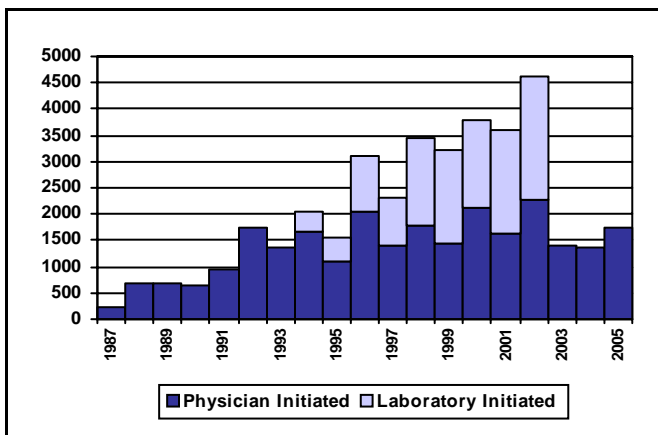


Lyme Disease—Connecticut, 2005

First identified in Connecticut in 1975, Lyme disease (LD) is most frequently reported in northeastern, mid-Atlantic, and north central states (1). The Connecticut Department of Public Health (DPH) has conducted surveillance for LD since 1984, although the disease did not become officially reportable until July 1987 (Figure 1). Currently, LD surveillance consists of passive physician reporting statewide and active reporting by participating physicians in 71 towns.

Figure 1. Lyme disease cases by surveillance method and year, Connecticut, 1987-2005



In 2005, 2556 reports of LD were received by the DPH. Of these, 1810 (71%) met the national LD surveillance case definition (2): 1436 (79%) were reports of erythema migrans (EM) only, 246 (14%) had one or more systemic manifestations, and 128 (7%) were reports of EM and systemic manifestations of LD.

Of the 246 systemic LD cases not associated with EM, arthritic symptoms occurred in 176, neurologic manifestations in 74, and cardiac complications in 6. Cases may have had multiple systemic symptoms.

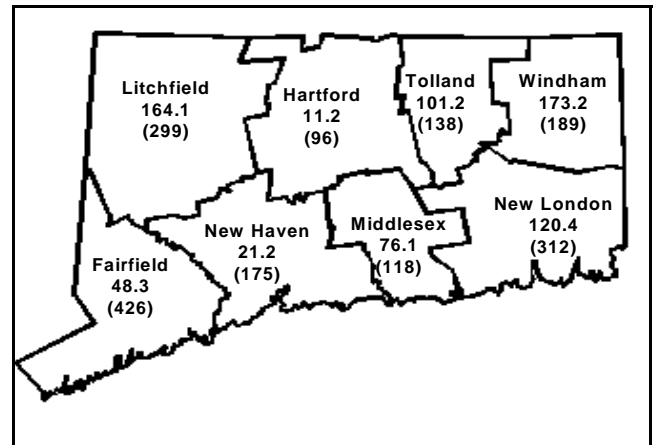
The remaining 746 reports either did not meet the surveillance case definition (89%), or had insufficient clinical information for classification according to national criteria (11%).

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The statewide incidence rate was 53 cases per 100,000 population. Windham County reported the highest rate of LD (173.2 cases per 100,000 population). Hartford County reported the lowest (11.2 cases per 100,000 population) (Figure 2).

Figure 2. Lyme disease cases and rates per 100,000 population by county, Connecticut, 2005



On average, children < 10 years of age had the highest rate of LD (91.3 cases per 100,000 population); the lowest rate occurred in those aged 20-29 years (23.1 cases per 100,000 population); and 56% were male. Of cases with known onset dates, 80% occurred during the summer months of June, July, and August.

Reported by: S Ertel, B Esponda, R Nelson, DVM, MPH, ML Carter, MD, MPH, Epidemiology and Emerging Infections Program, Connecticut Department of Public Health.

Editorial:

In 1984 and 1985, Connecticut was the first state in the nation to conduct statewide laboratory-based surveillance for Lyme disease, using the newly developed blood Lyme disease antibody tests. Over the years, surveillance for LD in

Connecticut has been modified several times to improve completeness of reporting and to collect additional demographic, clinical, and exposure information on patients.

