**19-ID-04**

**Committee:** Infectious Disease

**Proposed Title: Revision to the Case Definition for National Legionellosis Surveillance**

☒Check this box if this position statement is an update to an existing standardized surveillance case definition and include the most recent position statement number here: **09-ID-45.**

**Synopsis:** This position statement updates the case definition for legionellosis (previous position statement 09-ID-45) through the addition of new clinical and laboratory criteria.

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## I. Statement of the Problem

Legionellosis is a nationally notifiable disease in which cases are classified as "confirmed" or "suspect" based on the presence of clinically compatible symptoms and diagnostic testing. Currently, positive results from nucleic acid amplification testing (NAAT) classify a case as "suspect." Suspect cases are not included in the national total and are inconsistently reported to public health departments. Increased experience with diagnostic testing, along with increased confidence in the diagnostic performance of NAAT and its more prevalent utilization, have led to a need to update the laboratory criteria for the diagnosis of legionellosis.

Current case definition language provides limited guidance to assist public health jurisdictions in determining if cases meet clinical criteria. Further, the clinical criteria do not capture extrapulmonary disease, a rare, but important, clinical entity.

In addition, this position statement includes three appendices relating to incubation period, considerations for healthcare-associated cases, and considerations for travel-associated cases. These appendices were developed as tools for health department use, but they are not binding and are independent from the case definition and case classifications.

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## II. Background and Justification

Presently the majority (>95%) of legionellosis cases are diagnosed via urinary antigen testing (UAT), which is specific for *Legionella pneumophila* serogroup 1 (Lp1) and may not detect other *L. pneumophila* serogroups or *Legionella* species. Therefore, it is strongly encouraged that a culture on lower respiratory secretions be performed in concert to allow for detection of non-Lp1 *Legionella*. However, culture for *Legionella* is a lengthy process, requires specialized media, has decreased sensitivity when collected after antibiotic treatment has begun, and must be performed by laboratorians trained in the technique. As a supplement to culture, NAAT can also detect non-Lp1 *Legionella*, can be performed in far less time by most laboratorians, does not require specialized reagents, and is less affected by antibiotic use.

Since the legionellosis case definition was last revised in 2009, confidence in the diagnostic performance of NAAT has increased, and its use has become more widespread. In recent studies, NAAT has shown increased sensitivity and comparable specificity relative to culture when performed on lower respiratory tract specimens. More cases were detected when NAAT was performed in addition to UAT or culture alone. Sensitivity ranged from 92–97.4%, and specificity ranged from 98.6–99.9%. For these reasons, this proposal changes NAAT-positive cases from the suspect to the confirmed category[1-5].

Furthermore, in this proposal we update and clarify the clinical criteria for legionellosis, including providing cases ascertainment guidance regarding extrapulmonary presentations and providing more detail regarding

how to differentiate Pontiac fever from Legionnaires' disease. This position statement establishes criteria for the classification of extrapulmonary legionellosis cases which has a clinically and epidemiologically distinct illness presentation that is reportable to CDC but is not captured in the current CSTE position statement.

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## III. Statement of the desired action(s) to be taken

CSTE recommends the following actions:

1. Implement a standardized surveillance case definition for legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis).
    A. Utilize standard sources (e.g., reporting*) for case ascertainment for legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis). Surveillance for legionellosis should use the recommended sources of data to the extent of coverage presented in Section V.
    B. Utilize standardized criteria for case ascertainment for Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis presented in Section VI and Table VI in Technical Supplement.
    C. Utilize standardized criteria for case classification for legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis) presented in Sections VII and Table VII in Technical Supplement.

