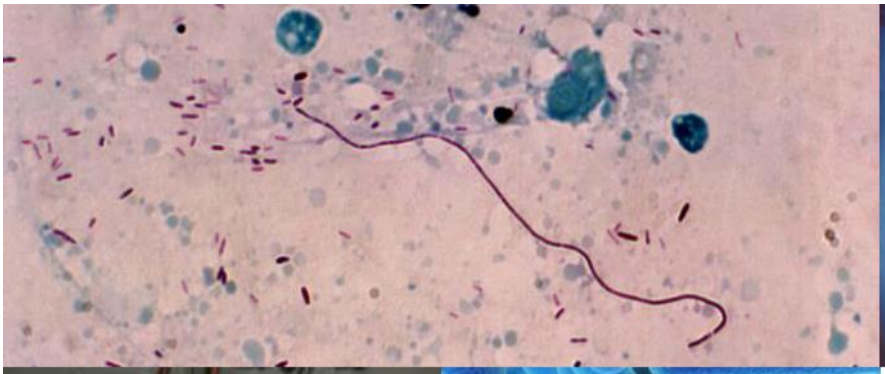
Georgia Department of Public Health

Georgia Legionellosis Control and Investigation Manual 2020





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Georgia Legionellosis Control and Investigation Manual

I. Disclaimer

These materials were prepared and are relevant as of July 31, 2017 and were updated April 6, 2020. Centers for Disease Control and Prevention (CDC), American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), and other organizations continue to release updated recommendations and guidance. Therefore, DPH policies, procedures, and recommendations will evolve as more information is released. Please do not hesitate to reach out to the DPH *Legionella* surveillance coordinator for updated resources or guidance.

II. Key Updates

This manual was updated in 2020 to reflect more recent data, new and revised guidance, and the 2019 Council of State and Territorial Epidemiologists (CSTE) legionellosis case definition.

A. Case Definition and Impact on Investigations

The 2019 CSTE legionellosis case definition reflects the incubation period for Legionnaires' disease and includes guidance regarding healthcare classification and investigations accordingly. Healthcare exposure case classification language has been updated in this manual to reflect those changes, but the threshold for full investigations in Georgia has not changed.

Previously, CDC recommended collecting a 10-day exposure history in accordance with the contemporaneous CSTE case definition for routine surveillance, with an expanded 14-day exposure history for cluster and outbreak investigations. Georgia elected to obtain the full 14-day exposure history for all cases to enable cluster detection.

Additionally, a single presumptive healthcare-associated case (formerly "definite healthcare-associated"), still triggers a full investigation. The language has changed in response to the updated CSTE exposure history period guidance but does not impact Georgia activities as the 14-day exposure period was already in use.

B. Laboratory Testing

All laboratories testing Georgia residents for notifiable diseases were advised to submit all primary *Legionella* isolates and, when isolates are unavailable, respiratory specimens that test positive for *Legionella*.

The CSTE case definition also includes updated guidance for confirmatory laboratory test methods.

C. New and Updated Resources

Updated guidance includes ASHRAE Standard 188-2018 (from the previous 2015 version). New resources include PreventLD online training. Sample communication documents are now available as appendices.

III. Biology of Legionellosis

A. Etiologic Agent

Legionnaires' disease is caused by bacteria called *Legionella.* The bacteria were named in 1976 following an outbreak of pneumonia among attendees at the American Legion convention in Philadelphia.

Legionella is a gram-negative bacterium common in many environments and is most often found in warm water (25-42°C/77-108°F). There are multiple species and serogroups; however, the most common cause of illness in humans is *Legionella pneumophila* serogroup 1. *Legionella* typically infects individuals when the bacteria are aerosolized and inhaled or aspirated. Exposure can occur from a variety of contaminated sources such as cooling towers, decorative fountains, faucets, hot tubs/spas, showers, and even ice machines. *Legionella* spread from person-to-person is not a meaningful route of transmission.

Legionella bacteria are widely distributed in water systems. They tend to grow in biofilms or slime on the surfaces of lakes, rivers and streams, and they are not eradicated by the chlorination used to purify domestic water systems. Low and even non-detectable levels of the organism can colonize a water source and grow to high concentrations under the right conditions.

Water conditions that tend to promote the growth of *Legionella* include:

- Stagnation, low water flow
- Temperatures between 20° and 50°C (68° - 122°F) (optimal range 35° - 46°C [95° - 115°F])
- pH between 5.0 and 8.5
- Sediment, that can promote growth of commensal microflora
- Growth of micro-organisms including algae, flavobacteria, and *Pseudomonas*, which supply essential nutrients for growth of *Legionella* or harbor the organism (e.g. amoebae).

B. Clinical Disease

Legionellosis can take one of three forms: Legionnaires' disease, Pontiac fever, and extra-pulmonary infection. People with Legionnaires' disease or Pontiac fever may have appetite loss, malaise, muscle pain, headache, and fever. However, Legionnaires' disease is associated with pneumonia, while Pontiac fever is a milder disease that does not cause pneumonia. The incubation period of Legionnaires' disease is 2-10 days after exposure, most often 5-6 days. The incubation period of Pontiac fever is 5-66 hours, with an average of 24-48 hours. Extra-pulmonary illness is non-respiratory and may include wound infection with *Legionella* bacteria. Extra-pulmonary illness is extremely rare.

While *Legionella* can infect young healthy individuals, those most at risk of getting sick from the bacteria are people 65 years of age or older, as well as smokers, or those who have a chronic lung disease (like emphysema). People who have weakened immune systems from diseases (such as cancer, diabetes, or kidney failure), or from medication to suppress the immune system (such as chemotherapy or transplant medications) are also more likely to get sick from *Legionella* bacteria.

C. Laboratory Testing

Laboratory tests to diagnose the diagnosis of legionellosis include a positive urine antigen, culture, direct fluorescent antibody (DFA) staining of respiratory samples and tissue, PCR assays of respiratory samples, or serologic testing of blood. Serologic tests of antibodies are only diagnostic with a 4-fold or greater rise in antibody titer in paired (acute and convalescent) antibody tests collected 4-8 weeks apart. Serologic testing is not recommended for clinical or public health purposes because of the delay inherent in convalescent testing.

The best practice for clinical *Legionella* testing is to test clinically compatible patients by both urine antigen and respiratory specimen culture as early as possible. It is preferable to collect the respiratory specimen prior to administration of antibiotics, but culture testing should be pursued even if antibiotic treatment has been initiated. It is not appropriate to test persons without symptoms, as that impacts the sensitivity and specificity of the test results. More specifically, testing indiscriminately by urine antigen may result in false positive results.

