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Division of Public Health

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Date: 7 APR 2014
To: NC Medical Providers
From: Dr. Megan Davies, State Epidemiologist
Subject: Annual Update on Surveillance for Lyme disease in North Carolina

Lyme disease Introduction:
Lyme disease (LD) is caused by infection with the bacteria *Borrelia burgdorferi* sensu stricto transmitted by the bite of an infected *Ixodes scapularis* tick. The North Carolina Division of Public Health (DPH) would like to ensure that health care providers consider the possibility of LD when appropriate. The diagnosis of LD should be based on a combination of symptoms, physical findings, the possibility of exposure to infected ticks and laboratory results.

Surveillance for Lyme disease
Per North Carolina law, LD is reportable by health care providers to their local health department. Isolation or identification of *B. burgdorferi* is reportable by laboratories to the Division of Public Health. [1] Surveillance for LD is based on the national case definition, which establishes uniform criteria for disease reporting in order to monitor trends, take action to reduce disease, and improve public health. [2] During 2013, a total of 179 (38 confirmed, 141 probable; provisional data) cases of Lyme disease were reported in NC. From 2008 to 2013 the number of reported confirmed cases (based on the presence of objective clinical manifestations and laboratory evidence of infection) has more than doubled, from 16 to 38 cases. In the same time period, the number of reported probable cases (based on physician diagnosis and laboratory evidence of infection) has increased almost four times from 38 to 141. Figure 1.

Endemic County
As of February 2014, four counties (Alleghany, Guilford, Haywood and Wake) are designated, for surveillance purposes, as **endemic**. Counties are designated as endemic if two laboratory confirmed cases of early LD (characterized by erythema migrans, EM) are identified in persons who did not travel outside of their county of residence during the incubation period. [2] In these situations, it is assumed that LD was acquired in the county of residence. A designation of endemic is not meant to imply a greater risk of transmission of *B. burgdorferi*, but is used to assist in classification of cases for surveillance. See figure 2.

Serologic Testing for Lyme disease
If LD is suspected in a patient, DPH requests that appropriate laboratory tests be ordered to support a surveillance diagnosis**. S**erologic testing is insensitive in the acute phase (the first two weeks) of infection and may be falsely negative, so should not be used for clinical decision-making in the acute phase. If laboratory testing is not supportive of a surveillance diagnosis, please consider reordering convalescent testing two weeks later. [3] All late manifestations of LD (musculoskeletal, cardiac, and nervous) and early LD with exposure in a non-endemic county must also be accompanied by appropriate laboratory testing to fulfill the case definition requirements. When ordering serologic tests be sure to request a total EIA (screening) test with an automatic reflex to IgG and IgM western blot if the EIA is positive or equivocal. See figure 3.

Erythema Migrans rash in NC
STARI (southern tick associated rash illness) can occur after the bite of the lone star tick (*Amblyomma americanum*), the most common tick in North Carolina, which is not a known vector for *B. burgdorferi*. The etiologic agent for STARI is unknown and there is no diagnostic test. STARI may cause an EM like skin lesion and is a confounder for LD surveillance and the primary reason that all cases of EM should be accompanied by

laboratory evidence of infection, to confirm diagnosis, particularly in areas where LD and STARI may coexist. In the southern United States, it has been recommended that EM rashes be treated presumptively as early LD, regardless of what the true cause of the rash may be. [4] However, where the incidence rate of LD is low, and the probability that an EM rash due to infection with *B. burgdorferi* is low, it has also been recommended that patients be observed, as opposed to receiving empiric treatment, to avoid complications of treatment. [5] Treatment for (potential) LD should be initiated on the best judgment of the attending clinician.

Education of patients, prevention of disease:
We encourage all providers to educate their patients about personal protective measures to minimize their risk of acquiring tick borne illness. Lyme disease prevention materials are available from the CDC. Please visit our website (http://epi.publichealth.nc.gov/cd/diseases/ticks.html) or contact Carl Williams or Jodi Reber at 919-733-3419 with any questions or concerns that you have regarding surveillance of Lyme disease. Your time and consideration on this topic are greatly appreciated.

