

## LEPTOSPIROSIS

Based on the MoH Communicable Diseases Control Manual 2012<sup>1</sup>

### Associated Documents

Case Report Form:

[K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Leptospirosis\FormsStdLettersQuest\Leptospirosis\\_Nov2013.pdf](K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Leptospirosis\FormsStdLettersQuest\Leptospirosis_Nov2013.pdf)

Fact Sheet:

<K:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets\LeptospirosisFactSheet.pdf>

### The Illness<sup>1-3</sup>

Leptospirosis, a disease caused by pathogenic *Leptospira* bacteria (spirochetes), occurs world-wide. It is considered the most common of all zoonoses, with a higher incidence in the tropics. Severity ranges from asymptomatic to fulminant fatal disease. Humans and a wide range of animals, including mammals, birds, amphibians, and reptiles can become infected. Leptospirosis is transmitted via direct contact with the body fluid of an acutely infected animal or by exposure to soil or fresh water contaminated with the urine of an animal that is infected. The spirochetes can survive in the environment for several months in moist, warm conditions.

The principal source of human infection is the rat but other sources include dogs, cattle, pigs, and other wild animals. The disease may be acquired during adventure travel or vacations that involve water sports or hiking, or as a consequence of flooding.

During acute infection, leptospire are thought to multiply in the small blood vessel endothelium, resulting in damage and vasculitis. Nearly any organ system can be affected, but particularly the kidneys and liver, the lungs, meninges and brain. Patients with severe leptospirosis may develop disseminated intravascular coagulation (DIC), haemolytic uremic syndrome (HUS), thrombotic thrombocytopenic purpura (TTP), and vasculitis.

#### Epidemiology in New Zealand

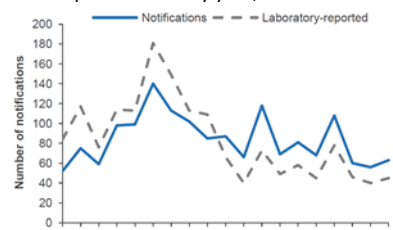
The annual number of leptospirosis notifications in New Zealand fell dramatically between 1980 and 2000 and has fluctuated since. The graph shows notifications from 1997-2012. Most cases had either had recent farm contact or had worked in the meat-processing industry. Human leptospirosis is less likely when animals have been vaccinated. Isolates seen in New Zealand include *Leptospira borgpetersenii* serovar hardjo, *L. interrogans* serovar pomona, and *L. tarassovi*. The two most common serovars seen worldwide, canicola and icterohaemorrhagiae, are not considered endemic in New Zealand.

For 2015 the highest rates of notifications were as follows:

- ◊ Age: 60-69 years
- ◊ Region: Hawke's Bay, Nelson Marlborough, Waikato and Southern DHBs.
- ◊ Ethnicity: Māori and European or Other
- ◊ Occupation: 72.0% were farmers or farm workers, 18.0% worked in the meat processing industry (as freezing workers, meat process workers or butchers).

Other details: males comprised 94% of notifications; 71% of cases were hospitalised.

NZ Leptospirosis notifications and laboratory-reported cases by year, 1997-2015



#### CASE DEFINITION

##### Clinical description

An acute illness characterised by fever, chills, headache, myalgia, nausea, diarrhoea, abdominal pain, meningitis, cough and conjunctival suffusion. Manifestations of severe disease can include jaundice, renal failure, haemorrhage, pneumonitis and haemodynamic collapse.

**Incubation:** 2-30 days (usually 10)

The latest version of this document is available on the CDHB intranet/website only.  
Printed copies may not reflect the most recent updates.

**Transmission:** Animals are the primary hosts and excrete leptospire in their urine. The organisms contaminate groundwater, soil and vegetation. Meat-processing staff may be exposed by direct contact with animal urine or organs of the renal tract. Leptospire enter humans through mucous membranes and skin (especially when abraded).

**Communicability:** Person-to-person transmission is very rare. Animals may excrete leptospire in urine for months to years. The organisms may remain viable for weeks in groundwater and moist soil.

**Prevention:**

No human vaccine is available. Prevention measures include the following:

- 1) avoiding exposure to potential sources of infection such as stagnant water and animal farm water runoff, (avoid swimming or wading in potentially contaminated water),
- 2) implementation of rodent control, and protection of food from animal contamination,
- 3) use of personal protective equipment in at risk occupations and situations
- 4) administration of prophylaxis (doxycycline) for individuals at high risk of exposure for example from adventure sports in high risk environments, and
- 5) vaccination of farm animals (and dogs north from Nelson-Marlborough). Vaccination provides variable levels of protection.