In 2019. The Georgia Public Health Laboratory (GPHL) in conjunction with DPH Epidemiology updated clinical specimen submission processes. All laboratories testing Georgia residents for notifiable diseases were advised to submit all primary *Legionella* isolates and, when isolates are unavailable, respiratory specimens that test positive for *Legionella*. The letter to laboratories and submission guidance is available. (Appendix F)

IV. Epidemiology of Legionellosis

A. Case Definition

Legionellosis		
Clinical Criteria: a.) **Legionnaires' disease:** fever, myalgia, cough, and clinical or radiographic pneumonia, b.) **Pontiac fever:** a milder illness without pneumonia, or c.) **Extrapulmonary legionellosis.**		
Confirmed	**Suspect**	**Probable**
A **confirmed** case meets the clinical criteria *and* at least one of the following confirmatory laboratory criteria: • Isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site, **or** • Detection of *Legionella* species from respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site by a validated nucleic acid amplification test • Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents, **or** • Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.	A **suspect** case meets the clinical criteria *and* at least one of the following supportive laboratory criteria: • Fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 *(*e.g., *L. micdadei*, *L. pneumophila* serogroup 6), **or** • Fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagent, **or** • Detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, pleural fluid, or blood by direct fluorescent antibody (DFA) staining, immunohistochemstry (IHC), or other similar method, using validated reagents**.**	A **probable** case meets the clinical criteria *and* has one of the following epidemiologic links: • A setting with a confirmed source of *Legionella* (e.g., positive environmental sample result associated with a cruise ship, public accommodation, cooling tower, etc.) • A setting with a suspected source of *Legionella* that is associated with at least one confirmed case Within the following timeframes: • 14 days before symptom onset for Legionnaires' disease • 3 days before symptom onset for Pontiac fever Note: Presumptive laboratory evidence is not required for probable case classification

Clinical criteria

- Legionnaires'disease:
  - Pneumonia diagnosis with radiographic evidence(patchy or focal areas of consolidation that may progress to bilateral involvement on chest x-ray) **or**
  - Pneumonia diagnosis without radiographic evidence(physician diagnosis of pneumonia in absence of radiographic testing) **or**
  - Description of clinical symptoms that are consistent with a diagnosis of pneumonia, even if "pneumonia" is not recorded explicitly
    - Clinical symptoms of pneumonia may vary but must include acute onset of lower respiratory illness with fever and/or cough

        - Additional symptoms could include myalgia, shortness of breath, headache, malaise, chest discomfort, confusion, nausea, diarrhea, or abdominal pain
- Pontiac fever: Absence of pneumonia with acute symptom onset of one or more of the following: fever, chills, myalgia, malaise, headaches, fatigue, nausea and/or vomiting

Epidemiologic Linkage

- Epidemiologic link to a setting with a confirmed source of *Legionella* (e.g., positive environmental sampling result associated with a cruise ship, public accommodation, cooling tower, etc.) **OR**
- Epidemiologic link to a setting with a suspected source of *Legionella* that is associated with at least one confirmed case

Laboratory criteria

Confirmatory laboratory evidence:

- Isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site
- Detection of any *Legionella* species from respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site by a validated nucleic acid amplification test
- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents
- 4-fold or greater rise in serum antibody titer to *Legionella pneumophila* serogroup 1 in paired (acute and convalescent) antibody tests paired 4-8 weeks apart using validated reagents

Supportive laboratory evidence:

- Fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6)
- Fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigens
- Detection of specific *Legionella* antigen or staining of the organism in in respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site associated with clinical disease by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents.

Criteria to Distinguish a New Case from an Existing Case

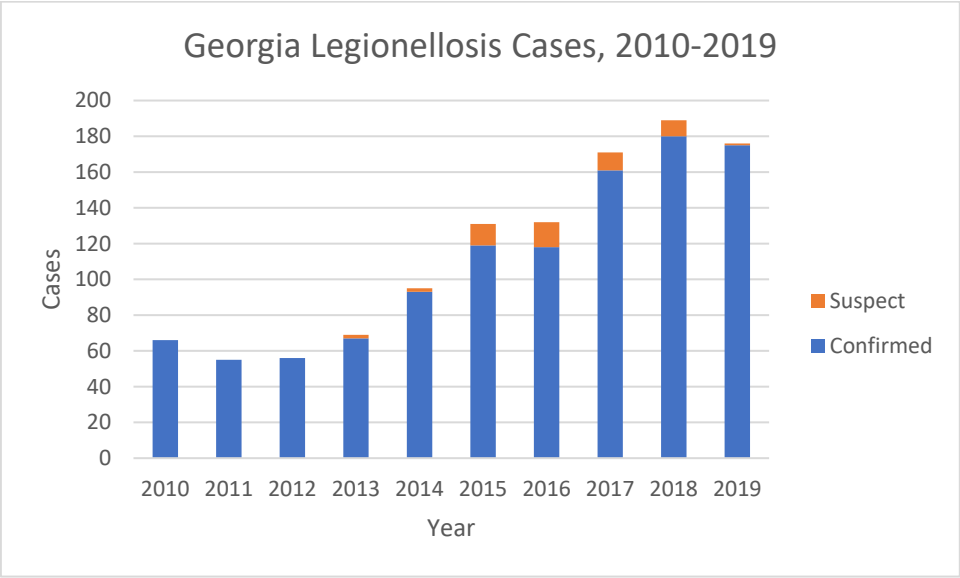
- An individual should be considered a new case if their previous illness was followed by a period of recovery prior to acute onset of clinically compatible symptoms and subsequent laboratory evidence of infection. The recovery period for legionellosis can vary based on patient-specific factors. CDC consultation is encouraged for case classification of individuals without clear periods of recovery or subsequent acute illness onset.

B. National Data

According to CDC, each year, between 8,000 and 18,000 people are hospitalized with Legionnaires' disease in the U.S. However, many infections are not diagnosed or reported, so this number may be higher. More illness is usually found in the summer and early fall, but it can happen any time of year.

C. Georgia Data

In Georgia, on average, 114 cases have been reported per year over the past ten years, with a range from 55 cases to 189.



The number of cases annually has trended upwards in Georgia over the past decade, and that trend is consistent with national patterns. Legionellosis cases in Georgia do exhibit seasonality similar to national trends, with an increase in cases during the warmer months when ambient water temperatures are more favorable for *Legionella*.

IV. Case Investigation

A. Epidemiologic Case Investigation

Reported cases of legionellosis should be investigated initially at the local level. It is the responsibility of the District Epidemiologist to interview the case in accordance with the Georgia Case Report Form (Appendix A). If the case cannot be interviewed, a family member or someone that is knowledgeable of the patient's exposure history may function as a proxy. **Case investigation should be initiated in a timely manner, including attempting to contact the case or proxy for interview within seven days of report.** If the district is unable to initiate contact within seven days, please communicate directly with the State *Legionella* Coordinator to arrange for temporary assistance.

Investigators should interview cases about specific risk factors for legionellosis, including:

- Overnight travel, especially hotel/motel stays
- Being in or near hot tubs and/or pools
- Recent hospitalizations or other healthcare facility exposure
- Recent dental work
- Occupation and employer
- Other potential exposures included in the Georgia Case Report Form

Please enter the completed Georgia Case Report Form into SendSS. It is not necessary to complete the CDC Case Report Form. The State *Legionella* Coordinator will report data to CDC.

If the case reports any travel or healthcare exposure during the 14 days prior to illness onset, notify the State *Legionella* Coordinator by email or phone as soon as travel/healthcare information is available, even if other information is pending. The State *Legionella* Coordinator will advise the Centers for Disease Control and Prevention (CDC) of the travel history and communicate with affected districts regarding travel and healthcare history. If travel is reported to a state other than Georgia, CDC will advise that state's *Legionella* Coordinator of the potential exposure. If the travel is within Georgia, the State *Legionella* Coordinator will advise the District Epidemiologist for the exposure location of the potential exposure. When CDC advises the State *Legionella* Coordinator of a potential exposure that occurred in Georgia, the Coordinator will update the District Epidemiologist for the location of the potential exposure.

B. Healthcare-Associated Cases

If a person with Legionnaires' disease reports exposure to a single healthcare facility 10 or more days during the 14 days prior to onset, they will be classified as a **presumptive healthcare-associated case.** Note that a single presumptive healthcare-associated case triggers a cluster or outbreak investigation. See the "Cluster or Outbreak Investigation" section for more information.

