



ECHO

Environmental influences
on Child Health Outcomes

A program supported by the NIH

Study Summary

Unusual Early Childhood Weight Patterns Associated with Higher Risk of Future Obesity

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Who sponsored this study?

The Environmental influences on Child Health Outcomes (ECHO) Program, Office of the Director, National Institutes of Health supported this research.

Why was this study needed?

[Childhood obesity](#) is defined as having a body mass index (BMI) 0at or above the 95th percentile for age and sex. Without early support or intervention, children who show patterns of high BMI during childhood are more likely to become overweight or obese as teenagers and adults. This increases their risk for long-term health issues, including diabetes and heart disease. To prevent these outcomes, it's important to understand how children's BMI changes over time and identify early-life factors—especially those that can be changed—that influence childhood growth patterns. This study aimed to identify unusual BMI patterns (sometimes called atypical BMI trajectories) in early childhood and understand which early-life factors may contribute to them.

What were the study results?

In this study, researchers found two common patterns in how children's BMI changes over time. Most children (89.4%) had a typical pattern where their BMI went down from ages 1 to 6, then slowly increased. A smaller group (10.6%) had an atypical pattern where their BMI stayed the same from ages 1 to 3.5, then showed rapid increases from ages 3.5 to 9. By age 9, these children were more likely to develop obesity, with an average BMI higher than the 99th percentile. Some factors that associated with the risk of a child developing obesity included high birthweight, maternal smoking during pregnancy, high maternal BMI before pregnancy, and greater maternal weight gain during pregnancy.

What was the study's impact?

The study highlights key prenatal risk factors and early childhood growth trajectories related to childhood obesity, offering opportunities for early prevention and intervention to help children stay on a healthy growth path and reduce their chances of becoming obese.

Who was involved?

The study included 9,483 children from diverse racial, geographical, and socioeconomic backgrounds from the ECHO Cohort.

What happened during the study?

Researchers looked at data collected over time about children's weight and height from medical records, measurements taken by staff, reports from caregivers, or measurements taken at home. They tracked how children's BMI changed as they grew and looked for patterns.

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 happens next?

Future studies could help researchers understand the biological mechanisms and social/environmental factors linked to childhood obesity, helping to develop targeted intervention programs that can redirect unhealthy BMI trajectories.

Where can I learn more?

Access the full journal article, titled "Early-Life Factors and Body Mass Index Trajectories Among U.S. Children in the ECHO Cohort," in JAMA Network Open.

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