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Hazardous Waste Management Program
GOVERNMENTS WORKING TOGETHER FOR A HEALTHIER AND CLEANER KING COUNTY

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Final report

Teaching safer cleaning practices in the homes of Spanish-speaking immigrants

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The Hazardous Waste Management Program, a coalition of local governments in King County, Washington, prepared this report. Our customers are residents, businesses, and institutions with small quantities of hazardous wastes. Our mission is to protect and enhance public health and environmental quality in King County by reducing the threat posed by the production, use, storage, and disposal of hazardous materials.

Participating agencies include the Water and Land Resources Division and Solid Waste Division of King County's Department of Natural Resources and Parks, Public Health – Seattle and King County, Seattle Public Utilities, and 37 cities and Tribal governments in King County.

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Executive summary

One of the Hazardous Waste Management Program 's[1] goals is to reduce exposures to hazardous cleaning products by teaching safer cleaning practices. In our prior work with the Spanish-speaking immigrant population in King County, we learned that they clean often and use many cleaning products, some of which are hazardous. This community expressed an interest in learning safer ways to clean their homes. In response, we partnered with Sea Mar Community Health Centers (Sea Mar) to teach participants safer cleaning practices in their homes.

The project had two goals:

1. Increase their awareness of the health risks of using bleach and mixing chemical cleaning products.
2. Shift their behavior for two months from using hazardous cleaning products to safer cleaning practices in at least one area of their home.

The Sea Mar Community Relations Department Field Team, or Field Team, conducted the safer cleaning training in 76 homes, reaching a total of 332 people, including those that lived in the home. They presented information on the health hazards of using some cleaning products and demonstrated how to identify them.

The Field Team then coached participants on making and using safer cleaning products using products from a safer cleaning kit. Then the participants used this homemade cleaner to clean an area of their home. Participants also practiced cleaning with a store-bought product, all-purpose spray with the Environmental Protection Agency, or EPA, Safer Choice label. At the end of the visit, the Field Team asked the participant to sign a pledge to start using this safer cleaning product instead of one of the hazardous products for two months.

Two months after the training, all participants received an evaluation call to measure the impact of the training on participants. Of the 76 homes visited, 51 of them (67%) responded to the call. All 51 participants were still using the safer cleaning products in the area they specified in their pledge. Many responded that their health had improved and that they were using the cleaning products in other areas of their home as well.

[1] The Local Hazardous Waste Management Program in King County recently changed its name to The Hazardous Waste Management Program.

Acronyms and abbreviations

EPA	United States Environmental Protection Agency
Haz Waste Program	Hazardous Waste Management Program
HIPPA	Health Insurance Portability and Accountability Act
ICE	Immigration and Customs Enforcement
Sea Mar	Sea Mar Community Health Centers
Field Team	Sea Mar Community Relations Department Field Team

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Introduction

Many cleaning products marketed to households are hazardous to human health and the environment. Researchers have associated the use of these cleaning products with acute health effects such as burns, headaches, dizziness, breathing difficulties, and eye irritation. Cleaning products may also contribute to chronic diseases such as asthma (Zock, 2001) and dermatitis (Bauer, 2013). Mixing chemicals can create toxic gases that can cause difficulty breathing and sometimes lung damage in those who inhale the gas over an extended period. (Reisz, 1986).

The Latino/Hispanic community is one of the largest communities of color in King County. Over the last several years, it has repeatedly expressed interest in learning safer cleaning practices. In response to this, the Hazardous Waste Management Program, or Haz Waste Program, has worked to increase awareness of the possible hazards of household cleaning products. During this time, we have learned more about the cleaning practices of the Latino/Hispanic community.

Previous research results

Before designing this project, we conducted several studies to learn about the community's barriers and motivators to using safer cleaning products. In the fall of 2017 through the spring of 2018, the Field Team visited 40 Latino/Hispanic homes in Auburn to inventory household cleaning chemicals. We learned that most participants used hazardous cleaning products and that bleach was used frequently and often at full strength (Rafii, 2018, p. 19).

During a Stakeholder Roundtable conducted in 2018, Latino/Hispanic community leaders identified the top five health concerns associated with cleaning as (1) the hazards associated with mixing chemicals, (2) the overuse of disinfectants (including bleach), (3) asthma prevention, (4) dermatitis and (5) fragrances (Local Hazardous Waste, Oct. 2018, p. 7).

In another study conducted in 2018, 102 intercept interviews with Latinos/Hispanics in South King County revealed that the biggest barriers to using safer cleaning products were (1) price, (2) lack of familiarity with them, (3) dislike of the smell, (4) difficulties using, and (5) belief that natural products are ineffective (Local Hazardous Waste, July 2018, pp. 8-9).

This same study found that the top motivators to use safer cleaning products were (1) they could be used to clean almost everything, (2) they clean well, (3) the belief they are safer, and (4) they have a pleasant odor (Local Hazardous Waste, July 2018, p. 10).

The Latinos/Hispanics interviewed also indicated that most would be open to (1) making their own safer cleaning products using ingredients they have at home and (2) buying a safer cleaner in a store (Local Hazardous Waste, July 2018, p. 7).

Small-group discussions conducted with community members identified that information about the health risks of certain cleaning chemicals and safer homemade cleaning products would help shift the community towards safer cleaning practices (Local Hazardous Waste, July 2018, p. 12).

Partnership with Sea Mar Community Health Center

King County has a long-standing practice of public engagement intended to inform and seek input from the communities we serve. A commitment to community partnerships is equally rooted in the principle that those affected by a decision have the right to be involved in the decision-making process. Community-based organizations facilitate access to decision-making for historically underrepresented communities and provide the expertise needed to remove barriers of race, cultural norms and practices, disability, and language in order to foster full and equitable civic participation.

The Hazardous Waste Management Program is partnering collaboratively with communities to ensure Program goods and services are relevant and accessible, so that all can benefit and to ensure equitable inclusion of customers' voices and participation. The Program's outreach and engagement approach is racially equitable and informed by our customers.

The Sea Mar Field Team's (see Appendix A) outstanding work in a previous project with us (Rafii, 2018) and the results of 102 interviews with Latinos/Hispanics that indicated they trusted health clinics for their health information (Local Hazardous Waste, July 2018, p. 13) led us to partner with them again. Sea Mar is highly trusted in the Latino/Hispanic Community and, despite the social and political environment during this period, they garnered enough trust among Latino/Hispanic immigrants to welcome them into their homes.

Decision to do in-home trainings

Previous efforts to increase awareness and shift behavior around cleaning practices in the Latino/Hispanic community involved group workshops in public spaces with sample cleaning products brought in by the trainers. In conversations with Sea Mar, we decided to try an in-home approach and use the cleaning products the participants have in their home to help them identify if the products in their home are hazardous. This individual training approach would also allow them to try the safer cleaning recipes in their homes.

Project goals

The project's goals were that participants who receive an in-home training will

- increase their awareness of the health risks of using bleach and mixing chemical cleaning products
- shift their behavior from using hazardous cleaning products to safer cleaning practices in at least one area of their home for two months.

Location of trainings

We focused most of the trainings in the cities of Burien and Kent because of the high proportion of Latino/Hispanic residents.

Methods

We designed the project based on the information we heard from the community.

Materials development

The project began with preparing materials Sea Mar would need to teach safer cleaning practices to their community and creating a survey to evaluate the effectiveness of the training.

Survey

We developed 11 survey questions to assess the participants' understanding of the risk of residential cleaning chemical exposures and their awareness and opinions about safer cleaning practices. The questions also evaluated the participants' self-efficacy[2] in the use of safer cleaning recipes and choosing safer cleaning products in the store. As part of the survey, we also asked about age, the number of people living in the home, gender, and zip code (see Appendix B).

Before developing the survey questions, we designed a logic model to help conceptualize the expected behavior (see Appendix C). We asked the survey questions before the safer cleaning training began. Two months after the in-home visit, we asked the same questions, in addition to three more questions about the pledge.

The key research questions informing the survey questions were the following:

- Does a follow-up phone call seven to ten days after the in-home visit increase the number of homes that change from using a hazardous cleaner to a safer cleaner?
- What percentage of homes overall have adopted the cleaning practices two months after the in-home training?

