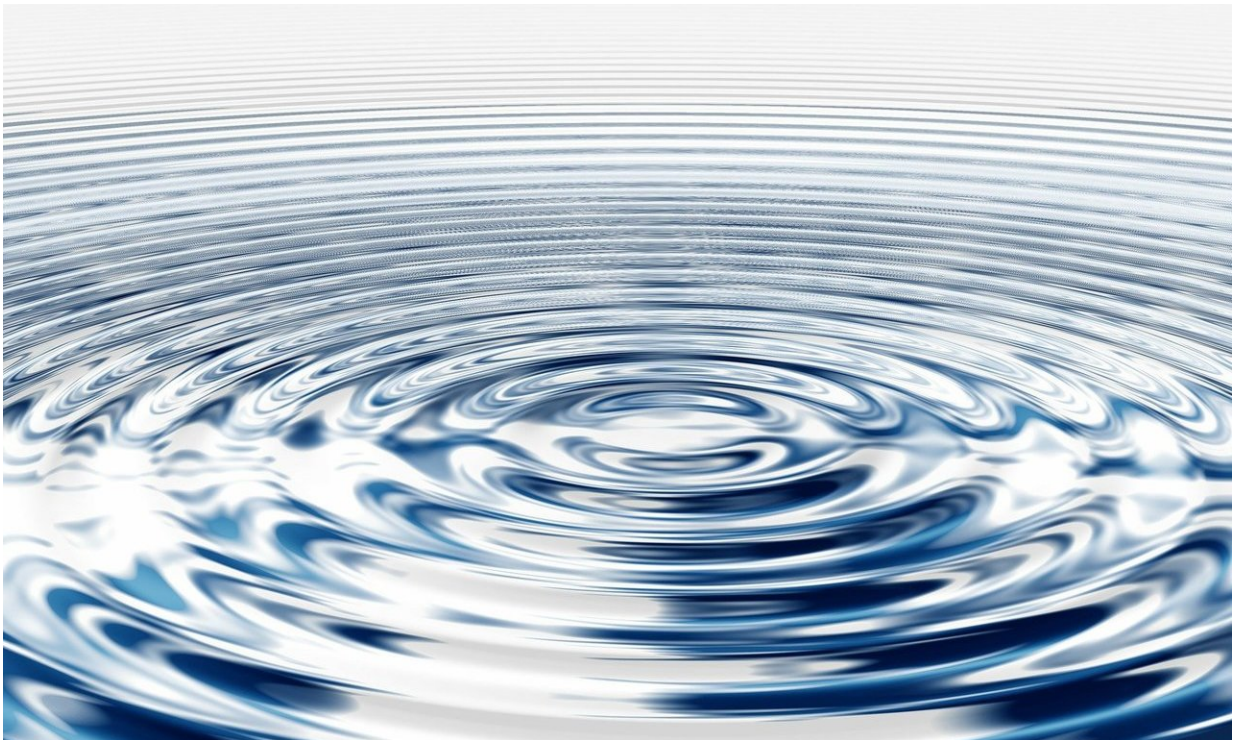


# Outbreak of typhoid on Dutch ship traced to contaminated drinking water

April 1 2023

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A large outbreak of typhoid on a ship in the Netherlands has been traced to contaminated water, this year's European Congress of Clinical Microbiology & Infectious Diseases ([ECCMID 2023](#), Copenhagen, April 15-18) will hear.

Seventy-two cases of typhoid were confirmed in the spring 2022 outbreak on the Liberty Ann, an old cruise ship which was being used as emergency accommodation in Haarlem for [asylum seekers](#).

An extensive investigation by the Municipal Health Service Kennemerland and the Regional Public Health Laboratory Kennemerland and others has traced the source of the outbreak to the water tanks on the ship.

One of those leading the investigation, Dr. Anne de Vries, of the Municipal Health Service Kennemerland, Haarlem, the Netherlands, says, "The freshwater and wastewater tanks shared a common wall which was severely corroded, with small holes. This allowed sewage containing Salmonella typhi (S. typhi), the bacterium which causes [typhoid fever](#), to leak into the [fresh water](#) which was then used as drinking water and to prepare food."

Typhoid, which is spread by food and water contaminated with S. typhi, is highly contagious. When treated promptly with antibiotics, the infection is usually mild but without treatment, it can be fatal. Symptoms include a high temperature, headache, stomach pain and constipation or diarrhea.

On April 6, 2022, the municipal health service in Kennemerland was notified about an ongoing outbreak of fever and abdominal complaints on the Liberty Ann.

Typhoid fever was quickly diagnosed and [control measures](#) were put in place to prevent further spread. Bottled water was provided, food preparation on the ship halted and all the asylum seekers were moved to other accommodation.

349 people had potentially been exposed to the bacterium and 72 cases

of typhoid were confirmed by culture among asylum seekers (50/72) and staff (20/72) between April 7 and May 24.

All cases were in adults. All of the asylum seekers, and most of the staff members, were male. All cases were in people who had been on the ship.

Twenty-five individuals were hospitalized and all recovered after treatment.

The Municipal Health Service visited the ship six times to carry out microbiological investigations and technical inspections. To identify the source of the outbreak and mode of transmission, all asylum seekers and staff members were asked to complete a questionnaire about their consumption of tap water and meals on the ship. They were also asked to provide fecal and [blood samples](#).

Frequent consumption of food and tap water on the ship was associated with developing typhoid.

Tests on *S. typhi* cultured from the cases' blood or feces showed all samples to be genetically identical—pointing to a common source of infection.

*S. typhi* was detected in the wastewater tank and *Salmonella* in the freshwater tanks, which shared a severely corroded common wall.

The study's authors conclude, "A large outbreak of typhoid fever in the Netherlands was caused by sewage water containing *S. typhi* leaking into a freshwater tank."

"Strict supervision of water quality is key to the health and safety of those on board ships. Water tanks and associated equipment must be

properly maintained and subject to regular inspections."

Provided by European Society of Clinical Microbiology and Infectious Diseases

Citation: Outbreak of typhoid on Dutch ship traced to contaminated drinking water (2023, April 1) retrieved 4 July 2023 from <https://medicalxpress.com/news/2023-03-outbreak-typhoid-dutch-ship-contaminated.html>

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