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Preventing Legionnaires' Disease: Environmental Health Expertise Is Key

Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, EHSB and guest authors share insights and information about environmental health programs, trends, issues, and resources. The conclusions in this article are those of the author(s) and do not necessarily represent the views of CDC.

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About 5,000 cases of Legionnaires' disease and at least 20 outbreaks are now reported to the Centers for Disease Control and Prevention (CDC) each year (Adams et al., 2015). People can get Legionnaires' disease or Pontiac fever (collectively known as legionellosis) by inhaling aerosolized water droplets containing *Legionella* bacteria (Fields, Benson, & Besser, 2002). Legionnaires' disease, the more serious type of legionellosis, can cause severe pneumonia (lung infection) and is deadly for about 1 in 10 people who get it (Dooling et al., 2015). Pontiac fever causes a milder, influenza-like illness. Legionnaires' disease was named after an outbreak of pneumonia in 1976 among people attending an American Legion convention in Philadelphia.

Legionella is rarely, if ever, transmitted from person-to-person (Correia et al., 2016);

it is found naturally in the environment, usually in warm water. Exposure to freshwater generally does not lead to disease. In human-made water systems, however, *Legionella* can amplify and spread to susceptible hosts via aerosolization from contaminated water. As such, keeping *Legionella* out of building water supplies and cooling towers, as well as pools, hot tubs, and fountains, is key to preventing infection and outbreaks (Garrison et al., 2016). Prevention is critical as *Legionella* was the cause of 66% of all potable water-associated outbreaks reported to CDC during 2011–2012 (Beer et al., 2015).

Environmental Health Expertise Is Key

To prevent Legionnaires' disease we must understand the environmental factors that

allow *Legionella* bacteria to survive and reach a susceptible host. Due to the relationship of *Legionella* to the environment, environmental health practitioners are ideally situated to provide expertise essential to both responding to Legionnaires' disease outbreaks and preventing future ones. Working with epidemiologists and public health laboratorians, environmental health practitioners need to be proficient in applying environmental interventions (e.g., recommending potable water flushing procedures to address *Legionella*-contaminated water in an unoccupied building wing) in outbreak settings to stop outbreaks and prevent future ones. Environmental health response in Legionnaires' disease outbreaks contributes to improved prevention practices. Additionally, they can help translate lessons learned from outbreak response into evidence-based prevention guidance for building owners and managers.

In June 2016, CDC released a *Vital Signs* focused on Legionnaires' disease (www.cdc.gov/vitalsigns) emphasizing the importance of building owners and managers to use new industry standards for the primary prevention of Legionnaires' disease in building water systems. This standard, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 188-2015, intends to reduce the risk of Legionnaires' disease and calls for the development and implementation of water management programs in buildings with large or complex building water systems. CDC stated that widespread use of these standards could reduce the number and size of Legionnaires' disease outbreaks and save lives. Moving forward, environmental health practitioners will

FIGURE 1

Developing a Water Management Program

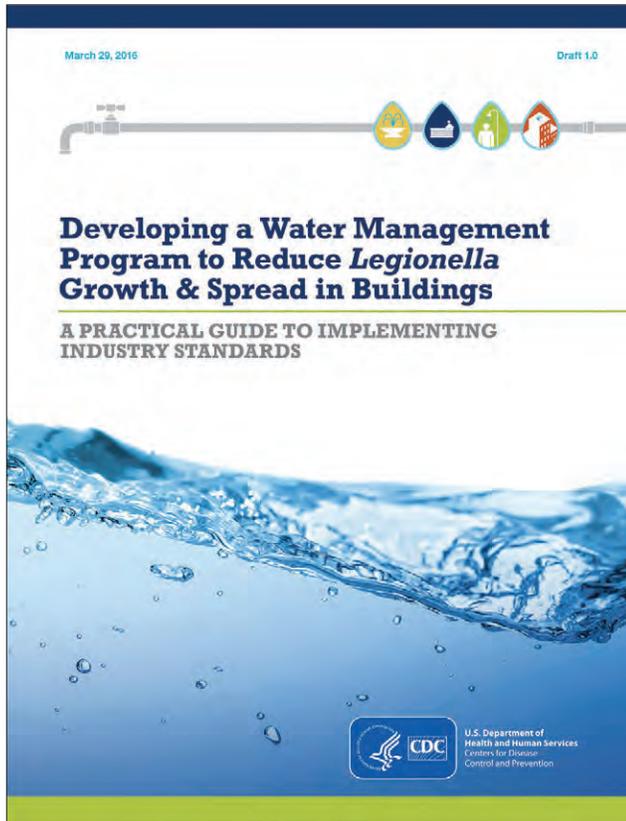
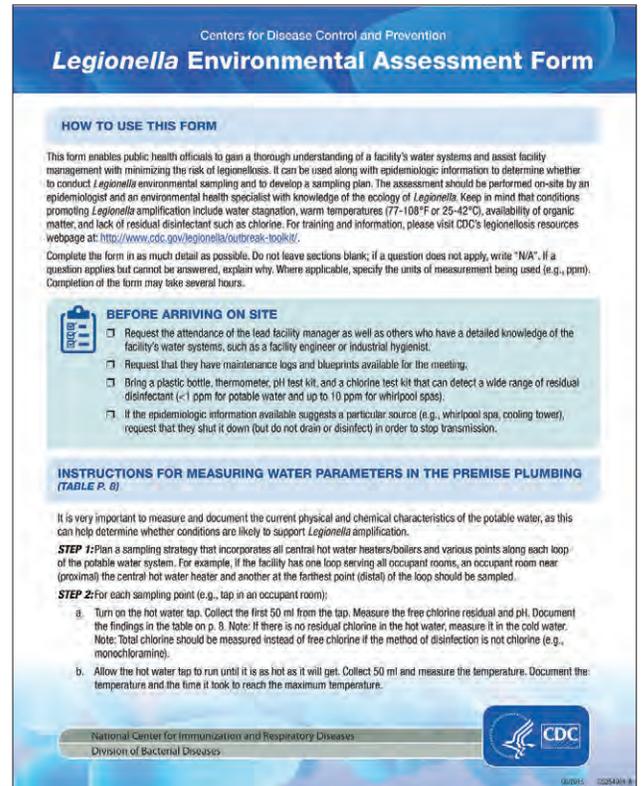


