Legionella Webinar: Exploring National Guidance and Local Experiences

May 30, 2018

The webinar will begin at 1:00 PM ET.

Please listen through the audio on your computer.
• Please listen through the audio on your computer
• This call is being recorded and the recording will be shared
• Submit questions through the Q&A Box at any time. We will discuss questions at the end of all the presentations
• If you need technical assistance, please use the Q&A box or email infectiousdiseases@naccho.org
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Welcome, Dr. Oscar Alleyne</td>
</tr>
<tr>
<td>1:05</td>
<td><em>Legionella</em> in a Gwinnett County Fitness Facility, Alana Sulka, MPH, RN, CPH and Brittany Carter, MPH, REHS</td>
</tr>
<tr>
<td>1:25</td>
<td>Legionnaires’ Disease: Trends and Outbreak Resources, Laura Cooley, MD, MPHTM</td>
</tr>
<tr>
<td>1:35</td>
<td>Legionnaires’ Disease Prevention: Environmental Health Perspectives, Jasen Kunz, MPH, REHS</td>
</tr>
<tr>
<td>1:45</td>
<td>Overview of resources, ASTHO and NEHA</td>
</tr>
<tr>
<td>1:50</td>
<td>Q&amp;A</td>
</tr>
</tbody>
</table>
Speaker Introductions

Alana Sulka, MPH, RN, CPH
Director of Epidemiology & Infectious Diseases
Gwinnett, Newton and Rockdale County Health Departments
Brittany Cantrell Carter, MPH, REHS
Epidemiology Program Manager
Gwinnett, Newton and Rockdale County Health Departments
Laura Cooley, MD, MPHTM
Medical Epidemiologist
Respiratory Diseases Branch, Division of Bacterial Diseases, National Center for Immunization and Respiratory Diseases, CDC
Speaker Introductions

Jasen Kunz, MPH, REHS
Environmental Health Officer
Water, Food and Environmental Health Services Branch (WFEHSB), National Center for Environmental Health, CDC
LEGIONELLA IN A
GWINNETT COUNTY FITNESS FACILITY

Gwinnett, Newton and Rockdale
County Health Departments

Alana Sulka, MPH, RN, CPH
Director of Epidemiology and Infectious Diseases

Brittany Carter, MPH, REHS
Epidemiology Program Manager
ABOUT US

▪ The Gwinnett, Newton, and Rockdale (GNR) County Public Health Department serves a population of over one million residents in a three county area East of metropolitan Atlanta

▪ Epidemiology Program Staff
  ▪ Provide infectious and chronic disease investigation, management, education, and prevention services for the county population
  ▪ Perform routine surveillance for over 70 notifiable diseases
  ▪ Provide disease prevention and mitigation activities protecting the health of the community
  ▪ Investigate reports of non-reportable diseases such as Norovirus, head lice, and community acquired MRSA
  ▪ Complete data requests from community partners and the general population
  ▪ Provide infection control guidance and trainings; and collaborate with the county school system to control the spread of infectious diseases in the school population
  ▪ GNR Epidemiology also assists and provides field investigations as requested by Georgia Department of Public Health and CDC
AN OUTBREAK IS IDENTIFIED

- Epidemiology staff conducting routine *Legionella* disease surveillance identified a common exposure among two Gwinnett County individuals
  - Initial case interviewed November 1, 2017
  - Second case interviewed November 6, 2017
- Both individuals had *Legionella pneumophila* SG1 confirmed by urine antigen testing
  - No cultures were available
- Both reported onset of fever, cough, fatigue, and shortness of breath in mid-October 2017 and were diagnosed with pneumonia (Legionnaires’ Disease) by chest x-ray
- The average age of the cases was 71 and both were female
- The common exposure included aquatic aerobics classes and use of the spa and shower areas at a local fitness facility

**CDC Guidance:**
“Clusters and outbreaks have the same definition and you can use either term. Both terms describe two or more people with Legionnaires’ disease exposed to *Legionella* at the same place at about the same time (as defined by the investigators)”

https://www.cdc.gov/legionella/health-depts/epi-resources/outbreak-investigations.html
LEGIONELLA BASICS

