CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
Keeping Connecticut Healthy

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Lyme Disease—Connecticut, 2007

First identified in Connecticut in 1975, Lyme disease is the most commonly reported tick-borne disease in the United States (1). The Connecticut Department of Public Health (DPH) maintains one of the most comprehensive Lyme disease surveillance systems in the United States. Analysis of data received through surveillance systems has allowed the DPH to determine Lyme disease trends over time (Figure 1), the progression of the disease through Connecticut, and identify high-incidence areas (Figure 2).

Over the past 20 years, surveillance methods have been modified several times in response to changing surveillance goals and resources. In addition to physician-based reporting, Connecticut conducted laboratory-based surveillance for Lyme disease during 1984-1985 and 1998-2002. In 2007, Lyme disease was again added to the list of laboratory reportable findings for those laboratories that had the capability of reporting electronically.

In this issue...

Figure 1. Lyme disease cases by source of report and year, Connecticut, 1987-2007

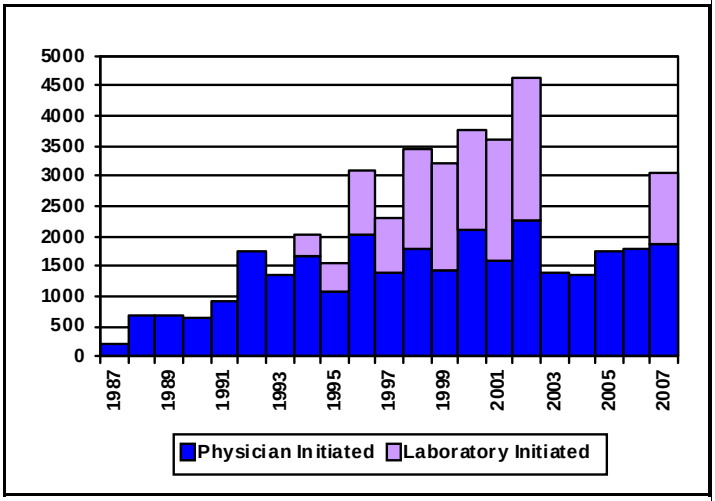
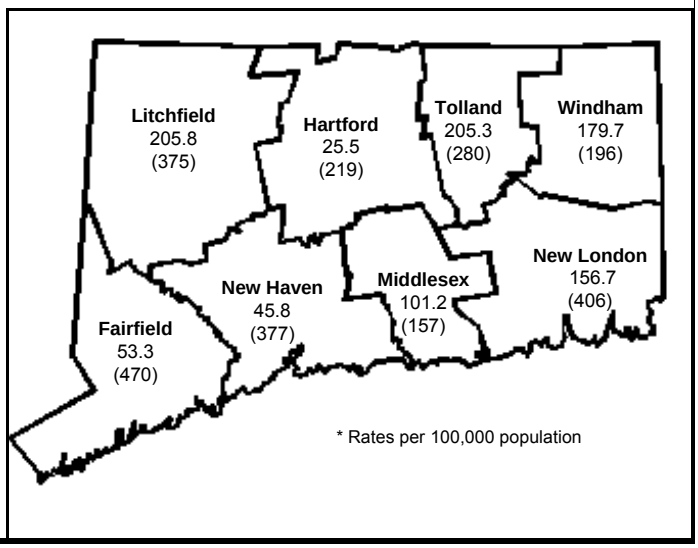


Figure 2. Lyme disease rates* and (cases) by county – Connecticut 2007



In 2007, DPH received reports of positive laboratory tests in an electronic format from a large clinical laboratory in Connecticut. Positive Lyme disease reports received by the DPH consist primarily of serologic tests indicating an antibody response to *Borrelia burgdorferi*. These reports do not contain clinical information necessary to determine disease status of patients. To obtain clinical information, supplemental reporting forms are sent to the ordering physicians. Returned supplemental forms are manually entered into the electronic database and the status of each patient is updated.

