



NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
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Commissioner

2015 Alert #30:

Legionnaires' Disease Outbreak in South Bronx Contained; Source Identified

- **No outbreak-associated cases of Legionnaires' disease (LD) have been reported in the South Bronx since the last reported patient became ill on August 3, 2015.**
- **Epidemiologic, environmental, and laboratory investigations identified a cooling tower as the source of the outbreak, and that tower has been disinfected.**
- **Providers should always consider LD when evaluating adults for pneumonia and, if appropriate, order urine antigen testing and respiratory tract specimen culture for *Legionella*.**
- **Report cases promptly to the NYC Health Department and submit all *Legionella* isolates to the Health Department's Public Health Laboratory for serogrouping and molecular typing.**

Please Distribute to All Clinical Staff in Internal Medicine, Pediatrics, Geriatrics, Primary Care, Infectious Diseases, Intensive Care, Emergency Medicine, Family Medicine, Laboratory Medicine, and Infection Control

August 20, 2015

Dear Colleagues,

Epidemiologic, environmental, and laboratory investigations of the Legionnaires' disease (LD) outbreak in the South Bronx have identified the cooling tower on the Opera House Hotel in Mott Haven as the source of this outbreak.

Evidence supporting this conclusion includes:

- **Epidemiologic:** Interviews of patients or their family members did not identify a common exposure among most cases other than living or spending time in the affected area of the South Bronx, and the geographic distribution of cases was consistent with community-wide exposure to a contaminated aerosol in the outdoor environment. Using a prospective space-time permutation scan statistical test, we analyzed clustering of LD cases around known cooling towers in New York City. We compared data from the outbreak period with the expected number of cases around each cooling tower based on citywide data during the outbreak, as well as historical data. The degree of clustering of cases within a kilometer radius around the Opera House Hotel during July 9 to August 3 was extremely unlikely to occur by chance alone ($p < 0.0001$).
- **Laboratory:** *Legionella pneumophila* serogroup 1 (Lp1) isolates from 17 case-patients who live in the affected area and 4 from case-patients who worked in or visited this area were compared to environmental Lp1 isolates cultured from cooling towers in the South Bronx using three different sub-typing methods: pulsed-field gel electrophoresis (PFGE), sequence-based typing (SBT), and whole genome sequencing (WGS). Tests were performed at three different laboratories: NYC's Public Health Laboratory, New York State's Wadsworth Center, and the Centers for Disease Control and Prevention. The Lp1 isolates from outbreak-associated cases were indistinguishable

from the Lp1 isolates cultured from the Opera House Hotel cooling tower when they were compared using the three methods. In contrast, Lp1 isolates cultured from all other cooling towers in the affected area of the South Bronx did not match the case-patients' isolates.

- Environmental: The Health Department inspection of the Opera House Hotel cooling tower revealed inadequate levels of biocide.

The Opera House Hotel initiated disinfection on July 31st and completed disinfection on August 1st. The Health Department continues to work with the hotel on maintenance, cleaning, and disinfection to prevent a recurrence of this outbreak.

Outbreak-Associated Cases

There have been no further outbreak-associated LD cases with illness onset after August 3, 2015 (see **Figure**). As of August 20th, the Health Department has identified 128 cases and 12 deaths associated with this outbreak: 104 were in persons who reside in the affected neighborhoods of High Bridge, Morrisania, Hunts Point, and Mott Haven, and the remaining 24 were in persons who reported visiting or working in this area of the South Bronx. The median age was 55 years (range 29 - 90 years), and 60% of case-patients were male. Common co-morbid health conditions include chronic obstructive lung disease, other lung diseases, diabetes, and chronic use of alcohol, cigarettes, and/or illicit substances. At least 21 (16%) case-patients are HIV-infected.

Most outbreak-associated cases were diagnosed by urine antigen testing only. Therefore, it is not possible to confirm that every single case in this outbreak is linked to the Opera House Hotel cooling tower. A positive respiratory tract specimen culture is needed to compare the *Legionella* strain found in a patient to the strain found in the Opera House Hotel cooling tower. Based on historical LD surveillance data in New York City, we expect to see slightly more than one case per day citywide at this time of year; therefore, some cases in the South Bronx may represent background disease due to other causes. It is also possible that there were additional outbreak-associated cases exposed in nearby neighborhoods that have not been counted in this outbreak, because it is not possible to know how far contaminated aerosols drifted.

This outbreak is the largest community-based outbreak of LD in New York City history. In the United States, the only other community-based outbreak that has been larger was the 1976 Philadelphia outbreak in which *Legionella* was first identified as a cause of human illness.

Guidance for Clinicians on Diagnosis and Management of LD

This outbreak has highlighted the critical importance of diagnosing and treating LD in adults being evaluated for community-acquired pneumonia. Patients at highest risk for infection and severe disease include the elderly, past or current smokers, and people with immune-compromising conditions, chronic lung disease, or diabetes. In persons with suspected pneumonia, *Legionella* infection is best diagnosed by urine antigen test or by culture of a respiratory tract specimen (sputum, tracheal aspirate, or bronchoalveolar lavage). Respiratory tract specimens should ideally be obtained before initiation of antibiotics, although antibiotics should not be delayed to obtain a specimen. Routine bacteriologic culture of respiratory tract specimens will not detect *Legionella*. **When ordering cultures, physicians must specify that the culture is for *Legionella*, because the laboratory must use special culture media and methods.** Culture has the added benefit of providing bacterial isolates for molecular typing. With molecular typing of isolates, a patient's isolate(s) can be compared to isolates from environmental sources and other patients to identify a potential source of infection, as in this outbreak. We do not recommend serological testing to diagnose LD or to test patients who do not have LD symptoms.