- Bacterial illness that can cause Legionnaires’ disease or Pontiac fever, collectively known as legionellosis
  - Over 60 species of Legionella
  - Most disease caused by Legionella pneumophila (especially serogroup 1)

- Individuals are infected when they breathe in small droplets of water that contain Legionella

- Legionella can be found naturally in freshwater environments but also grows in man-made water systems

- Legionella grow and multiply within amoebas and ciliated protozoa providing the Legionella nutrients for growth and protection from harsh environments due to extreme temperatures and chemicals
  - Legionella can also live and grow in biofilms

Information Source: https://www.cdc.gov/legionella/about/index.html
# LEGIONELLA CLINICAL FEATURES

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Legionnaires’ Disease</th>
<th>Pontiac Fever</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Features</td>
<td>Fever, myalgia and cough, shortness of breath, headache, and confusion; nausea and diarrhea may also be present.</td>
<td>Flu-like illness with fever, chills, headache, myalgia, fatigue, malaise</td>
</tr>
<tr>
<td>Diagnosis of Pneumonia</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Incubation Period</td>
<td>Generally 2 to 10 days following exposure</td>
<td>24 – 72 hours after exposure</td>
</tr>
<tr>
<td>Percent of people who become ill following exposure</td>
<td>Less than 5%</td>
<td>Greater than 90%</td>
</tr>
<tr>
<td>Treatment</td>
<td>Antibiotics</td>
<td>Supportive</td>
</tr>
<tr>
<td>Organism Isolation</td>
<td>Possible</td>
<td>Never demonstrated</td>
</tr>
<tr>
<td>Outcome</td>
<td>Hospitalization common. CFR 10% (25% for hospital acquired)</td>
<td>Hospitalization uncommon. CFR extremely low</td>
</tr>
</tbody>
</table>

Source: https://www.cdc.gov/legionella/clinicians/clinical-features.html
INITIAL STEPS TAKEN

- GNR staff notified and consulted with the Georgia Department of Public Health, Acute Disease Epidemiology Section (ADES)
  - Other Districts notified of outbreak and potential facility exposure

- Local hospitals also notified to conduct active case finding

- GNR Epidemiologist and Environmentalist met with facility management on site on November 6th to discuss the cases and provide initial recommendations

- Facility voluntarily closed all pools, whirlpools, steam and sauna rooms, and showers while investigation was ongoing
  - Facility notified patronage about closures via email

- GNR staff returned to the facility on November 7th to meet with facility management and a private consultant hired by the facility to assist with the investigation and any needed remediation
  - Standard inspection conducted under local pool regulations
    - No significant issues were identified under routine inspection
  - Full walk through and environmental assessment utilizing CDC’s *Legionella* Environmental Assessment Form was also completed
Form can be found at https://www.cdc.gov/legionella/downloads/legionella-environmental-assessment.pdf
INITIAL ENVIRONMENTAL INVESTIGATION

- Consultant presented facility and Health Department with a water testing and remediation plan in accordance with CDC and OSHA standards on November 9th including
  - Pre-remediation environmental water sampling
  - Remediation of the water systems in accordance with industry standards for Legionella (CDC and OSHA guidance were provided)
  - Post-remediation environmental water sampling
  - Establishment of a water management plan for the facility

- GNR approved the plan on November 9th

- Consultant conducted pre-remediation water sampling on November 10th

- Following water testing, the facility completed a full water system disinfection and treatment utilizing high heat and high level chlorine treatment

- Facility was allowed to reopen following full disinfection and treatment of the water system in accordance with the approved plan
SUMMARY OF ENVIRONMENTAL TESTING

- Pre-remediation results
  - *Legionella pneumophila* SG1 was identified in both the men’s and women’s hot tub filters

- Post-initial remediation results
  - No *Legionella* was detected in the water samples taken from the hot tubs
  - The filters were not tested initially due to them being replaced
    - We requested the filters be tested even through they were replaced
    - *Legionella* was again detected in the women’s spa filter

