

Opening Statement of  
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Public hearing on Recommendations for ticks and tick-borne  
diseases in Pennsylvania

September 9, 2019

Good morning. I'm Nicole Chinnici, Director of PA Tick Research Lab of East Stroudsburg University, currently the largest tick testing research facility in Pennsylvania.

Lyme disease, the most common infectious disease in the United States, is a rapidly growing public health concern that needs immediate attention. The topic you are addressing today is more important for residents of the Commonwealth than any other state. Since 2011, Pennsylvania has been the leading state for the number of Lyme disease cases per year nationwide.

Since 2005, the DNA Lab of ESU has been testing ticks for the public for a fee. In 2018, the DNA Lab received a \$500,000 grant from the Committee of Health and Human Services to begin a free tick-testing program for all PA residents. The funding was used to build a centralized data analytical website available to the public ([www.ticklab.org](http://www.ticklab.org)) and launch free testing which started April 1, 2019. Since the launch of this program, the lab has tested 6,700 ticks from all 67 PA counties. This service has provided our residents and physicians with important information on the exposure to tick-borne diseases before symptoms begin. Additionally, this program has collected valuable scientific data on tick distribution, tick-borne disease prevalence and exposure information on ticks.

I would like to take this time to present to you the data we have collected in just five months.

**Tick Activity:** The Blacklegged (deer) tick was the most common tick submitted for testing (68.4%), followed by the American dog tick (27.3%) and the Lone star tick (4.3%). In Pennsylvania and the United States, the blacklegged tick is a carrier of the majority of the tick-borne diseases associated with human illness. In Pennsylvania, total infection rates associated with blacklegged

ticks averaged 51.8% with the highest infection rates in northcentral PA (59.0%) and the lowest in northwestern PA (47.7%).

**Tick-borne diseases in PA:** Lyme disease is the most prevalent tick-borne disease with an average infection rate of 46.4% in adult female blacklegged ticks and 30.7% in nymph blacklegged ticks. The most prevalent tick-borne disease in American dog ticks and Lone star ticks was *Rickettsia* species with an 11.0% average infection in American dog ticks and 8.5% in Lone star ticks. *Rickettsia* species are potential causative agents for Rocky Mountain Spotted fever.

Understanding and considering the prevalence of these diseases is important for physicians when diagnosing a tick-borne disease. Symptoms among diseases may present the same and, without proper and accurate human diagnostic tests, it can become difficult for patients to receive early and accurate treatment. It is important to note, ticks are carriers of bacterial, protozoan and viral diseases, which all have their specified treatment strategies based on CDC recommendations. On average 12.6% of the blacklegged ticks in PA are infected with more than one disease. Co-infections can complicate the diagnosis and recovery of a patient, especially in cases where the tick is a carrier of a bacterial and protozoan or bacterial and viral infection.

**Exposure information:** Through our tick-testing program, we evaluated exposure to a tick bite, which included collecting data from the host on location, where the tick may have been picked up in the environment, activity they were doing when exposed, whether the host was a human or animal, age and gender of host, and location where the tick was attached. On average, 50% of tick bites occurred on residential properties. When we evaluate the age of the host, we identify children ages 2-10 are at greatest risk for a tick bite. While looking at activities for exposure, the most risky activity was playing in the yard or doing yard work.

Based on our research and data collected, I have summarized the following recommendations, which would have the greatest impact on slowing and reducing the number of Lyme disease cases in Pennsylvania per year.

- 1) Continue funding Statewide Environmental Survey and Surveillance Data Website through the PA Tick Research Lab
- 2) Develop a Health Care Provider Prevention and Educational Program

- 3) Develop an Educational Protocol and Funding Strategy for Schools in High Risk Areas
- 4) Begin funding Integrated Pest Management Strategies

It is essential we continue to evolve with the rapidly evolving world of ticks. Continuing to fund the free tick-testing program is critical in generating important education and tick-borne disease prevalence data as well as giving physicians an extra diagnostic tool to better understand their patients risk of developing a tick-borne disease. The data has provided a baseline understanding of diseases within the PA tick population. Additionally, we have identified high-risk activities and ages at greatest risk for a tick bite. This provides us with a starting point to begin implementing key educational protocols within schools and communities within endemic areas. Knowing your greatest risk for a tick bite is in your own backyard is a public health concern that needs immediate attention.

