

Discussion Paper | 2021-1 | April 2021

The downstream benefits of higher incomes and wages

Anna Godøy and Ken Jacobs



Contents

Abstract	3
Introduction	3
Context	6
Who Makes Up the Low-Wage Workforce?	6
Descriptive Evidence and Potential Mechanisms	8
Sources of Quasi-Experimental Variation.....	9
Racial Disparities	12
The Effects of Low Incomes on Child Development.....	12
The Effects of Low Incomes on Health	16
The Effects of Low Incomes on Crime	21
The Effects of Low Incomes on Civic Participation.....	25
Discussion	26
Conclusion	29
About the Authors	30
Acknowledgements	30
References.....	31
Appendix: Calculating Effect Sizes	39

The views expressed in this paper are those of the authors and do not necessarily represent those of the Federal Reserve Bank of Boston, the Federal Reserve System, the University of California Berkeley Center for Labor Research and Education, the Center on Wage and Employment Dynamics, the University of California, or the Norwegian Institute of Public Health.

Abstract

Jobs that pay low wages result in many families struggling to make ends meet. Black workers face a dual crisis of higher unemployment and disproportionate employment in low-wage jobs. Policies that improve wages or otherwise raise family income can have long-term effects on a range of societal outcomes. Family income is highly correlated with mental and physical health, child development and school achievement, civic engagement, and many other dimensions of individual and social well-being. It can be difficult, however, to separate cause from effect and to disentangle confounding variables. In this paper we identify and discuss studies that have used natural experiments to measure downstream effects that are clearly caused by changes in family income, and thus provide firm grounding for policy evaluation. We review the research literature that investigates how minimum-wage increases, the earned income tax credit, and other policy interventions that increase families' resources affect health, child development, crime rates, and civic participation. We find strong evidence of a causal effect of higher net income on child development, including math and reading test scores, educational attainment, birth weight, mental health, and health in adulthood. We find growing evidence of effects of income on adult stress, mental health, and work absences due to health. Causal effects of income on other aspects of adult health are less conclusive and in need of further research. There is suggestive evidence that available economic resources contribute to reducing recidivism and crime rates, and that greater resources increase future civic participation in children. Results point in the same direction in research on earned and unearned income, suggesting that money itself matters more than if it comes through wages or transfers. Further research is needed to determine if there are differences in the relative size of the effects between income sources. More research is also needed on differences by race and ethnicity. In general, the studies that include demographic analyses find that the effects are larger for black and Hispanic children, who start at a greater level of disadvantage. The research has important implications for policies aimed at maintaining incomes during the COVID-19 crisis and efforts to address structural racism that results in lower earnings and incomes for black workers.

Introduction

In 2017, almost three in 10 U.S. workers (29%) were in low-wage jobs;¹ that translates into 44.6 million low-wage workers in the United States as a whole.² Low-wage jobs leave many families struggling to cover their basic needs. In 2016, three out of 10 working families in the United States had family incomes under 200% of the federal poverty level—a proportion greater than that which preceded the last recession (Jarosz & Mather,

¹ Here we follow the Organization for Economic Co-operation and Development (OECD) in defining low wages as two-thirds of the median wage. This works out to \$13.31 an hour in the United States in 2017.

² Authors' analysis of Economic Policy Institute analysis of Current Population Survey Outgoing Rotation Group data for 2017.

2018). The share was even greater for racial and ethnic minorities: 46% of working families with an African-American head of household and 50% of those with a Latino head of household had low family incomes.

The recent killings of black men and women by police and subsequent Black Lives Matter protests have brought the issue of racism in America to the fore. Black workers face a twin crisis of low wages and higher rates of unemployment (Pitts, 2018). Unemployment rates for black workers have consistently been double the rate for white workers since the early 1970s. Black workers are also much more likely than white workers to be employed in low-wage jobs (Gould & Wilson, 2020). Occupational segregation remains widespread in the United States (Stainback & Tomaskovic-Devey, 2012). Drivers of segregation include current hiring discrimination (Pager & Shepherd, 2008; Pager, 2007), the legacies of past employment discrimination, and mutually reinforcing social and economic factors affecting career choices and options, which are themselves manifestations of institutional racism. (See, e.g., Miller & Garran, 2007; Stainback & Tomaskovic-Devey, 2012). There is also evidence of increased segregation between firms (Ferguson & Koning, 2018), which may further contribute to wage inequality (Card et al., 2016).

Lower-income families and racial and ethnic minorities have felt the largest brunt of the economic downturn from the COVID-19 pandemic. Most of the job losses were concentrated in the bottom 25% of the income distribution (Long et al., 2020), where occupations are more likely to involve close contact with others and much less likely to be able to be performed at home (Gould & Wilson, 2020). While employment in 2020 was down for all workers, Hispanic and black workers had the steepest declines in employment and have recovered at a much lower rate than white workers (Long et al., 2020).

Low incomes associated with low wages affect many of the most significant facets of individual and social well-being; these in turn have consequences for our economy and society. Family income is correlated with a wide range of outcomes including health, children's school achievement, and civic participation. These correlations are strongest at the bottom of the income distribution but continue upward. The same pattern can be found with children's educational attainment (Duncan et al., 2017) and adults' likelihood of voting (Akee, 2019).

There is less research on the direct effect of workers' wages—as opposed to family incomes, which includes transfers—on societal outcomes. While most poor (54%) and low-income (75%) families have at least one member who works, not all do (Jarosz & Mather, 2018). There may be differences between low-income families that work and those that do not, or differential effects between additional incomes received from wages and from nonwage sources. Wage and nonwage earnings have different effects on labor-market participation, which in turn could result in different effects on societal outcomes. Health outcomes could in part be related to the kinds of occupations low-wage workers are employed in; these occupations could entail greater stress or exposure to toxic chemicals (Leigh & Du, 2012). Several studies analyze these possibilities and find a direct relationship between wages in and of themselves and specific societal outcomes.

