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Joxel Garcia, M.D., M.B.A., Commissioner

Ehrlichiosis—Connecticut, 1995—1999

Human monocytic ehrlichiosis (HME) and human granulocytic ehrlichiosis (HGE) are emerging tick-associated infections of public health importance in Connecticut. HME and HGE present as acute, nonspecific, flu-like, febrile illnesses that can range from mild to severe and life threatening (1). The primary vector of *Ehrlichia chaffeensis*, the agent of HME (2), is *Amblyomma americanum* (the lone-star tick). The agent of HGE is closely related or identical to *E. equi* or *E. phagocytophila*, and is transmitted by *Ixodes scapularis* (3). This tick is also the vector of the pathogens that cause Lyme disease and babesiosis (4).

In Connecticut, HME and HGE have been physician and laboratory reportable diseases since 1995. To enhance surveillance, the Department of Public Health (DPH) and the Connecticut Emerging Infections Program provide free serologic testing for HGE on all ehrlichiosis specimens submitted to the DPH Laboratory. Serologic testing for HME remains available upon request. In 1997, active surveillance for HGE was initiated in the 12-town area around Lyme, Connecticut (5). Polymerase chain reaction (PCR) assays are performed on the subset of specimens submitted through the active surveillance program.

A confirmed case of ehrlichiosis is defined as an individual with a 4-fold change in antibody titer by IFA assay between the acute and convalescent specimens, or a seroconversion (negative to an antibody titer $\geq 1:80$), or visualization of morulae, or a positive PCR assay in the acute blood specimen. A probable case is defined as an individual with a single acute IFA titer of $\geq 1:80$, or static elevated titers (less than a 4-fold change) between acute and convalescent specimens.

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Between July 1995 and December 1999, 333 confirmed cases of ehrlichiosis were reported to the DPH: 327 cases of HGE and 6 cases of HME. The average annual incidence was 2.0 cases per 100,000 population and ranged from 0.9 cases per 100,000 population in 1995 to 2.2 cases per 100,000 population in 1998 (Table 1). A total of 447 probable cases were also identified.

Confirmed cases reported onset of illness during all months with 81% occurring between May - September. Cases were equally distributed between males and females.

Age specific incidence increased with age and was highest among those 70-79 years of age and lowest among those 0-9 years of age (Figure 1). The highest average annual incidence was detected in Middlesex County (9.9 cases per 100,000 population) followed by Windham (5.9 cases per 100,000 population) and New London (4.7 cases per 100,000 population) counties (Figure 2).

Editorial Note

Ehrlichiosis is an important cause of morbidity and is now the second most common tick-borne infection in Connecticut. The statewide annual incidence of confirmed cases increased 142% from 1995 to 1999. An additional 447 probable cases were also reported. While these cases may be interpreted as prevalent cases, a proportion may be true incident cases for which convalescent specimens were not obtained to confirm the diagnosis. (A four-fold rise in antibody

titer or seroconversion between acute and convalescent specimens is required as part of the confirmed case definition.) Thus, these data may underestimate the true incidence of ehrlichiosis in Connecticut. Increased utilization of molecular diagnostic methods, such as PCR, would allow for a confirmed diagnosis of ehrlichiosis with a single blood specimen.

Among confirmed cases, rates were lowest in those ≤ 9 years of age. By contrast, Lyme disease rates are highest in this age group. Erythema migrans (EM), which is present in 70 – 80% of patients with Lyme disease may preclude the need to obtain a blood specimen for diagnosis. Flu-like symptoms characterize an *Ehrlichia* infection and less than 50% of patients present with a rash. Reluctance among pediatricians to draw blood from pediatric patients with an acute febrile illness and lack of a specific clinical diagnostic marker such as EM may contribute to an underdiagnosis of ehrlichiosis in children.

In Connecticut, the geographic distribution of ehrlichiosis is similar to that of Lyme disease. The counties with the highest rates of ehrlichiosis also have the highest rates of Lyme disease (Middlesex, Windham, and New London counties).

Inclusion of ehrlichiosis in the differential diagnosis of acute febrile illnesses by physicians, increased use of PCR, and continued surveillance are needed to more accurately assess the true impact of ehrlichiosis in Connecticut.

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Table 1. Confirmed Ehrlichiosis Cases, Connecticut, 1995-1999.