**Notification Procedure**

Cases must be notified on suspicion. Notification should not await confirmation.

If suspected to be occupationally acquired all confirmed cases should be referred to the local Health and Safety division of the Ministry of Business, Innovation and Employment (MBIE) under the Notifiable Occupational Disease System (NODS), for occupational investigation.

- The case must give their consent, which may be verbal, before they can be referred.
- A Health and Safety inspector will investigate and enforce prevention and control.
- A NODS form is included with the documents posted to the patient (see Management of Case, Investigation) for completion and posting to MBIE.

**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 with a single raised agglutination titre by MAT of <400 (ie: less than the level required for a confirmed diagnosis).

**Confirmed:** A clinically compatible illness that is laboratory confirmed.

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

**Possible notification to WorkSafe**

- Refer to Reporting section, page 5.

**Laboratory Testing**

**Laboratory confirmation requires** at least one of the following:

- isolation of leptospire from a clinical specimen
- detection of leptospiral nucleic acid from a clinical specimen
- a four-fold or greater rise in leptospiral microscopic agglutination titre (MAT) between acute and convalescent sera.
- single high antibody titre of  $\geq 400$  in the MAT.
- It is recommended that both nucleic acid testing (NAT) and MAT testing be undertaken to improve diagnostic accuracy.
- ESR-NCBID is the national reference laboratory for MAT testing.

**Serology**

- IgM is useful as a screening test but not a diagnostic test because of cross-reactivity with other diseases.

The latest version of this document is available on the CDHB intranet/website only.  
Printed copies may not reflect the most recent updates.

- IgM can be detectable within the first week of illness and can persist for months.
- Seroconversion can take up to 3 weeks from the onset of symptoms. Acute and convalescent samples need to be tested in parallel by MAT. A four-fold or greater rise in titre or a demonstrated seroconversion is indicative of current or very recent infection. There should be a minimum of 2 weeks between sampling for acute and convalescent sera.

**Nucleic acid testing (eg, polymerase chain reaction [PCR])**

- NAT has the highest sensitivity of all available diagnostic tests and can be used for diagnosis in the acute septicaemic phase of the disease before an antibody response is mounted.
- The timing of the appropriate specimen is essential for a correct diagnosis. Leptospire can be excreted intermittently in the urine therefore a negative result in the context of a compatible clinical illness cannot exclude the diagnosis of leptospirosis.
- In cases of high clinical suspicion, a second urine sample should be submitted if the initial specimen tested negative by NAT.

**Management of Case**

**Investigation**

- Post Case Report Form to notifying doctor.
- Post questionnaire to case with covering letter, disease information, NODS form and self-addressed envelope within 1-2 working days.
- Phone laboratory and request the results to be faxed through (including acute and convalescent serology).
- Ensure serovar-specific MATs are tested on the case's serum. Information on serovars can assist in investigating the source of infection. Exotic serovars in animals are notifiable to the Ministry for Primary Industries under the Biosecurity Act 1993. MPI can assist with the investigation of animal sources.
- If suspected to be occupationally acquired all confirmed cases should be referred to the local Health and Safety division of the Ministry of Business, Innovation and Employment (MBIE) under the Notifiable Occupational Disease System (NODS), for occupational investigation (see Notification Procedure above).

**Restriction**

Nil.

**Treatment**

Early diagnosis of leptospirosis is essential since antibiotic therapy provides the greatest benefit when initiated early in the course of illness. Mild leptospirosis is treated with doxycycline, ampicillin, or amoxicillin. For severe leptospirosis, intravenous penicillin G has long been the drug of choice, although the third-generation cephalosporins cefotaxime and ceftriaxone have become widely used.<sup>3</sup>

**Counselling**

- Advise the case and their caregivers of the nature of the infection and its mode of transmission.
- A fact sheet is available at:  
<K:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets\LeptospirosisFactSheet.pdf>

**Outbreak**

If an outbreak is suspected, contact MOH and refer to:

- ◊ CPH Outbreak Response Procedure:  
<http://cdhbdepartments/corporate/documentmanagement/CDHB%20Libraries/Policies%20and%20procedures,%20guidelines,%20protocols,%20staff%20information%20etc/Com-Dis-Outbreak-Response-Plan.docx>.
- ◊ the CPH Outbreak Guide Template:  
<Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\OUTBREAK GENERAL\FormsStdLettersQuest>.