Health risk flyer

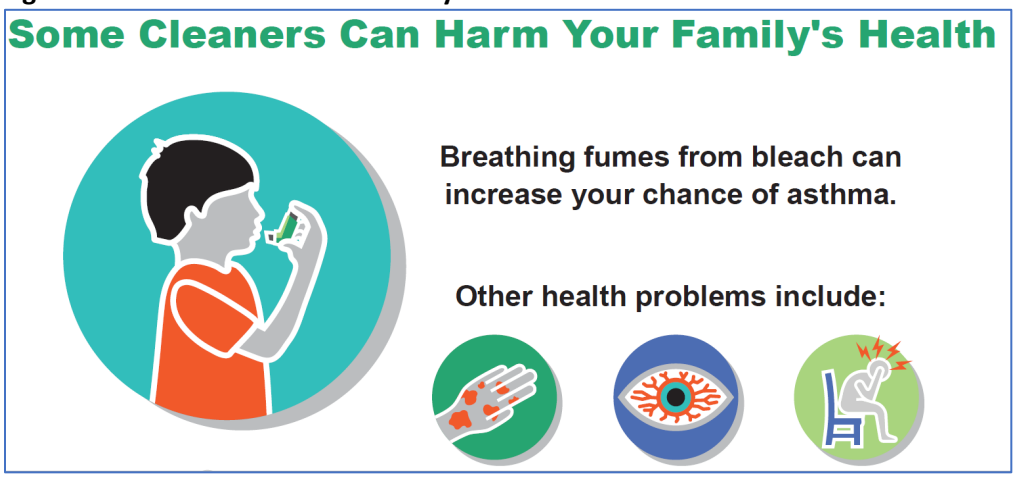
Before we designed this project, we conducted a stakeholder roundtable that brought 10 Latino/Hispanic community leaders to discuss the greatest risks to their community around chemical cleaning products. Their three highest risks/priorities to their community around cleaning were (1) mixing, (2) overusing disinfectants and (3) preventing asthma.

Based on this recommendation, we worked with the Field Team to create a flyer that communicated these health risks. This flyer follows the guidance of the Community Partnership portion of the King County Equity and Social Justice Strategic Plan, which includes relying on the expertise of community-based organizations to advance their equity and social justice outcomes (King County, 2015).

A portion of this flyer is shown in Figure 1 below. The full flyer is in Appendix D.

[2] Self-efficacy is an individual's belief that they can succeed in doing the behavior or accomplishing the task.

Figure 1: Portion of the health risk flyer



Handouts: Recipe card and how to buy a safer product

The Haz Waste Program was simultaneously developing two flyers to promote safer cleaning: one with six recipes to make safer cleaning products and one that showed how to buy a household product that is safer for your family (see Appendix D). These two flyers were developed based on feedback from the Field Team and other community partners and stakeholders.

The Safer cleaning kit and EPA Safer Choice all-purpose spray

We wanted to provide the opportunity for participants to make a cleaner from ingredients they may already have at home (vinegar, baking soda, etc.) and to try an affordable, safer cleaning product they could buy in the store.

A previous study helped us develop this strategy. The study reflected that 68% of Spanish-speaking immigrants interviewed said they would be willing to make a safer cleaner at home and 66% would be willing to buy a safer cleaner at the store (Local Hazardous Waste, July 2018).

The safer cleaning kit was comprised of

- a bucket to hold the materials
- white vinegar
- baking soda
- an ECOS brand dish soap (with EPA Safer Choice label)
- an empty spray bottle
- a scrubber sponge
- an e-cloth brand microfiber cloth
- an ECOS brand all-purpose spray (with EPA Safer Choice label)
- a recipe card with six safer cleaning recipes.

Figure 2: Safer cleaning kit

EPA Safer Choice labeled products

An EPA Safer Choice label indicates that ingredients are among the safest in the product class. The EPA evaluates ingredients against strict health and environmental criteria and also tests performance (U.S. EPA Safer Choice).

Figure 3: EPA Safer Choice label

Of the EPA Safer Choice products available, the ECOS all-purpose spray and dish soap were included in our Safer Cleaning kit for these reasons:

- They have the EPA Safer Choice logo on the label, making it easy for shoppers to identify. (Not all EPA Safer Choice products have this label).
- The price was equivalent to other all-purpose cleaning products this audience might purchase. (Price ranged from $2.48 to $4.49/bottle, depending on the store).
- They are lightly scented with non-toxic fragrances, which appealed to most that tested them and gave us feedback.
- These products are available online in a fragrance-free version.

e-cloth brand microfiber cloth

We included in our safer cleaning kit an e-cloth brand microfiber cloth because most Latinos/Hispanics were familiar with microfiber cloths and liked them. We also understood that for most, the need to disinfect was an essential part of the cleaning process. We wanted to provide a safer alternative to using bleach or other disinfectants that would allow them to disinfect without exposing them to toxic products.

The microfiber cloth “e-cloth” was the only microfiber cloth that has been demonstrated to remove over 99% of bacteria, including E. coli and Listeria, using just water (Pernot, 2010). As a result, we included an e-cloth in our safer cleaning kit.

In-home training script

We created a training script in English and the Field Team reviewed it and translated it into Spanish. (see Appendix B).

Pilot testing

Sea Mar tested the script and survey questions during three pilot trainings and modified it based on comments and suggestions from the participants. This gave all of us the opportunity to assess the survey questions for their length and understandability. Based on the findings of the pilot trainings, we revised the survey questions and parts of the script.

Recruitment

To be eligible for the training, the participant had to fulfil all the following criteria:

1. Do most of the cleaning in their home
2. Use bleach to clean
3. In the last year they have not participated in any King County safer cleaning programs.

The Field Team recruited eligible participants using a screening script (see Appendix E) at neighborhood churches, grocery stores, Mexican markets, Sea Mar Health Clinics, health fairs, and other community service organizations. The Field Team told the prospective participants that they would give them a free safer cleaning kit as an incentive. We offered no additional incentive.

During the recruitment phase, the Field Team informed the participants that the report would not include their personal information. The Filed Team kept all information they collected confidential, in accordance with the Health Insurance Portability and Accountability Act, or HIPPA, a federal law that restricts access to individuals' private medical information.

In-home trainings

Two native Spanish-speakers on the Field Team conducted the trainings. The Field Team also included the Sea Mar Contract Manager, who sometimes accompanied the staff to observe.

The Field Team found that the Latino/Hispanic families liked to welcome their guests to their home, offering them refreshments or inviting them for breakfast, lunch, or dinner, depending on the time of the visit. In some instances, the host/participants also wanted to engage in conversation before or during the visit. Because the visit was Sea Mar's responsibility and there were time constraints, the Field Team had to decline food or gifts stating that it was against Sea Mar policies to accept them[3].

Before the training, the Field Team asked participants the survey questions about their understanding of the hazards of some cleaning products, and their opinions of safer cleaning products.

During the training, the Field Team entered the participants' responses from the survey questions into the SnapSurveys online tool. With Snapsurveys you can create a survey in any language and download the data from it in the language of your choice. https://www.snapsurveys.com/

[3] For example, when conversation or lack of focus was the issue, the Field Team would say something like: "that is very interesting; however, in appreciation for your time let me ask you…" and we continue with the questions, or "I am so sorry, please allow me to hurry up so that I do not take more of your time."

Figure 4: Sea Mar staff teaches health risks

The Field Team used the health risk flyer to inform the following:

- The risks of using bleach and other disinfectants.
- The risks of increasing some health problems.
- The dangers of mixing different cleaning products.

This tool proved effective in communicating the potential risks and dangers of using some cleaning products. For the entire flyer, see Appendix D.

How to buy a safer cleaning product

Becoming familiar with the words on cleaning products that identify which ones are safe and which ones are hazardous was also part of the in-home training. The Field Team used the flyer, "How can I buy a household product that is safer for my family?" (shown in Figure 3 below) to help in this process. See Appendix D for the full-size version of this handout.

Figure 5: How can I buy a household product that is safer for my family?

The Field Team asked participants to bring their cleaning products to a table where they sorted them according to whether the following words appeared on the labels:

- DANGER or POISON = Most harmful.
- CAUTION or WARNING = Somewhat harmful.
- None of these four words = Safe enough.

- Either the EPA Safer Choice label or Cradle to Cradle logo = The safest.