2. Additional actions are included in the NNC Recommendation Statement.
    *Note: if NNC Recommendation Statement is approved, the National Office will move all desired actions to Section III.*

    * Reporting: process of a healthcare provider or other entity submitting a report (case information) of a condition under public health surveillance TO local, state, or territorial public health. Note: notification is addressed in a Nationally Notifiable Conditions Recommendation Statement and is the process of a local, state, or territorial public health authority submitting a report (case information) of a condition on the *Nationally Notifiable Conditions List* TO CDC

## IV. Goals of Surveillance

Legionellosis is an important public health problem. It is necessary for cases to be reported to public health so that outbreaks of illness may be identified, and common sources remediated to prevent ongoing exposure and illness. Updating the case definition to include NAAT as confirmatory, and to clarify the clinical syndromes of Legionnaires' disease versus Pontiac fever, as well as to include information about non-pulmonary presentations, is necessary to ensure that cases are accurately classified nationwide.

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## V. Methods for Surveillance:

Surveillance for legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis) should use the recommended sources of data and the extent of coverage listed in Table V.

Surveillance should be conducted using routine sources of data for legionellosis including clinician reporting, laboratory reporting, reporting by other health care institutions (e.g., hospitals, veterinarians, pharmacies), death certificate cause of death information, and hospital/electronic medical records.

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**Table V. Recommended sources of data and extent of coverage for ascertainment of cases of legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis).**

| Source of data for case ascertainment | Coverage | |
|---|---|---|
| | Population-wide | Sentinel sites |
| Clinician reporting | X | |
| Laboratory reporting | X | |
| Reporting by other entities (e.g., hospitals, veterinarians, pharmacies, poison centers), specify: | X | |
| Death certificates | X | |
| Hospital discharge or outpatient records | X | |
| Data from electronic medical records | X | |
| Telephone survey | | |
| School-based survey | | |
| Other, specify: | | |
| 2019 Template | | |

## VI. Criteria for case ascertainment

### A. Narrative: A description of suggested criteria for case ascertainment of a specific condition.

Standard reporting refers to the process of healthcare providers or institutions (e.g., clinicians, clinical laboratories, hospitals) submitting basic laboratory or clinical information to governmental public health agencies about cases of illness that meet certain reporting requirements or criteria. Legionellosis cases may also be ascertained by the secondary analysis of administrative health data or clinical data. The purpose of this section is to provide those criteria that should help to determine whether a specific illness should be reported.

### A1. Clinical Criteria for Reporting

No clinical criteria alone are sufficient to generate a report to public health authorities.

### A2. Laboratory Criteria for Reporting

Report any person with any of the following laboratory findings/results to public health authorities:

**Legionnaires' disease (LD):**

- Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, or pleural fluid
- Detection of any *Legionella* species from lower respiratory secretions, lung tissue, or pleural fluid by a validated nucleic acid amplification test
- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents
- Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents
- 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 antigen
- Detection of specific *Legionella* antigen or staining of the organism in lower respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents

**Pontiac fever (PF):**

- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents
- Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents
- 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 antigen

**Extrapulmonary legionellosis (XPL):**

- Isolation of any *Legionella* organism from any extrapulmonary site associated with clinical disease
- Detection of any *Legionella* species from any extrapulmonary site associated with clinical disease by a validated nucleic acid amplification test
- Detection of specific *Legionella* antigen or staining of the organism from any extrapulmonary site associated with clinical disease by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents

### A3. Epidemiologic Linkage Criteria for Reporting

None required

### A4. Vital Records Criteria for Reporting

1. Report any person whose death certificate lists Legionnaires' disease, legionellosis, extrapulmonary legionellosis or Pontiac fever as a cause of death or a significant condition contributing to death.

### A5. Other Criteria for Reporting

1. Report any person whose healthcare/medical record contains a diagnosis Legionnaires' disease, legionellosis, extrapulmonary legionellosis, or Pontiac fever.

### B. Disease-specific data elements to be included in the initial report

Clinical – Symptoms consistent with pneumonia, influenza-like illness, or symptoms of extrapulmonary disease.

Exposures - Within the two weeks (14 days) prior to illness onset, the following data elements should be included in the initial report when known:

a) Travel or overnight stay somewhere other than usual residence — if yes, location and dates of travel
b) Visiting or working in any healthcare facility — if yes, location and dates
c) Any water exposures (e.g. hot tubs, respiratory therapy equipment, or other sources of aerosolized water) — if yes, location and dates

## VII. Case Definition for Case Classification

### A. Narrative: Description of criteria to determine how a case should be classified.

### A1. Clinical Criteria

Legionellosis is associated with three clinically and epidemiologically distinct illnesses: Legionnaires' disease, Pontiac fever, or extrapulmonary legionellosis.

