

**POLICYLAB**

RESEARCH AT A GLANCE | SPRING 2018

A SYNOPSIS OF EMERGING POLICYLAB RESEARCH

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**A PORTRAIT OF  
DISADVANTAGE:  
UNDERSTANDING  
POVERTY'S  
INFLUENCE ON  
CHILD DEVELOPMENT**

## WHAT IS THE PROBLEM:

About one in five, or 16 million, children in the United States live below the federal poverty line (FPL) of \$24,230 for a family of four.

It has long been understood that children living in poverty experience poor health outcomes as a result of economic and social-emotional risk factors. For example, they face higher exposure to chronic stressors including food insecurity, unstable home environments and limited social support.

Though many other studies have examined how different factors impact child development, no other study has comprehensively looked at how the maternal, home and neighborhood risk factors associated with low socio-economic status (SES) affect children over the course of their first year of life. Understanding poverty's influence on child development at this young age will help us develop strategies to counteract such disadvantage and remove barriers that prevent all children from growing into healthy, productive adults.

### MATERNAL, HOME AND NEIGHBORHOOD RISK FACTORS FOR CHILD DEVELOPMENTAL DELAYS



#### MATERNAL RISK FACTORS

*Vocabulary knowledge  
Spatial visualization ability  
Exposure to stress*



#### HOME RISK FACTORS

*Emotional & verbal responsiveness of parent  
Parental acceptance of child's behavior  
Provision of appropriate play materials  
Opportunities for variety in daily stimulation*



#### NEIGHBORHOOD RISK FACTORS

*Living below poverty level  
Receiving public assistance  
Female-only households with minor children*

## WHAT WE ASKED:

How does poverty influence child development in the first year of life?

## WHAT WE DID:

We conducted a mixed-methods study to understand how children in different SES groups are exposed to risk factors that can lead to developmental delays in their first year of life. Our study cohort included 30 infants of low-SES (at or below the FPL) and 30 of higher-SES (above the FPL) from a large East Coast city. To focus in on the sole impact of poverty, the study enrolled healthy, African American mothers and their healthy infants from an urban hospital at the time of the infant's birth. This method minimized the influence of other factors such as race, gender, complex medical needs and urban/rural environments on outcomes.

Over the course of this mixed-methods study, we sent highly trained research staff to evaluate the home environment of study participants using widely accepted measurement tools, such as the Home Observation Measurement of the Environment Inventory (HOME). We also assessed the caregiving environment through factors such as the mother's cognitive and reasoning skills and social support resources. To evaluate infant development, we used both magnetic resonance imaging (MRI) scans of the infant's brain, and standardized evaluations of cognitive and language skills. Finally, we measured the cumulative risk—or the total risk of all of these different aggregated factors—that children from different SES groups had for developmental disadvantage.

## WHAT WE FOUND:

**Infants from the lower socioeconomic status (SES) group were more exposed to maternal risk factors for developmental disadvantage.** As pediatricians, this finding is particularly concerning because we know that a child's health is impacted greatly by that of their parents and caregivers.

**Low-income infants were also more likely to experience higher levels of home and neighborhood risk factors for developmental delay.** They were more likely to live in a neighborhood with concentrated poverty, have fewer age-appropriate toys and books, and more than twice as likely to experience food insecurity.

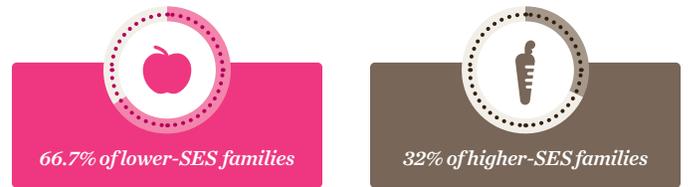
**Low-SES infants exhibited poorer performance** than higher-SES infants on measures of cognitive and language skills assessed at age one.

**Though low-SES children were at higher risk for developmental disadvantage than higher-SES children,** their scores actually were still within the average developmental range (90–109) compared to the general population.

