

FLOOR HEATING, COLD WATER SYSTEM, AND RESULTING *LEGIONELLA* DISEASE RISKS FOR OLDER PERSONS

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In the Netherlands, 45% of older persons (65+) live in apartments. An increasing number of apartments is equipped with floor heating to achieve added thermal comfort. Since the incidence of Legionnaire's disease is 8 times higher among older adults (65+) as compared to the 15-45 yrs cohort, it is clear that we should take special care of *Legionella* abatement for the older cohorts [1]. Another trend in housing construction is the use of poly-ethylene (PEX) piping for potable water systems instead of copper ones. The threshold temperature for noxious *Legionella* growth on PEX is lower (20°C) as compared to copper surfaces (25°C) [2]. Since potable water piping runs through the same floors as the floor heating system, an additional risk for *Legionella* growth arises.

In this study we investigate if the renewed use of copper piping can significantly reduce the additional risk of floor heating in dwellings for older adults

METHODS

Two apartment buildings are studied, each with 8 apartments equipped with floor heating. One building contains copper piping, the other PEX ones. Both construction and building services adhere to the Dutch Building Code, including a distance of at least 15 cm between potable water and heating piping in the floor concrete. Temperature of the cold water system is measured during 7 successive days and in each apartment one water sample is taken and analysed for *Legionella pneumophila* (detection limit 23 CFU/100ml) [3]. Water use is assessed with a questionnaire. With the Kruskal Wallis test differences in *Legionella* concentrations are evaluated.

RESULTS AND DISCUSSION

In all apartments the temperature of the cold water system exceeded 20°C for more than 80% of the time, and 25°C for more than 40%, indicating micro environments suitable for *Legionella* growth. In both the copper system and the PEX system *Legionella* was present above the detection limit, but the concentration of *Legionella* on PEX was significant higher. The use of copper piping reduces the risks for Pontiac fever and Legionnaire's disease by 30%.

CONCLUSION

Copper piping will decrease the additional risk of floor heating for the development of *Legionella* related disease, and should be advocated in dwellings inhabited by older persons.

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[2] Rogers R, Dowsett A, Dennis P, Lee J, Keevil C. *Applied and Environmental Microbiology* 1994;60(5):1585-1592

[3] Wellinghausen N, Frost C, Marre R, *Applied and Environmental Microbiology*, 2001;67(9):3985-3993