Researchers find Asian Americans to have significantly higher exposure to 'toxic forever' chemicals

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Asian Americans have significantly higher exposure than other ethnic or racial groups to PFAS, a family of thousands of synthetic chemicals also

known as "toxic forever" chemicals, Mount Sinai-led researchers report.

People frequently encounter PFAS (per- and polyfluoroalkyl substances) in everyday life, and these exposures carry potentially adverse health impacts, according to the study published in *Environmental Science and Technology*, in the special issue "Data Science for Advancing Environmental Science, Engineering, and Technology."

The scientists estimated a person's total exposure burden to PFAS and accounted for the exposure heterogeneity (for example, different diets and behaviors) of different groups of people that could expose them to different sets of PFAS.

They found that Asian Americans had a significantly high PFAS exposure than all other U.S. ethnic or racial groups, and that the median exposure score for Asian Americans was 89% higher than for non-Hispanic whites.

This is the first time that researchers accounted for complex exposure sources of different groups of people to calculate a person's exposure burden to PFAS. To achieve this, they used advanced psychometric and data science methods called mixture item response theory. The researchers analyzed human biomonitoring data from the U.S. National Health and Nutrition Examination Survey, a representative sample of the U.S. population.

This research suggests that biomonitoring and risk assessment should consider an exposure metric that takes into consideration the fact that different groups of people are exposed to many different sources and patterns of PFAS. Based on these findings, these researches believe that exposure sources, such as dietary sources and occupational exposure, may underlie the disparities in exposure burden. This will be an important topic of future work, as it is difficult to trace exposure sources

to PFAS because they are so ubiquitous.

"We found that if we used a customized burden scoring approach, we could uncover some disparities in PFAS exposure burden across population sub-groups," said Shelley Liu, Ph.D., Associate Professor of Population Health Science and Policy at the Icahn School of Medicine at Mount Sinai.

"These disparities are hidden if we use a one-size-fits-all approach to quantifying everyone's exposure burden. In order to advance precision environmental health, we need to optimally and equitably quantify exposure burden to PFAS mixtures, to ensure that our exposure burden metric used are fair and informative for all people."

PFAS pollution is a major health concern, and nearly all Americans have detectable levels of PFAS chemicals in their blood. PFAS are ubiquitous, and are used in products that resist heat, oil, stains, grease, and water. The Biden administration has allocated $9 billion to PFAS clean-up, and in March 2023, the Environmental Protection Agency proposed the first enforceable federal standards to regulate PFAS contamination in public drinking water.

In the future, Dr. Liu's team plans to incorporate toxicity information on each PFAS chemical into exposure burden scoring, to further evaluate disparities in toxicity-informed exposure burden in vulnerable groups and population subgroups.

More information: *Environmental Science and Technology* (2023).

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