

Current Trends Lyme Disease Surveillance -- United States, 1989 – 1990

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Surveillance for Lyme disease (LD) was initiated by CDC in 1982 (1), and in January 1991, LD became nationally reportable (2). Forty-six states reported cases in 1989 and 1990 (Figure 1), but the occurrence in nature of the causative bacterium, *Borrelia burgdorferi*, has not been documented in all of these states. From 1982 through 1989, the annual reported number of cases of LD increased 18-fold (from 497 to 8803, respectively) and from 1986 through 1989, nearly doubled each year (Figure 2). The provisional total of 7997 cases for 1990 suggests a plateau in this trend of rapid annual increase. This report summarizes surveillance of LD during 1990 in Connecticut, Georgia, Michigan, Missouri, New Jersey, and Wisconsin.

Connecticut

In 1990, the Connecticut Department of Health Services (CDHS) reported 704 cases (22 per 100,000 population) of LD based on the new national surveillance case definition adopted by the Council of State and Territorial Epidemiologists (CSTE) in 1990 (see box) (2). This total represented a 9% decrease from the 1989 total of 774 cases, but that total was based on the previous CDC case definition in use in 1989 (3). The total number of case reports received by CDHS (i.e., including those reports that did not meet the case definition in use), however, increased slightly (4%) from 1269 in 1989 to 1318 in 1990.

One criterion of the new national surveillance case definition is that the characteristic skin lesion of LD, erythema migrans (EM), must be greater than or equal to 5 cm in diameter. In 1990, CDHS assessed the impact of this criterion on LD reporting in Connecticut by requesting physicians to record the EM diameter on the CDHS case report form (telephone follow-up was done when information was not provided). Of the 1318 LD total case reports received by CDHS in 1990, 597 (45%) were based on reports of EM alone. Of these 597 reports, the EM diameter was greater than or equal to 5 cm for 388 (65%), less than 5 cm for 35 (6%), and unspecified for 174 (29%). Telephone follow-up for the 174 unspecified reports indicated the EM diameter was greater than or equal to 5 cm for 82 (47%), less than 5 cm for 35 (20%), and remained unspecified for 57 (33%). If information on EM diameter had not been collected, the surveillance total for 1990 based on the official case definition would have been 831, including the 597 cases with EM alone and 234 cases with late manifestations and a supporting positive serologic test; instead, the CDHS assessment resulted in a 15% (127/831) reduction in cases.

Georgia

The Georgia Department of Human Resources (GDHR) recorded a total of 62 cases of LD from 1982 through 1988, compared with 715 cases in 1989 (4). In 1990, however, the total number of reported cases declined to 161. Potential explanations for these shifts are that 1) free serologic testing was offered through the state public health laboratory in 1989 but was discontinued in July 1990; 2) the cut-off for serologic positivity used by the state public health laboratory (1:128 by immunofluorescent assay) was lower than that used by many laboratories in the country (1:256); 3) in 1989 GDHR and other institutions sponsored a series of state-wide educational seminars on LD, including two programs for physicians; and 4) the new national surveillance case definition was implemented in 1990 (5). Michigan

In Michigan, the number of reported LD cases with onset in 1990 (134) declined 19% when compared with 1989 (165), although the same case definition was used in both years. Missouri

During 1990, the Missouri Department of Health (MDOH) reported 205 cases of LD, a 90% increase from 1989 (108 cases). MDOH implemented the new national surveillance case definition (2) in 1990, but had used the previous CDC case definition in 1989 (3).

New Jersey

In 1990, the New Jersey State Department of Health (NJDOH) recorded a 58% increase in the number of confirmed cases of LD compared with 1989 (1074 cases and 680 cases, respectively), although the number of cases with EM increased modestly (680 and 716 cases, respectively). Potential explanations for these increases include: 1) use of a new generic case report form for communicable diseases that had been implemented by NJDOH in June 1990 to facilitate reporting by physicians; and 2) broadening of the case definition from only cases with documented EM to the new national surveillance case definition that includes persons with EM as well as persons with a positive serologic test result and rheumatologic, neurologic, or cardiac signs of LD.