If a person with *Legionella* infection reports exposure to any healthcare facility for any reason during a portion of the 14 days prior to illness onset and does not meet the criteria for presumptive healthcare-associated Legionnaires' disease, they will be classified as a **possible healthcare-associated case.** If two or more possible healthcare-associated cases are identified for the same facility within twelve months, a full cluster or outbreak investigation should be initiated. See the "Cluster or Outbreak Investigation" section for more information.

If a single possible healthcare-associated case is reported for a healthcare facility, the facility should be notified for their situational awareness. If the facility is within the same district, the District Epidemiologist should notify the facility. If the facility is in another Georgia health district or out-of-state, notify the state *Legionella* coordinator, who will notify the appropriate jurisdiction.

If a case is unable to recall an appointment or healthcare exposure date, please attempt to communicate with the provider to confirm the date. Often a quick call to confirm appointment dates can prevent time- and resource-intensive investigation activities in the future.

When notifying healthcare facilities of a single possible healthcare-associated case, provide the facility with DPH educational material about prevention of *Legionella* for healthcare facilities, including a link to the CDC Water Management Program Toolkit. The facility should ensure appropriate clinical testing and reporting for case identification. They should also have a robust water management program to prevent *Legionella* in place, per Centers for Medicare & Medicaid Services (CMS) requirements and CDC recommendations. Facilities should also continue to monitor for any additional cases.

Should a case report exposure to multiple healthcare facilities during the 14 days prior to illness onset, they will be classified as a possible healthcare-associated case for each of the facilities. Therefore, all facilities reported should be notified.

Although senior and assisted living facilities may not be classified as healthcare facilities depending on the care services offered, it is important to extend similar considerations to these facilities as they often serve an elderly population with increased susceptibility to *Legionella*.

C. Tourist Accommodation-Associated Cases

If a person with *Legionella* reports overnight stay at a tourist accommodation, they will be classified as a **travel-associated** case.

If a single travel-associated case is reported for a tourist accommodation, the facility should be notified for their situational awareness. If the facility is within the same district, the District Epidemiologist should communicate with Environmental Health to notify the facility. If the facility is in another Georgia health district or out-of-state, notify the State *Legionella* Coordinator, who will notify the appropriate jurisdiction.

When notifying tourist accommodations of a single travel-associated case, provide the facility with educational material about prevention of *Legionella* for tourist accommodations, including the CDC Water Management Program Toolkit. The facility should implement a water management program to prevent *Legionella,* per CDC recommendations. If the facility has a water management program in place, they should review the plan and revise as needed.

If two or more travel-associated cases are identified for the same facility within twelve months, a full cluster or outbreak investigation should be initiated. See the “Cluster or Outbreak Investigation” section for more information.

D. Pool and/or Hot Tub-Associated Cases

If a case reports exposure to a regulated recreational water facility (e.g. pool and/or hot tub), the facility should be notified for their situational awareness. If the facility is within the same district, the District Epidemiologist should communicate with Environmental Health to notify the facility. If the facility is in another Georgia health district or out-of-state, notify the State *Legionella* Coordinator who will notify the appropriate jurisdiction. If a case reports exposure to a recreational water facility that is not regulated (e.g. private hot tub), notification of the facility or owner/operator is at the discretion of the district.

When notifying regulated recreational water facilities of a single associated case, provide the facility with educational material about prevention of *Legionella*, including the CDC Water Management Program Toolkit. Per CDC recommendations, all hot tubs should have a water management program to prevent *Legionella*. Some pools may benefit from a water management program. Additionally, facilities with pools and/or hot tubs may benefit from a facility-wide water management program. For example, gyms may want to implement a water management program for the entire facility, as patrons often shower at these locations.

E. Other Settings

It is important to be mindful of settings not already described that serve a population at increased risk for *Legionella* or a population that is unable to leave the premises (e.g. prisons).

F. Cluster or Outbreak Definition

A cluster or outbreak of legionellosis is defined as two or more people diagnosed with legionellosis with exposure to the same location during the 14 days prior to illness onset. Outbreaks have been linked to water sources in the community, hospitals, cruise ships, and hotels. Common sources are whirlpool spas, cooling towers (a component of air-conditioning units from some large buildings), and water used for drinking and bathing. Keep in mind that "the same location" therefore could be anywhere within the aerosol distribution plume of a cooling tower, or in different buildings that are served by the same potable water system. For example, a medical office building on a hospital campus may have a plumbing system connected to the adjacent hospital. A cooling tower on the hospital may be a potential exposure for a patient at the medical office building.

A cluster or outbreak associated with a single location will warrant an immediate investigation by the state and district epidemiologists. An appropriate response will vary depending on the location and circumstances of the cluster/outbreak. Regardless of the details, cooperation and open communication are necessary at all levels of the investigation. Coordination of the epidemiologic investigation and the environmental assessment should begin as early as possible. The initial epidemiologic investigation should include active case finding and establishing links between ill persons and possible exposures. Strong epidemiological data may be important in the absence of environmental cultures.

If a cluster or outbreak is detected, see the "Cluster or Outbreak Investigation" section for more information.

VI. Cluster or Outbreak Investigation

A. Threshold for Public Health Investigation

Environmental investigations are triggered by either of the following situations:

1. Two or more cases report exposure to the same location/facility/water feature/etc. during the 14 days prior to illness onset within twelve months of each other
2. A single case reports exposure to a group living facility for the duration of the entire 10 days prior to illness onset (e.g. a patient is hospitalized, a resident does not leave the assisted living facility, or an inmate is incarcerated for the entire incubation period). In this instance, DPH will use the CDC's recommended 10-day exposure period as this is the more conservative approach.

In a cluster or outbreak situation, it is important to begin investigating immediately. Notify both the State *Legionella* Coordinator and the facility within one business day to initiate investigation and response activities. If the investigation involves a facility that is permitted for operation by Environmental Health (e.g. tourist accommodations or recreational water facilities), district and state Environmental Health should be notified, as well.

B. Communication

All investigation and response activities must be conducted in conjunction with public health and will require communication between public health and the facility throughout the investigation.

Best practice for coordinating response communication is to identify a single point of contact for the facility (often the infection control manager) and a single point of contact for public health (often the District Epidemiologist) through which all communication is relayed. Although technical information may need to be relayed to various subject matter experts, staff members, or contractors, this ensures a streamlined process for, and accountability of, all communications.

Depending on the circumstances, it may be appropriate for the facility to notify the patients/residents/clients, staff, and visitors regarding the possibility for *Legionella* exposure. Template letters can be provided by the State *Legionella* Coordinator as needed.

If the facility has any concerns regarding public communication, or if the facility or public health receive media requests, public health can work with the facility to craft and release joint and/or complimentary statements. Public health messaging will include epidemiology and public information officers at the local and state levels, as well as environmental health, if applicable.

DPH has found that best practice is to always provide recommendations and requests to facilities in writing on public health letterhead and signed by a district or state public health representative. This is often the district health director or DPH Medical Epidemiologist, depending on the preference of the district. Additionally, DPH Epidemiology can coordinate involvement of the DPH Office of General Counsel and/or the Healthcare Facility Regulation Division of the Department of Community Affairs if facilities are not responsive during a public health investigation.

C. Clinical Investigation

The clinical investigation should include retrospective chart review, active surveillance, and testing of additional persons that are clinically compatible with Legionellosis.

