

CONNECTICUT EPIDEMIOLOGIST



State of Connecticut Department of Health Services
 Frederick G. Adams, D.D.S., M.P.H., Commissioner

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LYME DISEASE IN CONNECTICUT

The annual number of reported cases of Lyme disease has increased since the Connecticut Department of Health Services (CDHS) began surveillance for this disease from 460 cases in 1984 to 774 cases in 1989. This increase may be related, in part, to the methods by which reports were collected.

In 1989, follow-up questionnaires were sent to physicians who reported a case of Lyme disease without supplying clinical information. Of the 1269 cases that were reported to the CDHS, 774 met the surveillance case definition. Erythema migrans (EM) occurred in 540 (70%) cases and 234 (30%) cases presented with a systemic manifestation and a positive serologic test for antibody to *Borrelia burgdorferi*. Of the 234 cases without EM but with a systemic manifestation, arthritic symptoms occurred in 155 (67%), neurologic manifestations occurred in 102 (44%) and cardiac complications occurred in 16 (7%) of the cases. Some cases had more than one systemic manifestation. The 495 reports submitted by physicians without clinical information were not counted as cases.

Onset dates were provided for 671 (87%) of the reported cases. While cases were reported throughout the year, 416 (62%) cases reported

symptom onset during the summer months of June and July.

As in past years, cases for 1989 were equally distributed among males (51%) and females (49%). Age-specific incidence rates for all reported cases were calculated by 10-year age groups (Table 1). The incidence ranged from 15 per 100,000 population for persons 20 - 29 years of age to 40 per 100,000 population for those 0 - 9 years of age.

In 1989, the overall incidence for Connecticut was 23 per 100,000 population. As in past years, the highest rates were among residents of New London and Middlesex counties (Table 2). Town-specific incidence ranged from zero to 815 per 100,000 population (Figure 1).

Lyme disease is a statewide problem. Consistent reporting by physicians over several years will be necessary for data from the current surveillance system to be useful for evaluating trends. Clinical information should accompany reports of Lyme disease; this information is used to classify cases. Follow-up forms will be sent to physicians who do not provide clinical information with the initial report.

A copy of this form is included in this issue. Additional copies can be obtained by calling the Epidemiology Program at 566-5058.