- Due to continued detection of *Legionella*, biofilm remediation was required

- Post biofilm remediation results
  - No *Legionella* was detected

- Facility was required to continue testing in accordance with CDC recommendations every two weeks for three months and then every month for an additional three months
  - To date, all follow up testing has been negative for *Legionella*
## SUMMARY OF PERTINENT LAB RESULTS

<table>
<thead>
<tr>
<th>Date</th>
<th>Remediation Status</th>
<th>Specimen</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/16/17</td>
<td>Pre-remediation</td>
<td>Women’s hot tub</td>
<td>None detected</td>
</tr>
<tr>
<td>11/16/17</td>
<td>Pre-remediation</td>
<td>Women’s hot tub filter</td>
<td>&lt;1 CFU/ml <em>Legionella pneumophila</em> SG1</td>
</tr>
<tr>
<td>11/16/17</td>
<td>Pre-remediation</td>
<td>Men’s hot tub</td>
<td>None detected</td>
</tr>
<tr>
<td>11/16/17</td>
<td>Pre-remediation</td>
<td>Men’s hot tub filter</td>
<td>7 CFU/ml <em>Legionella pneumophila</em> SG1</td>
</tr>
<tr>
<td>11/28/17</td>
<td>Post-initial remediation</td>
<td>Women’s hot tub</td>
<td>None detected</td>
</tr>
<tr>
<td>11/28/17</td>
<td>Post-initial remediation</td>
<td>Men’s hot tub</td>
<td>None detected</td>
</tr>
<tr>
<td>12/7/17</td>
<td>Post-initial remediation</td>
<td>Women’s hot tub filter*</td>
<td>&lt;1 CFU/ml <em>Legionella pneumophila</em> SG1</td>
</tr>
<tr>
<td>12/7/17</td>
<td>Post-initial remediation</td>
<td>Men’s hot tub filter*</td>
<td>None detected</td>
</tr>
<tr>
<td>12/18/17</td>
<td>Post biofilm remediation</td>
<td>Women’s hot tub filter</td>
<td>None detected</td>
</tr>
<tr>
<td>12/18/17</td>
<td>Post biofilm remediation</td>
<td>Men’s hot tub filter</td>
<td>None detected</td>
</tr>
</tbody>
</table>

* The filters were not initially tested in post-remediation testing because the sand filtration systems had been completely replaced. GNR requested these filters be tested.
LEGIONELLA OUTBREAK TIMELINE

11-1-17
1st Legionella case identified

11-6-17
2nd Legionella case identified

11-9-17
Facility completed all pre-remediation water testing and water system disinfection and treatment. Facility allowed to reopen

11-10-17
Health Department approves testing and remediation plan

11-28-2017
• Health Department met with facility to provide additional remediation recommendations following the report of Legionella detected in pre-remediation samples from the whirlpool spas. Remediation to include biofilm removal and disinfection.
• Facility voluntarily closes spas until additional remediation (including replacing sand filters for spas) and testing are completed.

12-7-17
Facility reported that biofilm remediation was completed and post remediation water sampling for spas was completed.

12-19-17
Health Department approved reopening of whirlpool spas following negative results

11-1-17
• Gwinnett Health Department Epi and EH staff have conference call with GA DPH.
• Facility visited by Gwinnett County Health Department staff to discuss illnesses and potential exposure at the facility.
• Facility voluntarily closes all aquatic areas.

11-7-17
• Gwinnett Health Department Epi and EH conduct a walkthrough and Legionella assessment at the facility.
• Gwinnett County EH staff conduct routine pool inspections

11-29-17
• Facility reports post remediation water sampling results negative (Note: whirlpool spas not tested because the filters had been replaced).
• Health Department requested the facility have the water systems feeding the spas retested prior to biofilm remediation.
• Spas remain closed.

12-8-17
• Facility reports post initial remediation water sampling results for whirlpool spas indicate low levels of Legionella in men’s spa.
• Spas remain closed until post biofilm remediation sampling results are negative.

12-18-17
• Final post biofilm remediation water sampling results for whirlpool spas are negative for Legionella.

