

Supplementary material

for

**Practitioners' Perspective on the Prevalent Water Quality
Management Practices for *Legionella* Control in Large
Buildings in the United States**

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Q-Q Plots for Facility Managers' Survey Data:

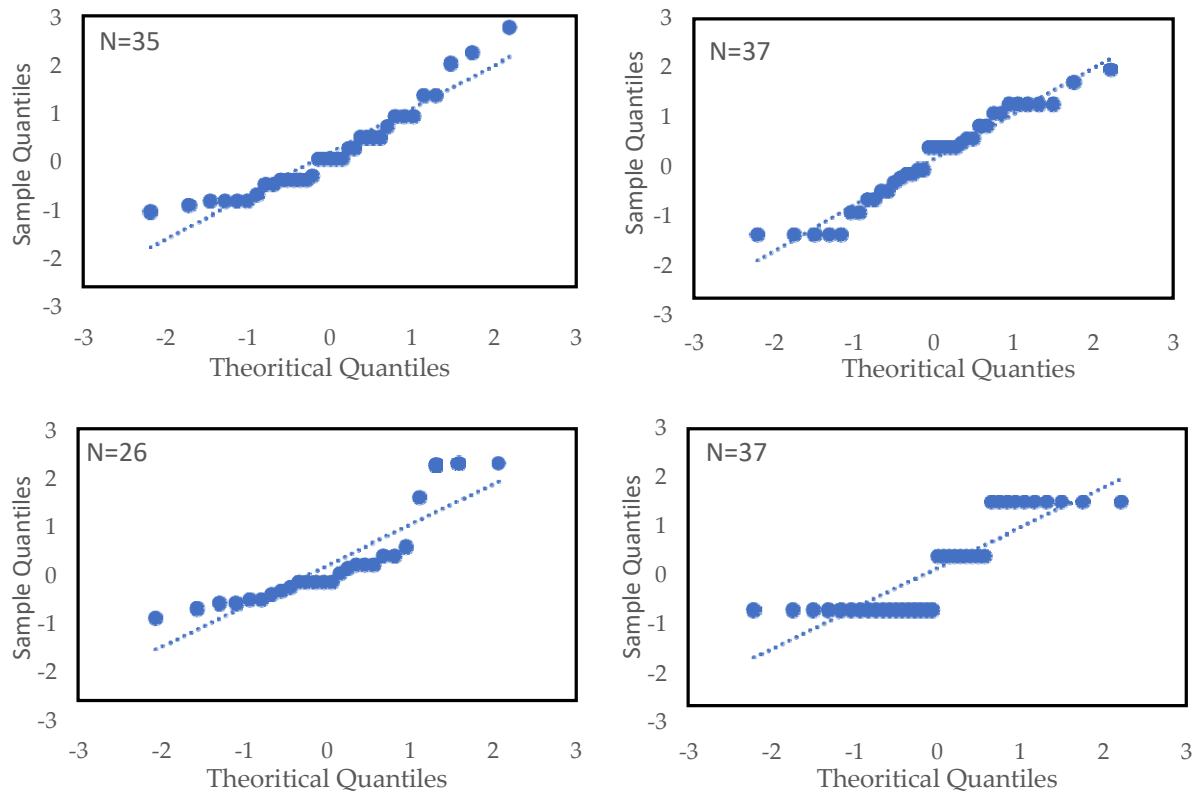


Figure S1: Q-Q plots for facility managers interview data collected for setpoint temperature (top left), point of use temperature (top right), recirculation temperature (bottom left), and time to tap (bottom right).

Structured Survey Protocol

Q1. What is your name? (optional)_____

Q2. What's the name of your organization? (optional)_____

Q3. Please tell about your background in managing building water quality.

- Design (1)
- Operations (2)
- Both (3)

Q4. How many years of experience in managing building water?_____

Q5. Please tell me about the water system for a building you manage

- Hospital (1)
- Residence primarily for those ≥ 65 years old (2)
- Hotel (3)
- High rise apartment (4)
- Assisted living (6)
- Nursing care (7)
- other (5) _____

Q6. Is it over 10 stories?