Surveillance systems help public health practitioners monitor the occurrence of disease; however, these systems only provide an estimate of the actual number of cases. Underreporting of disease is a major limitation of passive surveillance systems, including physician-based systems used for LD (3-5). Reporting generally becomes less complete as the disease reported becomes more common, especially if that disease is largely managed in the outpatient setting. For the more common outpatient diseases, only 10 to 25 percent of the actual number of cases occurring in a community may be reported. In 1992, a survey of Connecticut physicians suggested that, at best, only 16 percent of LD cases were reported (4). A study conducted in Wisconsin in 1992-1998 found that the passive surveillance system monitored trends in LD incidence reasonably well despite underreporting of cases (6).

In general, reporting for any disease can be improved with a laboratory-based surveillance component, if a suitable test is available. In 1992-1997, several laboratories voluntarily included a LD report form with each positive LD test result mailed to physicians. In 1998, as part of the department's application for LD research and education funding through the federal Centers for Disease Control and Prevention's (CDC), DPH agreed to add LD to the list of laboratory reportable significant findings, primarily to assess the impact of the use of the newly licensed LD vaccine.

Laboratory reporting of LD placed a significant burden on laboratory, health care provider, and DPH staff resources to report, collect, and manage the substantial number of reports. The DPH staff manually entered all laboratory reports and conducted follow-up. Because clinical information from the physicians is still needed to classify incident cases for surveillance purposes, supplemental reporting forms were then sent to the ordering physicians requesting clinical information.

When laboratories were required to report positive LD findings, the number of reports received by the DPH increased dramatically. From 1998-2002, after LD became a required laboratory reportable finding, the annual average number of reports was 10,432. In 1991, when all reports were received through

passive physician-based surveillance the DPH received 2136 reports. Overall, only 36% of reports received through required laboratory surveillance resulted in identification of cases that met the national surveillance case definition for LD. In contrast, 67% of the reports received through the physician-based surveillance systems resulted in the identification of cases that met the national surveillance case definition.

In 2002, the manufacturer withdrew the LD vaccine from the market. At about the same time, LD intervention projects became the focus of the federal funding through the CDC. In January 2003, LD was removed from the list of laboratory reportable significant findings. In 2003-2005, the number of physician reported LD cases was similar to that in prior years (Figure 1). From 1991 to 2005, the annual average number of cases identified through physician-based surveillance was 1615 (range 1081 in 1995 to 2257 in 2002).

Physicians should report LD cases with clinical information in a timely manner. Connecticut LD incidence rates by town and county can be found on the DPH Web site at: www.dph.state.ct.us/BCH/infectiousdise/tickborne/lyme.htm. For questions concerning LD reporting or to order reportable disease case reporting forms (PD23), contact the Epidemiology and Emerging Infections Program at (860) 509-7994.

The DPH is developing a statewide electronic laboratory reporting system, which will include LD laboratory reports. The system will be piloted with several clinical laboratories later in 2006. Other laboratories will be subsequently phased in to this system.

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Human Granulocytic Anaplasmosis (HGA) - Connecticut, 2005

Human granulocytic anaplasmosis (HGA) is a tick-associated bacterial infection of particular public health importance during the summer months. It is transmitted to humans by *Ixodes scapularis* (deer tick or black-legged tick), the same tick that transmits Lyme disease. The agent of HGA, previously referred to as *Ehrlichia phagocytophila*, was reclassified as *Anaplasma phagocytophilum* in 2003 (1).

In the national surveillance case definition for HGA, a probable case is defined as a clinically compatible illness with either a single positive indirect fluorescent antibody titer (IFA), or the visualization of morulae in leukocytes (2). A confirmed case of HGA is defined as a clinically compatible illness of fever or rash, *plus* one or more of the following: headache, myalgia, anemia, thrombocytopenia, leukopenia, or elevated hepatic transaminases; *plus* 1) a fourfold change in antibody titer to *Anaplasma* species antigen by IFA in paired serum samples, *or* 2) a positive polymerase chain reaction assay (PCR), *or* 3) identification of morulae in leukocytes and a positive IFA, *or* 4) immunostaining of antigen in a biopsy or autopsy sample, *or* 5) isolation and culture of an *Anaplasma* species from a clinical specimen.

In 2005, 30 confirmed cases were reported to the DPH (Figure 1). Onset of illness ranged from January through September; 77% occurred from June through August.

