



‘Legionella Focus and the Regulatory Landscape since ASHRAE Standard 188’

March 14, 2019 / Greensboro, NC

Bill Pearson, CWT – *BPEARSON* Consulting LLC / ASHRAE SSPC 188, Vice Chair



Bill Pearson, CWT



W.E. (Bill) Pearson II, CWT

BPEARSON Consulting LLC /
Arthur Freedman Associates, Inc.

Contact Information ...

Phone: 919.880.0829

Email: bpearson249@icloud.com

EXPERTISE AND SKILL:

➤ **WATER TREATMENT – Certified Water Technologist (CWT)**

- Cooling Towers/Process waters, Closed Loop Systems, Boiler Water Systems,
- Water Treatment Chemistry: Formulations / Scale, Corrosion & Microbial Control

➤ **LEGIONELLA – SME**

- Consultant / Expert Witness
- ASHRAE SSPC-188 / Legionella Standard, Vice Chair
- AWT Legionella Task Force, Chair
- AWT Legionella Guideline, author
- CTI GDL-159 / Legionella Guideline, Chair
- 'Legionella Water Management Specialist' / ASSE Qualifications Working Group

PROFESSIONAL BACKGROUND:

- Special Pathogens Laboratory: Sr. VP Business Development / Apr'16-Dec'17
- Southeastern Laboratories, Inc: VP Consulting & Technical Services / Sep'75-Mar'16
- Association of Water Technologies (AWT): Past President (2003)
- AWT / Ray Baum Memorial Water Technologist of the Year Award (2005)
- BS Biology / Medical Biochemistry

Disclosures / Disclaimer

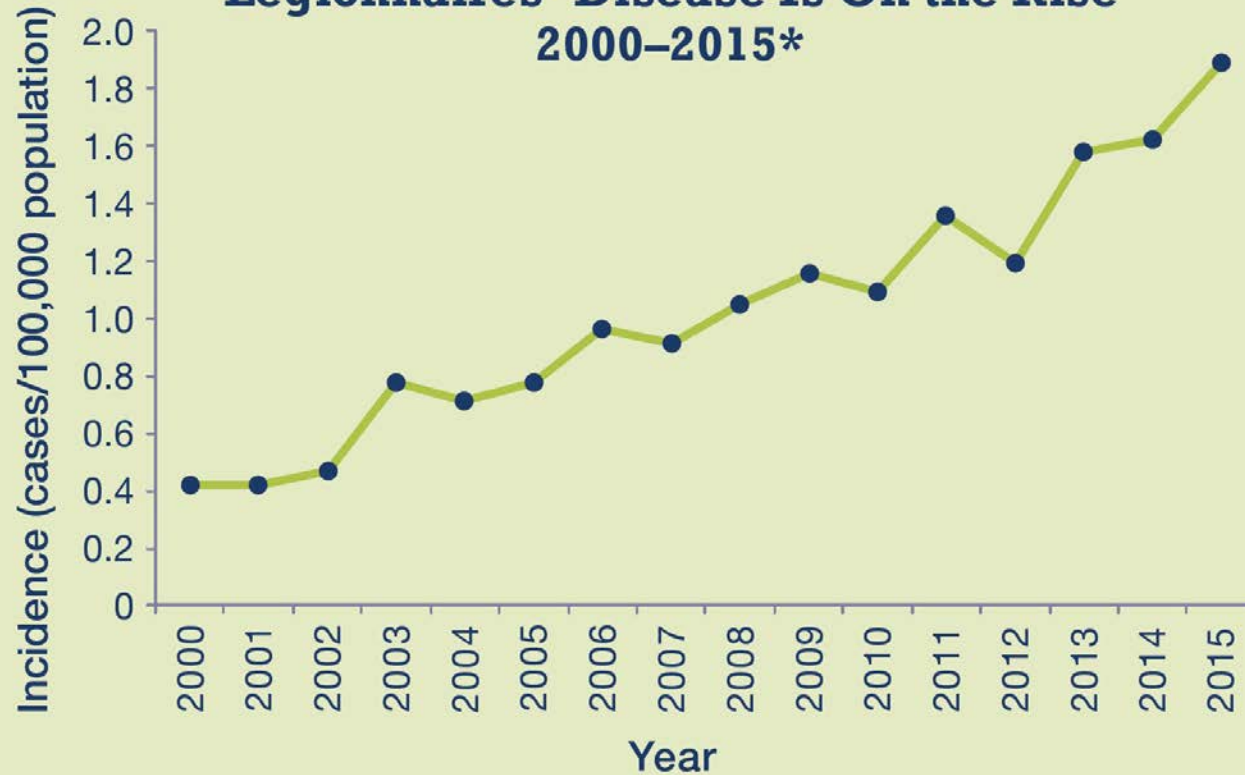
- Liaison for AWT to ASHRAE and CTI as a representative, member and participant with various *Legionella* and water treatment subject-related committees, working groups, and program activities.
- This presentation is as an independent SME and industry consultant – and not representing any professional or personal organizations, associations or affiliations.

Seminar Outline / Objectives

1. The increasing **focus** on *Legionella* and building water safety since ASHRAE Standard 188 – June of 2015!
2. *Legionella* as a waterborne pathogen: the basics, a few tidbits, myths & misconceptions – and some cool slides
3. The regulatory landscape of ‘acronym activity’ w/AHJs, plus: ASHRAE, CDC, **CMS**, TJC, EPA, NSF, NASEM, State/Local DoHs/Regs-Law → AWT, CTI, WQA, ASHE, AIHA, ASTM, ASSE, AWWA ... **others & others!**)
4. ASHRAE 188 – the importance of **here and now!**

LEGIONNAIRES' DISEASE CASES ON THE RISE ...

**Legionnaires' Disease Is On the Rise
2000–2015***



* National Notifiable Diseases Surveillance System



LEGIONELLA LITIGATION (CASES) ON THE RISE . . .



**GOOD JUDGEMENT COMES
FROM EXPERIENCE.**



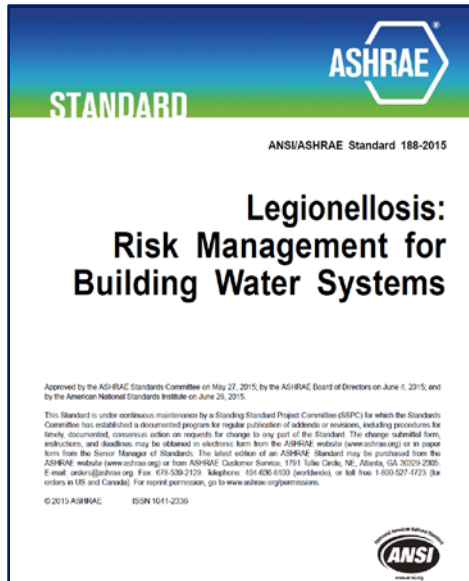
GOOD JUDGEMENT ?

...

**AND EXPERIENCE? WELL THAT COMES
FROM POOR JUDGEMENT.**

*So:
Let those already
'EXPERIENCED'
provide you
GOOD JUDGEMENT!*

The NEW FOCUS on *Legionella* and Disease Prevention . . .



**A LOT has happened since 2015 –
following ASHRAE Standard 188!**

***Legionella* (101) – The Science Basics**

Let's go back to 1976 for a
brief review of...

Legionnaires' Disease & *Legionella*



1976: Bellevue-Stratford Hotel/Philly



Legionnaires' Disease



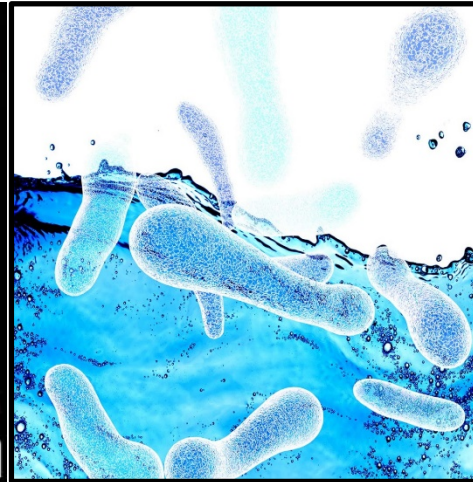
221 Sick!



34 Deaths!

It Was Soon Discovered . . .

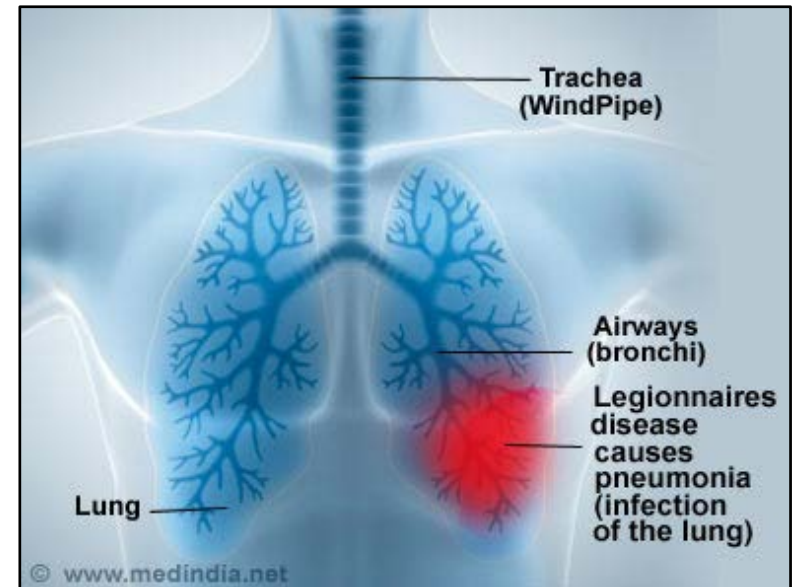
The cause of Legionnaires' disease was a common aquatic (water) **bacteria!**



Legionella pneumophila (Lp)

- One of 60+ named *Legionella* species / has 15+ serogroups
- ***Lp*** - the species responsible for **>90% of disease cases**
- The major infectious serogroup is serogroup 1 (*Lp1*) causing **>80% of disease cases**

"Lung-Loving"





