

Preliminary report: Outbreak of Legionnaires' disease in a hotel in Calp, Spain, update on 22 February 2012

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Research is ongoing on eighteen cases of Legionellosis, including four deaths, identified among tourists and employees in a hotel in Calp, Spain. Cases occurred during a period of two months, indicating the possibility of a point-source transmission at the hotel. An environmental investigation identified several positive samples in the hotel, which as a precautionary measure, was closed until requested improvements were made. Surveillance measures currently remain active.

Outbreak description and epidemiological investigation

On 14 December 2011 a Spanish tourist, who had stayed at a hotel in Calp, on the east coast of Spain, between 27 and 29 November was confirmed as a case of *Legionella* pneumonia. Thirteen days later, on 27 December 2011, a Spanish employee at the same hotel was identified as a second case. This prompted an epidemiological investigation to confirm or rule out an outbreak.

On 11 January 2012 another case was reported via the European Legionnaires' Disease Surveillance Network (ELDSNet) and involved an English tourist who had also stayed at the hotel. Following this, on 17 January 2012, three additional cases related to the hotel were reported, all British citizens.

The European case definition [1] was adapted for this outbreak, and a confirmed case was defined as a patient with clinical diagnosis of pneumonia, who had stayed or worked at the hotel between two and ten days before the onset of symptoms, with laboratory findings indicative of *Legionella* infection, including a positive urine test for *Legionella pneumophila* antigen, or a positive culture or isolation from respiratory secretions.

Currently, the outbreak is restricted to 18 cases. All cases were confirmed by positive urine antigen. Seven samples are pending sequencing by the Genomics and

Health Joint Unit, Centro Superior de Investigación en Salud Pública (CSISP) -University of Valencia, Spain. There have been four deaths, all involving male travel-related cases, over 70 years of age. Two of the cases who died had not sought prior medical care, while the other two cases died in the hospital 12 and 39 days after onset of symptoms.

All cases had stayed or worked at the same hotel in Calp during the incubation period of their illness. There were a total of 11 men and seven women with a mean age of 70 years (range: 44–88 years). Partial information is available on predisposing factors of cases: smoking in 3/9, heart disease in 2/13 and chronic respiratory disease in 1/13.

Fifteen of the eighteen cases were travel-associated (one Spanish, twelve English and two French) and three were members of the hotel staff. The three cases who were part of the hotel staff had an average age of 58 years (range: 47–74 years). For all of the 18 cases but two, symptoms began between 4 December 2011 and 2 February 2012. The date of onset of symptoms is unknown for two of the four cases who died (Figure).

Travel-associated cases occupied different rooms in the hotel, except for three couples, who respectively shared a room. Only two cases used the hotel's spa facilities.

Environmental investigation

When the first case appeared, on 4 December, the registered documentation on the Facilities Management Program Risk of the hotel was reviewed. We verified that certificates of cleaning and disinfection of water deposits, as well as of the network of cold water for human consumption and hot water were compliant with the Spanish *Legionella* surveillance legislation [2]. The documents certifying compliance were dated from 31 January 2011.

When the second case of Legionnaires' disease, a hotel employee, was reported, a new on-site investigation was immediately launched. In addition to the previously inspected documents, we obtained the analytical results, dated from 29 November 2011, of routine water samples from the hot-water deposits, jacuzzi, cold-water tank and rooms. All of the seven water samples that had been analysed had been negative for *Legionella*.

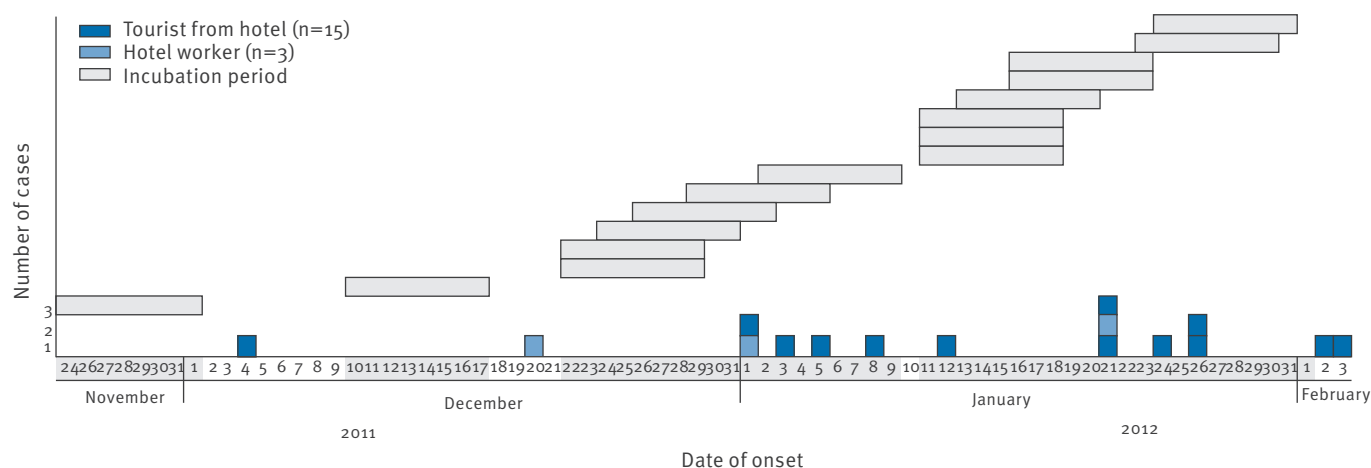
On 11 January, via ELDSNet a third, travel-associated case was reported. As a result, a thorough inspection of the hotel premises was performed. Chlorine levels and temperatures were checked in each column of the drinking water pipes. Deficiencies in the hot-water

