Alliance to Prevent
Legionnaires' Disease

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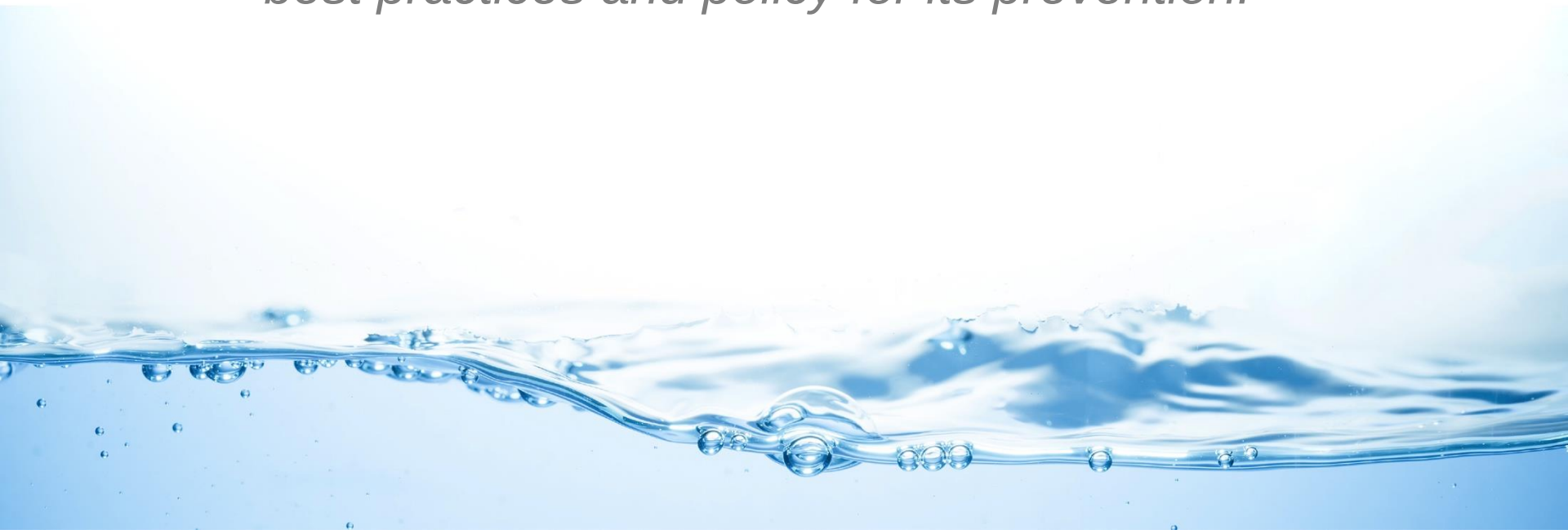
Director, Strategic Initiatives

preventlegionnaires.org

OUR MISSION:

The Alliance strives to reduce the occurrence of Legionnaires' disease by promoting public research and education on the disease, and best practices and policy for its prevention.



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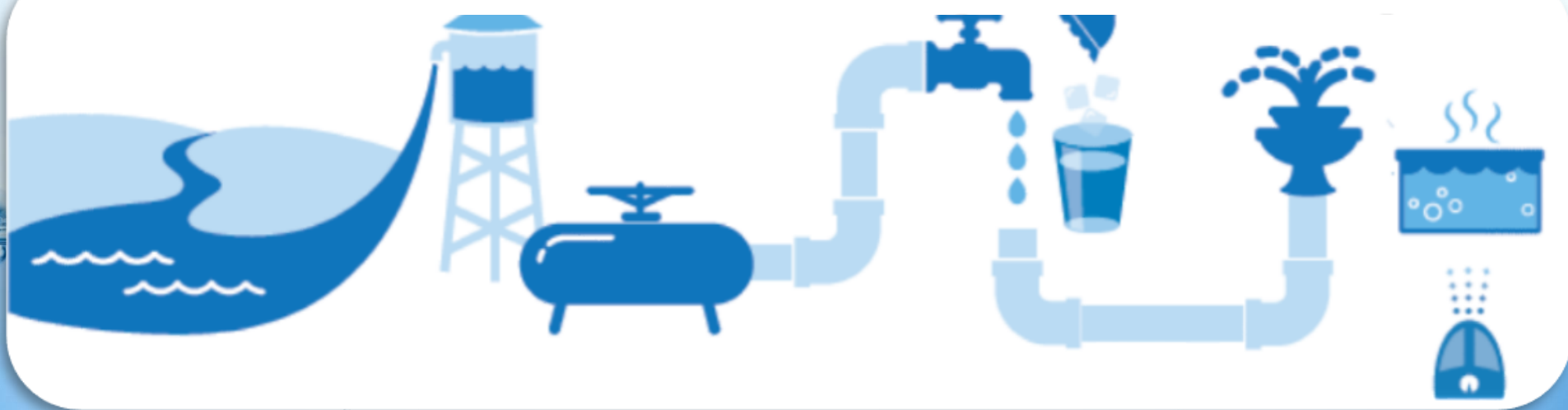
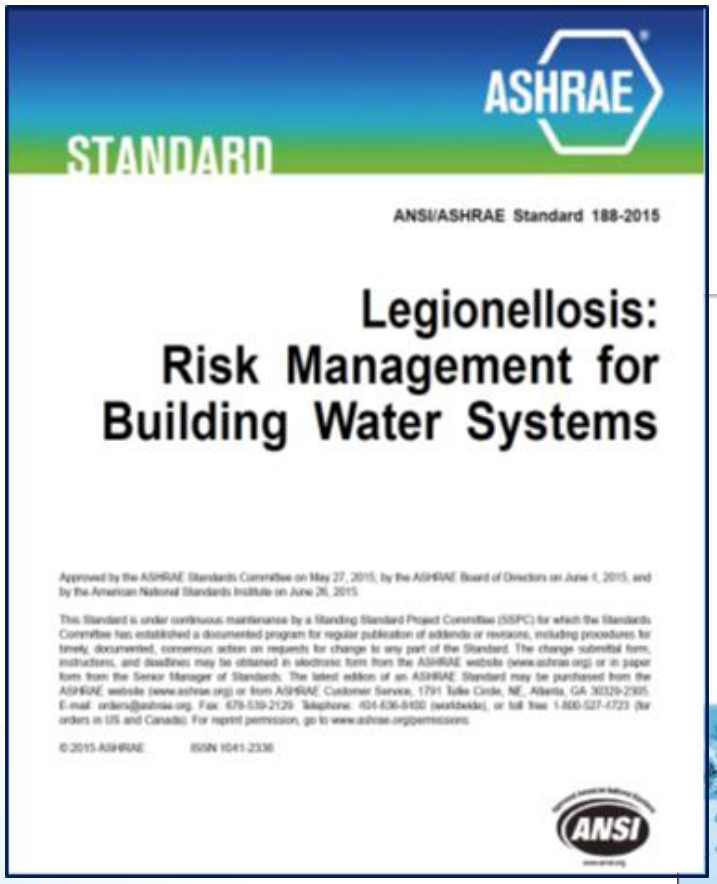
Legionnaires' Disease

There’s a lot we don’t know.

Primary Takeaway

We need to manage the complete water system




ASHRAE
STANDARD
ANSI/ASHRAE Standard 188-2015
Legionellosis: Risk Management for Building Water Systems
Approved by the ASHRAE Standards Committee on May 27, 2015; by the ASHRAE Board of Directors on June 4, 2015; and by the American National Standards Institute on June 26, 2015.
This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.
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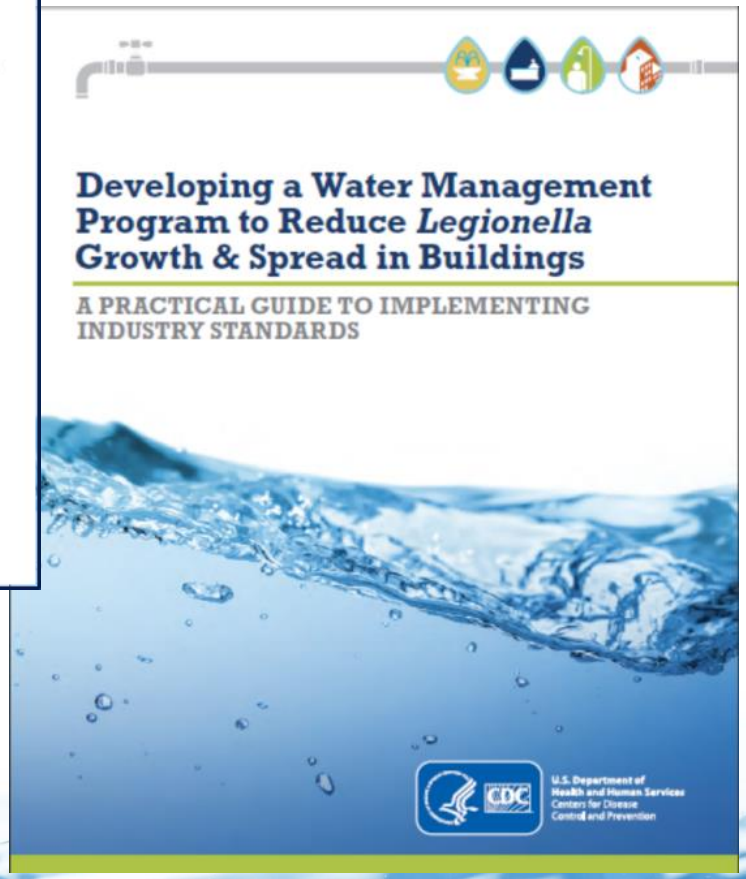
ANSI


Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings
A PRACTICAL GUIDE TO IMPLEMENTING INDUSTRY STANDARDS
CDC
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

