Reducing Legionnaires' disease Risk through Public Private Partnerships

Disclaimer:

This presentation is intended to introduce you to general principles based on current guidance and suggested practices from government agencies and industry groups. As with any overview program, these materials and our guidance are general, and you should always consult your own advisors as appropriate for your circumstances.

Characteristics and Ecology of *Legionella*

Legionella Characteristics

- Aerobic
- Normal aquatic bacteria
- Gram-negative (do not stain well)
- Nonspore-forming
- Flagellated
- Pleomorphic
- Facultative intracellular bacteria
- The causative agent of legionellosis including:
  - Legionnaires' Disease (*Legionella* pneumonia)
  - Pontiac fever

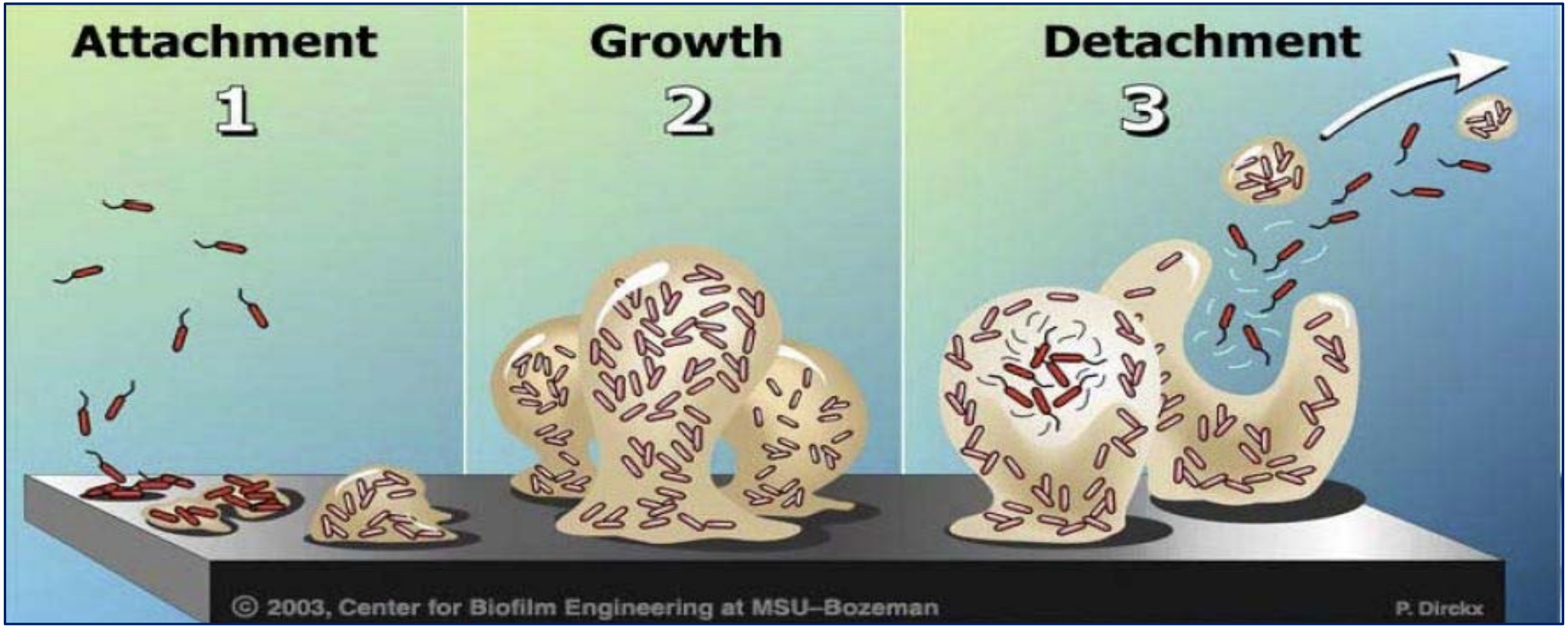
Where *Legionella* live

Potable Water

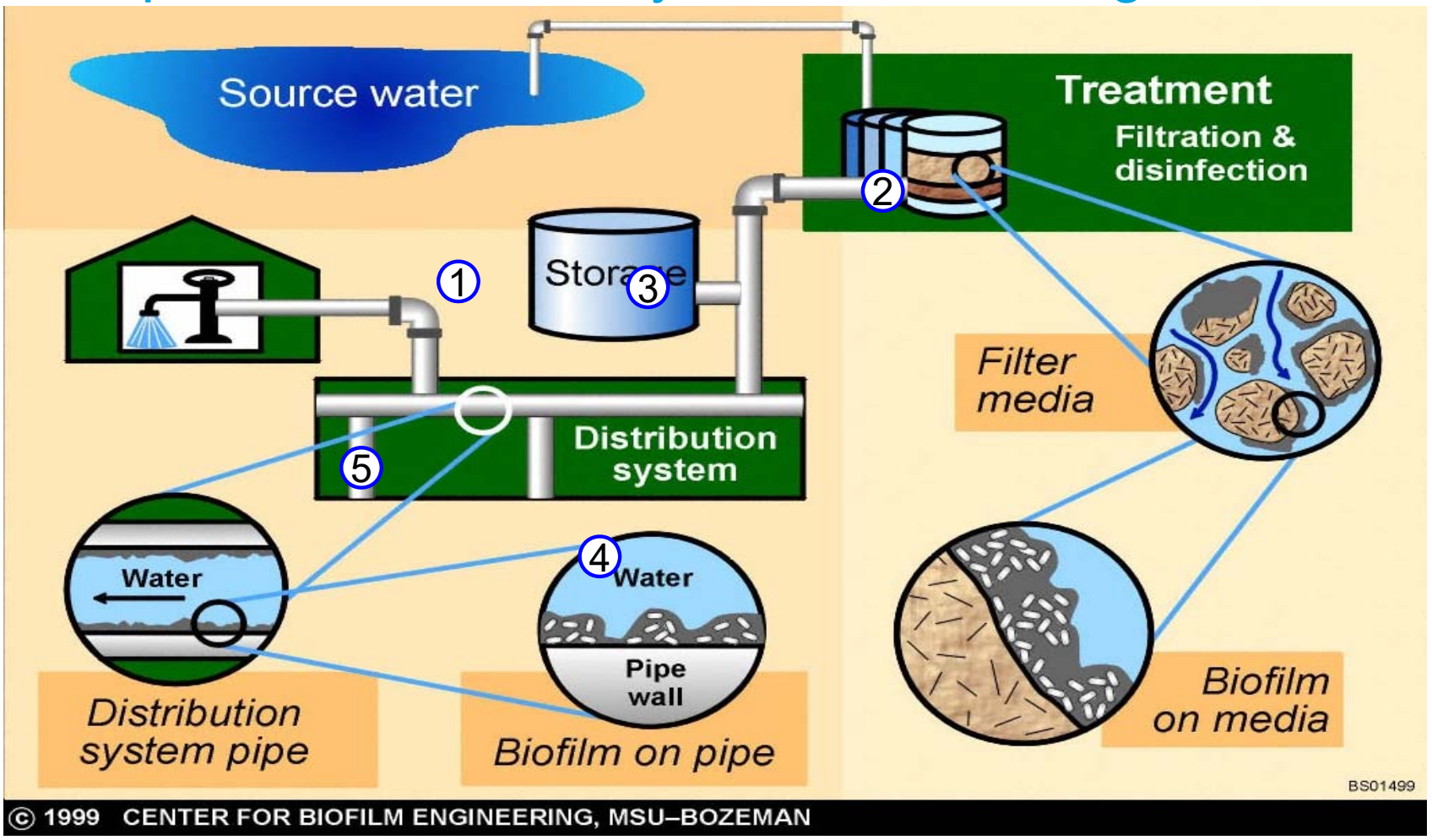
Hot Water and Cold Water

Nonpotable Water

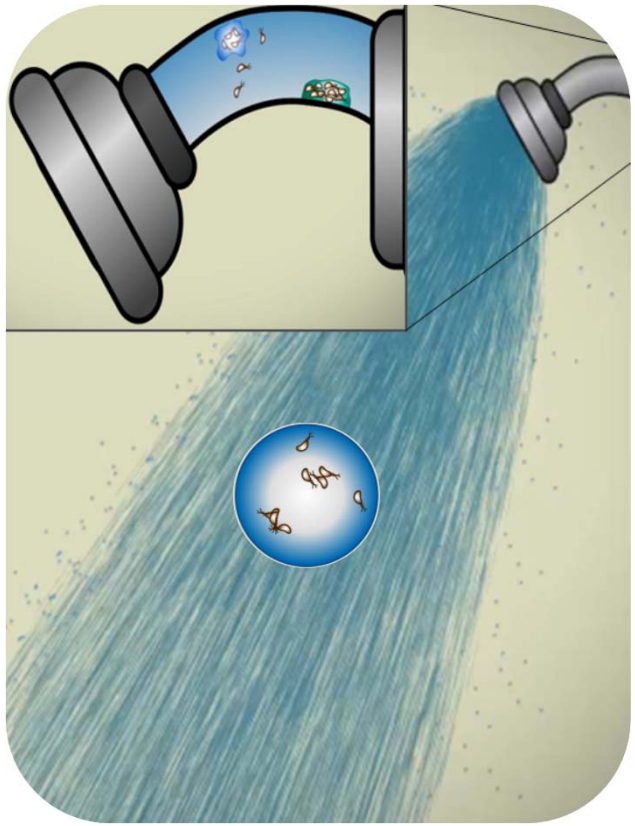
Biofilm harbors bacteria, including *Legionella*



