Global surge of Legionnaires' disease in 2024: urgent call for heightened awareness and preparedness

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Despite substantial advancements in understanding *Legionella* transmission since the first identified outbreak in 1976 at the American Legion convention in Philadelphia,[1] crucial research gaps in prevention and control measures remain, which hamper efforts to reduce the recurring surge in cases. Recent global outbreaks in 2024 highlight the urgent need for heightened awareness and preparedness among health-care professionals and the community.

In 2024, multiple regions reported major Legionnaires' disease (LD) outbreaks. By Aug 20, authorities in Laverton North, Melbourne, Australia, documented 114 cases and two fatalities linked to a cooling tower.[2] In Lombardy, Italy, 53 cases and four fatalities were recorded by Aug 26, 2024, owing to suspected deficiencies in building water systems.[3] In Lincoln, NH, USA, seven cases reported between June and July were linked to a cooling tower.[4] 30 confirmed cases and two deaths were reported in London, UK, by Sept 26.[5] Ten cases with three fatalities were also documented in a residential facility in Albany, NY, USA, by the same date.[6] Additionally, in Gaston County, NC, USA, a cluster of nine cases were recorded in September.[7] Reports from early October in Hong Kong confirmed two community-acquired cases, increasing the total number of LD cases to 89, and investigations into the outbreak sources are ongoing.[8] New Zealand documented 108 cases by Sept 27.[9] These successive outbreaks highlight the imperative need for preventive measures.

In the Melbourne outbreak, most affected individuals were older than 40 years, and many required hospitalisation, including some in intensive care for severe pneumonia.[10] In Milan, the outbreak affected individuals aged 26–94 years (29 women and 24 men).[3] Similarly, in London, the ongoing outbreak primarily affected men aged 37–76 years, although the source remains undetermined.[5] The rising incidence of LD, which correlates with decreased sulphur dioxide levels and other environmental changes, reflects the necessity for proactive epidemiological surveillance.[11]

Historically, LD has been reported worldwide, with major outbreaks associated with cooling towers documented in Spain (n=449, 2001), Italy (2005–8, lasting until 2012), Portugal (n=377, 2014), and Bronx, NY, USA (n=138, 2015). Travel-associated LD cases—such as those linked to complex water systems in Chicago, IL, USA (2015, n=114; 11 confirmed LD, 29 suspected, and 74 Pontiac fever cases), and 51 cases associated with travel to Dubai from 2016 to 2017—have also been recorded.[11,12] In the USA, cases surged by approximately 900% between 2000 and 2018, reflecting a global need to establish epidemiological connections between infection sources and reported cases.[12]

LD, caused by *Legionella pneumophila* serogroup 1, is a severe respiratory infection with symptoms including fever, chills, cough, and muscle aches. Atypical symptoms such as nausea, diarrhoea, and confusion might also occur. The bacterium proliferates in warm natural and artificial water systems, particularly those involving cooling towers, spas, and water fountains, as well as in potting mix and compost. Infection occurs through inhalation of contaminated aerosols or aspiration of contaminated sources.[1,2] Thus, only eliminating *Legionella* from potential sources is insufficient; rigorous preventive measures are essential to reduce future risks (appendix p 1).

See Online for appendix

Underdiagnosis and underreporting of LD remain substantial concerns, given its non-specific symptoms and potential severity. The actual incidence of LD is estimated to be 1·8–2·7 times higher than the reported figures.[13] This gap is partly attributed to inadequate immediate testing, which profoundly impacts the outcomes for immunocompromised individuals, among whom the mortality rate can be as high as 40% in severe cases of LD. Therefore, clinicians should maintain a high index of suspicion for LD, especially in individuals with community-acquired pneumonia who present with risk factors such as advanced age, smoking, or immunosuppression. Rapid diagnostic methods, such as urinary antigen testing and PCR on respiratory samples, are crucial for early detection and treatment.[10,13] Timely antibiotic therapy, guided by current therapeutic guidelines, is essential to reduce morbidity and prevent severe outcomes.

Public health coordination, including molecular testing of environmental and clinical samples, is crucial for source identification and effective outbreak management. Vigilance among health-care professionals, particularly those in emergency and primary care, is essential for early recognition of potential cases.[2] Enhanced public awareness and ongoing surveillance are crucial for controlling current

outbreaks and preventing future ones. In the absence of a vaccine and with limitations in antibiotic efficacy, preventive and control measures, such as strict hygiene protocols, systematic inspections of water systems, and chlorine treatments in public and communal facilities, are necessary to mitigate public health risks.[12]

The global resurgence of LD emphasises the need for a coordinated response to close crucial gaps in diagnosis and prevention. Enhanced diagnostic capabilities and rigorous preventive measures are essential to reduce the burden of LD and mitigate future outbreaks (appendix p 1).

We declare no competing interests.

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