

# Reducing Latina Women's Exposure to Cleaning Chemicals

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Etiology and Prevention

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## Abstract

**Introduction:** Although household cleaning products contain a wide variety of chemicals, these ingredients are often not required to be listed on the label. Some household cleaning products, including floor, window and bathroom cleaners, furniture polish, air fresheners, and other cleaning agents, have been shown to contain chemicals that are known or suspected to cause cancer or disrupt hormones. Research shows that Latina women use more cleaning products than women of other races and ethnicities, suggesting that they may be at increased risk of exposure. However, little is known about the extent that women are exposed to these chemicals of concern during routine housecleaning or how they might reduce their exposure. **Research Questions:** We aim to characterize the household cleaning products used by Latina women, learn which chemicals are in these products, measure the chemicals in the air that women breathe during routine cleaning, and determine whether these concentrations in air decrease when they replace their products with "green" or "low chemical" cleaning products and are educated on ways to reduce exposure. **Methods:** This study will take place in the Salinas Valley, CA, an agricultural region with a large Latino farmworker population, where our community-researcher collaboration has a long-standing, community-based project. Our group facilitates a Salinas-based Youth Council (YC) of high school students interested in health environmental leadership.

We will train the YC in research methods and work with them to design the study, develop questionnaires, conduct interviews and sample collection, analyze data, and disseminate results. The YC will recruit 80 Latina women living in or near Salinas and interview them about their household cleaning product use. At an initial home visit, each study participant will wear a small personal air monitoring device while she cleans her house using her usual products. Then, at a second home visit a few days later, the YC members will educate the participant on how she can reduce exposures to cleaning products, provide alternative "green cleaning" products, and collect a second air sample while she cleans her house with the new products. Air samples will be analyzed for the presence of 13 chemical classes of concern and we will determine whether chemical levels decreased when she changed cleaning products. We will also conduct laboratory analyzes to determine the chemical contents of several cleaning products of concern. Innovation. This study will be conducted primarily by youth. By employing teens to conduct the research, we will be empowering them, giving them marketable skills, creating job opportunities and raising their interest in science, community issues, breast cancer, and the environment. In addition, by engaging teens in the dissemination, education, and advocacy portion of the study, we are increasing our outreach. We hope that simple messages demonstrating chemical exposures in the air that women breathe while cleaning and showing how to reduce these exposures will have a powerful impact. In our work in the Salinas Valley, we have learned that children, often more acculturated and fluently bilingual, are a conduit for educating parents. Thus, through youth, we hope to raise community awareness about breast cancer and chemicals in the environment. Community Involvement. The proposed study is rooted in the 20 year-old CHAMACOS community- university partnership between the Center for Environmental Research and Children's Health (CERCH) and Clinica de Salud del Valle Salinas (CSVS). CHAMACOS partners have engaged in extensive environmental health education activities, reaching over 30,000 residents. The CHAMACOS project is guided by a Community Advisory Board with input from the YC, Grower Council, and Farmworker Council. For this project, the CHAMACOS partnership will work with the YC in conducting all phases of the study. The YC, in partnership with CERCH and CSVS, and in consultation with other breast cancer and environmental advocacy groups, will develop education materials and strategies to reduce household cleaning product exposures in the Latino community based on results of the study. Future Plans. We aim to disseminate the results of this study to local and statewide medical, health, and social service agencies involved in the health of Latino communities. The YC has engaged youth in environmental health research since 2010 and we hope to continue this tradition. As the youth graduate from high school, their participation in the YC helps prepare them for college and their careers.

## **Progress Report Abstract**

Many household cleaning products contain endocrine disrupting and carcinogenic chemicals that may contribute to breast cancer risk. Latina women may be at particular risk due to their increased use of cleaning products. The Lifting Up Communities through Interventions and Research (LUCIR) Study is a youth-led project to characterize how Latina women are exposed to chemicals in household cleaning products and to determine whether they can reduce these exposures by switching to "green" or "low chemical" products. The study also aims to educate community members to reduce their exposure to cleaning chemicals and to empower local high school students as environmental health leaders. We have been very successful in meeting our

study aims. This project was conducted by the CHAMACOS Youth Council, a youth empowerment and environmental health project based in Salinas, California. Youth Council members were involved in all aspects of the study design, implementation, and translation. We observed statistically significant decreases in air concentrations of 17 chemicals of concern when participants switched to “green” cleaning products, including decreases in geometric mean concentrations of 1,4-dioxane (-46.4%), chloroform (-86.7%), benzene (-24.8%), naphthalene (-40.3%), toluene (-24.2%), and hexane (-35.5%). We observed significant increases in air concentrations of three fragrance compounds: the plant-derived terpene, beta-myrcene (221.5%), and the synthetic musks celestolide (31.0%) and galaxolide (79.6%). Almost all participants (98%) said the replacement products worked as well as their original products and 90% said that they would consider buying the replacement products in the future. This study demonstrates that choosing cleaning products that are marketed as “green” may reduce exposure to several carcinogens and endocrine disruptors. However, fragrance chemicals continue to be a problem with “green” products and consumers should try to choose fragrance-free. One peer-reviewed paper has been published (Harley et al, EHP 2021) and another is in preparation (Calderon et al, in prep). We were also very successful in educating community members and empowering local youth. The youth have gained skills in public health research, public speaking, and advocacy as well as creating three short videos showing how to reduce exposure to cleaning chemicals.

## Publications

Title	Authors	Year
Changes in Latina Women's Exposure to Cleaning Chemicals Associated with Switching from Conventional to "Green" Household Cleaning Products: The LUCIR Intervention Study.	Harley KG, Calderon L, Nolan JES, Maddalena R, Russell M, Roman K, Mayo-Burgos S, Cabrera J, Morga N, Bradman A	2021
Air Concentrations of VOCs associated with Conventional and Green Cleaning Products in Real World Use and Laboratory Emissions Testing	Lucia Calderon, Randy Maddalena, Marion Anderson, Asa Bradman, Norma Morga, Kim Harley	2022
Potentially carcinogenic chemicals more associated with conventional cleaning products, but also with some “green” products	Lucia Calderon, Randy Maddalena, Marion Russell, Sharon Chen, James E. S. Nolan, Asa Bradman, Kim G. Harley	2022