

## Lyme and Other Tick-Borne Diseases

### Background

Lyme disease is caused by the bacterium *Borrelia burgdorferi* and is transmitted to humans through the bite of an infected black-legged deer tick, *Ixodes scapularis*. Lyme disease is more common in certain areas of the United States: the Northeast (Virginia to Maine), the Upper Midwest (Wisconsin and Minnesota), and to a lesser extent the West Coast (Figure 1)<sup>1</sup>. However, there is increasing risk of contracting Lyme disease near metropolitan Chicago based on tick surveys that have demonstrated a substantial percentage of *I. scapularis* ticks in the area carry *B. Burgdorferi*.<sup>2,3</sup> The ticks that transmit the bacterium of Lyme disease can also transmit other bacterium, such as *Anaplasma phagocytophila* (the cause of human granulocytic anaplasmosis (HGA)), or parasites, such as *Babesia microti* (the cause of babesiosis), and occasionally two infections may occur in one individual if the tick is carrying both pathogens.

### Human Surveillance

During the last six years (2008-2013) the number of reports of Lyme disease received by CDPH had increased from 78 reports in 2008 to 141 reports in 2013 (total number of reports were 648 reports). Of those, 94 cases were confirmed and met Lyme disease case definition. Among the six years, 2013 had the highest number of confirmed cases (32 cases) and 2009 had the lowest (3 cases) (Figure 2). The age range of these cases was 3-91 years (median by year, Table 1). There were more cases in males (61%) than females (39%). Seventy-five cases (80%) had illness onset during May through August (range: March-October), corresponding to the time when ticks are more active. Eight case-patients reported possible exposures in Illinois and 63 (71%) case-patients reported travel outside Illinois, including Wisconsin (34), Michigan (5), Minnesota (3), New York (6), Indiana (5) and one case in each of Colorado, Connecticut, Iowa, Maine, Massachusetts, Ohio, Pennsylvania, Rhode island, and Virginia. There were twenty cases (21%) with unknown travel history and three cases that traveled to multiple states.

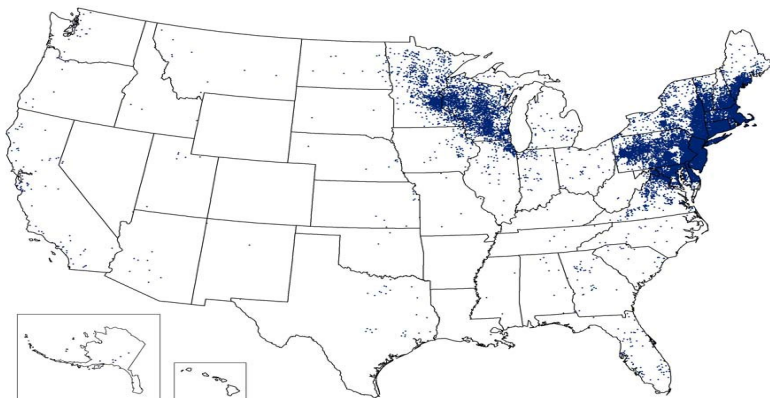
### Signs and Symptoms, Diagnosis, and Treatment

Typical symptoms of Lyme disease include fever, headache, fatigue, and a characteristic skin rash called erythema migrans, which occurs at the site of the tick bite. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful if used correctly and performed with validated methods; CDC currently recommends a two-step process when testing blood for evidence of antibodies against Lyme disease bacteria.<sup>4</sup>

Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include wearing protective clothing, using insect repellent, removing ticks promptly, applying pesticides to pets, and reducing tick habitat. If an engorged *I. scapularis* tick has been attached for  $\geq 36$  hours a single dose of antibiotic provided within 72 hours of tick removal may prevent Lyme disease.<sup>5</sup>

### Reporting

Lyme disease, as well as other tick-borne diseases (e.g., anaplasmosis, ehrlichiosis, and RMSF), are reportable within 7 days of identification. Clinicians should report suspect or confirmed cases in Chicago by calling the CDPH Communicable Disease Program at (312) 746-5924 or by entering case information in INEDSS. Laboratories should report patients who have a positive result on any laboratory test indicative of and specific for these infections.



**Figure 1. Reported cases of Lyme disease—United States, 2011.**<sup>1</sup>

One dot is placed randomly within the county of residence for each confirmed case. Though Lyme disease cases have been reported in nearly every state, cases are reported based on the county of residence, not necessarily the county of infection.

Figure 2. Number of confirmed cases of Lyme disease among Chicago and Illinois residents by year, 2008-2013.

