

TransAtlanticSafety

Legionella in UK Household Showers

Legionella bacteria are the causative agents of Legionnaires' disease, a potentially fatal pneumonia, and Pontiac fever, a milder self-limiting illness. These bacteria are ubiquitous in an aqueous environment but favour growth in man-made water systems that see water stagnation and operating temperatures between 20 °C and 45 °C. The uncontrolled growth of Legionella bacteria leads to water contamination. Some water systems, such as domestic showers, may generate airborne water droplets (aerosol) contaminated with these bacteria. It is the inhalation of these contaminated droplets that may lead to potentially life-threatening lung disease.

One such water system capable of generating aerosol is a domestic shower. The shower is the most frequently used aerosol-generating device in household settings. The environment within this water system favours the growth of the bacteria due to warm water temperatures. Depending on the hygiene habits, the shower may not be used frequently, adding another risk factor of water stagnation. With the aging population, the share of immunocompromised occupants susceptible to Legionnaire's disease is increasing. All of these factors highlight the importance of having preventative measures in place to control the growth of Legionella bacteria in domestic water systems and showers in particular.

A study by Collins et al. (2016) investigated the occurrence of Legionella in UK household showers. Ninety-nine showers from 82 separate properties in the South of England were sampled. The study has demonstrated that UK domestic showers are frequently positive for non-pneumophila Legionella. 48% of UK households included in this study were found to be contaminated with the bacteria. Although 48% may seem alarming, the identified Legionella species were non-pneumophila. Non-pneumophila species are believed to be implicated in only 10% of all Legionella infection cases (Muder & Yu, 2002). The majority of confirmed infections involving non-pneumophila Legionella species have occurred in immunosuppressed patients.

There was a negative correlation between the frequency of shower use and the proportion of positive samples (Collins et al., 2016). This demonstrates that more frequent flushing of the water systems reduces the potential for bacteria growth. Another correlation was established between the age of the shower head and the number of positive samples. Only 10.5% of showers <2 years of age were positive for Legionella, while 56% of showers >10 years old were contaminated with the bacteria. There was an estimated 43% increase in positive samples for a doubling of shower age. To control this risk factor, periodic cleaning and disinfection of the shower head should be carried out to prevent the colonisation of the water system outlet. Replacing the entire shower head and the hose every 5 years may also be beneficial.

Apart from domestic water systems, Legionella can be found in many industrial settings, such as cooling towers, adiabatic chillers, air conditioning units, and emergency showers, as well as leisure water systems such as pools and SPA. The control of bacteria in these water systems will follow the same principles of controlling the temperature outside the 20°C and 45°C range, preventing water stagnation through flushing and water circulation and system cleaning and disinfection. However, additional measures, such as chemical dosing to eliminate bacterial growth and to avoid limescale build-up, can be introduced for complex water systems.

The Control of Substances Hazardous to Health (2002) Regulations do not discriminate between the types of Legionella bacteria. In the eyes of the law, the same risk management measures must be applied to both pneumophila and non-pneumophila Legionella species. This includes the risk assessment, use and maintenance of control measures, exposure monitoring, and health surveillance.

References:

Collins, S. *et al.* (2017) "Occurrence of Legionella in UK household showers," *International Journal of Hygiene and Environmental Health*, 220(2), pp. 401–406. Available at: <https://doi.org/https://doi.org/10.1016/j.ijheh.2016.12.001>.

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DOMESTIC SHOWER FLUSHING VS POSITIVE LEGIONELLA SAMPLES