Legionella Species*



Legionella adelaidensis

Legionella anisa

Legionella beliardensis

Legionella birminghamensis

Legionella bozemanæ

Legionella brunensis

Legionella busanensis

Legionella cardiaca

Legionella cherrii

Legionella cincinnatiensis

Legionella clemsonensis

Legionella donaldsonii

Legionella drancourtii

Legionella dresdenensis

Legionella drozanskii

Legionella dumoffii

Legionella erythra

Legionella fairfieldensis

Legionella fallonii

Legionella feeleei

Legionella geestiana

Legionella genomospecies 1

Legionella gormanii

Legionella gratiana

Legionella gresilensis

Legionella hackeliae

Legionella impletisoli

Legionella israelensis

Legionella jamestowniensis

Candidatus Legionella jeonii

Legionella jordanis

Legionella lansingensis

Legionella londiniensis

Legionella longbeachae

Legionella lytica

Legionella maceachernii

Legionella massiliensis

Legionella micdadei

Legionella monrovia

Legionella moravica

Legionella nagasakiensis

Legionella nautarum

Legionella norrlandica

Legionella oakridgensis

Legionella parisiensis

Legionella pittsburghensis

Legionella pneumophila

Legionella quateirensis

Legionella quinlivanii

Legionella rowbothamii

Legionella rubrilucens

Legionella sainthelensi

Legionella santicrucis

Legionella shakespearei

Legionella spiritensis

Legionella steelei

Legionella steigerwaltii

Legionella saoudiensis

Legionella taurinensis

Legionella thermalis

Legionella tucsonensis

Legionella tunisiensis

Legionella wadsworthii

Legionella waltersii

Legionella worsleiensis

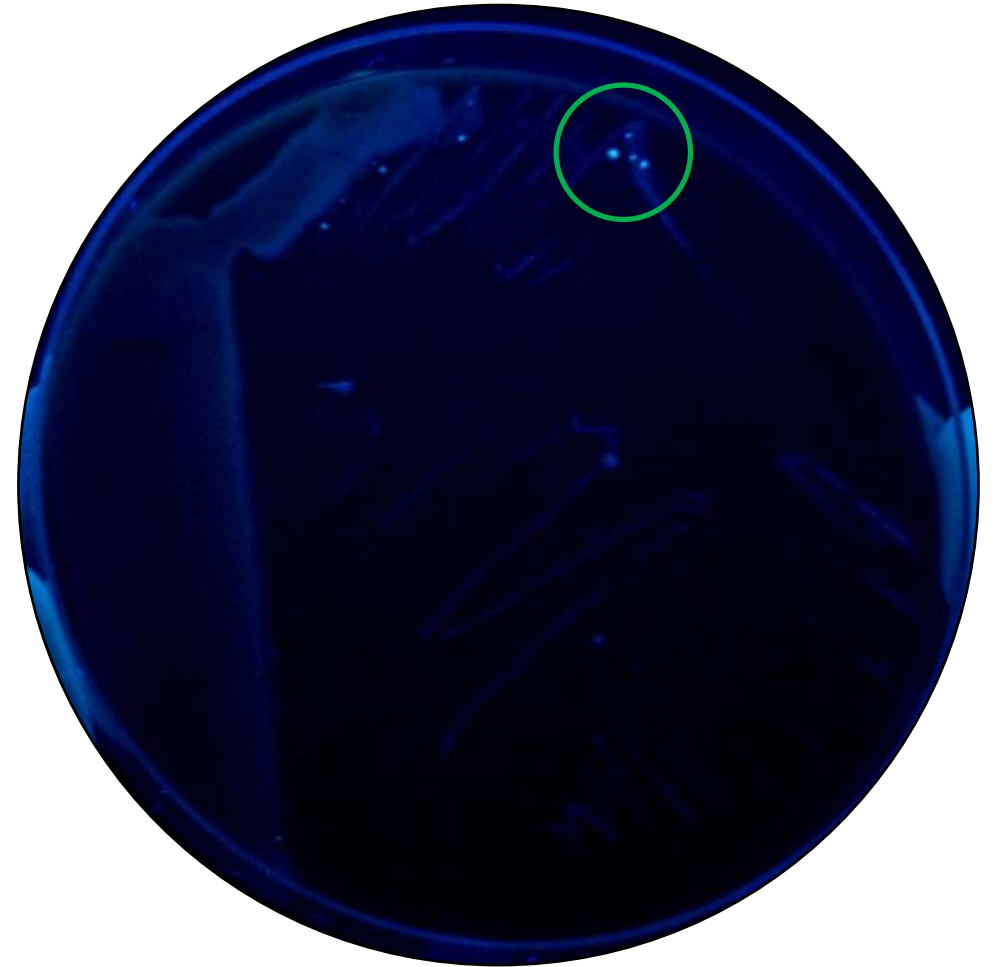
Legionella yabuuchiae

* Per Wikipedia listing and identification description

How about the naming of *Legionella* species . . .

Various species include:

- *L. anisa*,
- *L. bozemannii*,
- *L. dumoffii*,
- *L. gormanii*,
- *L. longbeachae*,
- *L. rubrilucens*, and
- ***L. clemsonensis***
(Oct 2016)



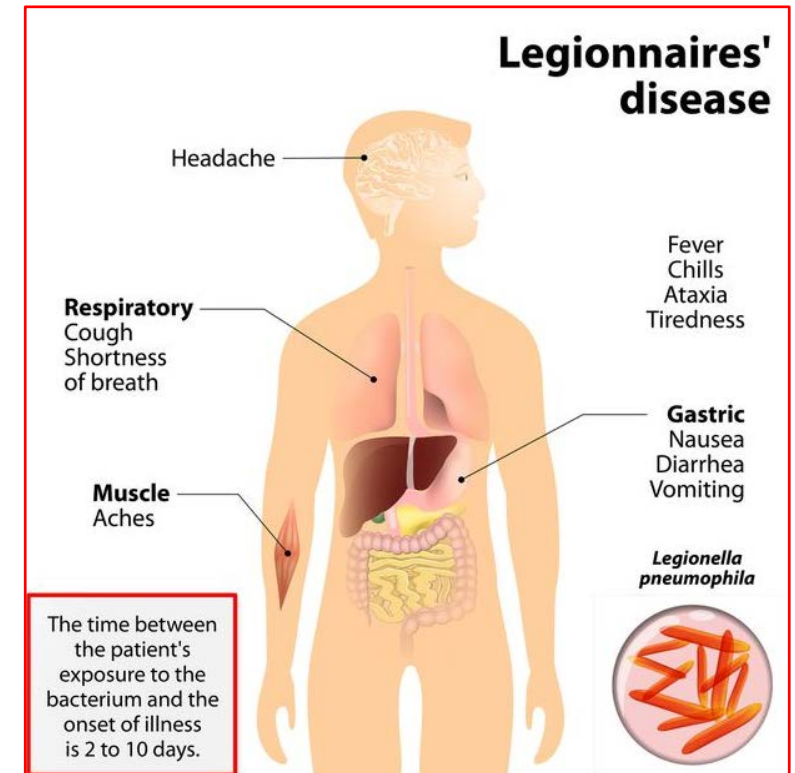
Legionellosis: Pontiac Fever

- Mild, flu-like illness—without pneumonia
- Appears w/in 24 hours to 3 days after exposure
- Lasts up to 5 days, generally less
- Does not require hospitalization or antibiotics
- **Susceptibility:** ~95% (\pm) of those exposed

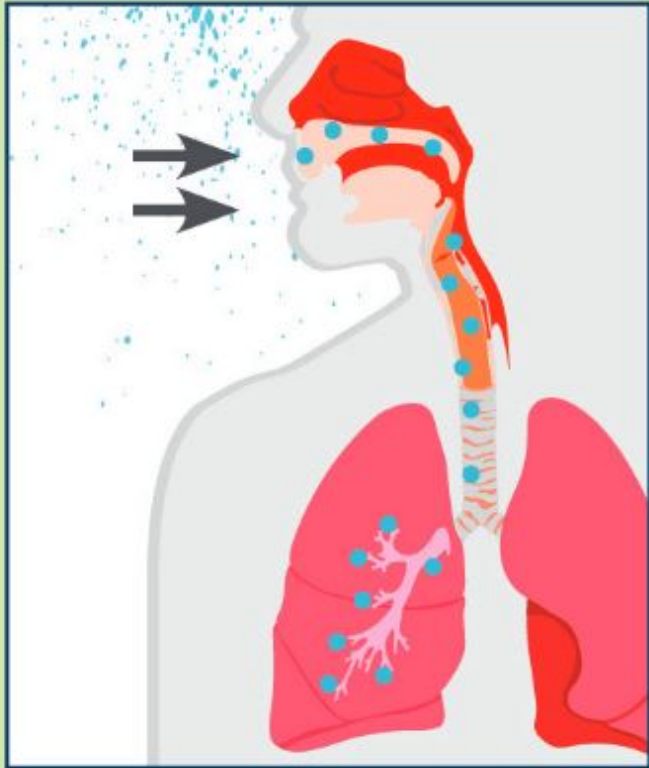


Legionellosis: Legionnaires' Disease

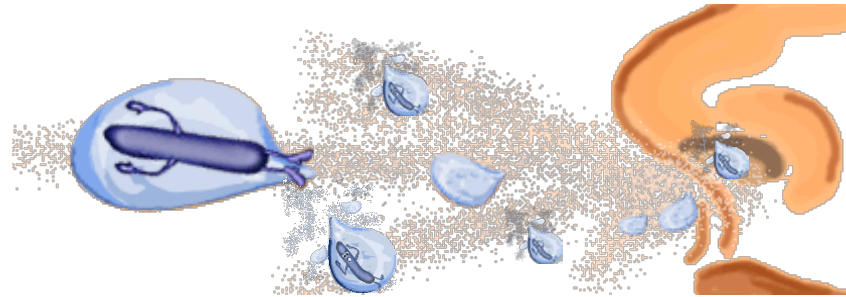
- Potentially fatal, multisystem respiratory illness, accompanied by **pneumonia**
- Symptoms: high fever, chills, muscle pain, headache, dry cough; diarrhea, vomiting, confusion and delirium are also common
- Appears **2-10 days** after exposure
- Recovery can be long term, debilitating
- **Susceptibility:** ~5% (\pm) of those exposed



Disease Cause & Transmission Sources



Legionnaires' disease, a type of severe pneumonia, is caused by breathing in small droplets of water that contain *Legionella*.



**Inhalation/Aspiration
of Aerosols (droplets)
containing
Legionella bacteria**

Common Sources of Infection

Outbreaks of Legionnaires' disease are often associated with large or complex water systems, like those found in hospitals, hotels, and cruise ships.

The most likely sources of infection include:



**Water used for showering
(potable water)**



**Cooling towers (parts of large
air conditioning systems)**



Decorative fountains



Hot tubs

Transmission and Infection

- ✓ Legionellosis is **not transmitted** from person to person
 - ***It is not a contagious disease*** *
- **Inhalation** (into the lungs) → of water aerosols or soil containing LB, can cause disease
- **Aspiration** (into the lungs) → of water/fluids resultant of gagging/swallowing/etc. problems, can cause disease

* *Probable Person-to-Person LD transmission reported in N Engl J Med. 2016;374:497–8. (Son/48-Mother/74; Portugal; Oct/2014)*

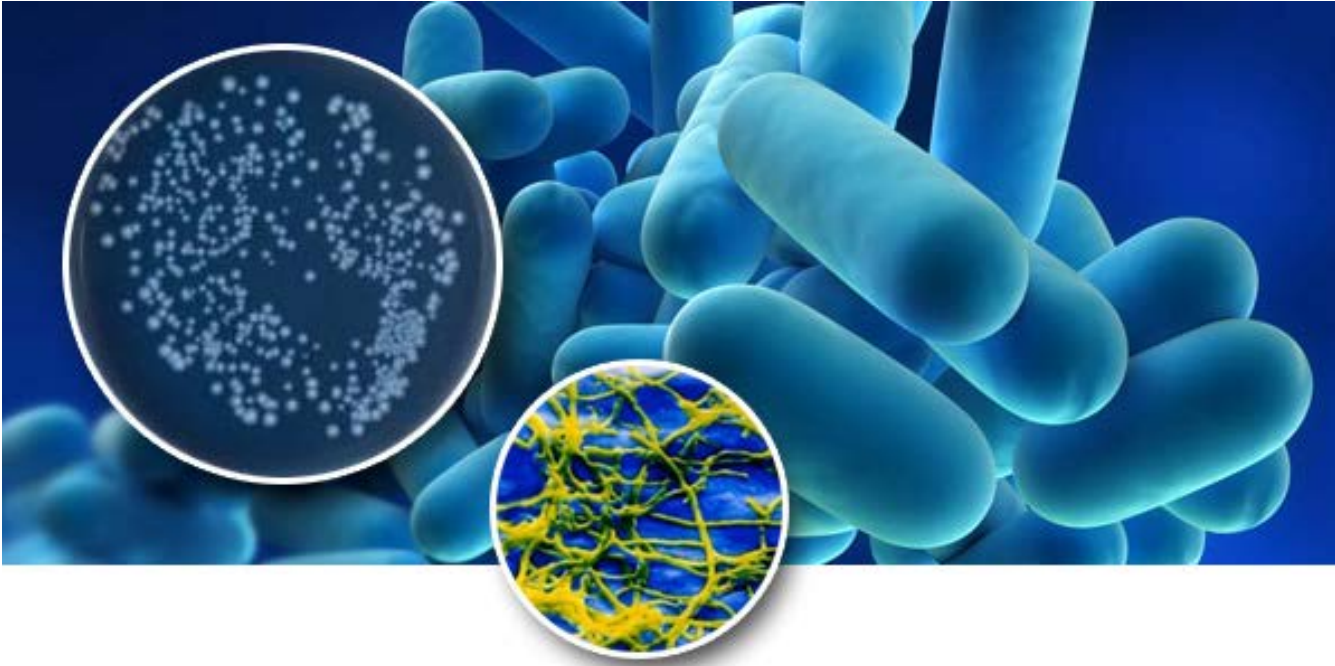
Legionella Microbiology

- Gram negative, rod-shaped, aerobic bacterium
- 60+ species and 70+ serogroups have been described for the genus
- ✓ **Commonly** found, natural inhabitant of fresh waters, muds and some soils
- ✓ **Survives and multiplies** as intracellular parasites in certain Protozoa (amoebae)



Amoeba proteus / Source: www.microscopy-uk.org.uk.