FIGURE 2

Legionella Environmental Assessment Form



be instrumental in facilitating the implementation and use of this new industry standard.

New Legionnaires' Disease Prevention and Outbreak Response Tools

To assist state and local health departments and environmental health practitioners, CDC developed new resources focused on preventing and investigating individual cases, clusters, and outbreaks of Legionnaires' disease (www.cdc.gov/legionella). Health departments can use CDC's new toolkit, *Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings: A Practical Guide to Implementing Industry Standards*, dedicated to developing and implementing a water management program to inform conversations with building owners and managers on how to reduce the risk of Legionella growth and spread in their building water systems (Figure 1).

Regarding Legionnaires' disease response, CDC also updated the Legionella Environmental Assessment Form (Figure 2) used to describe a facility's water system and help determine when and where to conduct Legionella environmental sampling. If sampling is warranted, health departments can use CDC's sampling procedure to collect environmental samples for Legionella culture during a cluster or outbreak investigation, or when cases of disease may be associated with a facility. CDC also has a sample data sheet that health departments can use to keep track of environmental samples taken for Legionella culture during an investigation.

In addition, CDC has a series of six new instructional videos for conducting environmental investigations of legionellosis outbreaks. Short training videos are available on the following topics.

- Legionella Ecology and an Introduction to Environmental Health and Engineering;

Learn why and where Legionella amplifies, as well as the basics of how cooling towers, premise plumbing, and whirlpool spas work.

- Conducting and Interpreting the Environmental Assessment: Learn useful tips about conducting an environmental assessment and how to interpret the results of key questions on CDC's Legionella Environmental Assessment Form.
- How to Make a Sampling Plan: Learn how to make a plan for the number of water and bio-film samples to take and where to take them.
- How to Sample Potable Water: Learn CDC's procedure for collecting potable water samples for Legionella culture.
- How to Sample Cooling Towers: Learn CDC's procedure for collecting environmental samples from cooling towers for Legionella culture.
- How to Sample Spas and Fountains: Learn CDC's procedure for collecting environ-

Legionella Quick Links

- Centers for Disease Control and Prevention's (CDC's) new *Legionella* Web site: Toolkit for implementing a building water management program, includes an environmental assessment form, sampling procedures, and instructional videos for investigating and preventing legionellosis outbreaks. www.cdc.gov/legionella/health-depts/inv-tools-cluster/environmental-inv-tools.html
- Disinfection of Hot Tubs Contaminated With *Legionella*: Fact sheet with best practices for how to remediate hot tubs. www.cdc.gov/legionella/downloads/hot-tub-disinfection.pdf
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Guideline 12-2000: Minimizing the Risk of Legionellosis Associated with Building Water Systems: Guideline providing information regarding the ecology of *Legionella* and guidance to minimize and remediate colonization in building water systems. www.techstreet.com/products/232891
- ASHRAE Standard 188-2015: Legionellosis: Risk Management for Building Water Systems (ANSI Approved): Standard establishing minimum risk management requirements for building water systems to prevent legionellosis. www.techstreet.com/ashrae/products/1897561?ashrae_auth_token
- Frequently asked questions about ASHRAE Standard 188-2015: Legionellosis: Risk Management for Building Water Systems. www.cdc.gov/legionella/health-depts/ashrae-faqs.html
- CDC *Vital Signs* on Legionnaires' Disease: CDC Reports and resources including practical guides, an infographic fact sheet, and more. www.cdc.gov/vitalsigns/legionnaires

mental samples from spas and fountains for *Legionella* culture (see photo above).

To get started, explore CDC's new Legionnaires' disease prevention and outbreak response tools and related resources noted in



Environmental investigators sample a spa.

the *Legionella* Quick Links sidebar. You just might prevent the next Legionnaires' disease outbreak! 🐞

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