatively short period of time, in a relatively small geographic area, triggered additional tick surveillance, above and beyond the routine surveillance, to determine if conditions changed in some way and if there is any heightened risk for local residents. The Department expanded its collection efforts to add an additional 30 locations in Saratoga County. A total of 2,700 ticks were collected at these additional sites. Today I can report that five pools, comprising only 22 ticks, tested positive for Powassan. Two of the positive pools were found at the Saratoga Spa State Park, one at the 100 Acre Woods Trail in Malta, one at the Saratoga National Historical Park in Stillwater, and the final pool at a private residence elsewhere in the County. This is the first time that Powassan has been found in ticks in Saratoga County. The enhanced surveillance will continue in the fall with collection of adult ticks from many of these same sites, as well as collection and testing of blood from hunter-killed deer, for previous exposure to Powassan.

Public education

The third primary role for the Department, in addition to human disease surveillance and tick surveillance, is public education. Fundamental to the prevention of tick-borne disease is the adoption of personal protection measures by the public. The Department strives to package and deliver those messages in ways that are most likely to result in the behaviors necessary for people to avoid contracting tick-borne illnesses. We use both human disease and vector surveillance data to help geographically direct our efforts. In recent years, the Department and local health departments have used digital media campaigns to target geographic regions that

are first experiencing (or are on the “leading edge” of) Lyme disease, since residents in these areas may have not been getting personal prevention messages in the past.

We also use surveillance data to guide education for health care providers. We let them know through regular provider advisories that tick season is present and they should be on the lookout for diseases carried by ticks. We also issue special advisories when conditions warrant. For example, the Department recently issued an advisory to health care providers in the Capital District area to make them aware of Powassan virus, what symptoms to look for, and how to get samples tested.

The Department and local health departments have used public-facing web pages for years to make information about tick-borne diseases available to the public. One of the features of which we are most proud is the recent addition of four short videos to our public website, which cover tick collection, tick testing, personal protection and proper use of repellents, and proper tick removal. The tick removal video has generated thousands of hits, and has been used or shared by other states, other countries, and numerous media outlets.

In recent years, we have expanded our efforts and activities in our three key areas of focus, due in significant part to supplemental support from, and in collaboration with, you and your colleagues in the Senate. Over the past few years, funding to support tick-borne disease research and awareness has been made available to the Adirondack Medical Center, the Trudeau Institute and Southampton Hospital, among others. The Department has convened two very successful and well-received meetings of tick-borne disease researchers from across the state to promote collaboration. We have also held three collaborative meetings with county health departments, focusing on best practices for surveillance and education. To further raise public awareness about tick prevention measures, we have distributed over 7,000 signs to

municipalities and counties and other state agencies, such the Department of Environmental Conservation and the Office of Parks, Recreation and Historic Preservation. Finally, we have enhanced our tick collection and testing capabilities with the support of graduate level students who assist with analyzing our data and supplement our educational efforts.

Next Steps

While we will continue our efforts on our multi-prong approach, we have also developed both short and long-term plans to augment our current activities regarding tick-borne disease. This fall, the Department will collaborate with the Department of Environmental Conservation to include tick and tick-borne disease materials in hunter education and licensure programs, including providing a link to our tick-removal video and other online tick resources. The Department has already provided several thousand tick identification cards to be distributed at in-person hunter education classes. In addition, the Department is collaborating with the State Education Department to implement recently enacted legislation that will make instructional tools and materials regarding tick-borne diseases available to school districts and libraries. These actions will enhance the public education and awareness efforts the Department has and will continue to undertake to ensure our messages are reaching as many New Yorkers as possible.

The Department's work on tick-borne diseases over the past several decades has fostered the development of a vast amount of knowledge and expertise and a significant collection of important data. In 2018, the Department will be taking significant steps to share this information with stakeholders and the public at large. First, the Department will release a tick-borne disease surveillance and response plan, similar to the plan in place for mosquito-borne diseases. This plan acts as a guidebook for local health departments, discussing the current status of tick-borne diseases, roles and responsibilities of the Department and local health departments,

prevention, and methods that can be considered to address ticks at the local level. Elements of this document have been developed as a result of the county collaboratives that we have held over the past three years.

Second, we will be moving our current and retrospective tick collection and testing results to Health Data NY, making these data available to the public. These data have always been shared with local health departments and with park managers to aid in their education and prevention campaigns. But given the considerable interest in these data from the public, providers, researchers, and advocates, we believe that making these data freely available is the responsible, transparent, thing to do. We expect the data to be available on the website by the start of tick season in 2018.

The Department has embraced the responsibility that comes with one of the highest burdens of tick-borne disease in the country, and has been, and will continue to be, a leader in tick-borne disease prevention and control since the Department's scientists first discovered the pathogen that causes Lyme disease in 1979.

Thank you again for the opportunity to speak today and I am happy to answer any questions you might have.