

# Legionnaires' Disease, 2001

## Key Points

- **In 2001, there were 3 cases of Legionnaires' disease notified to NDSC. All 3 were male and 2 were travel-associated.**
- **When compared with other European countries, Ireland is conspicuous by its low rate. This would suggest that a major degree of under-diagnosis and under-reporting of Legionnaires' disease currently exists in Ireland.**

## Introduction

Legionnaires' disease is a notifiable disease in Ireland as defined by the Infectious Disease Regulations 1981.<sup>1</sup> Forty three *Legionella* species and 65 serotypes have been described.<sup>2,3</sup> The most common cause of Legionnaires' disease is *Legionella pneumophila*, a gram negative aerobic non-spore forming bacillus.<sup>4</sup> *Legionella* lives as an intracellular parasite of amoebae in aquatic environments<sup>5,6</sup> and can be found naturally in environmental water sources such as rivers, lakes and reservoirs, usually in low numbers. Inadequately maintained man-made water systems provide a favourable environment in which the *Legionella* bacteria can proliferate.

Legionnaires' disease is a multi-system illness which can have wide-ranging clinical symptoms, though the principle manifestation of the disease is pneumonia.

Potential sources of Legionnaires' disease are shown below:

- Hot and cold water systems.
- Cooling towers and evaporative condensers.
- Respiratory and other therapy equipment.
- Spa pools/natural pools/thermal springs.
- Fountains/sprinklers.
- Humidifiers for food display cabinets.
- Water cooling machine tools.
- Vehicle washes/carpet cleaners/medication nebulizers.
- Potting-compost or soil, especially in warmer climates.

## Materials and Methods

### Definitions

Participants in the European Working Group for Legionella Infections (EWGLI), which includes Ireland, use the following case definitions:

#### **Confirmed case of Legionnaires' disease**

An acute lower respiratory tract infection with focal signs of pneumonia on clinical examination and/or radiological evidence of pneumonia and one or more of the following:

- *Culture* - isolation of any *Legionella* organism from respiratory secretion, lung tissue or blood.
- *Seroconversion* – a fourfold or greater rise in specific serum antibody titre to *L. pneumophila* serogroup 1 by the indirect immunofluorescent antibody test or by microagglutination.
- *Antigen detection* – the detection of specific *Legionella* antigen in urine using validated reagents.

#### **Presumptive case of Legionnaires' disease**

An acute lower respiratory tract infection with focal signs of pneumonia on clinical examination and/or radiological evidence of pneumonia and one or more of the following:

- *Serology* – a fourfold or greater rise in specific serum antibody titre to *L. pneumophila*, other serogroups or other *Legionella* species by the indirect immuno-fluorescent antibody test or by microagglutination.

- *Serology* – a single high titre\* using reagents to *L. pneumophila* serogroup 1 or other *Legionella* species and serogroups.

- *Antigen detection* – the detection of specific *Legionella* antigen in respiratory secretion or direct fluorescent antibody (DFA) staining of the organism in respiratory secretion or lung tissue using evaluated monoclonal reagents.

- PCR-detection of *Legionella* species DNA by Polymerase Chain Reaction.

*\*A single high serological titre: as differing serological testing methods are used in different countries, and as an internationally accepted validation exercise has not been carried out, no specific serological test or titre level can be specified. It is suggested however, that the single high titre result considered to indicate recent Legionella infection, in the presence of compatible symptoms, be set at a sufficiently high level to be specific for Legionella infection (i.e. to produce a low level of false positives).*

#### **Travel-associated cases**

A case is defined as travel-associated if the patient spent one or more nights away from their home in accommodation used for commercial or leisure purposes e.g. hotels, holiday apartments, ships, campsites etc. in the 10 days before the onset of illness. The onset of symptoms for Legionnaires' disease must be within ten days of the last date of travel. Travel-associated cases may involve travel within Ireland or travel abroad. A case must meet the clinical, microbiological