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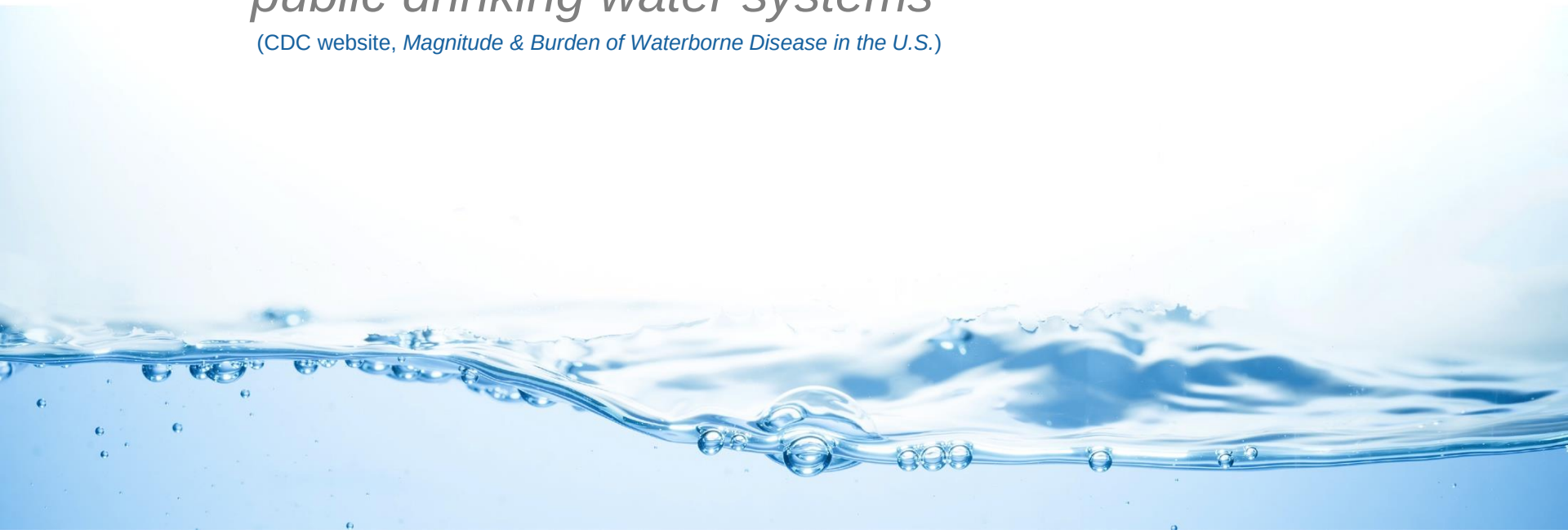
There’s a lot we do know.

Legionella is one of many waterborne threats

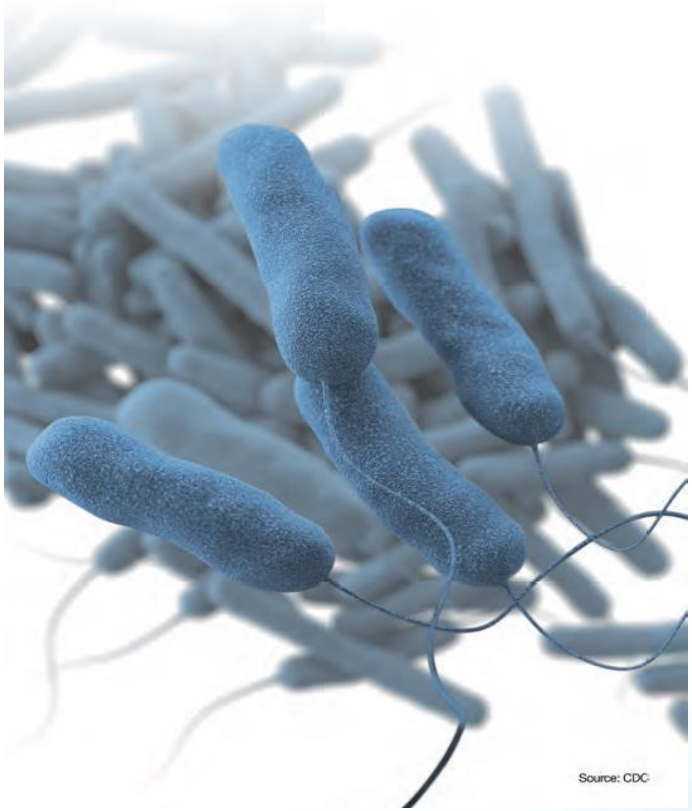
Although the U.S. has one of the safest drinking water systems in the world, there are more than 4 million cases of Acute Gastrointestinal Illness (AGI) per year from public drinking water systems

(CDC website, *Magnitude & Burden of Waterborne Disease in the U.S.*)



Legionella Bacteria Basics

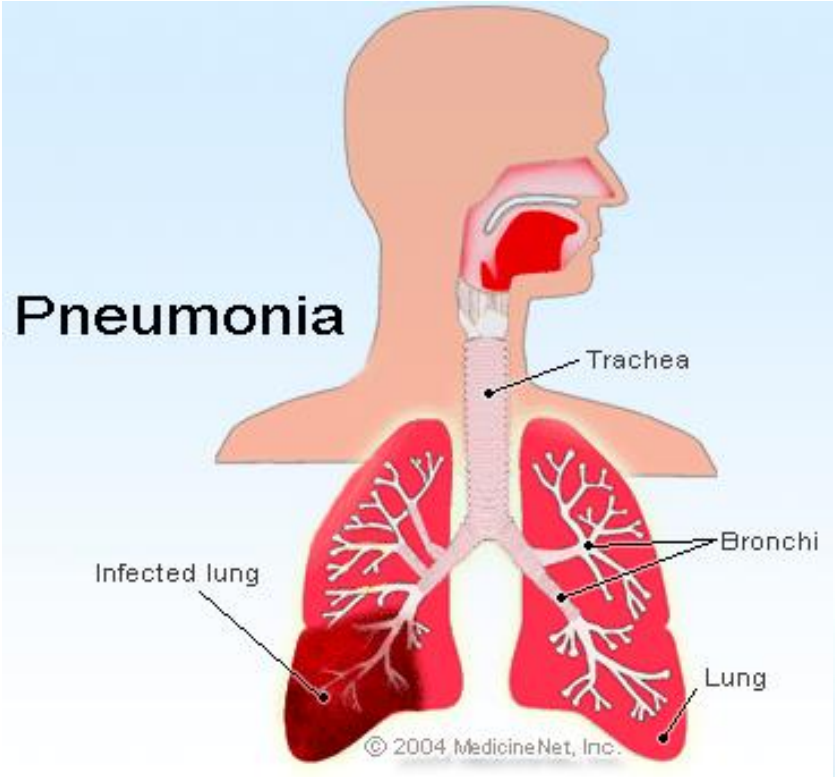
- Commonly found in nature and many source waters
- Numerous species and serogroups
- Most virulent strain associated with disease is *Legionella* pneumophila Serogroup 1



Picture Source: CDC Toolkit 1.0 6/7/2016

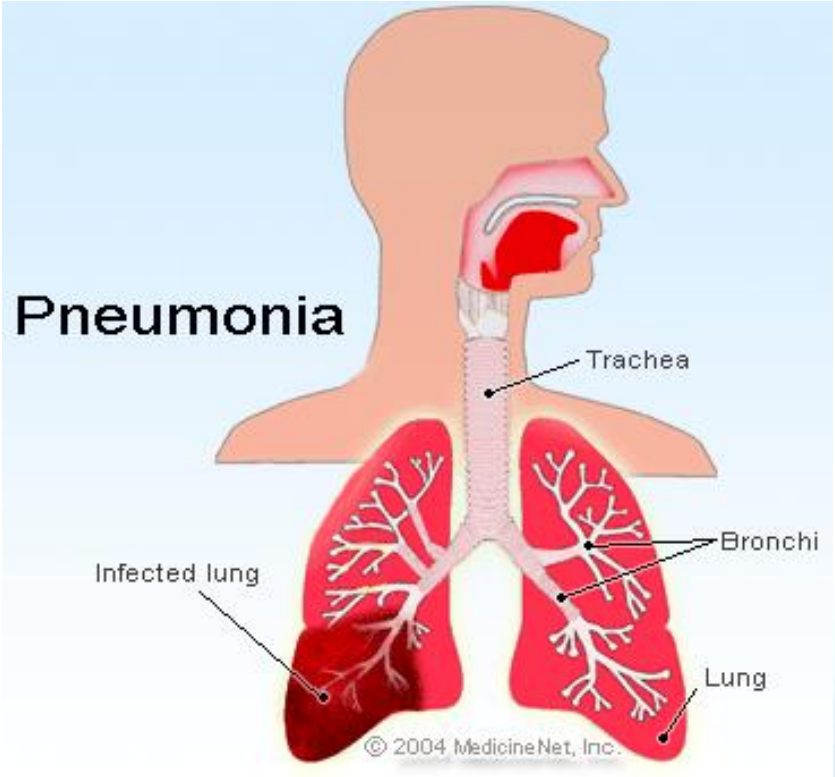
Legionnaires' Disease Basics

- Bacterial Pneumonia
- Bacteria must be brought deeply into the lungs by aspiration or inhalation to cause disease
- Environmental disease, not contagious