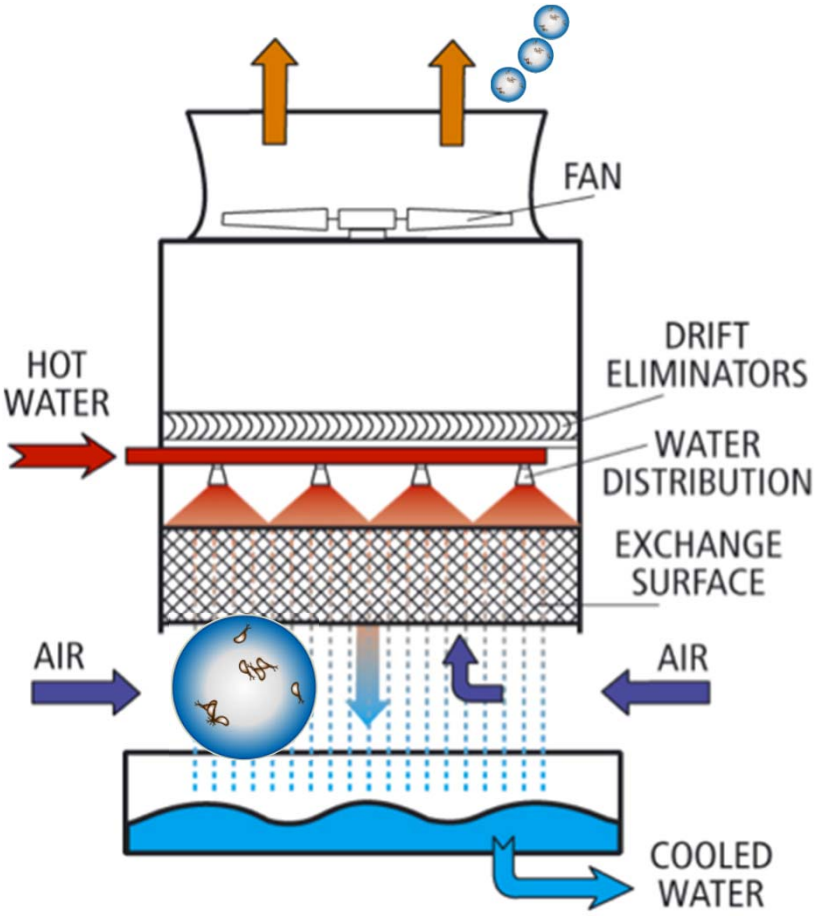
Biofilm is pervasive, not easily removed and regrows



