

The jury is still out on whether antibacterial chemical impacts microbiome or causes resistance

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Credit: Lynn Greyling/public domain

(Medical Xpress)—Alyson Yee and Jack Gilbert with the University of Chicago have published a Perspective piece in the journal *Science* where they offer a look at the evidence for and against possible problems with people using hand creams, soaps, toothpaste and other products that contain the commonly used chemical triclosan, an antibacterial agent.

Products that contain [antibacterial agents](#) have become very popular in the U.S. and other countries—using them supposedly kills germs that may reside on various parts of the body, preventing infections. How effective they are is still up for debate however, as are questions about whether they impact the human microbiome or lead bacteria to become more resistant to chemicals meant to kill them.

In their article Yee and Gilbert cite several studies that have been conducted as part of an effort to

settle this debate—they note, for example, one study showed that volunteers who quickly washed their hands using a soap with triclosan experienced little difference between it and regular soap in killing surface bacteria. They note that another team studying the impact of the [chemical](#) on zebrafish found it caused changes in their social behavior when exposed to it for a week. And most seriously, they highlight a study of exposure to fathead minnows where a research team found evidence of major changes to the microbiome.

The research pair also cite a more serious study on humans—volunteers were asked to use several [products](#) containing the [antibacterial](#) agent for four months and then to use others that did not contain the chemical for four months. A second group was asked to do the reverse. The researchers reported higher concentrations of triclosan in the urine of all the volunteers when they were using the antibacterial products. They also reported that there were no signs of changes to the microbiome.

Yee and Gilbert suggest the results between the studies differed because of environmental factors—the fish ingested the chemical while human volunteers did not. But they also note that to date, no studies have been done to investigate the possible impact of the chemical on newborn babies who likely are more susceptible to microbiome changes due to environmental factors and who are born into environments where the chemical is used very heavily.

More information: Is triclosan harming your microbiome? *Science* 22 Jul 2016: Vol. 353, Issue 6297, pp. 348-349. science.sciencemag.org/cgi/doi/10.1126/science.aag2698

Summary

Antibacterial soaps were originally used only in

hospitals, but since the 1990s, their use has expanded into households. Antimicrobial chemicals are now found in many soaps, wipes, hand gels, cutting boards, detergents, cosmetics, and toothpastes, as well as toys and plastics. One of the most common antibacterials, triclosan [5-chloro-2-(2,4-dichlorophenoxy)phenol], is found in 75% of antibacterial soaps (1). In 2008, it was detected in 75% of urine samples in the United States (2). There are concerns that triclosan use contributes to the development of antibiotic resistance and may adversely affect human health. Partial bans exist in the European Union and the U.S. state of Minnesota (3, 4). However, recent studies exploring triclosan's effect on the microbiome have given conflicting results.

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