



# ECHO

Environmental influences  
on Child Health Outcomes

A program supported by the NIH

## Study Summary

### ***How Do Biological, Behavioral, and Social Factors Affect Prenatal Health?***

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#### Who sponsored this study?

This research was supported by the Environmental influences on Child Health Outcomes (ECHO) program, Office of The Director, National Institutes of Health.

#### Why was this study needed?

There is little data on what can cause oxidative stress during pregnancy. Oxidative stress is a process that can trigger cell damage and it is thought to play a role in the development of some diseases. By identifying biological, behavioral, and socioeconomic factors in a mother's day-to-day life that may lead to increased risk for oxidative stress, research can help inform the development of targeted strategies for the prevention of poor prenatal health outcomes.

#### Who was involved?

This study involved approximately 2,000 pregnant people in the mainland United States and Puerto Rico who were enrolled in one of four ECHO cohorts.

#### What happened during the study?

Researchers collected urine samples from participants and measured the levels of biomarkers for oxidative stress. Researchers calculated how levels of oxidative stress biomarkers changed in response to biological, behavioral, and social factors. Maternal age, pre-pregnancy body mass index, marital/partnered status, parity, and smoking status were included as biological and behavioral factors while race/ethnicity, maternal education, and stressful life events were considered social factors.

#### What were the study results?

Pregnant people who were over 30 years old and had a college degree had lower levels of oxidative stress. Levels of oxidative stress were higher among pregnant people who were overweight or obese and unmarried. Also, current smokers or those with less than a high school education had higher levels of a oxidative stress biomarker. These results help identify how social, biologic, and behavioral factors may contribute to poor health in mothers and children.

Footnote: Results reported here are for a single study. Other or future studies may provide new information or different results. You should not make changes to your health without first consulting your healthcare professional.

## Impact

This is the largest study to date looking at the relationship between biological, social, and behavioral factors and oxidative stress during pregnancy. The results of this study provide important clues into how socioeconomic inequalities can contribute to poor health in pregnant people. This study may also inform future studies looking at risk factors for preterm birth.

## What happens next?

The research team is examining the impact of oxidative stress on adverse pregnancy outcomes, such as preterm birth.

## Where can I learn more?

The full journal article, titled “Associations between social, biologic, and behavioral factors and biomarkers of oxidative stress during pregnancy: Findings from four ECHO cohorts” is published in [Science of the Total Environment](#).

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