Controlling for worker characteristics and broad occupational variables, low wages are directly associated with greater stress; higher rates of diabetes, hypertension, and heart disease; and lower life expectancy (Leigh & Du, 2012). Other research finds a relationship between available wages and youth crime (Grogger, 1998).

In measuring the impact of low wages and incomes on societal outcomes, however, it is difficult to separate confounding relationships between variables and causes from effects. Low income affects health, while poor health also affects earnings. Child development is influenced by family earnings, but it is also influenced by other variables that are highly correlated with family earnings, creating the potential to draw erroneous conclusions if relying on simple relational data. However, there is a growing body of research that uses natural experiments to measure the effects of public policies and other practices designed to boost wages or augment incomes. These study designs provide a means to get at the direction of causation as well as to measure the effectiveness of the public policies studied, and they will be the main focus of the current review.

In this paper, we will examine the literature on the downstream costs of low family incomes and low wages, as well as the research that has been done on the effects of policy interventions to increase wages and incomes. The specific dimensions we will examine are health, child development and education, crime, and civic participation. These downstream outcomes have both private and social implications. Private outcomes include immediate effects on workers and their families in the short run, as well as long-term impacts on adult outcomes for children growing up in low-income families. In addition, several of the outcomes we include in this review also imply costs to society at large, both indirect (e.g., foregone tax revenue) and direct (e.g., costs of crime and recidivism).

Our review includes studies of contemporaneous impacts, such as the effects of low incomes on workers' health or their children's test scores. We also include long-term outcomes (i.e., studies capturing the effects of low income in childhood on outcomes such as educational attainment and earnings). Making the distinction between short- and long-term outcomes is therefore important in order to gauge the overall downstream costs of low-wage work; for example, if raising incomes of low-wage workers impacts the long-term incomes of their children, then these short-term impacts will understate the costs of low-wage work.

In this review, we are primarily focusing on evidence on the causal effects of increased wages and income at the lower end of the income distribution. To be clear, we are not hypothesizing that our definition of low-wage work is a threshold around which we would expect to see discontinuous effects of a change in income. Economic theory and empirical evidence point to nonlinear impacts of higher income over the income distribution. That is, the literature suggests the expected benefits of income increases will be greater at very low incomes, tapering off at higher income levels. (See, e.g., Løken et al.'s 2012 finding that causal effects of income on educational outcomes were concentrated among children in low-income families). We also examine differential effects of changes in income by race on each of the outcomes, with a specific focus on

black families. Given the racial disparities in income as well as many of the outcomes studied in this paper, we would expect to find a disproportionate effect on black workers and their families from policy interventions focused on improving incomes of low-wage working families.

The following section of this paper provides further context for this review. The remaining sections focus on the effects of low wages and incomes on the four broad outcomes we are examining: child development, including educational outcomes reflected in test scores, enrollment, and graduation rates; child and adult health; crime; and civic participation. We conclude with a summary of the state of the field together with a suggested agenda for further research.

Context

In this section, we begin by presenting characteristics of the low-wage workforce, followed by a review of descriptive evidence on the correlation between low-wage work and the various social outcomes, together with a discussion of potential mechanisms. The main focus of our review is the quasi-experimental literature aiming to estimate causal effects of wages and income on the social outcomes of low-income workers and their families. The papers we review use three broad sources of plausibly exogenous variation in disposable income: variation in minimum wages, changes to the earned income tax credit (EITC), and unconditional cash transfers. We also draw on evidence from the Supplemental Nutritional Assistance Program (SNAP, known previously as “food stamps”), and housing vouchers. The section concludes with a brief review of these programs, their established effects on income and wages, and potential complicating factors in leveraging these programs to analyze social outcomes.

Who Makes Up the Low-Wage Workforce?

As noted above, in 2017, 29% of U.S. workers earned low wages, defined here as two-thirds of the median full-time wage, which calculates to \$13.31 an hour.³ Inflation-adjusted wages for the bottom and middle of the wage distribution in the United States have barely risen since the late 1970s, even as earnings for high-wage workers rose sharply.⁴ The federal minimum wage remains at \$7.25 an hour, where it has been for a record-setting 11 years. Adjusting for inflation, by 2018 the federal minimum wage was worth only 73% of its value at its peak in 1968 (Zipperer, 2018).

If the workers earning low wages were mainly high-school students in middle-income families earning extra cash at part-time minimum-wage jobs, if few low-income families worked, or if jobs paying low wages were mainly a transitory step to more highly

³ Authors' analysis of Economic Policy Institute analysis of Current Population Survey Outgoing Rotation Group data for 2017.

⁴ Real wages for the median worker were only 16.8% higher in 2016 than they were in 1979; for the bottom 10%, wages were only 8.9% higher, while for the top 10%, wages rose 46.9% (Schmitt et al., 2018).

paid employment, then low wages might not be of significant concern to policymakers. It is therefore important to establish who low-wage workers are.

The vast majority of workers paid low wages in 2017 were adults; only 7% were teenagers, and the median age of low-wage workers was 32.⁵ Low wages are not supplemental income: on average, low-wage workers' earnings made up a majority of their family's income, with 45% of low-wage workers serving as the sole earners in their families. More than one-third (36%) of low-wage workers have children, and 46.9% are in families with incomes under 200% of the federal poverty level.

Low-wage work is not simply an issue of low educational attainment but of workers' bargaining power in the economy. Nearly half (48%) of low-wage workers have at least some college education, a significant change from 20 years ago. Nor is it mainly an issue of working part-time: close to two-thirds of low-wage workers are employed full time, and only 16% work fewer than 20 hours a week.