Infectivity – *Legionella* Aerosolization

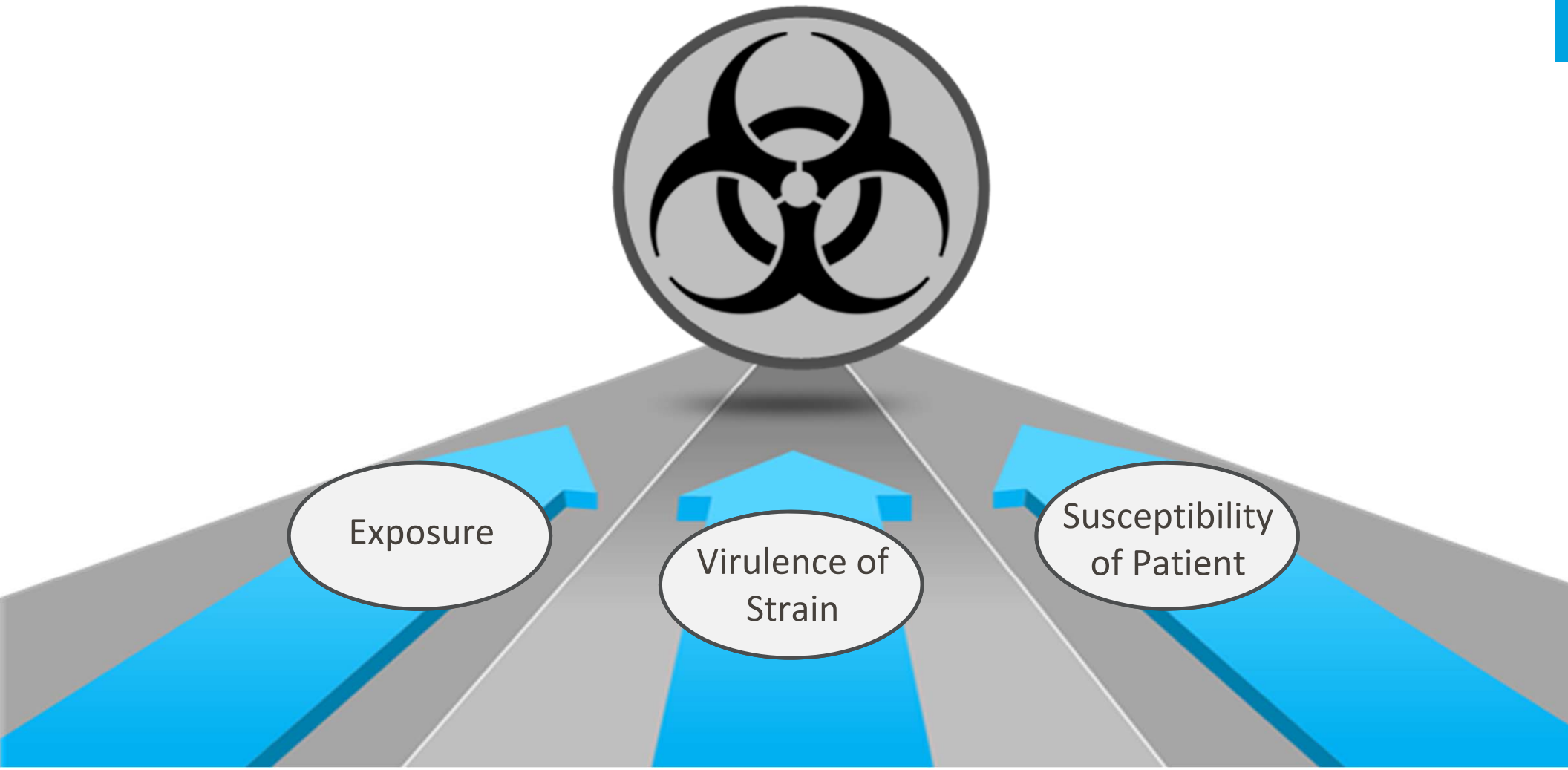


Shower aerosol



Cooling tower aerosol

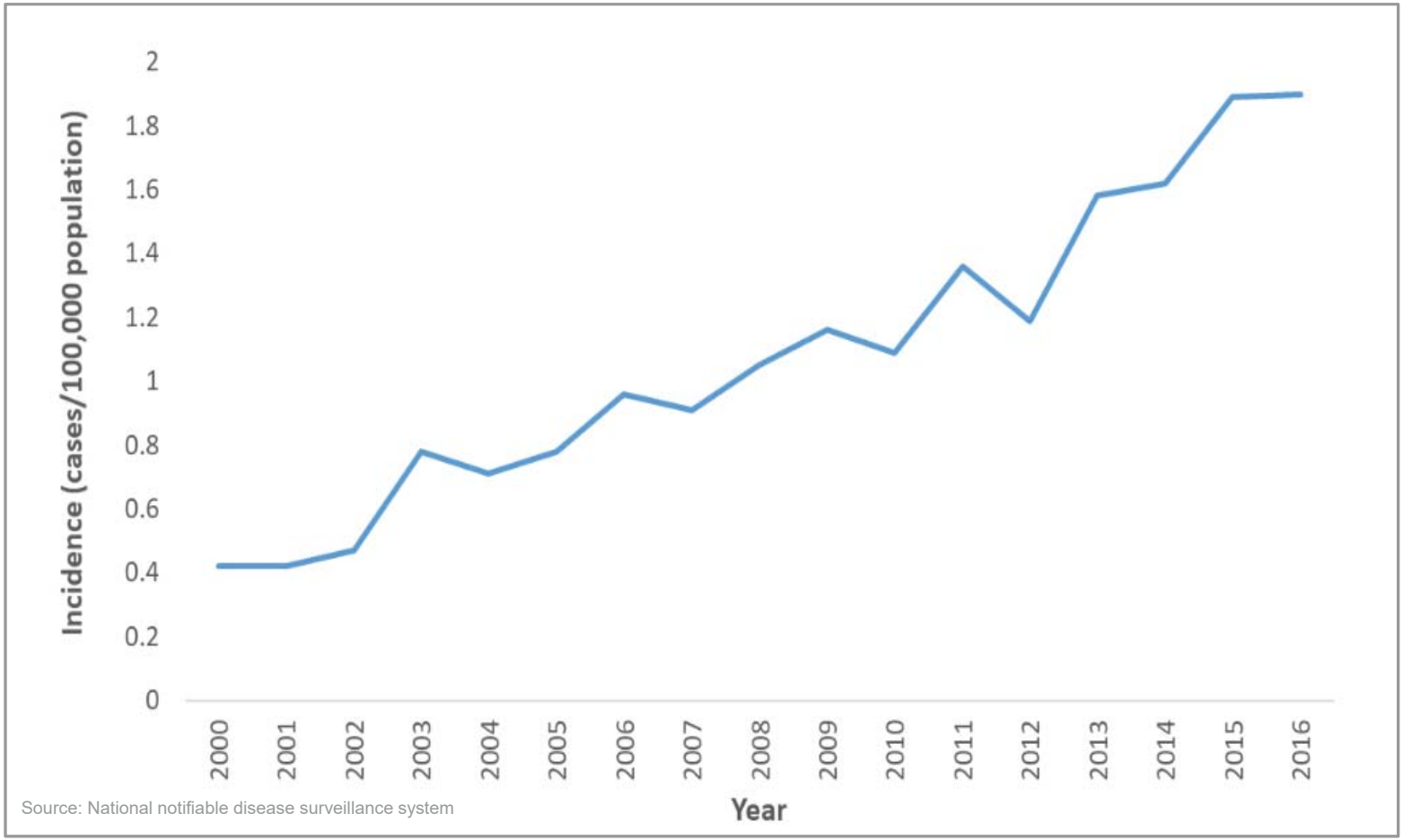
Infectivity Risk Factors – Need All 3



Why A Public Health Focus On Legionnaires' disease **Prevention**?

Legionnaires' disease is on the rise

- Reported cases have increased more than 550% in the last 15 years
- 8,000 to 18,000 people contract legionellosis in the U.S. each year (est.)
- ~10% of known cases are fatal, but **25%** if contracted in healthcare setting



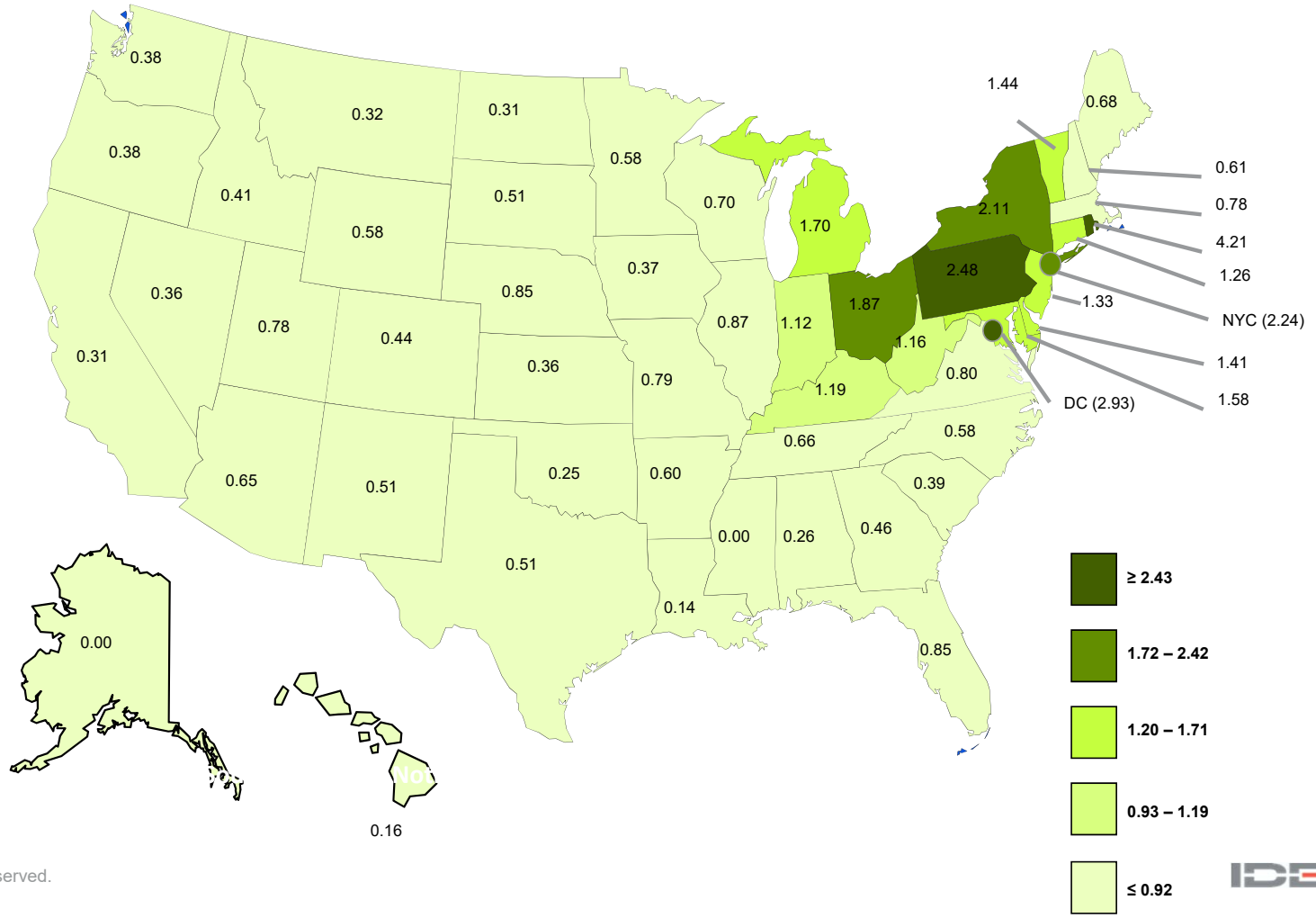
Source: National notifiable disease surveillance system

