



RAPID RISK ASSESSMENT

Outbreak of Legionnaires' disease in Lazise, Italy, July–August 2011

September 2011

Conclusions and recommendations

Eleven cases of travel-associated Legionnaires' disease (TALD) in one month, associated with four accommodation sites in the town of Lazise, Italy suggests a community outbreak from a point source. Intensive environmental investigations are underway in Italy to identify the source of this outbreak. As Legionnaires' disease cannot be transmitted from human to human, the risk in the European Union remains limited to current (and possibly future) visitors to this area and local residents.

Source and date of request

ECDC internal decision, 24 August 2011.

Public health issue

This is a rapidly-evolving cluster of 11 cases of Legionnaires' disease, all cases having experienced the onset of illness within a period of one month. Cases are tourists from Austria, Denmark, Germany, Italy and the Netherlands associated with four accommodation sites in the town of Lazise, in the province of Verona, Italy, indicating the possibility of a community outbreak.

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Disease background information

Legionnaires' disease is a common cause of atypical pneumonia caused by the *Legionella* bacteria, most commonly the species *Legionella pneumophila*. Another clinical manifestation of the infection is Pontiac fever, a self-limited febrile illness that does not progress to pneumonia or death. Legionnaires' disease is characterised by a non-productive cough, accompanied with anorexia, malaise, myalgia and headache. Abdominal pain and diarrhoea are also common. Illness can be severe and, despite improvements in diagnostics and treatment options, around 5–15% of cases may be fatal if not treated appropriately with antibiotics. Both sporadic cases and outbreaks occur worldwide and are more commonly recognised in summer and autumn. An outbreak of Legionnaires' disease may be difficult to detect due to low attack rates (0.1–5%) [1].

In the majority of the cases the incubation period of Legionnaires' disease is between two and 10 days, with a median of six days. However, the incubation period has been described as having a duration of up to 19 days [2]. Legionnaires' disease usually affects more males than females, with smokers and the elderly or immunocompromised individuals at higher risk of complications.

A laboratory diagnosis of Legionnaires' disease can be made using a variety of tests including: culture/isolation of the causative organism, antigen detection in urine, a significant rise in antibody titres or PCR methods. Determination of the monoclonal subtype and molecular sequence typing can support the link between strains from the sampled environment and patients.

Legionnaires' disease is a waterborne disease, associated with man-made water systems. In conditions favourable for *Legionella* growth (such as water temperatures in the range of 25–42°C, stagnant water with sediment build-up and low biocide levels) the bacteria can multiply. Aerosolisation of such a water supply can cause sporadic cases or outbreaks resulting from the inhalation of this aerosol. Cooling towers, evaporative condensers, humidifiers, decorative fountains, whirlpools, showers, etc. have been identified as possible risk installations [1,3].

Control measures available to reduce the amount of *Legionella* in a water system depend on the system engineering and use. They can include temperature control, disinfection using chemicals or other oxidising materials, use of biocides or installation of filters [3].

In accordance with Decision No 2119/98/EC of the European Parliament and of the Council of 24 September 1998 [4], surveillance and control of the disease is organised at the European level through the European Legionnaires' disease surveillance network (ELDSNet) [5]. A European case definition has been established for surveillance purposes. As part of the network activities, countries notify data detailing individual TALD cases on a daily basis. Identified clusters of TALD are shared with all Member States through ELDSNet. Risk assessments of accommodation sites associated with the cluster are undertaken by the Member State in which the accommodation site is located, reported to ECDC and shared with the network [5].

Event background information

Since 16 August 2011, 11 cases of TALD have been notified to the ELDSNet Surveillance Network. All cases – seven residents from the Netherlands, one from Italy, one from Austria, one from Germany and one from Denmark – stayed at four different accommodation sites in the touristic town of Lazise, Italy between 7 July 2011 (first arrival) and 31 August 2011 (last departure). Dates of onset range from 18 July 2011 to 24 August 2011 (Figure 2). Figure 3 shows the possible dates of exposure for each case by associated accommodation site.