Low-wage workers are disproportionately workers of color. Black, indigenous, and workers of color make up 38% of the workforce and 50% of those in low-wage jobs. Nearly half of all black workers (49%) and slightly more than half of Hispanic workers (52%) are in jobs paying low wages, compared to 28% of white workers.

Another way to discern how low wages are related to low family income is to explore the impact of minimum-wage increases at points along the income distribution. Dube (2019a) found the strongest effects of minimum-wage increases to be at the lower end of the family income distribution. One-third of the additional income from minimum-wage increases accrued to those in the bottom 15% of the family income distribution, and 80% to those in the bottom third.

Employment in jobs paying low wages is not a transitory step to higher earnings for most workers. A recent study from the Federal Reserve Bank of New York found that during the most recent economic expansion, after the Great Recession, only a little more than 5% of low-wage workers found a higher paying job within a one-year period—fewer than the share of those who became unemployed within the same amount of time (Gabe et al., 2018). Earlier studies with longer time horizons found similar restricted mobility, with some variation across industries (Osterman, 2008; Holzer, 2004). One study of the economic boom in the 1990s found that only slightly more than a quarter of workers who earned low wages at the start of the study period (1993–95) consistently earned enough to keep a family of four with a single parent above the poverty line at the end of the decade, even factoring in EITC payments.

The evidence thus indicates that low-wage workers rely on their incomes to support their families; that low wages are a significant factor in low family income; and that, with some variation across industries, low-wage jobs are not a transitional step to wages that bring economic self-sufficiency for most workers. This lends credence to the

⁵ Authors' analysis of Economic Policy Institute analysis of Current Population Survey Outgoing Rotation Group data for 2017.

hypothesis that policies that increase wages at the bottom are likely to improve earnings of lower-income working families, which may result in the positive societal downstream effects studied in this paper.

Descriptive Evidence and Potential Mechanisms

A well-established body of literature documents significant correlations between income and the downstream outcomes reviewed in this paper. The literature finds that family income is strongly correlated with children's school performance and health outcomes (Kaplan, 2009; Chaudry & Wimer, 2016; Woolf & Braveman, 2011; Duncan et al., 1998). The correlation between childhood poverty and later-life outcomes is especially strong when poverty is persistent and experienced in early childhood (Chaudry & Wimer, 2016; Duncan et al., 2011; Duncan, Ziol-Guest, & Kalil, 2010).

There is a strong positive correlation between income and health. Disparities in health outcomes exist throughout the income distribution: the poor have worse health outcomes than the middle class, who have worse outcomes than the rich (Braveman et al., 2010). The disparities are apparent in most health indicators (Woolf & Braveman, 2011) and throughout lifetimes: from low weight at birth, to disease in childhood and adulthood, to shortened life expectancy and premature death (Chetty et al., 2016; Krieger et al., 2008; Muennig et al., 2010; Kaplan, 2009).

Cooper and Stewart point toward two mechanisms by which increased family income could promote better child development outcomes based on the reviewed research. First, there is an increased ability of parents to secure goods and services for their children and to meet their basic material needs. Second, increased family income reduces parents' stress and anxiety and, in particular, is likely to reduce maternal depression (Cooper & Stewart, 2017; London School of Economics, 2017; Duncan, Magnuson, & Votruba-Drzal, 2017; Duncan, Morris, & Rodrigues, 2011). Similarly, higher income can affect health by allowing workers the means to meet basic needs, as well as through place-based factors (e.g., access to safer, more resourced neighborhoods) and reduced stress.

Individuals in lower-income families are less likely to vote, visit a public official, participate in school associations, or engage in religious or civic organizations (Levin-Waldman, 2012). This creates a self-reinforcing bias in public policy toward those with greater economic resources (Akee et al., 2018).

Economic theories of criminology postulate that criminal behavior is responsive to expected costs and benefits (Becker, 1968). We may expect higher wages to reduce crime committed out of economic need. More generally, crime rates could fall as the opportunity cost of crime increases; however, in theory the effect is ambiguous, as higher wages could also lead to improved opportunities for theft (as more people in the community are able to purchase valuable goods) or increased consumption of crime-related goods such as illegal drugs (Heller et al., 2011). Research has demonstrated the inverse relationship between available wages and youth crime (Grogger, 1998) and between labor market conditions for unskilled workers and property crime (Doyle et al., 1999).

Sources of Quasi-Experimental Variation

The preceding paragraphs summarized a substantial body of literature documenting significant correlations between low income and a number of adverse social outcomes. Interpreting these correlations is often complicated by concerns about the directions of causality. To illustrate, several studies indicate that low income is associated with worse health outcomes, but does low income *cause* poor health (e.g., by making someone unable to afford prescription drug copays)? Or does poor health cause low income (e.g., by making it difficult to maintain stable employment)? Or perhaps the association is due to “confounding factors,” meaning both poor health and low income are correlated with a separate variable (e.g., childhood trauma can contribute to both future low income and poor health). All of these pathways are plausible and, in fact, they could all be implicated simultaneously.

Over the past few decades, applied empirical researchers have increasingly focused on implementing research designs that can untangle cause-and-effect relationships and undertaking supplementary analyses to assess the validity of their identifying assumptions (Angrist & Pischke, 2010; Athey & Imbens, 2017). Researchers studying causal effects of wages on health will leverage natural experiments that result in variation in disposable wage income that is not affected by individual underlying health or by unobserved determinants of health. In this review, we consider evidence from various sources of variation in wages as well as income more broadly.

Variation in statutory minimum wages provides perhaps the cleanest source of variation in wages at the low end of the wage distribution. While the federal minimum wage sets a wage floor, many states and other localities have implemented their own laws mandating higher minimum wages. This generates substantial variation among pretax wages of low-wage workers.

