



## Alliance to Prevent Legionnaires' Disease

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Dr. Laura Cooley  
National Center for Immunization and Respiratory Diseases  
Division of Bacterial Disease  
Centers for Disease Control and Prevention  
1600 Clifton Road NE  
MS C25  
Atlanta GA 30329

***Re: CDC-2017-0069: Centers for Disease Control and Prevention; Effective Methods of Implementing Water Management Programs (WMPs) To Reduce Growth of Transmission of Legionella spp.***

Dear Dr. Cooley:

The Alliance to Prevent Legionnaires' Disease, a non-profit public health advocacy group with participation from health advocacy groups for the immune compromised, microbiologists, epidemiologists, water quality specialists, facility managers, and building equipment manufacturers, appreciates this opportunity to provide comments on the CDC's Request for Information: *Effective Methods for Implementing Water Management Programs (WMPs) To Reduce Growth of Transmission of Legionella*.

### **Executive Summary**

The Alliance advocates for best practices in the adoption and implementation of water management throughout the collection, treatment, distribution, consumption and use of water. We encourage the development of water management plans at all these stages. Many of our members were instrumental in the development of ASHRAE Standard 188 and supported the CDC's development and release of a Legionella Toolkit – both documents are promoted on our website [preventlegionnaires.org](http://preventlegionnaires.org). However, we strongly believe that the current inside-the-building approach is insufficient for meaningful waterborne disease reduction and that the CDC and the public health community must dedicate more focus, study, and resources to mitigating the upstream threat of *Legionella* in the public water distribution system before the bacteria enter buildings and homes. Certainly, the Flint outbreak makes clear that water supply can be a serious risk factor in community outbreaks of Legionnaires' disease. We believe a comprehensive approach is the only meaningful way to effectively address the risk of Legionnaires' disease and reduce the occurrence not only of outbreaks, but individual, sporadic Legionnaires' disease cases as well (which far outnumbers the incidence of outbreaks).

Given that there is still much to understand about Legionnaires' disease (LD) and its transmission, we are against any additional regulatory action at this time. Rather, we support a collaborative approach by the stakeholders that seeks smart, effective, science-based solutions from water treatment and water distribution through to transmission points in buildings and homes.

### **Recommendations**

- **The development of water management programs for water utility system managers** to include controlling *Legionella* from source to delivery into buildings, residual disinfectant requirements at all points of distribution, testing and monitoring, proactive communications regarding disruptive events to the system that could impact residents, and new technologies and equipment to ensure consistently *Legionella*-free water delivery to buildings.
- **Continued outreach** (including training and, if possible, resources) to educate the public and to support the voluntary adoption and implementation of water management plans (WMPs) by managers of complex buildings and healthcare facilities based on ASHRAE-188 and the CDC Building Water Management Toolkit.
- **Widespread adoption and use of thorough investigation protocols** by public health departments in response to all cases of LD such as comprehensive public and building water system testing with documentation of all potential system and building events including construction, usage patterns, and water exposure. This is critical to increase understanding of causes of *Legionella* development and transmission.
- **More research and funding** by the CDC and others directed to better understand and determine LD causes and risk reduction on a comprehensive level, from source water to consumption and use.

Please find specific answers to the questions posed below.

*(1) What existing standards or guidance does your organization use for the prevention of Legionella growth and transmission?*

For building water systems, the Alliance recommends careful coordination between public water system managers and building owners regarding system management, and voluntary adoption by building owners of ASHRAE Standard 188, ASHRAE Guideline 12 and the CDC Toolkit for *Legionella* prevention best practices.

However, we support a more comprehensive approach to the prevention of LD that, in addition to the adoption of best water management practices set by ASHRAE 188 and the CDC Water Management Toolkit, equally focuses on steps that can be taken—both short and long term—to reduce *Legionella* health risks originating in the public water supply system.

We emphasize root cause solutions and strategies that address the reality that *Legionella* bacteria can and does exist from source water through distribution systems, homes and buildings. Attempting to control *Legionella* only at points of exposure at the end of a very complex

distribution system is not only the most expensive and time consuming approach, it hasn't proven effective.

