



## The next few years in Legionella research

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**Diseases caused by Legionella bacteria are on the rise, despite national and international efforts to contain them. A joint paper by an international panel of researchers in this field highlights the important steps that need to be taken in the coming years to combat the pathogen.**

Legionella bacteria are found wherever there are damp and wet conditions such as water pipes, showers, boilers, garden hoses and compost. The pathogen causes Legionnaires' disease and Pontiac fever, and the number of infections has risen steadily over the last 20 years since measurements began. 'Legionella bacteria are found almost everywhere. They can only be contained with targeted measures,' says Frederik Hammes, a researcher at Eawag's Environmental Microbiology department and co-author of the study.

To combat this widespread pathogen and implement these targeted measures, further research is needed, as well as close cooperation between science, industry, and politics. This is the conclusion reached by a team of researchers in their paper 'Foresight 2035', which was recently published in *FEMS Microbiology Reviews*. In it, researchers from Eawag together with other scientists from different international institutions and fields of research, led by Frederik Hammes, summarise the issues that should be addressed in the coming years.

The starting point for the paper was a Legionella management symposium in 2024 at the Swiss aquatic research institute Eawag, which brought together numerous stakeholders from a wide range of disciplines and subject areas. As Hammes explains, 'Legionella research touches on many different areas, including sanitation and building technology, engineering, microbiology, politics and, of course, medicine.' Cooperation between politics, industry and science is the way forward to not only control but also contain Legionella infections. In their paper, the researchers highlight various problem areas that will be relevant in the coming years.



The symposium on Legionella bacteria took place last year at Eawag in Dübendorf (Photo: Frederik Hammes, Eawag).

### **Legionella likes it warm – but not too warm**

One of these potential new challenges is climate change. The team concludes that climate change will play a decisive role in the spread of Legionella in the future. Not only does Legionella grow faster at warmer temperatures, but there are also new risks for humans of becoming infected with the pathogen. While the population combats the heat with air conditioning, the devices themselves are sometimes an ideal home for the bacteria.

Efforts to save energy can also play into the hands of Legionella, for example when it comes to hot water consumption. If temperatures are lowered when showering or washing dishes to save energy, for example, the sanitary pipes provide ideal conditions for Legionella bacteria. This raises the question of how Legionella can be prevented under these conditions: Are additional disinfection methods required? And how can water systems such as boilers and pipes be optimised? These questions must be answered in collaboration with industry.

### **Legionella bacteria grow everywhere, but they are not dangerous everywhere**

A key aspect of the research efforts is also to find out where people can become infected. A defective boiler can be a breeding ground for Legionella bacteria, but it is unlikely that people will infect themselves there. The shower poses a greater risk, as we come into direct contact with contaminated water there. New technologies may also present potential sources of infection that are not yet known – these must be monitored proactively.



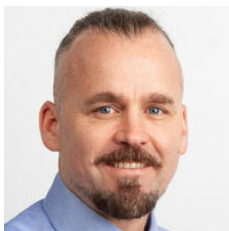


volume => protected49 (integer) issue => protected'2025' (4 chars) startpage => protected'fuaf022 (18 pp.)' (16 chars) otherpage => protected'' (0 chars) categories => protected'legionella; Legionnaires' disease; legionellosis; building plumbing; opportunistic pathogens; waterborne disease' (112 chars) description => protected'The disease burden from *Legionella* spp. infections has been increasing in many industrialized countries and, despite decades of scientific advances, ranks amongst the highest for waterborne diseases. We review here several key research areas from a multidisciplinary perspective and list critical research needs to address some of the challenges of *Legionella* spp. management in engineered environments. These include: (i) a consideration of *Legionella* species diversity and cooccurrence, beyond *Legionella pneumophila* only; (ii) an assessment of their environmental prevalence and clinical relevance, and how that may affect legislation, management, and intervention prioritization; (iii) a consideration of *Legionella* spp. sources, their definition and prioritization; (iv) the factors affecting Legionnaires' disease seasonality, how they link to sources, *Legionella* spp. proliferation and ecology, and how these may be affected by climate change; (v) the challenge of saving energy in buildings while controlling *Legionella* spp. with high water temperatures and chemical disinfection; and (vi) the ecological interactions of *Legionella* spp. with other microbes, and their potential as a biological control strategy. Ultimately, we call for increased interdisciplinary collaboration between multiple research domains, as well as transdisciplinary engagement and collaboration across government, industry, and science as the way toward controlling and reducing *Legionella*-derived infections.' (1565 chars) serialnumber => protected'0168-6445' (9 chars) doi => protected'10.1093/femsre/fuaf022' (22 chars) uid => protected34849 (integer) \_localizedUid => protected34849 (integer)modified \_languageUid => protectedNULL \_versionedUid => protected34849 (integer)modified pid => protected124 (integer) Hammes, F.; Gabrielli, M.; Cavallaro, A.; Eichelberg, A.; Barigelli, S.; Bigler, M.; Faucher, S. P.; Föchslin, H. P.; Gaia, V.; Gomez-Valero, L.; Grimard-Conea, M.; Haas, C. N.; Hamilton, K. A.; Healy, H. G.; Héchar, Y.; Julian, T.; Kieper, L.; Lauper, U.; Lefebvre, X.; Mäusezahl, D.; Ortiz, C.; Pereira, A.; Prevost, M.; Quon, H.; Roy, S.; Silva, A. R.; Sylvestre, É.; Tang, L.; Reyes, E. V.; Van Der Wielen, P. W. J. J.; Waak, M. (2025) Foresight 2035: a perspective on the next decade of research on the management of *Legionella* spp. in engineered aquatic environments, *FEMS Microbiology Reviews*, 49(2025), fuaf022 (18 pp.), doi:10.1093/femsre/fuaf022, [Institutional Repository](#)

## Project

[LeCo project – Legionella control in buildings](#)

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