A second source of variation in disposable wage income is generated by changes to the EITC, a refundable tax credit targeted primarily at low-income working families with children. Eligibility for the credit depends on family size and earned income. At low incomes, the credit is proportional to earned incomes up to a plateau; at higher incomes, the credit phases out; and maximum credit, phase-in, and phase-out rates vary with family size. The EITC thus functions somewhat like a wage subsidy, increasing the after-tax earnings of eligible families. At the same time, variation in income generated by the EITC differs from wages per se in several ways. First, the EITC is largely a targeted transfer, primarily benefiting families with minor children. Second, the cost is borne by the government, rather than by employers. Third, unlike wages, the EITC increases family resources with a delay, as qualifying workers receive the credit only after filing taxes the following year.

Studies leveraging variation in the EITC and the minimum wage may be especially informative on the causal effect of wages, as they raise the return to market work (i.e., the more one works in the formal labor market, the more one earns). However, for some of the downstream outcomes we cover in this review—crime and civic participation—there is limited empirical work on the effects of these policies. We therefore

supplement the review with studies that use three additional sources of variation in wages and income: (1) variation in wages driven by local labor market shocks; (2) unconditional transfers, such as cash transfers and housing vouchers; (3) the Supplemental Nutrition Assistance Program (SNAP)—the only transfer program that doesn't target specific demographics, such as families with children. While SNAP benefits can only be used for food items, the impact on household resources is similar to cash. To be clear, these additional three sources of variation will typically affect broader populations than just the low-wage workforce: a tighter labor market can raise incomes at higher levels of the wage distribution, while unconditional cash transfers and SNAP benefits reach not only low-wage workers but also people who do not work in the market.⁶

More generally, many of these quasi-experiments are not pure wage or income treatments, as employment may be shifted as well as wages. For example, a number of papers have analyzed the employment effects of the EITC, with many studies finding substantial increases in employment among single mothers (Hotz & Scholz, 2001). In a tight labor market, not only will wages be high, but also it will be easier to find work. With respect to unconditional cash transfers, economic theory predicts that an exogenous increase in nonlabor income will reduce labor supply; in practice, studies of unconditional cash transfers in the United States either fail to find significant reductions in labor supply or find only small reductions in earnings and hours worked. (See Marinescu (2018) for a review). Finally, since SNAP eligibility is conditional on family income, access to this program is expected to reduce labor supply. Evidence suggests this is indeed the case for some groups, with employment reductions for single women together with reductions in hours for some married men, though these effects are generally small (East, 2018a; Hoynes & Schanzenbach, 2012).

A well-established body of literature analyzes downstream outcomes of workers and their families following unanticipated economic shocks such as job displacement or plant closures. These unanticipated shocks are appealing in that they may yield plausible identification of causal impacts. While these studies thus provide a useful source of quasi-experimental evidence on the effects of economic determinants of downstream outcomes, we exclude these studies from the current review. Our reasoning for doing so is twofold, both stemming from the practical need to limit the scope of the review. First, we wish to focus primarily on studies that are most informative regarding the effects of increasing incomes specifically at the low end of the wage distribution. Second, unanticipated economic shocks like getting laid off may be qualitatively different events relative to the small changes in income associated with incremental changes in wages; that is, these shocks are not merely transitory negative shocks to income but potentially stressful events bringing large, unexpected shocks to time use and lifetime earnings (Schaller, 2016) and, as such, effects may not scale. We do, however, note that a

⁶ Between 2009 and 2011, an estimated 38% of the funds went to families with at least one member in the workforce (Jacobs et al., 2015).

number of studies have analyzed the impacts of job loss on downstream outcomes, finding significant impacts on various outcomes such as health, education, and crime (see, e.g., Sullivan & von Wachter, 2009; Stevens & Schaller, 2011; Bennett & Ouazad, 2019).

Empirical research on minimum wages typically leverages state-level variation in minimum-wage laws. Work on the EITC leverages two distinct sources of variation. First, there is variation resulting from the design of the federal EITC. The credit has been expanded several times, and these expansions have had differential impacts by family size. These expansions then yield substantial random-like variation in the federal credit that can be used to identify effects of the credit, provided the data contain the relevant information on family size and certain other variables. To illustrate, women who are pregnant with their first child will be less affected, as EITC eligibility is conditional on having qualifying children. The second variable is that several states have implemented their own EITCs: these credits typically take the form of top-up rates proportional to the federal credit. The resulting policy variation yields another potential source of quasi-random variation in net annual resources.

In order for these models to estimate causal effects, the resulting variation in income should be uncorrelated with other unobserved drivers of the social outcomes of interest. This assumption is not trivial, as state policy changes are not randomly assigned. Several of the more credible studies included in this review explicitly acknowledge this possibility and conduct various supplementary analyses to assess the validity of their empirical approach (Athey & Imbens, 2017). Such analyses include but are not limited to estimating placebo models on groups unlikely to be affected by either policy, testing for differential pretrends, and checking the robustness of the findings to specification choice, including adding more granular levels of geographic controls.

There is a wide body of literature on the effect of minimum wages on employment and worker earnings (Belman & Wolfson, 2014; Dube 2019b). While there is some variation in research results, the evidence is strong that minimum wages are effective in improving earnings for low-wage workers (Dube, 2019a). There is greater dispute in the research literature on the effects of minimum-wage policies on employment, however, the weight of credible evidence finds that employment effects on adults are negligible (Belman & Wolfson, 2014; Cengiz et al., 2018; Dube 2019b). While there is greater debate on teen employment (Neumark et al., 2013), more recent studies that take into account economic pretrends find equally small effects on teen employment (Allegretto et al., 2017; Cengiz et al.).