Legionellosis: US case rates 2007

Reported cases by state

2007

Cases/100,000 population

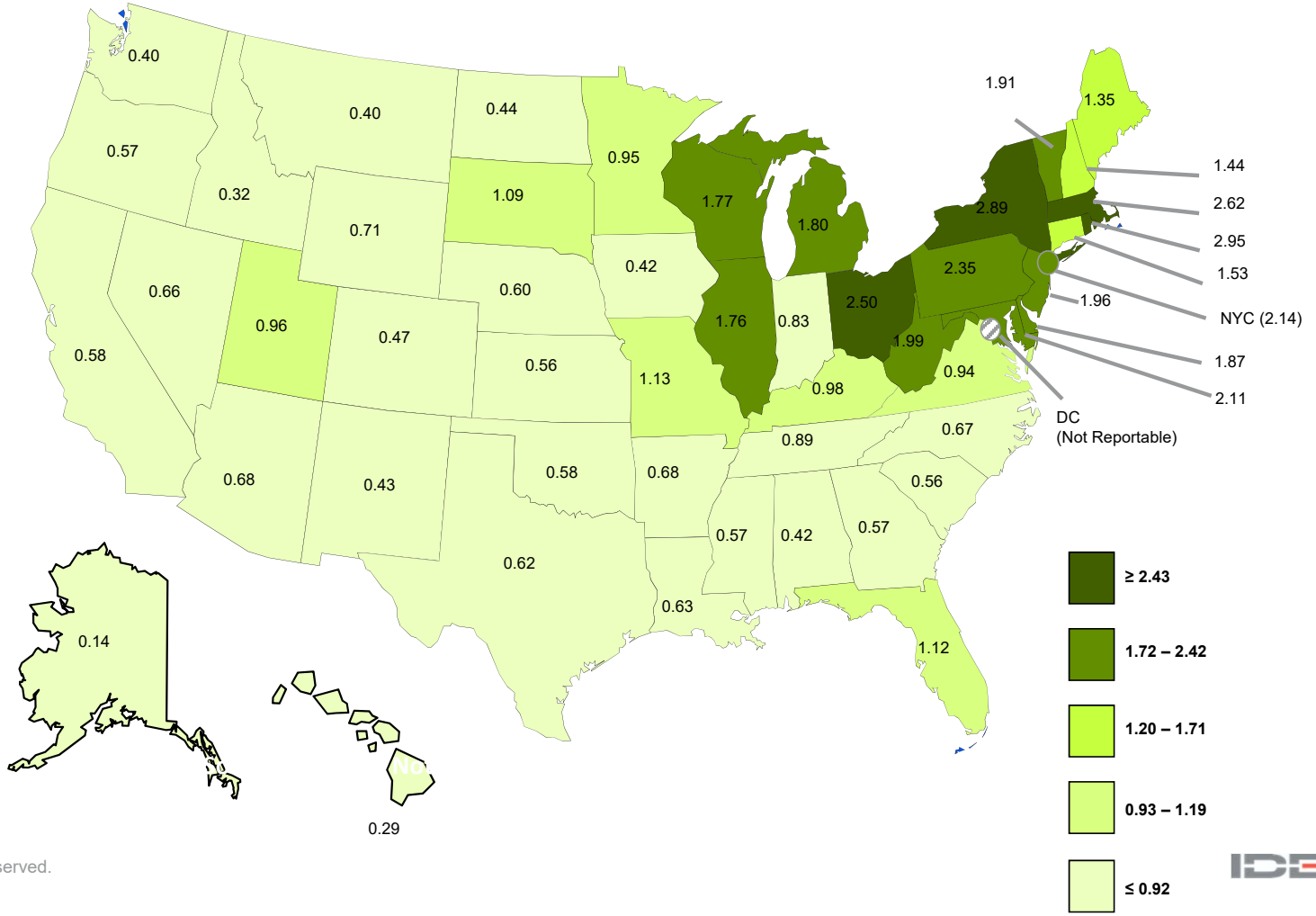


Legionellosis: US case rates 2012

Reported cases by state

2012

Cases/100,000 population

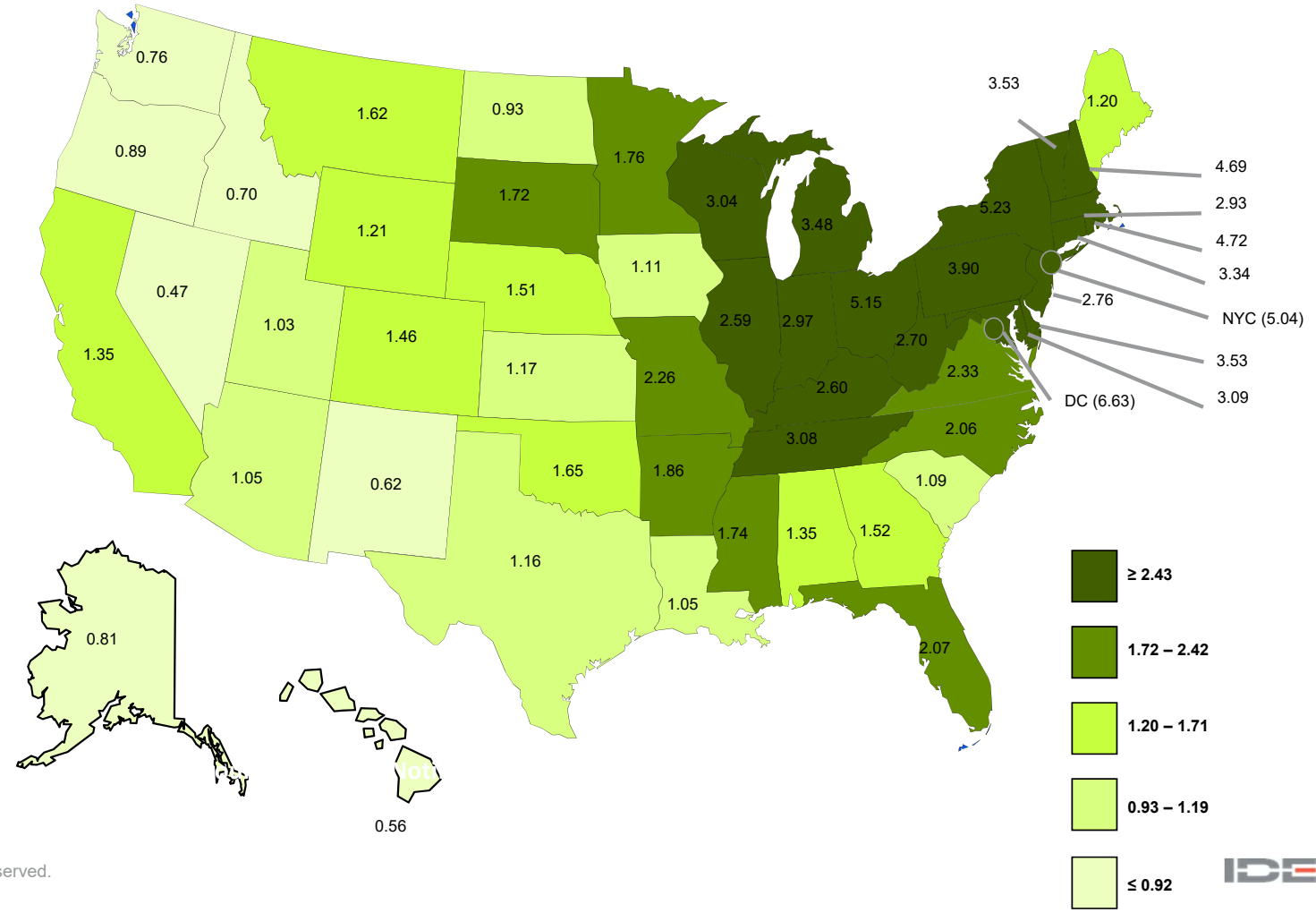


Legionellosis: US case rates 2017

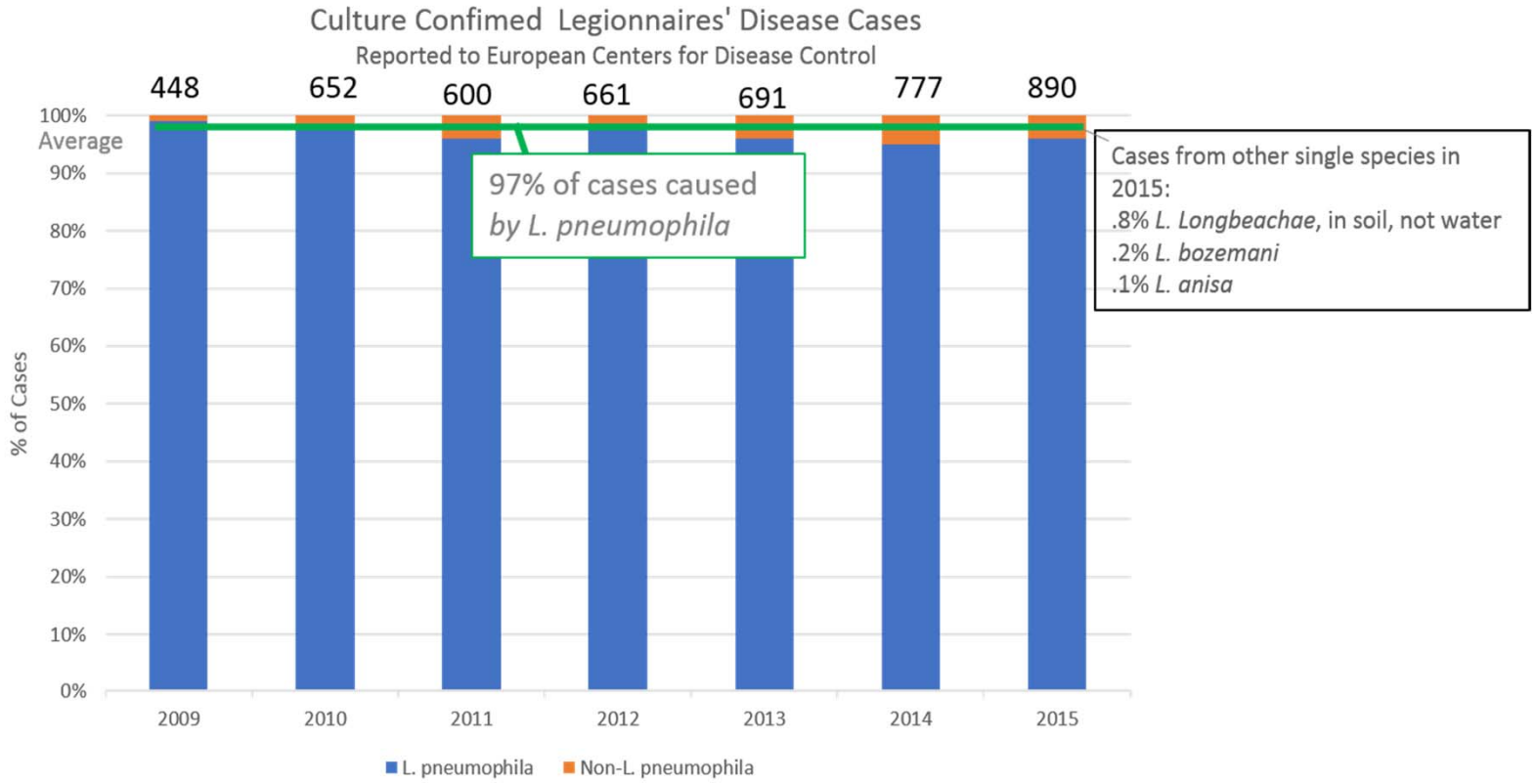
Reported cases by state

2017

Cases/100,000 population



L. pneumophila is the cause of 97% of Legionnaires' disease cases

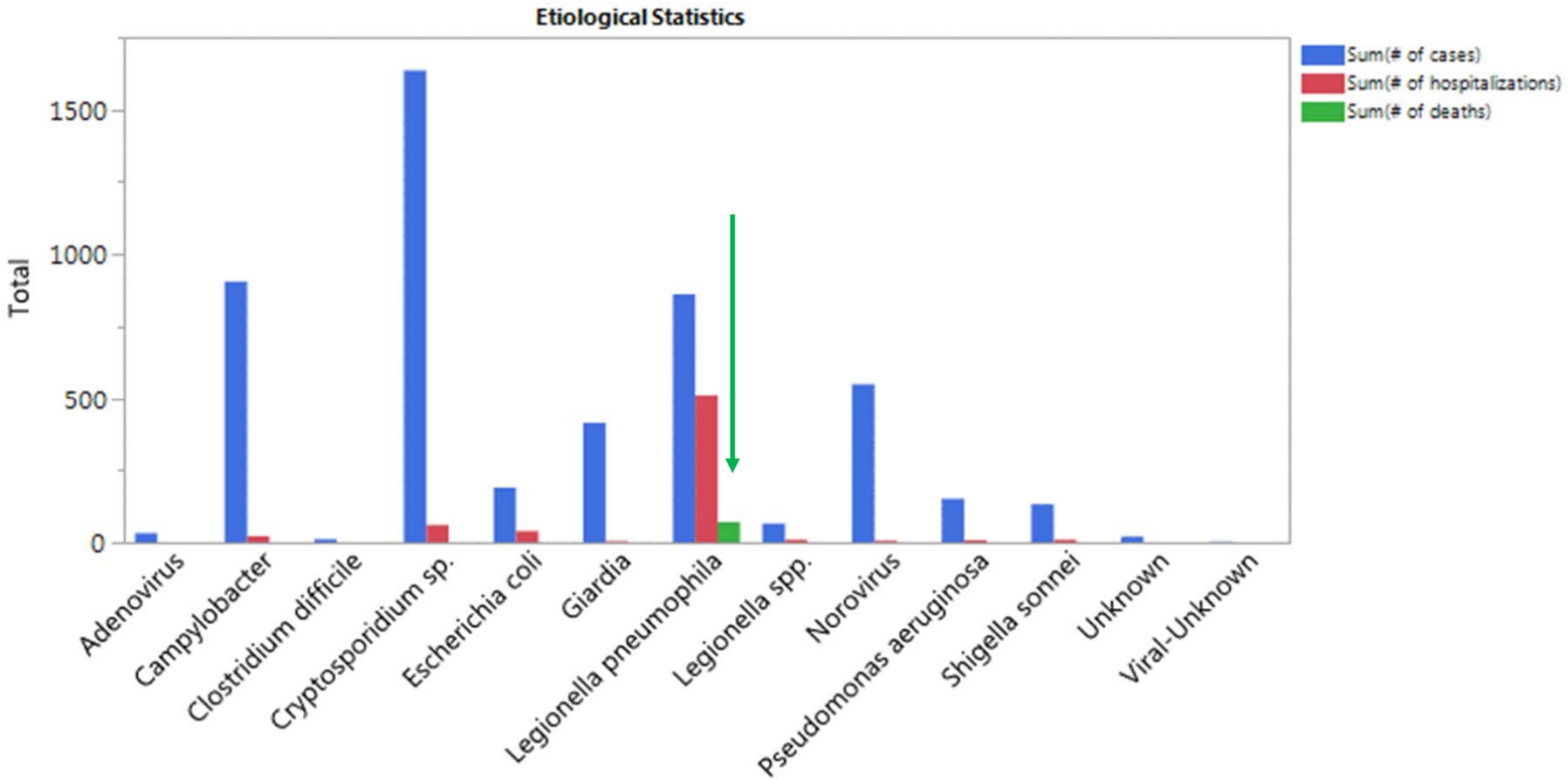