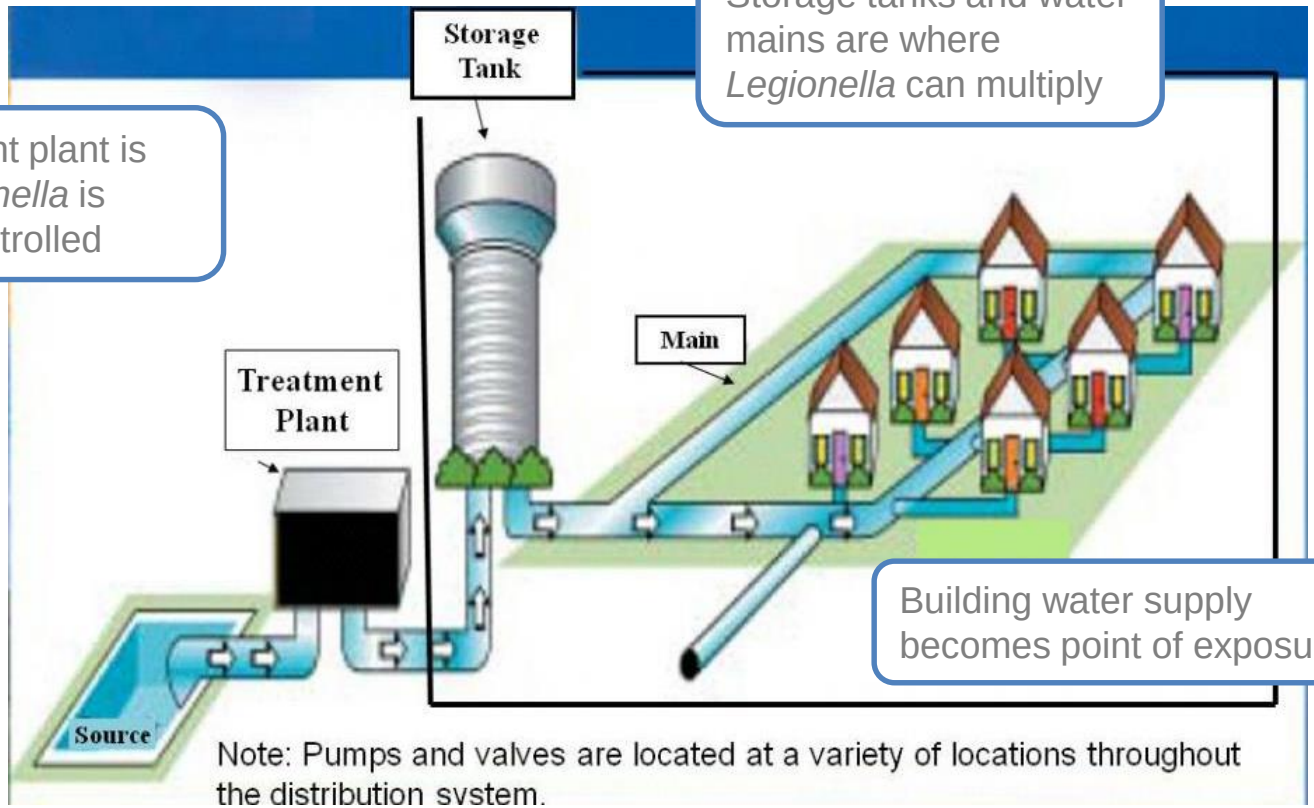


Legionnaires' Disease Basics

- 96% of all cases of Legionnaires Disease are individual, sporadic cases
- 4% of all cases of Legionnaires Disease are from outbreaks.



Typical Water Distribution System

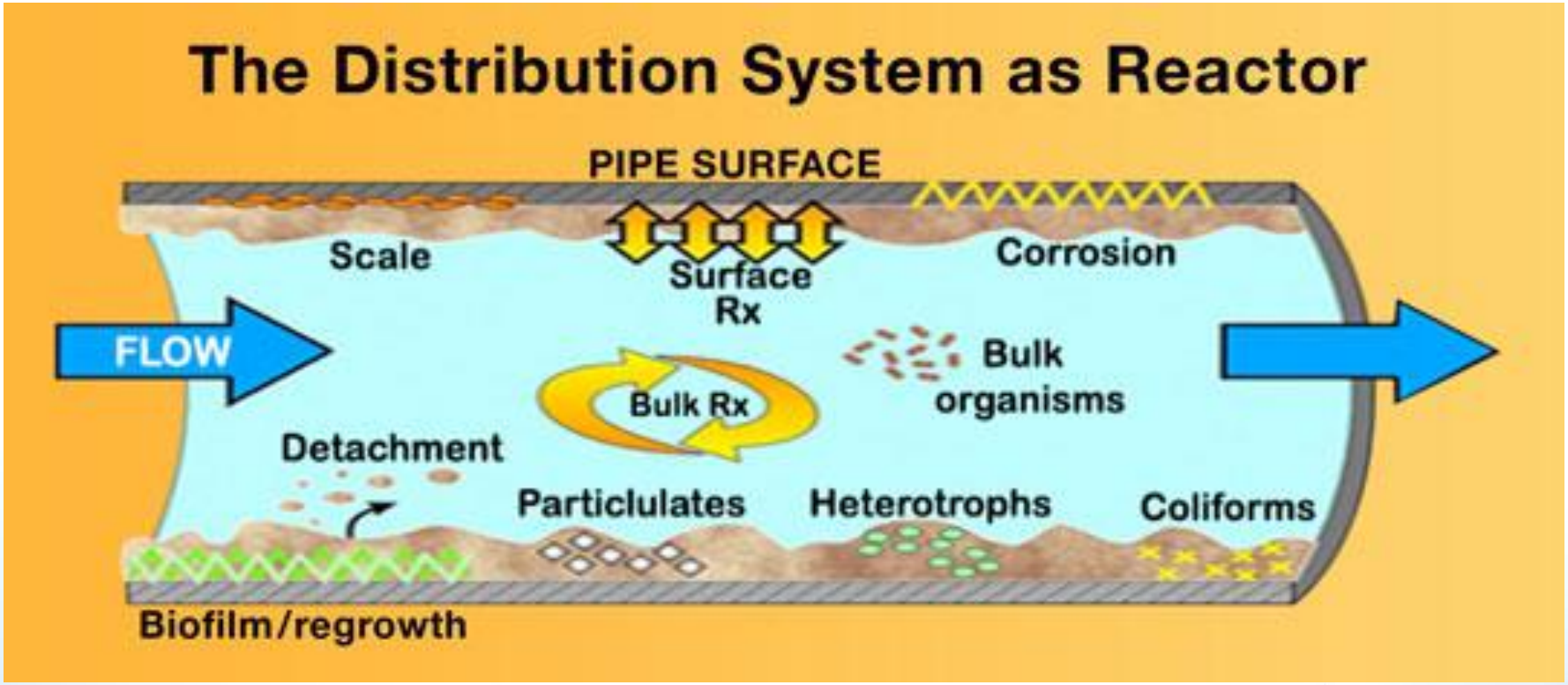


Storage tanks and water mains are where *Legionella* can multiply

The treatment plant is where *Legionella* is currently controlled

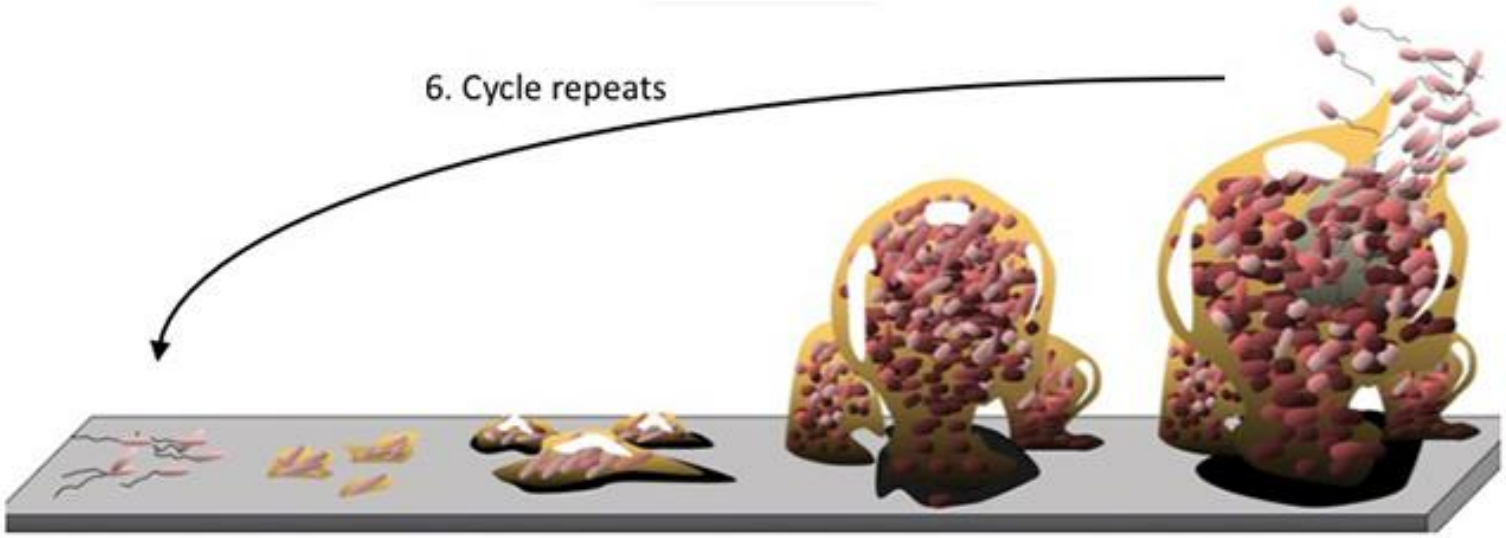
Building water supply becomes point of exposure