**Reported Lyme Disease Cases
Connecticut, 1989 (per 100,000 population)**

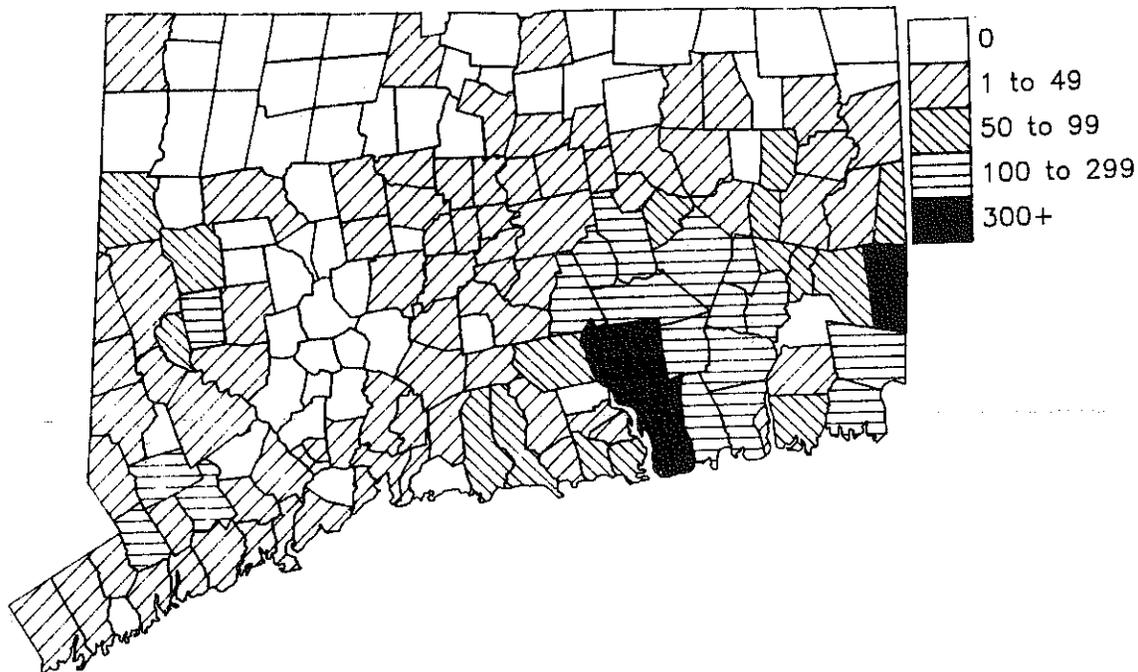


Figure 1

Table 1. Lyme disease incidence by 10-year-age group, Connecticut, 1989			Table 2. Reported Lyme disease cases by county, Connecticut, 1989			
Age	Cases	Rate/100,000 Pop.*	County	Cases	Rate/100,000 Population	% of Total Population
00-09	173	39.6	New London	299	114.3	39%
10-19	107	25.1	Middlesex	109	73.2	14%
20-29	77	14.5	Tolland	35	26.8	5%
30-39	102	19.3	Windham	19	18.6	3%
40-49	101	23.8	Fairfield	150	17.5	19%
50-59	62	19.2	New Haven	71	8.7	9%
60-69	78	24.3	Litchfield	19	10.8	2%
70+	53	16.0	Hartford	67	7.7	9%
Unknown	21	----	Unknown	5	----	1%
Total	774	23.0	TOTAL	774	23.0	100%
*Est. 1988, CT Dept. of Health Services			*Est. 1989, CT Dept. of Health Services			

TICKS, DEER, AND LYME DISEASE

Deer and B. burgdorferi Infection

During the 1989 fall hunting season, scientists at the Connecticut Agricultural Experiment Station conducted a study of blood samples obtained from deer that were killed and brought by hunters to four of the eleven biological deer check stations in the state.

The stations involved in the study were located in Sharon, Barkhamstead, Eastford, and East Haddam. Three of the stations were chosen for their location in the northern part of the state, where Lyme disease is less common. The town where each deer was killed was recorded. Sera were tested for total antibody to Borrelia burgdorferi using a new enzyme linked assay.

Sera were obtained from 108 of the 1721 deer seen at the four check stations. The percentage of deer tested that showed evidence of current or past infection with B. burgdorferi by county where the deer was killed is presented in Table 3. The results show that Lyme disease is present among deer in Litchfield and Windham counties, two counties that have been relatively spared in the

County	Total Deer Sera Analyzed	No. (%) positive
Litchfield	46	5(11)
Fairfield	0	--
Hartford	8	1(13)
New Haven	0	--
Tolland	2	0(0)
Middlesex	2	0(0)
New London	46	9(20)
Windham	40	12(30)
Totals	108	27(25%)

past. The Department of Health Services and the Connecticut Agricultural Experiment Station are planning studies to further define the extent of B. burgdorferi infection among animal hosts.

Ticks and B. burgdorferi Infection

Determining the rate of B. burgdorferi infection among Ixodes dammini, the deer tick, is a measure of the public health importance of Lyme disease in a given area.

In the summer and fall of 1989, scientists from the Connecticut Agricultural Experiment Station conducted tick studies at sites in nine Connecticut towns and cities. In Stamford, the study was done in collaboration with the local health department.

Immature and adult ticks were collected from clothing of the investigators or by flagging and dragging flannel cloth over vegetation along trails and at the borders of homeowners' properties in or near forests.

Ticks were transported alive to the laboratory. Midgut tissues were removed, acetone-fixed to glass microscope slides, and tested by murine monoclonal antibody (H5332) and a fluorescein-labeled conjugate for spirochetes. If spirochetes were observed by fluorescence microscopy, they were identified as B. burgdorferi because the monoclonal antibody is specific for this species.

At the sites in Sharon, Warren, and Killingly, I. dammini were not found by flagging. Tick infection rates by site where ticks were found are given in Table 4. Few ticks were found in Newtown.

In addition to these studies, studies of white-footed mice are being conducted at selected sites to determine the percentage of mice that carry I. dammini and the percentage of mice infected with B. burgdorferi.

LYME DISEASE SURVEILLANCE CASE DEFINITION, CONNECTICUT, 1990

A case of Lyme disease is defined as follows:

1. A person with erythema migrans; or
2. A person with at least one later manifestation and laboratory confirmation of infection.