**Legionnaires' disease (LD):** LD presents as pneumonia, diagnosed clinically and/or radiographically.

Evidence of clinically compatible disease can be determined several ways: a) a clinical or radiographic diagnosis of pneumonia in the medical record or b) if "pneumonia" is not recorded explicitly, a description of clinical symptoms that are consistent with a diagnosis of pneumonia[1].

**Pontiac fever (PF):** PF is a milder, influenza-like illness. While symptoms of PF[2] could sound similar to those described for LD, there are distinguishing clinical features. PF does not present as pneumonia. It is less severe than LD, rarely requiring hospitalization. PF is self-limited, meaning it resolves without antibiotic treatment.

**Extrapulmonary legionellosis (XPL):** *Legionella* can cause disease at sites outside the lungs (for example, associated with endocarditis, wound infection, joint infection, graft infection). A diagnosis of extrapulmonary legionellosis is made when there is clinical evidence of disease at an extrapulmonary site and diagnostic testing reveals evidence of *Legionella* at that site.

**A2. Laboratory Criteria**

***Confirmatory laboratory evidence*:**

- Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site associated with clinical disease
- Detection of any *Legionella* species from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site associated with clinical disease by a validated nucleic acid amplification test
- Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents
- Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents

***Presumptive laboratory evidence*:**

None required for case classification

***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 lower 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

**A3. Epidemiologic Linkage**

None required for case classification

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[1]Clinical symptoms of pneumonia may vary, but most often include fever and/or cough. Additional symptoms of pneumonia could include myalgia, shortness of breath, headache, malaise, chest discomfort, confusion, nausea, diarrhea, or abdominal pain.

[2]Clinical symptoms of influenza-like illness may vary, but could include fever, chills, myalgia, malaise, headaches, fatigue, nausea and/or vomiting.

**A4. Case Classifications**

**Confirmed Legionnaires' disease (LD):**
A clinically compatible case of LD with confirmatory laboratory evidence for *Legionella*.

**Confirmed Pontiac fever (PF):**
A clinically compatible case of PF with confirmatory laboratory evidence for *Legionella*.

**Confirmed Extrapulmonary legionellosis (XPL):**
A clinically compatible case of XPL with confirmatory laboratory evidence of *Legionella* at an extrapulmonary site.

***Probable*:** N/A

**Suspect Legionnaires' disease (LD)**
A clinically compatible case of LD with supportive laboratory evidence for *Legionella*.

**Suspect Pontiac fever (PF):**
A clinically compatible case of PF with supportive laboratory evidence for *Legionella*.

**Suspect Extrapulmonary legionellosis (XPL):**
A clinically compatible case of XPL with supportive laboratory evidence of *Legionella* at an extrapulmonary site.

**B. Criteria to distinguish a new case of this disease or condition from reports or notifications which should not be enumerated as a new case for surveillance**

None

## VIII. Period of Surveillance

Surveillance for legionellosis is expected to be ongoing.

## IX. Data sharing/release and print criteria

1. CSTE recommends the following case statuses* be included in the 'case' count released outside of the public health agency:

☒Confirmed
☐Probable
☐Suspect
☐Unknown

* Which case statuses are included in the case counts constitute the "print criteria."

2. Jurisdictions (e.g., States and Territories) conducting surveillance under this case definition can voluntarily submit de-identified case information to CDC, if requested and in a mutually agreed upon format.

