

Legionnaires' Disease in Domestic Hot Water Systems



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This short paper reviews research from the USA that links *Legionella* bacteria and Legionnaires' disease directly to domestic hot water systems, including home central heating systems, suggesting that such systems may be responsible for up to 20% of cases.

New research from the US has identified home hot water pipes and domestic hot water systems as a common source of Legionnaires' disease. Although more often associated with the air conditioning systems fitted to hospitals and large office buildings, Janet Stout, a microbiologist at the Veterans Administration Medical Center in Pittsburgh said "The evidence suggests that the residential water system is an under appreciated source of Legionnaires' disease".

Legionnaires' disease is a type of pneumonia and is named after an outbreak of severe pneumonia, which affected a meeting of the American Legion in 1976.

Domestic hot water systems

The germ, which causes Legionnaires' disease, is a bacterium called *Legionella pneumophila*. People catch Legionnaires' disease by inhaling small droplets of water suspended in the air, which contain the *Legionella* bacterium.

This latest research, combined with earlier studies, now suggests the responsible bacteria often grow in the biological slime lining residential hot water pipes and domestic central heating systems, and that home water may be responsible for up to 20% of cases.

Stout estimates that between 2% and 5% of the 600,000 pneumonia cases requiring hospitalisation in the United States each year are caused by the *Legionella pneumophila* bacteria. Correct diagnosis is often missed because identification requires both a bacterial culture and a special urine test.

Stout's team investigated the sources of Legionnaires' disease infections reported to health departments in Pennsylvania and Ohio. The families of 21 victims agreed to allow testing of

their home water, and *Legionella pneumophila* bacteria was found in 24% of those tested. Two of the patients studied died of their infections.

The bacterium, which causes Legionnaires' disease, is widespread in nature, flourishing at temperatures of between 90 and 105 °F. It mainly lives in water, for example ponds, where it does not usually cause problems.

Legionella bacteria

Outbreaks normally occur from purpose-built water systems where temperatures are warm enough to encourage growth of the bacteria, e.g. in cooling towers, evaporative condensers, showers, whirlpool spas and from water used for domestic purposes.

Water temperature

People often keep the temperature in their hot water tanks set low to prevent scalding, but to kill the Legionnaires bacteria, Stout recommends temporarily turning up the temperature to above 140 °F and running the hot water outlets for half an hour. Since the bacteria quickly return, this should be done regularly, especially if people prone to the infection are using the water. If the temperature is kept high, the bacteria return much more slowly or not at all. "The overall perception we have that drinking water in the home is free of bacteria is a misconception," said Stout. "Although Legionnaires' is a naturally occurring organism in water, people should be aware this is a potential source of disease."

Symptoms of Legionnaires' disease

The symptoms of Legionnaires' disease are similar to the symptoms of the flu:

- high temperature, feverishness and chills;
- cough;
- muscle pains;
- headache; and leading on to
- pneumonia, very occasionally
- diarrhoea and signs of mental confusion

The illness is treated with an antibiotic called erythromycin or a similar antibiotic, although medical advice should be sought immediately.