Another way minimum-wage increases could adversely affect health would be if employers responded to higher-wage mandates by reducing the value of the benefits they provide, specifically by cutting back access to or quality of employer-provided health insurance. The research on such trade-offs between wages and benefits is mixed, with some studies finding no effects and others finding small effects (Belman & Wolfson, 2014).

It should be noted that even well-designed studies may have limited external validity. In particular, most minimum-wage research has been conducted during periods of time in which wage mandates have been relatively modest. Numerous cities and states around the country have recently passed new mandates for significantly higher wages; these can be expected to have larger effects on employment and benefits and, as they are implemented, offer an important opportunity for future research.

Racial Disparities

As discussed in the introduction, there are persistent racial gaps in wages, earnings, employment, and wealth (Bayer & Charles, 2018; Chetty et al., 2020). Policies that raise earnings may thus disproportionately impact racial and ethnic minorities that are overrepresented in low-wage work. Black families are more likely than non-Hispanic whites to be eligible for the EITC (Nichols & Rothstein, 2015). Higher minimum wages may also reduce racial wage inequality. Analyzing the impacts of the 1966 Fair Labor Standards Act, which expanded minimum-wage coverage, Derenoncourt and Montialoux (2020) found that wage effects for black workers were twice as large as for whites. Wursten and Reich (2020) likewise found that subsequent raises in the minimum wage increased the earnings of all workers, with greater effects for black and Hispanic workers. Both studies found significant effects of the minimum wage in reducing the racial wealth gap.

A well-established body of literature documents racial disparities in the downstream outcomes covered in our review. Racial disparities in health are pervasive and persistent (see, e.g., Williams and Mohammed (2009) for a review). Black Americans have higher incidences of low birth weight and higher mortality rates at all ages (Lu & Halfon, 2003; Komro et al., 2019; Williams & Mohammed, 2009). Significant disparities exist in educational achievement and incarceration as well (see, e.g., Magnuson & Waldfogel, 2008; Rehavi & Starr, 2014; Carson, 2020). Given these disparities, a natural question is whether higher wages and incomes for low-wage workers and families could help reduce these disparities. We will return to this question in our review of the causal evidence below.

The Effects of Low Incomes on Child Development

Table 1 summarizes the effects of economic resources on child development.⁷ We include here studies of both short-term outcomes (e.g., test scores) and long-term outcomes (e.g., educational attainment, earnings in adulthood). Overall, we find strong causal evidence of the effects of parental income on childhood development. Increases in parental income are found to lead to higher test scores and better educational outcomes for children, greater likelihood of employment in young adulthood, and improved

⁷ A majority of the quasi-experimental papers we review in this and the next three sections have been included in existing review papers that helped to inform our analysis: Almond et al., 2018; Hoynes & Schanzenbach, 2018; Cooper & Stewart, 2017; Nichols & Rothstein, 2015; Leigh et al., 2019; Duncan et al., 2017.

earnings. There is suggestive evidence that increased parental incomes reduce child neglect, teen birth rates, and behavioral and emotional disorders in children.

Table 1 Child development

Study	Outcome variables	Data	Identifying variation	Effects
Chetty et al. (2011)	Test scores	Tax data and admin records	EITC	\$1,000 higher income: 0.06–0.09 SD higher test scores.
Dahl & Lochner (2012, 2017)	Math and reading test scores	National Longitudinal Youth Survey (NLSY) 1979	EITC	\$1,000 higher family income increases math and reading test scores by 0.04 SD; higher for black and Hispanic children (0.05 SD).
Maxfield (2013)	Educational attainment by age 19	NLSY	EITC	\$1,000 higher max credit increases high-school graduation by 2 percentage points, some college attendance by age 19 by 1.4 percentage points; high-school graduation increases 2.3 percentage points for minority children vs. 1.8 percentage points for non-Hispanic white children.
Bastian & Micheltore (2018)	High school and college completion, employment, and earnings	Panel Study of Income Dynamics (PSID)	EITC	\$1,000 higher EITC payment increases likelihood of high school, college completion by 1.3%, 4.2%, respectively. High-school graduation increases 2.7% for black boys.
Manoli & Turner (2018)	College enrollment	Tax and Social Security Administration	EITC	Higher EITC payments in spring of high-school senior year increases college enrollment.
Hamad & Rehkopf (2016)	Behavioral problems, home environment	NLSY	EITC	Higher EITC payments reduces behavioral problems, improves home environment.
Costello et al. (2003)	Psychiatric disorders	Great Smokey Mountain Survey (GSMS)	Unconditional cash transfer	Higher family income reduces some psychiatric disorders in poor children.

Akee et al. (2010)	High school completion, years of schooling at age 21, school attendance	GSMS	Unconditional cash transfer	Higher income increases school attendance, high-school graduation, schooling at age 21.
Akee et al. (2018b)	Personality traits/noncognitive skills	GSMS	Unconditional cash transfer	Higher family income improves child emotional, behavioral health and personality traits.
Bailey et al. (2019)	Human capital in adulthood	American Community Survey (ACS), Census, Social Security Administration (SSA) Numident	SNAP benefits	Childhood access to SNAP benefits increases human capital in adulthood by 6% of a SD
Raissian & Bullinger (2017)	Child maltreatment rates	National Child Abuse and Neglect Data System (NCAND)	Minimum wage	\$1 higher minimum wage reduces child neglect reports by 9.6%. No measurable difference by race.
Bullinger (2017)	Teen fertility	Vital statistics	Minimum wage	\$1 higher minimum wage reduces teen birth rates by 2%. Largest effect on non-white Hispanic children.

Note: EITC indicates Earned Income Tax Credit; SD, standard deviation; SNAP, Supplemental Nutrition Assistance Program.