   Production of national data summaries and national data re-release for non-NNCs:

- Prior to release of national data summaries CDC should follow the CDC/ATSDR Policy on Releasing & Sharing Data, issued on April 16, 2003 and referenced in 11-SI-01 and custodians of such data should consult the CDC-CSTE Intergovernmental Data Release Guidelines Working Group report http://intranet.cdc.gov/od/ocso/ssr/drgwg.pdf which contains data release guidelines and procedures for CDC programs re-releasing state, local, or territorial-provided data.
- CDC programs have a responsibility, in collaboration with states, localities, and territories, to ensure that CDC program-specific data re-release procedures meet the needs of those responsible for protecting data in the states and territories.
- Notification to CDC of confirmed legionellosis is recommended

## X. Revision History

| Position Statement ID | Section of Document | Revision Description |
|---|---|---|
| 09-ID-45 | VI. Criteria for case ascertainment A1 | Add extrapulmonary legionellosis |
| 09-ID-45 | VII. Case Definition for Case Classification A1 | Add clinical criteria for extrapulmonary legionellosis |
| 09-ID-45 | VII. Case Definition for Case Classification A1 | Update clinical criteria for Legionnaires' disease |
| 09-ID-45 | VII. Case Definition for Case Classification A1 | Update clinical criteria for Pontiac fever |
| 09-ID-45 | VII. Case Definition for Case Classification A2 | Change laboratory criteria to make validated nucleic acid amplification test a confirmatory laboratory diagnostic test |
| 09-ID-45 | VII. Case Definition for Case Classification A4 | Add case classifications for extrapulmonary legionellosis |
| 09-ID-45 | VII. Case Definition for Case Classification A4 | Revise case classifications for Legionnaires' disease |
| 09-ID-45 | VII. Case Definition for Case Classification A4 | Revise case classifications for Pontiac fever |
| 09-ID-45 | IX. Data sharing/release and print criteria | Revise case statuses to be included in the 'case' count to only confirmed |

## XI. References.

1. Council of State and Territorial Epidemiologists (CSTE). National Notification for Legionellosis. CSTE position statement 09-ID-45. CSTE June 2009. Available from: http://www.cste.org
2. Avni T, Bieber A, Green H, Steinmetz T, Leibovici L, Paul M. Diagnostic accuracy of PCR alone and compared to urinary antigen testing for detection of *Legionella* spp.: A systematic review. J *Clin Microbiol*. 2016 Feb;54(2):401-11.
3. Diederen BM, Kluytmans JA, Vandenbroucke-Grauls CM, Peeters MF. Utility of real-time PCR for diagnosis of Legionnaires' disease in routine clinical practice. *J Clin Microbiol*. 2008 Feb;46(2):671-7.
4. Chen DJ, Procop GW, Vogel S, Yen-Lieberman B, Richter SS. Utility of PCR, culture, and antigen detection methods for fiagnosis of legionellosis. *J Clin Microbiol*. 2015 Nov;53(11):3474-7.
5. Peci A, Winter AL, Gubbay JB. Evaluation and comparison of multiple test methods, including real-time PCR, for *Legionella* detection in clinical specimens. *Front Public Health*. 2016 Aug 31;4:175.

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# Council of State and Territorial Epidemiologists

## Nationally Notifiable Conditions (NNC) Recommendation Statement

**Position Statement Title**: Revision to the Case Definition for National Legionellosis Surveillance.

**Disease/Condition**: Legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis)

☐1. This statement recommends the addition of a disease/condition to the *Nationally Notifiable Conditions (NNC) List.*
☒2. This statement updates a disease/condition already on the *NNC List*.
  ☐a. A change to the CDC notification timeframe is recommended.
  ☐b. New subtypes or additional disease/condition categories are added to the accompanying position statement.
☐3. This statement removes a disease/condition from the *NNC List*.

### NNC Recommended Actions to be Taken

**By submitting this NNC recommendation, this statement recommends the following:**

1. Utilize standardized criteria for case ascertainment and classification (based on Sections VI and VII and Technical Supplement of accompanying position statement) for **legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis)** and add **legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis**) to the *Nationally Notifiable Condition List*
   - ☐ Immediately notifiable, extremely urgent (within 4 hours)
   - ☐ Immediately notifiable, urgent (within 24 hours)
   - ☒ Routinely notifiable
   - ☐ No longer notifiable

2. CSTE recommends that all States and Territories enact laws (statue or rule/regulation as appropriate) to make this disease or condition reportable in their jurisdiction. Jurisdictions (e.g. States and Territories) conducting surveillance (according to these methods) should submit case notifications* to CDC.