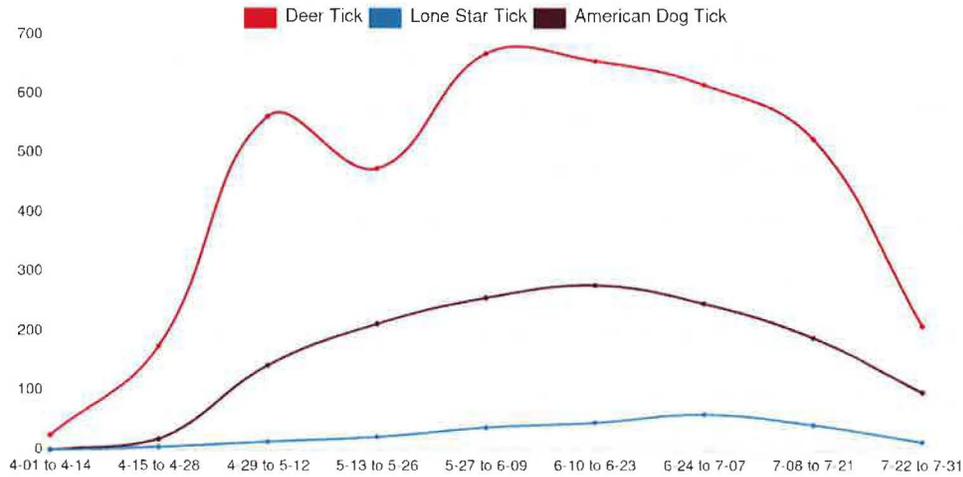
Furthermore, we need to start filling the gaps between physician and patient understanding of tick-borne diseases. Health care is rapidly changing and recommendations for treatment and diagnostic testing is changing. Mandating continuing medical education for PA registered physicians during this health crisis is needed. It is pertinent that at minimum, funding should be allocated to develop and implement a health care provider educational course in high-risk communities.

Lastly, research is needed to develop the most cost-effective pest management strategy that fits the geography of Pennsylvania. These strategies may include methods such as small rodent vaccination and white-tailed deer treatment stations, which could assist in reducing tick abundance in high endemic areas. Research is needed on these methods to determine the best strategy for PA to ultimately decrease our tick bite incident rates.

In conclusion, based on my expertise and extensive observations across Pennsylvania, the recommendations provided have the greatest impact on slowing and reducing the number of Lyme disease cases in Pennsylvania. With your support, together, we can make Lyme disease a preventable disease across the Commonwealth. I thank you for the opportunity to speak today on behalf of East Stroudsburg University of Pennsylvania and the Commonwealth. I would be happy to answer any questions.

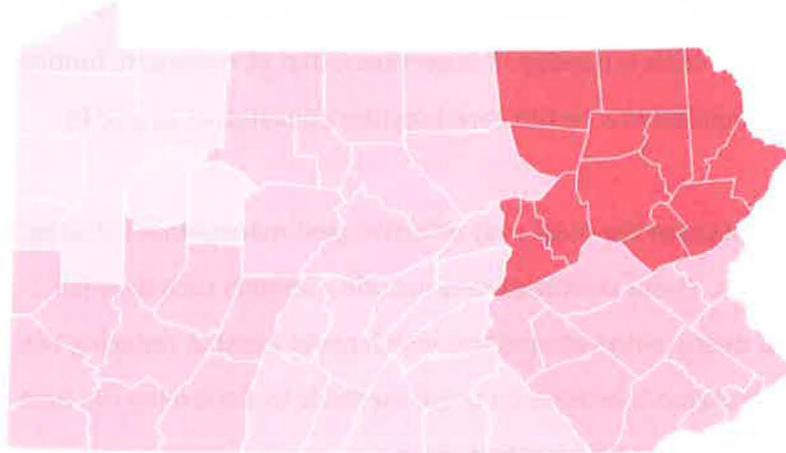
**Appendix - Graphs will be displayed through PowerPoint during the testimony**

**Tick Species Received over Time**



**Figure 1:** The Blacklegged (deer) tick was the most common tick submitted for testing. The peak adult tick season occurred between April 28, 2019 and May 13, 2019. The nymph blacklegged tick peak season occurred between May 27, 2019 and July 22, 2019.