All 11 cases have been confirmed by urinary antigen test. The average age of the cases is 54 years (youngest 42 years, oldest 78 years) and the gender distribution is 10 males/1 female.

Microbiological details are available for two cases. Sequence-based molecular typing showed that both the Danish case and one of the Dutch cases has sequence type 23. In addition, the monoclonal subtype has been determined for the same Danish case as Allentown/France (serogroup 1).

After the first TALD cases were reported by the Netherlands through the ELDSNet network (15–17 August 2011), epidemiological and environmental investigations were immediately initiated by the authorities in Italy. The National Institute of Health is supporting the local authorities in Lazise with local investigations [6].

Three of the accommodation sites are located south of the town centre, with two sites (where eight of the cases stayed) situated within 500m of each other. As yet no risk installations have been identified as probable sources. It is known that the water supply for the accommodation sites is different. Local risk assessment is ongoing and several water samples have been collected for testing by the Regional and National Reference Laboratories in Italy. Preliminary results show that *Legionella pneumophila* serogroup 1 was isolated from a shower at one of the accommodation sites. Sub-typing of these isolates is ongoing, as well as analysis of additional samples from other suspected sources at different locations in Lazise.

Local hospitals and general practitioners in the area have been alerted to support case-findings and accommodation sites have been briefed on the situation [6]. ECDC supported the preparation of letters to inform guests who have been staying at the different accommodation sites and current guests are being informed via leaflets. In addition, information is provided about the symptoms of Legionnaires' disease and guests are advised to seek medical care if they experience suspected symptoms. Precautionary control measures, such as hyper chlorination and the switching off of all aerosol-producing devices (spa pools, decorative fountains, sprinklers) were taken on 23 and 26 August 2011.

In Italy, there is no compulsory registration of wet cooling systems, as is the case in other EU countries [7].

Lazise (Figure 1) is a small town located about 20 km northwest of Verona. It has a population of 7 000 inhabitants [8] and there are an estimated 60 000 visitors to the town during the tourist season.

Figure 1. Geographic location of the outbreak in Italy, July–August 2011



Figure 2. Epidemic curve of outbreak, cases by date of onset, nationality and associated accommodation site (notified to ELDSNet as of 5 September 2011) (n=11)

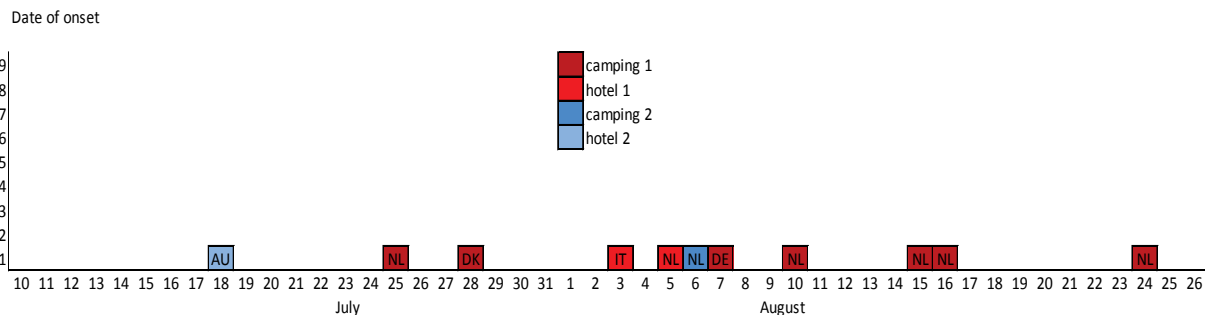
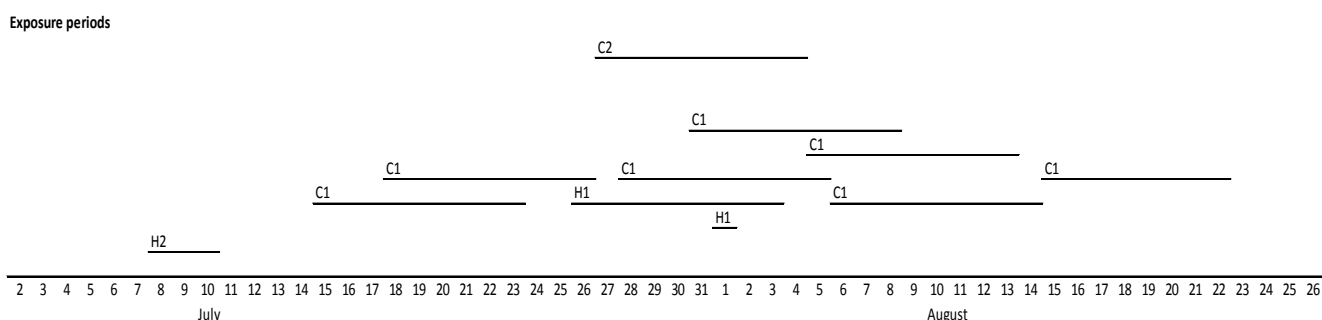


