ECHO
Environmental influences on Child Health Outcomes
A program supported by the NIH

Study Summary

ECHO Study Investigates Pollution Exposure and Birth Outcomes in Pregnant Women Living in Historically Redlined Neighborhoods

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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?

Exposure to tiny air pollutants known as PM2.5 during pregnancy can lead to outcomes like low birth weight and preterm birth. Factors such as weather, government policies, and social conditions can affect how much exposure pregnant women have to these pollutants. One factor that may have affected exposure is redlining, the historical practice of designating certain neighborhoods, often where minority groups lived, as risky investments for lenders. This grading system ranked neighborhoods on an A through D scale—A being the most desirable—which often led to disinvestment and lack of resources in lower-rated areas. While redlining was made illegal following the 1968 Fair Housing Act, it continues to affect the health outcomes of people living in historically redlined areas.

ECHO researchers wanted to learn whether living in historically redlined areas during pregnancy affects air pollution exposure and birth outcomes in New York City (NYC). Understanding what influences PM2.5 levels and their impact on birth outcomes can help improve the health of mothers and their children.

What were the study results?

The study found that living in lower-graded or ungraded census tracts during pregnancy was associated with higher exposure to PM2.5. These women also tended to have babies with lower birth weights. This association was strong even when considering factors such as race, ethnicity, and income at individual and community levels.

What was the study's impact?

The study supports the literature linking redlining to contemporary outcomes. This study highlights the multifaceted nature of structural racism. Findings from non-graded areas indicate that there are likely additional factors, along with redlining, that play a role in perpetuating modern-day inequality.

Who was involved?

The participants were 3,160 pregnant mothers and their babies in the NYC metropolitan area who were enrolled in six ECHO Cohort research sites. The study included pregnant mothers from 2005 to 2022 who

had air pollution estimates available for their residential address. Most participants who identified as Black or White lived in neighborhoods that had been given a D grade, the lowest rating. Most participants who identified as Hispanic lived in neighborhoods with B or C grades.

What happened during the study?

Researchers used statistical methods to explore whether living in neighborhoods that were historically redlined was associated with higher exposure to air pollution (PM2.5) during pregnancy. They also examined if living in these neighborhoods was associated with the baby's birth weight, the likelihood of being born early, and the chances of having a low birth weight.

Note: 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?

The authors note that future research could look at other practices like racial exclusionary zoning to fully understand the ongoing systemic effects of redlining.

Where can I learn more?

Access the full journal article, titled “Redlining in New York City: Impacts on Particulate Matter Exposure During Pregnancy and Birth Outcomes,” in *Journal of Epidemiology and Community Health*.