Data from clinical cultures of 4,719 patients over seven years in 17 countries

Source: https://ecdc.europa.eu/en/publications-data/legionnaires-disease-europe-2015

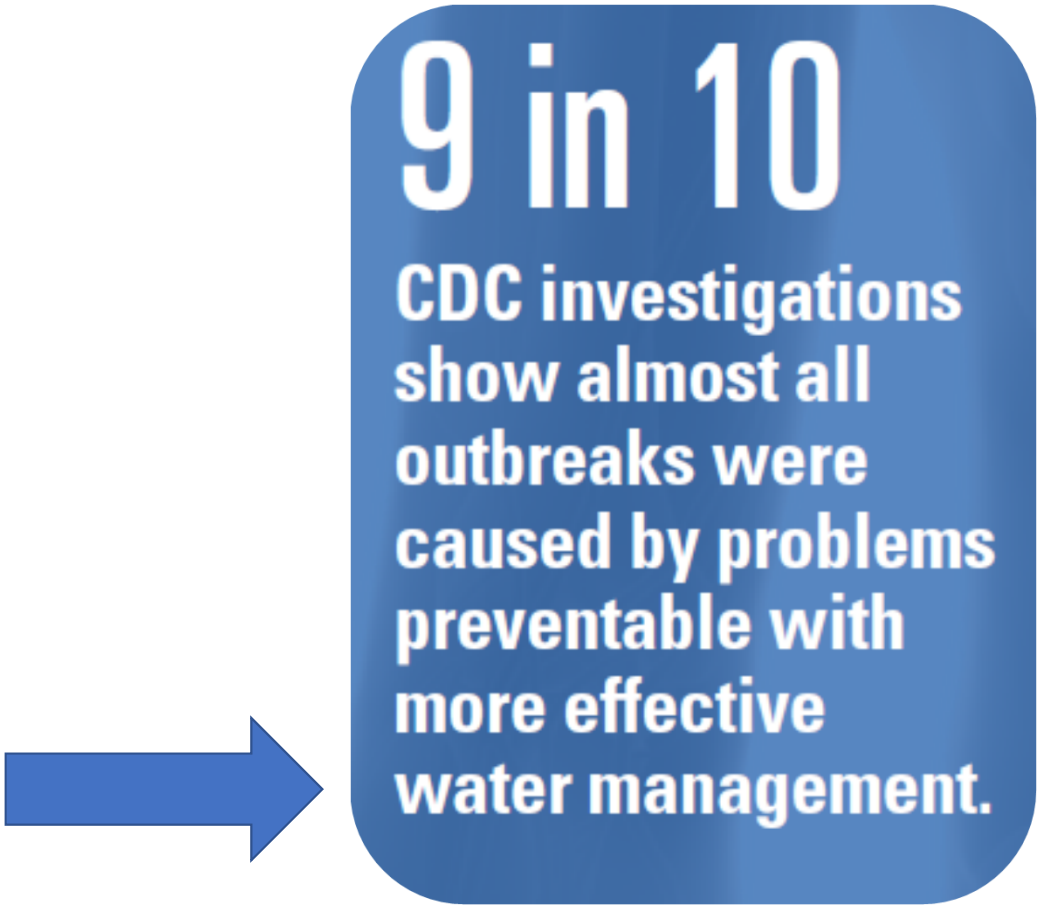
L. pneumophila is the most dangerous waterborne pathogen

Waterborne outbreaks associated with drinking water, 2013-2014



Benedict KM, Reses H, Vigar M, et al. Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2013–2014. MMWR Morb Mortal Wkly Rep 2017;66:1216–1221