Note: Facility will conduct routine water testing for 6 months following 12.18.17 negative results in accordance with CDC Legionella spa guidance.
SUMMARY

▪ An outbreak of *Legionella pneumophila* SG1 was investigated among patrons of a local fitness facility

▪ The facility voluntarily closed upon notification and followed all recommendations made by the Health Department

▪ Remediation steps were significant and resulted in the facility’s aquatic areas and showers being closed for close to a month
  ▪ Initially allowed to reopen following initial remediation
  ▪ Closed again following detection of *Legionella* after initial remediation

▪ No additional cases were identified despite active case finding

▪ Outbreak resulted in significant media interest
LESSONS LEARNED

▪ Relationships are key! Meeting in person and onsite with facility leadership and maintaining that personal communication was essential
  ▪ This proved important when drafting communication that was going to be sent to facility membership as well as the media
  ▪ Weekly meetings/and or calls kept facility and Health Department leadership apprised of the progress and mitigation plan

▪ Variations in environmental assessment and sampling tools and guidance available made the initial planning challenging
  ▪ Relied heavily on CDC guidance, but also reviewed OSHA standards

▪ Once a plan is set, ensure all guidance supports your plan and you can justify decisions.
  ▪ Ensure that affected areas are not allowed to reopen until all final testing results are in, regardless of the remediation steps
  ▪ Utilize available tools such as CDC’s “Disinfection of Hot Tubs that Contain Legionella” to help plan the investigation process and interventions
Disinfection of Hot Tubs that Contain Legionella

Hot tubs* that contain Legionella bacteria can cause outbreaks of disease. Legionella can cause Legionnaires’ disease, a serious type of lung infection, and a milder infection called Pontiac fever. It is critical to collect water samples then disinfect hot tubs linked to cases of Legionnaires’ disease or Pontiac fever.

**CDC-recommended best practices**

No scientific studies have determined the best way to disinfect a hot tub that contains Legionella. **CDC recommends following these steps** based on currently available scientific information:

1. **Close the hot tub immediately.**
   - Shut down the hydrotherapy jets and circulation pumps, but do not drain the water.
2. **Contact your state or local public health agency.**
   - The health department will determine if you need to conduct laboratory testing.
3. **Collect water samples if directed by the health department.**
   - If so, always collaborate with your state or local public health agency and a laboratory with Legionella testing expertise. View a CDC list of laboratories that test for Legionella.
   - Have samples taken from the tub, hydrotherapy jets, drain, and filters or filter media before proceeding to step 4. Find additional information and tools from CDC on water sampling.
   - You do not have to wait for laboratory results before disinfecting the hot tub. However, do not re-open the hot tub for use until all test results are negative for Legionella.
4. **Drain all water from the hot tub.**
   - Dispose of the water to waste or as directed by the local regulatory authority.
5. **Vigorously scrub all hot tub surfaces, skimming devices, and circulation components.**
   - Use water with free chlorine at a minimum concentration of 5 parts per million (ppm) to remove any biofilm (slime). After scrubbing, rinse the tub with clean water and flush to waste.
6. **Replace filters (for cartridge or diatomaceous earth filters) or filter media (for sand filters).**
   - Bag these and dispose as normal solid waste.
7. **Make any needed repairs.**
   - Inspect the hot tub thoroughly for any broken or poorly functioning components such as valves, sensors, tubing, or disinfectant feeders.
8. **Refill and hyperchlorinate using 20 ppm free chlorine.**
   - Keep the hydrotherapy jets off and let the hyperchlorinated water circulate for 1 hour in all of the components of the hot tub including the compensation/surge tank, filter housing, and piping.
   - Turn on the hydrotherapy jets to circulate the hyperchlorinated water for 9 additional hours. Maintain 20 ppm of free chlorine in the system for the entire 10 hours.

