National Institutes of Health
Environmental influences on Child Health Outcomes (ECHO)

ECHO



ENHANCING THE HEALTH OF CHILDREN FOR GENERATIONS TO COME

The NIH ECHO Program studies the effects of early environmental influences—including biological, behavioral, psychosocial, medical, chemical, physical, and societal factors—on child health and development.

ECHO RESEARCH FOCUSES ON...

5 CHILD HEALTH OUTCOME AREAS

- PRE-, PERI, AND POSTNATAL
- UPPER AND LOWER AIRWAY
- OBESITY
- NEURO-DEVELOPMENT
- POSITIVE HEALTH

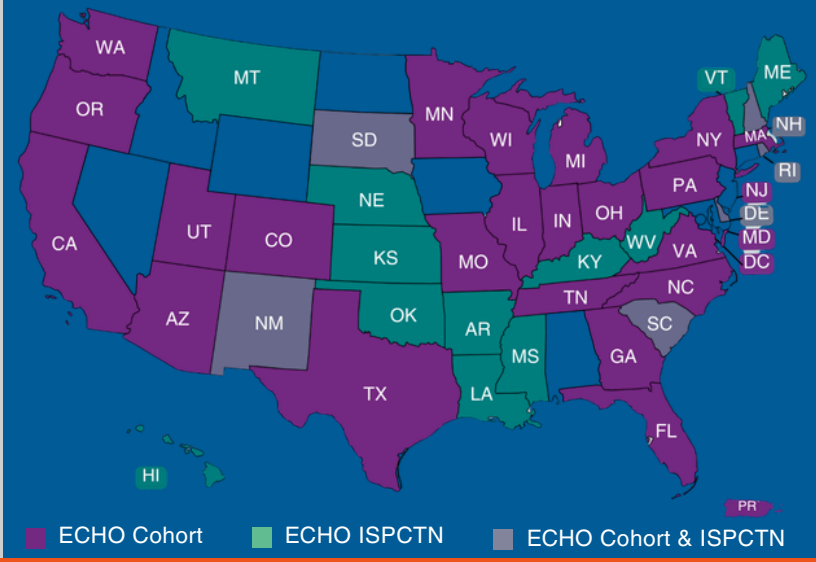
Because ECHO scientists have broad areas of expertise, research can look at the whole child, not just one disease or outcome.

The ECHO *Advantage*

The **ECHO Cohort**—for observational research—is the largest longitudinal child health study in the United States. Data from a diverse population of more than 170,000 participants, including 60,000 in active follow up, give the ECHO Cohort strong statistical power.

The ECHO IDeA States Pediatric Clinical Trials Network (ISPCTN)—for intervention research— is the only NIH clinical trial network focused on children from rural or underserved communities.

Together, these two unique research components are helping to answer ECHO is dedicated to both learning what factors affect child health **—observational research—**and finding ways to enhance it**—intervention research.**



ESTABLISHED 2016

MORE THAN 170,000 RESEARCH PARTICIPANTS

BASED IN 42 STATES DC, PR + 2 TRIBAL NATIONS

Scan for more information

www.echochildren.org
nihkidsandenvironment@od.nih.gov
@ECHOChildHealth



ECHO RESEARCH ON AIR QUALITY

The ECHO Program's uniquely varied, nationwide cohort includes harmonized data from 170,000+ participants. It allows researchers to investigate how air quality and airborne pollutants are associated with health and development during pregnancy and throughout childhood.

The ECHO Program studies how air quality in our environment affects the health of pregnant people and children, including a focus on air pollution and airborne contaminants. Many everyday exposures—such as traffic emissions, wildfire smoke, household pollutants, and industrial emissions—can affect the air families breathe.

Research supported by ECHO looks at how air quality may influence pregnancy outcomes as well as children's growth, respiratory health, behavior, learning, and overall well-being.

Since its launch, the ECHO Program has published more than 2,000 research articles on a wide range of child health topics. Within this body of work, many studies have examined the impact of air quality.

ECHO Research highlights on air quality include:

Higher Early-Life $PM_{2.5}$ Linked to Higher Childhood Blood Pressure, While Prenatal NO_2 Exposure Associated with Lower Blood Pressure, *Dec. 2025*
Children exposed to higher levels of certain air pollutants around birth had small differences in blood pressure later in childhood, with early pregnancy emerging as a particularly sensitive period.

Wildfire Smoke Exposure May Be Linked to Higher Risk of Preterm Birth, *Nov. 2025*
Nearly all pregnant participants were exposed to wildfire smoke, and higher exposure—especially during mid-to-late pregnancy—was linked to a slightly increased risk of preterm birth, particularly in the Western U.S.

The BREATHE Study: Bronchiolitis Recovery and Use of HEPA Filters, *Oct. 2025*
This clinical trial tested the use of HEPA filters in homes and found lower indoor air pollution and somewhat fewer breathing problems and unscheduled doctor visits among babies.

ECHO Study Observes Health Disparities in Air Pollution-associated Risk of Childhood Asthma, *Aug. 2025*
Higher exposure to fine particulate matter, nitrogen dioxide, and ground-level ozone was linked to a higher risk of asthma in children's first 10 years, with certain communities facing greater risk.

Prenatal Exposure to Air Pollution Associated with Higher Risk for Autism-related Outcomes, ECHO Study Finds, *Jun. 2025*
Children whose mothers were exposed to higher levels of air pollution during pregnancy showed a greater risk of autism-related traits and diagnosis, though patterns varied across regions.

Read More ECHO Research Related to Our Environment

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