Most participants used cleaning products with the signal words CAUTION or WARNING, and several products labeled DANGER or POISON.

Safer cleaning kit & recipe card

The participants used the materials in the safer cleaning kit to make their own cleaning products using a recipe.

Figure 6: Recipe card

The recipe card has six safer cleaning recipes that use both visual and word descriptions (see Appendix D for the full size of this flyer).

During the in-home training, participants could choose up to two recipes to make and use to clean different areas of their house.

The most popular recipes were the toilet bowl cleaner, the counter cleaner, and the tub & sink cleaner.

Previous research done in the Latino/Hispanic community indicated that they do not like the smell of vinegar. Consistent with this finding, most participants did not choose the recipe with vinegar.

Pledge

At the end of the visit, the Field Team asked participants if they would be willing to sign a pledge to stop using a hazardous cleaning product in one area of their house and instead clean with a safer cleaning product. All participants agreed to take the pledge. The pledge is at the bottom of the health risk flyer (see Appendix D).

Seven to ten-day follow up call

After the in-home visit, half of the participants were randomly selected from the 76 homes to participate in a seven- to ten-day follow-up call. The Field Team called these participants to reinforce key messages from the visit and offer the chance to ask questions or address concerns about making their own cleaning products or using the new safer cleaning practice (see Appendix F).

Two-month evaluation

Two months after the in-home training, another division of Sea Mar called all 76 homes and asked the same survey questions plus three additional ones. The purpose was to evaluate the participants' awareness of the hazards of some chemical cleaning products, and to ask if they kept their pledge to use a safer cleaning product. We used another division of Sea Mar to conduct the two-month call in order to

minimize any potential response bias. The questions were designed to be short and straightforward (see Appendix F).

Results

Haz Waste Program staff downloaded the data from the in-home trainings and exported it into an Excel spreadsheet for cleanup. We used Microsoft Excel to conduct our data analysis.

Participant demographics

A total of 76 individuals participated: 71 women and five men (with 332 family members) residing in Kent, Burien, and White Center. Most participants were in the age range of 21-60 years. They represented nine Latin American countries, with 76% from Mexico. Table 1 displays the participants' demographic information.

Table 1: Participants' demographic information

Characteristics	Number of participants	Percent
Gender		
Female	71	93%
Male	5	7%
Age		
21-40	31	41%
41-60	33	43%
>60	12	16%
Country of origin		
Mexico	58	76%
Peru	1	1%
Honduras	4	6%
Guatemala	3	4%
El Salvador	3	4%
Colombia	2	3%
Puerto Rico	2	3%
Centro America	1	1%
Costa Rica	1	1%
Declined	1	1%
City of visit		
Kent	42	56%
Burien	32	41%
Unincorporated King County - White Center neighborhood	2	3%

Seven to ten-day follow up call

Of the 51 participants who responded to the two-month evaluation call, 27 (53%) received a follow-up call. We observed a slight increase in the follow-up group regarding their awareness that breathing fumes from bleach can increase their chance of getting asthma as compared to participants who did not receive a follow-up call. Participants in the follow-up group also showed a slight increase in their awareness that mixing chemicals can form a toxic gas. The difference between the two groups seems unremarkable, showing little advantage to the participants who received a seven to ten -day follow-up call. Figures 7 and 8 below show this difference.

Figure 7: Comparison of seven to ten-day follow up call group on asthma risk

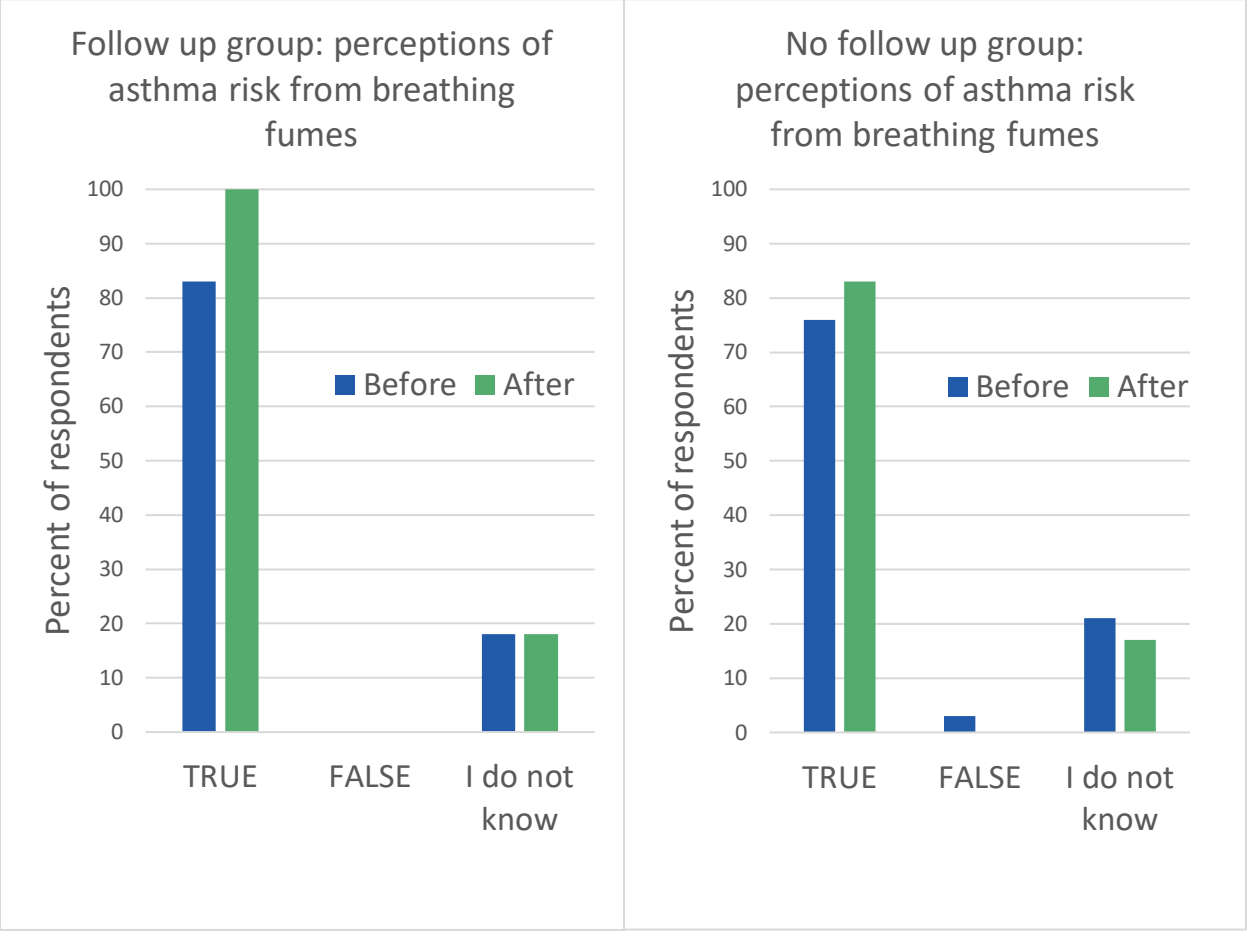
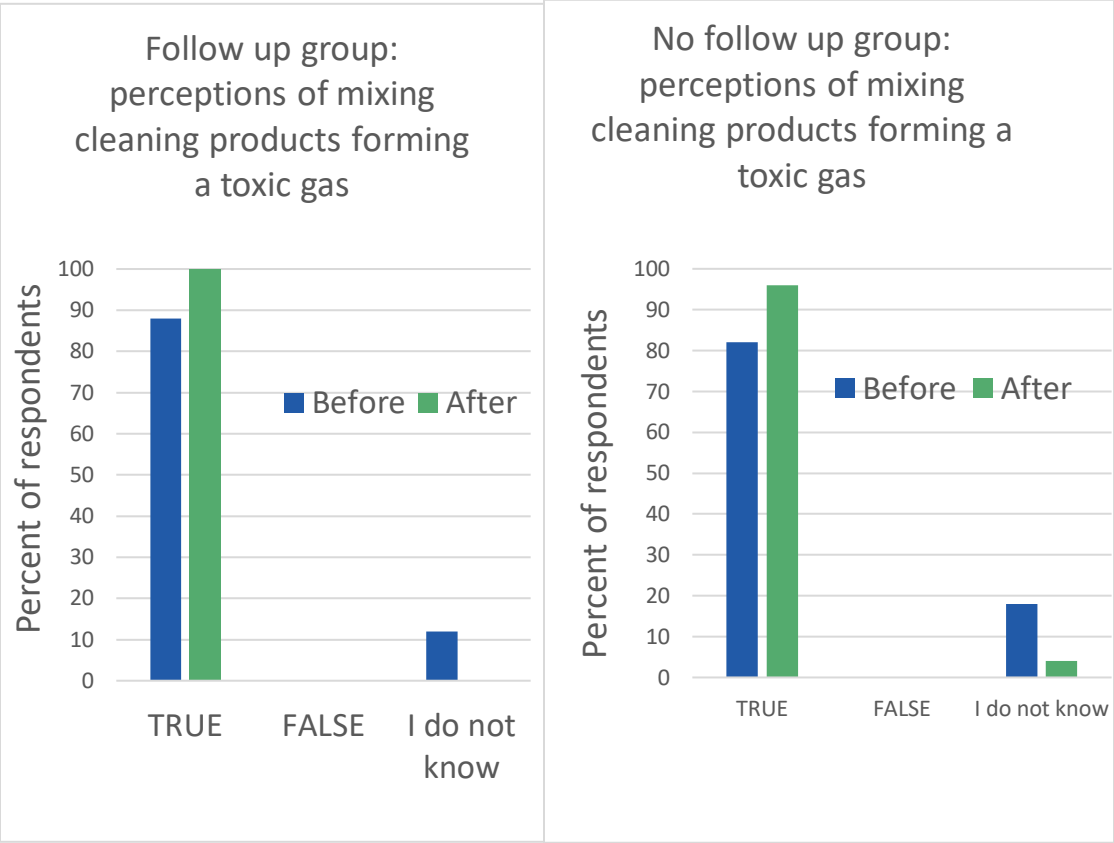