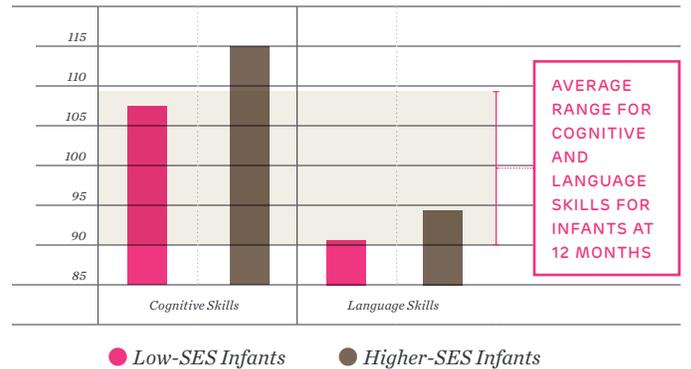
### MOTHERS OF LOW-SES CHILDREN...

- Scored lower on measures of vocabulary knowledge
- Scored lower on measures of spatial visualization ability
- Were more likely to experience higher levels of stress
- Received less social support than higher-SES mothers

### PERCENT OF FAMILIES EXPERIENCING FOOD INSECURITY



### INFANT DEVELOPMENTAL OUTCOMES AT AGE 12 MONTHS



## WHAT IT MEANS:

Children in poverty have higher exposure to environmental risk factors that impact developmental outcomes. Poverty's influence on child developmental outcomes can be detected as early as age one year.



Though lower-SES children were at high risk for developmental disadvantage, their scores at age one were still within the average range for children their age.



It is never too early to start combating these negative influences with services and interventions, such as home visiting programs and educational programs for parents and infants.

## STUDY METHODS

Infants for this report were participants in a mixed-method, longitudinal study on the effects of poverty on developmental and neural outcomes in the first year of life. We enrolled 60 African American mothers and their female infants, 30 who met criteria for low-SES and 30 who met criteria for higher-SES based on 2013 federal income-to-needs (ITN) ratios and education level.

Low-SES was defined as annual household income at or below the federal poverty line (for a family of four the poverty line was \$23,550 at the start of the project) with both parents having no more than a high school education. Higher-SES families had an ITN ratio greater than the poverty line and both parents had at least a high school diploma.

Using well validated measures, trained research staff evaluated maternal, home, and neighborhood level environmental characteristics of infants. Researchers measured 18 different factors using the following tools and scales: Wechsler Adult Intelligence Scale-IV (WAIS-IV); Beck Depression Inventory; Perceived Stress Scale; Parenting Stress Index-Fourth Edition (PSI-4); Social Support Scale; Home Observation Measurement of the Environment (HOME); Household Food Insecurity (HFI); Concentrated Neighborhood Disadvantage (CND). Infant development outcome was measured using the Bayley Scales of Infant Development Third Edition (BSID-III) and Preschool Language Scale (PLS-5).

We used multiple linear regression to determine whether maternal, home, and neighborhood factors accounted for variance in outcomes after controlling for SES group. SES groups were compared for elevated risk for each environmental factor. We determined high or low risk for each factoring using the following: (1) established categorical definitions of risk; (2) scores that corresponded to one standard distribution above or below the sample mean; or (3) scores in the bottom or top quartile of the sample distribution.

## RELATED POLICYLAB WORK

Hurt H, Betancourt LM. Effect of socioeconomic status disparity on child language and neural outcome: how early is early? *Pediatric Research*. 2015;79(1-2):148-158. doi:10.1038/pr.2015.202.

## PUBLICATION

Hurt H, Betancourt LM. Turning 1 Year of Age in a Low Socioeconomic Environment: A Portrait of Disadvantage. *Journal of Developmental and Behavioral Pediatrics*. doi:10.1097/DBP.0000000000000469

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3. Shonkoff JP, Garner AS, The Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, and Section on Developmental and Behavioral Pediatrics. The Lifelong Effects of Early Childhood Adversity and Toxic Stress. *Pediatrics*. 2012;129:e232. doi:10.1542/peds.2011-2663



The mission of PolicyLab at Children's Hospital of Philadelphia (CHOP) is to achieve optimal child health and well-being by informing program and policy changes through interdisciplinary research. PolicyLab is a Center of Emphasis within the Children's Hospital of Philadelphia Research Institute, one of the largest pediatric research institutes in the country.

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