

Laboratory Blood-Based Testing for Lyme Disease at a National Reference Laboratory: A 7-Year Experience (2010-2016)

Background

- In the United States, Lyme disease is most often caused by the bacterium *Borrelia burgdorferi*, which is transmitted to humans via tick.¹
- Approximately 30,000 cases of Lyme disease are reported annually to the Centers for Disease Control and Prevention (CDC).² However, a study based on data from 7 large commercial laboratories in the United States estimated an annual incidence of 244,000 to 444,000, which suggests under-reporting to the CDC.^{2,3}
- Further, analysis of testing volume for tick-borne infections (TBIs) at Massachusetts General Hospital indicated that both testing volume and the number of positive test results have increased over the last decade (2006-2016) in the northeastern region of the United States.⁴
- **Objective:** In this study, investigators evaluated trends in testing for TBI (*Borrelia burgdorferi*) and positivity rates across the United States according to test data from Quest Diagnostics, a national clinical reference laboratory.

Methods

- Lyme disease testing results were retrieved from the database archives at Quest Diagnostics and examined for the 7-year period of 2010 through 2016.
- Blood-based tests for *B burgdorferi* included in this analysis were a standard 2-tiered enzyme immunoassay, Western blot, and polymerase chain reaction.
- The testing data were categorized by year, age group, gender, test month, and state of residence.

Results

- For the period 2010 through 2016, Quest Diagnostics conducted 5,255,636 tests for Lyme disease, ranging between 723,410 and 770,946 total tests per year.
- Among the tests conducted, results were positive in 593,800 (11.3%).
- Although testing volume was relatively stable over time, the rate of positivity increased from 10.3% in 2014 to 13.3% in 2016.
- All 50 states and the District of Columbia had positive test results.
 - New York had the most positive tests; Connecticut had the highest positivity rate per 1,000 persons.
 - Over 85% of positive test results were from 14 states: CT, NY, WI, MA, RI, PA, MN, NH, ME, VT, MD, NJ, DE, VA.
 - Positivity rates in TX, FL, and CA have been low historically, but increased over the 7-year period.

Conclusions

- The results of this study provide further evidence that testing and positivity for Lyme disease recently increased in the United States, including in states that have, historically, had low rates.

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