Legionnaires' disease is **very, very** preventable



Adapted from CDC *vital*Signs June 2017
https://www.cdc.gov/vitalsigns/pdf/2017-06-vitalsigns.pdf

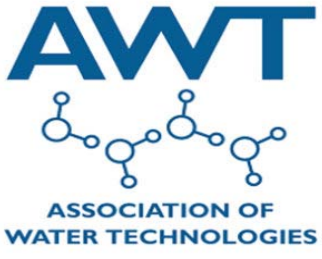
Water Management Plan

Acme Hotel
Main Street
Portland

Updated May 20, 2019

We **know** what to do **to save lives!**

Many organizations have rules or guidance on managing *Legionella* pneumonia

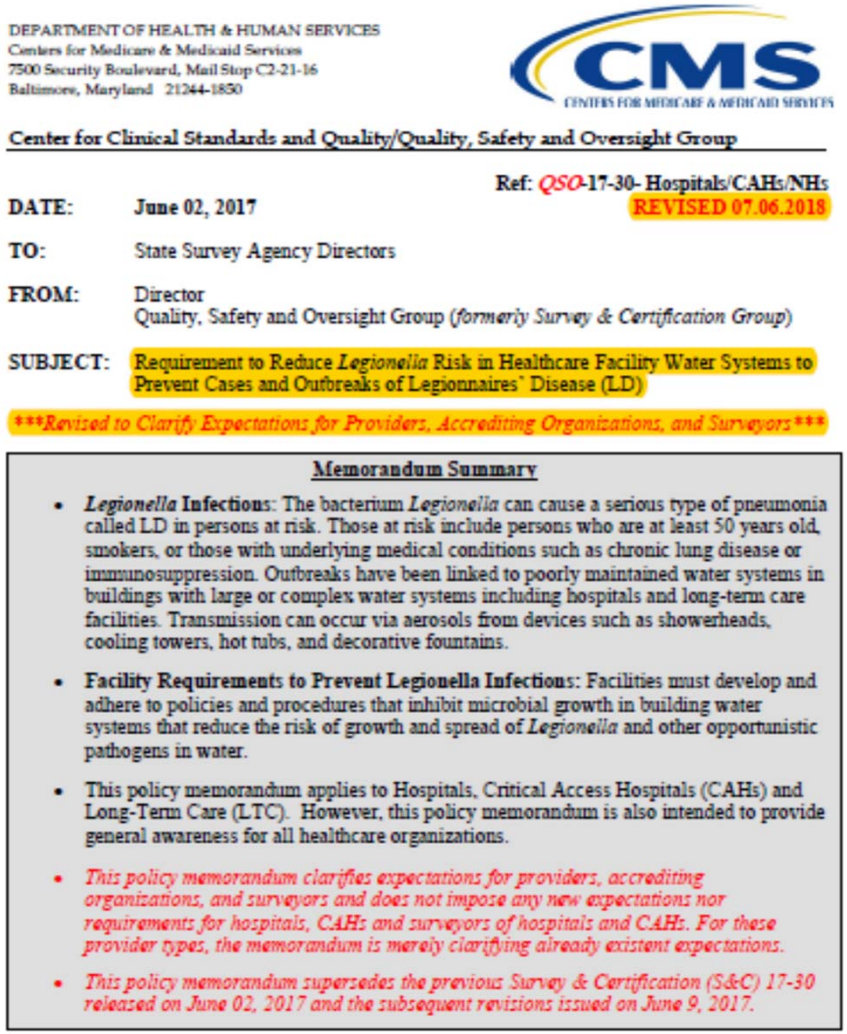


Centers for Medicare & Medicaid Service (CMS) Memo

Memo June 2017
Updated July 2018

Sent to:
State Survey Agency Directors

Subject:
Requirement to Reduce *Legionella* Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)



DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C2-21-16
Baltimore, Maryland 21244-1850

CMS
CENTERS FOR MEDICARE & MEDICAID SERVICES

Center for Clinical Standards and Quality/Quality, Safety and Oversight Group

Ref: *QSO*-17-30- Hospitals/CAHs/NHs
REVISED 07.06.2018

DATE: June 02, 2017

TO: State Survey Agency Directors

FROM: Director
Quality, Safety and Oversight Group (*formerly Survey & Certification Group*)

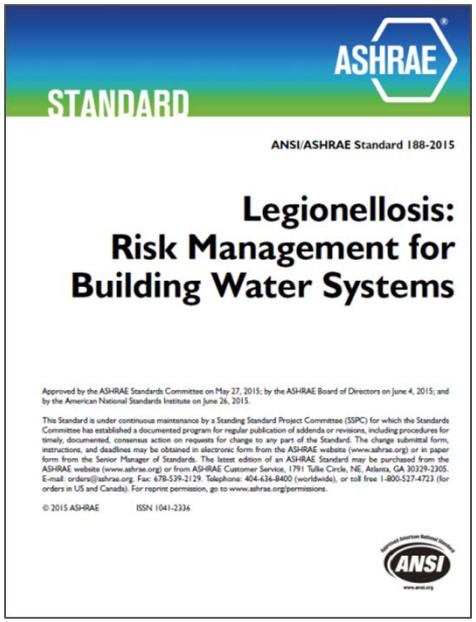
SUBJECT: Requirement to Reduce *Legionella* Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)

****Revised to Clarify Expectations for Providers, Accrediting Organizations, and Surveyors****

Memorandum Summary

- ***Legionella* Infections**: The bacterium *Legionella* can cause a serious type of pneumonia called LD in persons at risk. Those at risk include persons who are at least 50 years old, smokers, or those with underlying medical conditions such as chronic lung disease or immunosuppression. Outbreaks have been linked to poorly maintained water systems in buildings with large or complex water systems including hospitals and long-term care facilities. Transmission can occur via aerosols from devices such as showerheads, cooling towers, hot tubs, and decorative fountains.
- **Facility Requirements to Prevent Legionella Infections:** Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in water.
- This policy memorandum applies to Hospitals, Critical Access Hospitals (CAHs) and Long-Term Care (LTC). However, this policy memorandum is also intended to provide general awareness for all healthcare organizations.
- *This policy memorandum clarifies expectations for providers, accrediting organizations, and surveyors and does not impose any new expectations nor requirements for hospitals, CAHs and surveyors of hospitals and CAHs. For these provider types, the memorandum is merely clarifying already existent expectations.*
- *This policy memorandum supersedes the previous Survey & Certification (S&C) 17-30 released on June 02, 2017 and the subsequent revisions issued on June 9, 2017.*

ASHRAE 188:2018 Standard and the CDC Tool Kit: Resources to create water management plans



ASHRAE 188

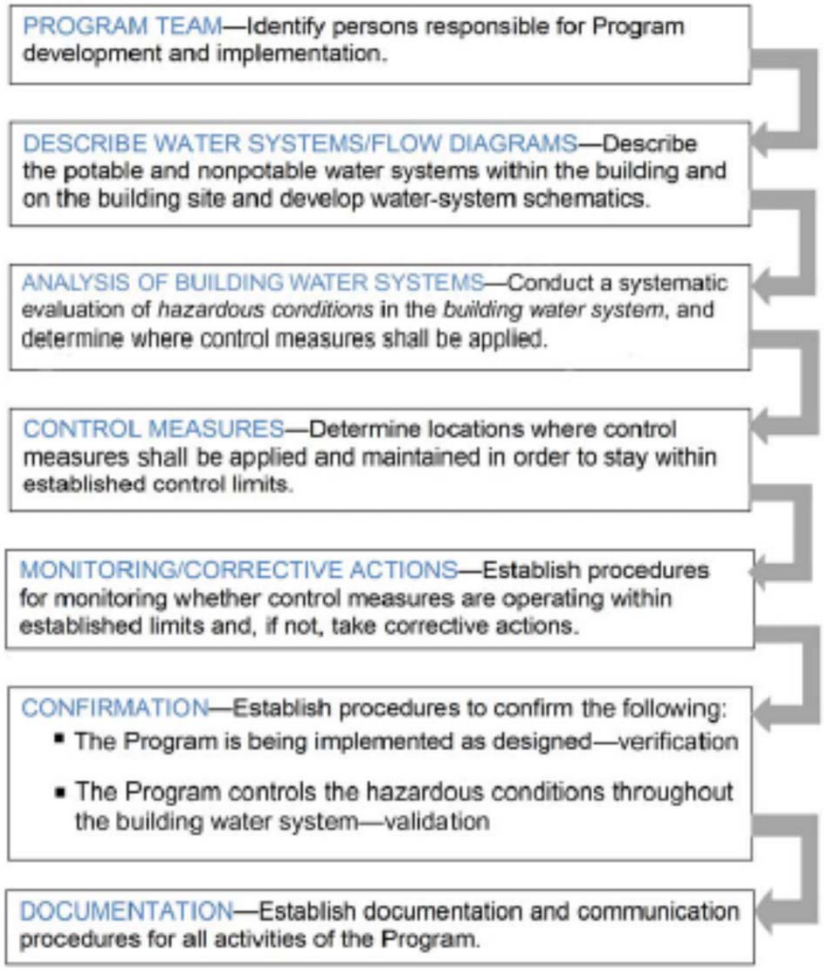
- First NA standard
- Only ANSI Accredited Standard
- Consensus view of the best practices for managing Legionnaires' risk in building water systems
- Recommended Water Safety Plan
- Testing specific section

CDC Toolkit

- Yes/No Worksheet for risky building areas
- Walk through of *Legionella* mgmt. program
- Example problem scenarios
- Healthcare-specific guidance

Water management planning – 7 core activities ASHRAE 188

1. Establish Team
2. Describe System
3. Assess Risk
4. ID Controls
5. Monitor/Correct
6. Verify/Validate
7. Document



But healthcare facilities still have questions about reducing Legionnaires' disease risk

Healthcare Facilities are asking:

- What is a water management plan (WMP)?
- Who's involved in writing a WMP?
- Who can help me?
- Do I have to perform water testing?

