

Brain Health & Prevention

ECHO Program: Enhancing the Health of Children for Generations to Come

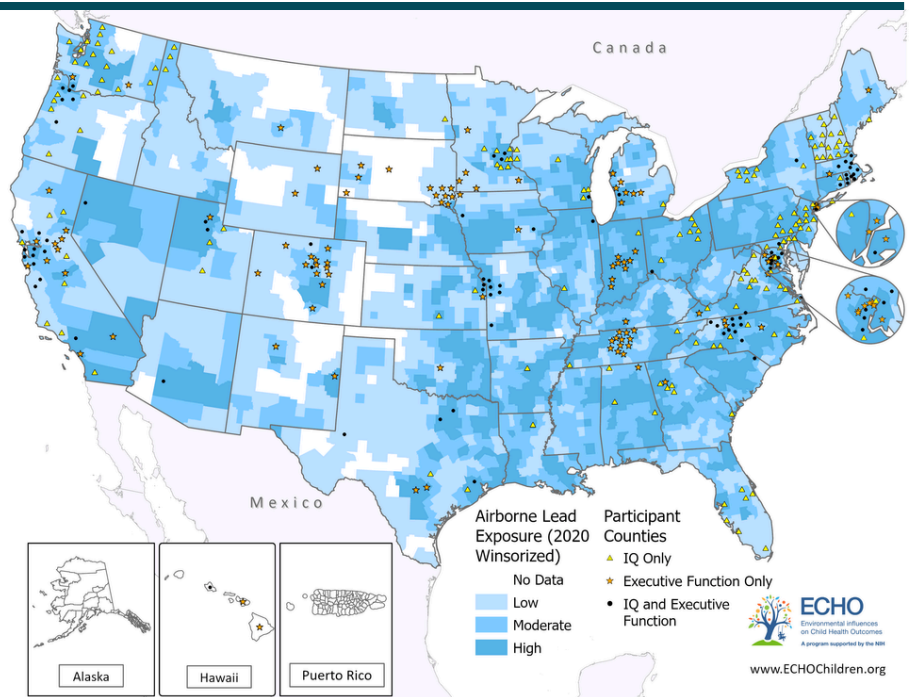
ECHO researchers know that a good start to life can last a lifetime and over generations.

The ECHO Program is highlighting research that promotes brain health, and raises awareness about neurodevelopmental disorders, diagnosis, and treatments.



AIRBONE LEAD EXPOSURE AFFECTS CHILDREN'S COGNITIVE DEVELOPMENT

- Despite overall decreases in children's blood lead levels, there are still disparities in lead exposure in children.
- Limited research on the effects of airborne lead from industrial emissions on child health.
- ECHO researchers found that **children who lived in areas with more lead pollution in the air in the early years of their lives showed less impulse control and had slightly lower IQ scores.**¹ when they reached preschool and school age.
- This effect was more noticeable in boys than girls.



Map shows study participants and county-level risk-screening environmental lead toxicity scores

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For questions on these findings or other ECHO Program activities, please email NIHKidsandEnvironment@od.nih.gov

ADDITIONAL ECHO RESEARCH ON BRAIN HEALTH PROMOTION & DISEASE PREVENTION:



ECHO researchers examine various early environmental factors that can influence the health of a child's brain. Their primary research goal is to understand these factors to prevent diseases from developing later in life.



ECHO investigators found that early childhood exposure to phthalates is associated with **ADHD and hyperactivity** in middle childhood and adolescence.²



Children of mothers with prenatal depression had slightly more autism-related traits indicating a higher likelihood of **ASD diagnosis**.³



Exposure to certain classes of flame-retardants and phthalates during pregnancy is associated with **preterm birth** which can impact brain development and cardiovascular health.^{4,5}

PUBLICATIONS & CITATIONS

1. Gatzke-Kopp, Lisa M et al. "Airborne Lead Exposure and Childhood Cognition: The Environmental Influences on Child Health Outcomes (ECHO) Cohort (2003-2022)." *American journal of public health* vol. 114,3 (2024): 309-318. doi:10.2105/AJPH.2023.307519
2. Oh, Jiwon et al. "Early childhood exposures to phthalates in association with attention-deficit/hyperactivity disorder behaviors in middle childhood and adolescence in the ReCHARGE study." *International journal of hygiene and environmental health* vol. 259 (2024): 114377. doi:10.1016/j.ijheh.2024.114377
3. Avalos, Lyndsay A., et al. "Prenatal depression and risk of child autism-related traits among participants in the Environmental influences on Child Health Outcomes program." *Autism Research* 16.9 (2023): 1825-1835.
4. Oh, Jiwon, et al. "Associations of organophosphate ester flame retardant exposures during pregnancy with gestational duration and fetal growth: the Environmental influences on Child Health Outcomes (ECHO) Program." *Environmental health perspectives* 132.1 (2024): 017004.
5. Trasande, Leonardo et al. "Prenatal phthalate exposure and adverse birth outcomes in the USA: a prospective analysis of births and estimates of attributable burden and costs." *The Lancet. Planetary health* vol. 8,2 (2024): e74-e85. doi:10.1016/S2542-5196(23)00270-X

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