Medical Xpress

Scientists call for immediate halt to consumer use of two widespread antimicrobial chemicals

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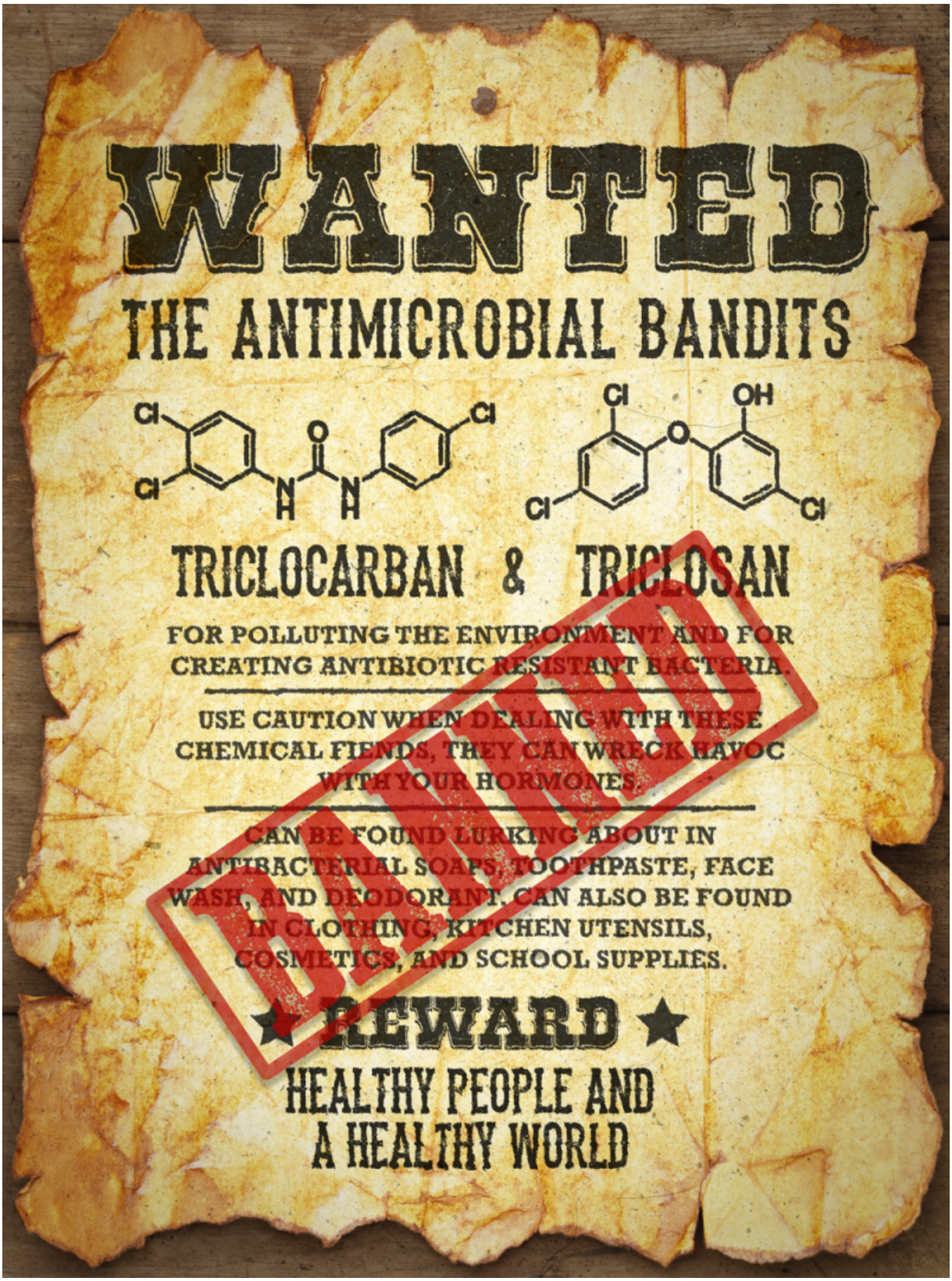
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THE ANTIMICROBIAL BANDITS
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TRICLOCARBAN & TRICLOSAN
FOR POLLUTING THE ENVIRONMENT AND FOR CREATING ANTIBIOTIC RESISTANT BACTERIA.
USE CAUTION WHEN DEALING WITH THESE CHEMICAL FIENDS, THEY CAN WRECK HAVOC WITH YOUR HORMONES.
CAN BE FOUND LURKING ABOUT IN ANTIBACTERIAL SOAPS, TOOTHPASTE, FACE WASH, AND DEODORANT. CAN ALSO BE FOUND IN CLOTHING, KITCHEN UTENSILS, COSMETICS, AND SCHOOL SUPPLIES.
BANNED
REWARD
HEALTHY PEOPLE AND A HEALTHY WORLD

Two chemicals known as triclosan and triclocarban are used in a welter of consumer products, particularly antimicrobial soaps, personal-care products and other items of daily use. But extensive research has shown that these chemicals are often ineffective in safeguarding the public from harmful microbes and, further, pose significant risks to human health and the environment. Now, more than 200 scientists have joined together top call for a halt in the use of these products. Credit: Jason Drees/Biodesign Institute

A pair of chemicals—prized for their antimicrobial properties—rose to become superstars in industry. Triclocarban is used in various soaps, while triclosan additionally appears in thousands of items of daily use in the United States and around the world, including pencils, clothing, toiletries, toys and yoga mats.