The Drinking Water Ecosystem



Source: University of Montana Center for Biofilm Engineering

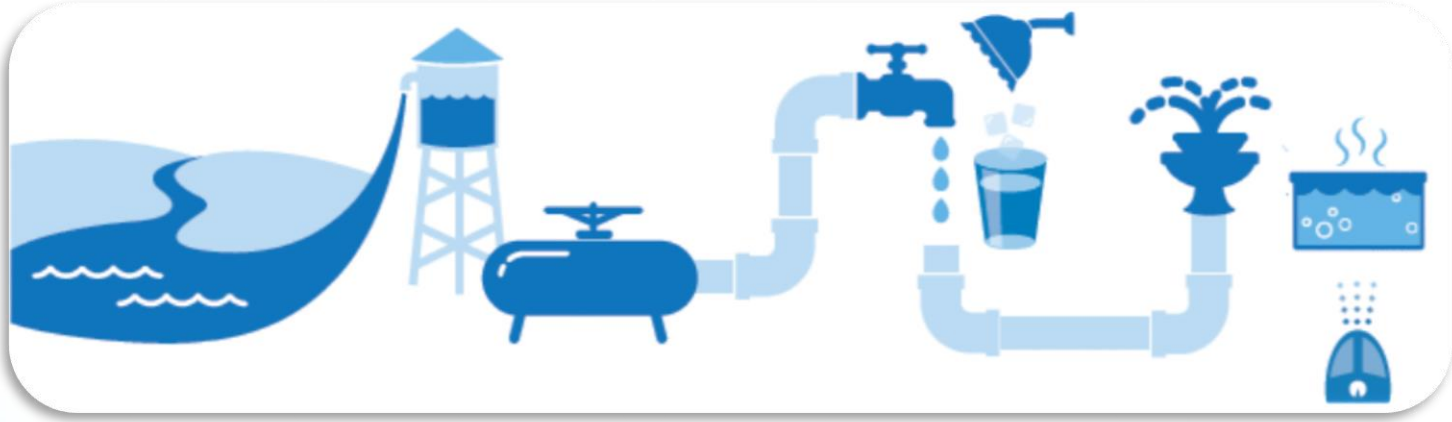
Biofilm Activity



Legionella Bacteria Growth and Exposure

*Legionell*a is found in source water and can MULTIPLY in the public drinking water distribution system

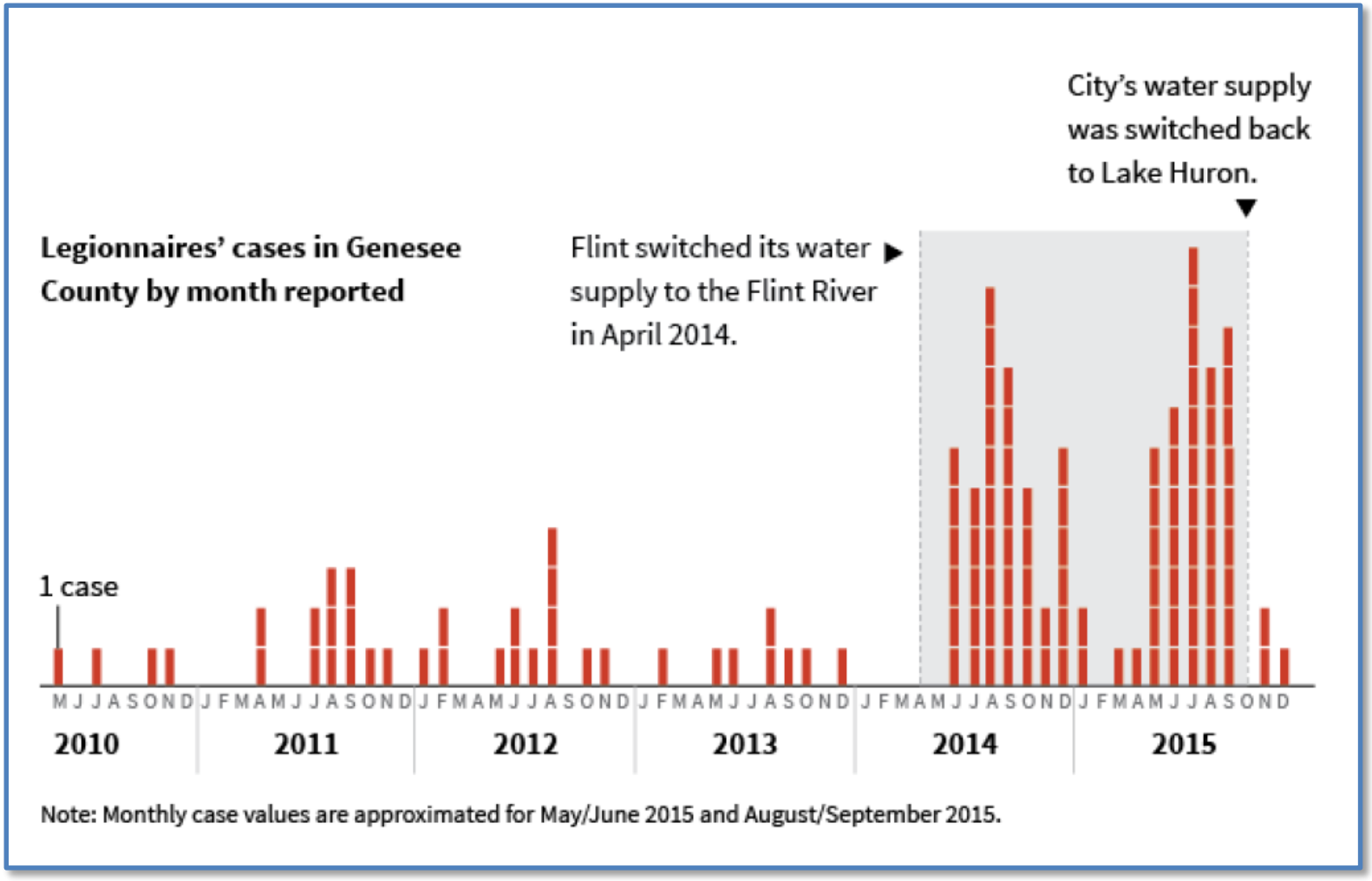
Bacteria ENTER dwellings with the public drinking water and can proliferate in building water systems (storage tanks and building water distribution system)



Bacteria live in the biofilm and can be RELEASED when disrupted by maintenance, water main breaks, pressure surges, or fire hydrant use

Bacteria can be DISSEMINATED from many water sources

Legionnaires' Surged in Flint



Alliance to Prevent Legionnaires' Disease

Why the emphasis on cooling towers?

Legionnaires' Disease Beginning

"Nearly six months after the outbreak, the CDC announced that it had cracked the case…

Although Legionella wasn't found in the hotel's cooling system because it had been cleaned by the time of its discovery, investigators surmised that the system's powerful fans emitted a mist of contaminated water that fell on pedestrians on the sidewalk below and were sucked into the lobby through a ground-floor vent where victims breathed in the tiny, infected water droplets."

http://www.history.com/news/the-discovery-of-legionnaires-disease

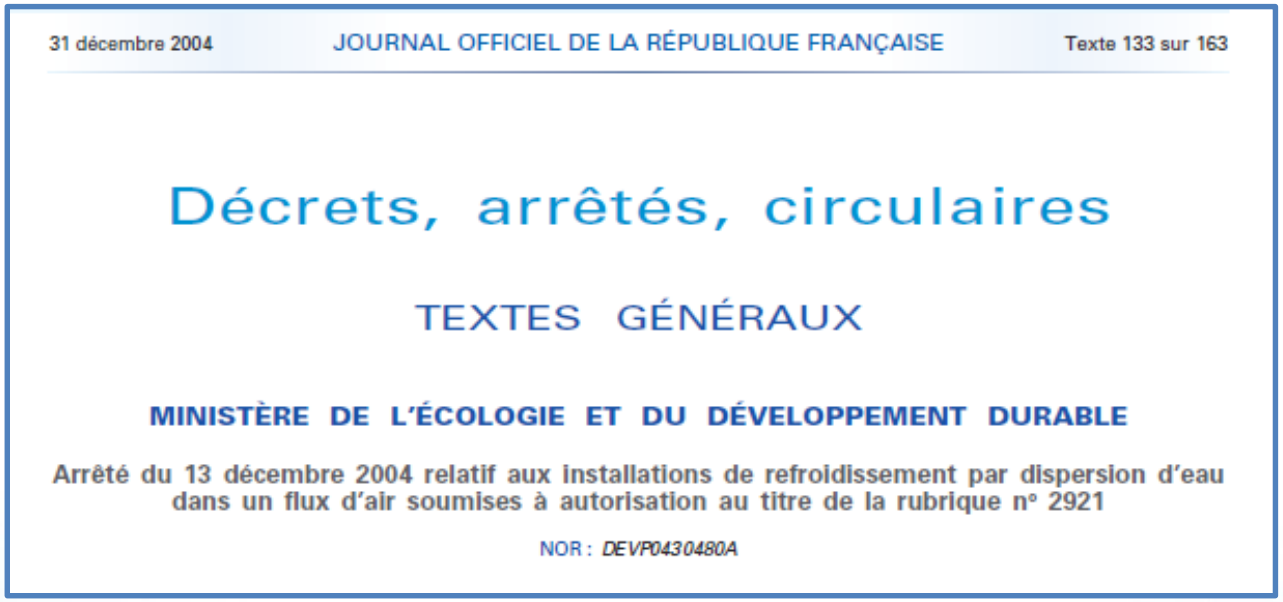
Bias began based on inconclusive evidence…

Bias

- Public drinking water supply is often ignored during outbreak investigations
- Potential sources are not sampled or tested
- This investigation bias puts more people at risk