9. **Flush the entire system.**
   - This removes the hyperchlorinated water from all equipment.
10. **Take new samples to confirm the elimination of Legionella.**
    - At least 24 hours after the device has been restored to normal operating conditions, have samples taken from:
      - Tub
      - Hydrotherapy jets
      - Drain
      - Filters or filter media
      - Any part of the hot tub that originally tested positive for Legionella
11. **Keep the hot tub closed until testing confirms the elimination of Legionella.**
    - If laboratory testing is positive for Legionella, repeat steps 4 through 10 until all testing is negative.
    - If laboratory testing is negative for Legionella, proceed to step 12.
12. **Ensure water quality prior to reopening the hot tub for use.**
    - Ensure that halogen (chlorine or bromine) and pH levels meet local and state standards.
13. **Maintain water quality according to local and state standards.**
    - See “Prevention through regular operation and maintenance” section below for additional information.
    - Continued Legionella testing may be considered on a case-by-case basis.
    - If the hot tub is associated with an outbreak, the following continued laboratory testing schedule may be considered:
      - Conduct culture-based testing every 2 weeks for 3 months, then every month for 3 months.
      - If testing finds Legionella at any time during this 6-month period, disinfect again and start the testing schedule over.
    - For hot tubs that continue to grow Legionella, consider hiring a consultant with expertise in Legionella remediation.

**Note:** There are no data to suggest that personal protective equipment is required for disinfecting a hot tub, but N95 respirator masks may be worn during the disinfection process. Respirators must be used in accordance with a comprehensive respiratory protection program, which includes fit testing, training, and medical clearance (see Occupational Safety and Health Administration standard 29 CFR 1910.134). Visit the [National Institute for Occupational Safety and Health N95 respirator web page](https://www.cdc.gov/niosh/topics/respirators/).

**Prevention through regular operation and maintenance**

Proper operation and maintenance of hot tubs can help prevent the growth of Legionella and protect people’s health. View CDC’s Model Aquatic Health Code for guidance on making water activities healthier and safer. Water management programs take a preventive approach by reducing the risk of Legionella growing and spreading in building water systems. See CDC’s toolkit on how to develop a Legionella water management program.

**References:**


* The phrase “hot tubs” in this document includes hot tubs, whirlpool spas, and hydrotherapy spas.
LESSONS LEARNED (CONT.)

▪ Internal Health Department relationships and collaboration are key
  ▪ Epidemiology and Environmental Health have to work as a team to fully assess the situation and develop a mitigation plan to prevent the spread of infection
  ▪ Having Epidemiologists that are Registered Environmental Health Specialists (REHS) adds credibility and the knowledge base to work collaboratively with Environmental Health partners

▪ Partnership and collaboration with Public Health Partners (Federal, State, and Local) and Legionella experts early in the process is beneficial
  ▪ Collaboration on the initial plan is beneficial and can lead to a more informed plan
  ▪ Recommendations and input received after the plan is in place can be challenging and create issues for follow-up
ACKNOWLEDGEMENTS

▪ Gwinnett County Health Department staff involved in the investigation
  ▪ Brittany Carter- Epidemiology Program Manager
  ▪ Keisha Francis – Environmental Epidemiologist
  ▪ Jason Reagan – District Environmental Health Director
  ▪ David Hornsby – Environmental Health Specialist
  ▪ Alana Sulka – Director of Epidemiology and Infectious Diseases
  ▪ Joseph Sternberg – Director of Environmental Health and Injury Prevention
  ▪ Summer Nix – Public Information Officer
  ▪ Veronica Mahathre – Health Communications Coordinator

▪ Facility leadership and staff

▪ Georgia Department of Public Health, Acute Disease Epidemiology Section Epidemiology staff
Legionnaires’ Disease: Trends and Outbreak Resources

Laura A. Cooley, MD, MPHTM
National Center for Immunization and Respiratory Diseases
NACCHO Legionella Webinar: Exploring National Guidance and Local Experiences
May 30, 2018
Legionnaires’ disease is on the rise in the United States

Rate of reported cases increased 4.5 times (2000–2016)

Source: National Notifiable Diseases Surveillance System
2005: Rates of reported legionellosis cases by state

Cases per 100,000 population
Source: National Notifiable Diseases Surveillance System
2010: Rates of reported legionellosis cases by state

Cases per 100,000 population
Source: National Notifiable Diseases Surveillance System
2015: Rates of reported legionellosis cases by state

Cases per 100,000 population
Source: National Notifiable Diseases Surveillance System
Possible reasons for these increases

- Increased susceptibility
  - 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
Steps leading to Legionnaires’ disease

