

Safer Disinfectant Use at Home During the COVID-19 Pandemic

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Using disinfectants on surfaces in your home or workplace can kill disease causing germs (bacteria and viruses), **but they may also have health risks.** For example, many common disinfectants (like bleach, many disinfectant wipes) have chemicals in them that can cause or worsen asthma.

If no one is sick at home:

Clean surfaces in your house with an all-purpose cleaner or soap, and a microfiber cloth (available online, in grocery stores and at big box stores). This will get rid of most of the germs on a surface and avoids excess exposure to disinfectants.

Disinfect after cleaning surfaces that you touch when returning from the outdoors, prior to washing hands.

If someone in your house is sick or suspected to be sick:

Clean surfaces, then disinfect with a product on both EPA lists: Design for the Environment antimicrobial pesticides and N: Disinfectants for use against SARS-CoV-2.

Look for these safer active ingredients:

- ▶ Citric Acid
- ▶ Hydrogen Peroxide
- ▶ L-lactic acid
- ▶ Ethanol
- ▶ Isopropanol
- ▶ Peroxyacetic acid
- ▶ Sodium Bisulfate.

Apply to the surface and leave glistening wet for the time listed on the product label.

If you can't access safer products

If you don't have access to a microfiber cloth, wash sponges or towels after every surface cleaned:

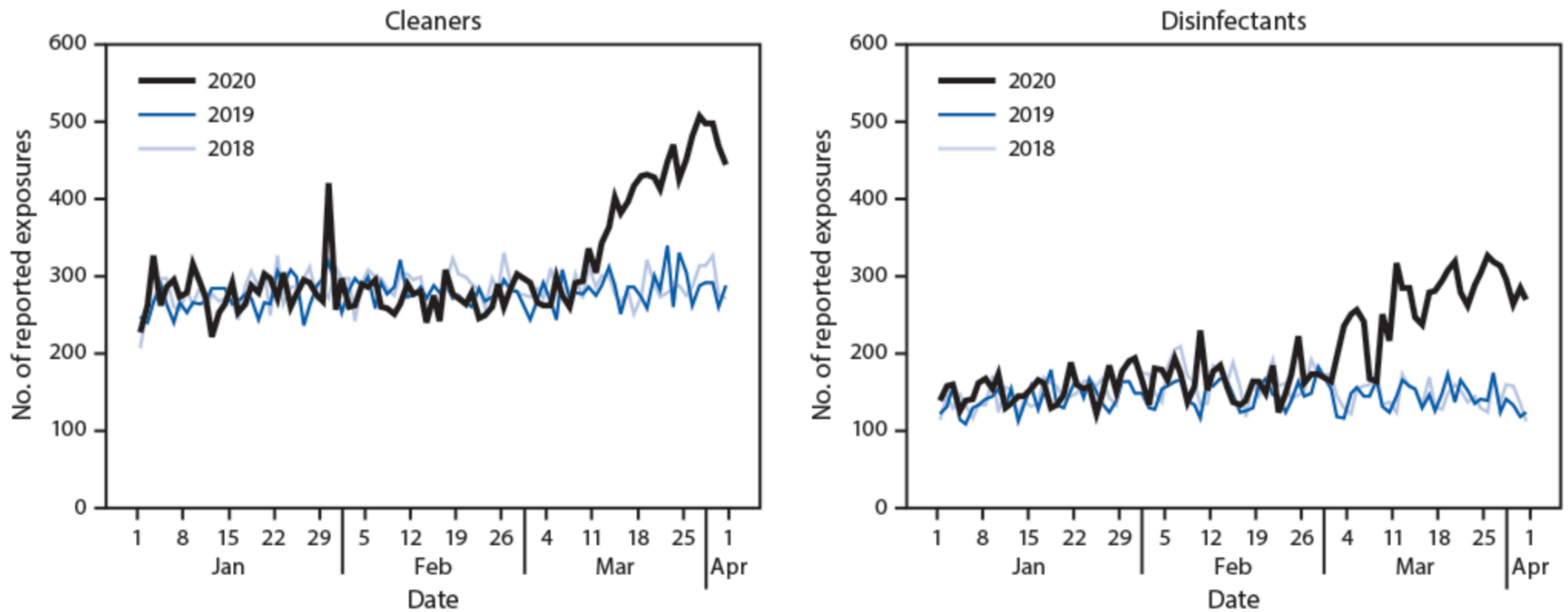
- ▶ Clean sponges by
 - washing in the dishwasher, or
 - soaking for one minute in 1/2 teaspoon of bleach, or
 - microwaving non-metallic, soaking wet sponges for one minute.
- ▶ Wash towels in a basin or washing machine.