**Blacklegged Prevalence By Region**

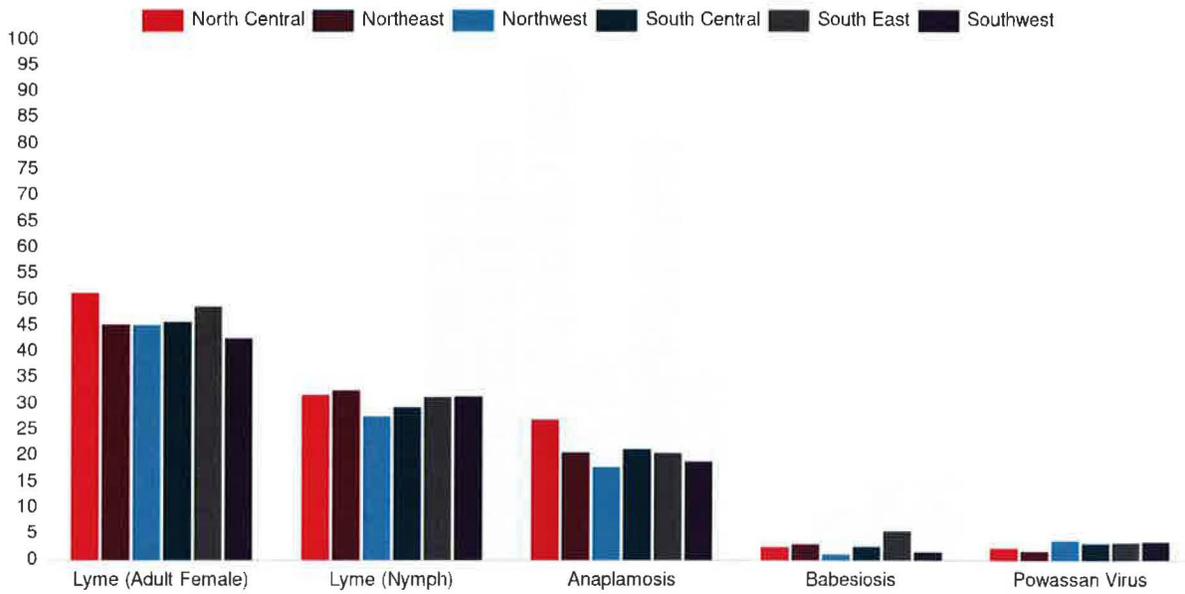


Region	Total Count	Postive Count	Negative Count	Infection Rate
NC	444	262	182	59.01%
NE	1324	692	632	52.27%
NW	369	176	193	47.7%
SC	474	245	229	51.69%
SE	607	314	293	51.73%
SW	602	291	311	48.34%

**Figure 2:** Prevalence of blacklegged ticks by region and the associated total infection rate. Northeast PA had the highest number of blacklegged ticks with 1,324 and northwestern PA had the lowest number of blacklegged ticks tested with 369. Northcentral PA had the highest total infection rate of 59.0% and northwestern PA had the lowest total infection rate of 47.7%.