During 2007, the DPH received 19,699 reports of potential Lyme disease cases. They included 2879 (15%) reports received from physicians and 16, 799 (85%) from the reporting laboratory. After removing duplicate laboratory reports and applying national surveillance criteria for laboratory confirmation (http://www.cdc.gov/ncphi/disss/nndss/casedef/lyme_disease_2008.htm), 5724 supplemental forms were sent to physicians for clinical information.

A total of 8594 reports were initiated by physicians or selected for follow-up from those received from the laboratory. Of these, 3058 (36%) met the national surveillance case definition (2): 1850 (61%) were reports of erythema migrans only, 1021 (33%) had one or more systemic manifestations, and 187 (6%) were reports of erythema migrans and systemic manifestations of Lyme disease.

Of the 1021 systemic LD cases not associated with EM, arthritic symptoms occurred in 764 (75%), neurologic manifestations (Bell's palsy, encephalitis, radiculoneuropathy, lymphocytic meningitis) in 289 (28%), and cardiac complications in 13 (1%). Cases may have had multiple systemic symptoms.

The remaining 5536 reports either did not meet the surveillance case definition (45%), or had insufficient clinical information for classification according to national criteria (55%).

The statewide Lyme disease incidence rate was 90 cases per 100,000 population. Litchfield County reported the highest county rate (206 cases per 100,000 population) followed by Tolland (205 cases per 100,000 population) and Windham (180 cases per 100,000 population) counties. Hartford County reported the lowest (26 cases per 100,000 population).

Persons aged 60-69 years (133 per 100,000 population) and children less than 10 years (126 per 100,000 population) had the highest rates of Lyme disease; the lowest rate occurred in those aged 30-39 years (43 cases per 100,000 population); and 56% were male. Of cases with known onset dates, 70% occurred during the summer months of June, July, and August.

Reported by: S Ertel, P Gacek, R Nelson, DVM, MPH, ML Cartter, MD, MPH, Epidemiology and Emerging Infections Program, Connecticut Department of Public Health.

Editorial:

The addition of laboratory surveillance results in an increased number of reports and cases received by the DPH compared to years when reports are received only from physicians. The number of reports and confirmed Lyme disease cases reported in 2007 increased by 652% and 71% respectively compared to 2006.

Method of surveillance can also affect case demographics. When compared to surveillance based on physician reports, patients with Lyme disease identified through laboratory surveillance more frequently are older, have systemic manifestations, and have onset of illness during the autumn and winter months.

While adding to the completeness of surveillance, reporting by laboratories is less efficient than reporting by physicians for monitoring trends in the occurrence of Lyme disease. Overall in 2007, only 7% (1190/16,799) of reports received through laboratory surveillance resulted in identification of a case that met the national surveillance case definition for Lyme disease. In contrast, 65% (1868/2879) of the reports received through the physician-based surveillance systems (passive and active) satisfied those criteria and resulted in the identification of cases that could be included in national statistics.

For 2008, surveillance will continue to include evaluation of positive laboratory reports from the two major commercial laboratories performing these tests in Connecticut. Additional laboratories will be added when development of the statewide electronic reporting system under development is completed.

Physicians should report patients with Lyme disease by completing the Reportable Disease Confidential Case Report Form (PD-23) or, if received, the Supplemental Lyme Disease Laboratory Case Report form in a timely manner. If there are questions concerning Lyme disease reporting, or to order Reportable Disease Confidential Case Report Form (PD-23), contact the Epidemiology and Emerging Infections Program at (860) 509-7994.

Connecticut Lyme disease incidence rates by town and county can be found by going to the DPH Web site at: http://www.ct.gov/dph, then selecting "Statistics & Research" from the left navigational bar, then "Disease & Injury Surveillance" and "Lyme disease."

References:

1. CDC. Lyme disease – United States, 2001-2002. MMWR 2004;53:365-369.
2. CDC. Case definition for infectious conditions under public health surveillance. *MMWR* 1997;46(No.RR-10):20-1.

