

# Early childhood origins of the income/health gradient: The role of maternal health behaviors

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## Abstract

Several recent studies in the US, Canada, and the UK have demonstrated a positive relationship between family income and child health, though the mechanisms underlying this relationship are poorly understood. Using data from the 1988 US National Maternal and Infant Health Survey and the 1991 follow-up, this paper tests whether maternal health status and health behaviors during pregnancy and early infancy can explain the relationship between family income and subjective health status at age 3. We find that, while a detailed set of controls for health risk factors including maternal smoking, drinking, and vitamin use during pregnancy, as well as breastfeeding and secondhand smoke exposure after birth, are significantly related to family income and maternal education, they do not explain the relationship between family income and maternal-assessed health of the child. We suggest that these results point to either more salient pathways through which family income impacts child health, such as maternal stress, or to the possibility that differences in subjective health status do not correspond to differences in objective health status in the same way for higher- and lower-income respondents.

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## Introduction

Several recent studies have documented a positive relationship between family income and child health in the US, Canada, and the UK (Case, Lubotsky, & Paxson, 2002; Chen, Martin, & Matthews, 2006; Currie, Shields, & Price, 2007; Currie & Stabile, 2003), with two of these studies finding that the slope of the “gradient” between family income and child health becomes steeper as children get older. With strong evidence for the existence of socioeconomic gradients in child health that begin early

in life, it is important to identify the mechanisms through which children acquire the double disadvantage of poor socioeconomic status and poor health.

This paper builds upon previous work on the income gradient in child health by testing whether health risks during pregnancy and early infancy can explain the observed relationship between family income and children’s health in the US. The paper employs unique data detailing the mother’s health and behaviors during pregnancy and the child’s early infancy, allowing a more comprehensive examination of the physical origins of the gradient in young children than has been previously carried out.

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## Background

While many studies have examined the relationship between socioeconomic status, especially poverty, and poor birth outcomes (Fairley & Leyland, 2006; Finch, 2003; Kramer, Seguin, Lydon, & Goulet, 2000), fewer have examined the nature of the income gradient in children's health beyond birth and how this gradient compares to the gradient in adults. Educational and income gradients for self-rated health, depression, and obesity in adolescents were found using data from the National Longitudinal Study of Adolescent Health (Goodman, 1999). Another study of adolescents found moderate-sized gradients between income and stunting and fighting behaviors, but no effects for other outcomes such as anxiety, hyperactivity, and obesity (Brooks-Gunn, Duncan, & Rebello Britto, 1999). Case et al. (2002) document a significant relationship between family income and childhood health at all ages in the US. Using household data from the National Health Interview Survey (NHIS), the Panel Study of Income Dynamics (PSID), and the Third National Health and Nutritional Examination Survey (NHANES III), they find that children's health is positively related to parental income, and that the slope increases as children age. Case et al. establish this relationship for parental assessed health status of the child as well as for specific health conditions facing children. They conclude that the health disadvantages of low income for children accumulate over time, such that poorer children arrive at adulthood with lower health status as well as more absences from school, both of which may adversely affect their future earnings, perpetuating the gradient. Chen et al. (2006), find a strong gradient by family income using the same NHIS data as Case et al, though they do not find a steeper gradient in global health status with age. Case, Paxson, and Vogl assert that the different conclusions result from Chen et al.'s inclusion of 17 and 18 year olds who live independently and report their current income rather than income from the family in which they were raised (Case, Paxson, & Vogl, 2007). Currie and Stabile (2003) estimate a similar childhood health gradient by income using Canadian household data, and like Case et al. they find that the relationship between income and health grows stronger for older children. Their evidence suggests that this steepening of the income–health gradient with age results from more frequent negative health

shocks for poorer children rather than an inability to recover as well from a given health shock. Most recently, evidence from the UK suggests that while there is a significant association between family income and child health status, the magnitude of this relationship is much smaller in the UK and the gradient does not get steeper with age (Currie et al., 2007).

In an effort to explain these recent findings, the current analysis focuses on the relationship between family income and child health controlling for maternal education, though we recognize that the relationship between parental education, health behaviors, and child health is an important research question in its own right. Since different policy interventions may be implied by mechanisms working through family income or parental education, we prefer to keep these variables separate rather than constructing a composite SES measure as was done in some recent work on SES and child health (Starfield, Robertson, & Riley, 2002; Stevens, 2006).

Thus far, the mechanisms responsible for the childhood income–health gradient are poorly understood. Case et al. find that controls for the insurance status of the child do not diminish the relationship between family income and children's health status. Currie and Stabile observe a childhood health gradient in the context of Canada's national health system, casting further doubt on the idea that access to medical care is the primary mechanism. Using low birth weight as a single indicator of poor health at birth, Case et al. do not find that income differences in children's health status can be explained by poor health at birth. Case et al. also find no evidence that mothers of infants in poor health at birth are less likely to be working during the first 3 years of the child's life, a finding that would have suggested reverse causality. Case et al. look at several indicators for family behaviors and routines, including whether the child has a regular bedtime, wears a seat belt, and whether someone in the household smokes. While these variables are significant predictors of children's health status, they do little to change the relationship between family income and parental assessed health of the child. In the UK, Currie et al. include child fruit and vegetable consumption and parental exercise and activity as controls and find that while they both significantly predict child health status, they do not explain the income gradient in subjective child health.

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