

U-bend offers layer of protection against COVID-19

April 2 2020, by Craig McManamon



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A set of tips and practical advice to help limit the potential spread of COVID-19 through internal plumbing, including running taps twice a day, has been published by a leading engineering academic.

Writing in *The Lancet Global Health* today (Tuesday 24 March), Dr. Michael Gormley says taking simple measures such as not ignoring foul smells in the home could make all the difference. Dr. Gormley is an expert in the transmission of infections through wastewater [plumbing](#) systems in large buildings.

He has been investigating the cross-transmission of infections within buildings for nearly 20 years at Heriot-Watt University's Institute for Sustainable Building Design. The dedicated interdisciplinary research group includes engineer, Dr. David Kelly and microbiologist, Honorary Associate Professor at Heriot-Watt and Director of Solidsense Ltd, Dr. Thomas Aspray.

The team has examined whether pathogens can be transmitted between rooms on different stories through wastewater plumbing systems when there is no water in the U-bend, usually found beneath sinks, showers, baths and toilets.

Dr. Gormley explains: "U-bends act as a protective barrier between us and the sewer system. When they have no water then there is a greater risk of air, contaminated with pathogen-laden aerosols, entering a room. Water traps can lose their water for a number of reasons such as system over-use, which causes pressure surges and can compromise the integrity of the system.

"Our research has found that the problem is increased when the room has an extraction fan on an interior wall that helps pull contaminated air out of the plumbing system and into the interior of the [building](#). As a result, tiny virus-laden droplets could enter the room then fall onto a surface where we know viruses can live for up to several days afterwards."

Dr. Gormley says the need to suppress and mitigate against the spread of

COVID-19, and relieve the pressure on the NHS, means considering every possible transmission route. He acknowledges the most significant transmission route for the virus remains direct contact between people and strongly supports the advice being promoted by the World Health Organisation and government in relation to social distancing and handwashing.

While trap seal failures in plumbing systems are not unprecedented, they are not common in low rise or 'uncomplicated' buildings similar to the majority of homes across the UK. Dr. Gormley adds that facilities managers in larger buildings, such as hospitals, must take extra care to manage and maintain plumbing installations due to the interconnectedness of the whole wastewater system.

Fortunately, in many cases, the solution to a dry U-bend trap appears to be straightforward with residents and facilities managers advised to run their tap for between five and 10 seconds before wiping down all nearby surfaces.

Dr. Gormley recommends the following steps be taken to ensure that transmission through the wastewater plumbing system is minimised:

1. do not ignore unexplained foul smells in bathrooms, kitchens, or wash areas;
2. make sure that all water appliances in bathrooms and kitchens are fitted with a functioning U-bend;
3. to prevent the loss of the water trap seal within a U-bend, open a tap on all [water](#) appliances for up to 10 seconds at least twice a day (morning and evening) paying special attention to floor drains in bathrooms and wet rooms;
4. if the wastewater pipework from an appliance appears to be disconnected or open, seal it immediately (ie, use an elastic rubber glove to cover the end; a [plastic bag](#) and some tape will

- suffice, ensuring the bag has no holes);
5. if there appears to be any crack or leak in pipework, seal with tape or glue; and
 6. continuously monitor whole system performance (for large or tall buildings).

More information: Michael Gormley et al. COVID-19: mitigating transmission via wastewater plumbing systems, *The Lancet Global Health* (2020). [DOI: 10.1016/S2214-109X\(20\)30112-1](https://doi.org/10.1016/S2214-109X(20)30112-1)

Provided by Heriot-Watt University

Citation: U-bend offers layer of protection against COVID-19 (2020, April 2) retrieved 20 March 2024 from <https://medicalxpress.com/news/2020-04-u-bend-layer-covid-.html>

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