Outbreak of Norovirus Gastroenteritis Associated with a Restaurant, Connecticut, 2008

In April 2008, the Connecticut Department of Public Health (DPH) was notified of a possible outbreak of gastrointestinal (GI) illness among persons who attended a banquet held at a restaurant (Restaurant A) 3 days earlier. In addition, several attendees of a private party held at Restaurant A on the same day also developed GI symptoms. Because of the possibility of a foodborne outbreak, staff from the DPH and two local health departments (LHDs) conducted an epidemiological and environmental investigation.

Epidemiological Investigation. Questionnaires were sent to a total of 141 banquet attendees, of which 104 (74%) responded. Telephone interviews were conducted among 21 (91%) of 23 private party attendees. Questions included information about demographics, illness history, and food consumption. A case was defined as an attendee who experienced vomiting and/or diarrhea (≥ 2 loose stools in a 24 hour period) within 3 days following the event.

Banquet. Of the 104 attendees who completed a questionnaire, 56 (54%) had illnesses consistent with the case definition (Figure 1): 46 (82%) had vomiting and 49 (88%) had diarrhea. The median age was 20 years (range 18-24 years); 32 (57%) cases were female. The median incubation period was 35 hours (range 1-84 hours); the median duration of illness was 2 days (range 1-5 days). Of those ill, 23 (41%) sought medical care.

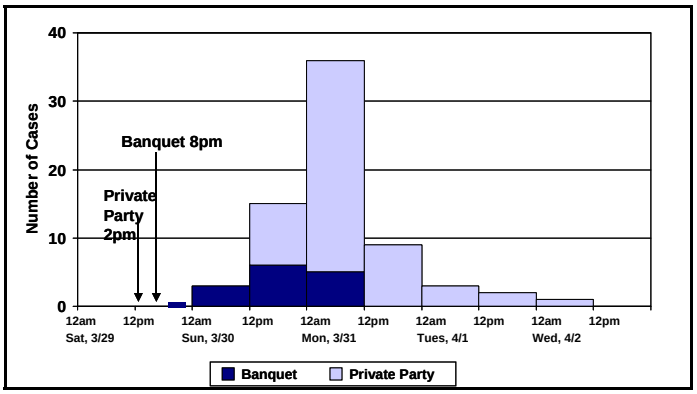
Although ill banquet attendees were more likely than non-ill attendees to have consumed chicken (Odds ratio [OR]=3.07, 95% confidence interval [CI] 1.32-7.15, p-value [*p*] = 0.008), only 29 (53%) of 55 cases consumed chicken, whereas 54 (96%) of 56 cases consumed salad. Initial analysis did not show a significant association of salad with illness (OR=4.85, 95% CI 0.95-24.6, *p*=0.07). However, after stratification, consumption of salad independent of chicken was associated with illness.

Private Party. Of the 21 attendees interviewed, 14 (67%) had illnesses consistent with the case definition (Figure 1): 13 (93%) had vomiting and 14 (100%) had diarrhea. The median age was 42 years (range 17-85 years); 14 (100%) cases were female. The median incubation period was 30 hours (range 12-44 hours); the median duration of illness was 2 days (range 1-3 days). Of those ill, 1 (7%) sought medical care.

Among private party attendees, consumption of salad was found to be the only significant risk factor for illness (Risk ratio [RR] = 2.44, 95% CI 0.98-6.08, *p*=0.02).

Environmental Investigation. Restaurant A had a separate banquet hall and kitchen in addition to its general dining facility and main kitchen. All attendees of the banquet event were seated in the banquet hall; attendees of the private party were seated in the general dining area along with regular restaurant patrons. Common foods served at both events included salad, pasta, and rolls; the salad was prepared by the same food worker. All food items were prepared and cooked in the main kitchen. Plating of dishes for the banquet occurred in both kitchens. The salad contained a variety of vegetables and lettuce, all rinsed with running water by bare hands in a multi-purpose sink, then placed in a bus pan. The chicken was a pre-made frozen commercial product cooked to 165°F prior to serving.