Legionella Bacteria are ...



Very, very, very, very ...
***small* bacteria**

0.3–0.9 μm (by)
2–20 μm

**What filter size would you use for a
Legionella control strategy?**

Let's Not Misunderstand 'Ubiquitous'

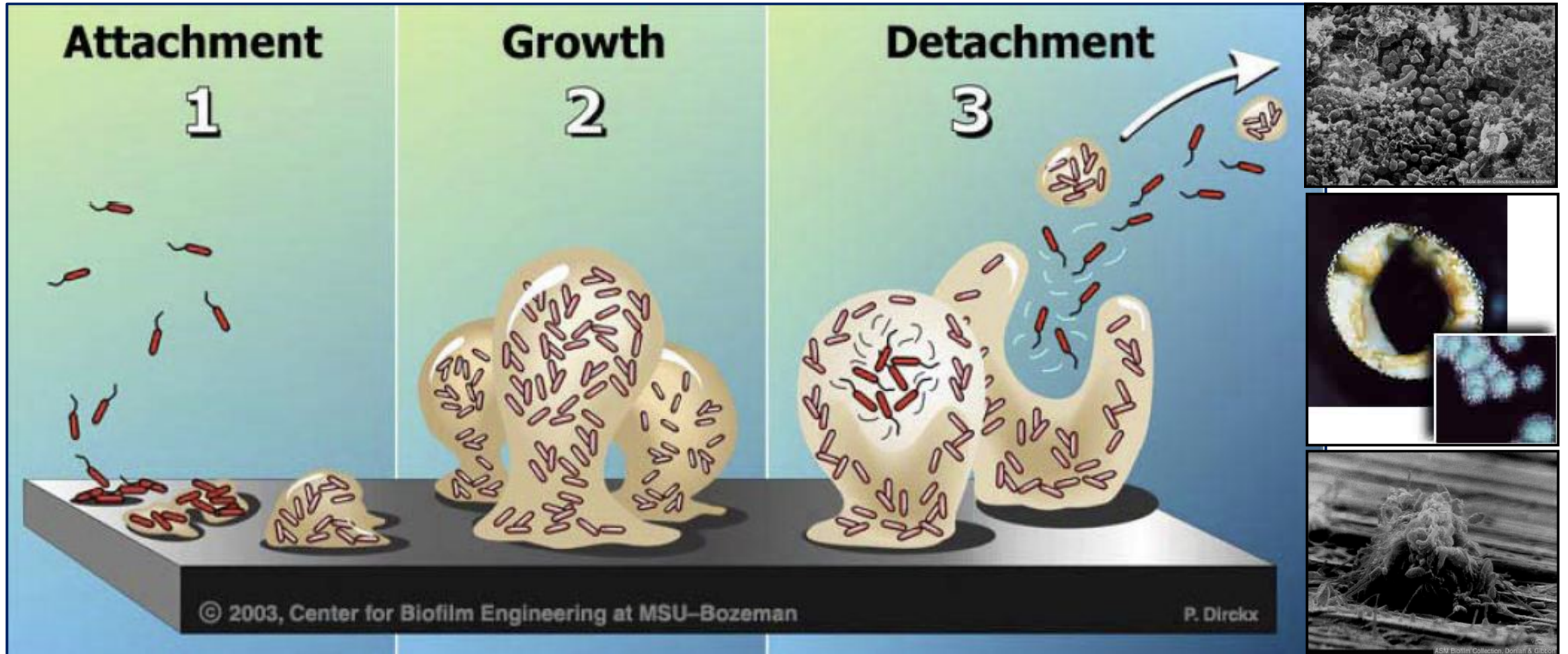
Ubiquitousness of *Legionella pneumophila* in the Water Supply of a Hospital with Endemic Legionnaires' Disease

Janet Stout, M.S., Victor L. Yu, M.D., R. M. Vickers, B.S., Jeffrey Zuravleff, M.S., Michele Best, B.A., Arnold Brown, M.D., Robert B. Yee, Ph.D., and Robert Wadowsky, M.S.

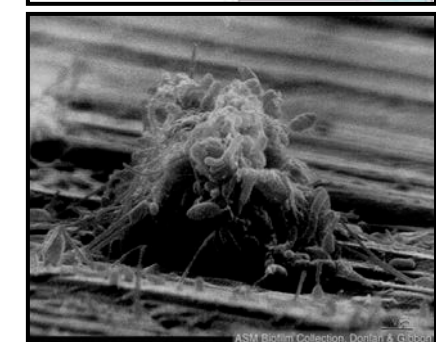
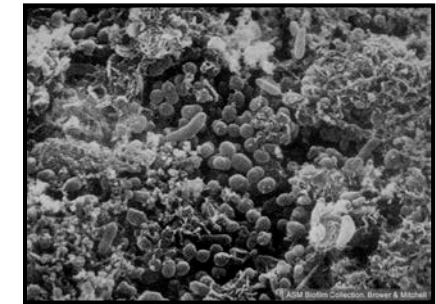
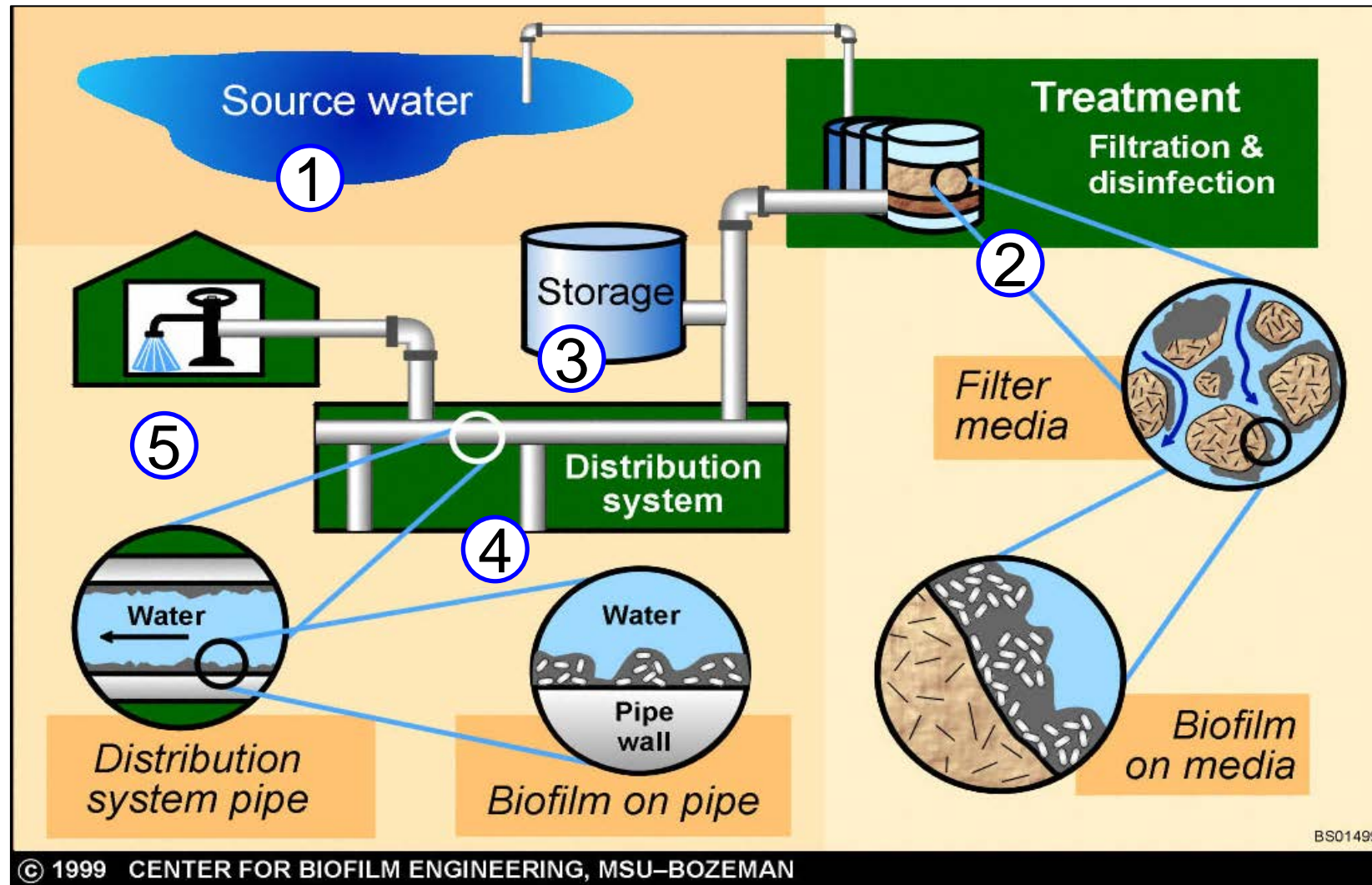
N Engl J Med 1982; 306:466-468 | February 25, 1982 | DOI: 10.1056/NEJM198202253060807

- *Legionella* is **not ubiquitous (everywhere)** in water systems or devices
- It is a **common** bacteria and natural inhabitant of fresh waters, muds and soils – generally, in **very low levels and not causing disease**
- **Scientific evidence:** a wide variance, but found in ~30-70% of premise plumbing (man-built) systems – **if/when** favorable conditions present
- That's what ASHRAE Standard 188 is about – managing building water systems that **can/could** harbor *Legionella*!

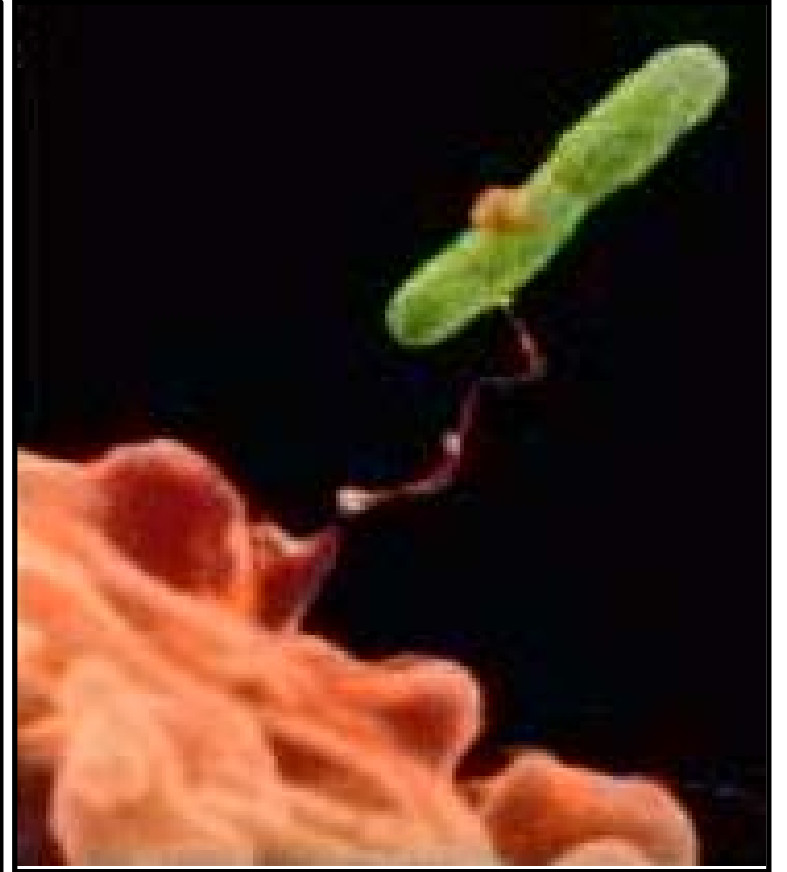
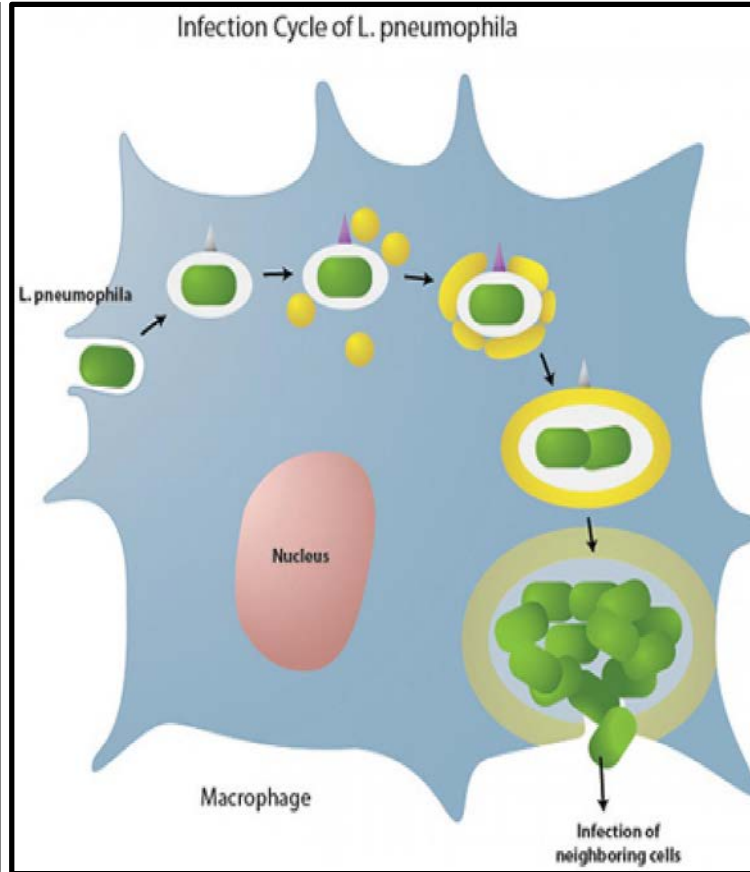
Legionella: Thrive within Biofilm



