

“Antimicrobial” Face Mask Unnecessarily Toxic

**Tennessee Black Caucus,
citing disproportionate
harm, calls for free masks
to be recalled after it’s
discovered to be treated
with a toxic material**

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While wearing a mask is an important practice to help reduce the spread of Covid-19 infection,* a mask produced with pesticide-laden material for Tennessee residents and others, sold throughout the U.S, has been identified as possibly elevating the virus’s health risks and/or introducing toxic chemical exposures. The state of Tennessee began at the end of May providing residents with free face masks made from sock fabric incorporated with antimicrobial silver pesticide and then stopped after an investigative report by NewsChannel 5 in Nashville. After EPA issued a statement that misled the public on the completeness of its review, the state continued with its distribution of the free masks.



The investigative unit of NewsChannel 5 Nashville discovered that the masks contain a toxic antimicrobial pesticide. Because of the U.S. Environmental Protection Agency’s (EPA) interpretation of federal pesticide law, textiles and other materials infused with toxic antimicrobial substances are not evaluated by the agency for the wide range of exposure patterns associated with the use of these toxic products. In addition, the silver product in the sock material, Silvadur 930 Flex, states on its label that over 99% of product ingredients are “other ingredients,” providing no disclosure of what they are or their potential hazards.

Beyond Pesticides’ board member Warren Porter, PhD, environmental toxicology professor at University of Wisconsin at Madison, in an interview with NewsChannel 5, assessed the situation bluntly. Dr. Porter told reporters over a Zoom interview, “I wouldn’t wear one,” after explaining the potential impacts on the respiratory system.

TENNESSEE BLACK CAUCUS RAISES ALARM, PEOPLE OF COLOR DISPROPORTIONATELY AFFECTED

Following news reports, support from Beyond Pesticides, and at the urging of the Tennessee Black Caucus of State Legislators, Governor Bill Lee (R) recalled the chemically treated masks. “We know that many people in some of our more disadvantaged communities took advantage of the giveaway and now we need to protect them from the protection they believed we were providing for them,” Representative G.A. Hardaway (D-Memphis) told Channel 5. “We are concerned that many of those people may have health issues that may have become aggravated by the masks.”

FABRIC TREATED WITH A PESTICIDE

The masks, dubbed “sock masks” because the state contracted with a sock production company to fabricate them, are impregnated with the pesticide product Silvadur 930 Flex Antimicrobial. Containing silver as an active ingredient, Silvadur (manufactured by DowDupont) and other similar products are registered for use in consumer goods like carpet, footwear, wall and floor coverings, and other industrial and household fabrics. When incorporated into consumer products, including clothing, its use is intended to inhibit the growth of microbes that may cause “deterioration of the treated product.”

EXPOSURE RAISES SAFETY CONCERNS

It should be emphasized that the treated sock fabric was not intended to be used as a face covering. This use can result in exposure to silver that may be dislodged from the fabric.

* Chu, Derek, Akl, Elie, et al. *Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis.* *Lancet*, June 1, 2020; 395: 1973–87.

Asked about the risk of having Silvadur products so close to one's nose and mouth, Dr. Porter responded, "That would definitely be more vulnerable because you've got all your respiratory surfaces and a lot of things that can get through those respiratory surfaces."

"You start messing around with DNA, which is the genetic material controlling your cell operations, you interfere with the messaging and bugger up the communication that goes on in cells, like I say, you've got a molecular bull in a china shop," Dr. Porter told NewsChannel 5. "There are all kinds of ways that it can disrupt cellular activity."

PEOPLE AT RISK OF VIRUS THREAT PUT AT GREATER RISK WITH PESTICIDE EXPOSURE

Although Governor Lee's efforts to protect residents from Covid-19 by encouraging the use of face masks may have been well-intentioned, Dr. Porter states that it is critical to avoid the use of toxic pesticides that may further undermine respiratory or immune system health. This applies to a range of pesticide uses: the use of disinfectants; toxic spray programs for mosquitoes that can be effectively managed with larval control and the reduction of breeding sites; land management of parks, playgrounds and playing fields that can be managed organically, and; other community pesticide use programs.