Figure 1. Number of cases from Banquet and Private Party held at Restaurant A, March 30-April 2, 2008



Of the 27 food workers present at Restaurant A on the day of both events, 13 served only the banquet, 4 served only the private party, and 1 prepared the salad for both parties and other restaurant patrons. Interviews with all staff at Restaurant A revealed only the salad preparer had GI illness that started the day before the banquet and private party.

Laboratory Investigation. Stool specimens were collected from 6 banquet attendees, 4 private party attendees, and all 27 food workers. Specimens from all attendees and the salad preparer tested positive for Norovirus genotype II. All specimens tested were negative for *Campylobacter, Escherichia coli* 0157:H7*, Salmonella,* and *Shigella*.

Reported by: A Guh, MD, MPH, J Krasnitski, MPH, D Mlynarski, MPH, Q Phan, MPH, Epidemiology and Emerging Infections Program; L Bushnell, RS, Food Protection Program; C Welles, State Laboratory, Connecticut Department of Public Health, Local Health Department staff.

Editorial Note:

Noroviruses, previously known as "Norwalk-like viruses," are a group of related viruses belonging to the family *Caliciviridae* that can cause acute gastroenteritis in humans (1). Transmitted primarily through the fecal-oral route, noroviruses can also spread through contaminated environmental surfaces, fomites, and airborne droplets from vomitus (2). Although person-to-person spread and

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waterborne outbreaks have been described (3), norovirus outbreaks are predominantly foodborne from contamination by infectious food workers. Among 816 worker-associated foodborne outbreaks reported in North America and Europe since the 1920s, 338 (41%) were caused by norovirus or probable norovirus (4). Among 232 outbreaks of norovirus illness in the United States reported to the Centers for Disease Control and Prevention from July 1997 to June 2000, 57% were foodborne (1).

Noroviruses are highly contagious and as few as 10 viral particles may be sufficient to infect an individual (1). The incubation period is usually between 24 and 48 hours, but symptoms can occur within 12 hours of exposure (1). Illness usually lasts 1-3 days and is characterized by acute-onset of nausea, vomiting, and watery non-bloody diarrhea with abdominal cramps. Recovery is usually complete without any serious sequelae.

In this outbreak, it is likely that the salad was contaminated by the ill food worker during preparation. Although the high percentage of all banquet attendees (89%) who consumed the salad may have limited the statistical power to detect a significant association with illness, the results of stratified analysis and of the private party cohort all implicate the salad as the contaminated food item. The salad was a shared food item between both events and was prepared by the only food worker with a positive stool test for norovirus. In addition, of the 19 calls received at the local health department from ill restaurant patrons, salad was the only common food item consumed by all.

Correct handling of cold foods, strict hand washing after using the bathroom, and paid sick leave may substantially reduce foodborne transmission of noroviruses (1). Ill food workers should be excluded from work for at least 72 hours after resolution of GI symptoms. To ensure thorough and adequate disinfection, closure of a food establishment may sometimes be necessary. Exposed food or contaminated fomites should be discarded, and surface areas and bathrooms should be properly disinfected with a bleach solution (2).

References:

1. CDC. Norovirus: Technical fact sheet. http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus-factsheet.htm Accessed April 24, 2008.
2. CDC. Norovirus outbreak associated with ill food-service workers --- Michigan, January--February 2006. *MMWR* 2007;Vol. 56(46):1212-6.
3. Hewitt J, Bell D, Simmons GC, Rivera-Aban M, et al. Gastroenteritis outbreak caused by waterborne norovirus at a New Zealand ski resort. *Appl Environ Microbiol* 2007;73 (24):7853-7.
4. Greig JD, Todd EC, Bartleson CA, Michaels BS. Outbreaks where food workers have been implicated in the spread of foodborne disease. Part 1. Description of the problem, methods, and agents involved. *J Food Prot* 2007;70 (7):1752-61.