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An outbreak of Legionnaires' disease occurred in an area of northwestern Italy

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Background: *Legionella pneumophila* (LP) is recognized as a cause of atypical pneumonia known as Legionnaires' disease (LD). The incubation period of LD is typically 5–6 days (range 2-10 days) following exposure to aerosolized water containing the bacteria. Sporadic cases and large outbreaks of LD are reported worldwide. Numerous large outbreaks of LD have been reported typically associated with cooling towers, which distribute aerosolized plumes to relatively large areas. The present study reports an outbreak of LD occurred in Parma, Northern Italy, spanning over a 2-month period.

Material/methods: From 27th August to 11th November 2016, 504 urine samples were examined for the direct detection of LP serogroup 1 antigen by immunocromatographic (Alere BinaxNOW *Legionella* Urinary Antigen Card – Alere, USA) and/or immunofluorescence (Sofia *Legionella* FIA – Quidel, USA) assays. When a positive result was observed by the urine antigen test (UAT), a respiratory specimen for direct detection of microorganism by conventional culture and/or molecular method (Allplex Respiratory Panel 4 – Seegene, Korea) and serum samples for antibodies evaluation by indirect immunofluorescence (*Legionella* IFA – Focus Diagnostics, USA) were required.

Results: Since 27th August when the first LP positive urine sample was reported in a 56-year-old woman, a total of fifty-one of the 504 analyzed samples were positive for the LP antigen. In particular, these positive samples belonged to 22 females (aged 27–97, median age 69) and 29 males (aged 41–87, median 68). In the majority of the cases (29), these patients lived in the south-east district of the

town or attended the same area for working or family reasons. Two patients with concomitant pathologies died. Only in 5 cases, respiratory specimens were sent to the laboratory: 4 (collected 10-13 days after UAT) were negative and 1 (collected one day after UAT) was positive only for LP DNA. For 39 patients, at least a serum sample was analyzed for the detection of antibodies: 12 were negative, 16 had a titre ranging from 1:16 to 1:64 and 11 a titre > 1/64; in 5 cases, it was possible to reveal a seroconversion. In the same period, LP serogroup 1-8 antibodies were detected (titre \geq 1:256) for 3 additional patients living in the epidemic area.

Conclusions: This report describes an outbreak of LD involving 54 patients 32 of which were geographically related to a district of Parma. Unfortunately, till now, the source of infection is unknown. Legionellosis outbreaks, frequently observed during season changes, can be difficult to identify; thus, the timely identification and prevention are crucial for the management of the cases and the attention for *Legionella* -associated disease should be maintained at high level.