3. Expectations for Message Mapping Guide (MMG) development for a newly notifiable condition: the National Notifiable Diseases Surveillance System (NNDSS) is transitioning to HL7-based messages for case notifications; the specifications for these messages are presented in MMGs. When CSTE recommends a new condition be made nationally notifiable, CDC must obtain Office of Management and Budget Paperwork Reduction Act (OMB PRA) approval prior to accepting case notifications for the new condition. Under anticipated timelines, notification using the Generic V2 MMG would support transmission of the basic demographic and epidemiologic information common to all cases and could begin with the new *MMWR* year following the CSTE annual conference. Input from CDC programs and CSTE would prioritize development of a disease-specific MMG for the new condition among other conditions waiting for MMGs.

4. CDC should publish data on legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis) as appropriate (see Section IX of corresponding position statement).

5. CSTE recommends that all jurisdictions (e.g. States, Localities, or Territories) with legal authority to conduct public health surveillance follow the recommended methods outlined in this recommendation and in the accompanying standardized surveillance position statement.

**NNC data sharing/release and print criteria**

CSTE recommends the following case statuses be included in the CDC Print Criteria:

- ☒Confirmed
- ☐Probable
- ☐Suspect
- ☐Unknown

# Council of State and Territorial Epidemiologists
## Technical Supplement

This technical supplement is designed to accompany a Standardized Surveillance for Diseases or Conditions Position Statement. For submission of a Standardized Surveillance for Diseases or Conditions Position Statement to be considered complete, authors are **required** to submit this technical supplement. Please reference Sections VI and VII in the accompanying position statement to complete the tables below. This technical supplement will be shared with and reviewed by membership but will NOT be voted on by the Council. Please contact the CSTE National Office (770-458-3811 or positionstatements@cste.org) for assistance in table completion. One-on-one support is available.

### Table VI. Table of criteria to determine whether a case should be reported to public health authorities.

| Criterion | Legionnaires' Disease | Extrapulmonary Legionellosis | Pontiac Fever |
|---|---|---|---|
| ***Laboratory Criteria for Reporting*** | | | |
| Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, or pleural fluid by culture | S | | |
| Isolation of any *Legionella* organism from any extrapulmonary site associated with clinical disease by culture | | S | |
| Detection of any *Legionella* species from lower respiratory secretions, lung tissue, or pleural fluid by a validated nucleic acid amplification test | S | | |
| Detection of any *Legionella* species from any extrapulmonary site associated with clinical disease by a validated nucleic acid amplification test | | S | |
| Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents | S | | S |
| Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents | S | | S |
| 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) | S | | S |
| Fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigens | S | | S |
| Detection of specific *Legionella* antigen or staining of the organism in lower respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, | S | | |

| | | | |
|---|---|---|---|
| immunohistochemistry (IHC), or other similar method, using validated reagents | | | |
| Detection of specific *Legionella* antigen or staining of the organism from any extrapulmonary site associated with clinical disease by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents | | S | |
| ***Vital Records Criteria for Reporting*** | | | |
| Death certificate lists Legionnaires' disease as a cause of death or a significant condition contributing to death | S | | |
| ***Other Criteria for Reporting*** | | | |
| Healthcare record contains a diagnosis of Legionnaires' disease | S | | |
| Healthcare record contains diagnosis of Pontiac fever | | | S |
| Healthcare record contains a diagnosis of extrapulmonary legionellosis | | S | |
| Healthcare record contains a diagnosis of legionellosis | S | S | S |

Notes:
S = This criterion alone is SUFFICIENT to report a case.
N = All "N" criteria in the same column are NECESSARY to report a case.
O = At least one of these "O" (ONE OR MORE) criteria in **each category** (categories=clinical evidence, laboratory evidence, and epidemiological evidence) **in the same column**—in conjunction with all "N" criteria in the same column—is required to report a case.