Figure 8. Comparison of seven to ten-day follow up call group on mixing products



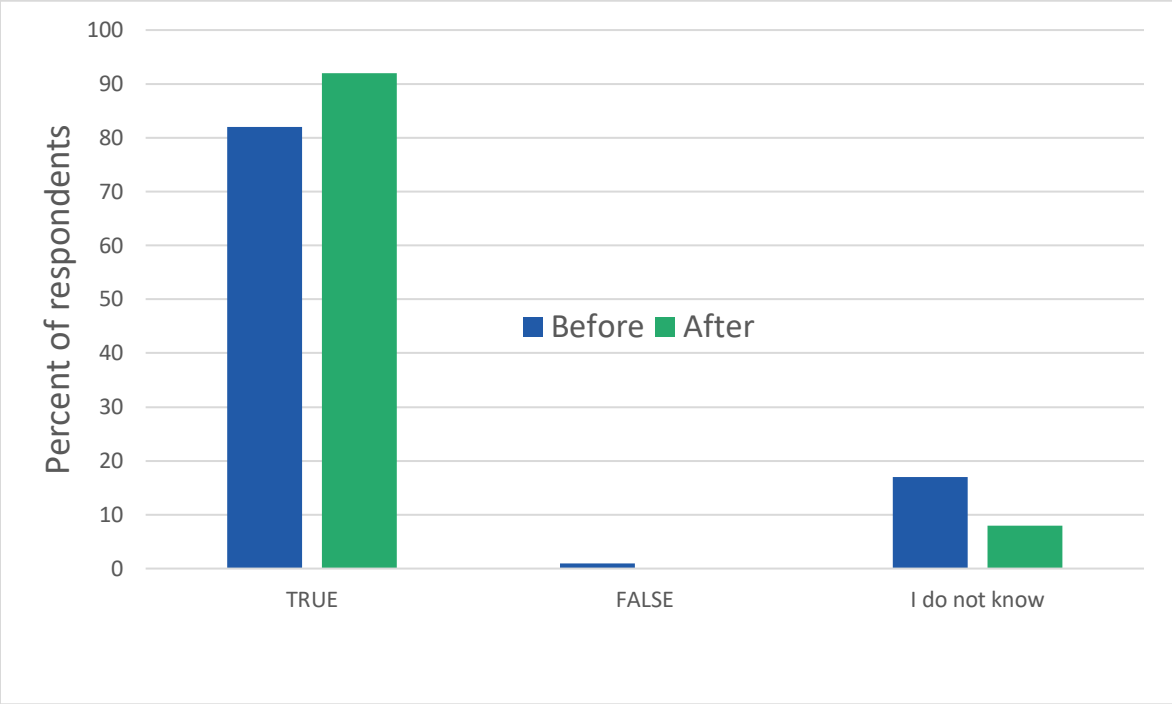
Two-month evaluation results

Of the 76 participants who received an in-home training two months after their visit, 51 (67%) responded to the call. See the results below in Tables 9 through 17.

Increased awareness of the health hazards of bleach and mixing chemicals

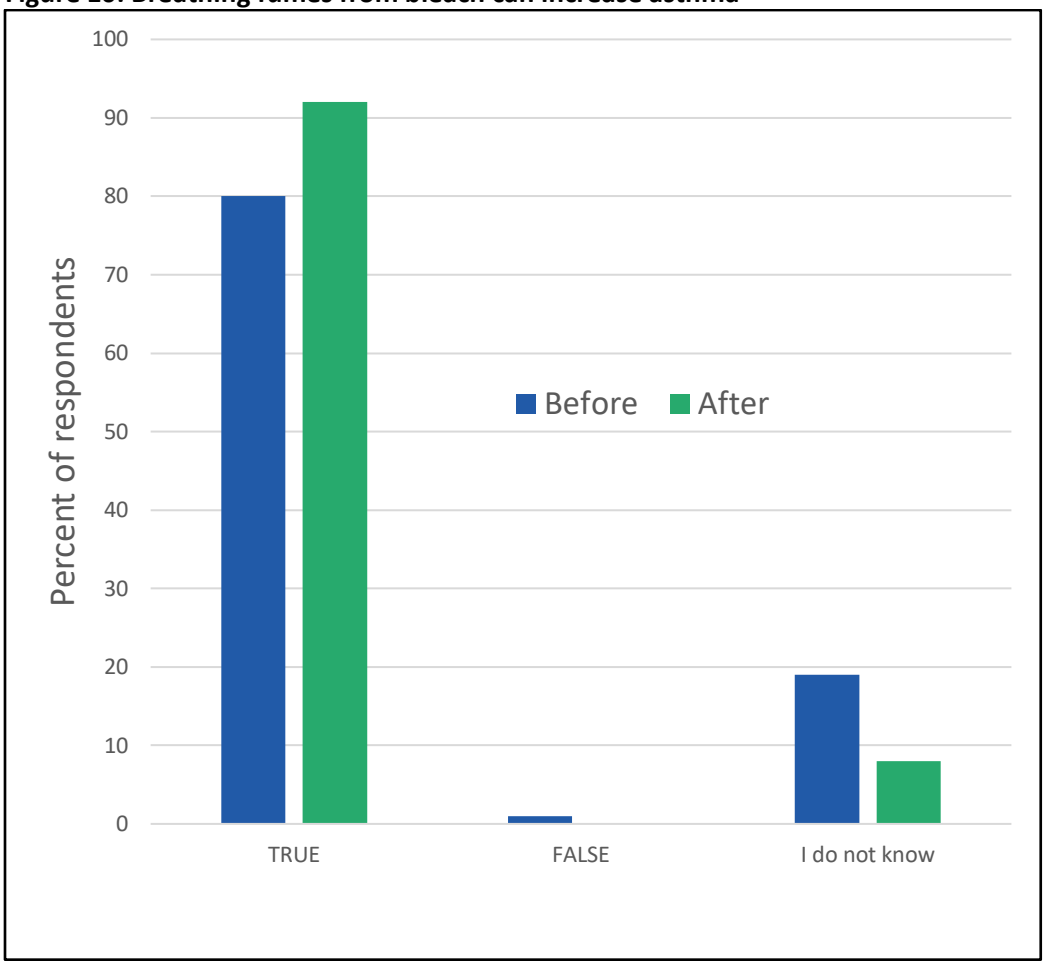
Before the training, 82% of participants believed that cleaning with bleach could increase the risk of skin problems; two months later, 92% of participants recognized the increased risk of skin problems when cleaning with bleach. See Figure 9 below.