The latest version of this document is available on the CDHB intranet/website only.  
Printed copies may not reflect the most recent updates.

<b>Management of Contacts</b>	
	<p><b>Definition of a Contact</b> A contact is any person who has experienced similar exposures to the case within the preceding 10 days.</p> <p><b>Investigation, Restriction and Prophylaxis</b> Nil.</p> <p><b>Counselling</b></p> <ul style="list-style-type: none"> <li>• Advise contacts of the nature of the infection and its mode of transmission.</li> <li>• Advise to use protective clothing.</li> <li>• A fact sheet is available at: <a href="K:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets\LeptospirosisFactSheet.pdf">K:\CFS\Quality\ApprovedDocuments\ProtectionTeam\FactSheets\LeptospirosisFactSheet.pdf</a></li> <li>• Advise contacts to see a doctor if they develop any symptoms.</li> </ul>
<b>Other Control Measures</b>	
	<p><b>Identification of source</b></p> <ul style="list-style-type: none"> <li>• Check for other cases among contacts.</li> <li>• All confirmed cases should be referred to the local branch of the Department of Labour under NODS, for occupational investigation (refer Notification Procedure section above).</li> <li>• In the case of a recreational water source, all swimming pools should comply with the New Zealand Standard for Pool Water Quality (NZS 5826:2010).</li> </ul> <p><b>Disinfection</b> Articles soiled with urine should be cleaned and disinfected.</p> <p><b>Health education</b></p> <ul style="list-style-type: none"> <li>• Educate the public to avoid swimming or wading in potentially contaminated water.</li> <li>• Immunisation of dairy herds prevents disease in animals and subsequent infection of humans. Pigs should receive an annual vaccination. Vaccination is not compulsory but it is strongly advocated by WorkSafe NZ and from a personal health perspective.</li> </ul>
<b>Reporting</b>	
	<ul style="list-style-type: none"> <li>• Ensure complete case information is entered into EpiSurv.</li> <li>• 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.</li> <li>• If an outbreak, write report for Outbreak Report File <a href="Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Leptospirosis\Outbreaks">Y:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Leptospirosis\Outbreaks</a>.</li> <li>• If suspected that the infection was acquired at work, complete the WorkSafe notification form 'Notifications under sections 197 and 199 of the Health and Safety at Work Act 2015, Notifications by Medical Officers of Health' (paper copies are kept in the office).</li> <li>• File.</li> </ul>
<b>References and further information</b>	
	<ol style="list-style-type: none"> <li>1. Ministry of Health, Communicable Diseases Control Manual 2012, Leptospirosis: <a href="http://www.health.govt.nz/publication/communicable-disease-control-manual-2012">http://www.health.govt.nz/publication/communicable-disease-control-manual-2012</a></li> <li>2. Notifiable and other diseases in New Zealand: Annual Surveillance Report 2012. <a href="https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2015/2015AnnualReportFinal.pdf">https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2015/2015AnnualReportFinal.pdf</a></li> <li>3. Medscape, Infectious Diseases, Leptospirosis: <a href="http://emedicine.medscape.com/article/220563-overview">http://emedicine.medscape.com/article/220563-overview</a></li> </ol>

**The latest version of this document is available on the CDHB intranet/website only.  
Printed copies may not reflect the most recent updates.**

### Further information

Leptospirosis in New Zealand: an overview of best clinical practice. ACC Review 54, May 2014

[http://www.acc.co.nz/PRD\\_EXT\\_CSMP/groups/external\\_providers/documents/guide/wpc133884.pdf](http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/documents/guide/wpc133884.pdf)

Up-to-date: Treatment and prevention of leptospirosis:

<http://www.uptodate.com/contents/treatment-and-prevention-of-leptospirosis>

Worksafe New Zealand. Safer farms. Prevention and Control of Leptospirosis.2015

<http://saferfarms.org.nz/assets/guides/WSNZ-1368-Prevention-and-Control-of-Leptospirosis-GPG-v5-0-FA1-LR.pdf>

Worksafe New Zealand. Safer farms. Leptospirosis: Information for meat processing workers, 2015.

<http://www.worksafe.govt.nz/worksafe/information-guidance/all-guidance-items/leptospirosis-fact-sheets/meat-processing-workers>

**The latest version of this document is available on the CDHB intranet/website only.  
Printed copies may not reflect the most recent updates.**