Historical Cooling Tower Bias

French cooling tower regulations require monthly testing for *Legionella*



31 décembre 2004 JOURNAL OFFICIEL DE LA RÉPUBLIQUE FRANÇAISE Texte 133 sur 163

Décrets, arrêtés, circulaires

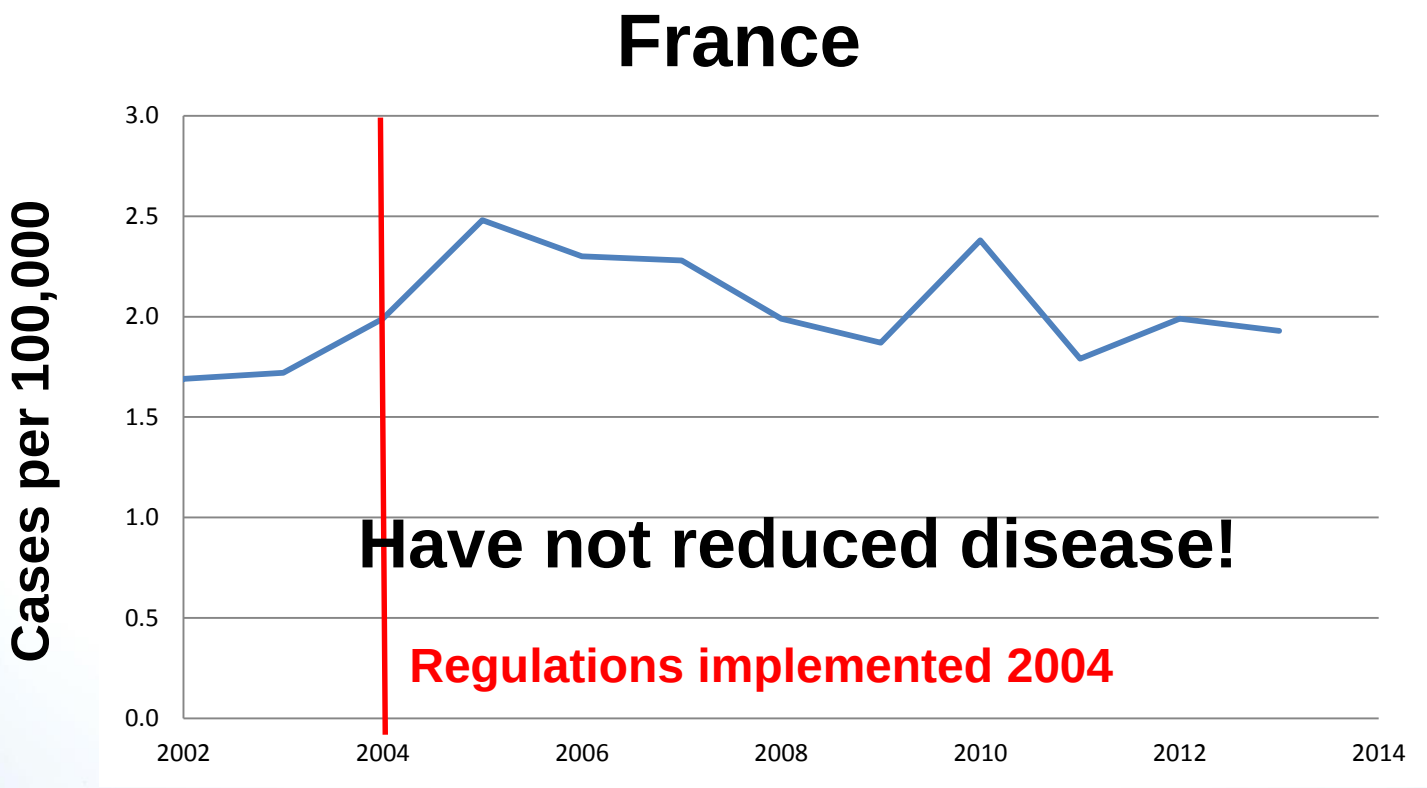
TEXTES GÉNÉRAUX

MINISTÈRE DE L'ÉCOLOGIE ET DU DÉVELOPPEMENT DURABLE

Arrêté du 13 décembre 2004 relatif aux installations de refroidissement par dispersion d'eau dans un flux d'air soumises à autorisation au titre de la rubrique n° 2921

NOR : *DEVP0430480A*

French Regulations Focused on Towers

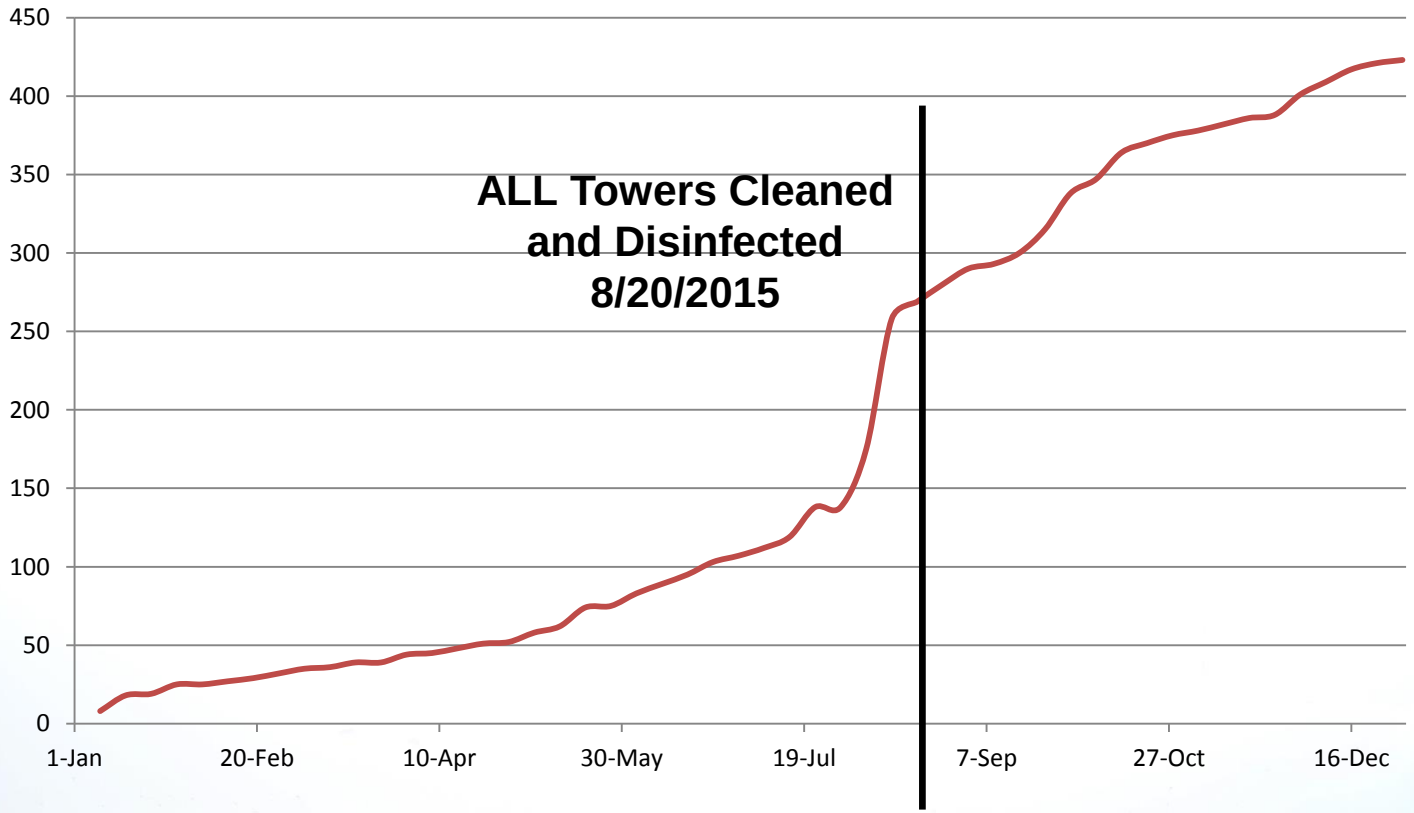


NYC – Another Example of Bias

- NYC officials repeatedly claimed that “the drinking water is unaffected”
- Water supplies in buildings linked to the initial Bronx outbreak ***were never tested***
- *“If you don’t test for it* [*Legionella* bacteria in the drinking water], *it’s ridiculous.”*