**Table VII. Classification Table: Criteria for defining a case of legionellosis (including Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis).**

| Criterion | Suspect Legionnaires' Disease | Confirmed Legionnaires' Disease | | Suspect Extrapulmonary Legionellosis | Confirmed Extrapulmonary Legionellosis | | Suspect Pontiac Fever | Confirmed Pontiac Fever | |
|---|---|---|---|---|---|---|---|---|---|
| ***Clinical Evidence*** | | | | | | | | | |
| Patient presents with clinical or radiographic pneumonia[3] | N | | N | | | | | | |
| Patient presents with influenza-like symptoms[4] | | | | | | | N | | N |
| | | | | | | | | | |
| Diagnostic testing reveals evidence of *Legionella* from an extrapulmonary site of disease | | | | N | | N | | | |
| ***Laboratory Evidence*** | | | | | | | | | |
| Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, or pleural fluid by culture | | | O | | | | | | |
| Isolation of any *Legionella* organism from any extrapulmonary site associated with clinical disease by culture | | | | | | O | | | |
| Detection of any *Legionella* species from lower respiratory secretions, lung tissue, or pleural fluid by a validated nucleic acid amplification test | | | O | | | | | | |
| Detection of any *Legionella* species from any extrapulmonary site associated with clinical disease by a validated nucleic acid amplification test | | | | | | O | | | |
| Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents | | | O | | | | | | O |
| Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents | | | O | | | | | | O |

[3] Clinical symptoms of pneumonia may vary, but most often include fever and/or cough. Additional symptoms of pneumonia could include myalgia, shortness of breath, headache, malaise, chest discomfort, confusion, nausea, diarrhea, or abdominal pain.
[4] Clinical symptoms of influenza-like illness may vary, but could include fever, chills, myalgia, malaise, headaches, fatigue, nausea and/or vomiting.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 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) | O | | | | | | O | | |
| Fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigens | O | | | | | | O | | |
| Detection of specific *Legionella* antigen or staining of the organism in lower respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents | O | | | | | | | | |
| Detection of specific *Legionella* antigen or staining of the organism from any extrapulmonary site associated with clinical disease by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents | | | | O | | | | | |
| ***Other Records Evidence*** | | | | | | | | | |
| Healthcare record contains a clinical diagnosis of pneumonia | O | | O | | | | | | |
| Healthcare record contains a radiographic diagnosis of pneumonia | O | | O | | | | | | |
| Healthcare record contains diagnosis of influenza-like illness | | | | | | | O | | O |
| Healthcare record contains diagnosis of Pontiac fever | | | | | | | O | S | O |
| Healthcare record contains a diagnosis of extrapulmonary legionellosis | | | | | S | O | | | |
| Healthcare record contains diagnosis of Legionnaires' disease | | S | O | | | | | | |

Notes:

S = This criterion alone is SUFFICIENT to classify a case.

N = All “N” criteria in the same column are NECESSARY to classify a case. A number following an “N” indicates that this criterion is only required for a specific disease/condition subtype (see below). If the absence of a criterion (i.e., criterion NOT present) is required for the case to meet the classification criteria, list the absence of criterion as a necessary component.

O = At least one of these “O” (ONE OR MORE) criteria in **each category** (categories=clinical evidence, laboratory evidence, and epidemiologic evidence) **in the same column**—in conjunction with all “N” criteria in the same column—is required to classify a case. A number following an “O” indicates that this criterion is only required for a specific disease/condition subtype.

**Appendix 1.**
*Note: Appendices were developed as tools for health department use, but they are not binding and are independent from the case definition and case classifications.*

## Incubation Period

The incubation period for legionellosis should inform the collection of data related to possible sources of exposure. We recommend that public health practitioners conduct case investigations and gather potential exposure sources across the time frames below based on incubation period data. Use of consistent time frames for case investigations facilitates cross-jurisdiction notification which is critical for travel- and healthcare-associated cluster detection. Because the incubation periods for Legionnaires' disease and Pontiac fever are different, we recommend that exposure history collection time frames differ accordingly.

