



Study Summary

Home conditions and outdoor air pollution may together influence children's asthma risk, ECHO study finds

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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 asthma may be influenced by multiple indoor and outdoor environmental exposures. Prior research has examined indoor and outdoor exposures separately and frequently lacked the power to fully evaluate their cumulative or interacting effects on childhood asthma. The ECHO Cohort allowed researchers to bring together data from many sites across the country, providing a clearer picture of how different environmental factors may influence childhood asthma.

What were the study results?

The study found that several environmental exposures during early childhood were linked to asthma risk. First, exposure to ambient fine particulate air pollution (PM_{2.5}) was associated with an increased risk of developing asthma. In addition, water damage or dampness in the home was also linked to a higher asthma risk, even after accounting for PM_{2.5} exposure, indicating an independent effect. In contrast, having a dog in the home during infancy was associated with a reduced risk of childhood asthma.

What was the study's impact?

The study demonstrated the importance of considering multiple early-life exposures together when assessing risk factors for childhood asthma. It highlighted that both indoor (home dampness, pets) and outdoor (PM_{2.5}) exposures should be considered in prevention strategies.

Who was involved?

Participants included 6,413 children born between 1987 and 2016, enrolled in nine ECHO Study Sites across the United States. These sites included both general-risk and high-risk populations at higher risk, defined by a parental history of asthma or allergy.

What happened during the study?

The study looked at children's early-life environments to understand how they relate to asthma risk. Researchers examined levels of outdoor air pollution during the first three years of life, along with conditions inside the home, such as water damage or dampness, whether dogs or cats were present during infancy, and exposure to dust mites. Childhood asthma was identified based on reports from caregivers or a doctor's diagnosis between birth and age five. The analysis considered differences in family and neighborhood factors that could also affect asthma risk, helping to isolate the role of these environmental exposures.

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?

Additional studies examining how indoor and outdoor exposures interact could help researchers better understand their role in childhood asthma risk. Future research could also explore ways to reduce or prevent harmful exposures in early life.

Where can I learn more?

Access the full journal article, titled "Individual and combined effects of indoor home exposures and ambient PM_{2.5} during early life on childhood asthma in US birth cohort studies," in [Environmental Epidemiology](#).

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