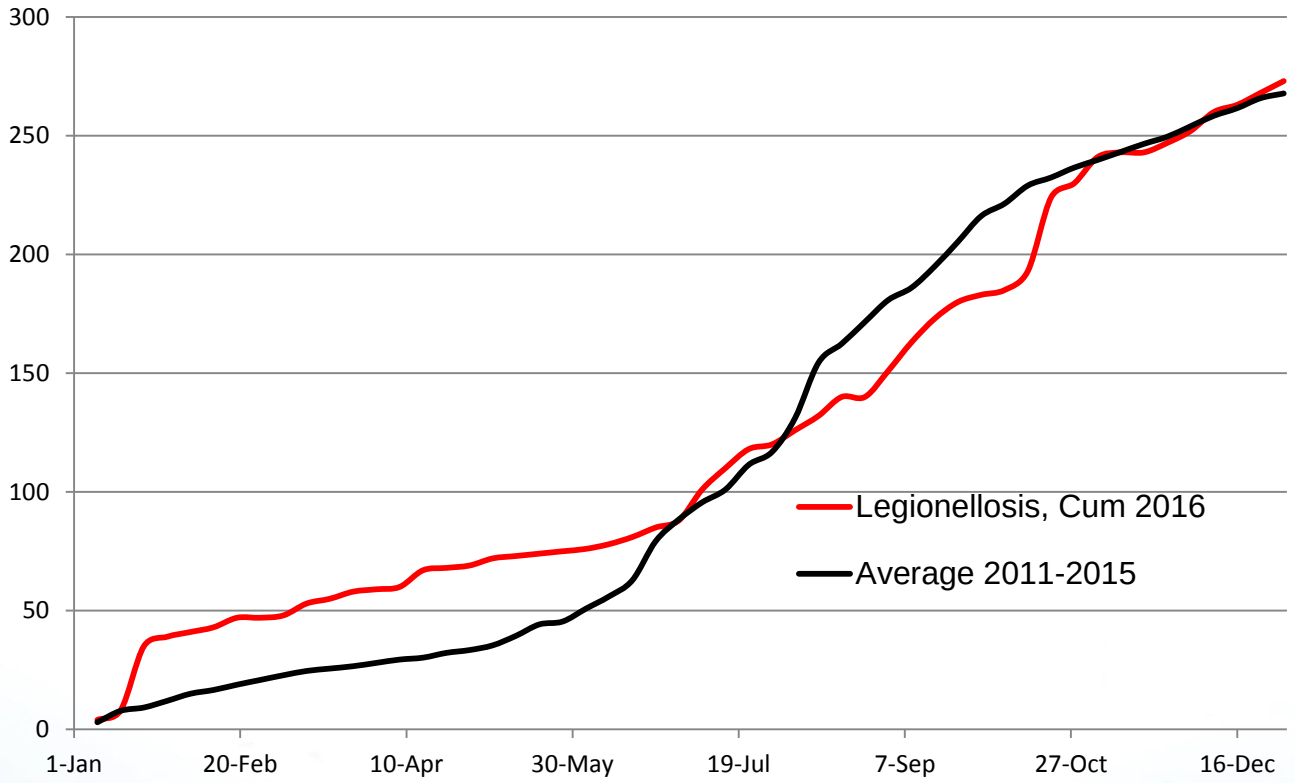
Dr. Stephen Edberg, Yale University

NYC Reported Legionnaires' Cases 2015



Source: CDC MMWR

NYC Reported Legionnaires' Cases 2016



Source: CDC MMWR

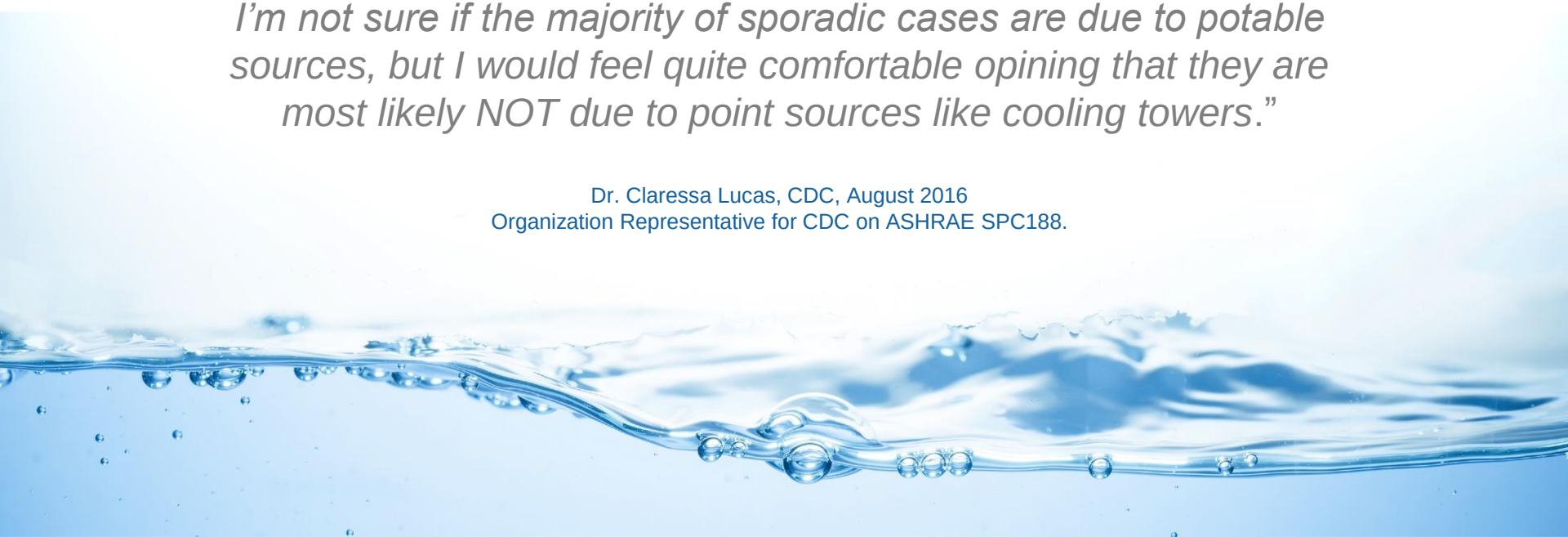
The Scientific Community Agrees

"…it is the professional opinion of a CDC researcher that we should be able to apply lessons learned from outbreaks to help prevent disease, both sporadic and outbreaks…

However, to extrapolate the source of sporadic cases from outbreak root causes is not good practice because other, unknown variable are almost certainly in play.

I'm not sure if the majority of sporadic cases are due to potable sources, but I would feel quite comfortable opining that they are most likely NOT due to point sources like cooling towers."

Dr. Claressa Lucas, CDC, August 2016
Organization Representative for CDC on ASHRAE SPC188.



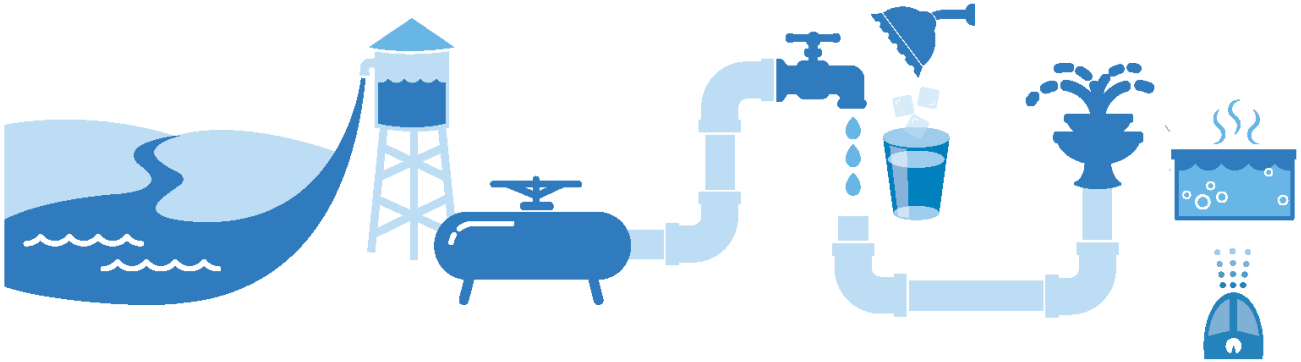
Mitigating Risk – Lines of Defense

LEGIONNAIRES' DISEASE
LINES OF PREVENTION

#1 EDUCATION

The general public, building owners and health care professionals need **more information** on *Legionella* bacteria and how it may cause Legionnaires' disease. There are many myths surrounding the disease, so up-to-date and accurate information is crucial to reduce its incidence and increase prevention. Knowledge of the origins and exposure points of *Legionella* throughout the water system help us to understand how best to prevent its spread.

preventlegionnaires.org



#2 SOURCE WATER TREATMENT

The water we use, collected from lakes, rivers and reservoirs, is known as **source water**. Source water naturally contains bacteria and nutrients. To protect public health it is treated and filtered* to limit the levels of contaminants, per the Safe Water Drinking Act.

* New York City does not filter 90% of its water, having been given an exemption from the EPA if the water meets certain criteria, including residual disinfectant concentrations, and not being identified as a source of a waterborne disease outbreak.

#3 PUBLIC WATER TREATMENT

After collection and treatment, source water enters the **public water system**. Opportunities exist for *Legionella* and other bacteria to colonize and reproduce in the public water system. Pipe biofilm and corrosion, potential low chlorine levels and stagnant water all contribute to growth. It is critical to design, manage and maintain new distribution systems, as well as upgrade and repair older ones, to limit the growth of bacteria.

#4 BUILDING WATER SYSTEMS

Multi-story buildings are at greater risk of water-borne bacteria than smaller buildings, as the complexity of their piping provides more opportunity for bacterial growth. The exposure points in a **building water system** are numerous, from showers, baths and drinking water to ice machines, faucets, and cooling equipment. A multi-disciplinary team has developed ASHRAE Standard 188 for risk management of building water systems.

#5 WATER EQUIPMENT MANAGEMENT

Proper selection, placement, maintenance, treatment, monitoring, and management of **water-based equipment**, such as medical equipment, humidifiers, misters, hot tubs and pools, can further reduce the risk of exposure to water-borne *Legionella* bacteria.

#6 INVESTIGATION PROTOCOL

When Legionnaires' disease clusters or outbreaks are reported, it is crucial to determine the point of exposure by **testing** all water sources within the water system.* When the exposure point is found, it can be treated to stop the spread. Prematurely ending an investigation with the first positive sample may lead to further outbreaks which could occur unexpectedly, even months later, as multiple exposure points to bacteria are possible within one water system. Failure to test throughout the system may result in inconclusive or incorrect findings, or mis-identification of the source of the bacteria that caused the illness.