### Legionnaires' disease

We recommend that exposure history data be collected for the 14 days prior to illness onset. This recommendation is based on observations that most cases have illness onset within 10 days of exposure, but up to 16% of cases have onset more than 10 days after exposure.[1,2,3] 99% of cases have illness onset within 14 days of exposure.[4,5] Use of a 14-day exposure history period will better enable cluster detection than use of a ten-day exposure history period.

### Pontiac fever

We recommend that exposure history data be collected for the 3 days prior to illness onset. This recommendation is based on observations that most cases have onset within 2 days of exposure and all cases had onset with 3 days with only one exception noted in the literature.[2,6,7,8]

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**Appendix 2.**
*Note: Appendices were developed as tools for health department use, but they are not binding and are independent from the case definition and case classifications.*

**Travel-Associated Case Definition**

Cases of legionellosis may be associated with travel on a cruise ship or staying overnight in a hotel or other public accommodation. Like other travel-related infectious diseases, the identification of any given outbreak is hindered by the difficulties inherent in detecting clusters of infections among persons who have recently dispersed from a point source and returned to their home states. Outbreaks can occur in many settings, but are often reported in association with travel exposures.

Timely reporting of travel-associated cases with complete travel information aids early identification and control of sources of infection.

During an outbreak these definitions may be modified.

Public health response to cases, including defining an outbreak or decisions regarding environmental investigation, will be based on the local or state jurisdiction's assessment of the *Legionella* exposure risk at the identified accommodation(s) and evidence of epidemiologic links.

Standardized reporting definitions[5] for travel-associated legionellosis:

**Travel-associated Legionnaires' disease**: A case of Legionnaires' disease in a patient who has a history of spending at least one night away from home (excluding healthcare settings) in the 14 days before onset of illness.

**Travel-associated Pontiac fever**: A case of Pontiac fever in a patient who has a history of spending at least one night away from home (excluding healthcare settings) in the 3 days before onset of illness.

The following goals for timely reporting of legionellosis cases are recommended:

- Within 7 days of the notification of a legionellosis case, the investigating health department will ascertain whether the patient spent at least 1 night away from home in the 14 days before onset of illness.
- If a history of travel is present in the 14 days before onset of illness, the state health department will, within 7 days of the initial notification, report the travel accommodation details (i.e., city, state, and address) and dates of travel to CDC.
- If there is no history of travel in the 14 days before onset of illness, the state health department will send complete legionellosis case information to CDC following case closeout.
- If there are epidemiologically linked travel-associated legionellosis cases, CDC will notify within 1 day and support state health departments to investigate further.

[5] These definitions apply to both confirmed and suspected cases.

**Appendix 3.**
*Note: Appendices were developed as tools for health department use, but they are not binding and are independent from the case definition and case classifications.*

## Healthcare-Associated Case Definition

Cases and outbreaks in healthcare settings may lead to investigation and preventive intervention. Thus, there is a need for a standardized definition to support identification and reporting of healthcare-associated Legionnaires' disease.

Outbreaks can occur in many settings, but are most frequently reported in association with travel and healthcare exposure.

During an outbreak these definitions may be modified.

Public health response to cases, including defining an outbreak or decisions regarding an environmental investigation, will be based on the local or state jurisdiction's assessment of the *Legionella* exposure risk at the identified facility/facilities and evidence of epidemiologic links.

Standardized reporting definitions[6] for healthcare-associated Legionnaires' disease.

> **Presumptive healthcare-associated Legionnaires' disease:** A case with ≥10 days[7] of continuous stay at a healthcare facility[8] during the 14 days before onset of symptoms.
>
> **Possible healthcare-associated Legionnaires' disease:** A case with exposure to one or more healthcare facilities that does not exceed 9 continuous days during the 14 days before onset of symptoms.

[6] These definitions apply to both confirmed and suspected cases and to cases with multiple facility stays.

[7] The majority of Legionnaires' disease cases have illness onset within 10 days of exposure; for healthcare-associated case surveillance purposes, the goal is to capture the most likely exposure source.

[8] Examples of healthcare facilities include acute care facilities, long term acute care facilities, skilled nursing facilities, and clinics

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