Biofilm is in (films) our Water Systems!



But, *Legionella* ‘Live’ within Protozoa!

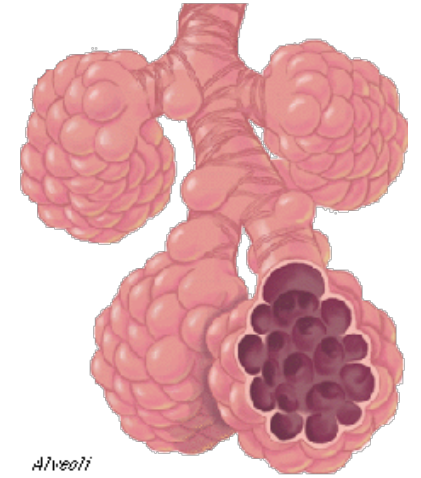


(Intracellular Parasites)

Legionella → Pathogenesis

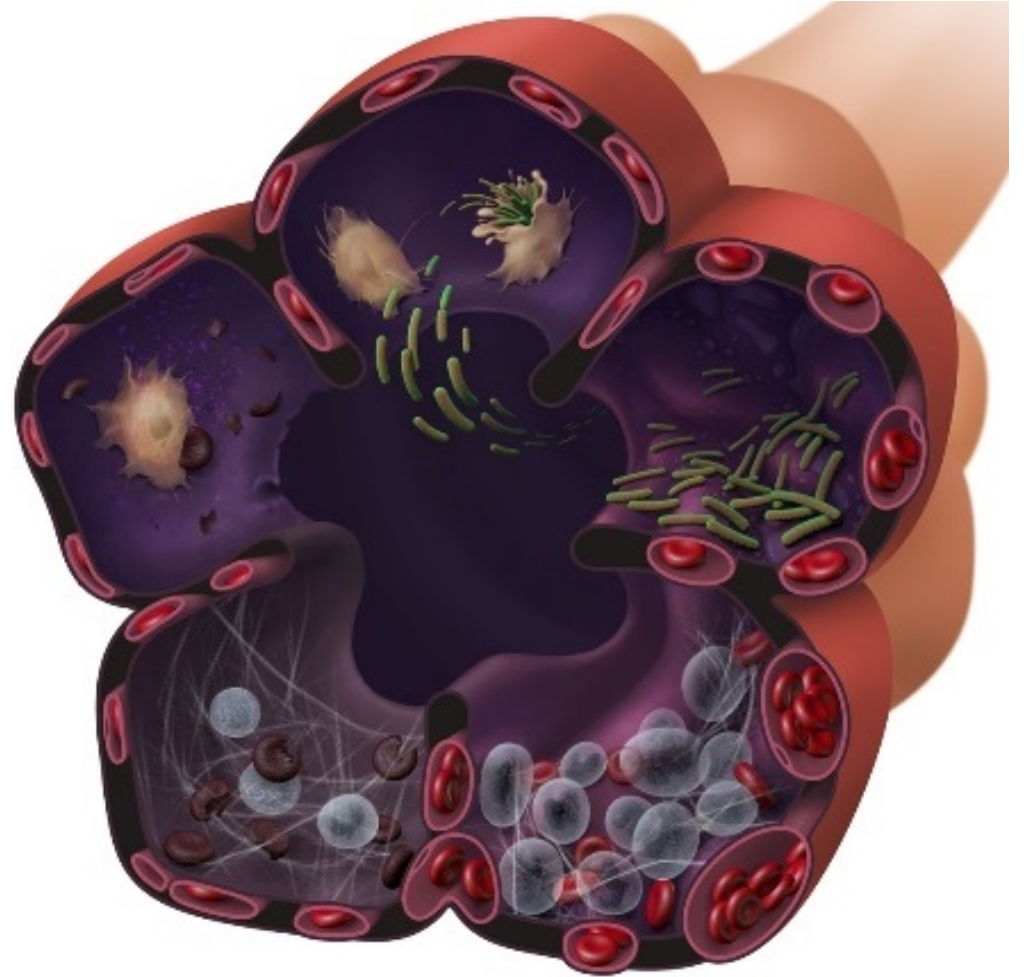
1. Enter the host, penetrating deep into the alveolar regions of the lungs ...
2. Macrophages come to **ingest** and destroy the invading bacteria;

However, *Legionella* **survive** & multiply within the macrophage, as they do in nature – living within host Protozoa (Amoebae) ...

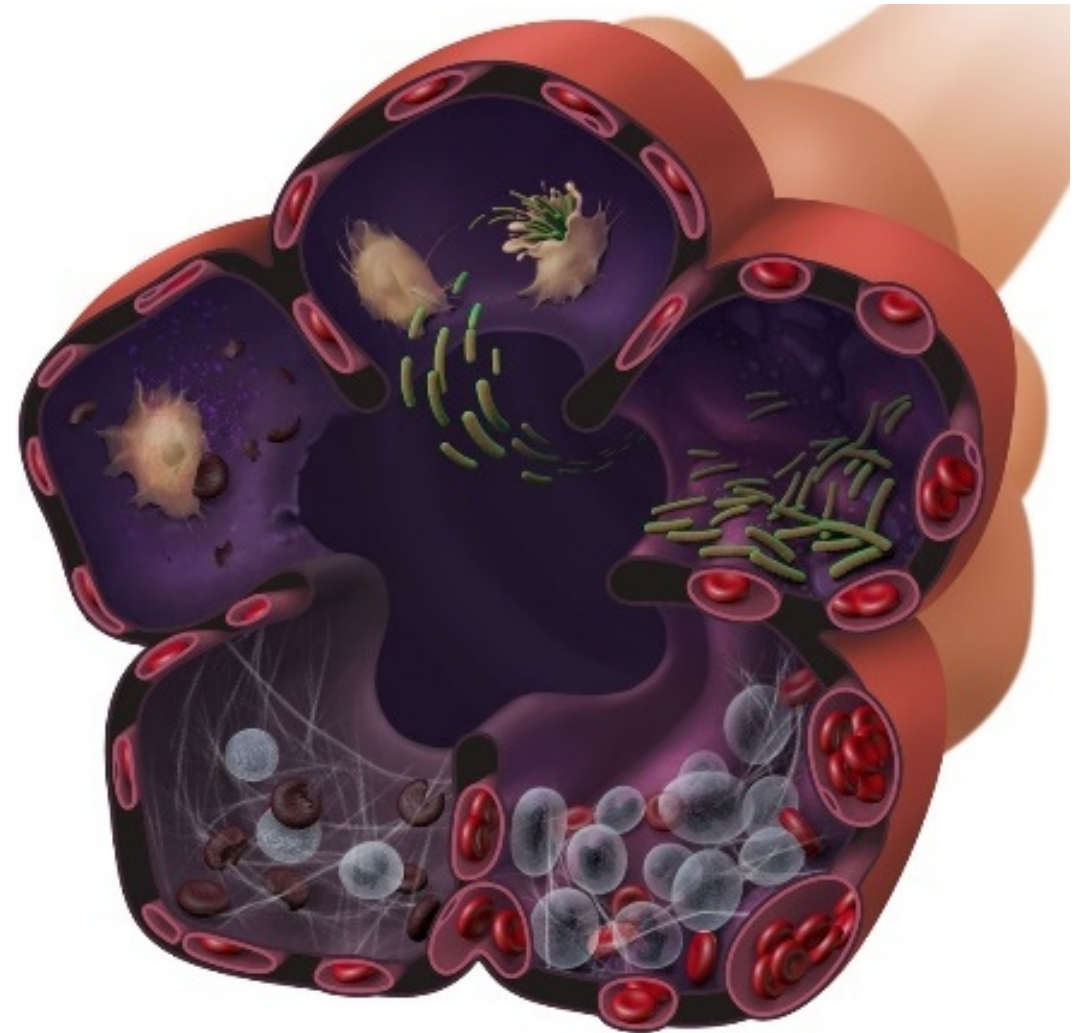


Legionella → Pathogenesis

3. The *Legionella* ultimately lyse (burst open) the macrophage cell, killing it, while releasing **many** new *Legionella* and worsen the infection →



SO – let's see a 'MOVIE' of this . . .



Risk of Acquiring Legionellosis ...

Exposure Alone ≠ Disease Infection



?

***Legionella
Virulence ...
(genetics)***

***Infectious
Dose ...
(not known)***

?

Aerosol (Mist) Producing Devices ...

- Faucets and shower heads
- Spas and whirlpool tubs
- Humidifiers
- Decorative fountains
- Sprinklers
- Cooling towers
- Evaporative condensers
- Medical/dental equipment . . .
and others



Legionnaires' Disease → an 'Exposure Myth'

*Cooling Towers are **Not** the major reservoir or source causing Legionnaires' disease!*

- **The potable (domestic) water distribution systems** of large buildings, including hospitals and hotels, are considered the primary source of *Legionella* and disease as supported by peer reviewed research data and expert sources, such as the CDC
- **Cooling Towers** - long thought to be the major source for *Legionella* and disease - are considered an overemphasized source according to current data.

Who Would Think – A Grocery Store?



- An ultrasonic mist-maker device was operating over one section of the produce display ...
- No one at the grocery store was familiar with the operation or maintenance of the device ...
- High levels of *Legionella* (*Lp1*) were recovered from the device: **34 cases/2 deaths! (Bogalusa, LA / Winn-Dixie store)**

Who Would Think – An Ice Machine?!



- Aspiration of **ice chips** contaminated w/LB
- 20% of Ice Machines had **Lp1**
- 3 Cases / 1 Death (2013)

Where?

can *Legionella* grow:

- Hot and cold water storage tanks
- Water heaters
- Water-hammer arrestors
- Expansion tanks
- Water filters
- Electronic faucets
- Aerators
- Faucet flow restrictors
- Shower heads and hoses
- Nonsteam aerosol-generating humidifiers
- Infrequently used equipment, including eyewash stations
- **Ice machines**

Water Birth & Legionnaires' Disease → ☹️

- **Case 1:** Home delivery in a tub filled with warm tap water
- **Case 2:** Home delivery in a rented 'hot tub' filled with tap water.