temperature and other structural points were detected, as hot water stagnated in the feedback circuit. Twelve new water samples that were taken, yielded negative results a few days later. Nevertheless, all the hotel facilities were cleaned by hyperchlorination [2]. Two days later, additional water and biofilm samples were collected to check the efficiency of the cleaning procedures. All the samples tested negative.

On 31 January, new water and biofilm samples were taken from the network of cold water for human consumption and the hot water. Fourteen biofilm samples tested positive and the hotel was immediately closed on 2 February.

FIGURE

Cases of Legionnaires' disease, by date of symptom onset, ongoing outbreak in Calp, Spain, 24 November 2011–22 February 2012 (n=18)



Dates of symptom onset for two of 18 cases who died are not known. These two cases are not shown on the figure.

TABLE

Environmental investigation, outbreak of Legionnaires' disease in Calp, Spain, 24 November 2011–22 February 2012

Date of action	Action	Result
04 December 2011	Review of the registered documentation on the Facilities Management Program Risk of the hotel	Certificates, dating from 31 January 2011, of cleaning and disinfection of water deposits, the network of cold water for human consumption and hot water were obtained
03 January 2012	On-site inspection	A whirlpool cleaning and disinfection certificate dated from 02 November 2011 was obtained The certificate dating from 29 November 2011 showed that analytical results of seven routine water samples had been negative for <i>Legionella</i>
12 January 2012	On-site investigation Water chlorine levels and temperatures were checked Seven new water samples were taken	All water samples were negatives
16–17 January 2012	All the hotel facilities were cleaned by hyperchlorination	One water and 12 biofilm samples were taken on 19 January 2012 to check the result of the cleaning procedure
19 January 2012	New on-site investigation One water and 12 biofilm samples were taken	Deficiencies in the hot-water temperature and other structural points All the samples tested negative
31 January 2012	32 water and 24 biofilm samples were taken	14 biofilm samples were positive on 2 February 2012
2 February 2012	14 biofilm samples were positive	Precautionary closure of the hotel
8–9 February 2012	Cleaning and hyperchloration after correction of deficiencies in the water distribution network was conducted between 8 and 9 February	The hotel reopens to the public on 10 February

Environmental intervention requested from the hotel

As a result of the environmental investigations, the hotel had to make changes in the hot water system to prevent the growth of *Legionella*. The changes had to ensure that the hot water temperature would be higher than 50°C in all endpoints. Improvements in the water disinfection system were also requested and the use of well-water for irrigation and toilets' cisterns was prohibited.

Discussion

From 1999 to 2009, 26% of Legionnaires' disease outbreaks in Spain have been travel-associated, and have affected 435 people [3]. However, in recent years there has been a decrease in the number of cases and outbreaks affecting travellers [4,5]. Interestingly, travel-associated Legionnaires' disease mortality in non-Spanish citizens is 2.6 times higher than in Spanish citizens travelling in their own country [3].

Here we report on the ongoing investigations into an outbreak in a single hotel in Calp, affecting 18 individuals and causing four fatalities. In the last 10 years, the incidence of travel-associated *Legionella* clusters in Calp has been very low. In 2006, an outbreak in the same hotel involved six cases. During 2011, a cluster of two travel-associated cases was reported in a different hotel of the same city.

Unlike other point-source transmission outbreaks, the onset of the one reported here was insidious with 13 days between the notifications of the two first cases. In addition, the second case was a hotel worker. These circumstances have made the early stages of the investigation quite difficult [6-8].

In this outbreak, the majority of hotel guests were from the European Union (EU), especially from the United Kingdom, France, Italy and Belgium. There were also Spanish guests and some from other countries outside the EU (United States, Russia, Kazakhstan, Brazil, New Zealand, Australia). Identified cases were from three EU countries. For the surveillance of Legionnaires' disease and especially for the detection of travel-associated clusters, collaboration among European countries through ELDSNet is very important and facilitates a rapid risk assessment [9-11]. Nevertheless, it would be interesting to have more detailed information about the patients involved in travel-associated clusters to improve research and control of outbreaks.

Guests and tour operators have been informed about the outbreak and strict control and cleaning measures, including the closure of the hotel, were implemented. The hotel resumed normal operation once the structural deficiencies and additional cleaning procedures were performed. Surveillance measures will remain active until further notice.

The results of genomics analyses of human and environmental samples are still awaited. The final report on the outbreak will be delivered once it is considered closed and we have all the results related to the investigation.

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