The Alliance to Prevent Legionnaires' Disease recommends the following steps to prevent *Legionella* growth and transmission (further outlined in Attachment 1):

1. **Educate the public about the realities of *Legionella* bacteria**, where it originates and lives, how it is treated, how it can come into our homes and places we work and play, how we can be exposed to it, how it can be transmitted (aspiration/inhalation), those most at risk, when risk levels are higher and what factors can increase its prevalence (such as system upset conditions, biofilm buildup, nutrients that feed it such as organics, corrosion, and naturally occurring ammonia), symptoms of LD and what to ask your doctor. We must put everyone in a better position to actively protect themselves by equipping them with access to information they can use to prevent the disease, or to quickly secure aggressive medical treatment when affected.
2. **Ensure effective treatment of source water** through the full range of variables in water quality fluctuations – robust monitoring of water inflows, controlling for contaminant overloads (such as impact of flooding, seasonal impacts on source water stability such as lakes through inversion periods, seismic events, and pollution). Identify, promote, and publish best practices. Include proactive communications on water quality fluctuations and variability, accessible online in real time.
3. **Require residual disinfectant levels at points throughout the water distribution system** to address bacterial releases from biofilm. Reaffirm and enforce Safe Drinking Water Act requirements that eliminate organics and allow disinfectant protocols to be more effective and efficient while ultimately permitting lower levels of disinfectant (such as chlorine, chloramine) in the water. Monitor water quality in the water distribution system and track, monitor and publish water system disruptions from flooding, construction, main breaks, seismic events, system maintenance, source water shifts, flow/pressure fluctuations. Notify residents, building owners, and health care facilities of any changes immediately.
4. **Define best practices in *Legionella* control for homes, all buildings and public water usage** (such as fountains, displays, irrigation, and firefighting). The CDC did an excellent job in the development of their *Legionella* Toolkit based on ASHRAE Standard 188 and other sources, however, Standard 188 is based on buildings 10 stories and higher. We'd recommend research on advanced water management techniques, which can be used to develop new approaches to home and building water distribution designs and new guidance for homeowners, all building types and public water users. Understand better how the water distribution system may "seed" our homes, buildings and public water uses. Resist oversimplifying to simple definitions of *Legionella* management until true science develops a greater fact base. Do not adopt or accept building only solutions that do not include a comprehensive water system management approach from source water to all points of consumption, as buildings are only one element of a single, complex system.
5. **Develop and define best practices for managing water and biofilm development** across all materials, fixtures and equipment that use water. ASHRAE Standard 188 offers a good start, but it must be expanded with requests to all parties who manufacture, maintain, use and operate equipment and fixtures to develop guidance for voluntary adoption.

6. **Develop, adopt and promote robust investigation protocols** to be utilized in all cases of LD – specifically including individual cases that comprise the vast majority of cases but remain severely under investigated. Promote investigation protocols that address systemic issues that can be used to advance our understanding of the true behavior of *Legionella* in our water systems. Narrow investigations that target single points of exposure or equipment must not be accepted, as each investigation should pursue root causes to help advance our *Legionella* management techniques. Definitive declarations of specific “sources” of *Legionella* following outbreaks or individual LD cases should be avoided whenever narrow investigations are completed.
7. **Invest in additional research** that evaluates complete water systems, all points of distribution and consumption. Consolidate wherever possible government funding of research into a system-wide approach, capable of offering comprehensive solutions. Engage a broad range of parties in the development of future solutions, including residents, building owners and managers, water utilities, public health advocates and departments, equipment and fixture manufacturers, and government agencies. Create an atmosphere of true research to achieve genuine and comprehensive solutions.

*(2) Are there other standards or guidance for the prevention of Legionella growth and transmission that you would find useful but do not exist or are not currently available to you? If so, what information should those standards or guidance contain?*

There is a significant need for:

1. Guidance that addresses the entire water system from source to consumption, acknowledging that legionella is a systemic issue with opportunities to control throughout the system.
2. Guidance for water utilities and treatment facilities on monitoring, managing and controlling: legionella inflows, legionella growth throughout the system, biofilm development and releases, corrosion and other nutrients, disruptive events, residual disinfectants, stagnation, lake and water tower inversion impacts.
3. Guidance for all homes, buildings, and public water on best practices for controlling for legionella (not just buildings 10 stories or higher)
4. Guidance for controlling, reporting, treating and investigating individual cases of Legionnaires’ disease (95%+ of all cases).