- Retrospective chart review should be conducted for the period six months prior to the earliest associated case through the point of notification. A line list should be provided to public health for all persons with positive results for *Legionella*, pneumonia (diagnosed by clinician or chest x-ray), or severe respiratory illness requiring hospitalization. The line list should include patient name, date of birth, symptom onset date, symptoms, outcome, diagnosis, chest x-ray results, and any lab results for *Legionella*.
- Retrospective testing of cases may be warranted. Persons diagnosed with pneumonia (clinical or chest x-ray) with illness onset within the past month should be tested for *Legionella*. If symptoms are ongoing or resolved within the past 7 days, they should be tested by both urine antigen and respiratory specimen culture. If symptoms resolved more than 7 days prior, they should be tested by urine antigen only.
- Conduct prospective active surveillance for at least six months following onset of the last known associated case or the last positive environmental sample, whichever is later.
- Specific recommendations for who to test and how to test are provided by CDC and available online https://www.cdc.gov/legionella/clinicians/diagnostic-testing.html
- The facility should immediately report to public health any persons identified as clinically compatible with *Legionella* and ensure they are tested appropriately.

D. Environmental Assessment

An environmental assessment should be conducted in conjunction with public health as soon as possible. The environmental assessment is important for providing both the facility and public health with a better understanding of the water distribution systems and for identifying water features that may present risk for *Legionella.* Conduct the environmental assessment either in-person (preferable) or over the phone using the CDC *Legionella* Environmental Assessment Form: https://www.cdc.gov/legionella/downloads/legionella-environmental-assessment.pdf

The environmental assessment should include infection control, facilities management, and administrative personnel from the facility. Local and state epidemiology personnel must participate in the environmental assessment, either in-person or by conference call. Local environmental health personnel must participate if a regulated facility (e.g. tourist accommodation) or water feature (e.g. pool/hot tub) is under investigation. For facilities not directly regulated by environmental health (e.g. healthcare facilities, prisons), inclusion of environmental health personnel is at the discretion of the district.

The environmental assessment in conjunction with public health is **not sufficient** for identification of all plumbing features likely to promote *Legionella* contamination, survival, growth, or dispersal. These factors must be considered when implementing an environmental sampling plan. Therefore, **the facility must also work with a third-party vendor (Plumbing Engineer or Industrial Hygienist with expertise in *Legionella* investigations) to conduct a technical assessment of the facility and develop a sampling plan accordingly.**

E. Environmental Sampling

Environmental sampling is a required component of *Legionella* cluster or outbreak investigations. The Georgia Public Health Laboratory does not have the capacity to test environmental samples (nor clinical samples) for *Legionella*. Therefore, the facility will need to employ a third-party vendor to test environmental samples for *Legionella.* Labs must be CDC ELITE Program members for environmental testing. https://wwwn.cdc.gov/elite/public/memberlist.aspx

The *Legionella* sampling plan must be comprehensive and representative of the entire water distribution system to which associated cases were possibly exposed. Because *Legionella* colonization anywhere within a water distribution system may result in exposure at any particular point, it is necessary to assess the entire system. It is not appropriate to conduct testing at only locations where cases were in contact with the water system. Sampling must include storage tanks, proximal, medial, and distal locations along the water delivery system, and plumbed water features. Sampling should also include, but must not be limited to, specific rooms or water features epidemiologically associated with cases.

Samples should include bulk water and swabs. Bulk water samples should be 1L in volume, and it is important to ensure that the testing laboratory will process the entire sample. Samples (bulk water and swabs) must be treated with 0.1N sodium thiosulfate solution to neutralize residual disinfectant at the time of collection. Samples must be collected by persons with experience collecting environmental samples for *Legionella* testing. See the CDC sampling guidance for additional recommendations regarding testing practices. https://www.cdc.gov/legionella/downloads/cdc-sampling-procedure.pdf

Environmental sampling and testing is a resource-intensive process, both in terms of personnel and finances. In order to ensure that sampling is appropriate for public health purposes, **it is critical that facilities provide the sampling plan to public health for review prior to sample collection.** Many vendors (including ELITE labs) do not routinely conduct testing in accordance with parameters requested by DPH and CDC.

Ensure that any samples that test positive will be held by the private lab for further characterization by public health. If appropriate, DPH will coordinate sample submission to CDC for additional testing (e.g. genome sequencing).

F. Remediation and follow-up testing

If a comprehensive sampling plan and appropriate testing (as approved by public health) is conducted and all results are negative, then no remediation activities are required at that time. All facilities undergoing investigation should proceed with implementing and/or updating their water management program regardless of environmental sampling results.

If environmental sampling yields any positive results, the facility must immediately implement short-term remediation activities to reduce the ongoing risk of exposure to *Legionella*. Upon conclusion of the short-term remediation actions to address the current colonization of *Legionella,* the facility must implement long-term activities to prevent re-colonization with *Legionella*. **Short-term remediation and long-term prevention activities will vary by facility, water distribution system components, water parameters, plumbed water features involved, and several other site-specific aspects.** Therefore, the facility must work with an appropriately-credentialed consultant (e.g. Plumbing

Engineer or Industrial Hygienist with *Legionella* expertise) to determine site-specific remediation and prevention activities.

After the facility conducts short-term remediation activities, they must perform follow-up testing to ensure that the remediation effectively eliminated existing *Legionella* and effectively prevents re-establishment of *Legionella*. The follow up testing must be conducted per the previously described sampling plan, where all positive water delivery systems or plumbed water features are sampled to represent the entire system. Separate, closed water systems that tested negative do not need follow-up testing unless cases were associated with that water system.

Follow-up sampling should be conducted on the following schedule:

- Every two weeks for three months
- Monthly for three months

Should any positive results be identified during the follow-up testing, additional short-term remediation activities and long-term prevention strategies should be implemented, and the follow-up testing schedule should be re-started from the beginning.

G. Water Management Program

All facilities undergoing investigation should proceed with implementing and/or updating their water management program regardless of environmental sampling results. A written water management program should include; a description of the water system, routine maintenance and activities to prevent *Legionella*, ongoing measurement of water parameters, and specific response activities should water parameters favorable to *Legionella*, positive environmental sampling results, or associated cases be identified. The water management program should incorporate findings from the environmental assessment, technical assessment by a *Legionella* expert, sampling results, and any other possible contributing factors identified during the investigation.

Implementing long-term prevention strategies can be a lengthy process, but it is reasonable for facilities to submit the water management program for public health review within six months of the first round of negative environmental results.

H. Investigation Conclusion

The investigation can be considered concluded when the following measures are met.

- Active prospective surveillance has continued without identification of any new cases for at least six months from the last associated case or positive environmental sample (whichever is later).
- If positive environmental samples were identified, remediation has been conducted and the follow-up testing schedule is complete (every two weeks for three months and then monthly for three months, without additional positive results).
- A water management program has been submitted for public health review and subsequently updated and/or implemented.

