

Does the sea pose a risk to our health?

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A new study has discovered viruses in almost 40 % of more than 1,400 bathing water samples collected from coastal and inland areas in 9 European countries. The findings, presented in the journal *Water Research*, suggest that the presence of infectious adenoviruses and noroviruses in water samples 'could pose a risk to health.'

While the concentrations are low, the researchers say monitoring of the [microorganisms](#) is needed, particularly at times when their numbers grow such as after a period of heavy [rainfall](#). Contrary to the maximum levels for [bacteria](#) - for instance intestinal [enterococcus](#) and *E. coli* - established by the European Bathing Water Directive, there is no particular limit for viruses. The regulation only recommends that scientific investigations be performed to determine reference parameters and reliable detection methods.

The VIROBATHE project, which brought together 16 research organisations from Germany, Spain, France, Italy, Cyprus, Poland, Portugal, the Netherlands and the United Kingdom, evaluated the presence of adenoviruses (viruses with deoxyribonucleic acid (DNA)) and noroviruses (which have ribonucleic acid (RNA) and cause gastroenteritis) in 1,410 samples of swimming

water, both freshwater and [seawater](#). For instance, VIROBATHE partners from the University of Barcelona (UB) investigated the beaches at Gavà.

The VIROBATHE team observed that 553 samples contained viruses, representing 39.2 % of the total. Adenoviruses were found in 36.4 % of the samples, against 9.4 % for noroviruses. It should be noted that more were found in freshwater than saltwater.

The researchers also found that around 25 % of microorganisms in a small number of samples had infectious capacity. Experts say adenoviruses are associated with gastroenteritis in children, as are ear infections, conjunctivitis and respiratory infections. They point out, however, that because a large number of people have already been in contact with them, they have built resistance to infection by most of the strains.

"In general, adenoviruses do not necessarily pose a significant risk to the population (if they are common strains that have already infected most people in childhood and if they remain at low levels)," explains co-author Rosina Girones, Director of the UB's Laboratory of Water and Food Viral Pollution.

The team says it takes longer for viruses to return to acceptable levels following heavy rains compared to bacteria. Several virus communities have the capacity to survive waste water treatment processes more than what bacteria can, and they are more resistant to seawater.

Commenting on the findings of the study, Dr. Girones says: "It shows that we already have a reliable technique that can be easily standardized (quantitative PCR) for detecting and quantifying viruses in bathing waters, which makes it possible to estimate the faecal contamination and quality of water. Aside from this there is no clear correlation between the levels of bacterial indicators cited in the regulation and the presence of the viruses studied."

The results also give weight to the theory of using measurements of human adenoviruses that are excreted all year long in every geographical area. They are founded in 100 % of waste [water samples](#) , as an indicator of viral [water](#) contamination.

More information: Wyn-Jones, A.P., et al. (2011) Surveillance of adenoviruses and noroviruses in European recreational waters. *Water Research* 45: 1025. [DOI: 10.1016/j.watres.2010.10.015](https://doi.org/10.1016/j.watres.2010.10.015)

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