Shortly after the NewsChannel5 piece ran, officials in Nashville's Metro Public Health Department announced it would postpone distribution of the silver-tainted masks "out of an abundance of caution" and to "allow Metro Health officials to learn more about the masks from state officials."

Impregnating any consumer fabric with potentially hazardous antimicrobials is an unnecessary measure that has no proven public health benefit. However, the pesticide industry has long played on consumers fears of bacteria in order to find new markets for these toxic products. The U.S. Centers for Disease Control and Prevention (CDC) recommends simple cloth face coverings to protect against coronavirus. The agency suggests the following on its website: "CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies), especially in areas of significant community-based transmission." Beyond Pesticides warns people to avoid any fabric or clothing that markets "extra protection" in the form of a patented antimicrobial.

POLICY CREATES LOOPHOLE IN PROTECTION AND MISLEADING LABELING

Underlying a serious public health threat associated with inhaling antimicrobial silver, there is a serious policy issue behind this story. The sock and mask manufacturer, Renfro (headquartered in Mount Airy, NC with a manufacturing facility in Cleveland, TN), responded to the TV piece by distinguishing its use of Silvadur 930 Flex silver antimicrobial pesticide from another silver antimicrobial, Silvadur, claiming that its product is "safe." The only difference on the labels of these products is the percentage of silver. Both products work

by releasing silver ions (see Factsheet, p.18). The label indicates that over 99 percent of the ingredients are "other ingredients" not disclosed to the public. While claiming that its sock fabric "has been determined to be safe in consumer products," it has been reported that the manufacturer says the pesticide washes out of the fabric after numerous washings. Pesticides are not registered as "safe" by EPA, but are subject to risk assessments and allowable levels of harm.

EPA EXEMPTS PESTICIDE-TREATED MASKS FROM REVIEW AS LONG AS NO SAFETY CLAIM IS MADE

Under what is known as the "treated articles exemption" (40 CFR 152.25(a)), all products treated with antimicrobials are not regulated by EPA unless the manufacturer makes a public health claim. Renfro, in claiming the safety of the sock, material, does not disclose the exemption from exposure reviews that its socks (as do other antimicrobial-impregnated products) enjoy. Renfro notes that the toxic antimicrobials are "used for inhibiting microbial growth in order to reduce odor on textiles and garments." EPA does not look at exposure patterns associated with the treated textiles. Beyond Pesticides has long told EPA that it is an outrage not to evaluate the exposure patterns associated with textiles impregnated with pesticides. (See EPA's explanation of the treated article exemption in Box 1.) Beyond Pesticides maintains that this EPA failure allows manufacturers to mislead the public on product safety and efficacy.

For more information on the hazards associated with many antimicrobials registered as pesticides, as well as proper safety measures to clean surfaces of coronavirus, see Beyond Pesticides' program page on Disinfectants, Antimicrobials, and Sanitizers (www.bp-dc.org/disinfectants).

BOX 1

EPA Policy Statement on Pesticide-Treated Fabrics, Plastics, Paints, Etc.

PRN 2000-1: Applicability of the Treated Articles Exemption to Antimicrobial Pesticides

This notice clarifies EPA policy with respect to the scope of the "treated articles exemption" in 40 CFR 152.25(a). This exemption covers qualifying treated articles and substances bearing claims to protect the article or substance itself. EPA does not regard this exemption as including articles or substances bearing implied or explicit public health claims against human pathogens.

This notice addresses the types of claims that are not permitted for antimicrobial pesticide products exempt from registration under this provision and gathers together in one place guidance the Agency has offered on labeling statements it believes would or would not be covered under this provision. This notice also explains the requirement that the pesticide in a treated article be "registered for such use."

This notice provides guidance to producers and distributors of pesticide treated articles and substances, and to producers and distributors of pesticides used as preservatives to protect treated articles from microbial deterioration.