Figure 9: Cleaning with bleach can increase the risk of skin problems



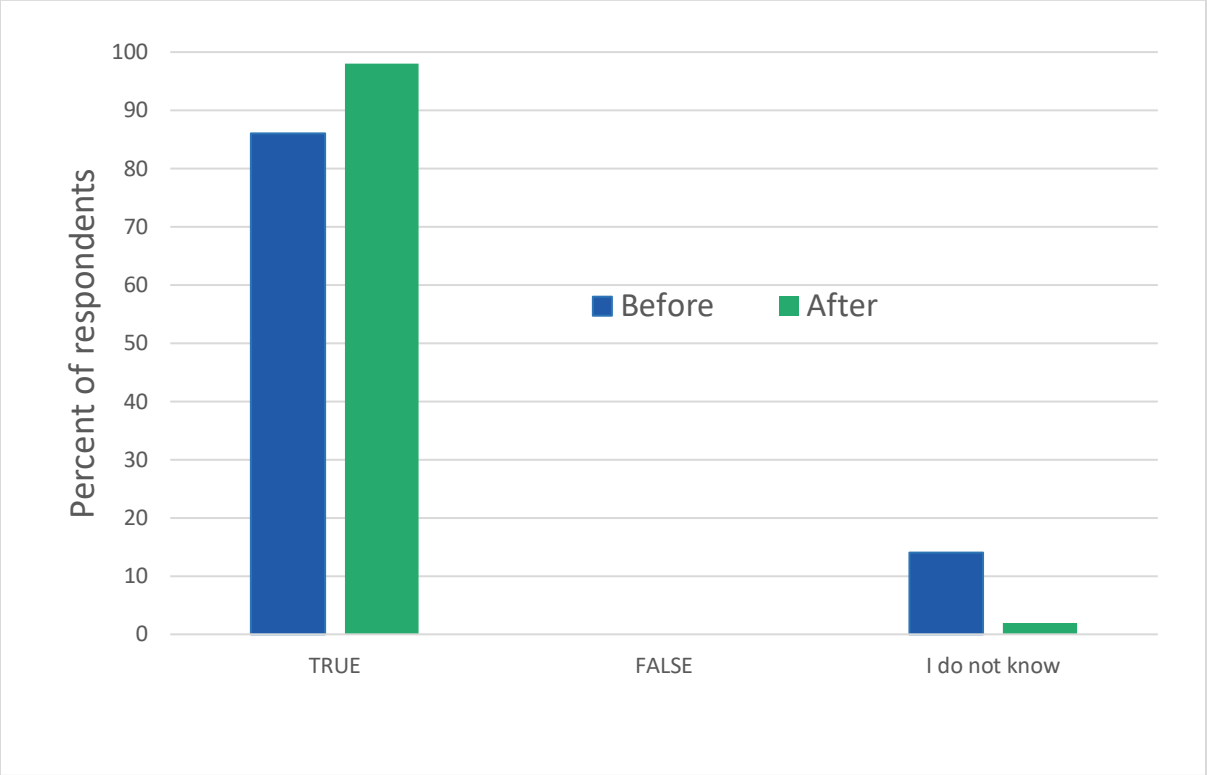
When asked whether breathing fumes from bleach can increase the chance of getting asthma, 80% of participants before the training thought this was true. Two months later, 92% identified this statement as true. This is illustrated in Figure 10 below.

Figure 10: Breathing fumes from bleach can increase asthma



When asked whether mixing different cleaning products could form a toxic gas, 86% of participants before the training stated this was true; two months afterward, 98% of respondents said it was true. See Figure 11 below.

Figure 11: Mixing cleaning products can form a toxic gas



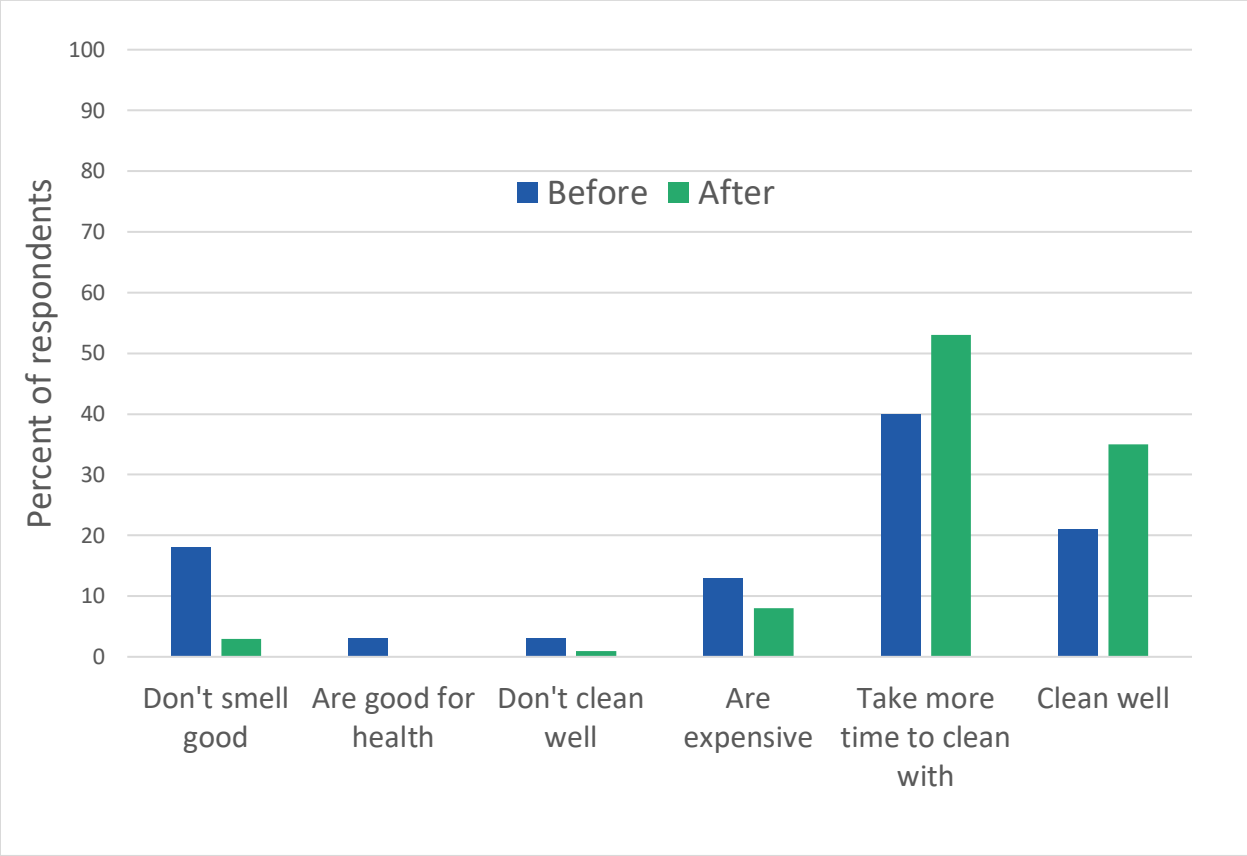
Opinions about safer cleaning products: reducing barriers and increasing motivators

During the two-month evaluation call, participants were asked about their opinions on safer cleaning products again, like dish soap, vinegar, baking soda, or microfiber cloths. Participants could choose more than one option, so there were more than 51 answers. We saw a positive shift in attitude regarding safer cleaning products in the areas of effectiveness, smell, and price:

- **Effectiveness:** before the training, 21% of participants indicated that safer cleaning products "clean well," whereas two months later, 35% said they clean well.
- **Smell:** 18% of participants before the training believed safer cleaning products didn't smell good; however, two months later, only 3% of participants said they didn't smell good. It is possible they previously associated safer cleaning with vinegar. For this training, we intentionally provided five safer cleaning recipes that did not have vinegar.
- **Price:** before the training, 13% indicated safer cleaning products were expensive, whereas after the training, only eight percent thought they were expensive.

We also observe that before the training, 40% believed that safer cleaning products took more time to clean, and two months later, more participants stated (53%) thought that they took more time to clean with. Figure 12 below summarizes their opinions on this.