Table 1. Number of Legionnaires' disease cases notified in Ireland, 1991-2001

Year	Legionnaires' disease cases notified	Rate per million population
1991	0	-
1992	2	0.6
1993	0	-
1994	1	0.3
1995	1	0.3
1996	2	0.6
1997	6	1.7
1998	2	0.6
1999	2	0.6
2000	9	2.5
2001	3	0.9

1991 population: 3,525,719; 1996 population: 3,626,087

Table 2. Rate of Legionnaires' disease in European countries in 2001<sup>7</sup>

Country	Number of cases	Rate per million population
Spain*	1026	25.48
Denmark	115	21.7
France	800	13.29
The Netherlands	182	11.38
Belgium	109	10.9
Malta	4	10.46
Norway	43	9.56
Italy	302	5.25
Austria	39	4.88
Scotland	19	3.7
England & Wales	175	3.31
Finland	15	2.94
Switzerland	115	1.6
Sweden	78	0.9
<b>Ireland</b>	<b>3</b>	<b>0.83</b>
Northern Ireland	0	0

\*The largest ever community outbreak occurred in Murcia in Spain in 2001

and travel history criteria for it to be notified to the European Working Group on Legionella Infection surveillance scheme (EWGLINET).

### Notification

An enhanced surveillance form is completed by public health doctors on each case that is notified to the Departments of Public Health. This form is then faxed to NDSC where details are entered onto an MS Access database. If the case fulfils the definition of a travel-associated case, NDSC forwards on details of the case to EWGLI.

### Results

#### Cases

In 2001, there were 3 cases of Legionnaires' disease notified. All 3 were male and were Irish nationals. Admission dates to hospital were in July, September and December.

#### Microbiology

All 3 cases were *Legionella pneumophila* serogroup 1. One case was positive on urinary antigen detection alone. One case was positive on serology (4 fold rise in titre). The third case was positive on urinary antigen, serology and culture of bronchial washings.

#### EWGLI

Two cases were travel-associated cases and were notified to EWGLI. One travelled to Italy and the other to both Spain and Italy.

### Outcome

There were no deaths among these cases.

### Discussion

It would appear that Legionnaires' disease is rare in Ireland but when compared with other European countries Ireland is conspicuous by its low rate. This would suggest that a major degree of under-diagnosis and under-reporting of Legionnaires' disease currently exists in Ireland. Table 1 shows the number of cases of Legionnaires' disease notified in Ireland over the last 10 years and table 2 shows the number of cases notified in some European countries in 2001.<sup>7</sup> The average incidence rate of Legionnaires' disease in European countries in 2001 was 7.6 per million population.<sup>7</sup>

On 1 July 2002, new European guidelines under which the European surveillance scheme for travel-associated Legionnaires' disease will operate were introduced, as was a new identity for the scheme – EWGLINET.<sup>8</sup>

Participation in EWGLINET ensures standardised methods of diagnosis, recording and reporting of disease and permits direct comparisons from other participating countries. Outbreaks or clusters of cases of Legionnaires' disease in travellers can be quickly identified through this European network allowing rapid alerts to be communicated to all participating countries, WHO and other relevant bodies.

### Useful Documents

Health and Safety Commission. Legionnaires' disease: the control of legionella bacteria in water systems: approved code of practice and guidance. ISBN 0 7176 1772 6, ref. L8. HSE Books, Suffolk, 2000. This document can also be ordered online at <http://www.hsebooks.co.uk>

The Management of Legionnaires' disease in Ireland. ISBN 0-9540177-2-2. National Disease Surveillance Centre, 2002. Available at <http://www.ndsc.ie>

European Guidelines for the control and prevention of travel-associated Legionnaires' disease. European Working Group for Legionella Infections, 2002. Available at <http://www.ewgli.org>

### References

1. Infectious Diseases Regulations 1981 (SI No. 390 of 1981).
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5. Rowbotham TJ. Isolation of *Legionella pneumophila* from clinical specimens via amoebae and the interaction of those and other isolates with amoebae. *J Clin Pathol* 1983; **36**: 978-86.
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7. Personal communication; Lever F. European Working Group for Legionella Infections, 2002.
8. The European Working Group for Legionella Infections. European guidelines for control and prevention of travel-associated Legionnaires' disease. London: EWGLI, 2002.