But a growing chorus of researchers has raised serious questions regarding both the efficacy and safety of these products. These voices have now culminated in the Florence Statement on Triclosan and Triclocarban, a declaration signed by more than 200 scientists and medical professionals from around the world. Their claim, supported by extensive peer-reviewed research, is that these chemicals are ineffective in safeguarding the health of consumers and in fact may pose grave risks to human health and the environment.

The full text of the Florence Statement appears in the current issue of the U.S. National Institute of Environmental Health Sciences' flagship journal, *Environmental Health Perspectives*.

Rolf Halden, director of the Biodesign Center for Environmental Security at Arizona State University and lead author of the Florence Statement, lays out a convincing case against these two ubiquitous antimicrobials:

"Triclosan is a case study of the many things that can go wrong when formulating consumer products. To start out with, it's a chemical that contains dioxin—a potent toxic carcinogen," he said. "When you use the chemical, it is mostly ineffective in protecting from germs and instead actually may increase microbial risks by producing bacteria that are cross-resistant to antibiotics your doctor prescribes to save lives. It increases susceptibility to allergies. When released into water or soil, it persists for long periods of time and forms additional dioxins. When it is burned, it produces the most toxic forms of dioxin known."

Triclocarban, a structurally related antimicrobial chemical, while free of dioxins, also contains and can be transformed to other potent cancer-causing chemicals, namely chloroanilines.

Further, research has convincingly shown that hand washing, as practiced by the average consumer, with products containing triclosan and triclocarban provides no additional health benefit beyond the use of simple soap and water, though these chemicals are implicated in a multitude of ill effects to health, including endocrine disruption. Research has demonstrated developmental impairment in animal studies, and the effects of these products on human reproduction and development are matters of serious concern.

As the Florence Statement notes, the U.S. Food and Drug Administration (FDA) recently responded to mounting apprehension over certain pervasive chemicals, issuing a September 2016 ban on 19 additives found in over-the-counter consumer antiseptic wash products, including triclosan and triclocarban. Unfortunately, as the Florence authors note, the restriction does not include a welter of building and household products that are outside the purview of the FDA but still contain hazardous and ineffective antimicrobials sold throughout the U.S. and worldwide.

Triclosan in particular remains widespread, finding its way into a broad range of personal-care and consumer products.

"It's an air pollutant, a water pollutant, a soil pollutant. It accumulates in the environment and is detectable in the breast milk of over 97 percent of U.S. women. It's detectable in babies at birth," Halden said.

Blood-borne triclosan and triclocarban readily cross the placenta, with triclosan showing up in samples of human cord blood.

It has also been detected in the urine of a majority of humans tested.

"Common sense dictates that we must abandon this failed chemistry and avoid unnecessary antimicrobials or turn to safer, greener alternatives where needed," said Halden, who is also a professor in the Ira A. Fulton Schools of Engineering.

But getting rid of persistent and hazardous chemicals is vastly more difficult than introducing them in the first place. Regulatory mechanisms often fail to properly examine the safety of newly introduced chemicals, from their point of production to the end of their use life. Discontinuing the use of these harmful chemicals often faces daunting obstacles, from aggressive industry lobbying to a lack of funding to carry out definitive scientific safety analyses.

Once such products have taken hold in society, their chemical legacy can persist in the environment for decades, even after they are formally discontinued. A case in point are remnants of triclosan and triclocarban that were used in New York and other coastal cities some 50 years ago and that persist to this day in coastal sediments of the East Coast, as revealed by Halden's research team.

Even when exceptional steps are taken to rid the market of hazardous

chemicals, the problem often quickly resurfaces, as Arlene Blum, executive director of Green Science Policy Institute, explained: "I was happy that the FDA finally acted to remove these chemicals from soaps. But I was dismayed to discover at my local drugstore that most products now contain substitutes that may be worse."

While the human-health effects of triclosan and triclocarban are just beginning to be appreciated, their adverse impact on the environment—particularly aquatic plants and animals—is well established. Triclosan typically appears in personal-care products that flow down the drain after use. They can accumulate in the environment due to the particular chemistry of triclosan, which is highly resistant to natural degradation.

When these antimicrobials are broken down, the results are often worse, as profoundly toxic byproducts including dioxins, chloroform and chlorinated anilines result. And the name "antimicrobial" is misleading because the chemicals harm seabirds, fish and marine mammals and are actually more toxic to algae and aquatic life than to the microorganisms they are supposed to wipe out.

The Florence Statement lays the groundwork for a broad rethinking of the effects of chemicals on human health and the environment, while also drawing attention to the shortcomings of current regulatory efforts. Triclosan and triclocarban provide a cautionary tale: In the future, chemicals produced and used in such massive abundance must be subject to far more stringent scientific scrutiny, if humans are to avoid falling victim to their own creations.

More information: For more information, see www.fda.gov/AnimalVeterinary/S … UseofAntimicrobials/

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Provided by Arizona State University

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