- Bacteria called *Legionella* live in fresh water
  - Natural reservoir
  - Insufficient numbers to cause disease

- Conditions in large, complex water systems can lead to bacteria growth
  - Temperature (77–108°F)
  - Stagnation
  - Scale and sediment
  - Biofilm
  - Protozoa
  - Absence of disinfectant
Steps leading to Legionnaires’ disease

- Certain devices can aerosolize water containing *Legionella*
  - Showers and faucets
  - Cooling towers
  - Hot tubs
  - Decorative fountains

- People breathe *Legionella* in and some are more likely to get sick
  - People ≥ 50 years old
  - Current or former smokers
  - People with weak immune systems
  - People with chronic disease
What do we know about source attribution?

• 2016: CDC analyzed data from 27 building-associated outbreaks (2000–2014)

• Common settings
  • Hotels (44%)
  • Long-term care facilities (19%)
  • Hospitals (15%)

• Common sources
  • Potable water (56%)
  • Cooling towers (22%)
  • Hot tubs (7%)
  • Decorative fountains (4%)
  • Industrial equipment (4%)

9 in 10

CDC investigations show almost all outbreaks were caused by problems preventable with more effective water management
New, expanded resources for health departments

- Surveillance and reporting
  - Case definitions
  - CDC surveillance classifications
  - Guidance on reporting cases

- Epidemiology
  - Case verification
  - Patient interview tools
  - Considerations during outbreaks

www.cdc.gov/legionella/
New, expanded resources for health departments

- Healthcare resources
  - Key definitions
  - Considerations specific to healthcare cases and outbreaks

- Communication resources
  - Notification letter templates
  - Fact sheets
  - Sample press releases and health advisories
Detailed considerations for outbreak investigations

- Conducting a full investigation
  - From identification to remediation
- Considerations specific to
  - Potable water
  - Cooling towers
  - Hot tubs
  - Decorative fountains
  - Travel
  - Community-based
Centers for Disease Control and Prevention (CDC)
Customizable questionnaire templates

Legionnaires’ Disease Hypothesis-generating Questionnaire Template

<Instructions to the interviewer appear in italics. Please read the entire questionnaire before beginning the interview.>

After confirming a case of Legionnaires’ disease or Pontiac fever and completing the CDC Legionellosis Case Report Form, you can use this form to collect additional epidemiologic data. These data may be useful in detecting outbreaks or in a future cluster/outbreak investigation. You may add this form to your state’s electronic notifiable disease surveillance system in whole or in part for routine data collection. A more detailed questionnaire that you can customize to the outbreak location should be developed and used for cases associated with a known outbreak.>

What was the patient’s outcome? □ Recovered □ Still Ill □ Died □ Unknown

Interviewer identification

Interviewer’s name: ___________________________ Health department: ________________
Customizable line list templates

- Travel-associated
- Community-associated
- Healthcare-associated

<table>
<thead>
<tr>
<th>ID #</th>
<th>Age</th>
<th>Sex</th>
<th>Underlying medical conditions (list)</th>
<th>Date of symptom onset</th>
<th>Symptoms</th>
<th>Outcome of illness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Centers for Disease Control and Prevention (CDC)

For Health Departments

CDC developed the following resources to assist state and local health department personnel in investigating individual cases and outbreaks of Legionnaires’ disease. State and local health departments have jurisdiction over investigations in their state.

Laboratory Investigation Resources
CDC developed tools to assist in the laboratory component of Legionnaires’ disease outbreak investigations.

SURVEILLANCE AND REPORTING RESOURCES
Provides case definitions, surveillance classifications, instructions on how to report cases...

EPIDEMIOLOGY INVESTIGATION RESOURCES
Explains how to verify cases, what to consider during investigations, prevention tips...

