CHE Collaborative for Health & Environment

Webinar Highlights

Chemicals and Pregnancy Complications: Findings from Nontargeted Analysis

Toxic chemicals are ubiquitous in the environment. Fewer than one percent of the more than 40,000 chemicals imported, processed, or used in the U.S. are regularly biomonitored. Still fewer have been evaluated for adverse health outcomes during pregnancy. Chemical exposures during pregnancy have been linked with lifelong consequences for both maternal and child health, including cardiovascular disease, diabetes, adverse infant neurodevelopment, and adverse reproductive outcomes. These health outcomes are increasing at rates that cannot be fully explained by genetics or improvements in diagnostics.

Nontargeted analysis (NTA) methods can help tentatively identify chemicals that are not regularly studied. After being identified, these chemicals can then be quantified through "targeted" methods, giving us the ability to evaluate associations with adverse health outcomes.

Dr. Jessica Trowbridge and Dr. Tracey Woodruff presented findings of their new study, Extending Nontargeted Discovery of Environmental Chemical Exposures during Pregnancy and Their Association with Pregnancy Complications—A Cross-Sectional Study. This research used the results of NTA methods to identify nine environmental chemicals in maternal samples and in cord blood, and their association with adverse pregnancy outcomes — measuring some of these chemicals for the first time in pregnant people.

Featured Speakers: Jessica Trowbridge, PhD, Associate Researcher with the Program on Reproductive Health and the Environment (PRHE) at the University of California, San Francisco and **Tracey Woodruff, PhD, MPH**, Director of and Alison S. Carlson Endowed Professor for PRHE, speaking September 14, 2023.

This fact sheet has been created by CHE based on information presented in an EDC Strategies Partnership webinar. Selected quotes in bold are from the webinar speaker(s). For the full set of resources provided by the webinar presenters, see the webinar page, where you'll also find associated slides and resources.

The Problem

Chemical production continues to increase. Only a fraction of these chemicals are regularly measured in people and fewer still are evaluated for exposure levels or health impacts among pregnant people or children.

Targeted analysis can be used to measure exposures to known toxicants. This approach, however, will not identify exposures to unknown chemicals. For unknown chemicals, researchers are turning to nontargeted analysis (NTA).

While NTA can help identify exposures, it does not quantify exposure levels; this approach can tell you what chemicals are present, but not their concentrations. The PRHE study measured concentrations of chemicals previously identified by NTA in maternal serum and cord blood samples, then looked for associations between those chemical exposures and pregnancy complications.

Key findings:

- Researchers found multiple chemical exposures in all study participants and in most cord blood samples.
- Chemicals measured included perfluoroalkyl substances (PFAS), abnormal fatty acids used in plastics production, and solvents used in consumer products, pesticide production, and plastics production.
- PFAS and the abnormal fatty acids identified were found to be associated with increased odds of gestational diabetes mellitus (GDM). The fatty acids were also found to be associated with preeclampsia and pregnancy-related hypertension.

> **"Pregnancy-related complications can have lifelong consequences for both the birthing parent and the infant."**

Recommendations

Biomonitoring studies can identify chemicals and their risks to pregnancy and health only after we have already been exposed. However, the speakers emphasized that to better protect health, chemicals should be screened for safety before, not after, their use and resulting exposures become widespread.

> **"These chemicals should be known and identified, so that we know where they're being used in commerce and we know their potential for adverse health effects — so we can prevent the exposures before we have to detect them in biomonitoring studies."**

To Find Out More

- Watch the September 14, 2023 webinar: Chemicals and Pregnancy Complications: Findings from Nontargeted Analysis
- Read the presentation slides: Chemicals and Pregnancy Complications: Findings from Non-Targeted Analysis
- Read the study: Extending Nontargeted Discovery of Environmental Chemical Exposures during Pregnancy and their Association with Pregnancy Complications: A Cross-Sectional Study

About the Speakers

Jessica Trowbridge, PhD is an Associate Researcher with the Program on Reproductive Health and the Environment (PRHE) at the University of California, San Francisco. Her curiosity about the impact of exposure to environmental chemicals on health came out of her experience living binationally and experiencing the environmental burdens of pollution in her communities in central Mexico and Richmond, California. She has studied exposures to toxic environmental chemicals in women firefighters and pregnant women. Dr. Trowbridge is a part of PRHE's Science and Policy team and she studies prenatal exposure to toxic environmental chemicals and infant neurodevelopment. Dr. Trowbridge is a proud community college graduate, after which she studied Environmental Health Sciences at the University of California, Berkeley.

Tracey Woodruff, PhD, MPH is the Director of and Alison S. Carlson Endowed Professor for PRHE and is a Professor in the UCSF Department of Obstetrics, Gynecology and Reproductive Sciences and the Philip R. Lee Institute for Health Policy Studies. She is also the Director of a newly awarded NIEHS Environmental Health Core Center grant, the Environmental Research and Translation for Health (EaRTH) Center at UCSF. She is a recognized expert on environmental pollution exposures and impacts on health, with a focus on pregnancy, infancy, and childhood, and her innovations in translating and communicating scientific findings for clinical and policy audiences. Before joining UCSF, Dr. Woodruff was a senior scientist and policy advisor for the U.S. EPA's Office of Policy. She was appointed by the governor of California in 2012 to the Science Advisory Board of the Developmental and Reproductive Toxicant (DART) Identification Committee.