Figure 1

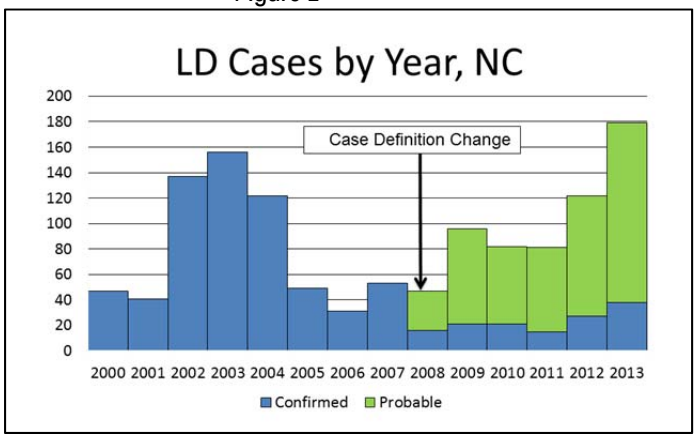


Figure 3

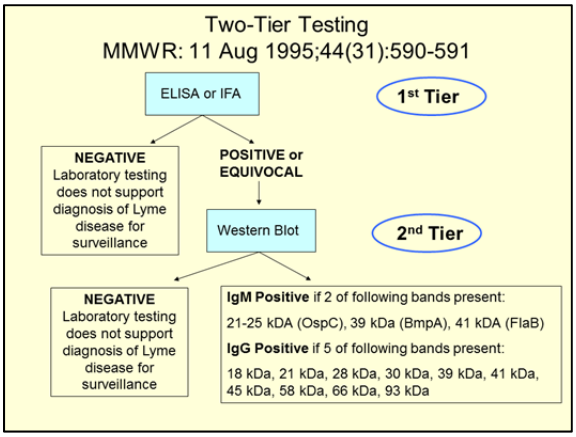
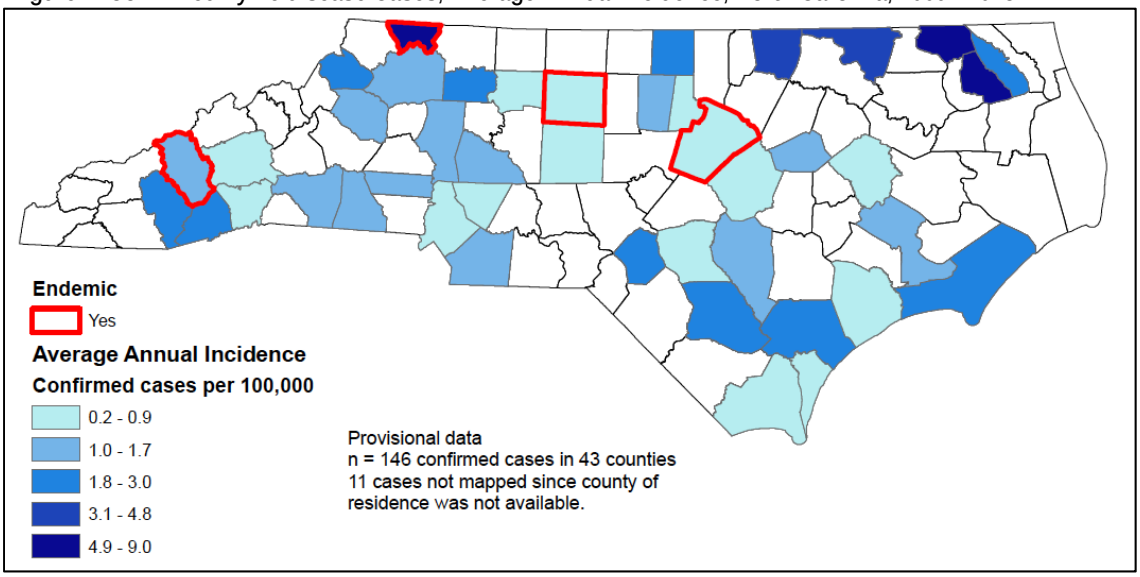


Figure 2. Confirmed Lyme disease Cases, Average Annual Incidence, North Carolina, 2009 - 2013



References:

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3. Wormser, et. al. The Clinical Assessment, Treatment, and Prevention of Lyme Disease, Human Granulocytic Anaplasmosis, and Babesiosis: Clinical Practice Guidelines by the Infectious Diseases Society of America. CID. 2006 November 1;43:1089-1134
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5. Lantos, et. al. Empiric Antibiotic Treatment of Erythema Migrans-Like Skin Lesions as a Function of Geography: A Clinical and Cost Effectiveness Modeling Study. Vector Borne and Zoonotic Diseases. 2013 Dec;13(12):877-83