Several studies have used the EITC expansions to study the effects of increased family income on the development of children, analyzing effects on educational outcomes. Dahl and Lochner (2012) looked at the extent to which children’s test scores changed after their family income increased, finding substantial improvement in math and reading scores. Putting these findings into perspective, Nichols and Rothstein (2015) noted that the effects Dahl and Lochner found were four times as much per dollar as the effects found in a study of class size reductions that cost around \$12,000 per student.⁸ Another study found that a child whose family received the largest EITC increase had a 4.8 percentage-point higher probability of finishing at least one year of college by age 19, “an improvement comparable to the effect of major educational interventions such as

⁸ We should note that a coding error resulted in the estimated first stage being too small and Instrumental Variable estimates that were too big. Correcting this error yielded estimated effects that, while highly statistically significant, were approximately 30% smaller (Dahl & Lochner, 2017). In Table 1, we report the 2017 (corrected) estimate.

reducing classroom size” (Maxfield, 2013, as reported in Marr et al., 2015). The EITC may have different impacts across the income distribution of eligible families. Manoli and Turner (2018) found that for students from low-income families at the phase-in region of the EITC schedule, higher EITC payments received in the spring of students’ senior year in high school significantly increased college enrollment.

Other studies looking at EITC have found that increases in income result in improved academic testing performance (Chetty et al., 2011), reduced child behavioral problems (Hamad & Rehkopf, 2016), and increased educational attainment (Bastian & Michelmore, 2018). Bastian and Michelmore found that a \$1,000 increase in EITC exposure when a child is age 13–18 leads to a 1.3% increase in their likelihood of completing high school by age 20 and a 4.2% increase in their likelihood of completing college by age 26. They also found that a \$1,000 additional EITC exposure leads to a 1% increase in the likelihood of being employed between ages 22 and 27, and a \$560 (2.2%) increase in average annual earnings. Nichols and Rothstein conclude that, taken all together, “there is robust evidence of quite large effects of the EITC on children’s academic achievement and attainment, with potentially important consequences for later life outcomes” (Nichols & Rothstein, 2015, 39). Moreover, there is evidence that greater resources in early childhood could significantly improve schooling later in life: exploiting the differential rollout of SNAP, Bailey et al. (2019) found that access to SNAP benefits in childhood (ages 0–5) increased adult human capital by 6% of a standard deviation.⁹

Using data from the National Child Abuse and Neglect Data System, Raissian and Bullinger (2017) found that a \$1 per hour increase in the minimum wage resulted in a 9.6% decline in child-neglect reports. The effects were concentrated among toddlers and school-age children, with little effect on neglect rates of teenagers. The authors point out that their results are “particularly salient” since women are more likely than men to be the caretaking adult in cases of child maltreatment as *well as* more likely to benefit from a minimum wage increase (Johnson, 2017). In another study, a \$1 increase in the minimum wage was found to decrease birth rates among teens ages 15–19 by 2%. The effects were largest among non-Hispanic white and Hispanic adolescents (Bullinger, 2017).

Beginning in 1996, all adult Eastern Cherokee tribal members living in North Carolina received unconditional per capita transfers of profits from a Cherokee-owned casino, averaging \$4,000 per person annually. Jane Costello from Duke University had already been conducting a study of the well-being of children in the area and was therefore able to use this natural experiment to examine the effect of the income transfers on the children’s mental health (Costello et al., 2003). Among children whose families were able to move out of poverty as a result of the casino funds, Costello found significant reduction in the frequency of psychiatric symptoms, to the point that their rates were no higher than those of children who never experienced poverty. The majority of the

⁹ The authors construct a human-capital index based on the following variables: years of schooling, high school/GED completion, any college attendance, college completion, professional degree completion, and professional occupation.

improvements were specific to behavioral symptoms (i.e., conduct and oppositional disorder), with smaller effects on emotional symptoms like anxiety and depression.

Additional analyses of these data were conducted by Akee et al. (Akee et al., 2010; Akee, Copeland, Costello, & Simeonova 2018), who found that children in households receiving casino income were more likely to have higher levels of education; among the poorest households, an additional \$4,000 per year increased educational attainment at age 21 by one year. The researchers also found that the income transfers reduced behavioral and emotional disorders and improved the personality traits of affected children; the additional income was found to positively affect the attributes of conscientiousness and agreeableness. Further, the strongest effects were seen among children who were initially the most deficient in these traits (Akee, Copeland, Costello, & Simeonova, 2018).

Of the 12 studies discussed in this section, six analyzed differences by race on at least one of their outcomes; in three of the studies, American Indians make up the entire treatment group, and three do not include an analysis by race or ethnicity. Among families receiving a \$1,000 increase in parental income, Dahl and Lochner (2012) and Maxfield (2013) found larger effects on test scores and high-school graduation for black and Hispanic children than for white children. Bastian and Michelmore (2018) confirmed their results on high-school graduation rates, finding the largest effect on black boys (2.7% increase from a \$1,000 increase in income). Raissian and Bullinger (2017) found no measurable difference in child maltreatment based on race following an increase in the minimum wage. Bullinger (2017) found the largest effect on teen fertility following a minimum-wage increase among nonwhite Hispanic adolescents. She found no measurable effect on black adolescents, for whom she also found no treatment effect as a result of a higher minimum wage. Overall, there is strong causal evidence that increased family earnings lead to greater educational attainment and test scores among children of all races and that these effects are largest for children of color, who are more likely to start from greater economic disadvantage.

The Effects of Low Incomes on Health

Table 2 summarizes selected quasi-experimental evidence of the effects of low wages on health outcomes. Overall, we find strong causal evidence of the effects of parental income on children's birth weights and that parental income during pregnancy and early childhood has persistent effects on children's health in adulthood. Evidence of teen earnings on alcohol-related fatalities is inconclusive. There is suggestive evidence that increases in income reduce stress, improve mental health, and reduce suicides among adults. Parental stress is a likely causal mechanism in the children's outcomes discussed above. There is also suggestive evidence that higher wages reduce workers' absences due to health. More research is needed on the effects of wages and incomes on adult health.