Face Masks Treated with Silver Pesticides Elevate Risk Factors

Both ionic silver and nanosilver have virtually the same adverse effects from exposure to silver ions, although nanosilver may have additional risks attributable to particle size. According to the science, silver ions

kill bacterial cells at the same rate as they harm human cells. Both ionic silver and nanosilver are toxic not only to microbes, but to other species as well. Although intact skin may pose an effective barrier against the absorption of silver, mucosal surfaces (respiratory tract, gastrointestinal tract, urinary

tract, and reproductive tract) are observed to be less effective barriers and compromised skin is often a poor barrier.

Silver is deposited in many or all organs, and there is evidence that it may persist in the body for weeks to months. The accumulation of silver in soft tissues is responsible for the most widely known effect, argyria, which lends a grayish hue to the skin—but silver is also deposited in the liver, spleen, adrenal glands, muscle tissue, and brain. High doses can be lethal. Other health effects that have been documented include weight loss, hypoactivity, altered neurotransmitter levels, altered liver enzymes, altered blood values, enlarged heart, and immunological effects. Since silver accumulates in the body, it is dangerous to discount these effects as being associated with higher doses than would be predicted by exposure to silver through a face mask.

EPA has not evaluated the exposure pattern associated with exposure to fabrics fabricated for face masks and inhaling air through the pesticide-treated material. On its Technical Data Sheet for the chemical applied by Renfro—Silvadur 930 Antimicrobial (Flex is an additive combined with Silvadur 930)—DowDupont states, “Avoid prolonged inhalation of SILVADUR™ 930 Antimicrobial vapors.” The antimicrobial in the sock fabric works by releasing silver ions. It has been reported that the antimicrobial properties diminish over time as the pesticide washes out, again releasing silver ions.

EPA HAS NOT REVIEWED USE OF PESTICIDE-TREATED FABRIC AS A FACE MASK

Products treated with antimicrobials, like the sock fabric, are not regulated by EPA unless the manufacturer is making a public health claim—under what is known as the “treated articles exemption” in federal pesticide regulation.

BACTERIAL RESISTANCE—A PUBLIC HEALTH THREAT

The spread of antimicrobial resistance is a health care crisis of major proportions. The Centers for Disease Control and Prevention (CDC) calls it “one of the world’s most pressing public health problems.” Many bacterial infections are becoming resistant to the most commonly prescribed antibiotics, resulting in longer-lasting infections, higher medical expenses, and the need for more expensive or hazardous medications. The development and spread of antimicrobial resistance is the inevitable effect of the widespread use of antimicrobials. Microbes evolve quickly, and antimicrobials provide strong selection pressure for those strains with genes for resistance to antibiotics, as well.

Silver is used on surgical sites—commonly in dressings—and surgical sites are a common entry point for dangerous antibiotic-resistant infections (including methicillin resistant *Staphylococcus aureus* (MRSA)). It is important that we maintain options—including ionic silver—for preventing and treating MRSA and other opportunistic infections in surgery. A recent review article found, “The declining efficacy of existing antibiotics potentially jeopardizes outcomes in patients undergoing medical procedures.” In particular, the study found:

We estimate that between 38.7% and 50.9% of pathogens causing surgical site infections and 26.8% of pathogens causing infections after chemotherapy are resistant to standard prophylactic antibiotics in the USA. A 30% reduction in the efficacy of antibiotic prophylaxis for these procedures would result in 120,000 additional surgical site infections and infections after chemotherapy per year in the USA (ranging from 40,000 for a 10% reduction in efficacy to 280,000 for a 70% reduction in efficacy), and 6,300 infection-related deaths (range: 2,100 for a 10% reduction in efficacy, to 15,000 for a 70% reduction).

Silver is an antimicrobial with medical uses, so it is important to avoid unnecessary consumer non-medical use that could lead to resistance. Sütterlin et al. found, “Despite a restricted consumption of silver-based products in Swedish health care, silver resistance genes are widely represented in clinical isolates of *Enterobacter* and *Klebsiella* species. To avoid further selection and spread of silver-resistant bacteria with a high potential for healthcare-associated infections, the use of silver-based products needs to be controlled and the silver resistance monitored.”

