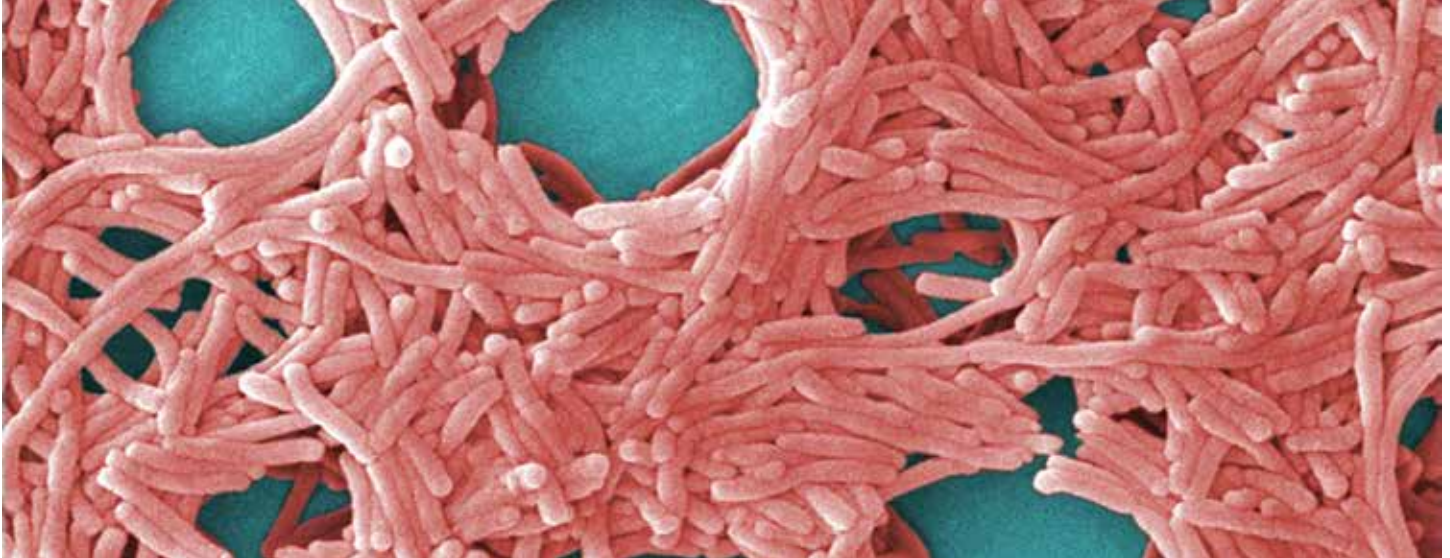




# ADVANCED MOLECULAR DETECTION

## Critical to Halting Legionella Outbreak in New York City



**In the summer of 2015, over 100 cases of Legionnaires' disease (or Legionellosis) were identified in New York City (NYC) — the largest outbreak ever recorded.**

This outbreak led to more than half of the cases hospitalized and 12 people dead. Legionnaires' disease is caused by exposure to the bacteria *Legionella*. This bacteria can be found in a number of warm water sources such as showers, cooling towers, fountains and hot tubs. *Legionella* is spread through water vapor in the air that either go on to infect other water supplies or infects people when these droplets are inhaled. The disease is not passed from person to person, but rather contracted through exposure to contaminated water supplies.

In most cases, exposure to this bacteria is of no consequence, however, exposure to certain strains of this bacteria can have severe consequences. People with compromised immune systems, smokers and those with chronic lung disease are at an especially high risk for developing Legionnaires' disease upon exposure to *Legionella*. It presents as a very severe form of pneumonia, and those with previous pulmonary issues are at a higher risk for contracting the disease and having more complications.

During the NYC outbreak this past summer, epidemiologists contacted infected individuals to try to track down the source of *Legionella* associated with this outbreak by identifying common water sources of infected individuals. Several common sources were identified and screened

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(i.e., tested for the presence of *Legionella* bacteria). *Legionella* was detected in a number of different water sources in the area but a definitive link to the water source causing illness could not be made. Decontamination and detection is time consuming and costly, highlighting the need to determine the exact source of the outbreak.

Advanced Molecular Detection (AMD) tools were put to the test in New York this summer in the outbreak of Legionnaires'. AMD technologies allows scientists to sequencing the genomes of pathogens quickly allowing them to detect small genetic variations of strains of bacteria and quickly determine the source of the outbreak. In the case of the Legionnaires' outbreak in New York, this technology allowed public health laboratorians and epidemiologists to determine the exact water source containing the *Legionella* bacteria that was causing the outbreak. DNA sequences from bacteria infecting individuals were matched to bacteria found in the water at the Opera House Hotel. This allowed officials to concentrate decontamination efforts on the cooling towers at this affected establishment and nearby establishments to which the bacteria may have spread. Without AMD technology, there would have been resources wasted on screening and decontaminating water sources that were not the source of the Legionnaires' disease outbreak leading to additional illnesses. This information allowed officials to contain the outbreak and prevent it from becoming an even larger public health crisis.

*AMD combines the latest pathogen identification technologies with enhanced capabilities in bioinformatics and advanced epidemiology to improve understanding and prevention. AMD has proven a versatile tool for identifying sources of foodborne illnesses and controlling outbreaks of infectious disease, among other interventions.*