

An Engineer's Mission to Combat Mold and Disease Transmission in Puerto Rico

*A Guest Article by Andrew Robertson, PE
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Hurricanes Irma and Maria, now distant memories for most Americans, remain top of mind for Puerto Ricans who are still laboring to recover from those historic storms. As an engineer-volunteer for [Water Engineers for the Americas \(WEFTA\)](#), I traveled with my 13-year old daughter, Kati, to Puerto Rico this spring to lend a helping hand.

Battling Mold and Bacteria

During the hurricanes, many homes in Puerto Rico flooded with contaminated water. But the problem didn't end there - many homes had their roofs blown away, so every time it rains, the homes flood again. Water finds its way under roofs and in walls and ceilings, causing a major infestation of mold and other microbes.

Structures with severe damage are completely covered with mold, creating a health hazard for residents and recovery workers alike. Moreover, according to local public health workers, bacterial contamination in people's homes has led to a marked increase in infectious diseases, such as gastrointestinal diseases and respiratory infections.

Kati and I arrived in Puerto Rico in late March, in time to help address these problems with a tool from the world of chemistry: a donation of 4,000 pounds of chlorine disinfectant from the [American Chemistry Council's Chlorine Chemistry](#)



The author instructs community leaders in a train-the-trainer session on packaging chlorine disinfectant for individual household disinfection and mold removal in Canóvanas, Puerto Rico.

Division. The product, granular “NaDCC¹,” was waiting for us in a temporary warehouse set up for Operation Blessing International. Together with the Institute of Science for the Conservation of Puerto Rico (InCiCo), we spent the next week visiting five communities with a combined population of 10,000 people to help residents learn to disinfect their homes.

Training the Trainers

WEFTA’s and InCiCo’s strategy was to identify local leaders in each of the five communities, and train them on how to (a) safely package the disinfectant from 50-pound pails into six-ounce bags, and (b) use the disinfectant safely in the home. These local leaders would then be responsible for re-packaging and distributing the bags of chlorine within their neighborhoods, and most importantly, teaching their neighbors how to use the product to disinfect their homes safely. Hence, our mission was to “train the trainers”; the door-to-door training of residents is being done by these local community volunteers.

I would be remiss if I failed to mention the importance of providing good quality



Community residents in Puerto Rico work to package chlorine disinfectant for mold and bacteria remediation.

photos and training materials for the community volunteers to work with. Kati played a key role as our official trip photographer.

Traditionally, Puerto Ricans use chlorine bleach for household sanitation and disinfection, but bleach has been in short supply since the hurricanes. An advantage of using NaDCC is that it has a longer shelf life than bleach, while providing the same mold- and pathogen-busting chemistry. Solutions can be prepared on an as-needed basis.

More Trouble to Come?

In addition to the serious problems of mold and bacterial infections, another consequence of the waterlogged landscape is mosquitoes and the diseases they transmit. Zika, dengue and chikungunya were endemic in Puerto Rico before the hurricanes, but they are undoubtedly worse now. Why? One of the main tenets of mosquito-borne disease prevention is to avoid leaving objects outdoors that can collect water, such as old tires, cups or pots, because mosquitoes breed in small pools of stagnant water. Imagine what happens when a hurricane wrecks houses and strews debris – pieces of corrugated roofing, kitchen sinks and



The author’s daughter, Kati, during their mission to Puerto Rico

¹ Sodium dichloroisocyanurate is commonly used as a swimming pool water disinfectant and in formulations for cleaners and sanitizers. It also can be used for emergency drinking water disinfection.

refrigerators—all over the place, and that place is surrounded by dense vegetation. Even uprooted trees can trap water in the overturned root balls. The result is there are many more mosquito breeding areas near population centers now than before the storms.

InCiCo has a three-pronged strategy to address this (humorously called the “*Tres Mosquiteros*”, which in Spanish means both “three musketeers” and “three mosquito-hunters”). The three *mosquiteros* are: (1) distributing insect repellent, (2) teaching community members to make and use mosquito nets, and (3) removing and disinfecting storm debris that holds stagnant water.

Puerto Rico has suffered on a historic scale during the past eight months. But what Kati and I heard from residents again and again is that “*lo que no nos mata nos hace más fuerte*” (“what doesn’t kill us makes us stronger”) and “*Puerto Rico se levantará*” (“Puerto Rico will rise.”) Puerto Rico will rise up stronger than before, thanks to the resilience of its people. The American Chemistry Council gave them a tool to help themselves.

In his day job, Andrew Robertson is vice-president of Souder, Miller & Associates, a mid-sized civil/ environment engineering consulting firm in New Mexico. He volunteers with WEFTA on weekends and during his vacation time. Katarina Inocencia Robertson, age 13, was born in New Mexico, but her mother’s family is from Puerto Rico. Her grandmother lives in Guayama, Puerto Rico, a few miles from one of the communities where WEFTA works.

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