Do some anti-microbial soaps do more harm than good?

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If co-workers and family members are coming down with infections this winter, you may be tempted to turn to an anti-bacterial soap for protection.

But some scientists are increasingly concerned that a common anti-bacterial ingredient called triclosan may harm people's health. Laboratory studies have found that it may disrupt hormones, interfere with muscle function and promote the growth of stronger bacteria - and other research suggests it is building up in the environment to the possible peril of wildlife.

What's more, there is no evidence that hand-washing with soap containing triclosan or other anti-microbial ingredients offers any health advantages over regular soap and water, according to advisory committees for the American Medical Association and the U.S. Food and Drug Administration.

"Triclosan is what we call a stupid use of a chemical," said Dr. Sarah Janssen, a physician and senior scientist with the Natural Resources Defense Council, an environmental advocacy group. "It doesn't work, it's not safe and it is not being regulated."

The nation's main trade association for soap manufacturers, the American Cleaning Institute, says triclosan is effective against certain infectious bacteria and the health concerns are overblown.

Yet the FDA, which oversees the use of chemicals in food and drugs, has never completed a safety review and issued binding usage rules for triclosan. For nearly 40 years, manufacturers have been free to make and market products using the chemical even as evidence of potential health and environmental problems mounted.

Spurred by research results as well as lawsuits and petitions, the FDA in 2010 agreed to take another look at triclosan. The U.S. Environmental Protection Agency, which regulates the chemical's use as a preservative and pesticide, also moved up a comprehensive re-evaluation to 2013, a decade ahead of schedule.

The FDA promised to publish a review based on recent science by spring 2011. After missing that deadline, the agency set winter 2012 as the next target. The agency now says it does not have a new target date, frustrating health and safety advocates.

"We want to get it right before we put something out there, and we haven't been able to do that yet," said Doug Throckmorton, who is coordinating the review for the FDA.

Originally created for use in health care settings, triclosan (and triclocarban, used in solid soaps) has been added to dozens of consumer products, including body wash, toothpaste, deodorant, toys, clothing and yoga mats. Currently the only triclosan benefit recognized by the FDA is its ability to prevent gingivitis when added to toothpastes.

Allison Aiello, an associate professor of epidemiology at the University of Michigan, conducted a review of available scientific literature and concluded in a 2007 report that soaps containing triclosan "were no more effective than plain soap at preventing infectious illness symptoms and reducing bacterial levels on the hands."

Hand-washing, she notes, works largely by dislodging and rinsing away bacteria and viruses on the skin rather than killing them.

Soap industry spokesman Brian Sansoni, however, cites other research indicating that triclosan-treated soaps "are safe and effective, and they do what they say they do."

"They kill germs that make us sick," he said. "It has been one of the most researched and reviewed ingredients in consumer and health care products over the past 40 years."

For example, one review published in 2011 found that anti-microbial soap had a small advantage over regular soap in terms of microbes left on the skin. The benefit was strongest when hands carried higher bacterial loads.

The author, Rutgers University food science professor Donald Schaffner, said examples would include instances when a person's hands were contaminated with "vomit or feces or they had been handling ground beef or raw chicken."

Schaffner acknowledged that the American Cleaning Institute both funded and helped shape the scope of the research but said he stood behind the findings.

Aiello questioned whether the benefits found in that study were relevant to everyday hand-washing and said other research promoted by the soap industry lacked rigor and relied on small sample sizes.

Whether or not triclosan makes hand-washing more effective, Aiello and other scientists fear that frequent use will cause bacteria to develop an increased tolerance to the chemical, decreasing its effectiveness in settings where it is truly needed, such as in hospitals.

Though laboratory studies have demonstrated that exposure to triclosan can allow more tolerant bacteria to multiply, it remains unclear whether everyday use would increase bacterial resistance.

Meanwhile, concerns over other potential health effects continue to grow, fueled in part by the discovery that traces of triclosan and its byproducts are present in human urine, plasma and breast milk.

Federal health research conducted a decade ago concluded that triclosan was in the urine of 75 percent of Americans, with the highest levels occurring in people in their 20s and those with the highest household incomes. The most recent analyses, from 2009-2010, found a slight rise in urinary concentrations and consistent rates of detection.