Appendix A: DPH Legionellosis Case Report Form

*This form does not reflect additional variables added the SendSS case report form in early 2020

Legionellosis Case Investigation Form

I. DEMOGRAPHICS

Name: _____ (Last, First)

Address: _____ (Street)

_____ _____-_____ (City, Zip Code)

County/District: _____ / _____

Date of Birth: _____ / _____ / _____ **Age:** _____

Sex: ☐ Female ☐ Male

Race: ☐ White ☐ Multiracial ☐ Black ☐ American Indian/Alaska ☐ Asian ☐ Native Hawaiian/Pacific Islander ☐ Other _____

Ethnicity: ☐ Hispanic ☐ Non-Hispanic ☐ Unknown

Home Phone:( )_____ **Cell Phone:**( )_____ **Work Phone:**( )_____

II. CASE INVESTIGATION

Date of first report: _____/_____/_____

Interviewer information:

Name _____

Affiliation: _____

Phone: ( ) _____

Date of first interview attempt: _____/_____/_____

Date of interview: _____/_____/_____

Respondent was: ☐ Case ☐ Surrogate

Surrogate Name _____

Surrogate Relation to Case _____

Surrogate Phone ( ) _____

III. CLINICAL INFORMATION

Date of Onset: _____/_____/_____ **Outcome:** ☐ Survived ☐ Died ☐ Still Ill ☐ Unknown

1. What type of medical care was sought for this illness? (Mark all that apply)

YES NO DK	Primary Care Doctor	Facility Name _____ Visit Date _____/_____/_____
YES NO DK	Urgent Care Facility	Facility Name _____ Visit Date _____/_____/_____
YES NO DK	Emergency Room	Facility Name _____ Visit Date _____/_____/_____
YES NO DK	Hospital Admission, not ICU	Facility Name _____ Admission Date _____/_____/_____ Discharge Date _____/_____/_____
YES NO DK	Hospital Admission, ICU	Facility Name _____ Admission Date _____/_____/_____ Discharge Date _____/_____/_____

2. Did you experience the following symptoms?

Fever: ☐ YES ☐ NO ☐ DK

Date of fever onset: _____/_____/_____

Cough: ☐ YES ☐ NO ☐ DK

Shortness of breath: ☐ YES ☐ NO ☐ DK

Pneumonia: ☐ YES ☐ NO ☐ DK

If yes, how was pneumonia diagnosed? ☐ Clinician ☐ Chest X-Ray

Other: ☐ YES ☐ NO ☐ DK

Specify:_____

IV LABORATORY INFORMATION

1. Laboratory: _____ Collection Date: _____/_____/_____ Test: _____ Specimen: _____
2. Laboratory: _____ Collection Date: _____/_____/_____ Test: _____ Specimen: _____
3. Laboratory: _____ Collection Date: _____/_____/_____ Test: _____ Specimen: _____

Fax the completed report to the Acute Disease Epidemiology Section at 404-657-7517 version Aug-2016

Legionellosis Case Investigation Form

V. POTENTIAL SOURCES OF EXPOSURE (14 days prior to onset)

1. Occupation: __________________________________ **Employer Address** Street:___________________________________

   Employer: ____________________________________ City:_______________________ State:_____ Zip:_______________

2. Does work involve contact with industrial water? ☐YES ☐NO ☐DK County/District:___________________________

3. Do you recall any general construction, plumbing projects, water main breaks, or other water line work in the 14 days prior to illness onset at your home, workplace, or travel destinations? ☐YES ☐NO ☐DK

   If yes, describe incident and provide location: ____

4. Did you enter (visit, work, or volunteer at) any healthcare facility (e.g. hospital, long term care, assisted living, senior living, clinic, doctor or dentist office, rehab, or any other healthcare facility)? ☐YES ☐NO ☐DK

   If yes or possibly, provide information for each visit:

☐ Inpatient ☐ Outpatient ☐ Employee ☐ Volunteer ☐ Visitor	Facility Name: ______________________________ Facility Location: ____________________________ City ______________ State _____ Zip _________ Facility Type:_______________________________	Reason for Visit: ___________________________ ____ ____ Dates: ___________________________________
☐ Inpatient ☐ Outpatient ☐ Employee ☐ Volunteer ☐ Visitor	Facility Name: ______________________________ Facility Location: ____________________________ City ______________ State _____ Zip _________ Facility Type:_______________________________	Reason for Visit: ___________________________ ____ ____ Dates: ___________________________________
☐ Inpatient ☐ Outpatient ☐ Employee ☐ Volunteer ☐ Visitor	Facility Name: ______________________________ Facility Location: ____________________________ City ______________ State _____ Zip _________ Facility Type:_______________________________	Reason for Visit: ___________________________ ____ ____ Dates: ___________________________________
☐ Inpatient ☐ Outpatient ☐ Employee ☐ Volunteer ☐ Visitor	Facility Name: ______________________________ Facility Location: ____________________________ City ______________ State _____ Zip _________ Facility Type:_______________________________	Reason for Visit: ___________________________ ____ ____ Dates: ___________________________________
☐ Inpatient ☐ Outpatient ☐ Employee ☐ Volunteer ☐ Visitor	Facility Name: ______________________________ Facility Location: ____________________________ City ______________ State _____ Zip _________ Facility Type:_______________________________	Reason for Visit: ___________________________ ____ ____ Dates: ___________________________________

Comments:____

____

5. In the 14 days prior to your illness onset, did you use a nebulizer, CPAP, BiPAP, or other respiratory therapy equipment? ☐YES ☐NO ☐DK

   If yes, dates of use ________________________

   If yes, does this device use a humidifier? ☐YES ☐NO ☐DK

   If yes, what type of water is used in the device? Check all that apply.

   ☐Sterile ☐Distilled ☐Bottled ☐Tap ☐Unknown ☐Other, please specify: __________________________

Legionellosis Case Investigation Form

6. Did you spend any nights away from home (excluding health care facilities)? ☐ YES ☐ NO ☐ DK

If yes (or possibly), please provide information for each stay away from home:

Accommodation Name (or private residence): _____ Room # _____
Address: _____ Arrival____/____/____
City _____ State _____ Zip _____ Country_____ Departure____/____/____

Accommodation Name (or private residence): _____ Room # _____
Address: _____ Arrival____/____/____
City _____ State _____ Zip _____ Country_____ Departure____/____/____

Accommodation Name (or private residence): _____ Room # _____
Address: _____ Arrival____/____/____
City _____ State _____ Zip _____ Country_____ Departure____/____/____

Comments: _____

_____

7. Did you have exposure to any of the following during the 14 days prior to onset?

YES NO DK	Hot tub or whirlpool spa (entered)	Name/Location:_____ Date(s): _____
YES NO DK	Hot tub or whirlpool spa (near, not entered)	Name/Location:_____ Date(s): _____
YES NO DK	Jacuzzi bathtub	Name/Location:_____ Date(s): _____
YES NO DK	Pool	Name/Location:_____ Date(s): _____
YES NO DK	Recreational misters	Name/Location:_____ Date(s): _____
YES NO DK	Steam room or wet sauna	Name/Location:_____ Date(s): _____
YES NO DK	Decorative fountain	Name/Location:_____ Date(s): _____
YES NO DK	Humidifier	Name/Location:_____ Date(s): _____
YES NO DK	Shower (away from home only)	Name/Location:_____ Date(s): _____
YES NO DK	Gym facility	Name/Location:_____ Date(s): _____
YES NO DK	Hotel (without overnight stay)	Name/Location:_____ Date(s): _____
YES NO DK	Grocery store with produce mister	Name/Location:_____ Date(s): _____

YES NO DK	Public gathering	Name/Location:_____ Date(s): _____
YES NO DK	Mall/department store	Name/Location:_____ Date(s): _____
YES NO DK	Home improvement or other large store	Name/Location:_____ Date(s): _____

Comments: _____

_____

8. Are there other locations where you spent several hours away from home in the 14 days prior to onset? ☐ YES ☐ NO ☐ DK

   If yes (or possibly), please provide information for location:

   Location name _____

   Type of facility _____

   Address: _____

   City _____ State _____ Zip _____ County/District _____/_____

   Dates _____

   Activities while at location _____

   _____

9. Do you know anyone else with similar symptoms? ☐ YES ☐ NO ☐ DK

   If yes, please provide information about shared exposure, including dates and location: _____

