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Study: Polluting chemicals found in high levels in local people

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Noah Scovronick, Ph.D., an Emory University professor, discusses the results of a pilot study on Tuesday at Howard Coffin Park looking at local human exposure to polluting chemicals.

Michael Hall/The Brunswick News

Hal Hart wasn't totally surprised to learn he had higher-than-average levels of polluting chemicals in his blood.

He has lived in Glynn County his entire life, not far from industrial operations whose tarnished environmental legacies have left behind federal Superfund cleanup sites and several other areas of concern that require environmental mitigation.

“I’ve been around here forever,” Hart said Tuesday after hearing a presentation on the results of an Emory University pilot study that informed him of the high levels of things like PCBs and Toxaphene in the 100 local people tested. “My numbers were all over the place. Some things were really high. Some things weren’t.”



One thing Hart is sure of is that researchers need more money to expand the study so that the people of Glynn County can get a clearer picture of how pollutants are affecting their lives and potentially their health.

A team of researchers from Emory’s Rollins School of Public Health presented the results of their small study Tuesday at Howard Coffin Park in Brunswick to a crowd of more than 100 people. Some people present were participants in the study and armed with a chart showing specific levels of chemicals in their blood and how the levels relate to the average American’s exposure levels. Other people came to learn about how much pollutants in the local environment may be impacting local people.

Several local organizations assisted with the study.

The interests of the researchers were piqued by the proliferation locally of active environmental cleanup sites and legacies left by industrial operations and how they may be affecting humans. They know already, thanks to a 2016 study, that PCBs and other chemicals were found in the highest levels ever in local dolphins and also in humans on Sapelo Island.

“We have not known if the pollutants have entered the bodies of people,” said Noah Scovronick, Ph.D., assistant professor of environmental health at Emory. “We wanted to know what does it mean to grow up, to raise your families around these sites.”

He laid out a few caveats about the study and results before presenting them. The study only looked at exposure levels in the individuals who voluntarily gave blood to be tested, he said.

Researchers cannot answer when or how exposures to chemicals occurred. The study also did not collect information on health impacts or diseases people may have experienced or will experience as a result of the exposures.

Scovronick's colleague, Melanie Pearson, Ph.D., director of community engagement for the Rollins School at Emory, said the presentation on Tuesday was of aggregate results prior to the study being peer reviewed. A final report may look a little different than the results presented Tuesday, she said. The researchers wanted to show the community the results first, she said.

"Our position is that this is your data," Pearson said. "This is literally hot off the press."

The peer review process could take another 12-18 months, Scovronick said.

The study drew blood from 100 people in Glynn County. The average age of the participants was 60, 67% of whom were female and 33% of whom were male. The participants were also 46% Black and 54% White. The average participant has lived in Glynn County for 47 years.

"So these were mostly long-term residents of Glynn County," Scovronick said.

EXPOSURES

The study tested for four types of chemicals – metals, lead, cadmium and mercury; pesticides, DDE and toxaphene; polychlorinated biphenyls, or PCBs; and per- and polyfluoroalkyl substances, or PFAS.

Researchers were particularly interested in levels of exposure to mercury, toxaphene and three types of PCBs.

PFAS are chemical substances used in firefighting foam and are also used in things like nonstick pans, water-repellent clothing and products that resist grease. Scovronick said the team decided to add PFAS later in the study because firefighter foam had been recently used in industrial fires like the one at Pinova on April 15.

METALS

Lead and mercury were found mostly in similar levels to what are found in average Americans, based on the CDC surveys they used to compare to the population studied locally. There were some study participants in both categories that tested above the 95th percentile, which means they had much higher exposure and are among the top 5% most exposed of Americans.

Mercury was of particular interest to the researchers, Scovronick said, because of the legacy left by LCP Chemicals at the 813-acre Superfund site off of Ross Road just north of Brunswick and adjacent to the current Glynn County Detention Center. Mercury is also known to exist in seafood, making Glynn County's coastal locale a prime spot for frequent seafood eaters.

Only one person tested above the high-exposure mark in the 95th percentile for mercury, Scovronick said.

Cadmium occurred in levels that were a little higher than what is found in the average American, but Scovronick said that was to be expected because it is also found in cigarettes and some of the participants noted that they smoke, he said.

"At this point, it is not something that has set off alarm bells for us," Scovronick said.

There were 96 participants whose blood was tested for metals. Some blood samples were not large enough for a proper test, he said.

PCBs

Polychlorinated biphenyls were banned in the 1970s but are still found in the environment because of half lives that can be upwards of 20 years. Half life means that in a period of time, the amount of a chemical compound will be half of what it was when first introduced into an environment.

Studies by the U.S. Environmental Protection Agency and the CDC in 2016 found PCBs present in all marine life in local waterways and in humans on Sapelo Island.

Participants in Glynn County experienced lower exposure levels to four types of PCBs, which are manmade substances used in things like electronic equipment, hydraulic fluids and products to facilitate heat transfer in industrial operations. Those types of PCBs are identified by the numbers PCB 118, 138, 152 and 180. They are PCBs found more commonly in humans throughout the U.S., Scovronick said.

Three other types of PCBs — PCB 196/203, PCB 199 and PCB 206 — were the PCB compounds the researchers were most interested in because they were part of Aroclor 1268, a brand name chemical that was also used at the LCP Chemicals site, Scovronick said.