Centers for Disease Control and Prevention
MMWR
Weekly / Vol. 66 / No. 22

Morbidity and Mortality Weekly Report
June 9, 2017

Two Cases of Legionnaires' Disease in Newborns After Water Births — Arizona, 2016

Geoffrey Granseth, MPH^{1,2}; Rachana Bhattarai, MS¹;
Tammy Sylvester, MSN³; Siru Prasai, MD³; Eugene Livar, MD¹

Tub was kept at 98°F the week prior to delivery!

A LOT has happened
in less than 4 years -
since ASHRAE 188!



**... after many years
of getting our head
out of the sand since
1976 ... ☺**

2015: Summer of *Legionella* ...

First US
Legionella
Standard
published
June 26, 2015

Emergency **LB**
regulations
passed (NY)
August 20,
2015

1

2

!!

July 2015
Start of New
York City **LD**
Outbreak

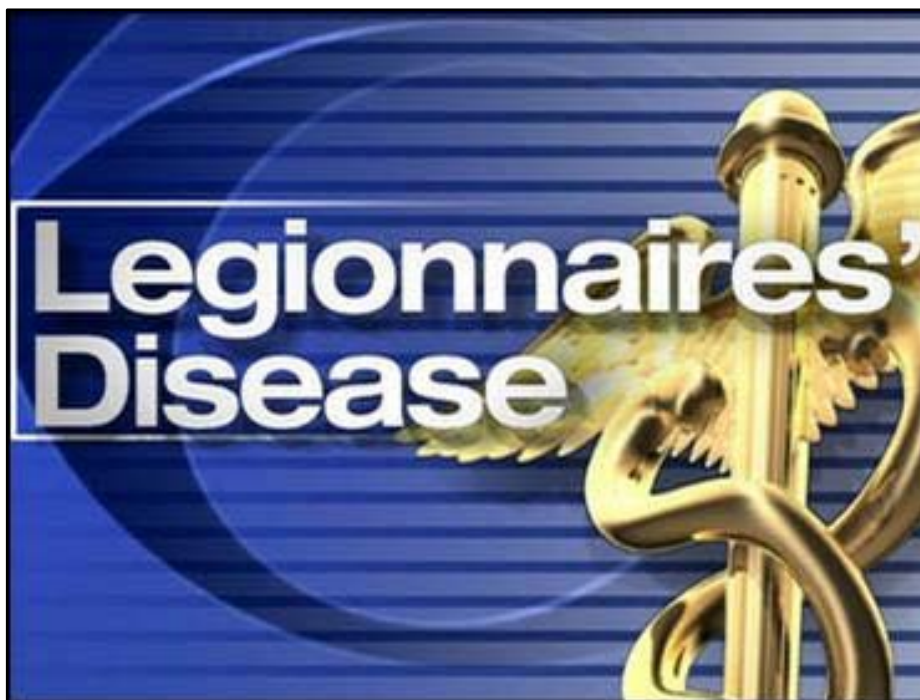
**BREAKING
NEWS**

12 Die of Legionnaires' Disease in New York City!

BBC NEWS

August 11, 2015

Legionnaires' outbreak widens to 12 dead in New York



► **130 Cases Reported with 12 Deaths.** Officials say the outbreak is centered on the area near the Opera House Hotel in South Bronx

2016: CDC Focus on *Legionella* & 188 ...

CDC Reports
on **Legionella**
& **WMPs**
June 2016

CDC provides
“Toolkit” for
ASHRAE 188
June 2016

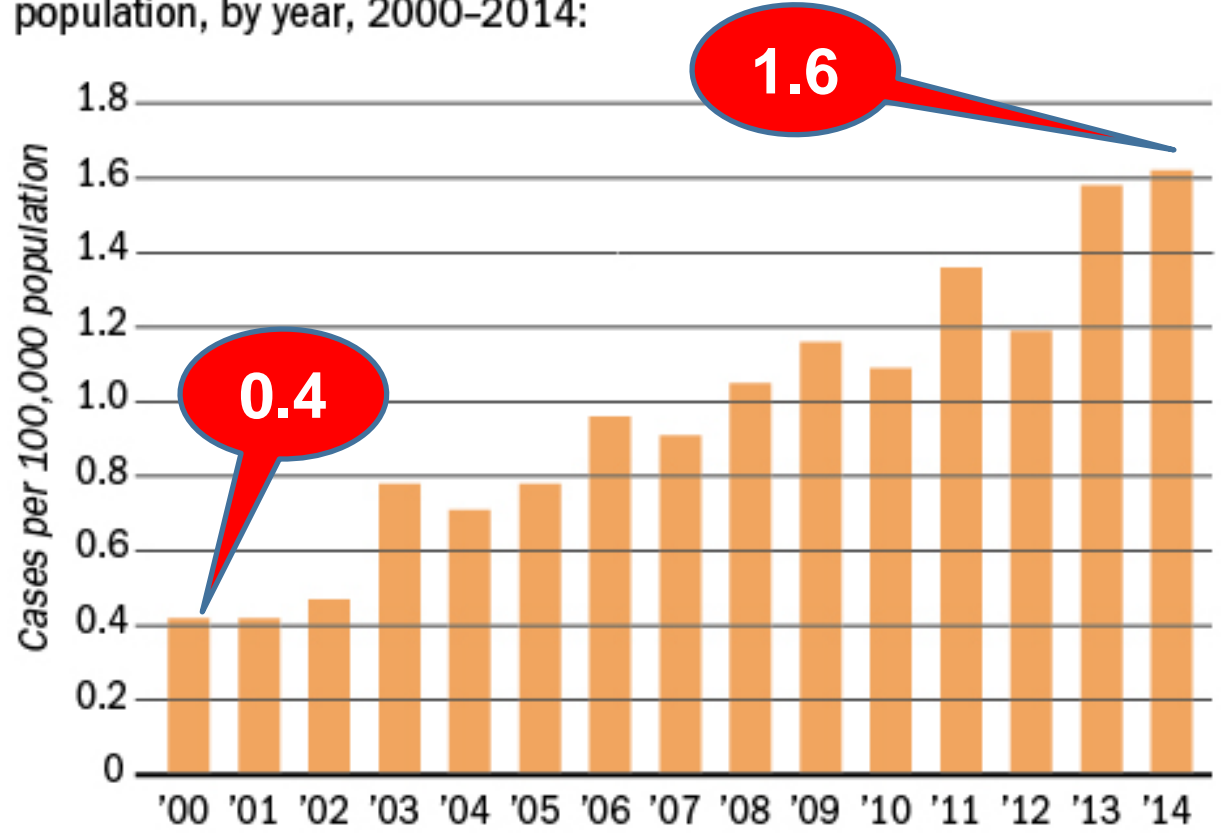


June 2016
CDC provides
‘VitalSigns’ LD
Reporting

Legionnaires' Cases Quadruple!

Legionnaires' cases increasing

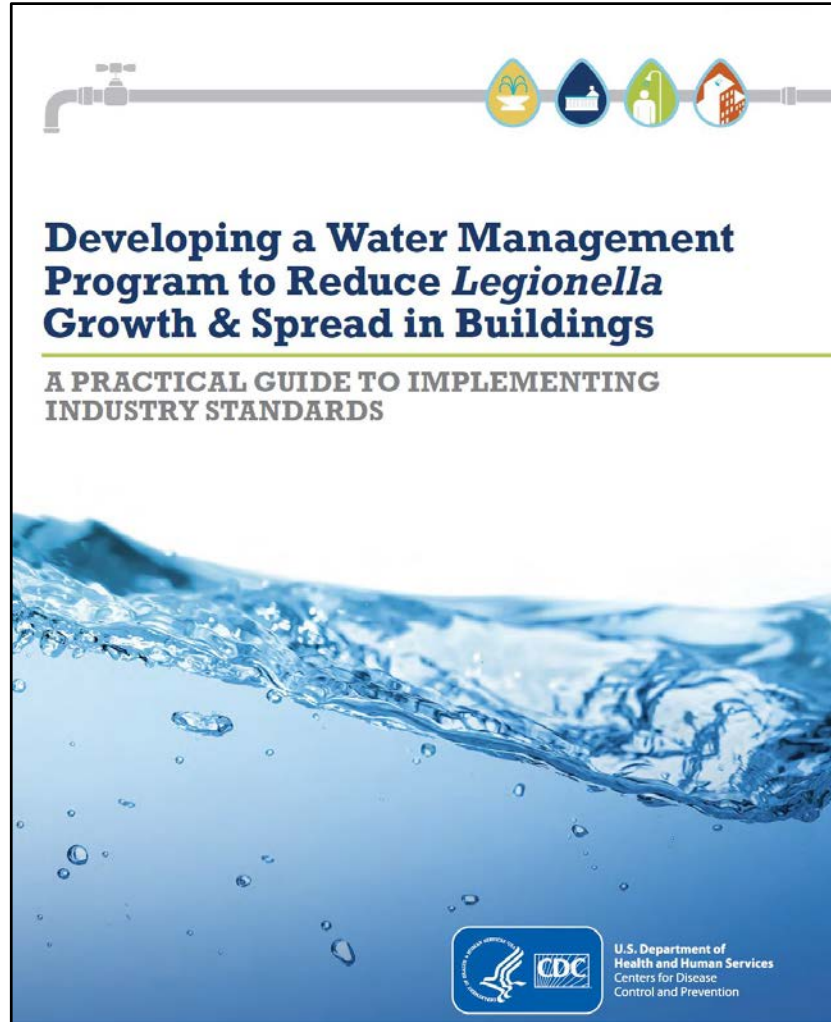
Reported cases of Legionnaires' disease in the U.S. per 100,000 population, by year, 2000-2014:



June 6, 2016

**CDC Releases
new reports on
Legionnaires'
Disease**

CDC Toolkit for Standard 188



June 6, 2016

**CDC Provides a
“Toolkit” for
ASHRAE
Standard 188**

2017: CMS Issues a *Legionella* Memorandum ...

CDC reports
new **Disease**
research data!
June 2017

1

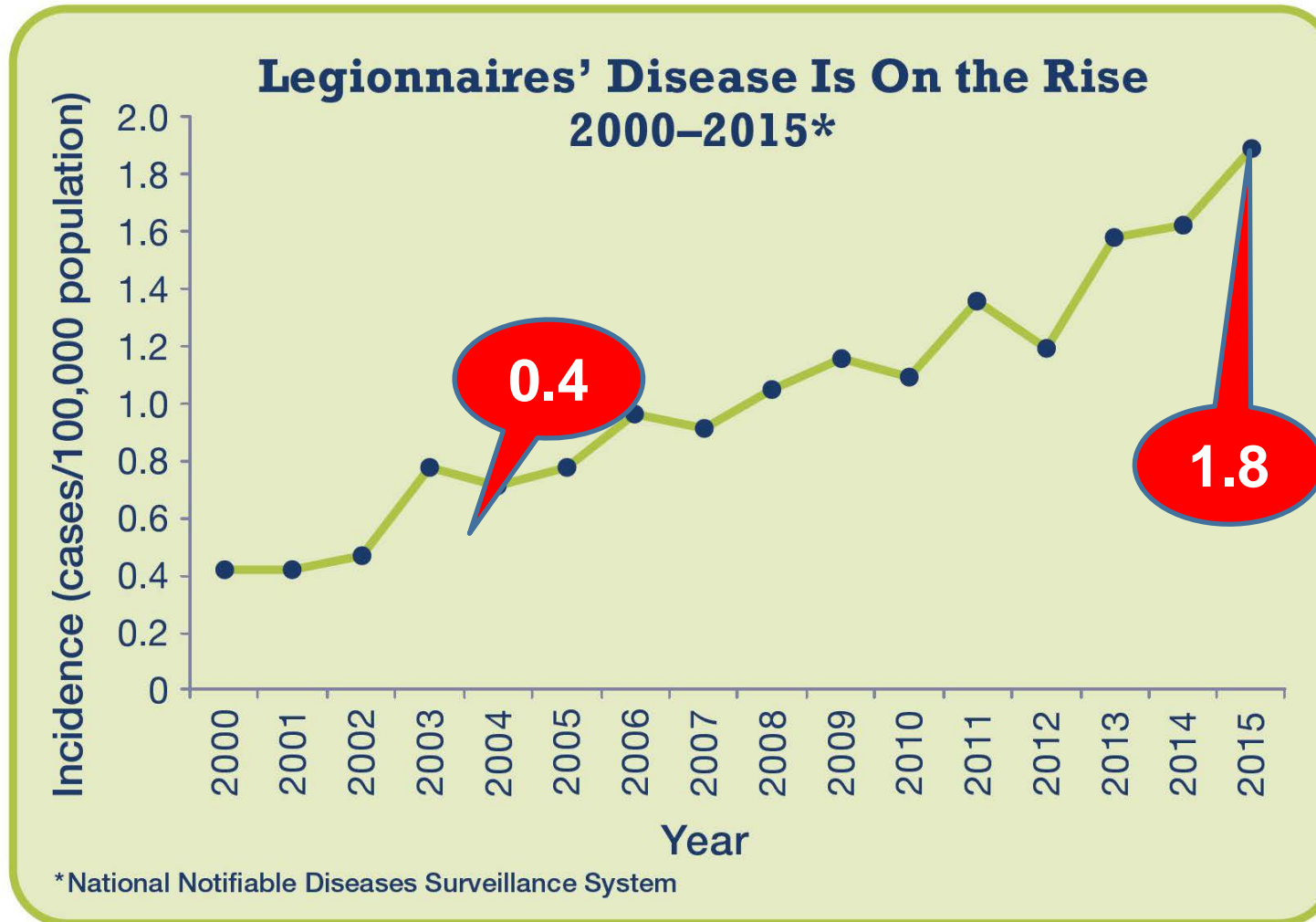
2

CMS sends **LB**
directive to
HC-Facilities
June 2, 2017

!!!