HEALTHCARE INVESTIGATION RESOURCES
Describes how to define healthcare-associated Legionnaires’ disease, what to consider, prevention tips...

www.cdc.gov/legionella/
Legionnaires’ Disease Prevention: Environmental Health Perspectives

CDR Jasen Kunz, MPH
National Center for Environmental Health
Environmental Health Specialist, Legionella Team
Environmental health expertise is key to preventing Legionnaires’ disease

• We must understand environmental factors that allow Legionella to survive and reach susceptible host

• Need Laboratory + Epidemiology + Environmental expertise to identify and control Legionella outbreaks

• Developing and adopting evidence-based environmental prevention practices = reducing risk

• Environmental health Legionnaires’ disease capacity is lacking completely or is inadequate in most states
Environmental health capacity building

- Since FY 2016, CDC has partnered with state and local health departments through the *Legionella* ELC Cooperative Agreement

- Key environmental health ELC goal
  - Build capacity for Legionnaires’ disease response and prevention through increased utilization of environmental assessments and water management programs (WMPs) that are compliant with industry standards
Prevention Resources
Primary prevention of Legionnaires’ disease

- Ensuring proper maintenance of building water systems and aerosol-generating devices is key
- Current guidelines, standards, and protocols
  - VHA Directive 1061 (2014)
  - AIHA Guideline (2015)
  - NYC/NYS regulations (2015, 2016)
  - NSF 453 (2017)
  - CMS Memo (2017)
  - Others in development
Translating ASHRAE 188 for wider audiences

- CDC *Legionella* WMP toolkit
- Plain language
- Step-by-step guide to creating a WMP

www.cdc.gov/legionella/WMPtoolkit
Steps in a water management program

1. Establish a water management program team
2. Describe the building water systems using text and flow diagrams
3. Identify areas where *Legionella* could grow and spread
4. Decide where control measures should be applied and how to monitor them
5. Establish ways to intervene when control limits are not met
6. Make sure the program is running as designed and is effective
7. Document and communicate all the activities

Continuous program review (see below)

[www.cdc.gov/legionella/WMPtoolkit](http://www.cdc.gov/legionella/WMPtoolkit)
Response Resources
**Legionella Environmental Assessment Form (LEAF)**

- **Use the LEAF to:**
  - Document a facility’s water systems,
  - Help determine whether to conduct *Legionella* environmental sampling,
  - And, if so, develop a sampling plan

Environmental investigation videos

Videos:

• *Legionella* Ecology and Introduction to Environmental Health and Engineering
• Conducting and Interpreting the Environmental Assessment
• How to...
  • Make a Sampling Plan
  • Sample Potable Water
  • Sample Cooling Towers
  • Sample Spas and Fountains

[https://www.cdc.gov/legionella/videos.html](https://www.cdc.gov/legionella/videos.html)
Additional resources

Considerations when working with *Legionella* consultants:

- Level of experience
- Laboratory expertise
- Environmental assessment expertise
- Remediation expertise
- Water management expertise
- Knowledge of codes, standards, and regulations
- Potential conflicts of interest

https://www.cdc.gov/legionella/wmp/consultant-considerations.html
Questions?

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Abraham G Kulungara, BDS, MPH
Senior Director, Environmental Health
Association of State and Territorial Health Officials
2231 Crystal Drive, Suite 450, Arlington, VA 22202
Email: akulungara@astho.org
Office: 571-527-3154
EH Role in *Legionella*

- What programs lack
- What elements are necessary in a functioning program

Christl Tate ctate@neha.org
A committee of experts will produce a comprehensive report regarding improvements in the management of *Legionella* in water systems to protect public health and identifying gaps in research that are barriers to more effective management. The report will be useful to federal, state, and other agencies with responsibilities to protect public health, supply safe drinking water, and maintain high quality water in built water systems.

*Engage with us!*  
Bookmark and explore these pages, which will be updated throughout the project  
[DELS project page](#)  
[NASEM Current Projects page](#)  

Subscribe to our updates via the [DELS project page](#)  

Contact study director Laura Ehlers ([lehlers@nas.edu](mailto:lehlers@nas.edu)), associate program officer Andrea Hodgson ([ahodgson@nas.edu](mailto:ahodgson@nas.edu)), or senior project assistant Remy Chappetta ([rchappetta@nas.edu](mailto:rchappetta@nas.edu)) if you have material you would like to share with the committee.
Discussion

Please enter your questions/comments in to the Q&A box
Thank you for joining us!

Contact us with questions

Email: infectiousdiseases@naccho.org