Year				Incidence/ 100,000 pop.
	HME	HGE	Total	
1995	3	27 (6)	30	0.9
1996	3	29 (1)	32	1.0
1997	0	72 (1)	72	2.2
1998	0	126	126	3.8
1999	0	73	73	2.2
Total	6	327 (8)	333	2.0

(#) indicates cases that also had titers to HME.

Figure 1. Number and Annual Average Incidence of Confirmed Human Granulocytic Ehrlichiosis Cases by Age Group, Connecticut, 1995–1999.

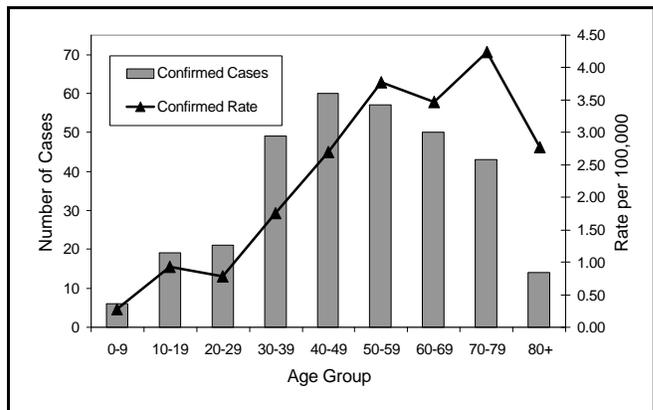
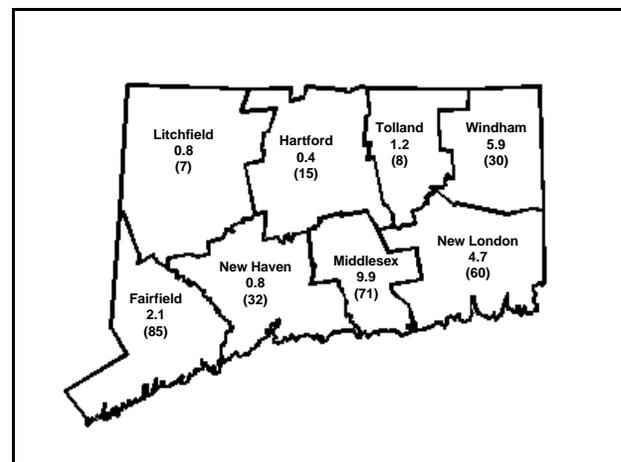


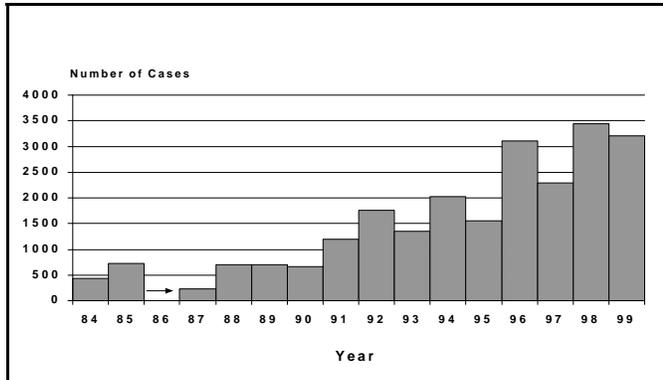
Figure 2. Average Annual Incidence and (Cases) of Confirmed Ehrlichiosis by County, Connecticut 1995-1999.



Lyme Disease—1999

Lyme disease (LD) is the most commonly reported tick-borne disease in the United 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).

Figure 1: Lyme disease cases, Connecticut, 1984-1999.



The DPH added LD to the list of laboratory reportable diseases in 1998. Follow-up consists of mailing supplemental LD report forms to the attending physician listed on the laboratory report form (OL15C) with a cover letter requesting additional clinical information. Only reports that meet the national LD surveillance case definition are counted as cases (2).