   _____

VI. MEDICAL HISTORY

1. Have you ever been told by a healthcare provider that you had the following?

   ☐ YES ☐ NO ☐ DK Chronic lung disease (COPD, emphysema)
   ☐ YES ☐ NO ☐ DK Asthma
   ☐ YES ☐ NO ☐ DK Weakened immune system (cancer, organ transplant, HIV, immune-suppressive meds)
   ☐ YES ☐ NO ☐ DK Diabetes
   ☐ YES ☐ NO ☐ DK Chronic Kidney Disease
   ☐ YES ☐ NO ☐ DK Heart Disease or CHF
   ☐ YES ☐ NO ☐ DK Liver disease
   ☐ YES ☐ NO ☐ DK Other conditions Specify:_____

Comments: _____

_____

2. Are you a current smoker? ☐ YES ☐ NO Packs per day _____ Duration (years) _____
3. Are you a former smoker? ☐ YES ☐ NO Packs per day _____ Duration (years) _____
4. Do you drink alcohol? ☐ YES ☐ NO Drinks per day _____ Duration (years) _____

Appendix B: DPH Recommendations for Healthcare Facilities with a Single Possible Healthcare-Associated Case

Georgia Department of Public Health

Brenda Fitzgerald, MD, Commissioner | Nathan Deal, Governor

2 Peachtree Street NW, 15th Floor
Atlanta, Georgia 30303-3142
dph.ga.gov

Legionellosis

Georgia Department of Public Health Recommendations for Healthcare Facilities with a single Possible Healthcare-Associated Case

Recommendations are different for facilities with two or more possible healthcare-associated cases.

A possible healthcare-associated case of Legionellosis is a patient who spent part of the 10 days prior to illness onset in the facility.[1]

Increase Surveillance Activities

- Review records for other patients that tested positive for *Legionella* infection in the past six months. Ensure that all cases are reported to the Georgia Department of Public Health (GDPH) or to your District Epidemiologist.
- Review clinical protocols for testing. Encourage physicians to test for Legionella per CDC and Infectious Diseases Society of America (IDSA) recommendations[2]:
    - Patients with healthcare-associated pneumonia
    - Patients who have failed outpatient antibiotic therapy for community-acquired pneumonia
    - Patients with severe pneumonia, in particular those requiring intensive care
    - Immunocompromised patients with pneumonia
    - Patients with pneumonia in the setting of a Legionellosis outbreak
    - Patients with a travel history within two weeks of illness onset
- Order appropriate testing. Best practice is to obtain lower respiratory specimens for culture at the time of urine antigen and/or PCR testing, preferably before antibiotic administration.[2]

Review your Water Management Program

- You should have a water management program for your hot and cold water distribution system, and it should be reviewed at this time. The CDC toolkit, **Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings**, can assist with development and review of your water management program.[1]
- Inform members of the water management program team of the possible healthcare-associated case.
- Assess the circulating water temperatures and chlorine levels in your facility. Hot water should circulate above 125°F, cold water should circulate below 68°F, and free chlorine should be greater than 0.5ppm throughout the system.

What to do if you identify possible or definite healthcare-associated *Legionella* cases:

- Contact GDPH or your District Epidemiologist for additional recommendations if you identify any additional Legionellosis cases.

References

1. CDC: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings http://www.cdc.gov/legionella/downloads/toolkit.pdf
2. CDC: Diagnosis, Treatment, and Prevention http://www.cdc.gov/legionella/clinicians/diagnostic-testing.html

Appendix C: Legionellosis Investigation Resources

References

1. ASHRAE Standard 188-2018. Legionellosis: Risk Management for Building Water Systems. (2018)

2. CDC: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings http://www.cdc.gov/legionella/downloads/toolkit.pdf

3. CDC: Diagnosis, Treatment, and Prevention http://www.cdc.gov/legionella/clinicians/diagnostic-testing.html

4. CDC ELITE Program Member List https://wwwn.cdc.gov/elite/Public/MemberList.aspx

5. CDC: Sampling Procedure and Potential Sampling Sites https://www.cdc.gov/legionella/downloads/cdc-sampling-procedure.pdf

6. CDC: PreventLD Training: A Training on *Legionella* Water Management Programs http://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html

7. Department of Veterans Affairs: Prevention of Healthcare-Associated *Legionella* Disease and Scald Injury from Potable Water Distribution Systems. Directive 1061. Appendix A. Emergency Remediation of the Potable Water Distribution Systems. (2014) Page A-6. http://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3033

8. EPA: Comprehensive Disinfectants and Disinfection Byproducts Rules (Stage 1 and Stage 2): Quick Reference Guide https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100C8XW.txt

9. OSHA Technical Manual Section III: Chapter 7 https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html

Appendix D: Regulatory Statutes and Authority

A. Tourist Accommodations and Pools/Hot Tub Spas

The Georgia Department of Public Health (DPH) is empowered to adopt rules and regulations prescribing reasonable standards for health, sanitation, and safety of tourist accommodations, as provided in Official Code of Georgia (O.C.G.A.) § 31-28-5. DPH rules for tourist accommodations are found in Chapter 511-6-2 of the Rules and Regulations of the State of Georgia. The county boards of health are authorized to promulgate additional rules to supplement these statewide rules. O.C.G.A. § 31-28-5(b).

Permits for tourist accommodations are issued by the county boards of health. Under O.C.G.A. § 31-28-3, a county board of health may suspend or revoke a tourist accommodation permit, or deny an application for a permit, as required for the "health, sanitation, and safety of the public." In addition, under DPH Rule 511-6-20(1), a county board of health may summarily suspend a tourist accommodation permit "if any part of the tourist accommodation presents an imminent health hazard to members of the public." Although this language is not specific to *Legionella*, it does provide clear authority for a county board of health intervention should a facility be associated with a *Legionella* outbreak.

DPH is also required by statute to promulgate rules and regulations for the operation of public swimming pools, including tourist accommodation pools and hot tub spas. *See* O.C.G.A. §§ 31-2A-6, 31-28-5, and 31-45-10. DPH rules governing public swimming pools are found in Chapter 511-3-5 of the Rules and Regulations of the State of Georgia.

Permits for tourist accommodation pools and spas are issued by the county boards of health upon the submission of an application and an inspection by the county board of health. Under O.C.G.A. § 31-45-9 and DPH Rule 511-3-5-.23(4), a county board of health may suspend or revoke a pool or spa permit if an inspection finds that an imminent health hazard exists.

When a permit is suspended, revoked, or denied by a county board of health, the aggrieved party may appeal to DPH for review. O.C.G.A. § 31-5-3(a)(1). A party who disagrees with the final decision of DPH may file a petition for judicial review in superior court. *Id.*

B. Other Facilities

DPH is not the direct regulatory authority for numerous other types of facilities (e.g. healthcare facilities, occupational settings, corrections facilities, etc.) which may be involved in a *Legionella* outbreak investigation. However, even in the absence of direct regulatory authority, the county boards of health are authorized to "take such steps as may be necessary to prevent and suppress disease and conditions deleterious to health and to determine compliance with health laws and rules, regulations, and standards adopted thereunder." O.C.G.A. § 31-3-4(a)(3). The county boards of health are also required to "secure compliance with the rules and regulations of the department that have local application" and to "enforce, or cause enforcement of, all laws pertaining to health." O.C.G.A. § 31-3-5(a)(3), (4).

These powers are delegated by law to the District Health Director, who serves as the "chief executive officer" of the County Board of Health. O.C.G.A. §§ 31-3-11(a), 31-3-12, 31-3-15. Thus, if a person or entity refuses to comply with public health directives during a *Legionella* outbreak investigation,

the District Health Director may issue an administrative order compelling the person or entity to take or cease specific actions to protect the public health.