General definitions:

1. **Erythema migrans (EM):** For purposes of surveillance, EM is a skin lesion that typically begins as a red macule or papule and expands over a period of days or weeks to form a large round lesion, often with a partial central clearing. A solitary lesion must reach at least 5 cm in size. Secondary lesions may also occur. Annular erythematous lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM. In most patients, the expanding EM lesion is accompanied by other acute symptoms, particularly fatigue, fever, headache, mild stiff neck, arthralgias, or myalgias. These symptoms are typically intermittent. The diagnosis of EM must be made by a physician. Laboratory confirmation is recommended for persons with no known exposure.
2. **Late manifestations:** These include any of the following when an alternative explanation is not found.
 - a. **Musculoskeletal system:** Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints sometimes followed by chronic arthritis in one or a few joints. Manifestations not considered as criteria for diagnosis include chronic symmetrical polyarthritis. Additionally, arthralgias, myalgias, or fibromyalgia syndromes alone are not accepted as criteria for musculoskeletal involvement.
 - b. **Nervous system:** Lymphocytic meningitis, cranial neuritis, particularly facial palsy (may be bilateral), radiculoneuropathy or rarely, encephalomyelitis alone or in combination. Encephalomyelitis must be confirmed by showing antibody production against *B. burgdorferi* in the cerebrospinal fluid (CSF), demonstrated by a higher titer of antibody in CSF than in serum. Headache, fatigue, paresthesias, or mild stiff neck alone are not accepted as criteria for neurologic involvement.
 - c. **Cardiovascular system:** Acute onset, high grade (2nd or 3rd degree) atrioventricular conduction defects that resolve in days to weeks and are sometimes associated with myocarditis. Palpitations, bradycardia, bundle branch block, or myocarditis alone are not accepted as criteria for cardiovascular involvement.
3. **Exposure:** Exposure is defined as having been in wooded, brushy, or grassy areas (potential tick habitats) in an endemic county no more than 30 days prior to the onset of EM. A history of tick bite is not required. All Connecticut counties are endemic for Lyme disease.
4. **Laboratory confirmation:** Laboratory confirmation of infection with *B. burgdorferi* is established when a laboratory isolates the spirochete from tissue or body fluid, detects diagnostic levels of IgM or IgG antibodies to the spirochete in serum or CSF, or detects a significant change in antibody levels in paired acute and convalescent serum samples. Syphilis and other known causes of biologic false positive serologic test results, should be excluded as appropriate, when laboratory confirmation has been based on serologic testing alone.

Note: It should be emphasized that this is an epidemiologic case definition intended for surveillance purposes.

STATE OF CONNECTICUT DEPARTMENT OF HEALTH SERVICES
SUPPLEMENTAL LYME DISEASE REPORT FORM - 1990

PATIENT NAME: _____

TOWN AND STATE OF RESIDENCE: _____

AGE: _____ SEX: M F

RACE: White Black Asian/Pacific Islander
 Amer. Indian/Alaskan Native Unknown

ETHNICITY: Hispanic Not Hispanic Unknown

IS PATIENT PREGNANT? Yes No

HOSPITALIZED: Yes No

CLINICAL PRESENTATION

DATE OF ONSET OF EARLIEST SYMPTOMS: ____/____/____
mo day yr

ERYTHEMA MIGRANS (EM) PRESENT?

Yes No Unknown

Check yes only if a solitary lesion is at least 5 cm in size. If yes, diameter = _____ cm

Did skin lesions have central clearing?

Yes No Unknown

ARTHRITIS: Yes No Unknown

Check *only* if objective joint swelling is present.

NEUROLOGIC SIGNS/SYMPTOMS: Yes No Unknown

If yes, please specify: _____

CARDIAC SIGNS/SYMPTOMS: Yes No Unknown

If yes, please specify: _____

LYME SEROLOGY

Serology 1: ____/____/____
mo day yr

Results: IgG Positive yes no
IgM Positive yes no

Serology 2: ____/____/____
mo day yr

Results: IgG Positive yes no
IgM Positive yes no

PHYSICIAN NAME: _____ PHONE #: _____

ADDRESS: _____

Please return form to: State of Connecticut Department of Health Services
Epidemiology Program, 150 Washington Street, Hartford, Connecticut 06106.

Table 4. Percentage of ticks infected with B. burgdorferi by town of site surveyed.

Towns	Sampling Periods	% Ticks Infected (# infected/# tested)			
		Larvae	Nymphs	Adult	
				Males	Females
East Haddam	May-Oct.	0 (0/1)	9 (11/120)	43 (3/7)	67 (2/3)
Old Lyme	May-Dec.	0 (0/15)	13 (18/144)	48 (13/27)	15 (2/13)
Lyme	May-Dec.	0 (0/7)	15 (77/513)	37 (10/27)	41 (11/27)
Newtown	May-Dec.	0 (0/2)	0 (0/6)	0 (0/1)	0 (0/2)
Burlington	Oct.-Dec.	---	---	0 (0/4)	28 (5/18)
Stamford	May-Dec.	0 (0/43)	14 (4/28)	33 (1/3)	58 (7/12)

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