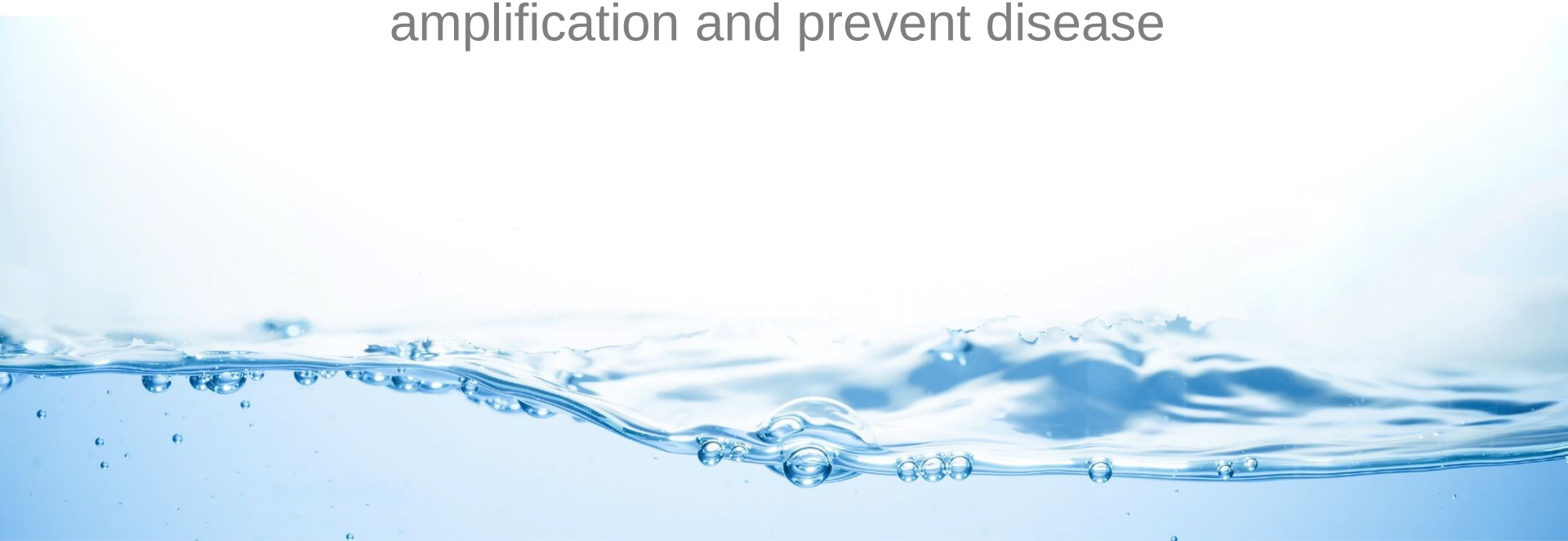
*Currently, single cases are rarely investigated, except in healthcare facilities.

#7 ONGOING RESEARCH

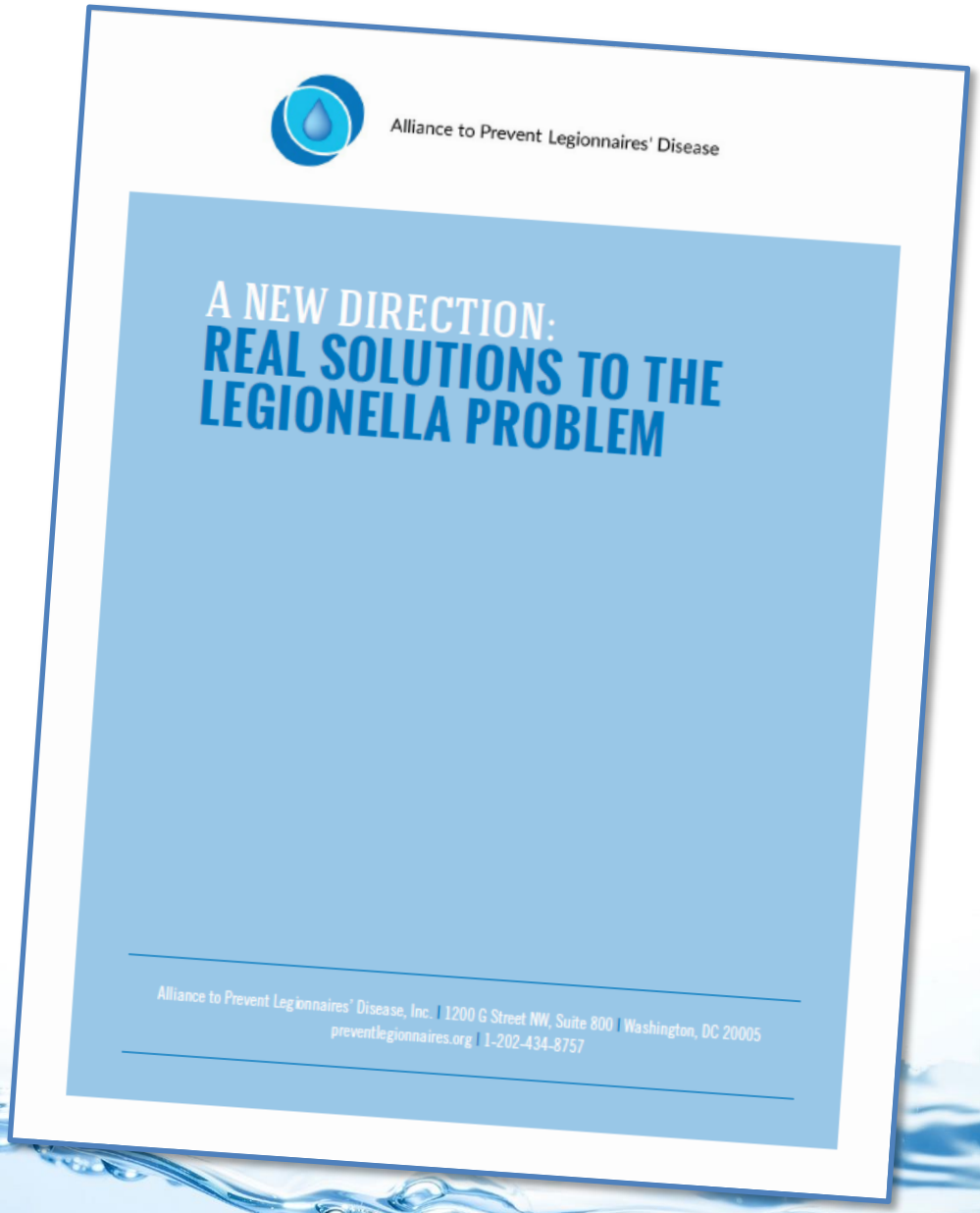
As Legionnaires' disease is a relatively newly discovered disease, ongoing **research** is imperative to better understand its causes, prevention and treatment. New studies and their findings are published periodically and it is important that this new information is communicated to dispel myths with proven measures for combatting the disease.

Preventing Legionnaires' Disease

Ensuring the water that flows into buildings is properly disinfected against *Legionella* and other waterborne pathogens is the first and primary line of defense to address *Legionella* amplification and prevent disease



Education


Alliance to Prevent Legionnaires' Disease
A NEW DIRECTION:
REAL SOLUTIONS TO THE LEGIONELLA PROBLEM
Alliance to Prevent Legionnaires' Disease, Inc. | 1200 G Street NW, Suite 800 | Washington, DC 20005
preventlegionnaires.org | 1-202-434-8757

Alliance to Prevent Legionnaires' Disease

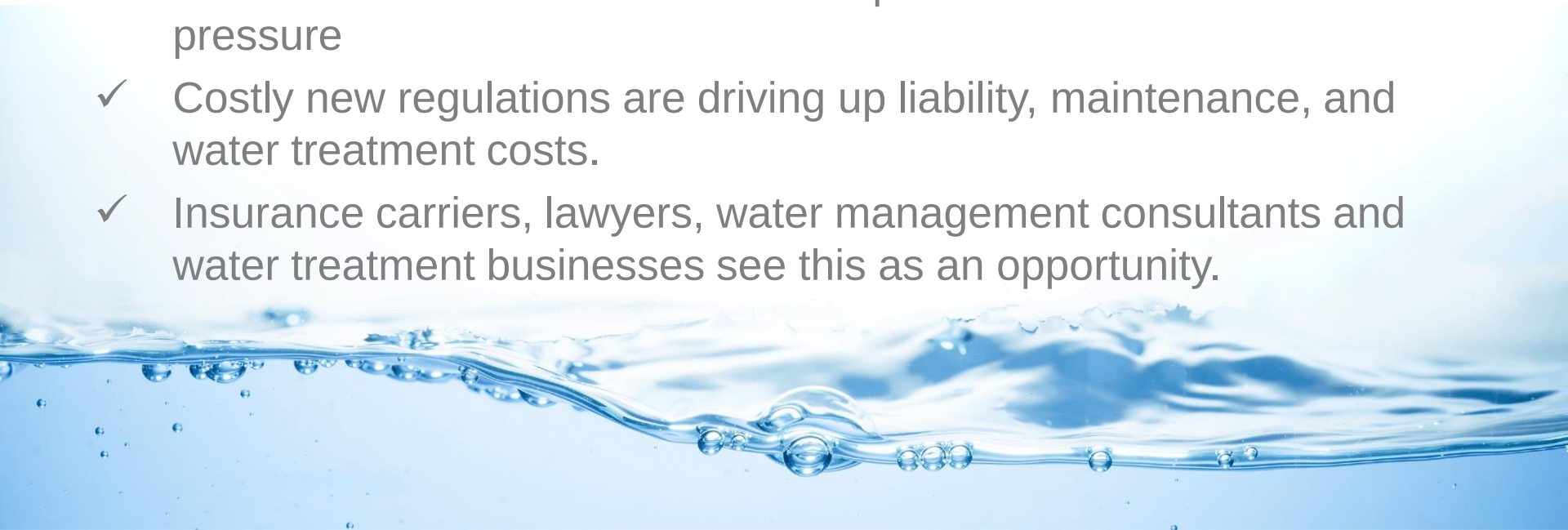
Mitigating Risk of Legionella Bacteria in Building Water Systems

Key Points

Building Owners and Engineers

Understand the Growing Risks

- ✓ Bacterial threats exist in the distribution system that delivers your water.
- ✓ Narrow investigations during outbreaks can leave you exposed to unsubstantiated claims of fault
- ✓ The public relations pressure during an outbreak is the most difficult time to address the issue as public officials feel the pressure
- ✓ Costly new regulations are driving up liability, maintenance, and water treatment costs.
- ✓ Insurance carriers, lawyers, water management consultants and water treatment businesses see this as an opportunity.



