UW-Madison: Study finds higher asthma rates among Black and Hispanic children regardless of neighborhood income or density

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MADISON, Wis. – A new, large study found that although there is a correlation between childhood asthma and being born into a densely populated or lower-income neighborhood, Black and Hispanic children had consistently higher rates of asthma than white children even in more affluent neighborhoods.

The research, which was conducted as part of a multi-institutional collaboration led by Dr. James Gern, professor of pediatrics and medicine at the University of Wisconsin School of Medicine and Public Health, included data from 5,809 children born throughout the United States over a span of four decades, providing important insight into how racial and ethnic health inequities may cause children to develop wheezing – a symptom involving whistling breathing sounds due to narrowed airways – and asthma.

“This study found that poverty and low-income status is associated with asthma, but that’s not all,” he said. “There are other things that we need to identify that are also associated with increased asthma rates in Black and Hispanic children.”

Gern directs the Childhood Respiratory and Environmental Workgroup (CREW), a national consortium of 12 medical centers that are examining data from groups of people born at a similar time, or birth cohorts, to better understand the root causes of asthma.

The current study is the first in a series of three planned research phases for CREW.

The study, which was published recently in *JAMA Pediatrics*, was led by consortium members Antonella Zanobetti, principal research scientist at the Harvard T.H. Chan School of Public Health, and Patrick H. Ryan, professor of pediatrics at University of Cincinnati and Cincinnati Children's Hospital Medical Center.

Researchers at each of 10 study site locations used questionnaires and interviews to collect information over many years from parents and children including demographics, wheezing and asthma occurrence and medical history. The home address of each child was matched to U.S. Census tract data for the decade closest to their birth year.

Researchers examined the relationship between incidence of wheezing and asthma with children's race and ethnicity, their mother's education level and smoking habits and socioeconomic conditions of the neighborhood in which they were born.

Wheezing and asthma were common. Of the 5,809 children, 46% experienced wheezing in their first year of life, with 26% having wheezing through age 11. Diagnosis of asthma by age 11 varied by cohort, with an overall median prevalence of 25%. Children in neighborhoods with higher population density and with more low-income households and families living below the poverty level experienced more asthma, as well as early and persistent wheeze.

Black and Hispanic children remained at higher risk of asthma than white children, even in neighborhoods with higher income. The researchers suggest that the social and environmental legacy of structural racism may broadly and adversely influence respiratory health.

"Neighborhood- and individual-level characteristics and their root causes should be considered as sources of respiratory health inequities," Zanobetti said. "Reducing these inequities requires identifying and repairing differences between and within neighborhoods to create equal access to healthy living conditions."

Previous birth cohort studies have identified some risk factors that leave children more vulnerable to developing asthma, but the impact of these risk factors is small and at times limited by specific population characteristics. The CREW consortium, which was established in 2016, was created to overcome the statistical limitations of smaller studies. It is part of a seven-year initiative from the National Institutes of Health's Environmental Influences on Child Health Outcomes (ECHO) program.

CREW cohorts are in diverse urban, suburban and rural areas across eight states in the Northeast, Midwest and Southwest. Data from 8,997 children were collected starting in 1980. New enrollees have been added to new cohorts over the decades until 2013.

“The CREW study and the overall ECHO program for the first time enables information from multiple and diverse U.S. asthma birth cohort studies to be combined so that investigators can identify causes of disease and develop new strategies to prevent severe childhood asthma,” Gern said.

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