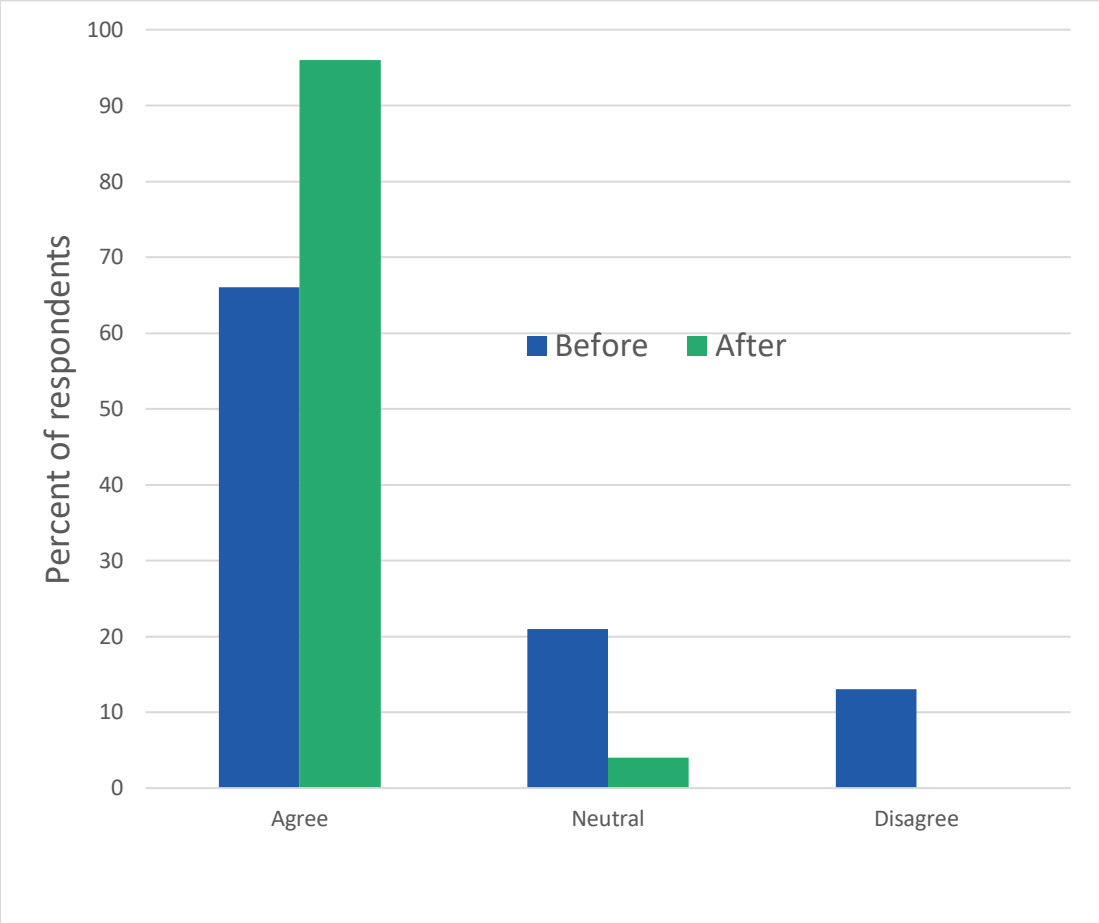
Figure 12: Summary feedback on cleaning products – vinegar, dish soap, baking powder



When asked before the training if it is worth their time to make cleaning products at home, 66% of participants indicated that it was; after the training 96% stated it was worth their time.

Figure 13 illustrates these results.

Figure 13: Making cleaning products at home is worth my time

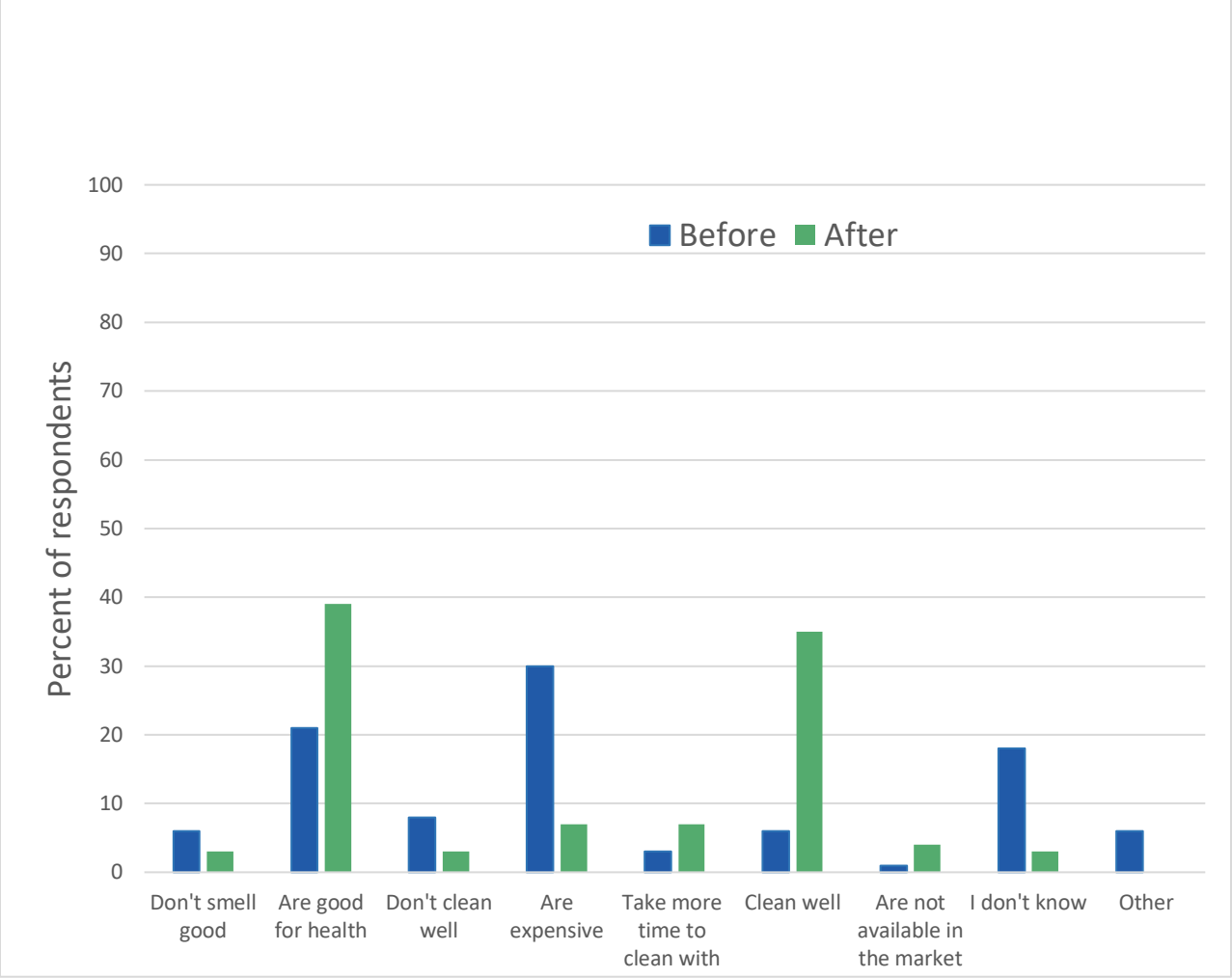


In addition to learning how to make a safer cleaning product using the recipe card, we gave participants a store-bought EPA Safer Choice all-purpose spray, and they practiced using this cleaning product in their home. Two months after the in-home visit, we asked them their opinions on safer products people can buy in the store. We saw the most changed opinions in these areas:

- **Price:** before the visit, 30% believed that safer cleaning products people can buy in the store were expensive, and after the visit, only seven percent thought they were expensive.
- **Effectiveness** (cleans well): prior to the visit, only eight percent of participants believed that store-bought safer cleaning products clean well, but after the visit, the number increased to 35%.
- **Health:** before the visit, 21% indicated these products are good for their health, and after the visit, the number increased to 39%.

Figure 14 summarizes these results.