Empiric treatment of community-acquired pneumonia should include adequate coverage for *Legionella*. Regimens currently recommended by the Infectious Diseases Society of America and the American Thoracic Society (levofloxacin OR ceftriaxone plus azithromycin) provide this coverage. Full details on treatment regimens are available on the Infectious Diseases Society of America website at http://cid.oxfordjournals.org/content/44/Supplement_2/S27.full.pdf+html.

To help the Health Department investigate future potential clusters of Legionnaires' disease in New York City, healthcare providers should continue to:

- Maintain a high index of suspicion for Legionnaires' disease among all patients presenting with community-acquired pneumonia
- Specifically request both respiratory tract specimen culture and urine antigen testing for *Legionella* when indicated.
- Report all cases of Legionnaires' disease to the Health Department by calling the Provider Access Line at 1-866-692-3641.
- Send all cultured isolates of *Legionella* to the Health Department's Public Health Laboratory for serogrouping and molecular typing. Send isolate and laboratory test request form to:
Public Health Laboratory
455 First Ave, Room 136
New York, NY 10016

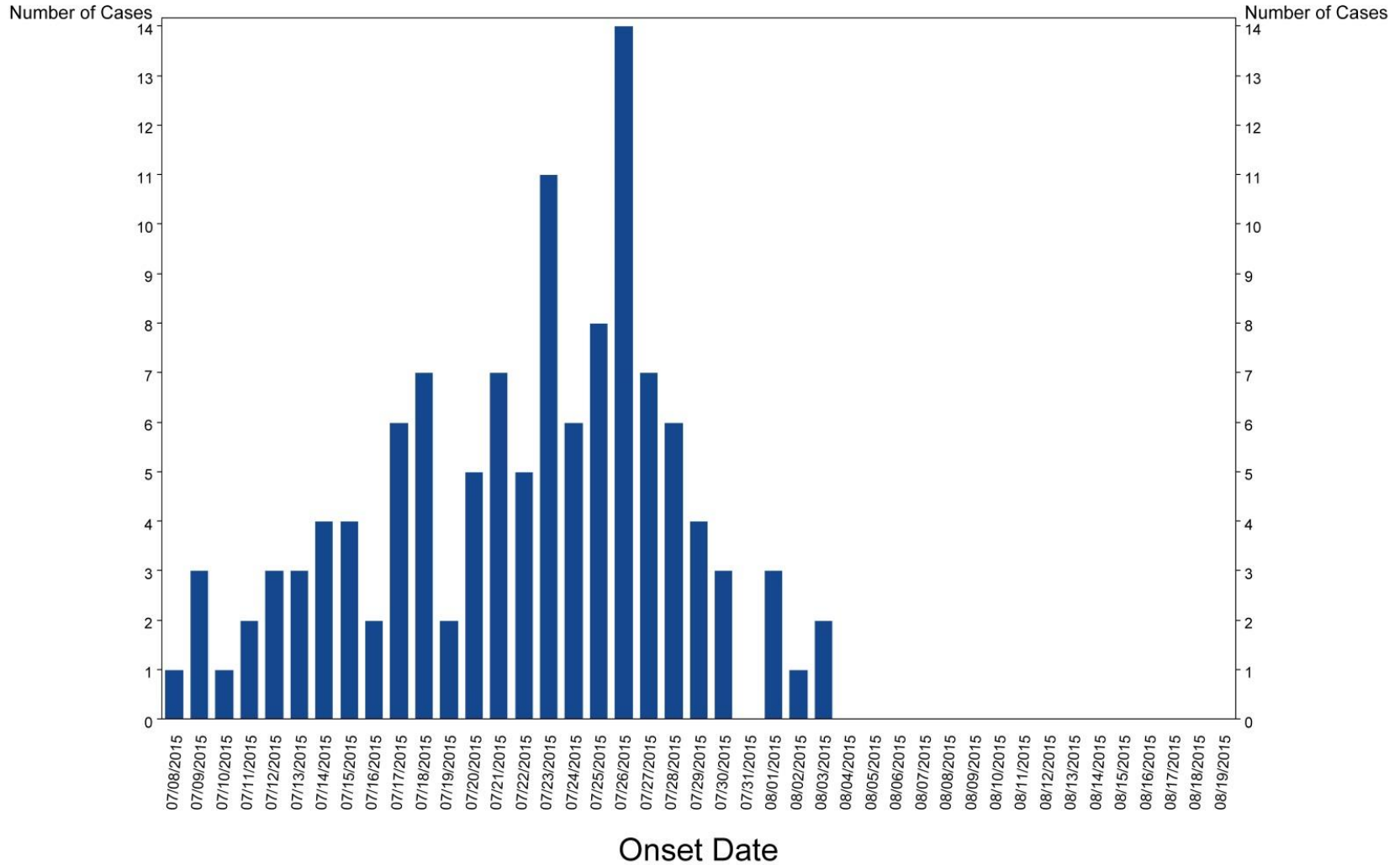
Additional information on Legionnaires' disease for clinicians can be found at <http://www.cdc.gov/legionella/index.htm>. As always, we appreciate our ongoing collaboration with healthcare providers in New York City to help us address emerging infectious disease concerns.

FIGURE

Legionnaires' Disease Outbreak in the South Bronx

07/08/2015 - 08/19/2015, by day

Last updated 08/20/2015



Date of symptom onset obtained from patient interviews. Reporting lags may exist due to patient availability.
Case was not shown if patient was unable to be interviewed or refused.