All three of those chemicals occurred on average among participants at levels higher than in average Americans when compared to the most recent CDC surveys.

About 40% of the participants tested at the highest, 95th-percentile levels for PCB 206, which is the most common component of Aroclor 1268. That is more than twice what the researchers would expect in the average population, Scovronick said.



Additionally more than 16% of the study participants tested at the highest levels for PCB 196/203 and more than 26% of participants tested at the highest levels for PCB 199.

Only 79 participants were tested for PCBs because some blood samples did not have enough blood to get a good reading, Scovronick said.

PESTICIDES

Researchers looked at two specific pesticide chemicals that were once produced in Glynn County – DDE, which is formed when DDT breaks down, and toxaphene, a pesticide outlawed in 1990 that was once produced at Hercules in Brunswick. DDT was banned in 1972.

Levels of DDE were on average among participants lower than the American average and no one tested higher than the 95th percentile threshold.

Toxaphene runoff is responsible for contaminated ground and water at the Terry Creek outfall Superfund site on the east side of U.S. 17 in Brunswick just north of the intersection with the F.J. Torras Causeway. That is across the road from where Hercules used to produce the chemical. Standing fish advisories are in place in the waterways around Terry Creek warning fishermen not to eat fish there.

Toxaphene exposure may affect the nervous system, kidneys, liver and may cause cancer, Scovronick said.

Researchers had to use a study of Canadians from 2009 for comparison because Americans have not been tested on a large scale for toxaphene exposure, Scovronick said.

About 25% of local participants' exposure exceeded the 95th percentile threshold for both toxaphene 26 and toxaphene 50. On average participants' exposure was elevated above what can be expected for most Americans.

Seventy-nine participants were tested for pesticides.

PFAS

Scovronick said the recent use of firefighting foam, which usually contains PFAS, prompted the test for the chemicals, but there were only 25 samples that could be tested. The tests found that exposure to PFAS was about the same as is found in average Americans, and that a couple of participants tested in the highest ranges.

Scovronick noted that where the average local participant and the average American values fall are within the range scientists say can create adverse health effects in humans.

The PFAS addition to the study was also noteworthy because the study of people living on Sapelo Island in 2016 showed elevated exposure levels in study participants.

Exposure to PFAS can affect reproduction, cause cancer, increase cholesterol and cause liver damage, among other things.

OTHER RESULTS

The researchers asked questions of each participant that included race and gender, where they live, if they smoke cigarettes and if they fish or eat locally caught seafood, among other things.

Fishermen had consistently higher levels of PCBs, toxaphene and PFAS in their blood than those who do not fish, the results showed.

Older people tended to have higher levels of toxaphene and PCBs in their blood, which was not surprising because the chemicals can build up over time and because they were around when some of the chemicals were being produced.

Black participants had slightly higher levels of the PCBs associated with Aroclor 1268 and toxaphene 26 in their blood. White participants had slightly higher levels of toxaphene 50 in their blood.

Those results are all still being analyzed, Scovronick said.

WHAT'S NEXT?

The researchers hope to expand the pilot study to a larger, more expansive peer-reviewed study and are already seeking funding to do so, Scovronick said. A larger study could cost as much as \$1 million to complete, he added.

“It takes a while to get funding for this type of study, but we are working on it madly,” he said.

In that larger study, researchers hope to have more participants and explore things like health outcomes and more details about where and how the exposures may occur.

With the pilot study, Scovronick said the team is planning to host webinars for health-care providers in Brunswick to review the results and hope to explore activities on how to reduce exposures.

The team is also working with Coastal Community Health to help establish care for people who may not have access to it so they can address potential issues from chemical exposures, Scovronick said.

“We really care about this work and have done everything we can to make this happen,” he said, citing local organizations who helped make the pilot study happen.

Alice Keyes, vice president of coastal conservation for the environmental group One Hundred Miles, said the study was long overdue and that she hopes this and future studies will help hold corporations accountable for pollution.

“There are generations of exposure to these chemicals,” Keyes said. “There has been damage to human bodies. This shows that there is a legacy to their actions.”

Local organizations involved included the Environmental Justice Advisory Board, Glynn Environmental Coalition, One Hundred Miles, Coastal Community Health, Coastal Equity and Resilience Hub, Community First Planning Commission, the UGA Marine Extension, EcoAction, the Glynn County Health Department and Rebuilding Together of Glynn County.

The study was funded through a pilot grant from Emory University’s Exposome Research Center.



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Chemical	Was the average level of study participants higher, lower or about the same compared to the average American?	Were any of the individual study participants as high as the most exposed 5% of Americans?
Lead	ABOUT THE SAME	YES
Cadmium	A LITTLE HIGHER	YES
Mercury	ABOUT THE SAME	YES
PCB 118	LOWER	NO
PCB 118	LOWER	NO
PCB 152	LOWER	NO
PCB 180	LOWER	YES
PCB 196/203	HIGHER	YES
PCB 199	HIGHER	YES
PCB 206	HIGHER	YES
DDE	LOWER	NO
Toxaphene 26	A LITTLE HIGHER / HIGHER	YES
Toxaphene 50	A LITTLE HIGHER / HIGHER	YES
Total PFAS	ABOUT THE SAME	YES

For all chemicals except toxaphene, (data on average Americans is based on the CDC's NHANES database. Toxaphene is based on a study by Health Canada.

Emory Study results
 Michael Hall 21 hrs ago

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