

# Home and hospital health care could be in 'hot water'

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Hospitals and homes are havens for germs and disease—but a well-regulated hot water system can prevent the spread of waterborne pathogens, including an emerging infectious disease problem from

"superbugs" which can be resistant to most antibiotics.

However, Flinders University experts warn that some drinking water treatment methods may be ineffective against some waterborne pathogens that pose a threat to immune-compromised individuals—and point-of-use devices such as taps and showerheads may create havens for these microorganisms to grow.

The elderly, newborns and those with compromised immune systems are especially vulnerable to waterborne infections. Numbers are rising of people with conditions such as advanced age, cancer and immunodeficiency issues who may be more at risk of "opportunistic premise plumbing pathogens" (OPPP) infection.

Regular changes to tap and outlet filters, hot water service maintenance checks (for heat and pressure) and effective cleaning of shower and tap faucets are recommended for immune-compromised patients receiving health care at home or post- surgical management.

Health care at home has emerged as an alternative to extensive inpatient hospital stays—especially through the COVID-19 pandemic, to reduce the burden on the health care system and to support those with potential long term respiratory side effects.

"These measures can help reduce the risk of waterborne infections in [home care](#), along with quality treatments of mains water to provide safe drinking water," says lead researcher Claire Hayward, from Flinders University's College of Science and Engineering.

A new study published in the journal *Current Opinion in Infectious Diseases*, by environmental health experts at Flinders University found evidence of hospital water as a source of potential infection and even antimicrobial and multidrug resistant organisms.

"Biofilms formed on taps, showers, drains and other outlets provide an ideal niche to harbor these dangerous antibiotic resistant pathogens originating from the supply water or the human microbiota from washing contaminated hands," says Hayward.

OPPP infections such as *Legionella pneumophila*, *Pseudomonas aeruginosa* and *Mycobacterium avium* are a group of waterborne pathogens that are slowly receiving increased public health attention in [infection](#) control guidelines.

"However, drinking water as a source of health care-associated infections continues to be overlooked or underestimated in this monitoring," Hayward says.

The OPPP waterborne pathogens can be disinfectant resistant and persist in refuges with low nutrients, then form biofilms capable of supporting other clinically relevant pathogens such as *Staphylococcus aureus*, *Enterobacteriaceae*, *Klebsiella pneumoniae* and *Escherichia coli*.

Once these biofilms are established on plumbing surfaces, there are many ways for contamination and transmission. The design of outlet devices that result in splashing and aerosolizing of water can also increase the risk of contaminating nearby areas.

"The rise of these resistant pathogens has been identified by the World Health Organization and US Centers for Disease Control and Prevention as one of the most significant threats to global public health," says research co-author, Flinders University microbiology expert Professor Melissa Brown.

"While the COVID-19 pandemic has increased the use of disinfectants and sanitizers, particularly in health care facilities, these antiseptic soaps do not tackle what's going on behind the scenes in the water supply pipes

and faucets," she says.

The researchers recommend broad, universal surveillance guidelines to understand the role of drinking water and water-related devices to reduce health care associated infections and the rise of possible antimicrobial resistance that poses a threat to at risk individuals in residential and health care settings.

The article has been published in the journal *Current Opinion in Infectious Diseases*.

**More information:** Claire Hayward et al, Hospital water as the source of healthcare-associated infection and antimicrobial-resistant organisms, *Current Opinion in Infectious Diseases* (2022). [DOI: 10.1097/QCO.0000000000000842](https://doi.org/10.1097/QCO.0000000000000842)

Provided by Flinders University

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