

Cleaning products could expose children to dangerous contaminants at childcare facilities

March 3 2020



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Toddlers and young children spend much of their day crawling, playing and climbing. For parents and child care providers, that means constant mopping and dusting to keep floors and furniture clean and safe. But a

new peer-reviewed study, co-authored by two Indiana University researchers, suggests high levels of dangerous contaminants—known as PFAS—are finding their way into child care centers through the very products intended to keep children healthy.

The study, co-authored by O'Neill School of Public and Environmental Affairs researchers Amina Salamova and Guomao Zheng in the journal *Environmental Pollution*, is one of the first to examine PFAS exposure risks in indoor settings other than people's homes. It found that PFAS are abundant in child care environments, which leads to "significant early-life exposures."

"Children are especially vulnerable to environmental exposures because of how quickly they're developing," Salamova said. "We really need to better understand the exposures children experience in places where they spend a significant amount of time such as their home, child care facilities and even vehicles. These early exposures could have harmful effects later in life."

Poly- and perfluoroalkyl substances, or PFAS, are a class of chemicals that have been widely used for decades in firefighting foam and a range of stain- and grease-resistant products such as carpeting, upholstery, clothing, cleaning products, food packaging and cookware. PFAS chemicals are known to leach into food from kitchenware and packaging and evaporate from consumer products and get into indoor air and dust.

PFAS are highly persistent chemicals that have been linked to cancer, hormone disruption and immune system harm.

"We're just beginning to understand how prevalent PFAS contamination is," said Erika Schreder, science director at Seattle-based Toxic-Free Future and one of the study's authors. "The more we look, the more we find. We know these toxic chemicals have made their way into our

water, our air and even our food. And now we can see they've made their way into the places our children spend time learning, discovering and exploring."

While children typically spend the most amount of time in their own home, they spend an average of seven to 10 hours a day in a child care facility, making those places a significant potential source of exposure.

The researchers analyzed nap mats and dust for 37 types of PFAS chemicals at seven child care facilities in the greater Seattle area and one in West Lafayette, Indiana. Researchers recruited a variety of facilities including a former church, a former home and a facility with multiple classrooms. Only one facility had carpeting. All the centers were vacuumed or mopped daily.

Researchers found 28 different PFAS compounds in the dust samples they collected. Salamova said the researchers were surprised that some PFAS were present in the dust at child care facilities at levels higher than in homes in the U.S. and Canada. Even more surprising was that the dust contained unexpectedly high levels of fluorotelomer sulfonates, a class of PFAS used in cleaners, waxes and polishes.

Researchers believe that if the floor products are contaminating [child](#) care facilities, there is a strong possibility they can be contaminating other indoor environments, like hospitals and senior care facilities.

People trying to reduce their exposure to PFAS should avoid the following types of products:

- Foods packaged or served in grease-repellant packaging such as microwave popcorn bags.
- Stain-resistance treatments for clothes, shoes, furniture, luggage and carpets.

- Teflon and non-stick cookware.
- Personal care products with ingredients that include the words "fluoro" or "perfluoro." These can be found in dental floss and cosmetics such as nail polish, moisturizers and eye make-up.
- Cleaning products that contain perfluorinated or polyfluorinated ingredients.

More information: Guomao Zheng et al. Indoor exposure to per- and polyfluoroalkyl substances (PFAS) in the childcare environment, *Environmental Pollution* (2019). [DOI: 10.1016/j.envpol.2019.113714](https://doi.org/10.1016/j.envpol.2019.113714)

Provided by Indiana University

Citation: Cleaning products could expose children to dangerous contaminants at childcare facilities (2020, March 3) retrieved 27 April 2024 from <https://medicalxpress.com/news/2020-03-products-expose-children-dangerous-contaminants.html>

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