# Infection Rate (%) By Pathogen & Region

*Ixodes scapularis*, Single-tick orders

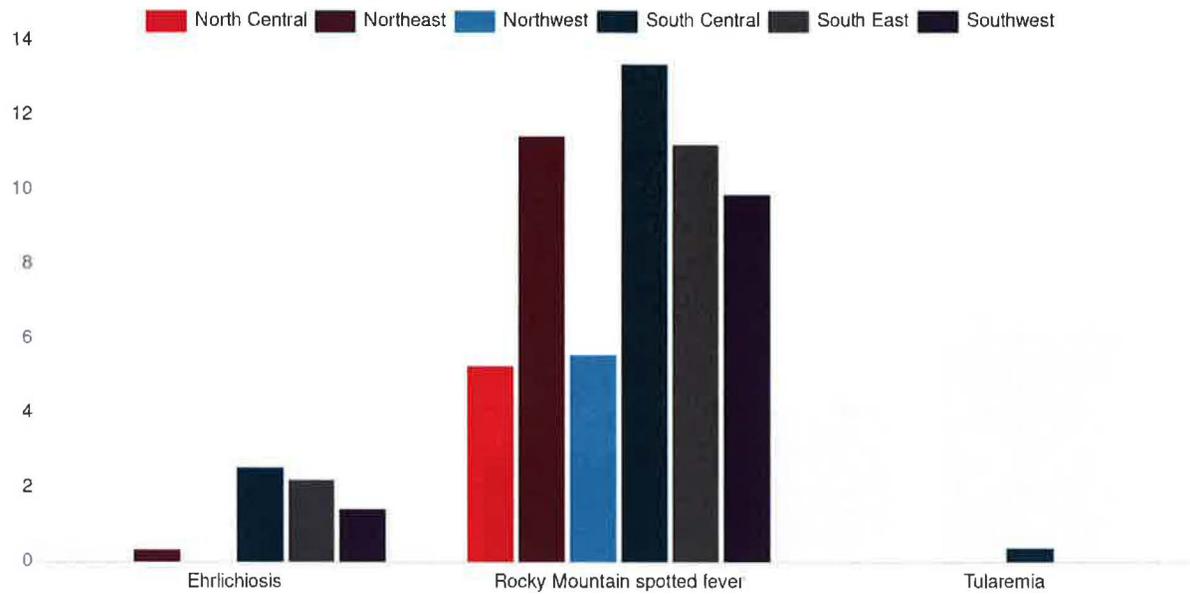


Region	Lyme (Adult Female)	Lyme (Nymph)	Anaplasmosis	Babesiosis	Powassan Virus
NC	51.3%	31.8%	27%	2.5%	2.3%
NE	45.3%	32.7%	20.7%	3%	1.7%
NW	45.2%	27.7%	17.9%	1.1%	3.8%
SC	45.8%	29.4%	21.3%	2.5%	3.2%
SE	48.7%	31.3%	20.6%	5.6%	3.3%
SW	42.6%	31.5%	18.9%	1.5%	3.5%

**Figure 3:** Prevalence of Lyme disease, Anaplasmosis, Babesiosis and Powassan virus in blacklegged ticks across six regions of PA.

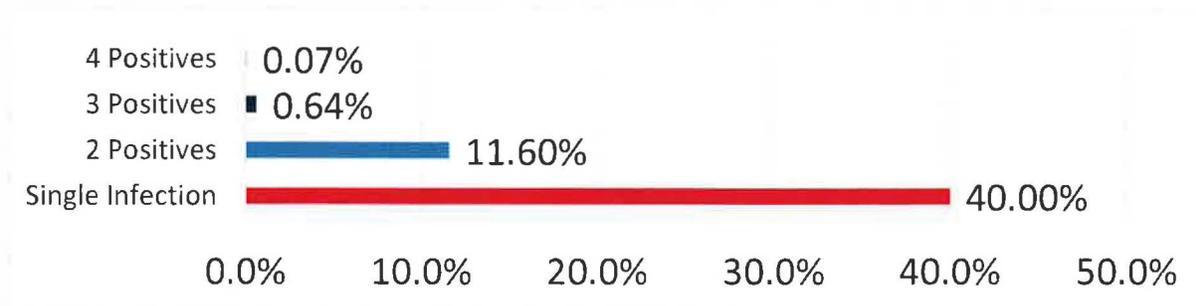
## Infection Rate (%) By Pathogen & Region