- yes (1)
- No (4)

Q7. What Kind of hot water system do you have?

- Gas (1)
- Electric (2)
- Steam (3)
- Other (4) _____

Q8. Is it centralized?

- Yes (1)
- No (2)

Q9. Does it have recirculation loop?

- Yes (1)
- No (4)

Q10. What hot water set point do you use at the heater?_____

Q11. What is the temperature of the water at the tap (faucets)?_____

Q12. What is hot water temperature at the end of the return/ re circulation loop? _____

Q13. For the re circulation loop, Do you monitor the temperature?

- Yes (1)
- No (2)

Skip To: Q15 If For the re circulation loop, Do you monitor the temperature? = No

Q14. If yes, Type of monitoring

- Manual Check (1)
- Automated (2)
- Automated with alarm if it drop below a given temperature (3)
- Other (4) _____

Q15. How long does it take for the water to get warm after a tap is opened? _____

Q16. Do you do any water treatment on water used in sinks and showers?

- Softening (1)
- Disinfectant addition (2)
- None (3)
- Other (4) _____

Q17. Do you monitor the domestic water system (supply for sinks and showers) ?

- Yes (1)
- No (2)

Skip To: Q21 If Do you monitor the domestic water system (supply for sinks and showers) ? = No

Q18. What monitoring of the domestic water system (supply for sinks and showers) do you undertake?

- Temperature at distal tap (1)
- Temperature of re circulation return loop (2)
- Temperature at water heater (3)
- Hardness (4)
- PH (5)
- Microbial (6)
- Residual disinfectant (7)
- others (8) _____

Skip To: Q19 If What monitoring of the domestic water system (supply for sinks and showers) do you undertake? = Temperature at distal tap

Q19. Are results archived?

- yes (1)
- No (4)

Q20. Is there a written water quality management plan?

- yes (1)
- no (2)

Q21. Does your system have any spot that might cause water quality problems or that you need to keep an eye on? For each box checked please describe any action you have taken to address this issue.

- Dead ends (1) _____
- cold water passing close to hot water pipe (2) _____
- seldom used areas/fixture (3) _____
- Thermostatic mixing valves (4) _____
- Greywater holding tank (5) _____
- Cooling towers (6) _____
- Centrally installed mister, atomizer, air washer, or humidifier, If yes, indicate which? (7) _____
- Decorative fountain (8) _____
- Other water feature (9) _____
- hot tubs (10) _____
- Electronic faucets (11) _____
- Showers with flexible hoses (12) _____
- Heat recovery system (13) _____
- solar water heaters (14) _____
- Manifold systems (15) _____
- End of re circulation loop (16) _____

Skip To: Q23 If Does your system have any spot that might cause water quality problems or that you need to keep a... = Dead ends

Skip To: Q23 If Does your system have any spot that might cause water quality problems or that you need to keep a... = Showers with flexible hoses

Q22. Do you periodically replace or disinfect shower heads?

- No (2)
- Replace, if yes please indicate, how often? (1) _____
- Clean and disinfect, if yes, please indicate how often (4) _____

Q23. You indicate that you have flexible shower hoses, do the hoses drain so they are empty between uses?

- yes (1)
- no (2)

Q24. What information sources do you use to help maintain building water quality?

- CDC (1)
- ASHRAE 188 (2)
- EPA (3)
- State guidance (4)
- City guidance (5)
- International plumbing code (6)
- Other (7) _____
- None (8)

Q25. Is there any information you would like to have to assist you in maintaining building water quality?

- Help identifying issues (1)
- Clear guidance on acceptable vs unacceptable practices (2)
- Water management/safety plan development (4)
- other (5) _____
- None (6)

Q26. Can you think of anyone else we might want to talk to who could help us understand building water quality management? If yes, Please provide contact information_____