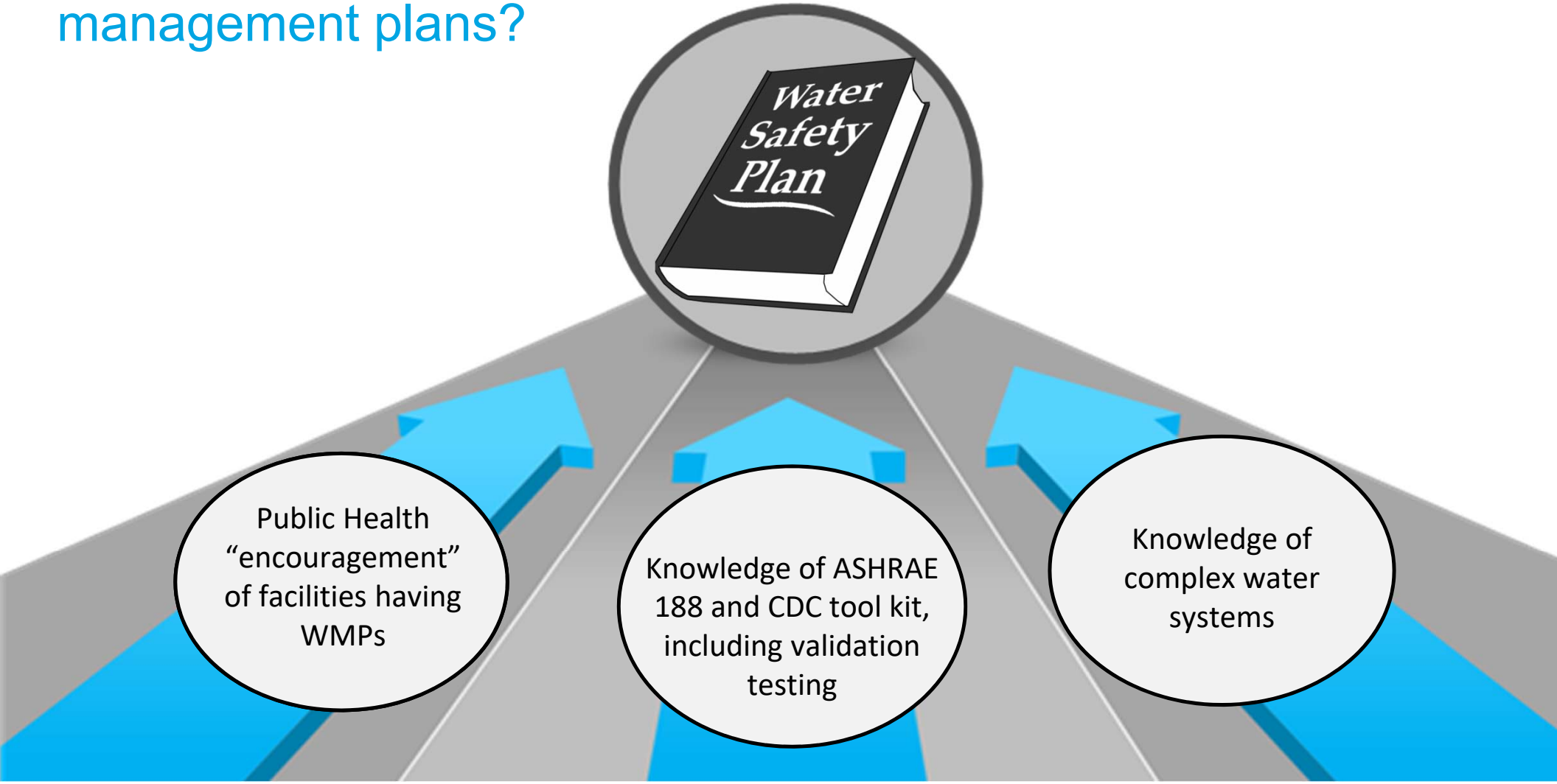
Public Health can offer advice, *if that competency is available* ***internally***, ….. but what if it isn't?

Public Health Laboratories' Roles in Reducing Legionnaires' disease

Clinical and environmental laboratories work together in Legionnaires' disease cases and outbreaks

What about **prevention** of Legionnaires' disease?
Does the public health team have expertise there?

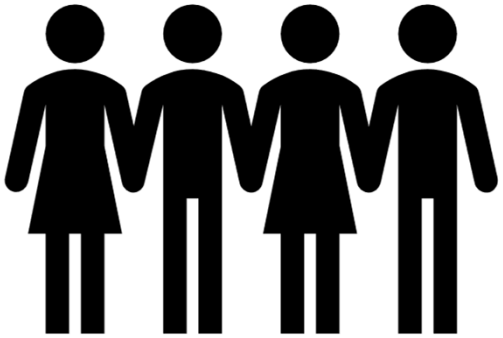
What is needed to drive successful implementation of water management plans?



Public Health has the standing and the relationships to deliver a powerful Legionnaires' disease prevention message

- Local health officials
- Covered hospitals
- Covered long-term care facilities
- Retirement communities
- Hotel and resort facilities
- Local employers and building owners

Public Heath teams are excellent resources for disease prevention information



- ✓ Epidemiologists
- ✓ Infection preventionists
- ✓ Communication and outreach specialists
- ✓ Trainers
- ✓ Clinical laboratorians
- ✓ Environmental laboratorians
- ✓ And more

Healthcare facilities **need cross-functional education** to write and implement effective water management plans

Example

Skilled Nursing Facilities Are Not Prepared

Los Angeles County (LAC) has 317 freestanding skilled-nursing facilities (SNFs). The LAC Department of Public Health (DPH) conducts approximately 3 healthcare-associated Legionnaires' Disease investigations annually. Anecdotally, LAC DPH observed that most SNFs did not have a water management plan to prevent *Legionella* growth and that most SNF administrators did not know about *Legionella* as a health concern.

- Average 3 outbreaks per year
- Little to no awareness of Legionnaires' disease
- 65% of SNF personnel expected to participate in creating Water Management Plans rated their knowledge as "Low" (pre-educational workshop survey)

Education is the key to getting **any facility** to write and implement a water management plan

Facility owners and managers need to know:

- ✓ Why a water management plan is necessary
- ✓ The 7 steps of water management planning according to ASHRAE 188 and CDC Toolkit
- ✓ Who should participate on the water management team and what role each should play
  - o How to find and/or choose the right consultants
  - o How to assess the water system for risk
- ✓ How to choose a testing laboratory
- ✓ How and where to sample the water
  - o How and where to implement water treatment, if needed
- ✓ Who to reach out to at public health is a case or outbreak is identified

Public Heath environmental **laboratories** are a resource
They can provide guidance on environmental monitoring