Figure 1. Human granulocytic anaplasmosis confirmed cases statewide, Connecticut, 1995—2005

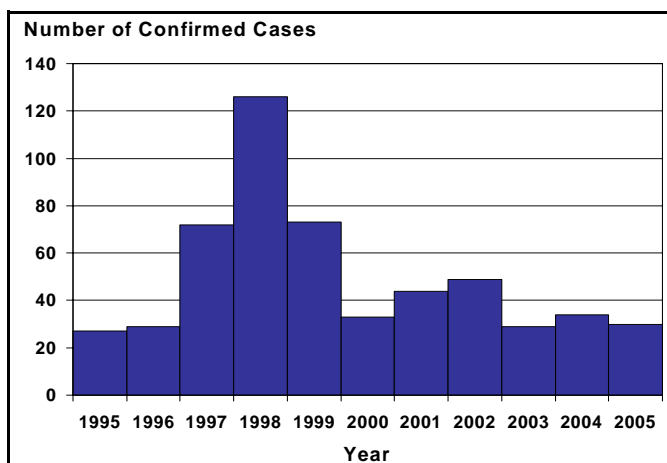
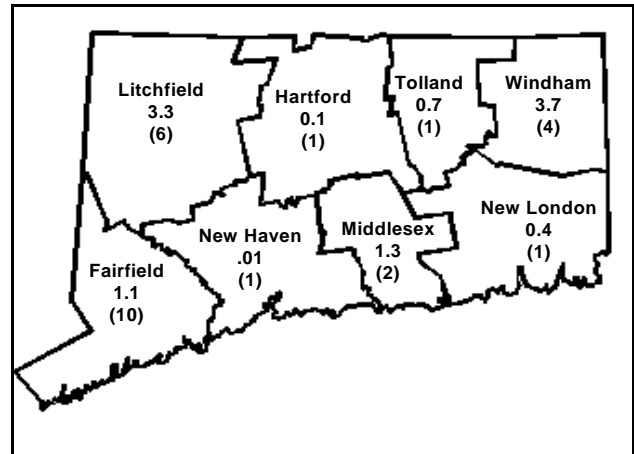


Figure 2. HGA cases and rates per 100,000 population by county, Connecticut, 2005



Age data was available for 21 (70%) confirmed cases, of which 10 were reported in the 50-59 year age group. The age specific rates for confirmed infections increased with age and were highest among those ≥ 50 years of age (4 cases per 100,000 population cumulatively); and 53% were male.

The largest percentage of cases was reported from Fairfield County (33.3%). Windham County had the highest incidence rate with 3.7 cases per 100,000 population. The lowest rates were reported from New Haven and Hartford counties (0.1 cases per 100,000 population respectively).

The symptoms most frequently reported were fever 100% (30), myalgia 90% (27), and headache 83% (25). Rash was reported in 10% of cases. Acute respiratory distress syndrome was reported in one case. No cases were reported as having meningitis, disseminated intravascular coagulopathy, or renal failure. Note that cases could have had more than one symptom.

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Editorial:

While *Anaplasma phagocytophilum* was identified as a veterinary pathogen over 70 years ago, the first human case was identified in 1990. Since anaplasmosis surveillance started in Connecticut in 1995, it has become the second most commonly reported tick-borne disease in Connecticut. From 1995-2005, a total of 546 confirmed cases were reported (range 27-126).

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A special epidemiological study that included active surveillance for cases of ehrlichiosis resulted in the peak of reported cases in 1997-1999 (3).

In the eastern United States, reforestation of farm lands has contributed to abundant habitat for support of the tick vector and principal mammalian reservoir of *A. phagocytophilum*, white-footed mice. Additionally, construction of residential dwellings in wooded areas brings people in frequent contact with ticks in the peridomestic environment. Measures for the prevention of anaplasmosis, as for LD, includes environmental measures to reduce ticks in areas around homes where people recreate and personal protective measures to avoid tick bites where ticks are present.

Anaplasma phagocytophilum is one of only four bacterial pathogens known to multiply in neutrophils. While much is not yet understood about the pathogenesis of manifestations in people and why some patients develop severe illness, they appear associated with immune and inflammatory processes (1).

Testing is readily available through commercial laboratories. Delayed diagnosis has been implicated as a risk factor for patients requiring intensive care. Physicians are urged to continue to include anaplasmosis in the differential diagnosis of acute febrile illnesses, especially during spring and summer months, and to report suspected cases to the DPH. Contact the Epidemiology Program at (860) 509-7994 for reporting forms.

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