Georgia law does not specify an enforcement mechanism for administrative orders. If a District Health Director issues an order during a *Legionella* outbreak investigation and the person or entity refuses to comply, then the District Health Director may petition the Superior Court for a mandatory injunction. In addition, the County Commission may by ordinance impose penalties, including fines and imprisonment, for the violation of public health regulations and orders.

Appendix E: Sample Communication Templates

A. Sample Letter to Facility following Environmental Assessment

[On local or state letterhead per local district's preference]

[Address]
c/o [single facility point of contact]

[Date]

Thank you for participating in the meeting on [date] with [Local Health Jurisdiction (LHD)] and the Georgia Department of Public Health (DPH) Acute Disease Epidemiology Section regarding the cluster of *Legionella* cases associated with [facility].

To date, public health has identified two patients with *Legionella* meeting the CDC definition for possible healthcare-associated cases. Their illness onset dates occurred within 12 months of one another and range from [dates.] Both cases reported entering the [facility] during the incubation period for *Legionella*. These cases raise concern for the possibility for risk of ongoing transmission within the facility. As we discussed at the meeting, a full *Legionella* investigation involves the following:

Active Clinical Surveillance

- Active clinical surveillance should be conducted by healthcare providers, therefor it is important to share the following recommendations with the healthcare providers within the facility.
    - Please report positive test results for *Legionella* to public health within seven days per routine notifiable disease reporting processes. If possible or definite healthcare-associated cases are identified, please report those cases to public health immediately.
    - Update clinical staff regarding the healthcare-associated cases so that they can monitor for any new illnesses that might be consistent with *Legionella* infection among patients or staff.
    - Conduct active review of all lower respiratory cultures, all newly diagnosed pneumonia cases, and all chest radiographs prospectively for at least six months from the last positive *Legionella* lab result, whether clinical or environmental.
    - Please share the following testing recommendations with clinicians at the facility. **This is particularly critical for clinicians practicing at the [outpatient facility] who may not be aware of testing recommendations or testing clients that present in the outpatient setting.** Encourage physicians to test for *Legionella*, per CDC and Infectious Diseases Society of America (IDSA) recommendations[1], among:
        i. Patients with healthcare-associated pneumonia (pneumonia occurring 48 hours or more after admission)
        ii. Patients who have failed outpatient antibiotic therapy for community-acquired pneumonia
        iii. Patients with severe pneumonia, in particular those requiring intensive care
        iv. Immunocompromised patients with pneumonia
        v. Patients with pneumonia in the setting of a legionellosis cluster or outbreak

vi. Patients with a travel history within two weeks of pneumonia illness onset

- Encourage physicians to order appropriate testing for *Legionella* diagnosis. It is important to order both urine antigen testing and lower respiratory culture for *Legionella,* preferably before antibiotic administration[1]. Endotracheal aspirates or bronchoscopy specimens can be sent in lieu of sputum cultures. Urine antigen detects only one serogroup of illness-causing *Legionella pneumophila.*
- Retain any positive isolates for possible further analysis and characterization. Consult with public health regarding storage and transportation of *Legionella* isolates.

Environmental Assessment

Thank you for working with [LHD] and DPH to complete the onsite Environmental Assessment during the meeting on [date.] The purpose of the assessment is to provide public health with a better understanding of your water distribution system and plumbed water features, evaluate possible environmental exposures, and inform more comprehensive technical assessment prior to environmental testing.

Water Assessment, Testing, and Management Program Activities

- It is important to move forward with technical assessment of the water distribution system for the facility to determine the potential risk of *Legionella* growth and exposure to patients and building occupants.
- **Please consult with a premise plumbing engineer or industrial hygienist with expertise in remediation for and control of *Legionella* within one week of receipt of this letter**
- Your consultant should conduct an on-site technical assessment of the hot water distribution system, cold water distribution system, and any other plumbed water features on campus for both the hospital and clinic locations. The assessment should be conducted in the context of a *Legionella* investigation, and should therefore identify any features of the water system with the potential to enable *Legionella* growth, biofilm presence, and *Legionella* exposure (e.g., temperature, stagnation and/or disinfectant levels).
- Upon completion of the technical assessment, the contractor should develop a sampling plan for *Legionella* in accordance with CDC sampling guidance.[2] We request that the sampling plan be submitted for public health review ([LHD], c/o [LHD contact person]) prior to sample collection to ensure that the sampling plan is appropriate for public health purposes. The environmental sampling should be comprehensive and representative of the entire water distribution system and plumbed water features. **The sampling plan should be submitted within two weeks of receipt of this letter.**
- Test for *Legionella* throughout your facility in conjunction with an ELITE laboratory.[3] **It is important to have water samples collected by someone experienced in testing for *Legionella*.** Your contracted engineer or the ELITE laboratory should be able to help with this.
- Please share all environmental test results with CDPH (c/o [LHD contact]) within two business days of receipt from the testing laboratory.
- Ensure that any positive environmental samples are held by the ELITE laboratory for possible further analysis and characterization. Consult with public health regarding storage and transportation of *Legionella* isolates.
- Should *Legionella* be detected, it is important to conduct emergency remediation of your water distribution system as soon as possible. Thermal eradication or shock chlorination are two examples of emergency remediation activities. After emergency remediation has been conducted, long-term management activities can be implemented. Please consult with your

contracted environmental engineer for assistance with both emergency remediation and long-term *Legionella* prevention. An additional resource with information pertinent to healthcare facilities is the Department of Veterans Affairs Directive on Prevention of Healthcare-associated *Legionella* disease.[4]

- Conduct routine testing for free chlorine throughout all individual water systems in your facility, including at the point of introduction from the municipal water source. The free chlorine residual should be greater than or equal to 0.5 mg/L (ppm) throughout the system to prevent *Legionella* growth. The EPA maximum residual disinfectant level for chlorine is 4 mg/L.[5] Where secondary disinfectant processes are in use (e.g. the cold water delivery systems at [facility]), ensure ongoing maintenance of the target goals for free chlorine.
- Monitor temperatures throughout all individual water systems in your facility, including at the point of introduction from the municipal water source. Cold water should circulate throughout the entire cold water distribution system at temperatures equal to or lower than 68°F to prevent *Legionella* growth. Hot water should circulate throughout the entire hot water distribution system at temperatures equal to or greater than 125°F to prevent *Legionella* growth.[6]
- *Legionella* growth and proliferation can be prevented through multiple mechanisms. Measures must be undertaken to prevent *Legionella* in both the hot water distribution system and the cold water distribution system. Prevention efforts may be different for each system depending on what works best for your facility. These efforts should be incorporated into the water management program. ***Legionella* prevention activities should be determined in conjunction with your contracted technical advisor and should align with ASHRAE 188-2018.[7]**
- Ongoing significant construction in or near the facility increases the potential risk for *Legionella* growth and exposure in the [facility]. Enhanced monitoring of building water systems may be warranted during the construction phase.
- Incorporate flushing of low-use fixtures into your water control and management plan, where not already included. Include any emergency water systems as they are likely to be low-use. Additional recommendations for the water control management plan are available in the CDC toolkit and ASHRAE Standard 188-2015.[7,8]

Communication

Thank you again for your communication to date. We will move forward with communication via email and will schedule conference calls or on-site meetings to review ongoing activities as needed. Please feel free to reach out to [LHD] (c/o [LHD point person]) if you have any questions. [LHD] and DPH are happy to coordinate with your facility regarding any public communications or requests as well.

