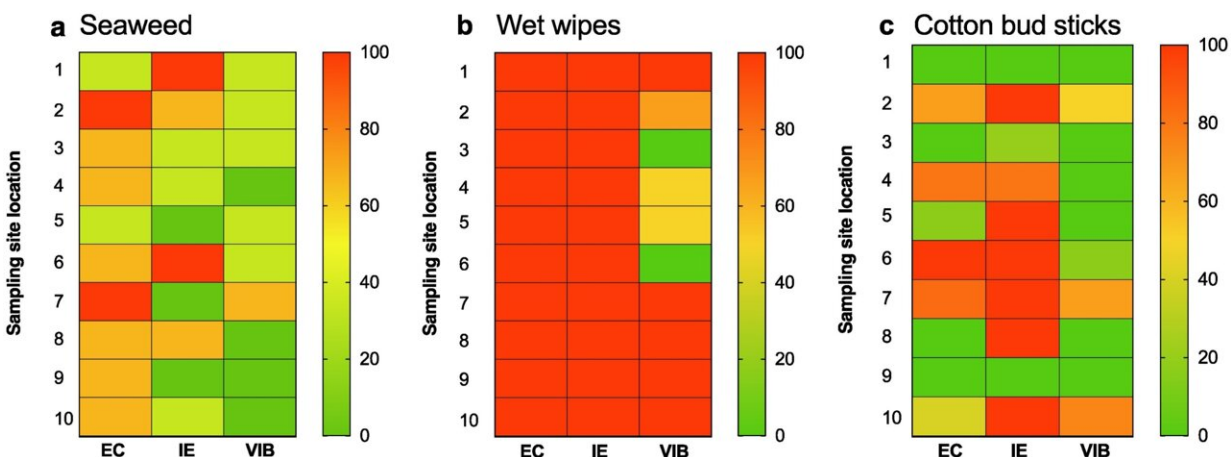


# Harmful bacteria survive on wet wipes washed up on beaches, study finds

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FIOs and *Vibrio* spp. recovered from seaweed, wet wipes and cotton bud sticks in the Forth estuary. Using selective media, FIO and *Vibrio* spp. were identified on (a) seaweed, (b) wet wipes and (c) cotton bud sticks from the ten sampled sites along the Firth of Forth. The color scale indicates the percentage of material that was colonized by each species. Credit: *Marine Pollution Bulletin* (2022). DOI: 10.1016/j.marpolbul.2022.113766

Harmful bacteria on sewage-associated plastic waste washed up on beaches can survive long enough to pose a risk to human health, new research has found.

The team at the University of Stirling found "concentrated reservoirs" of fecal bacteria still present on waste such as wet wipes and cotton bud

sticks on beaches in Scotland.

Led by Professor Richard Quilliam, the team found that bacteria such as *E. coli* and intestinal enterococci (IE) were binding to these plastics more often than to naturally occurring materials such as seaweed and sand, thereby prolonging their persistence in the water and at the beach.

"We all know that [sewage](#) waste on our beaches is unsightly, but it could also be a risk to [public health](#)," said Professor Quilliam.

There has been much coverage recently of sewage waste being directly discharged into rivers and the sea, especially after heavy rain when some [sewage treatment plants](#) exceed their capacity for effective treatment.

## **Bags of plastic waste collected**

"Some of the plastic waste we have recovered could be from legacy sewage spills that have persisted in the environment, but the volume of waste we are seeing is shocking," said Professor Quilliam.

His team collected plastic waste from ten beaches along the Firth of Forth estuary in Scotland, including bathing water beaches such as Aberdour Silver Sands and Portobello. "We expected to collect a few wet wipes everywhere, but the team came back with bags of them," he said.

Ph.D. researcher Rebecca Metcalf, also from the University of Stirling, is lead author of a new paper reporting the study. She said: "Finding fecal bacteria could also indicate the possibility of other human pathogens such as norovirus, rotavirus, or salmonella.

"The extent to which people could be exposed to these pathogens is beyond the scope of our study, but obviously there's always a risk of

children picking up and playing with wet wipes or other plastic waste on the beach."

## Antimicrobial resistance

The team also found evidence that species of vibrio—a naturally occurring bacteria, some strains of which can cause a severe upset stomach—were able to colonize wet wipes. And they found high rates of antimicrobial resistance—resistance to antibiotics—present in the bacteria on the wipes and cotton bud sticks.

The research is part of the "Plastic Vectors" project, which is investigating how plastics in the environment can help transport bacteria and viruses, and the impact that may have on [human health](#).

The paper, "Sewage-associated [plastic waste](#) washed up on beaches can act as a reservoir for fecal bacteria, potential human pathogens, and genes for [antimicrobial resistance](#)," is published in the journal *Marine Pollution Bulletin*.

**More information:** Rebecca Metcalf et al, Sewage-associated plastic waste washed up on beaches can act as a reservoir for faecal bacteria, potential human pathogens, and genes for antimicrobial resistance, *Marine Pollution Bulletin* (2022). [DOI: 10.1016/j.marpolbul.2022.113766](#)

Provided by University of Stirling

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