Wisconsin

In 1990, the Wisconsin Division of Health (WDOH) noted a 54% decrease in total LD case reports when compared with 1989 (909 and 1996, respectively), although the same case definition was used in both years. The number of confirmed cases also declined from 1989 to 1990 (762 and 337 cases, respectively). This is the first decrease in reported LD cases in Wisconsin since 1985. Potential explanations that may account for some of this change include: 1) a decrease in media coverage of LD; 2) a decreased prevalence of *Ixodes dammini*, the tick vector of *B. burgdorferi* in that region, based on anecdotal reports from entomologists to WDOH; and 3) success of educational efforts to prevent tick bites (6). In addition, from 1989 through 1990, use of commercial and reference laboratories for LD serology declined (6): in 1990, the Wisconsin State Laboratory of Hygiene tested 8309 specimens compared with 17,222 specimens in 1989. This decrease in laboratory use may reflect a true decrease in incidence, changing medical practices, or other factors; the effect on case reporting is unknown. Reported by: ML Cartter, MD, JL Hadler, MD, State Epidemiologist, Connecticut State Dept of Health Svcs. JD Smith, JA Wilber, MD, State Epidemiologist, Georgia Dept of Human Resources. MG Stobierski, DVM, KR Wilcox, Jr, MD, State Epidemiologist, Michigan Dept of Public Health. HD Donnell, Jr, MD, State Epidemiologist, Missouri Dept of Health. C Genese, KC Spitalny, MD, State Epidemiologist, New Jersey State Dept of Health. JJ Kazmierczak, DVM, JP Davis, MD, State Epidemiologist, Div of Health, Wisconsin Dept of Health and Social Svcs. Bacterial Zoonoses Br, Div of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, CDC.

Editorial Note

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Different surveillance case definitions for LD have been used throughout the United States since 1982; each definition has incorporated a combination of elements of early and late manifestations of illness, a history of endemic exposure, and a positive serologic test result (7,8). On January 1, 1991, LD became nationally reportable in the United States. However, the new standardized surveillance case definition, which had been approved by CSTE (2), was used by some states in 1990. The findings in this report suggest that the factors affecting trends in LD reporting are multiple and complex, and require further definition. For example, in Connecticut, a 1-year assessment that focused on reporting of EM resulted in a 15% decrease in cases that otherwise would have been included in the annual total. The findings in Georgia highlight how heightened physician awareness and laboratory-based surveillance for LD may affect reporting. In Missouri, case reports continued to increase despite the use of the new case definition, possibly reflecting increased awareness and reporting compliance and/or a true increase in incidence. Of note, however, is that *B. burgdorferi*, the etiologic agent of LD, has not been isolated from ticks, vertebrate hosts, or human case-patients in Georgia or Missouri. In New Jersey, use of the new case definition appeared to identify cases with late manifestations of illness. In Michigan and Wisconsin, case reports may have declined as a result of ecologic or other factors unrelated to a change in case criteria.

The new national surveillance case definition was developed to achieve greater specificity in case identification. This effort to exclude non-cases may have also excluded true cases from national totals. The impact of the new case definition can be further assessed after this definition has been implemented uniformly by all states and in use for at least 1 full year.

References

1. Schmid GP, Horsley R, Steere AC, et al. Surveillance of Lyme disease in the United States, 1982. *J Infect Dis* 1985;161:1144-9.

2. Wharton M, Chorba TL, Vogt RL, Morse DL, Buehler JW. Case definitions for public health surveillance. *MMWR* 1990;39(no. RR-13):19-21.
3. Ciesielski CA, Markowitz LE, Horsley R, Hightower AW, Russell H, Broome CV. The geographic distribution of Lyme disease in the United States. *Ann NY Acad Sci* 1988;539:283-8.
4. CDC. Tickborne diseases--Georgia, 1989. *MMWR* 1990;39:397-9.
5. Georgia Department of Human Resources. Lyme disease--1990. *Georgia Epidemiology Report* 1991;7:2-3.
6. Wisconsin Division of Health. Lyme disease update. *Wisconsin Epidemiology Bulletin* 1991;13:1-4.
7. Ciesielski CA, Markowitz LE, Horsley R, Hightower AW, Russell H, Broome CV. Lyme disease surveillance in the United States, 1983-1986. *Rev Infect Dis* 1989;11(suppl 6):S1435-41.
8. CDC. Lyme disease--United States, 1987 and 1988. *MMWR* 1989;38:668-72.

LYME DISEASE* Clinical Description A systemic, tick-borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is the initial skin lesion, erythema migrans, that occurs among 60%-80% of patients.

Clinical Case Definition

- Erythema migrans (greater than or equal to 5cm in diameter), or
- At least one late manifestation (i.e., musculoskeletal, nervous, or cardiovascular system involvement) and laboratory confirmation of infection. Laboratory Criteria for Diagnosis
- Isolation of *Borrelia burgdorferi* from clinical specimen, or
- Demonstration of diagnostic levels of IgM and IgG antibodies to the spirochete in serum or cerebrospinal fluid, or
- **Significant change in IgM or IgG antibody response to *B. burgdorferi* in paired acute- and convalescent-phase serum samples. Case Classification Confirmed: a case that meets one of the clinical case definitions above. *Adapted from the 1990 Council of State and Territorial Epidemiologists surveillance case definition (2).**

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