

Houston residents' chemical exposure increased post-Hurricane Harvey, study finds

July 18 2022, by Molly Rosbach



Credit: Pixabay/CC0 Public Domain

Researchers at Oregon State University used silicone wristbands to measure Houston residents' increased exposure to hazardous chemicals in the wake of Hurricane Harvey in 2017.

The wristbands recorded exposures to 162 different chemicals, including pesticides, flame retardants, industrial compounds, phthalates and [polycyclic aromatic hydrocarbons](#).

Researchers followed up with study participants a year after Harvey to approximate a baseline so they could parse out which exposures were caused by the storm. On average, 75% of the chemicals detected across both timepoints were found in higher concentrations immediately after the [hurricane](#), but people's baseline exposure was already high.

"Houston is one of our most industrialized cities," said co-author Kim Anderson, head of OSU's Department of Environmental and Molecular Toxicology and the inventor of the study's wristbands. "When we look a year after the storm, we see that several neighborhoods that are closer to industrial zones—socioeconomically disadvantaged neighborhoods—had higher concentrations of chemicals right from the get-go, and that was only exacerbated when the hurricane came in."

The silicone wristbands absorb chemicals from the air and from skin contact, making them a useful screening tool. Anderson has used them in similar studies in Africa, Europe and South America.

Many of the chemicals recorded in the Houston study have not yet been thoroughly tested to determine their potential health effects, researchers said. But some heavier polycyclic aromatic hydrocarbons have been found to be carcinogenic, and phthalate exposure can have adverse effects on reproductive health.

The research team started work almost immediately after Harvey made landfall, receiving approval for sampling within a week and distributing wristbands for the study to 173 residents within three weeks.

"At that point, flooding was still occurring. I think that's a huge strength

of this study," said co-author Diana Rohlman, associate professor in OSU'S College of Public Health and Human Sciences. "From the public health perspective, that's the data people want: 'I'm actively flooded, actively cleaning my house; what am I being exposed to right now?'"

This rapid response is important, she said, as previous disaster responses were slowed up to six months waiting on testing approval, such as with the Gulf of Mexico oil spill in 2010.

The team also conducted a small pilot study of 27 residents within the first 10 days after Harvey hit. Those 27 samples had the largest number of chemicals of any study the researchers have done anywhere else in the world, Anderson said.

A major concern in Houston was the number of Superfund sites that were damaged by flooding after Harvey. Superfund sites are areas with severe enough pollution that the Environmental Protection Agency has deemed them in need of federal mitigation efforts.

A 2020 report by the Shriver Center on Poverty Law found that 70% of Superfund sites nationwide are located within a mile of federal housing projects, underscoring the disproportionate burden of pollution placed on low-income communities, most often communities of color.

The state of Oregon has nine Superfund sites in total; the city of Houston has 41. Of these, 13 were flooded during the hurricane, but the sum effect of that flooding is unclear, researchers said.

"There is this pocket of contaminants that mobilized in the water, but they were also in five feet of rain, which could be a diluting factor," Anderson said.

Within the first few days of the hurricane, 89 industries reported

"unintentional releases," Rohlman said. Some plants in Houston shut down in the storm's aftermath, which reduced their emissions, but the state of Texas also granted emergency exemptions from clean air requirements for manufacturing plants, so some may have been polluting more, researchers said.

In addition to chemicals unleashed by [storm damage](#), the wristbands also recorded many chemicals used in common household cleaners, which residents were exposed to as they cleaned their homes after the flooding.

Until more research is done on the individual chemicals recorded in the study, Rohlman said they can't offer specific safety information other than the standard recommendation to wear gloves and masks when cleaning up flooded areas.

The research was published in the *International Journal of Environmental Research and Public Health*. Additional authors on the Houston study were Samantha Samon, Lane Tidwell and Peter Hoffman at OSU and Abiodun Oluyomi at Baylor College of Medicine.

More information: Samantha M. Samon et al, Associating Increased Chemical Exposure to Hurricane Harvey in a Longitudinal Panel Using Silicone Wristbands, *International Journal of Environmental Research and Public Health* (2022). [DOI: 10.3390/ijerph19116670](https://doi.org/10.3390/ijerph19116670)

Provided by Oregon State University

Citation: Houston residents' chemical exposure increased post-Hurricane Harvey, study finds (2022, July 18) retrieved 18 May 2024 from <https://medicalxpress.com/news/2022-07-houston-residents-chemical-exposure-post-hurricane.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.