June 2017
CDC updates
'Toolkit' and
'VitalSigns'
(**Healthcare!**)

June 2017 Report = 4.5 x!



2015 = 6,079

2014 = 5,166

2010 = 3,516

2005 = 2,301

2000 = 931

CDC / MMWR

CDC: *Vital*signs™ (June 2016 / 2017)

JUNE 2016

CDC Vitalsigns™

Legionnaires' Disease

Use water management programs in buildings to help prevent outbreaks

CDC investigated the first outbreak of Legionnaires' disease, a serious lung infection (pneumonia), in 1976. An increasing number of people in the US are getting this disease, which is caused by breathing in small water droplets contaminated with *Legionella* germs. About 5,000 people are diagnosed with Legionnaires' disease and there are at least 20 outbreaks reported each year. Most identified outbreaks are in buildings with large water systems, such as hotels, long-term care facilities, and hospitals. *Legionella* grows best in building water systems that are not well maintained. Building owners and managers should adopt newly published standards that promote *Legionella* water management programs, which are ways to reduce the risk of this germ in building water systems.

Building owners and managers can:

- Learn about and follow newly published standards for *Legionella* water management programs. <http://bit.ly/1Ph3wQP>
- Determine if the water systems in their buildings are at increased risk of growing and spreading *Legionella*.
- Develop and use a *Legionella* water management program as needed. www.cdc.gov/legionella/WMPtoolkit
- Monitor and respond to changes in water quality.

Want to learn more? www.cdc.gov/vitalsigns/legionnaires

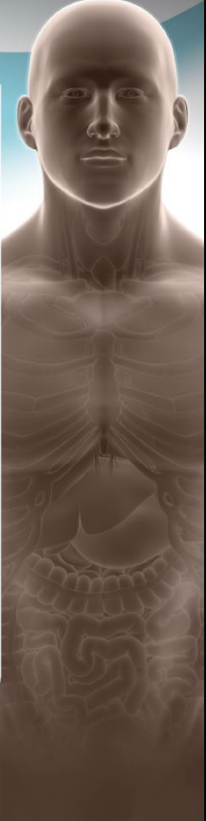
National Center for Immunization and Respiratory Diseases
National Center for Environmental Health

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

4x
The number of people with Legionnaires' disease grew by nearly 4 times from 2000–2014.

1 in 10
Legionnaires' disease is deadly for about 10% of people who get it.

9 in 10
CDC investigations show almost all outbreaks were caused by problems preventable with more effective water management.



JUNE 2017

CDC Vitalsigns™

Legionnaires' Disease

A problem for health care facilities

Legionnaires' disease (LD) is a serious, and often deadly, lung infection (pneumonia). People usually get it by breathing in water droplets containing *Legionella* germs. People can also get it if contaminated water accidentally goes into the lungs while drinking. Many people being treated at health care facilities, including long-term care facilities and hospitals, have conditions that put them at greater risk of getting sick and dying from LD. *Legionella* grows best in buildings with large water systems that are not managed effectively. CDC outbreak investigations show that effective water management programs—actions that reduce the risk of *Legionella* growing and spreading in building water systems—can help prevent problems that lead to LD. Health care facility leaders* should be aware that LD is a risk in their facility and that they can take action to prevent infections.

Health care facility leaders can:

- Build a team focused on keeping their facility's water safe.
- Create and use a water management program to limit *Legionella* and other waterborne germs from growing and spreading. www.cdc.gov/legionella/WMPtoolkit
- Work with healthcare providers to identify LD cases early and determine if the cases may be associated with a health care facility.
- Report LD cases to local public health authorities quickly and work with them to investigate and prevent additional cases.

Want to learn more? www.cdc.gov/vitalsigns/legionella

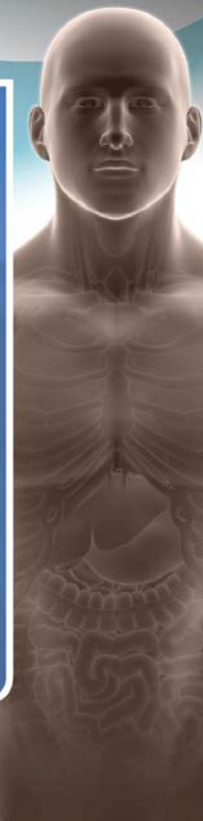
*Leaders may include infection control practitioners, facility managers, hospital administrators, quality assurance staff, or others.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

76%
People definitely got Legionnaires' disease from a health care facility in 76% of locations reporting exposures.

1 in 4
Legionnaires' disease kills 25% of those who get it from a health care facility.

4 in 5
Most problems leading to US health care-associated outbreaks could be prevented with effective water management.



CMS: New *Legionella* Directive!

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



Center for Clinical Standards and Quality/Survey & Certification Group

Ref: S&C 17-30-ALL

DATE: June 02, 2017

TO: State Survey Agency Directors

FROM: Director
Survey and Certification Group

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

Effective Immediately: June 2, 2017

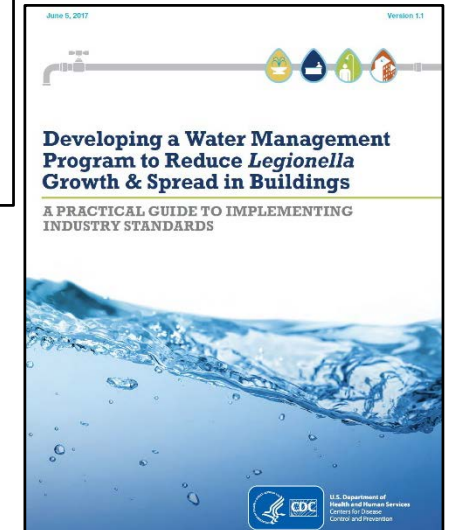
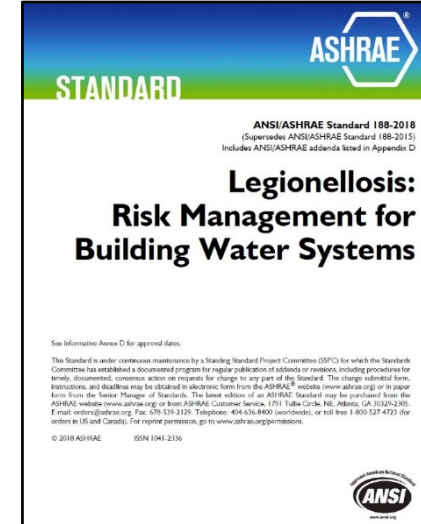
CMS: Expectations

- “Conduct a **facility risk assessment** to identify where *Legionella* and other opportunistic waterborne pathogens could grow and spread in the facility water system.”

Serial No:			LEGIONELLA RISK ASSESSMENT		
Auditor Details		Audited Property Address		Landlord/Agent Address	
Name:		Name:		Name:	
Address:		Address:		Address:	
Tel No:		Tel No:		Tel No:	
Date Of Audit:		Date Of Review:		Property Type:	
THE RISK ASSESSMENT					
Did you consider whether you could eliminate the risk?				Yes	No
Is there any tenant, resident or regular visitor particularly susceptible to Legionella due to age, health or lifestyle?				Yes	No
Did the person carrying out the assessment have access to competent help and advice when carrying out the assessment?				Yes	No
Describe type of cold water system e.g. mains feed or from storage tank:					
Describe type of hot water system e.g. mains feed via combi boiler or from storage tank:					
RISK CATEGORY - Water Outlet Temperature					
Is cold water temperature at outlets below 20°C?				Yes	No
Is the hot water temperature above 50°C at outlets?				Yes	No
<small>Cold water must flow from outlets at below 20°C and hot water above 50°C to minimise risk. If temperatures are too low/high then adjustments need to be made to the system such as lagging of pipework or adjustment of temperature settings for hot water.</small>					
Identified Defect/Risk:			Recommendations:		
RISK CATEGORY - Cold Water Systems					
Is a Cold water storage tank present?				Yes	No
Is the cold water tank accessible?				Yes	No
Cold water storage tank location:					
Does it have a tight fitting lid?				Yes	No
Is the water in the tank clean and free from rust, debris, scale and organic matter?				Yes	No
Is the temperature of the water in the tank below 20°C?				Yes	No
Is the cold water tank insulated?				Yes	No
Is the cold water tank accessible?				Yes	No
<small>If any debris etc. is present in the system it should be drained and thoroughly cleaned. If debris is from corrosion on the tank itself then the tank may need to be replaced. All cold water tanks should have tight fitting lids to prevent debris entering the system. The water in the tank should be below 20°C and the tank should be insulated to prevent the temperature rising above this level.</small>					
Identified Defect/Risk:			Recommendations:		
RISK CATEGORY - Hot Water Systems					
Is the temperature setting on the boiler and/or hot water tank such that hot water is heated to and stored at a temperature of 60°C?				Yes	No
Are the hot water distribution pipes insulated?				Yes	No
If more than one calorifier is used, are they connected in parallel?				Yes	No
Does the calorifier have the following fitted:					
a drain valve?				Yes	No
a temperature gauge on the inlet and outlet?				Yes	No
an access panel?				Yes	No
<small>If the temperature is set at above 60°C this can cause scalding to users. The temperature setting on the boiler and/or hot water tank should be set and maintained at 60°C.</small>					
Identified Defect/Risk:			Recommendations:		
Top Copy: Responsible Person Bottom Copy: Auditor To reorder call free on 0800 690 6404 or go to www.gasfit.co.uk					

CMS: Expectations

- ▶ “Implement a **Water Management Program** that considers the ASHRAE industry standard (188) and the CDC Toolkit that includes”:
 - ✓ Control measures ...
 - ✓ Temperature management ...
 - ✓ Disinfectant level control ..., and
 - ✓ Environmental testing for pathogens ...



CMS: New *Legionella* Directive!

- This policy memorandum applies to
 - Hospitals
 - Critical access hospitals (CAHs), and
 - Long-term care (LTC) facilities ...
- This policy memorandum is also intended to provide general awareness for **all healthcare** organizations



CMS: Water Borne Pathogens

- *Legionella*
- *Pseudomonas aeruginosa*
- *Acinetobacter*
- *Burkholderia*
- *Stenotrophomonas*
- Nontuberculous mycobacteria (NTM)
- Fungi ...





The Joint Commission (TJC): follows CMS directive!