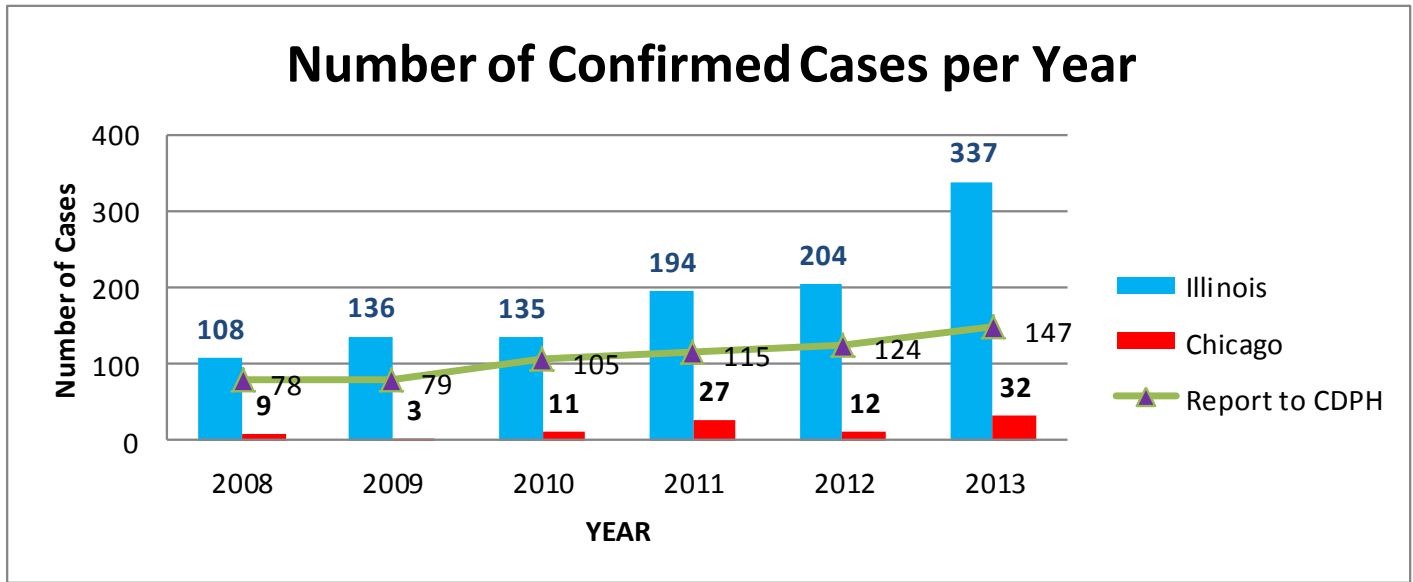


Table 1. Surveillance of Lyme disease in years 2008-2013.

| Year  | Number of Cases | Median age | Sex  |        | Month of onset |     |     |     |     |     |     |     |     |     |   | Un-known | Total |
|-------|-----------------|------------|------|--------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|----------|-------|
|       |                 |            | Male | Female | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |   |          |       |
| 2008  | 9               | 31         | 2    | 7      |                |     | 1   |     | 1   | 4   | 2   | 1   |     |     | 0 | 9        |       |
| 2009  | 3               | 44         | 1    | 2      |                |     |     |     |     | 1   | 1   | 1   |     |     | 0 | 3        |       |
| 2010  | 11              | 40         | 11   | 0      |                |     | 1   |     | 2   | 2   | 2   | 2   | 1   |     | 1 | 11       |       |
| 2011  | 27              | 46         | 18   | 9      | 1              |     | 1   |     | 3   | 11  | 6   | 3   | 1   | 1   | 0 | 27       |       |
| 2012  | 12              | 47         | 7    | 5      |                |     | 1   | 1   | 1   | 4   | 2   | 1   | 1   | 1   | 0 | 12       |       |
| 2013  | 32              | 32         | 18   | 14     |                |     |     |     | 5   | 7   | 7   | 6   |     |     | 7 | 32       |       |
| TOTAL | 94              | 42         | 57   | 37     | 1              | 0   | 4   | 1   | 12  | 29  | 20  | 14  | 3   | 2   | 8 | 94       |       |

References

1. <http://www.cdc.gov/lyme/stats/maps/interactiveMaps.html>.
2. Emerg Infect Dis 2006; 12(6):1039-41.
3. Emerg Infect Dis 2007; 13(11):1799-1800.
4. <http://www.cdc.gov/lyme/diagnostesting/LabTEST/TwoStep/index.html>.
5. Clin Infect Dis 2006; 43:1089-134.