Figure 3. Possible exposure dates for each reported case by associated accommodation site (notified to ELDSNet as of 5 September 2011)



H1 = hotel 1, H2 = hotel 2, C1=camping 1, C2=camping 2 (n=11)

ECDC threat assessment for EU/EEA countries

Legionnaires' disease cannot be transmitted from human to human. The risk associated with any specific source is therefore limited to a population confined in time and space to the area where any contaminated water-aerosolising installation is situated.

The age and profile of reported cases in the current outbreak is typical for a Legionnaires' disease outbreak, as is the attack rate for a community outbreak, if we assume a 0.1–0.5% attack rate in a population estimated at 15 000 residents in Lazise over a one-month period.

The disease has principally affected tourists visiting Lazise (and more specifically those staying at four identified accommodation sites in a localised area of the town) which strongly suggests the existence of a contaminated installation or device at or in the near proximity of the accommodation sites.

The exact spatial area and time of risk for any *Legionella* exposure depends on several factors. In addition to the characteristics of the water source and the installation (contamination level of the water source, capacity and volume of aerosol formation, placement and height of the installation), external factors such as wind direction and wind speed can also play a role in the dispersion pattern of the infective aerosol.

As no evidence has yet been found to incriminate one specific source it is unknown whether the source, and thus risk for exposure, has now been eliminated. During local investigations at the associated accommodation sites, the simultaneous implementation of control measures, such as hyper chlorination, might have diminished the risk for further exposure. However, as long as there is no strong evidence found for one or more sources, the exposure might persist or reappear in the coming weeks and months depending on the effectiveness of precautionary measures.

To support the epidemiological investigation to find a probable source, the Member States investigators involved have elaborated a common questionnaire. ECDC has been actively supporting the collaboration through the Epidemic Intelligence Information System (EPIS) for ELDSNet, and will facilitate the data collection. A specific ad-hoc discussion forum has been opened in EPIS ELDSNet.

An important finding is the determination of the monoclonal subtype (from Denmark) and especially the DNA sequence type of the strain for two clinical isolates (from Denmark and the Netherlands). This will potentially allow the matching of the strain to any positive water samples identified in attempts to assess the source. However, it should be noted that in a significant proportion of outbreaks no source can be found.

Conclusions

Although the exact source of the outbreak has not been identified, the close clustering of the cases suggests a community outbreak.

Intensive environmental investigations are underway in Italy to identify the source of the outbreak. This is vital to evaluate whether there is a considerable ongoing risk of *Legionella* infection in the area. In the meantime, the implementation of precautionary control measures at any suspected risk installations or devices identified in the neighbourhood is of utmost importance to reduce the risk of exposure.

In the absence of an identified and controlled source of *Legionella* in Lazise, there may be an ongoing risk of exposure to *Legionella* for persons visiting or residing in the town. The risk of contracting Legionnaires' disease should be considered higher for persons over 40 years, smokers and immunocompromised individuals. For this group timely diagnosis and appropriate treatment will be particularly important.

As Legionnaires' disease cannot be transmitted from human to human, the risk in the European Union remains limited to current (and possibly future) visitors to this area and local residents.

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