IWCINNOVATIONS

THE POWER OF **FLUSHING**

WHAT IS THE RISK?

Legionella bacteria can be dangerous for water systems because they can grow and spread in the water, especially in warm and stagnant conditions. If people inhale tiny water droplets containing *Legionella* bacteria, it can lead to a severe lung infection called Legionnaires' disease, which can be very harmful, especially for vulnerable individuals like the elderly or those with weakened immune systems.

HOW WELL DOES FLUSHING WATER OUTLETS AT A NORMAL FLOW RATE (LIKE DURING A SHOWER) REDUCE *LEGIONELLA* BACTERIA LEVELS COMPARED TO FLUSHING AT THE HIGHEST FLOW RATES?

- Research has shown that regular use of water was effective at reducing levels of *Legionella* bacteria
- Several immediate benefits of flushing include:
  - Evacuating free-floating bacteria
  - Disruption of biofilm formation activity by microorganisms
  - Replenish disinfectant levels (e.g. chlorine) from city/municipal water supplier

HOW OFTEN AND FOR HOW LONG SHOULD YOU FLUSH WATER SYSTEMS TO NOTICEABLY LOWER *LEGIONELLA* BACTERIA LEVELS IN BOTH COLD AND HOT WATER?

- Start by flushing cold water until water quality (temperature, appearance, disinfectant concentration) appears to match the main line
- Once achieved, run for an additional 5 minutes
- Next, flush hot water in the same outlet for an additional 5 minutes once temperature has stabilized
- Higher disinfectant concentrations can be achieved from regular water use and flushing activities, which challenge the growth conditions for bacteria, therefore minimal or no growth is often observed

WHAT WATER QUALITY MEASUREMENTS CAN PEOPLE WITHOUT TECHNICAL EXPERTISE COLLECT TO KNOW WHEN TO FLUSH WATER SYSTEMS?

- Temperature, Residual Disinfectant (e.g. Free Chlorine, Total Chlorine)
- Ideal timing for flushing to be determined by last known utilization of an outlet
- Testing for levels of *Legionella* bacteria

IS FLUSHING A COST-EFFECTIVE SOLUTION FOR LOWERING *LEGIONELLA* BACTERIA LEVELS?

- Research has shown that developing a water quality target-based flushing protocol (temperature, disinfectant concentration levels, bacterial levels, and outlet utilization) can promote the reductions in water and energy usage compared to fixed-duration protocols with arbitrary flushing times
- Cost considerations are the man hours needed for manual flushing activities

Waak, M., Meegoda, C., Hozalski, R.M., Halle, C. (2024). Demonstrating the Effectiveness of Flushing for Reducing the Levels of *Legionella* in Service Lines and Premise Plumbing. *Water Research Foundation*, Project No. 5033.