



Video by Alfonso Velasquez

Public Health students use capstone project to think globally, but act locally by finding safe solutions to clean reusable bags.

STUDENTS TEST SAFER CLEANING SOLUTIONS FOR SENIOR CAPSTONE PROJECT



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By Karen Angelo

A team of public health students from the [Zuckerberg College of Health Sciences \(uml.edu/Health-Sciences/default.aspx\)](http://uml.edu/Health-Sciences/default.aspx) has found that we pack more than groceries in reusable bags. Gym clothes, lunch and laundry are just a few of the other items that get transported in them. And how do we clean those reusable bags? Most of us don't.

Public health students Nicole Kebler, Adorrah Khan, Ross Goding and Spencer Gifford found safer cleaners for reusable bags.

Nicole Kebler, Adorrah Khan and Ross Goding, seniors who are working at the [Toxics Use Reduction Institute \(TURI\)](http://www.turi.org) (<http://www.turi.org>) on their capstone project, conducted a survey on consumer habits related to

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cleaning reusable bags for the town of Westford, which instituted a ban on plastic bags on Jan. 1.

“We found that more than 96 percent of the survey’s participants ‘sometimes’ or ‘never’ clean their bags, and more than 60 percent never replaced their bags,” says Kebler. “This question got me thinking about my own habits, and I realized I wouldn’t want a shirt that I use once or twice a week to go unwashed for six months to a year. From the survey results, we decided it was important to find cleaning solutions made from common ingredients that customers might have at home.”

With growing concerns about the environmental impact of single-use plastic bags, more communities are restricting them. In Massachusetts, 40 percent of cities and towns have enacted bans, which are expected to reduce litter, protect marine and wildlife and cut greenhouse gas emissions and solid waste. Along with Westford, Lowell also instituted a single-use plastic bag ban this year.

Jeffrey Stephens, Westford’s health director, was concerned about keeping reusable bags clean to protect public health, so he asked TURI to help find safe cleaning solutions. The students worked with Stephens under the supervision of Alicia McCarthy, a laboratory specialist at TURI.

“We wanted to encourage our residents to clean their reusable bags with safer products, rather than use harsh chemicals,” says Stephens. “We didn’t expect to learn from the survey that many people don’t clean their bags at all. This makes it even more important for us to get the word out on how to effectively clean reusable bags.”

Students Evaluate DIY Cleaning Recipes

Based on the survey feedback on what people carry in their bags, the students tested how well cleaning formulations removed various soils. With assistance from graduate student Spencer Gifford, they searched for effective and safer cleaning solutions that consumers can make at home.

“We tested the removal of soils such as ink, flour, peanut butter, ketchup and sweat and came up with three formulations that work on the various materials,” says Le Khan.

The first recipe, which is effective on cotton, reusable plastic and insulated bags, contains:

- 1 cup of warm water
- 1 tablespoon of castile soap
- 1 teaspoon of baking soda

The second recipe is effective on plastic reusable and insulated bags:

- 1 ½ cups of warm water
- 1 tablespoon of lemon juice
- ¼ cup of hydrogen peroxide

The third recipe is effective on plastic reusable and cotton bags:

- 1 to 2 teaspoons of baking soda (or enough to cover the stain)
- 1 tablespoon of vinegar, poured onto the baking soda

Taking the project a step further, the students are now working with [Assoc. Prof. Nancy Goodyear](http://uml.edu/umass-BMEBT/faculty/Goodyear-Nancy.aspx) (uml.edu/umass-BMEBT/faculty/Goodyear-Nancy.aspx) of [Biomedical and Nutritional Sciences](http://uml.edu/Health-Sciences/biomedical-nutritional/default.aspx) (uml.edu/Health-Sciences/biomedical-nutritional/default.aspx) to evaluate whether do-it-yourself cleaners and affordable safer solutions can remove bacteria.

“From our previous experience, we know that cleaning solutions can do a good job removing bacteria, so we want to let people know this before they reach for harsh cleaning chemicals or disinfection wipes,” says McCarthy.

Students Gain Research and Communication Experience

The students say that the reusable bag project has not only given them important lab and research experience, it is also helping them sharpen their communications skills.

“The Westford Department of Public Health offered us an opportunity to communicate to the public about our research on cleaning these bags,” Goding says. “We compiled the survey results and recipes in a brochure to educate residents.”

Stephens, who often hires UML students for public health internships, says the students were professional and helpful.

“The students listened intently to what we were trying to achieve, and they came up with a plan and then implemented it,” says Stephens. “Working with this group of students was fantastic, and TURI is a fantastic part of the university.”

An important lesson for students, says McCarthy, is how to communicate science in a way that will trigger change.

“It’s important to know how to take information and translate that in a way your target audience understands and cares about,” she says.

To help get the word out to the public, the students are developing a public service announcement (PSA) with the help of Lowell Telecommunications Corporation. They took a video editing course and created a storyboard. The PSA, they hope, will influence residents to clean their reusable bags with safer and less expensive products.