Table 2. Health outcomes

Study	Outcome variables	Data	Identifying variation	Effects
Hoynes et al. (2015)	Birth weight	Vital statistics	EITC	Higher EITC payments increases average birth weight, reduces LBW.
Baker (2008)	Birth weight	Vital statistics	EITC	1993 EITC expansion increased birth weight, reduced LBW.
Strully et al. (2010)	Birth weight	Vital statistics	EITC	The presence of a state EITC policy increases average birth weight by 16 g.
Markowitz et al. (2017)	Birth weight, gestation	Vital statistics	EITC	Larger state EITCs improve birth weight, reduce LBW, slightly longer gestation.
Komro et al. (2019)	Birth weight, gestation	Vital statistics	EITC	State EITCs improve birth outcomes, black mothers see larger reductions in LBW, longer gestation.
Komro et al. (2018)	Birth weight, infant mortality	Vital statistics	Minimum wage	\$1 higher minimum wage predicts 1%–2% reductions in LBW, 4% reductions in post-neonatal mortality.
Wehby et al. (2018)	Birth weight	Vital statistics	Minimum wage	\$1 higher minimum wage increases birth weight, reduces share of LBW for less-educated mothers by 1%.
Almond et al. (2011)	Birth weight, infant mortality	Vital statistics	SNAP benefits	Access to SNAP increases birth weight, reduces low birth weight.
East (2018b)	Birth weight, child health	National Health Interview Survey (NHIS), Vital statistics	SNAP benefits	Access to SNAP improves birth weight, child health.
Bronchetti et al. (2019)	Child health	NHIS	SNAP benefits	Greater SNAP purchasing power increases preventive health care, reduces school absences.
Hoynes et al. (2016)	Adult health	Panel Study of Income Dynamics (PSID)	SNAP benefits	Childhood access to SNAP reduces metabolic syndrome incidence in adults.

Bailey et al. (2019)	Mortality	American Community Survey (ACS), Census, Social Security Administration (SSA) Numident	SNAP benefits	Childhood access to SNAP increases longevity by 0.4 percentage points.
Adams et al (2012)	Alcohol-related teen traffic fatalities	Fatality Analysis Reporting System (FARS)	Minimum wage	10% higher minimum wage increases alcohol-related fatal accident rates by 11%.
Sabia et al. (2019)	Alcohol-related teen traffic fatalities	FARS	Minimum wage	No robust effect of minimum wage on fatal accident rates.
Du & Leigh (2018)	Work absence and self-reported health	PSID 1997-2013	Minimum wage	Minimum wage reduces work absences, improves self-reported health.
Evans & Garthwaite (2014)	Maternal health	Behavioral Risk Factor Surveillance System (BRFSS), National Health and Nutrition Examination Survey (NHANES)	EITC	Higher EITC credit improved self-reported health, with fewer poor mental health days, and improved biomarkers.
Horn et al. (2017)	Worker health	BRFSS	Minimum wage	10% higher minimum wage reduces self-reported health (men and women), reduces bad mental health days for women.
Meltzer & Chen (2011)	Body mass index	BRFSS	Minimum wage	\$1 increase in real minimum wage reduces average body mass index by 0.06 points.
Dow et al. (2019)	Suicides and drug deaths	Center for Disease Control (CDC) mortality	Minimum wage and EITC	10% higher minimum wage or EITC reduces nondrug suicides by 3.6% or 5.5%, respectively.

Note: EITC indicates Earned Income Tax Credit; LBW, low birth weight; SD, standard deviation; SNAP, Supplemental Nutrition Assistance Program.

According to the fetal-origins hypothesis, conditions in utero have profound impacts on outcomes later in life. While early research on the hypothesis focused on larger incidents, such as famine, recent work has highlighted that even relatively mild deprivations during pregnancy can have significant effects on later outcomes (Almond et al., 2018). Given the importance of pregnancy and birth conditions as predictors of adult outcomes, a number of studies have estimated the effects of the social safety net and other economic policies on birth weight and related outcomes.

Five studies use quasi-experimental methods to analyze the impact of EITC on infant birth weights. Hoynes et al. (2015) leverage this exogenous variation in EITC payments to estimate difference-in-differences models of birth outcomes. Event study models indicate that rates of low birth weight for first- and later-born children trended in parallel before EITC expansions were implemented. After the expansions, low birth weight fell significantly for second and higher-order births relative to first births, indicating that higher EITC payments improved birth outcomes for these babies. Additional analyses indicated that effects lined up well with estimated exposure; the authors also implemented several placebo tests.

The estimated effects indicate that for every \$1,000 in EITC benefits there was a 2%–3% decline in rates of low birth weight for children of single mothers without college education. The effect was particularly pronounced among African-American mothers. The mechanisms by which higher EITC benefits decrease low birth-weight rates are reduced maternal smoking, reduced maternal alcohol consumption, and earlier and more frequent prenatal care.

Using variation in state EITCs over time, Strully et al. (2010) found that on average, the implementation of state EITC policies increased birth weights by 16 grams. Three other studies found similar results (Baker, 2008; Markowitz et al., 2017, Komro et al., 2019). Consistent with these results, two recent papers found positive effects of the minimum wage on birth outcomes (Komro et al., 2016; Wehby et al., 2016); however, the findings of these papers could in part reflect differential trends in birth outcomes that may be correlated between states, as neither paper explicitly examines parallel pretrends.