*(3) What is your organization's role, and your role within the organization, in achieving implementation of WMPs by owners and managers of buildings at increased risk for Legionella growth and transmission?*

The Alliance to Prevent Legionnaires’ Disease promotes the use of Water Management Programs as described by ASHRAE or the CDC toolkit in our discussions with various stakeholders as ONLY one area in the prevention of LD.

The Alliance works to advance the holistic understanding of *Legionella* bacteria from source water to consumption and human exposure, and promote systemic solutions that prevent all cases of Legionnaires’ disease.

In discussions with organizations like the Building Owners and Managers Association (BOMA), we promote and encourage them to include contingencies for water events outside of the building to their prevention and water management plans. We inform them that just having a Water Management Plan is not enough to protect the health of their residents, because outside factors can influence their treatment plans.

The water management program must take into account upsets due to construction nearby, fire hydrant use, water velocity changes in mains and weather events.

*(4) In your organization's experience, what are the principal barriers to implementation of WMPs by building owners and managers?*

The principal barrier to implementing WMPs is the lack of understanding of the issue by all parties – including all federal and state agencies, water utilities, and policy makers. The approach by policy makers has been to place the burden of disease prevention management onto building owners without assurance that the water received in a given building is *Legionella*-free. Holding building owners accountable while ignoring the *Legionella* in the public water system only deflects responsibility and delays ultimate solutions, and substantially ignores the bigger issue that 95%+ cases are individual and sporadic.

Research has shown that *Legionella* is commonly found in the water system, and in a high percentage of homes. We must develop a more complete understanding of *Legionella* control. It took more than 10 years for ASHRAE to develop Standard 188. We can't expect building owners to immediately understand and adopt the Standard's practices without extensive engagements. Forcing controls and approaches developed in relative isolation and without the meaningful involvement of frontline stakeholders is not effective.

*(5) Where there are barriers, what has your organization done to overcome these barriers?*

The primary barrier has been the outbreak-driven policy mindset and the "top down" approach that over burdens building owners for an issue that is poorly understood and responsibility not fully accepted among all parties responsible for managing our entire water system. An outbreak and public health department mentality tends to drive solutions that can be over-responsive to local political pressure, rather than develop long-term root cause solutions.

*(6) No comment*

*(7) No comment*

*(8) A limited number of jurisdictions have implemented regulations to reduce the risk of Legionella growth and transmission (e.g., New York, New York City). In your state or local jurisdiction, should building codes or other types of public health regulation or legislation be used to help prevent Legionnaires' disease? Why or why not?*

Regulations must be evidence-based. The evidence suggests that regulations enacted in New York, Canada and Europe have **not** been successful in reducing the incidence of *legionellosis* in those jurisdictions. In 2015, New York City enacted Local Law 77, which was designed to strictly regulate maintenance and inspections of cooling towers by building owners with heavy handed tactics and fines for violations. Earlier this year, two years after the enactment of Local Law 77, the New York City Department of Health and Mental Hygiene published a report showing no decrease in the incidence of Legionnaires' cases while simultaneously recommending no changes to the Local Law and no additional prevention measures.

So far this year (as of Week 40) in New York City, there have been 339 cases reported to the CDC. At this same point last year, there had been only 182. This 85% increase in cases clearly shows that Local Law 77 has been ineffective, despite costing building owners' an estimated amount of more than \$130 million annually.

Narrowly focused policies like this one, which concentrates on one water based mechanical device in a building fails to address the larger risks associated with *Legionella* bacteria and we do **not** recommend this as a model for Legionnaires' prevention in any jurisdiction.

Ninety-six percent of reported Legionnaires' cases are sporadic in nature, while only four percent are considered outbreaks; a fact that has been shared by the CDC. Of those cases that are sporadic, epidemiology points directly to drinking water as the source for transmission<sup>1</sup>.

*(9) Are there other approaches to reducing the risk of Legionnaires' disease that your organization has found to be useful besides implementation of WMPs?*

We strongly believe that it is critical to manage *Legionella* at the public water distribution system level that is operated by knowledgeable individuals rather than shift sole responsibility onto thousands of premise plumbing locations and individuals ill-equipped to handle the complexities of a water management program designed to protect the health of its occupants.