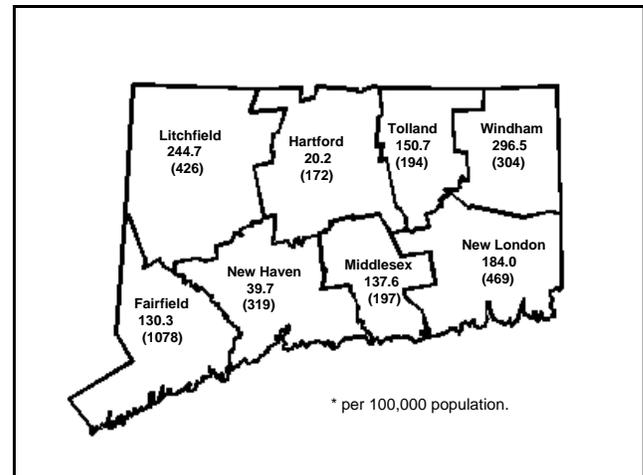
Of 9,209 LD reports received by the DPH in 1999, 3,213 (35%) met the surveillance case definition. Of these, 1,972 (62%) were reports of erythema migrans (EM) only, 137 (4%) were reports of EM and a systemic manifestation of LD, and 1,104 (34%) had one or more systemic manifestations and a positive serologic test for antibody to *Borrelia burgdorferi*.

Of the 1,104 systemic LD cases, arthritic symptoms occurred in 886, neurologic manifestations occurred in 381, and cardiac complications occurred in 14. Cases may have had more than one of these LD symptoms.

The remaining 5,996 reports either did not meet the surveillance case definition (52%) or had no clinical information (48%).

In 1999, Connecticut had the highest reported rate of LD of any state (97.8 cases per 100,000 population). Windham County reported the highest rate of LD with 296.5 cases per 100,000 population (Figure 2). In contrast, Hartford County reported 20.2 cases per 100,000 population, the lowest county rate in the state.

Figure 2. Lyme Disease Rates* (Cases) by County, Connecticut, 1999.



Of cases with known onset dates, 69% occurred during the months of June, July, and August. Children aged 5 through 9 years had the highest incidence (194 cases per 100,000 population). The lowest rate occurred in those aged 20 through 24 years (32 cases per 100,000 population).

Editorial Note

In 1992, the DPH received a cooperative agreement from the Centers for Disease Control and Prevention to enhance LD surveillance. The cooperative agreement has provided funding for a dedicated LD surveillance coordinator for the past 8 years.

During this time, active surveillance for LD has been implemented in the 12-town area around Lyme, the counties of Litchfield, Windham, and Tolland, and the towns of Weston and Westport. Since 1998, when LD became a laboratory reportable finding, there has been a dramatic increase in the number of LD reports.

From 1992-1997 the average annual number of LD reports received by the DPH was 3,551.

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Ehrlichiosis, Lyme Disease

From 1998-1999, the average annual number of LD reports was 8,232 and represents a 132% increase.

Of 9,209 reports received in 1999, 7,125 (77%), originated from a laboratory. Of these, 5,247 (74%) had an attending physician name. A maximum of four requests for clinical information were mailed to each physician. Of the 5,247 requests, 3,820 (73%) physicians completed and returned the supplemental report form

The timely reporting of LD cases and the provision of needed clinical information are critical to the success of our ongoing efforts to assess the impact of this emerging vector-borne disease. If reporting forms are needed, please contact the Epidemiology office at (860) 509-7994 and request form PD23.

If you have questions concerning the incidence of LD in your area of Connecticut, or reporting of LD cases, please contact Starr-Hope Ertel at (860) 509-7994. Connecticut LD incidence rates

by town and county can be found on the DPH Web site at www.state.ct.us/dph.

References

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**For Public Health Emergencies
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on weekends
call the
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(860) 509-8000**

<p>Division of Infectious Diseases</p> <p>James L. Hadler, MD, MPH State Epidemiologist</p>	<table border="0"> <tr> <td>AIDS Epidemiology</td> <td>(860) 509-7900</td> </tr> <tr> <td>Epidemiology</td> <td>(860) 509-7994</td> </tr> <tr> <td>Immunizations</td> <td>(860) 509-7929</td> </tr> <tr> <td>Pulmonary Diseases</td> <td>(860) 509-7722</td> </tr> <tr> <td>Sexually Transmitted Diseases (STD)</td> <td>(860) 509-7920</td> </tr> </table>	AIDS Epidemiology	(860) 509-7900	Epidemiology	(860) 509-7994	Immunizations	(860) 509-7929	Pulmonary Diseases	(860) 509-7722	Sexually Transmitted Diseases (STD)	(860) 509-7920	<p>Connecticut Epidemiologist</p> <p>Editor: Matthew L. Cartter, MD, MPH</p> <p>Assistant Editor: Starr-Hope Ertel</p>
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