Building Owners and Engineers

Steps You Should Consider

- ✓ Plan ahead and voluntarily adopt best practices (S. 188 and CDC).
- ✓ Understand how the water system impacts your facility.
  - Monitor incoming water quality (ASHRAE S. 188)
- ✓ Build a working relationship with your water utility manager.
- ✓ Request in writing that your water utility manager notify you of all upsets and maintenance to the system
- ✓ Make a written request to local officials for notice of all reported cases of waterborne illness
- ✓ Support your local water utility manager in getting funding to upgrade the system and management tools

Education

Resources are available to learn more about *Legionella* Bacteria and Legionnaires' Disease

- ASHRAE Standard 188-2015
  - Ashrae.org
- CDC Toolkit
  - cdc.gov/legionella/maintenance/wmp-toolkit.html
- Cooling Technology Institute
  - cti.org
- Alliance to Prevent Legionnaires' Disease
  - Preventlegionnaires.org

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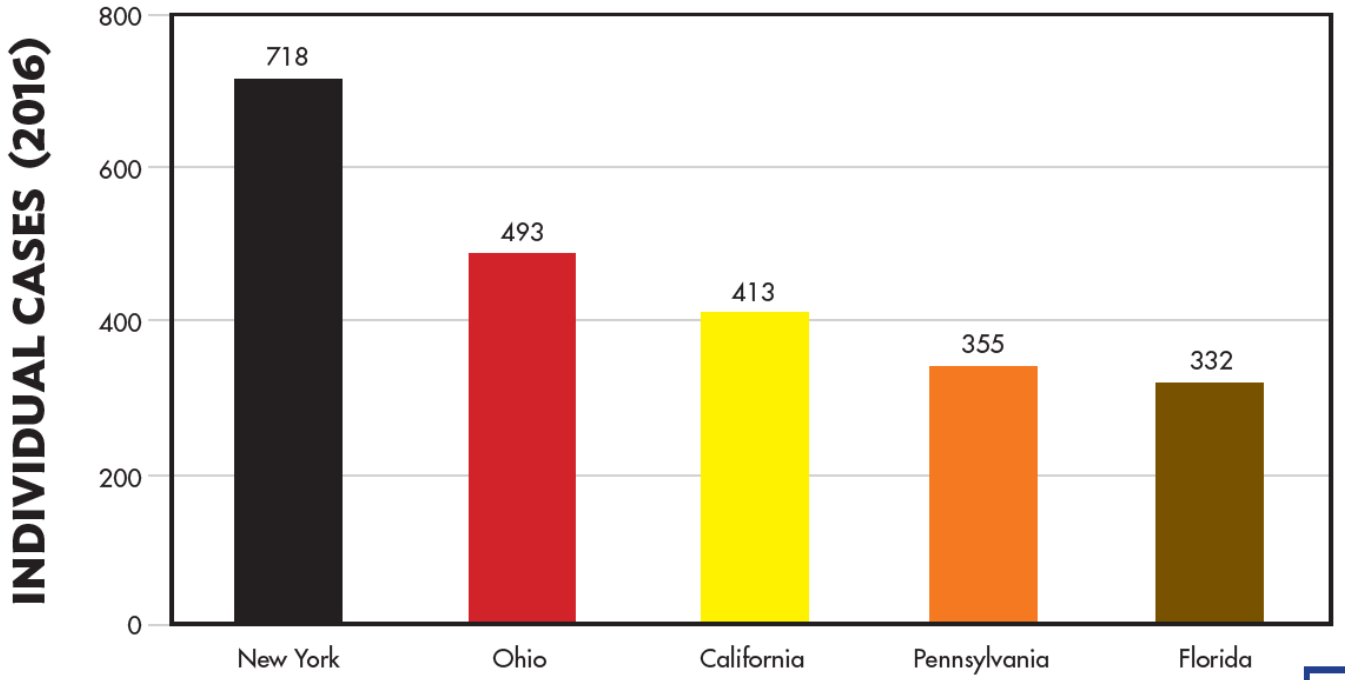
Legionnaires' Disease

Questions & Answers

CASES OF LEGIONNAIRES' DISEASE BY STATE

SOURCE: Center for Disease Control



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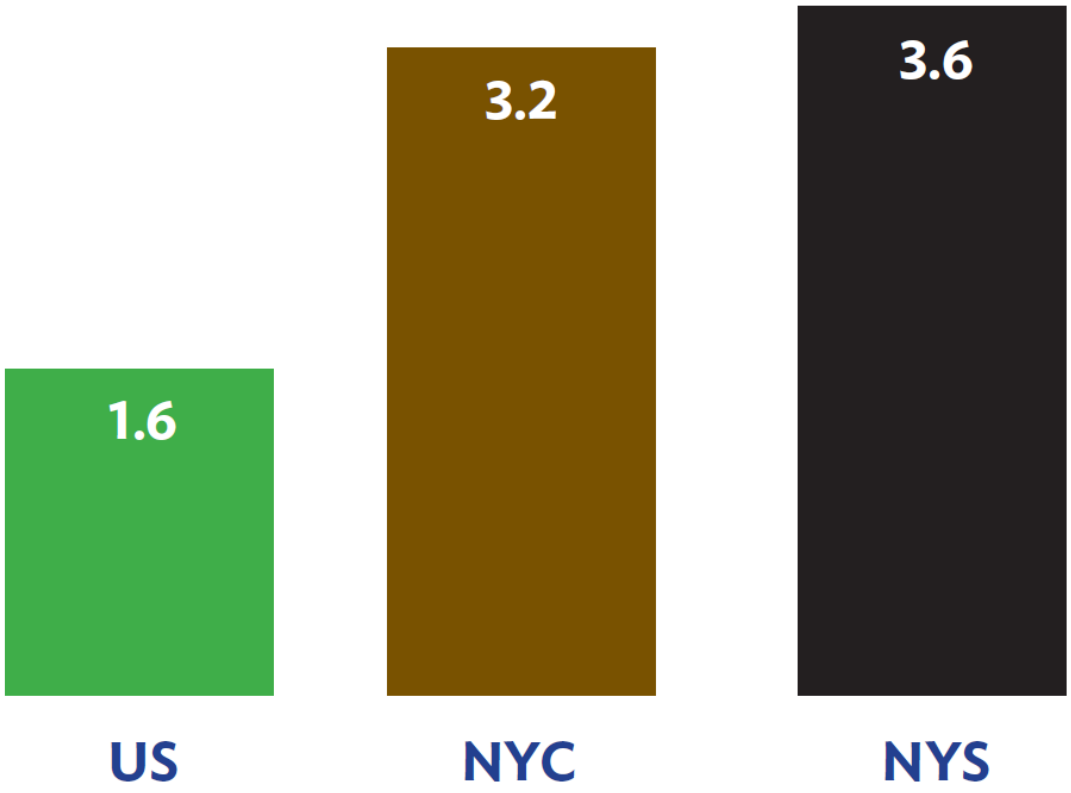
LEGIONNAIRES' DISEASE 2016
REPORTED CASES PER 100,000 POPULATION



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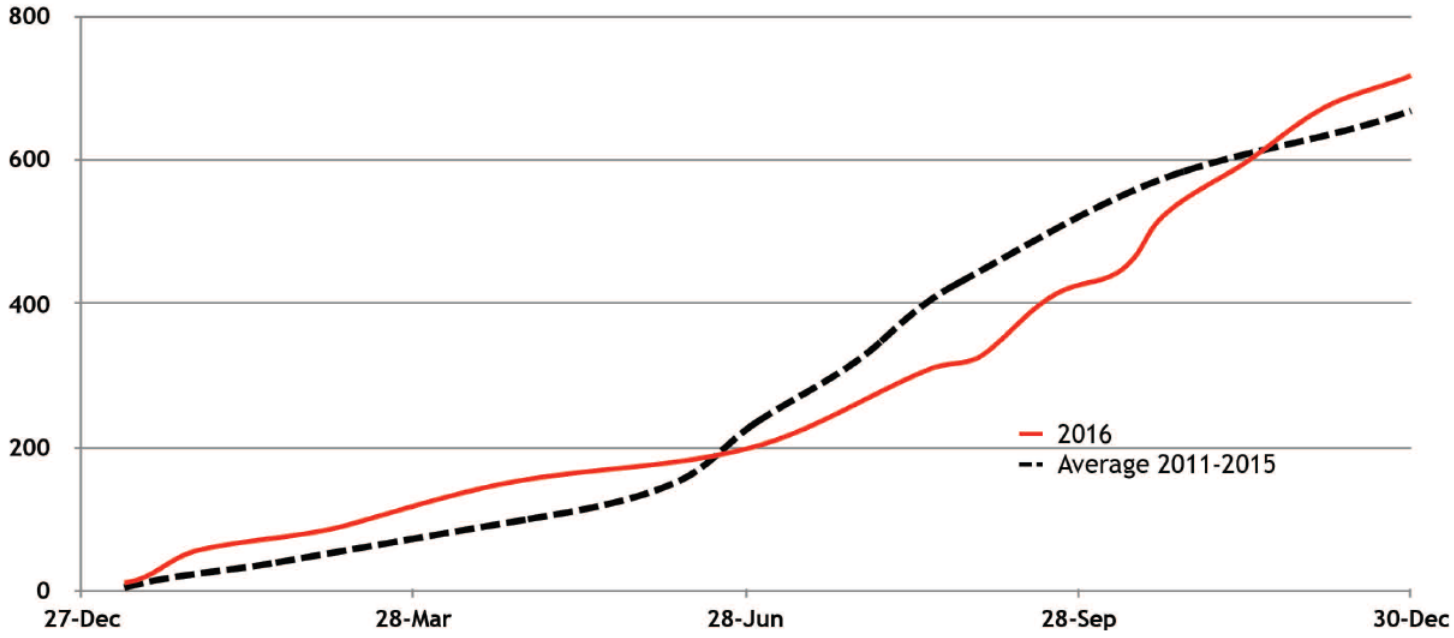
NEW YORK STATE REPORTED LEGIONELLOSIS
2016 COMPARED TO 5-YEAR AVERAGE



Current regulations have led to
NO CHANGE IN THE LEGIONNAIRES' DISEASE RATE

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Thank You!