The Evolving Geographic Distribution and Minimum Infection Rate of *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, *Babesia microti*, and *Borrelia miyamotoi* in Manitoba, Canada from 1995 to 2017

Cheryl PZ Foo1, Catherine Sutcliffe2, L. Robbin Lindsay3

1 Memorial University of Newfoundland and Labrador, St. John’s, NL
2 Bloomberg School of Public Health, John Hopkins University, Baltimore, MD
3 Zoonotic Diseases and Special Pathogens, National Microbiology Laboratory, Public Health Agency of Canada, Winnipeg, MB

**Background**

- The expanding geographic range of *Ixodes scapularis* (blacklegged ticks (BLT)) poses an emerging public health risk.
- The public and healthcare provider awareness of at-risk areas of BLT, capable of transmitting *Borrelia burgdorferi*, *Borrelia miyamotoi*, *Anaplasma phagocytophilum*, and *Babesia microti*, is necessary for early diagnosis and prevention (1).
- The Public Health Agency of Canada (PHAC) in collaboration with Manitoba Health and the University of Manitoba conducts surveillance through passive tick surveillance via submission from animals or humans to the National Microbiology Laboratory, physician reporting of human cases of Lyme Disease, and active tick surveillance from field sampling at sentinel sites.

**Objectives**

1. To determine the geographic distribution of BLTs submitted to the PHAC’s tick surveillance program to assess the risk of exposure to *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, *Babesia microti*, and *Borrelia miyamotoi* in Manitoba from 1995 to 2017

**Methods:**

- Submitted ticks were tested by PCR for *B. burgdorferi* since 1995, *A. phagocytophilum* since 2006, and *B. microti* and *B. miyamotoi* since 2013.
- MIR of ticks acquired from Manitoba was calculated for each pathogen and analyzed by linear regression by year.
- Global positioning system coordinates of positive and negative tick submissions were plotted by year of collection

**Results**

- 3218 ticks were submitted from Manitoba
- The MIR per 1000 ticks were:
  - 141.5 (95% confidence interval (CI) 130.8-152.1) for *B. microti*
  - 10.9 (95% CI 6.8-15.2) for *B. burgdorferi*
  - 15.3 (95% CI 6.7-23.9) for *B. miyamotoi*
  - MIRs of *B. microti* and *B. miyamotoi* had no statistically significant change from 2013-2017

**Conclusion:**

*B. burgdorferi* and *A. phagocytophilum* are emerging tick-borne pathogens with MIRs that are increasing over time in BLTs from Manitoba. New regions in Manitoba are at risk due to the expanding geographic range of *B. burgdorferi* infected ticks. Surveillance should focus on areas surrounding known at-risk regions to capture emergence of infected ticks into new areas.

**References:**