Note, if premises treat their incoming potable water by boosting the incoming disinfection level because the residual from the potable water system is too low, they may fall under the EPA definition of a Public Water System (PWS) requiring complex testing, reporting, and oversight. The threshold for being a PWS is quite low and many buildings and hospitals easily satisfy the definition.

“A public water system provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year.”<sup>2</sup>

In addition to the challenges facing building owners in implementing water management programs, which must be tailored to the unique factors of individual buildings, their cost and lack of resources can also interfere with proper building water management. It is not practical to expect every building owner to effectively control for waterborne threats, especially when water supply disruptions may introduce unanticipated variables which building owners may be ill-equipped to handle.

We urge the CDC and others to do more research and provide more funding for studying the risk of LD caused by the public water distribution system and how such risks can best be minimized. Such research should shed light not only on headline grabbing outbreaks, but more importantly on the overwhelming disproportionate occurrence of sporadic cases (96 percent sporadic vs. 4 percent outbreak). As part of this research, we would suggest looking at whether setting minimum disinfectant residual levels throughout the water distribution system would be reasonable and beneficial to monitor for *Legionella* bacteria entering the building through the public water system.

Another area worthy of consideration is creating guidelines for utilities to communicate with building managers, healthcare facilities, and communities on water disruption events that could trigger a higher *Legionella* risk.

Longer term we believe that *Legionella* should be included in the EPA bacteria contaminant list for mandatory monitoring at the water system level and support for additional funds to utilities and municipalities for water infrastructure upgrades, as recommended by the Alliance's comments in response to the EPA's March 2017 Six-Year Review Results. These prevention methods, in addition to effective building water management, could provide for a more comprehensive solution to reducing the risk of exposure to *Legionella* bacteria.

In addition to WMPs, consider the following:

- Public education about *Legionella* and the public water system
- Requirements for residual chlorine at 0.5mg/L at all points throughout the public water distribution system
- Public notification of planned and unplanned upset conditions in the public water system
- Use of comprehensive investigation protocols that include historical CDC testing requirements for all LD cases
- Compliance with the Safe Drinking Water Act requirements for proper total organic carbon (TOC) removal
- Additional *Legionella* research regarding causation and prevention

*(10) What additional considerations are relevant to developing guidance for preventing Legionnaires disease?*

It is essential to adopt broader approaches that include improvements to public water systems and their management practices as the leading element, the promotion of Water Management Programs and an increase in patient testing for LD to improve the metrics of the disease.

A comprehensive approach includes proper treatment of water inside and outside of the building. The Flint outbreak makes it clear that water supply is a serious, if not primary, risk factor in community outbreaks of Legionnaires' disease. With that focus, we can reduce not only *Legionella*, but also other waterborne pathogens that are present in our public water system.

*(11) Has your organization implemented specific approaches to reducing the risk of disease due to other opportunistic waterborne pathogens besides Legionella? If so, please explain. Do these approaches conflict in any way with your approaches to reducing the risk of Legionnaires disease?*

The Alliance believes our recommendations for reducing the cases of Legionnaires' disease will also be effective in reducing other opportunistic pathogens in the water distribution system. An excellent example of this is in Louisiana with the *Naegleria fowleri* (brain eating amoeba) parasite which was found in two public water systems, the state initiated an immediate increase in disinfectant residual levels to control the amoeba, subsequently discovered that cases of Legionnaires' dropped off dramatically<sup>3</sup>.

The Alliance to Prevent Legionnaires' Disease appreciates the opportunity to submit comments on this important topic. We look forward to continue working with the CDC to minimize the risk of Legionnaires' disease.

Sincerely,



Daryn Cline  
Director, Technology and Science  
Alliance to Prevent Legionnaires' Disease

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<sup>1</sup> Potable water as a cause of sporadic cases of community-acquired legionnaires' disease, *The New England Journal of Medicine*. (Stout, 1992)

<sup>2</sup> Public Water System Definition, <https://www.epa.gov/dwreginfo/information-about-public-water-systems>

<sup>3</sup> Louisiana response to *Naegleria fowleri* in drinking water, Louisiana Department of Health and Hospitals. (2014). [http://www.swawwa.org/ace14presentations/Louisiana Response to Naegleria fowleri Causey.pdf](http://www.swawwa.org/ace14presentations/Louisiana%20Response%20to%20Naegleria%20fowleri%20Causey.pdf)