

## One Health Research Project Abstract

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**Title:** Risk-risk tradeoffs and risk-perception study associated with cleaning and disinfection (C&D) using “green” products

### Research Abstract:

**Background:** Risk perceptions are people's intuitive assessments of hazards to which they are or may be exposed. Risk perception affects the decision and behavior of humans in a variety of ways. During the COVID-19 pandemic, risk perception of contaminated surfaces increased, as did the importance of office and home hygiene. This led to changes in cleaning and disinfection (C&D) protocols with unknown health consequences. While C&D of surfaces likely reduces infection risks posed by contaminated surfaces, there is evidence that C&D is associated with asthma-related risks in occupational settings, especially in healthcare. However, not all C&D products are the same: Selecting and usage of different kinds of C&D products can affect the likelihood of asthma-related outcomes. In the U.S., “green” or “environmentally friendly” products are not specifically defined and regulated. There is mixed evidence regarding the effects of “green” products on respiratory health and whether they pose smaller risks than more traditional C&D products. Furthermore, most of the “green” C&D products studies were not conducted with the “one health perspective,” where most studies focus solely on human health consequences. The **objective** of this study is to evaluate perceptions and evidence of “green” products vs. traditional products in terms of health risks posed to humans and the environment. The **long-term goal** is to inform C&D protocols that prioritize both human and environmental health while still maintaining appropriate environmental hygiene. I will work towards this objective and long-term goal through the following aims:

**Aim 1. Inventory current evidence of the toxicological effects of “green” vs. traditional C&D products on environmental and human health.** I will conduct a systematic literature review to investigate evidence for “green” and traditional C&D chemicals regarding their effects on respiratory health and other health outcomes associated with C&D exposure (e.g., cancer). Chemicals known for asthma risks will especially be focused on in developing the search strategy (e.g., aldehyde compounds, sodium hypochlorite.). In addition to human health, I will search for literature related to potential environmental impacts, including decomposition time of the chemical products and potential effects on groundwater, soil, atmosphere, animals, and plants. PubMed and Embase will be searched for relevant publications. The search strategy and data extraction tool will be finalized through discussion with Dr. Wilson and Jean McClelland (MEZCOPH librarian).

**Aim 2. Compare risk perceptions of health effects from using “green” vs. traditional C&D products among AZ nurses.** I will adapt a survey developed by Dr. Wilson to survey AZ nurses on their perceptions of using “green” C&D products vs. using traditional products and their definitions of “clean” regarding surfaces in work and home environments. Nurses will be recruited through the Arizona Nurses Association through an online, anonymous survey, and will be compensated using funds available through Dr. Wilson. I hypothesize that nurses will perceive “green” C&D products as less effective and less harmful relative to traditional products, depending upon their perception of “clean” (e.g., visually inspecting for dirt vs. concerns about microbial pathogens). Other questions will include frequency of

use of “green” or traditional C&D products, health issues encountered with using either type of product, and rationales for choices in selecting C&D products at work or at home.

**Impact** Understanding risk-risk tradeoffs related to C&D will improve C&D protocols to reduce the potential risks of respiratory health issues for healthcare workers. Acquired information on nurses’ preferences and perceptions of different types of products and available evidence on the safety of different product choices will promote and protect the health of nurses and the environment.