*Dermacentor variabilis*, Single-tick orders



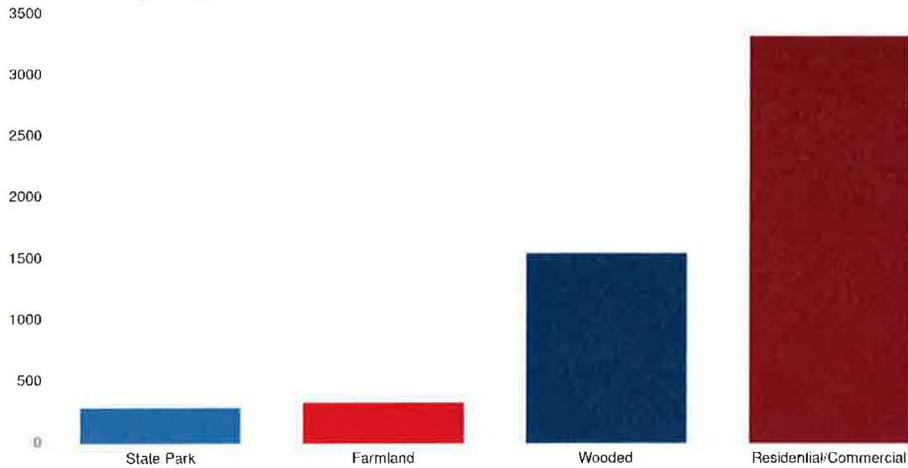
Region	Ehrlichiosis	Rocky Mountain spotted fever	Tularemia
NC	0%	5.3%	0%
NE	0.3%	11.4%	0%
NW	0%	5.6%	0%
SC	2.5%	13.4%	0.4%
SE	2.2%	11.2%	0%
SW	1.4%	9.9%	0%

**Figure 4:** Prevalence of Ehrlichiosis, *Rickettsia* sp. and Tularemia in American dog ticks across six regions of PA.



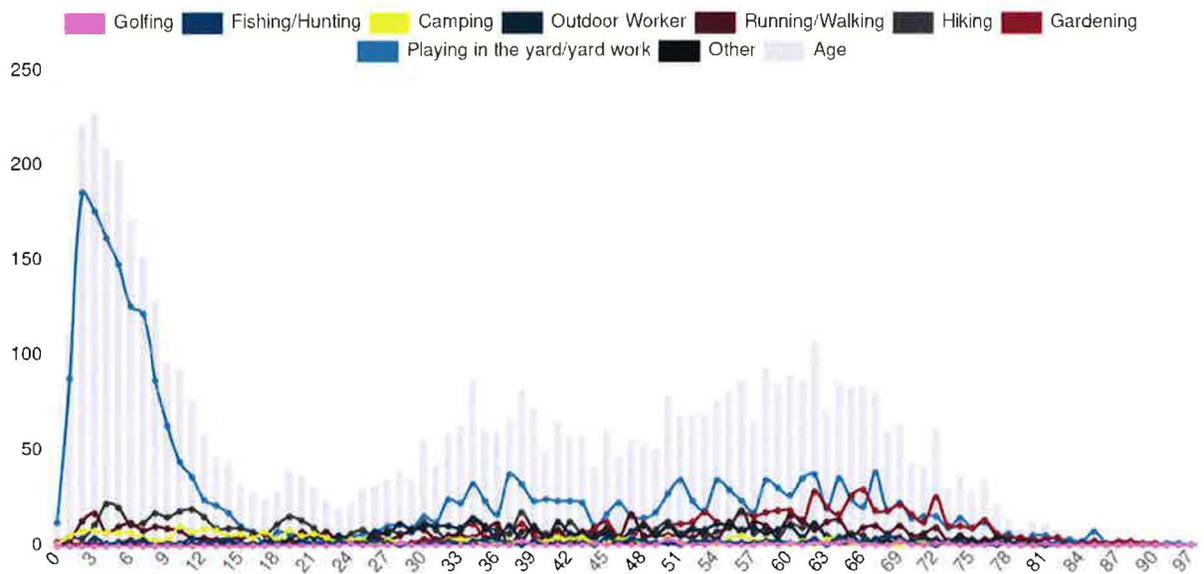
**Figure 5:** Co-infection rate among blacklegged (deer) ticks.

## Area of Exposure



**Figure 6:** Description of the area in which the resident was exposed to a tick bite. Over 50% of tick bites occurred on residential properties.

## Activity of Exposure across Ages



**Figure 7:** When evaluating activity of exposure across age classes, the activity putting you at greatest risk was playing in the yard and doing yard work. Additionally, ages 2-10 are at highest risk for exposure to a tick bite.