

# Poverty and childhood health

*Four panelists addressed the relationship between poverty and childhood health. Anna Aizer discussed the relationship between parental income and childhood health, and the mechanisms through which this relationship may work. She concluded that policy interventions targeting childhood health appear to substantially reduce the intergenerational transmission of inequality. Margot Jackson examined the simultaneous effects of poverty and poor health on children's cognitive achievement. The findings she presented support the idea that poverty is an important early factor in children's development, and also suggest that health investments are a key part of the antipoverty safety net. Rourke O'Brien presented evidence on the effects of the Medicaid expansions of the 1980s and 1990s on intergenerational economic mobility, concluding that early access to health insurance promotes mobility and that local variation in access explains some of the local variation in mobility. Claudia Persico explored whether in utero exposure to pollution helps to explain differences by income in children's cognitive and physical development. She concludes that exposure to pollution appears to cause lower test scores, and an increased likelihood of behavioral problems and cognitive disabilities, and that the "Superfund" cleanup program is associated with significant improvements in long-term cognitive and developmental outcomes for children. This set of articles summarizes their presentations.*

## How childhood health affects poverty in adulthood

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By any measure, there is a large income gradient in child health in the United States, meaning that children born into poorer families have worse child health. This relationship can be observed across a wide range of child health outcomes, including newborn health, infant mortality, and physiological differences in brain structure.<sup>1</sup> The gradient also increases as children age, meaning that a given decrease in income is associated with a larger decline in health for older children.<sup>2</sup> In this article, I explore current knowledge about the effect of parental income on child health and discuss the implications for policy.

### The income-health gradient

Birth outcomes, such as the probability of low birth weight (defined as under 2,500 grams, or 5.5 pounds) or infant mortality, illustrate the income gradient in child health. For example, low birth weight occurs in about 10 out of 1,000 births for poor women, compared to six out of 1,000 births to nonpoor women.<sup>3</sup> Similarly, the rate of infant mortality is 14 out of 1,000 births to poor women, compared to eight out of 1,000 births to nonpoor women.

### How child health affects future income

There is evidence that health in childhood affects earnings in adulthood, through two mechanisms. First, child health is correlated with adult health, and poor adult health lowers

earnings. For example, a sibling study found that those with poor health in childhood had 24 percent lower earnings than their healthier siblings.<sup>4</sup> Second, child health can affect schooling and cognitive achievement, which can in turn affect income. For example, a study of the effects of the eradication of hookworm disease in the American south in the early 1900s found large increases in educational attainment attributable to the health improvement.<sup>5</sup>

### Pathways through which family income affects child health

Families with fewer economic resources clearly have less ability to spend money in ways that enhance their children's health, but two additional factors are relevant. First, education matters; those with higher educational attainment are more likely to follow medical treatment plans. Second, poor families tend to have different beliefs about how to keep their children healthy, including being less likely to believe that they can influence their children's cognitive function with their own actions.<sup>6</sup>

There are many different mechanisms through which family income can affect child health. Several of these are discussed in other articles in this issue, such as access to medical care and health insurance (by Rourke O'Brien), exposure to pollution and environment toxins (by Claudia Persico), and violence (by Lawrence Berger). Other potential mechanisms include stress and mental health issues, infectious diseases, and income inequality and relative deprivation.

Stress, and mental health in general, also provide a mechanism through which family income can affect child health. The poor face a greater number of stressful events in their lives and have higher average levels of the stress hormone cortisol relative to their wealthier counterparts.<sup>7</sup> There is some evidence that this relationship is causal;

increases in income from the Earned Income Tax Credit (EITC) have been found to result in lower self-reported levels of stress in mothers.<sup>8</sup> Evidence also suggests a causal relationship between mothers experiencing even relatively mildly stressful events during pregnancy and child outcomes.<sup>9</sup>

Serious parasitic and bacterial diseases are prevalent among the poorest populations in the United States, such as those living in Appalachia and the Mississippi Delta. These diseases exacerbate poverty through effects on pregnancy outcomes, child development, and labor market outcomes.<sup>10</sup>

Research on inequality and relative deprivation indicates that relative income—where one’s total income falls relative to other people in the society—more than absolute income, determines mortality in industrialized countries.<sup>11</sup> There is some evidence that high relative deprivation is associated with a higher probability of death for adults, but there is less evidence regarding deprivation and child health.<sup>12</sup>

## Public policy, child health, and the intergenerational transmission of income

In a review of research on the effects of public programs for poor children on child health and well-being, Joseph Doyle and I concluded that health interventions were generally the most effective type of policy intervention.<sup>13</sup> In order to test this conclusion, I looked at social spending in Organization for Economic Cooperation and Development (OECD) countries, and identified the type of programs that were funded in each country.<sup>14</sup> I then tried to connect spending changes to changes in mobility and equality. We found that countries that increased their spending on health tended to have larger declines in inequality. This relationship did not hold true for social spending as a whole, or for other categories of social spending. I looked further at how countries spent money on health interventions. I found, for example, that within countries over time, increases in the number of pediatricians per capita and decreases in infant mortality predicted large reductions in both inequality of test scores and intergenerational income mobility 10 to 15 years later. These changes in inequality came entirely from raising test scores for those at the bottom of the distribution, not from lowering test scores for those at the top. While this analysis cannot show that the health spending caused inequality to decrease, it does reinforce the idea that health interventions are a particularly effective way to affect inequality.