If you only have access to bleach or quaternary ammonia-based disinfectants:

- ▶ Dilute disinfectants per the package instructions;
- ▶ Do not combine disinfectants; and
- ▶ Be sure to ventilate the area as well as possible (open windows, turn on fans).

Why worry about Cleaning and Disinfecting Products?

FIGURE. Number of daily exposures to cleaners and disinfectants reported to U.S. poison centers — United States, January–March 2018, 2019, and 2020*,†



Why worry about Cleaning and Disinfecting Products?

- Those who do cleaning work have highest rates of work-related asthma^{1,2}
- Increased risk of asthma in anyone whose job involves cleaning product exposure, especially those preparing disinfectants³
- People who clean their own homes have higher rates of lower respiratory symptoms if they use bleach or multiple kinds of sprays^{4,5}
- Children whose homes have higher VOCs are more likely to have asthma⁶
- Increased risk of subclinical airways inflammation with increased cleaning spray use in the home⁷
- Children exposed to more cleaning products in infancy are more likely to wheeze when they're older⁸

¹Reinisch et al 2001, ²Dumas 2019, ³Gonzalez et al 2014, ⁴Zock et al 2009, ⁵Bedard et al 2014, ⁶Mendell 2007, ⁷Casas et al 2013, ⁸Parks et al 2020

Cleaning and Disinfecting Your Home

- Differences between cleaning, sanitizing and disinfecting may not be well understood.
 - Cleaning
 - Sanitizing
 - Disinfecting
 - Visible soiling requires use of a cleaning step prior to disinfection.
 - Dwell Time
 - No products certified for disinfection of porous surfaces (untreated wood, fabric).
-



Health Effects of Common Types of Disinfectants

Bleach (Sodium hypochlorite)

- Most common disinfectant used
- Mechanism thought to be by protein aggregation
- Dwell time usually 5-10 min
- Large acute exposures clearly cause respiratory effects
- Chronic low-level bleach exposure associated with asthma in animal studies and custodial workers^{1,2}
- Designated asthmagen
- Responsible for 62% of the increase in poison center calls³



¹Kim et al 2014, ²Mirabelli et al 2007, ³MMWR

Quaternary Ammonium Compounds (QACs)

- Cationic detergents
- Disinfect via multiple routes:
 - disruption of cellular membranes
 - possible intracellular effects
- Usual dwell times: 4-10 minutes
- Ammonia released during cleaning
- Known asthmagens, higher odds ratio after exposure than bleach
- Evidence of mutagenicity and possible reproductive toxicity in animal studies¹
- Chloramine gas released if mixed with bleach, see https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3793292.pdf



¹Ferk et al 2007, Hrubec et al 2017



Advocating for Safer Products

Safer Cleaning Products



EPA's Design for the Environment Antimicrobial Pilot Project

Active Ingredients	Year Approved
Citric acid	2009
Hydrogen peroxide	2009
L-lactic acid	2009
Ethanol	2012
Isopropanol	2012
Peroxyacetic acid	2015
Sodium Bisulfate	2015



Look for DfE Products on the N list

EPA Registration Number	Active Ingredient/s	Product Name	Company	Follow the disinfection directions and preparation for the following virus	Contact Time (in minutes)
	Hydrogen Peroxide				

Active Ingredients	Year Approved
Citric acid	2009
Hydrogen peroxide	2009
L-lactic acid	2009
Ethanol	2012
Isopropanol	2012
Peroxyacetic acid	2015
Sodium Bisulfate	2015



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