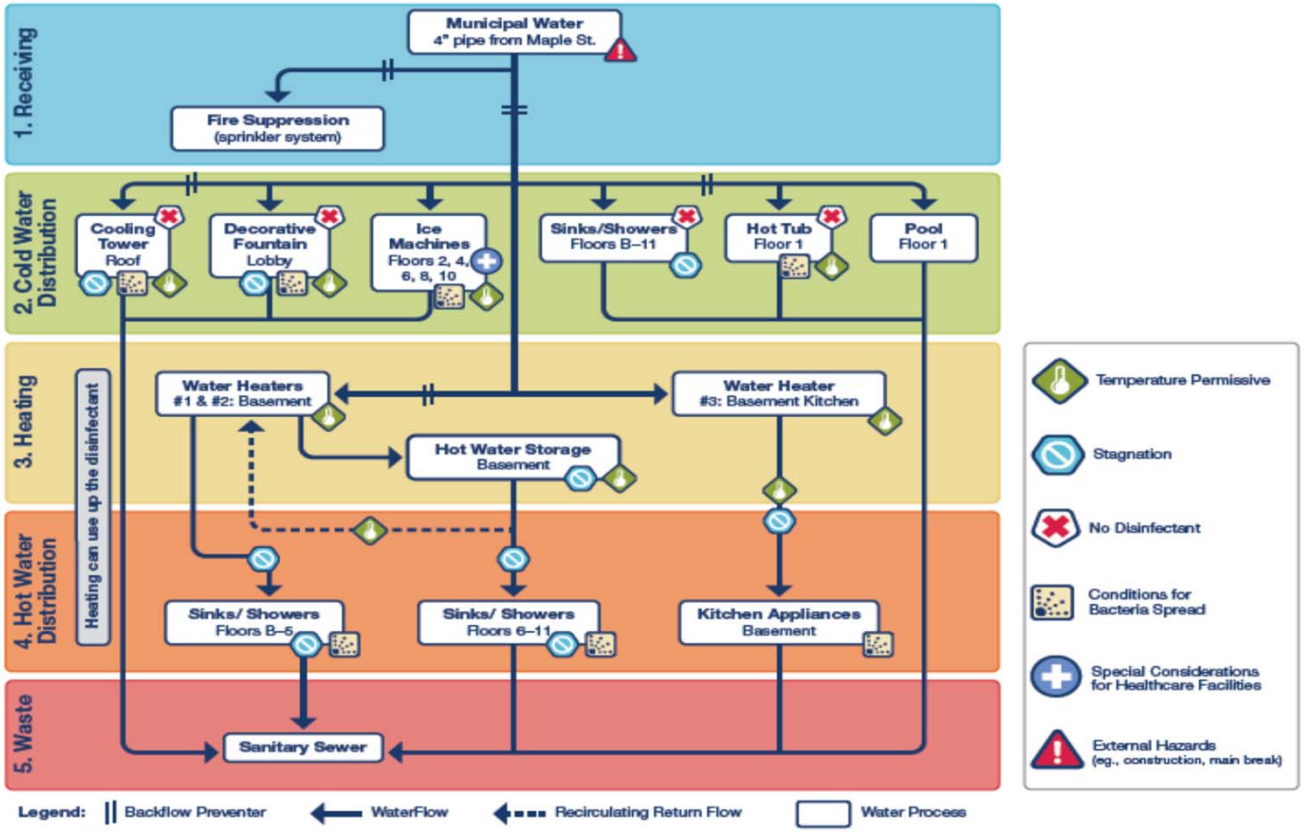
Explain the value of routine testing for *L. pneumophila* as the validation step to

1) ensure the Water Management Plan is effective and
2) to be able to adjust the plan as needed

Recommend using **accredited** laboratories for testing, per updated ASHRAE 188 Annex

Offer advice or first-hand experience for choosing between different culture testing methods, explain the value of having a viable isolate, etc.

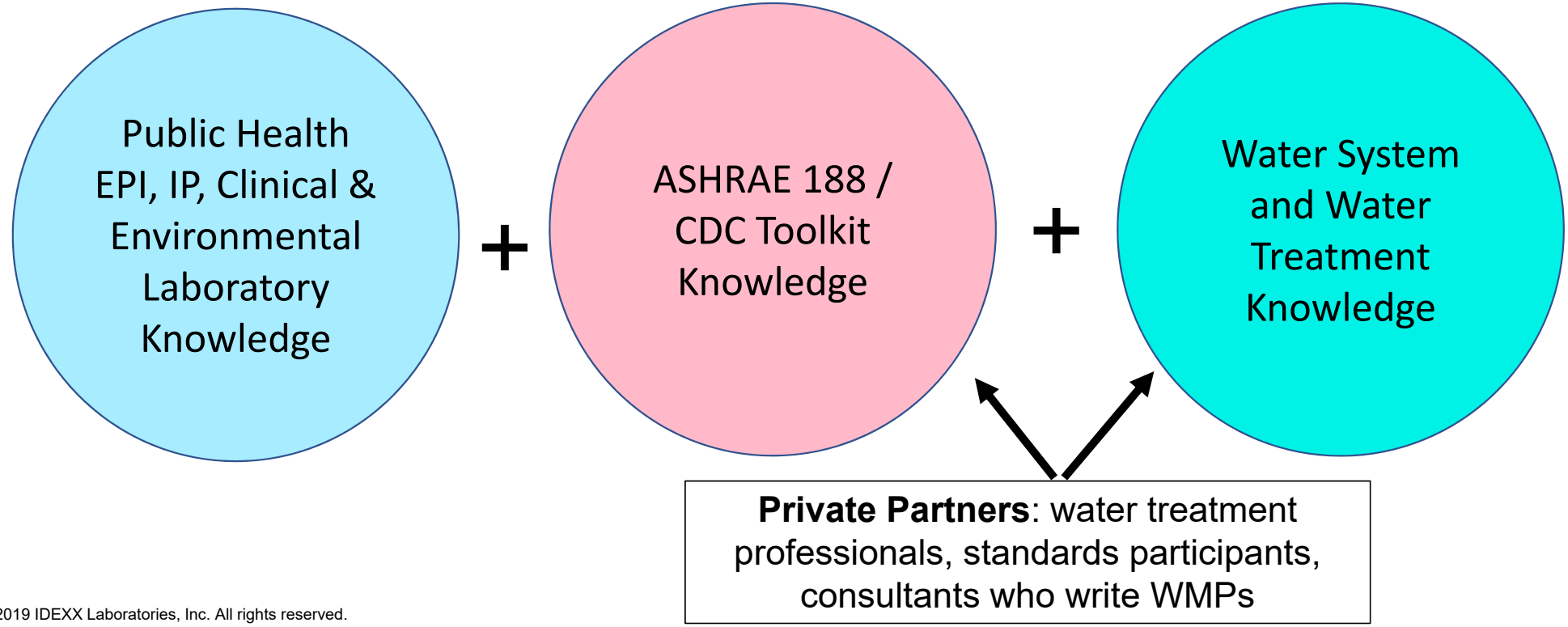
Beyond testing, ***understanding complex water systems*** **is not** a traditional public health core competency



Public Private Partnerships Can Help

Public private partnerships can create valuable learning opportunities

Public health can get help from industry and key, subject matter experts to provide training to healthcare on effective water management planning.



LA County SNF education initiative feedback

- ✓ 100% of attendees reported their understanding of WMPs increased
- ✓ 100% of attendees would recommend the training to a peer

"I got a greater understanding of what to do and how to start Water Safety Management Planning in my facility"

Cross-functional education seminars work

A LA County SNF survey was repeated 3 months after the training.
Among the 32 facilities that responded to the survey and attended the training:

- 81% of respondents correctly identified that *Legionella* bacteria can grow in facility water systems and cause infections (up from 41%)
- 28% indicated that they now had a water management plan

Conclusion

- Offering water management training by experts is an efficient method of increasing knowledge among a large group of attendees.
- **However**, additional follow-up, such as technical assistance, might be necessary to increase implementation of effective WMPs

Keys to success

Adapt your format to your educational goal and audience

- ✓ Offer tailored training to subsets within healthcare: hospitals, skilled nursing, etc.
- ✓ Reach out to other public health offices providing training
- ✓ Consider inviting multiple stakeholders in a given community (water utility, cooling tower owners, regulators, JCAOHA accreditors etc.)
- ✓ Include in other professional development programs

Leverage **private partners who have experience** in water management planning

- ✓ Individuals with experience applying ASHRAE 188 and CDC Toolkit requirements

Request help from **subject matter experts** in water quality and treatment

- ✓ Water treatment, private water testing laboratories, public utilities

Provide connections to outside resources that can help the attendees take the steps to actually write and implement a WMP

Water Management Planning resources

- **Association of Water Technologies** (AWT) Certified Water Treaters list WWW.AWT.org and a list of accredited testing laboratories
- **HC Info:** WSM Templates, checklists & technical information https://hcinfo.com/home/
- **ASHRAE:** Guidance on Reducing the Risk of Legionella www.ASHRAE.org
- **Centers for Disease Control (CDC):** Information on Legionella and the CDC Tool Kit www.cdc.gov/legionella
- **IDEXX:** information on *L. pneumophila* and a directory of testing laboratories www.idexx.com/findlp
- Your local **water utility** and/or water provider

Water management education through PPP works – for everyone

- Water management planning educational sessions have been successful.
- Reaching out to industry and creating PPP can lead to *effective* water management within healthcare and other buildings.

Questions?
Answers?