



# ECHO

Environmental influences  
on Child Health Outcomes

A program supported by the NIH

## Study Summary

### ***Some pregnancy complications may slow children's development***

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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.

#### What were the study results?

The researchers found that babies who were exposed to preeclampsia or gestational diabetes while they were developing in the womb were biologically younger than babies without those exposures, indicating that these exposures may have slowed down babies' biological development. This difference was more noticeable in female babies compared to male babies.

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.

#### What was the study's impact?

In this study, researchers found that certain pregnancy complications are related to slower biological development at birth, with girls being more affected than boys. These results provide an important clue about how pregnancy complications can affect underlying biological processes in newborn infants, as preeclampsia and gestational diabetes have been linked to child health outcomes.

#### Why was the study needed?

Preeclampsia (high blood pressure that can cause kidney or other organ damage during pregnancy) and gestational diabetes (high blood sugar during pregnancy) have been linked to a number of birth complications and children's health outcomes, including birth weight. More research is needed to identify the biological processes in newborn babies that are affected by these pregnancy complications so doctors can use that information to provide treatments to improve children's health. This study evaluated how pregnancy complications affect newborn infant's [epigenetic age](#), a measure of their "biological age" based on molecular markers in their cells.

#### Who was involved?

The study included 1,801 children from 12 ECHO cohorts across the United States. The participants were born between 1998 and 2008 to mothers who had preeclampsia or gestational diabetes during pregnancy.

### What happened during the study?

ECHO researchers calculated each infant's biological age by analyzing DNA samples collected at birth and compared their biological age (epigenetic age) to their chronological age at birth (measured in pregnancy weeks). Then, the researchers compared the biological ages of newborns exposed to pregnancy complications to the biological ages of babies who were not exposed.

### What happens next?

The researchers will continue this research with a larger number of participants. They also plan to see whether the same biological changes detected at birth are related to health outcomes later in childhood.

### Where can I learn more?

Access the full journal article, titled "Analysis of Pregnancy Complications and Epigenetic Gestational Age of Newborns," in [JAMA Network Open](#).

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