020-LIPS

Antimicrobial, Triclosan (TCS) Increases Trihalomethanes in Tennessee Drinking Water in Response to COVID-19

Abstract

Organochlorine contaminants, such as Triclosan (TCS), are present in drinking water sources across the United States. Developed in the late 1960s, TCS is widely used in consumer products and can be ingested or absorbed through the skin, found in human plasma, breast milk, and urine samples. The expanded use of antimicrobial agents has led to their persistence in the ecosystem, notably in soil and water. Concerns related to TCS overuse include dermal irritations, antibacterial-related allergies, microbial resistance, endocrine disruptions, altered thyroid hormone activity, metabolism, and tumor growth. Organochlorine contaminant exposures can increase inflammation, leading to chronic inflammation associated with cardiovascular disease and cancers. Chronic inflammation from these agents can result in loss of immune competence. Our research examined the overuse of TCS-containing products, increasing total trihalomethane (TTHM) levels and affecting drinking water supply quality. To understand the impact of the COVID-19 pandemic, we conducted a systematic review of literature to identify studies on water quality and organochlorine contaminant levels using pre-established techniques and keywords. Secondary data on TTHM concentrations were obtained from annual water safety (CCR) reports for major metropolitan water plants in Tennessee. Additional data, including population and median household income, was sourced from the United States Census Bureau. The water quality data was prepared for descriptive statistical analysis and ANOVA. We analyzed TTHM levels, such as chloroform, a product of free chlorine added to TCS, in primary metropolitan water sources across Tennessee. Our study found that increased TCS use has led to higher levels of trichloromethane, resulting in elevated TTHM levels in water quality reports. Supported by NIH grant U54CA163066.