Figure 14: Summary of feedback on store-bought safer cleaning products



Increased self-efficacy in using safer cleaning products

We asked the participants if they knew how to make a cleaning product from a recipe, and if they were confident they could make their cleaning products for their home.

The results indicate increased self-efficacy in both areas. Before our training, 73% reported they knew how to make a cleaning product using a recipe. However, two months later, this percentage rose to 94%. See Figure 15 below.

Figure 15: Increased self-efficacy in making a safer cleaner using a recipe

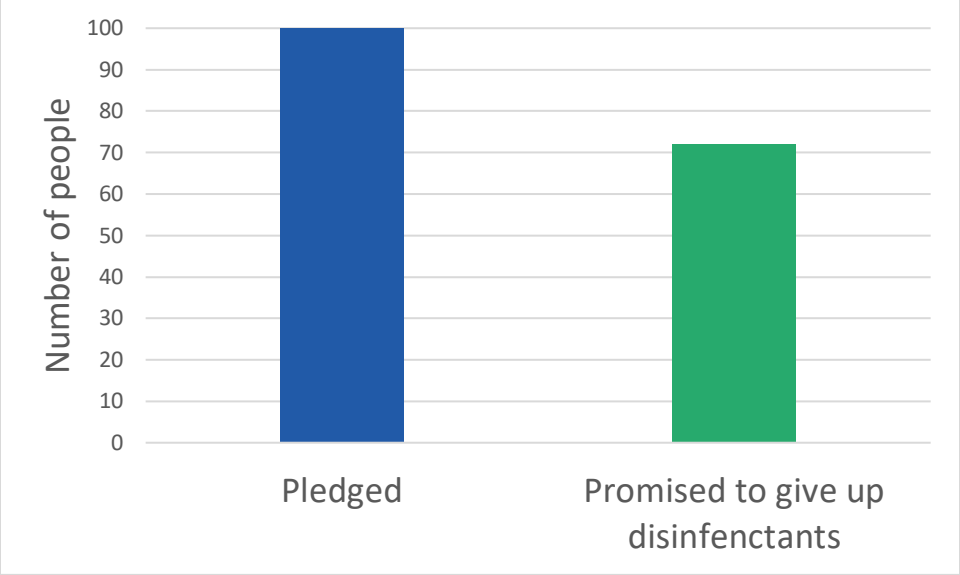
Pledge

At the end of the in-home training, all participants agreed to stop using a hazardous cleaner in one area of their home and instead use a safer cleaning product for two months.

When filling out the pledge, the participants chose between using an EPA Safer Choice product and using a safer cleaning product they make from a recipe. Thirty-five participants (46%) said they would make their own safer cleaning products, while 41 participants (54%) promised to use the EPA Safer Choice all-purpose spray that people can buy at a store.

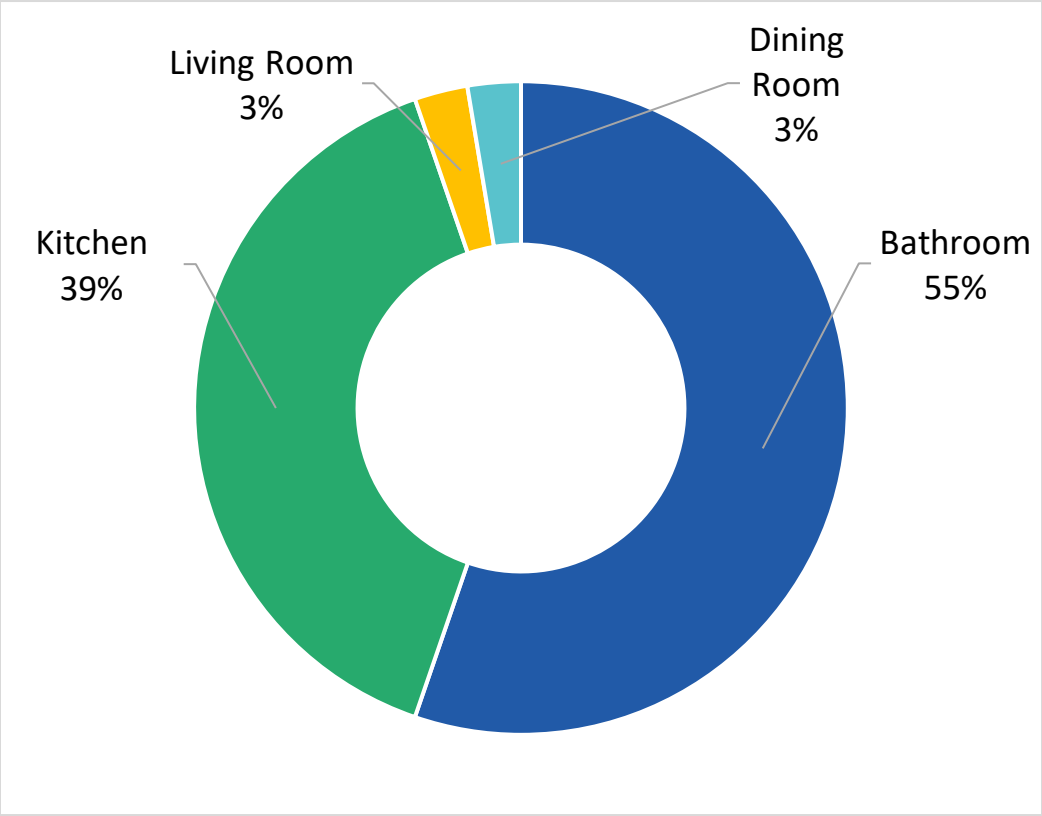
Fifty-five participants (72%) promised to give up a disinfectant and instead use a safer cleaning product, in the area where they pledged to use a safer cleaner. See Figure 16 below. The three most common disinfectants given up were (1) bleach or bleach-containing all-purpose cleaning products (2) Lysol and all-purpose products containing Lysol, and (3) Pine-Sol.

Figure 16: Participants who pledged and gave up disinfectants



Most participants chose the bathroom to use the safer cleaning products, followed by the kitchen. The surfaces they pledged most to clean were the toilet, the kitchen counters, and the bathroom tub and sink. Figure 17 shows the distribution of rooms where participants chose to use safer cleaning products.

Figure 17: Distribution of rooms where participants chose to use safer cleaning products



Discussion

Increased awareness of the risks of using some chemical cleaning products

After the Field Team reviewed the health risk flyer with the participants, participants shared their experiences and concerns about how the cleaning products were personally impacting them or someone they know.

- “When I clean, it makes me sneeze and cry. It's bad.”
- “I have asthma, and Clorox affects it.”
- “Mixing bleach and soap to wash the dishes hurts my breathing. Fragrances can cause allergies.”
- “Clorox causes eye and skin irritation. I didn't know that the fumes were toxic and so harmful.”
- “I work in a hotel, and they gave us chemical cleaning products to use, and we thought they didn't clean well so we added soap. It caused a skin rash from using [it].”
- “[Mixing products] causes breathing problems for days.”

When the Field Team sorted the participants’ cleaning products according to the “signal words” on the product label (CAUTION, WARNING, DANGER, and POISON) and explained that these words were required by law because the products were hazardous, the expressions on their faces revealed that most were surprised they had harmful cleaning products in their homes.

Health appeared to be a strong motivator for this community, and the focus of health in this training appeared to be effective. In the two-month follow-up call, several participants commented on how their health had improved because of using safer cleaning products:

- “I feel better with my asthma. Thank you very much.”
- “I am using all the products for my health. They are very good, and I don’t feel any allergies. I am happy to use them.”
- “I can’t believe that just baking soda and soap cleaned my bathroom. Now I have no side effects.”
- “[I’m] doing the recipes and I’m doing better with my asthma.”
- “I don’t get allergies with [ECOS]. Thank you for teaching me.”

Reducing barriers and increasing motivation to use safer cleaning products

Frequently voiced barriers to using safer cleaning products in the Latino/Hispanic community include lack of familiarity, disagreeable odor, longer cleaning times, cost, and poor performance.

The hands-on training and cleaning products in the safer cleaning kit the Field Team provided allowed participants to gain familiarity with them. Making and using the cleaning products in their own homes allowed them to test their effectiveness and odor. The participants also expressed their approval of these cleaning products:

- “Wow! It cleans well!”
- “Good and cheaper than the products I am using.”
- “It cleaned, and it was fast.”