CMS S&C *Legionella* Memo

Expectations for Healthcare Facilities and Surveyors

Review policies and procedures and reports documenting water management implementation results to verify that the facility has:

- Conducted **risk assessment** for potential areas of growth and spread.
- Implemented a **water management program** that considers the ASHRAE industry standard and CDC toolkit and that includes control measures (e.g., physical controls, temperature management, disinfectant level control, visual inspections, and environmental testing).
- Specified **testing protocols** and acceptable ranges for control measures and documented the results of testing and corrective actions taken when control limits are not maintained.

CMS: Directive ... Revised! / Changed?

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



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

DATE:

June 02, 2017

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

REVISED 07.06.2018

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****

NOTE: *CMS does not require water cultures for Legionella or other opportunistic water-borne pathogens. Testing protocols are at the discretion of the provider.*

CDC at NASEM 1st Legionella Meeting ...



The National Academies of
Sciences • Engineering • Medicine
**Management of *Legionella*
in Water Systems**

Centers for Disease Control and Prevention

February 8, 2018

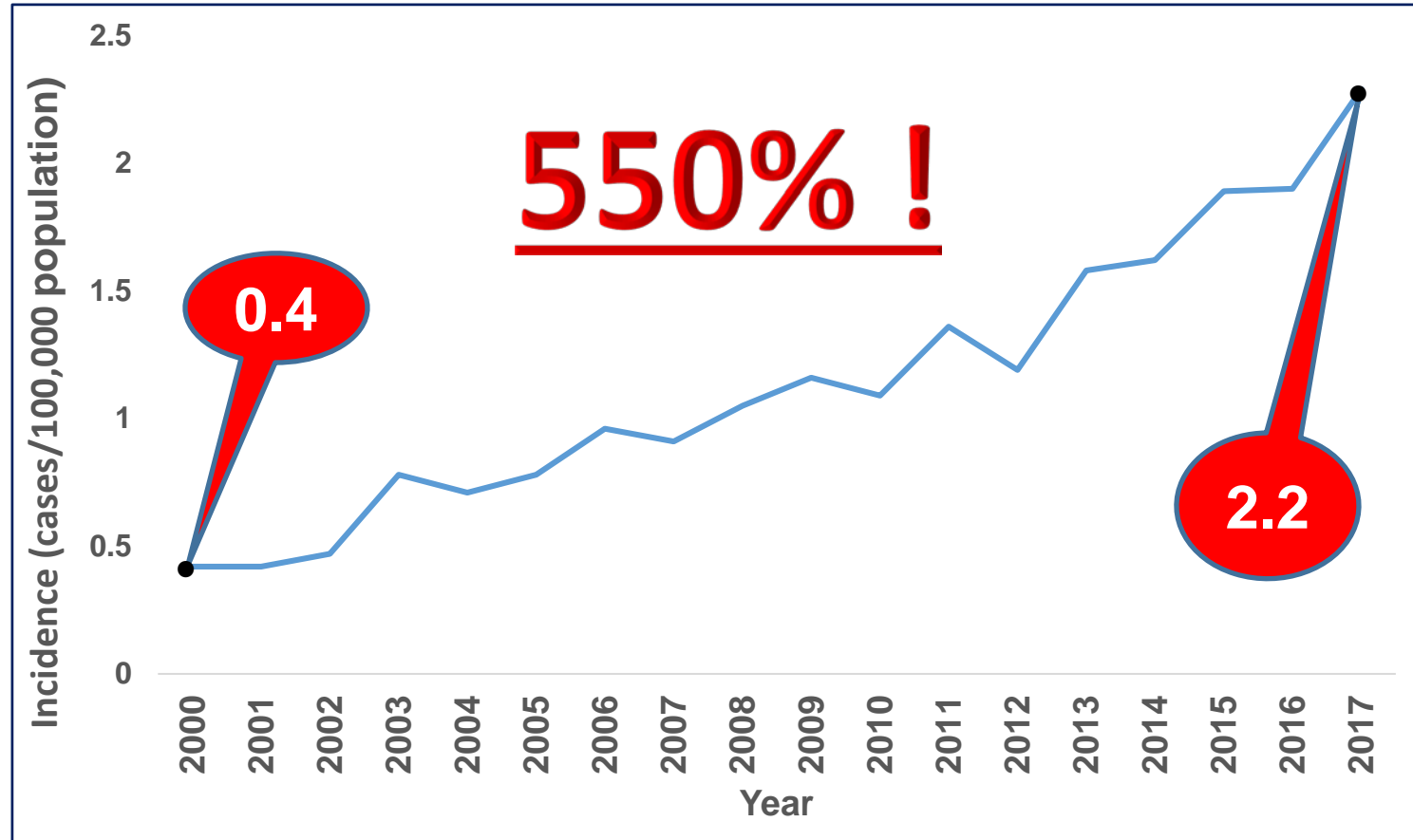


“Legionella Management and Guidelines”

Water Research Foundation Webinar

December 4, 2018

Legionnaires' Disease continues to rise in the US!



2017 = 7458

2015 = 6079

2010 = 3516

2005 = 2301

2000 = 931

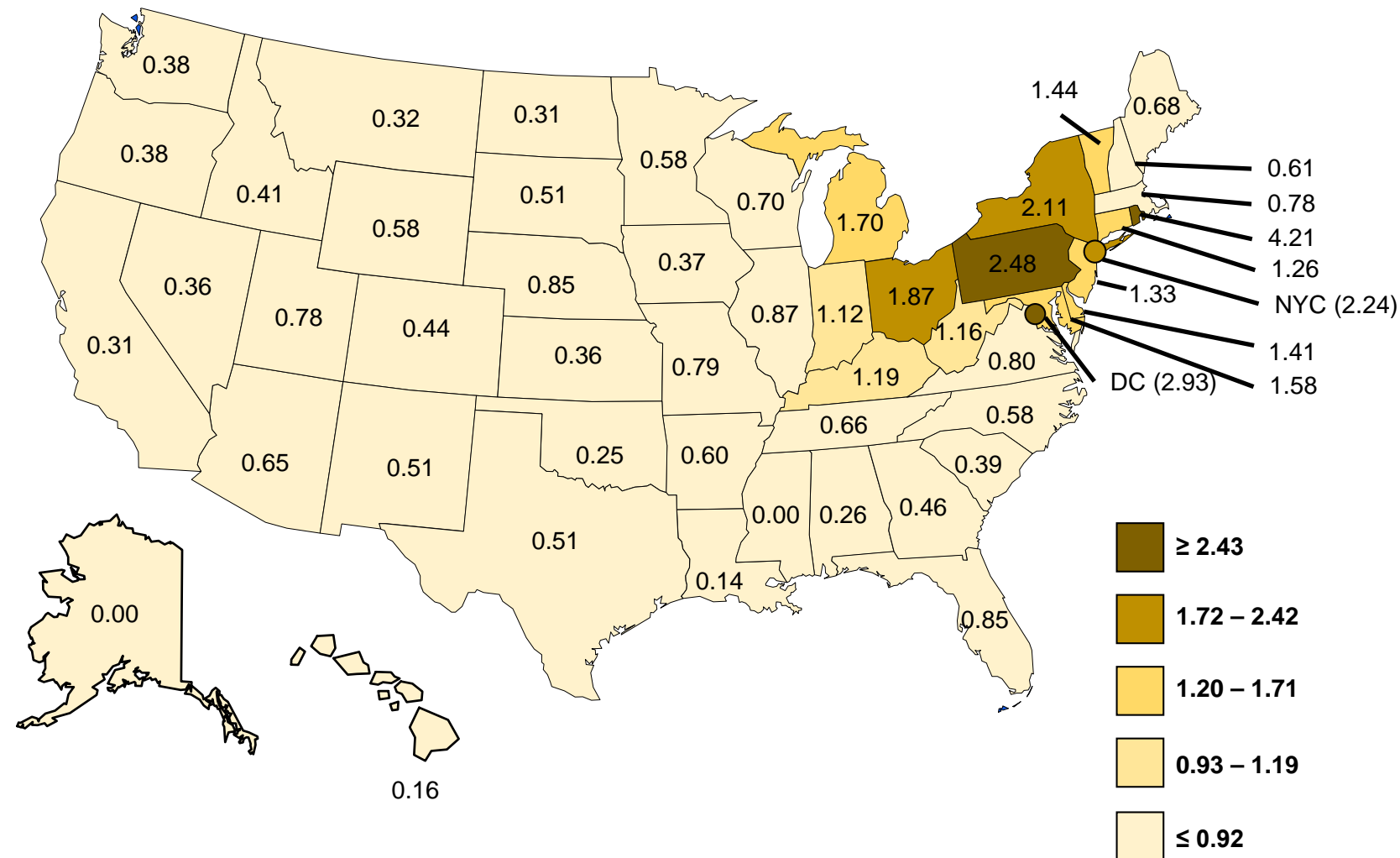
CDC/MMWR



Rate of reported US cases increased **5.5 times!** (2000-2017)

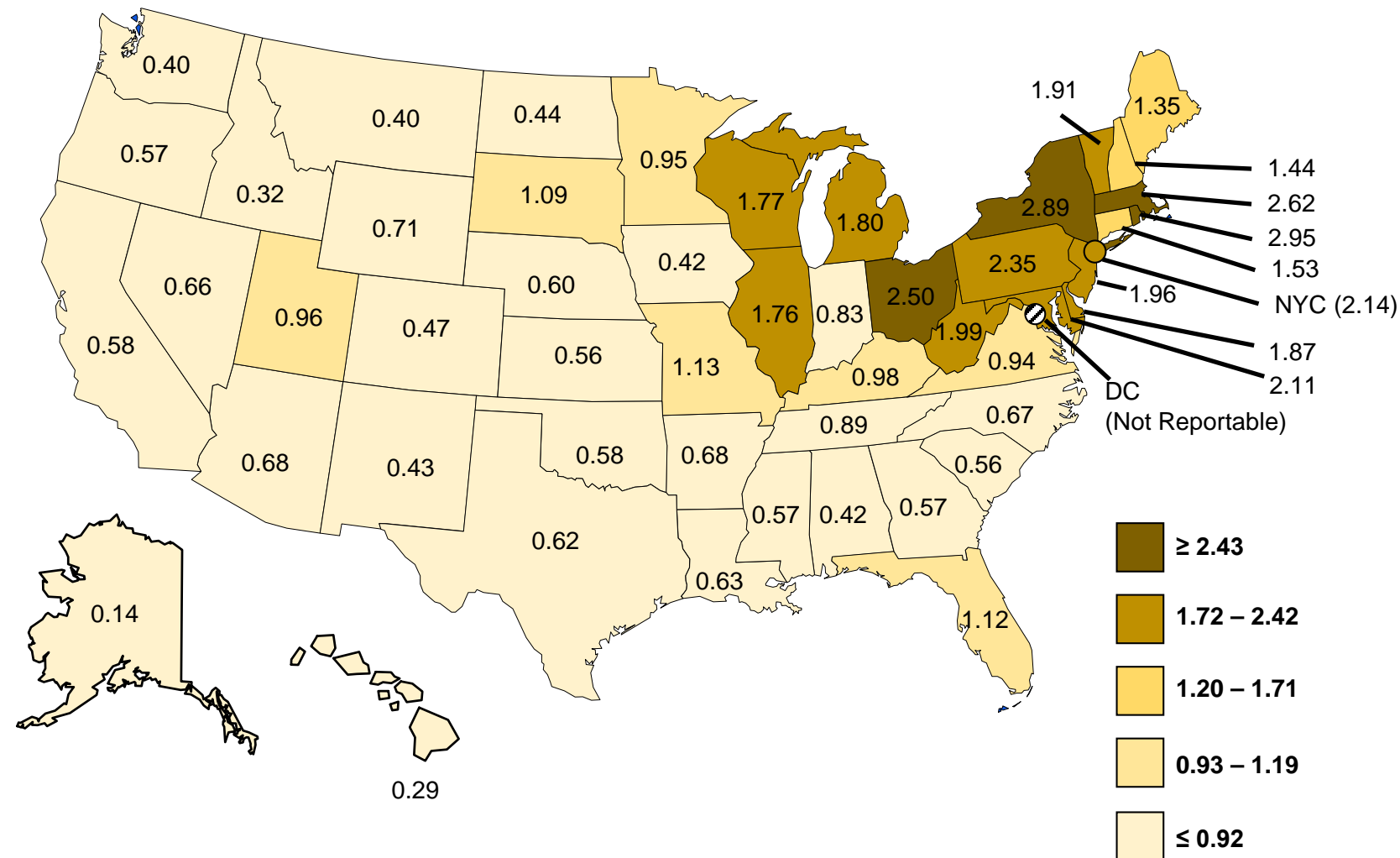
Reported rates of legionellosis cases in the US ...