Sincerely,
[DPH Epidemiologist or LHD Representative (e.g. District Health Director) at preference of LHD]

References

10. CDC: Diagnosis, Treatment, and Prevention http://www.cdc.gov/legionella/clinicians/diagnostic-testing.html
11. CDC: Sampling Procedure and Potential Sampling Sites https://www.cdc.gov/legionella/downloads/cdc-sampling-procedure.pdf
12. CDC ELITE Program Member List https://wwwn.cdc.gov/elite/Public/MemberList.aspx
13. Department of Veterans Affairs: Prevention of Healthcare-Associated Legionella Disease and Scald Injury from Potable Water Distribution Systems. Directive 1061. Appendix A.

Emergency Remediation of the Potable Water Distribution Systems. (2014) Page A-6. http://www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3033
14. EPA: Comprehensive Disinfectants and Disinfection Byproducts Rules (Stage 1 and Stage 2): Quick Reference Guide https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100C8XW.txt
15. OSHA Technical Manual Section III: Chapter 7 https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html
16. ASHRAE Standard 188-2018. Legionellosis: Risk Management for Building Water Systems. (2018)
17. CDC: Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings http://www.cdc.gov/legionella/downloads/toolkit.pdf

B. **Sample Letter to be posted at Healthcare, Assisted Living, Senior, or Other Residential Facilities**

[on facility letterhead]

[Date]

To all residents, staff, and visitors

On [date], we were notified that [one] of the [residents/patients/staff] at our facility contracted Legionellosis, commonly referred to as Legionnaires' Disease.

We want to share with you some general information concerning the disease. In addition, we want to tell you what we are currently doing here at [facility name] to ensure all necessary steps are taken to address health concerns.

Legionellosis, or Legionnaire's Disease, is a type of pneumonia caused by bacteria called *Legionella*. Legionnaires' disease is not contagious, and you cannot catch it from another person. *Legionella* bacteria are common and grow in water. People often are exposed to low levels of the bacteria in the environment without getting sick. Legionellosis usually occurs only when someone who is already susceptible receives concentrated exposure to the bacteria. People who are heavy smokers, who are elderly, or whose ability to resist infection is reduced are more likely to contract Legionnaires' disease than healthy nonsmokers. According to the Centers for Disease Control and Prevention, there are between 10,000 and 50,000 cases of Legionnaires' disease every year in the U.S. Please refer to the attached fact sheet for more information about *Legionella*. [Attach CDC fact sheet]

We are cooperating fully with [LHD] and Georgia Department of Public Health officials who are investigating this matter. To date, [one] case of the disease has occurred among residents at this facility. We will be working with health officials to assess and minimize the risks of *Legionella,* including implementing a plan to assess the building water system and disinfect accordingly.

What you should do now:

1. If you are not sick, there is no need for you to see a doctor.
2. If you are now sick with a cough and fever, or if you become sick within 14 days of visiting this facility:

    A. See your private doctor or contact _____ to arrange to see a _____ physician.
    B. Tell the physician that you were in a building that is involved in a Legionnaires' Disease investigation.
    C. If you see a physician, notify _____ so that your illness can be tracked.

If you have any concerns or questions about this investigation, please contact facility staff. Your health and safety are of great concern to us, and we will be grateful for your cooperation in this matter.

C. **Sample Letter to be posted at Tourist Accommodations**

[On facility letterhead]

Dear [Facility] Guest:

The [LHD/BOH] and Georgia Department of Public Health (DPH) are investigating an outbreak of Legionnaires' disease, a serious type of bacterial pneumonia, in [City], GA. [LHD] received information that persons who stayed at [facility] recently were diagnosed with Legionnaires' disease.

In response to this information, the [LHD] in conjunction with DPH and with the full cooperation of [facility] management immediately conducted an environmental assessment. Water samples will be collected to determine if bacteria that cause this illness are present in the facility. Results of these tests are pending.

In order to prevention additional illness and to identify any other persons who may have been diagnosed with pneumonia after staying at the [facility] we ask the following:

- If you become ill within 14 days of your stay at the [facility], please refer to the attached fact sheet regarding the symptoms of this illness and seek medical attention should you have those symptoms. If you experience symptoms of Legionnaires' disease, please tell your physician about this letter and ask him/her to contact the local health department to obtain further instruction on recommended laboratory testing and how to report your illness as soon as possible after your diagnoses.
- Please refer to the attached fact sheet to find out if you are at increased risk for acquiring Legionnaires' disease.

FCBOH and DPH are working with the management of the [X] to take appropriate actions to protect the health of guests and employees and to disinfect the water if *Legionella* is found. Please see the Fact Sheet for more information about Legionnaires' disease.

For more information, please contact [hotel contact].

Sincerely,
[Hotel management]

Appendix F: Letter to Laboratories

GEORGIA DEPARTMENT OF PUBLIC HEALTH

Kathleen E. Toomey, M.D., M.P.H., **Commissioner** / Brian Kemp, **Governor**

2 Peachtree Street, NW, 15th Floor
Atlanta, Georgia 30303-3142

dph.ga.gov

Dear Submitter,

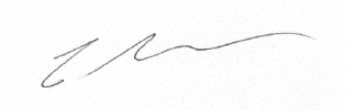
In accordance with Georgia Department of Public Health Rule 511-2-1-.02, "Clinical laboratories shall retain clinical materials containing an agent of a notifiable disease for at least one week from the date of the report, and shall send said materials to the Department for further testing upon request…" (Ga. Comp. R. & Regs. 511-2-1-.01.)

The purpose of this letter is to request that all labs performing culture and/or PCR testing for *Legionella* submit all primary *Legionella* isolates and, when isolates are unavailable, respiratory specimens that test positive for *Legionella* to the Georgia Public Health Laboratory (GPHL) for further characterization. This additional testing is crucial for public health purposes by enabling culture of specimens tested by culture-independent diagnostic test methods and by providing isolates for outbreak detection and investigation.

We have provided the guidelines for preparing specimens and isolates for submission to GPHL (see attached). If you are having difficulty facilitating shipment of samples to GPHL, we can help coordinate sample submission to GPHL for additional testing.

Please call the DPH Acute Disease Epidemiology Section at (404) 657-2588 for additional information.

Sincerely,



Cherie L. Drenzek DVM, MS
State Epidemiologist
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2 Peachtree Street NW, Suite 14-420
Atlanta, GA 30303
404-657-2609
cherie.drenzek@dph.ga.gov

Instructions for Specimen Handling and Shipping

1. Prepare materials for shipment according to the *Legionella* Specimen Handling Guidelines for Testing below.
Each clinical specimen or isolate must be shipped with a GPHL form. Select test order code "1130 Special Bacteriology," check "Other," and write in "*Legionella*."
https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/GPHL%20Lab%20Submission%20Form_Fillable.docx

	***Legionella* Isolate(s)**	**Respiratory Specimen(s)** (sputum, BAL, tracheal aspirate, lung tissue, and others)
Specimen Minimum Requirements	Prior identification as presumptive *Legionella* genus	•BAL & tracheal aspirate: 500 µl •Other samples as available
Specimen Preparation	Visible growth on BCYE agar	Fresh frozen (not formalin-fixed) tissue preferred
Short-term Storage Before Shipping	≤14 days at 4°C	Freeze immediately at ≤-20°C
Long-term Storage Before Shipping	Freeze at ≤-20°C *or* Re-streak on fresh agar (consult with GPHL)	Freeze at ≤-20°C
Shipping Conditions	Ship BCYE agar slants *or* plates with visible growth at 4°C (regular cold packs)	Ship frozen at ≤-20°C (dry ice or super cold packs rated for temps below -70°C)

2. Ship by next-day to:
Georgia Public Health Laboratory
1749 Clairmont Road
Decatur, GA 30033
(404) 327-7900

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