- “My hands are very bad I think because of the dangerous cleaning products, and I have eczema. Now I will be better. The floor is fine, I thought it was going to be sticky, but it looks good.”
- “It looks good, and the smell is fine.”

One goal of the training was for participants to pledge to clean one area of their home with a safer cleaning product for two months. However, at the end of the training almost half of participants expressed a desire to go beyond their pledge and stated they would clean their entire home with the safer cleaning products.

Members of this community have indicated over the years that a motivator they consider when buying and using cleaning products is that they “clean fast”. During the two-month follow up call, participants stated that cleaning with the safer products Sea Mar left took longer but they continued to use them anyway, indicating a commitment to protecting their family’s health. (see Figure 12).

Increased self-confidence in making and using safer cleaning products

Participants’ comments indicated that their confidence in making and using safer cleaning products had greatly increased. Below is a sampling of their comments:

- “I clean the tub with baking soda, and I like the way it looks.”
- “I used all the products you gave me, in addition, I went to the store and bought multiple ECOS products because I don't get allergies with those. Thank you for teaching me."
- “I have been using the products you gave me. I like them; I bought some products at WinCo's.”
- “Yesterday I cleaned my toilet with a little bit more of the dish soap I added vinegar and baking soda. It looks good.”

Strengths and limitations of the study

Strengths

One major strength of this study is the Latino/Hispanic community’s readiness for this information. Over the years this community has expressed their desire to have information about the health risks of some cleaning products and training on safer cleaning. Health is a significant motivator for this community, and we were able to provide them with effective and healthier ways to clean. We listened and wanted to be proactive with this community, to increase awareness about exposures to toxic cleaning chemicals, and provide education on safer alternatives.

Another strength of this study was our partnership with Sea Mar Community Health Centers, which played a crucial role in all phases of this project. Sea Mar is highly trusted in this community. Because Sea Mar employs native Spanish speakers, they were able to work in language with the participants, making the training much more effective. In addition, the Field Team is highly skilled in developing relationships with the participants. During the two-month evaluation, many participants asked for them by name, requesting they call them regarding their additional cleaning questions.

Finally, another strength of this project was the Field Team’s commitment and passion for teaching safer cleaning practices and their determination to continue recruiting after the increased ICE raids in their

community. Recruitment required the Field Team to be very flexible in their hours to accommodate participants' schedules, who frequently worked seven days a week and sometimes started early in the morning and working late into the evening.

Limitations

Upon reflection, our survey questions about bleach and mixing chemicals (Figures 9, 10, and 11) were leading and likely would have encouraged people to respond that they were familiar with these issues when they may not have been. We will reframe future questions to avoid being leading by making them open-ended.

Also, feedback from our Field Team about the survey questions, which were written in English and then translated into Spanish, revealed that we did not consider the various education levels of participants (from no education to college level). Therefore, some participants may not have been familiar with the words used or may have misinterpreted the questions.

The two-month evaluation was conducted over the phone, rather than in-person. We recognize that the best way to evaluate whether participants have changed behavior is via direct observation. However, this was not possible given that the desired behavior took place in their homes.

Only 51 of the 76 participants responded to the two-month evaluation. Thus, we cannot exclude the possibility of response bias. In other words, we cannot be sure that the responses of these 51 respondents were representative of the original 76 participants.

Because of the small number of homes visited, this study does not allow us to extrapolate the results to all Spanish-speaking immigrants in King County.

We recognize that a two-month evaluation is not enough time to evaluate long-term behavior change. Research shows that it takes between 18 to 224 days to make a new behavior a habit and that it varies according to individuals (Lally, 2009). Therefore, in an extension of this project with Sea Mar in 2020, we will call the 76 participants six- to nine- months after their visit to evaluate whether participants are continuing the desired cleaning practice.

Challenges and lessons learned

Participant recruitment

Recruitment started in early May 2019 and continued with relative ease until mid-July, when President Trump tweeted that he was increasing Immigration and Customs Enforcement or ICE raids. This environment created great fear in many immigrants, including the Latino/Hispanic community. The Field Team found it much more difficult to recruit participants. After mid-July, 60% of those they did recruit, either canceled or did not answer the door for their appointment. Despite this challenge, the Field Team increased its recruiting efforts and was able to complete the number of trainings specified in the contract.

Data collection tool

We used Snap Survey to record the data in real-time during the trainings. The tool was flexible and allowed the Field Team to view the script that matched each question, as well as to enter data and comments. Unfortunately, the online survey tool failed about 10% of the time, causing gaps in data collection. We were not able to determine if this was due to a software issue or operator error. This situation greatly increased the work of the Field Team, who began carrying paper copies of the test questions and script so they could continue their visit and data collection with as little interruption as possible. Even with this technical difficulty, the Field Team was able to record pledge information from all 76 home trainings.

We will work with the Snap Survey technical team to analyze possible causes of and solutions to the problem.

Survey questions

The survey questions were developed in English and then translated by the Field Team into Spanish. The Field Team then conducted a community review to ensure the translation met Universal Spanish requirements. In the testing phase, we heard complaints about redundancy in the questions and awkwardness of the phrasing. It took several edits before the Field Team and participants in the pilot tests were comfortable with the questions. We intend to continue to refine the questions to make them more understandable.

EPA Safer Choice cleaning products

During the planning phase of this project, only one all-purpose spray cleaner (ECOS) had an EPA Safer Choice label that was similarly priced to products popular with our audience. As of June 2020, the Seventh G eneration brand added the EPA Safer Choice label to their dish soap. This brand is also in a priced similarly to the ECOS product. Consequently, we now have a second product line to recommend, which gives our communities more options and greater ease in finding safer cleaning products.

Because EPA Safer Choice products are not available in all stores in King County, the Field Team shared with each participant the names of stores where these products are available in their area. However, several participants did not remember where to buy Safer Choice products. For the next phase of this project, we will consider the best way for the Field Team to help participants retain this information.

We also learned that participants remembered the brand name ECOS but were not familiar with the EPA Safer Choice label. Again, in this project's next phase, we will spend more time teaching about the EPA Safer Choice label and put less emphasis on the brand name.

Conclusions and recommendations

Conclusions

The in-home safer cleaning training was effective in modifying the cleaning practices of the participants for two months. It also resulted in an increased awareness of the risk of hazardous cleaning products and increased self-efficacy and motivation to make safer cleaning products.

We compared the data collected from participants who received a seven- to ten-day follow-up call with those that did not receive follow-up calls. We noticed no remarkable difference between these two groups.

These findings indicate that it would be beneficial to continue this approach in the Latino/Hispanic community to see if these results can be repeated. In an extension of this project in 2020, we will conduct a 9-to 12-month follow-up call with the 76 homes to determine whether participants are still using safer cleaning products.

Recommendations

Some participants commented that the EPA Safer Choice cleaning products were not available where they shopped. We recommend increasing the market availability of EPA Safer Choice label products, especially the all-purpose sprays, through targeted outreach to stores frequented by our audience.

During the research phase of this project, added fragrances to products was a concern among many of the stakeholders. We recommend adding messaging in the training script about the potential hazards of fragrances along with messaging about the safety of fragrances in products with an EPA Safer Choice label.

With the goal of protecting the health of those that have the most exposure to hazardous cleaning products, we recommend holding a workshop for residential professional cleaners to hear about their experiences. We would like to learn how to support them in reducing their exposures to hazardous cleaning products.

In addition to continuing the private in-home training, we recommend a multifaceted outreach approach to increase awareness of the health risks of using hazardous household cleaning products. This could include the following:

- Continue to provide information about how to make and identify safer cleaning products.
- Provide this information via influential social media sites, local radio, and other outreach to the local Latino/Hispanic community.
- Collaborate with other community-based organizations, academic institutions, and housing agencies to spread this message.

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Appendix A:
Project staff & equipment

Appendix B:
Script: survey questions and in-home training script

Appendix C:
Logic model to promote safer cleaning practices in in-home training

Appendix D:
Health flyer/pledge;
How can I buy a safer product;
Recipe card: English and Spanish

Appendix E:
Script: Screening participants for training: English and Spanish

Appendix F:
Seven- to ten-day follow up call;
Two-month evaluation call: English & Spanish