Reported
cases by state
2007
Cases/100,000
population



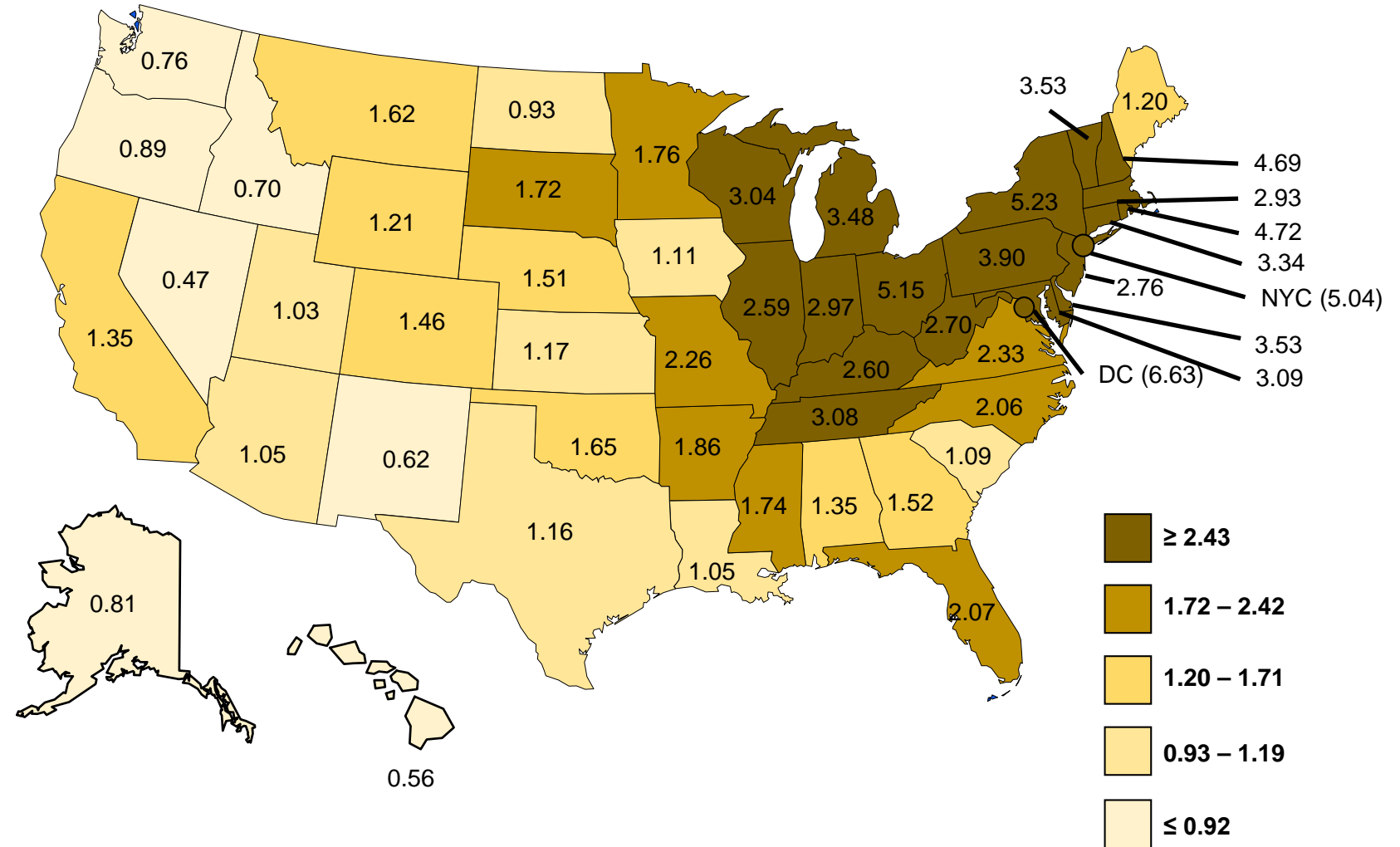
Reported rates of legionellosis cases in the US ...

Reported
cases by state
2012
Cases/100,000
population



Reported rates of legionellosis cases in the US ...

Reported
cases by state
2017
Cases/100,000
population



Possible reasons for increasing number of reported cases *

- **Increased susceptibility of the population**
 - Aging U.S. population
 - More people on immune suppressing medications
- **More *Legionella* in the environment**
 - Warmer temperatures
 - Aging infrastructure
 - Water-saving building modifications
- **Improved diagnostic capabilities**
 - Urinary antigen test (UAT) availability
- **Improved diagnosis and reporting**
 - Increased awareness and testing
 - Increased surveillance capacity



2017 = 7458

2015 = 6079

2010 = 3516

2005 = 2301

2000 = 931

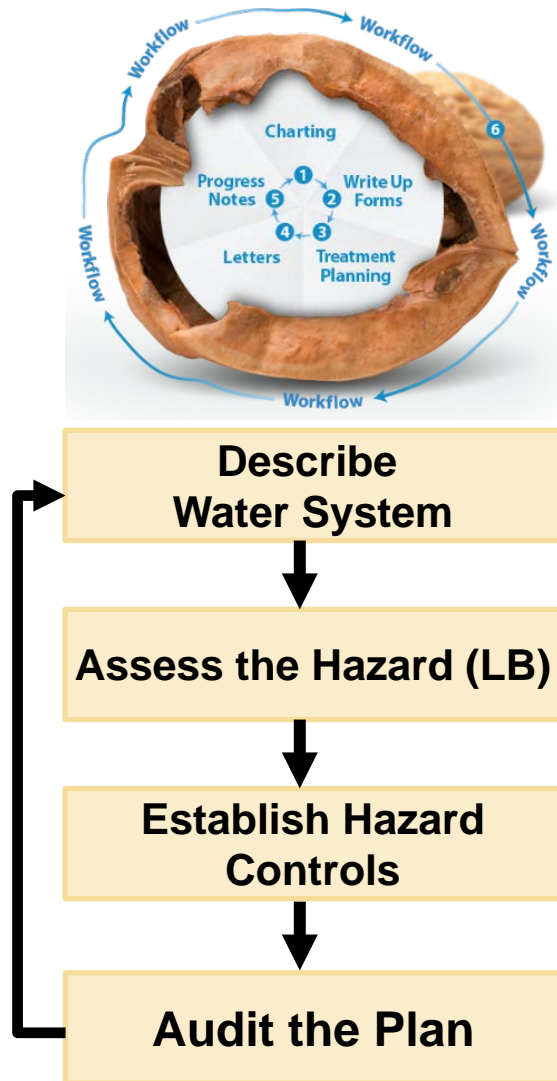
CDC/MMWR

Legionella (now) has Everyone's Attention ...

- ASHRAE, AWT, CTI, IWC, NSFi, NSF, NASEM, ASTM, AWWA, WQA, **IFMA** ...
 - CDC, EPA, VHA, State and Local DOHs / DHMMHs / ASHE, AIHA, CMS, TJC, NIH ...
 - Related industry organizations APIC, ASPE, ASSE, IAPMO, WRF...
- ... and many, more!**



ASHRAE Standard 188 ... in a Nutshell ...



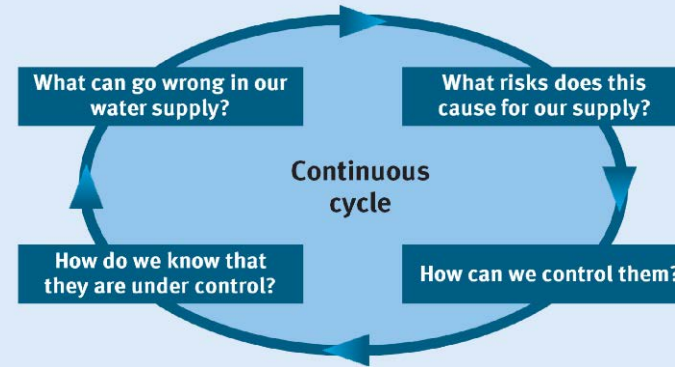
Compliance w/ASHRAE 188 requires facility owners (managers) to:

1→ Establish a **Team** with assigned responsibilities & accountabilities

2→ Have, Practice, Audit and Maintain a **Water Management Program (WMP)** for **legionellosis risk management** within building water systems and devices

ASHRAE 188: Water Management Plan (WMP)

(Section 6)



ANSI/ASHRAE Standard 188-2015

Figure 1. Elements of a Water Management Program (WMP)

1

PROGRAM TEAM—Identify persons responsible for Program development and implementation.

2

DESCRIBE WATER SYSTEMS/FLOW DIAGRAMS—Describe the potable and nonpotable water systems within the building and on the building site and develop water-system schematics.

3

ANALYSIS OF BUILDING WATER SYSTEMS—Evaluate where hazardous conditions may occur in the water systems and determine where control measures can be applied.

4

CONTROL MEASURES—Determine locations where control measures must be applied and maintained in order to stay within established control limits.

5

MONITORING/CORRECTIVE ACTIONS—Establish procedures for monitoring whether control measures are operating within established limits and, if not, take corrective actions.

6

CONFIRMATION—Establish procedures to confirm that

- the Program is being implemented as designed (verification), and
- the Program effectively controls the hazardous conditions throughout the building water systems (validation).

7

DOCUMENTATION—Establish documentation and communication procedures for all activities of the Program.

► **State Health Officials hold the keys to *Legionella* prevention ...**

- Regulations are ultimately needed for facilities to implement WMPs, state officials hold the keys to preventing Legionnaires' disease – as states are the entities most likely to regulate.
- The CDC won't establish regulations. It has influence but does not issue regulations.
- The EPA focuses on water distribution up to the street tap, not on systems within buildings.
- Water treatment professionals, engineers, and consultants can continue talking about better methods and procedures – **but the information won't prevent disease unless it changes the way building water systems are designed, operated, and maintained** – which, will invariably depend on regulations to do so.

Ultimately, then, it's up to health departments or other state agencies.

► Regulations based on a Standard can be established quickly ...

- CMS simply issued a memorandum that hospitals and nursing homes must implement a WMP that reduces the risk of Legionnaires' disease
- The entire memorandum was less than 3.5 pages, primarily background information. The directive itself consisted of **only three sentences!**
- **With just the stroke of a pen**, CMS did more to increase *Legionella* prevention in hospitals and nursing homes than had been accomplished with decades of guidelines, warnings, standards, articles, speeches, conferences, seminars, webinars and e-courses!

CMS could not have established the requirement so simply or quickly without a standard (ASHRAE 188) to reference as a guide for WMPs.

► **ASHRAE Standard 188 is the best standard on which to base *Legionella* regulations – why?**

- **It is ready** – here and now – waiting for a “better” standard will cost health and life.
- It is in **continuous maintenance** – there is a formal process for accepting and considering comments and making changes.
- 188 outlines the **essential elements** and **framework** for a WMP – states can monitor documentation for specific procedures and performance criteria they deem imperative.
- ASHRAE has proven trustworthy ...

Summary

- ✓ *Legionella* is a common bacteria in man-built water systems
- ✓ Disease causation is **not** simple – involves many factors:
 - favorable conditions for LB growth, means of transmission (aerosols) and exposure route to susceptible persons
- ✓ Cooling water and potable water systems *all* important
- ✓ ***There IS a ‘standard of care’ – not ‘best practice’ – that has gained recognition and is required by certain AHJs for Legionellosis Risk Management in Building Water Systems – ASHRAE Standard 188.***

QUESTIONS

