Legionellosis

Epidemiology in New Zealand

Legionella bacteria are ubiquitous in the New Zealand environment, particularly in soil and aquatic environments, making it difficult to prevent pathogens from entering engineered water reticulation systems. The disease is more common in older people, smokers, chronic disease sufferers and the immunocompromised.

Most cases in New Zealand are caused by L. longbeachae and L. pneumophila. The primary sources of these bacteria are constructed warm-water systems (L. pneumophila) and composted vegetative material (L. longbeachae). Further information on Legionella species in New Zealand can be found in the Ministry of Health publication The Prevention of Legionellosis in New Zealand: Guidelines for the control of legionella bacteria (Ministry of Health 2011).

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

Case definition

Clinical description

Infection with Legionella is an important cause of community-acquired pneumonia and occasionally multi-systemic disease, occurring both sporadically and in outbreaks. Legionella infections can cause a spectrum of symptoms, including subclinical infection (infection with no disease).

For notification purposes, the following three categories meet the clinical criteria for a clinically compatible illness:

1 pneumonia (Legionnaires’ disease)
2 non-pneumonic disease (eg Pontiac fever) – a self-limiting acute febrile illness which may be accompanied by cough
3 extrapulmonary disease – involving skin, joints, pericardium or other organs.

Although the most common clinical manifestation of legionellosis reported worldwide is Legionnaires’ disease, non-pneumonic disease is often clinically unrecognised and therefore likely to be under-reported.

Laboratory test for diagnosis

Laboratory definitive evidence for a confirmed case requires at least one of the following:

- isolation (culture) of Legionella species from respiratory secretions or other clinical samples
- detection of Legionella species nucleic acid (by PCR or other detection method)
• a fourfold or greater rise in IFA titre against *Legionella* species to ≥ 256 between paired sera tested in parallel using pooled antigen at the same reference laboratory

• detection of *Legionella pneumophila* serogroup 1 (Lp1) antigen in urine.

**Laboratory suggestive evidence for a probable case requires:**

• one or more elevated *Legionella* species serology titres of ≥ 512 tested using pooled antigen at a reference laboratory.

**Case classification**

• **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.

• **Probable:** A clinically compatible illness that has laboratory suggestive evidence.

• **Confirmed:** A clinically compatible illness that has laboratory definitive evidence.

• **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

**Note:**

• A single elevated titre is a useful screen, but can be a false positive, hence the need for confirmatory testing. Public health investigations should take account of all the information available.

• A positive nucleic acid amplification test (NAAT) (PCR or other nucleic acid detection method) is very useful for rapid diagnosis and case management but may not identify the causative agent. In this situation, further testing to identify the causative agent is required (*Legionella* culture or convalescent serology).

• Urine antigen testing is not completely specific for Lp1 and there can be cross-reactivity with other serogroups. Therefore convalescent serology may be useful to clarify the causative species/serogroup.

• Isolation of *Legionella* bacteria remains the gold standard for diagnosis of legionellosis.

**Spread of infection**

**Incubation period**

The time between exposure and the first sign of symptoms for:

• Legionnaires’ disease is usually 2–10 days but can be up to 14 days

• Pontiac fever is usually 24–48 hours, but can be between 5 hours and 3 days.

**Mode of transmission**

Transmission is through inhalation of aerosols of either water or dust particles carrying *Legionella* bacteria, or via aspiration of contaminated water. Common sources of water or soil colonised with *Legionella* bacteria include cooling towers, spa pools, potting mix and other compost-related products, and warm-water systems (including fittings).
Period of communicability
Person-to-person transmission has not been demonstrated.

Notification procedure
Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case
Investigation
Obtain a two-week history of places visited before the onset of symptoms (including social, work, educational and recreational settings) and exposure risks (including exposure to compost and potting mix, large-building water systems and aerosolised or sprayed water, such as from cooling towers, commercial or hand car-washing apparatuses, air conditioners, nebulisers, heated swimming pools, spa pools, water blasters and showers).

Establish if the case has been an inpatient or outpatient of a medical facility or had dental procedures in the two weeks before the onset of symptoms.

Ensure the attending medical practitioner has obtained laboratory confirmation, including identification to species and serotype level. Samples should also be referred to the Legionella Reference Laboratory at ESR for confirmatory testing or typing (for serology, this includes both acute and convalescent paired sera).

Treatment
To be coordinated by the notifying medical practitioner.

Restriction
Nil.

Counselling
Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Management of contacts
Definition
A contact is any person who has experienced exposures similar to the case within the preceding three months.
Investigation
Because there is no person-to-person spread with legionellosis, advise contacts about the mode of infection and encourage them to go promptly to their general practitioner if symptoms develop.

Prophylaxis
Nil.

Other control measures
Identification of source
Refer to The Prevention of Legionellosis in New Zealand: Guidelines for the control of legionella bacteria (Ministry of Health 2011) for detailed information on investigation of cases.

The medical officer of health is responsible for coordinating an investigation into the source of infection.

The Ministry of Health liaises with the medical officer of health regarding the public health response and ESR regarding the laboratory testing and results.

The public health unit will take environmental samples to test for Legionella bacteria from potential sources.

Following any hospital-acquired case, infection prevention and control and building services for the hospital should be notified.

Suspected occupational sources and clusters of cases should be thoroughly investigated. In the case of a suspected occupational source, WorkSafe New Zealand is responsible for investigating specific risks in a workplace. Sporadic cases, however, may not warrant extensive investigation because of the difficulty in identifying the specific source and the likelihood of detecting a variety of natural or constructed water-distribution systems naturally colonised with other Legionella strains.

Even when cases appear to be sporadic, an assessment of space–time clustering with other cases should be considered.

For further information on environmental testing, please refer to:
- www.esr.cri.nz/health-science/specialist-testing/show/761
- www.who.int/water_sanitation_health/emerging/Legionella.pdf

Disinfection
Disinfection of contaminated water sources is an important control measure. Disinfection is obligatory:
- when Legionella bacteria are detected in a domestic water system
• in cooling towers when the level is at or above 10 colony-forming units/mL (refer to AS/NZS 3666).

For advice on disinfection of any contaminated site, contact the Legionella Reference Laboratory at ESR.

For further information on disinfection, refer to *The Prevention of Legionellosis in New Zealand: Guidelines for the control of legionella bacteria* (Ministry of Health 2011).

**Health education**

Medical officers of health are responsible for health education in the event of a non-occupational cluster of cases.


Another educational resource is the Ministry of Health pamphlet on safe gardening, which is available at [www.healthed.govt.nz/system/files/resource-files/HE4605.pdf](http://www.healthed.govt.nz/system/files/resource-files/HE4605.pdf)

**Reporting**

Ensure complete case information is entered into EpiSurv.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

**References and further information**