Research also has indicated that triclosan can disrupt hormones in the body, including a series of studies by EPA scientists over the last six years showing that the chemical can induce hormonal changes in rats.

The concentrations that triggered those changes were much higher than levels reported in humans. But last year, University of California at Davis researchers published a paper in the Proceedings of the National Academy of Sciences that found impaired muscle function in mice whose triclosan blood levels were similar to those seen in some human studies.

"We found it to be quite potent at disrupting the process that leads to cardiac and skeletal muscle contraction and relaxation," said Isaac Pessah, a professor of neurotoxicology. "These findings provide strong evidence that the chemical is of concern to both human and environmental health."

These studies and others recently prompted some health care providers to abandon triclosan, including the entire Kaiser Permanente hospital

group.

"Where there is credible evidence for us to think there is a problem with a chemical or product, we consider it our obligation to identify a safer alternative," said Kathy Gerwig, environmental stewardship officer at Kaiser Permanente, which phased out triclosan soaps by 2010.

Some manufacturers also have made changes. Last year, triclosan was among the chemicals Johnson & Johnson said it would remove from its products by 2015. GlaxoSmithKline in 2009 removed triclosan from toothpastes including Aquafresh and Sensodyne. And in 2011, Colgate/Palmolive - which still uses triclosan in its Colgate Total toothpaste - removed triclosan from Ultra Palmolive Antibacterial Dish Liquid, replacing it with lactic acid.

"There has undeniably been a backlash about triclosan in household soaps, but it seems limited to a certain segment of the population (typically, the better informed consumer)," wrote industry analyst Mike Richardson of the Freedonia Group, a business research firm. "I don't know that they're right about triclosan, but they at least know that other people are worried about it."

As the EPA begins its review, expected to take six years, worry is increasing among environmental groups and scientists about triclosan residues in sewage sludge, waterways, aquatic animals and earthworms.

Last month, University of Minnesota scientists reported in Environmental Science and Technology that levels of triclosan and its byproducts are rising in Minnesota lakes where wastewater is dumped, a trend the scientists link directly to use of the chemical in consumer products.

The American Cleaning Institute took issue with the study, saying

researchers found "vanishingly low levels of the chemical in the environment" and there "are no negative impacts associated with those trace compounds."

The study's lead author calls that argument "disingenuous."

"Even when things are in small concentrations in the environment, you have biological processes that can concentrate them in organisms," said William Arnold, a professor of civil engineering at the University of Minnesota.

Last spring a Canadian government report concluded that triclosan "in significant amounts" can harm the environment, a development that U.S. Rep. Edward J. Markey, D-Mass., said "underscores the urgency for the FDA to release its nearly four-decades-overdue final rule on this dangerous chemical. ... It poses a public health concern and continues to pollute our bodies."

Markey has urged the government to ban triclosan from materials that come into contact with food products and those intended for children's use.

The chemical's leading U.S. manufacturer, BASF-owned Ciba, stresses that it is "dedicated to the responsible management of the health, safety and environmental aspects of triclosan and all of our products throughout their life cycles."

The company did not answer follow-up questions about studies on hormone disruption and other potential harm except to say that "we do not have the full details or methods and do not know if our products were involved."

Janssen of the resources defense council, which is suing the FDA over

its delays on triclosan, said the anti-microbial chemical is not the only ingredient of concern that the agency has allowed on the market for decades before determining its safety and issuing rules for use.

Citing bisphenol A and compounds in sunscreen as other examples, Janssen said the long delays "benefit the industry FDA is supposed to be regulating rather than the consumers it is mandated to protect."

The "billion-dollar anti-bacterial soap industry has a lot to gain from FDA's delays," said defense council attorney Mae Wu, while "the public has "been turned into their guinea pigs."

Is triclosan in my products?

Although some companies have phased triclosan out of certain products, many still use them. The list is always changing, so if you are concerned:

Look for triclosan (or triclocarban) on the ingredient list of soaps, cosmetics, lotions, acne medicines, toothpastes, deodorants and other personal-care products.

Be aware that plastic- and fabric-based products marketed with the label Microban or Biofresh may be made with triclosan.

Keep in mind that most alcohol-based hand sanitzers do not contain triclosan and come highly recommended by health care professionals.