## Implications

Why are public health investments so productive? It may be that we know much more about how to produce child health than we do about producing other positive outcomes such as high test scores. In the United States, a very large amount of money—18 percent of the Gross Domestic Product—is spent on health, but little of that is spent on children; most

is spent on the elderly. Evidence suggests that it may be worthwhile to consider spending more on children’s health, where we know these expenditures can be productive in both the short and long run.■

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<sup>1</sup>See, for example, A. Chen, E. Oster, and H. Williams, “Why Is Infant Mortality Higher in the United States Than in Europe?” *American Economic Journal: Economic Policy* 8, No. 2 (May 2016): 89–124.

<sup>2</sup>A. Case, D. Lubotsky, and C. Paxson, “Economic Status and Health in Childhood: The Origins of the Gradient,” *The American Economic Review* 92, No. 5 (December 2002): 1308–1334.

<sup>3</sup>D. Wood, “Effect of Child and Family Poverty on Child Health in the United States,” *Pediatrics*, 112, No. 3 (September 2003): 707–711.

<sup>4</sup>J. P. Smith, “The Impact of Childhood Health on Adult Labor Market Outcomes,” *Review of Economics and Statistics* 91, No. 3 (September 2009): 478–489.

<sup>5</sup>H. Bleakley, “Disease and Development: Evidence from Hookworm Eradication in the American South,” *The Quarterly Journal of Economics* 122, No. 1 (2007): 73–117.

<sup>6</sup>F. Cunha, I. Elo, and J. Culhane, “Eliciting Maternal Beliefs about the Technology of Skill Formation,” working paper, November 4, 2015. [https://econ.georgetown.edu/sites/econ/files/documents/cunha\\_elo\\_culhane\\_2015.pdf](https://econ.georgetown.edu/sites/econ/files/documents/cunha_elo_culhane_2015.pdf).

<sup>7</sup>A. Steptoe, S. Kunz-Ebrecht, N. Owen, P. J. Feldman, G. Willemsen, C. Kirschbaum, and M. Marmot, “Socioeconomic Status and Stress-Related Biological Responses Over the Working Day,” *Psychosomatic Medicine* 65, No. 3 (May 2003): 461–470.

<sup>8</sup>W. N. Evans and C. L. Garthwaite, “Giving Mom a Break: The Impact of Higher EITC Payments on Maternal Health,” *American Economic Journal: Economic Policy* 6, No. 2 (2014): 258–290.

<sup>9</sup>See, for example, A. Aizer, L. Stroud, and S. Buka, “Maternal Stress and Child Outcomes: Evidence from Siblings,” *Journal of Human Resources* 51, No. 3 (August 2016): 523–555.

<sup>10</sup>P. J. Hotez, “The Neglected Tropical Diseases and the Neglected Infections of Poverty: Overview of Their Common Features, Global Disease Burden and Distribution, New Control Tools, and Prospects for Disease Elimination,” in *The Causes and Impacts of Neglected Tropical and Zoonotic Diseases: Opportunities for Integrated Intervention Strategies*, Institute of Medicine (Washington, DC: The National Academies Press, 2011). Pp: 221–237.

<sup>11</sup>A. Deaton “What Does The Empirical Evidence Tell Us About the Injustice of Health Inequalities?” in *Inequalities In Health: Concepts, Measures and Ethics*, eds. N. Eyal, S. A. Hurst, O. F. Norheim, and D. Wikler (Oxford, UK: Oxford University Press, 2013). Pp: 263–281.

<sup>12</sup>C. Eibner and W. N. Evans, “Relative Deprivation, Poor Health Habits, and Mortality,” *Journal of Human Resources* 40, No. 3 (2005): 591–620.

<sup>13</sup>A. Aizer and J. J. Doyle, Jr., “Economics of Child Well-Being: Measuring Effects of Child Welfare Interventions,” in *Handbook of Child Well-Being: Theories, Methods and Policies in Global Perspective Volume 3*, eds. A. Ben-Arieh, F. Casas, I. Frønes, and J. E. Korbin (New York: Springer, 2014). Pp: 1563–1602.

<sup>14</sup>The Organization for Economic Co-operation and Development (OECD) currently includes 35 countries.