The nationwide rollout of SNAP (then called “food stamps”) in the 1960s and 1970s was implemented in a staggered manner across counties, yielding potentially exogenous variation in exposure rates. Almond et al. (2011) leveraged this variation to estimate effects on birth outcomes, finding that access to SNAP benefits during pregnancy significantly improved birth outcomes. Birth weights increased significantly, and the share of babies with low birth weight (i.e., < 2,500 grams) fell.

More recent data confirm these findings. East (2018b) exploited variation in immigrants’ SNAP eligibility following the passage of welfare reform in 1996 to estimate effects on infant and child health, finding that maternal access to SNAP benefits reduced the incidence of low birth weight. Moreover, access to the program in utero and in early childhood (up to age 4) significantly improved health outcomes at ages 6–16. Bronchetti et al. (2019) leveraged regional variation in food prices to estimate effects of the real

value of SNAP benefits on child health. The authors found that greater local purchasing power of SNAP benefits led to increased utilization of preventive care and a reduction in children's health-related school absences; parent-reported health status, meanwhile, was not affected.

Recent research indicates that these beneficial effects of childhood exposure to SNAP benefits may stretch well into adulthood. Hoynes et al. (2016) found that people who accessed SNAP benefits as children had a significantly lower incidence of metabolic syndrome in adulthood, and Bailey et al. (2019) found that childhood access to SNAP benefits significantly increased longevity. Full access to SNAP in early childhood reduced the probability of dying during the sample period (2012 or earlier) by 0.07 percentage points.¹⁰ Scaling these estimates by the average participation rates yields large treatment-on-the-treated estimates: receiving SNAP benefits reduces mortality by just under 11%.

As a group, teenagers are highly exposed to the minimum wage; moreover, they tend to spend a higher fraction of their income on discretionary purchases rather than necessities. Using data from the Fatality Analysis Reporting System, Adams et al. (2012) found that higher minimum wages increased alcohol-related teen traffic fatalities: a 10% increase in the minimum wage increased accident rates by 11%. The authors show that the states that implemented higher minimum wages trended in parallel with a group of control states in the years leading up to the minimum-wage increase. However, a recent follow-up study found that these results may be sensitive to the choice of sample period as well as specification choices (Sabia et al., 2018).

Using data from the Behavioral Risk Factor Surveillance System, Horn et al. (2017) found mixed impacts of minimum wages on health. The authors found negative effects of higher minimum wages on self-reported health for both men and women with high-school degrees or less educational attainment. For less-educated women, however, the authors estimated a reduction in self-reported "bad mental health days." In addition, the authors estimated triple-difference models, modeling effects on groups that are arguably not affected by minimum-wage changes—retirees and college-educated workers—as a verification test. However, the authors included in their treatment group workers with some college education, who as a group are less likely to be affected by a minimum-wage increase; as a result, the overall share of workers in their sample who may have experienced wage increases could be small.

Du and Leigh (2018) found that higher minimum wages significantly reduced work absences due to own illnesses among less-educated workers, while absences due to others' illnesses were not affected. Meltzer and Chen (2011) found that higher minimum wages reduced obesity. The authors attribute this decline to the higher price of fast food resulting from higher wage costs in limited-service restaurants rather than income effects among minimum-wage workers. However, interpretation of their findings is

¹⁰ The sample includes the 1950–1980 birth cohorts, who would have been 32–62 years old in 2012.

complicated by the way their preferred minimum-wage measure is constructed: the authors deflate nominal minimum wages using regional consumer price indices, meaning the resulting estimates reflect variation in regional price levels as well as changes to minimum-wage laws.

Evans and Garthwaite (2014) studied the impacts of the 1993 EITC expansion on maternal health. The EITC expansion gave “dramatically more money” to families with two or more children, causing the authors to hypothesize that if more income lowered mothers’ stress levels, then mothers with two or more children would see greater reductions in stress as a result of the EITC expansion than mothers with one child. This is precisely what was found in the study; there were larger reductions in biomarkers for stress as well as self-reported “bad mental health days” among mothers with two or more children than there were among similar mothers with just one child. Evans and Garthwaite’s finding that higher EITC payments reduce maternal stress is striking in part because of the implied spillover effects on children. As pointed out by Cooper and Stewart (2017), improved mental health of mothers provides a compelling mechanism by which raising incomes of low-wage workers could improve child development.

Consistent with the findings of Evans and Garthwaite, recent research indicates that higher minimum wages and EITCs may reduce suicides. Dow et al. (2019) used variation in state EITCs and minimum wages to estimate the effects on so-called “deaths of despair”—deaths from suicide and drug overdoses. While these policies do not have significant effects on drug-related mortality, the number of nondrug suicides dropped sharply at the time that states implemented higher minimum wages or top-up EITCs. Effects are concentrated among people with high-school degrees or less educational attainment; those with bachelor’s degrees, who are typically not exposed to minimum-wage jobs or the EITC, do not experience any significant effects of either policy.

Several of the studies summarized in Table 2 reveal differential impacts by race. Hoynes et al. (2015) found that the impact of EITC on birth weight was approximately four times larger for black infants than for non-black infants, while the effects for Hispanic infants were smaller than for non-Hispanic infants. Likewise, Komro et al. (2019) found larger impacts of state EITCs on birth outcomes of black mothers. A similar pattern was found in three studies of SNAP. Almond et al (2011) found that the positive impact of the program on birth weight was approximately twice as large for children born to black mothers, while the positive effect on adult health and longevity was larger for nonwhite Americans (Hoynes et al., 2016; Bailey et al., 2019).

The Effects of Low Incomes on Crime

Table 3 summarizes selected empirical papers estimating causal effects of income or income-like resources on crime. Empirical evidence on the causal effects of wages on crime is somewhat limited. To complete the picture, this section broadens the evidence base to include studies of local labor market conditions, unconditional transfers, and SNAP.

Table 3. Crime

Study	Outcome variables	Data	Identifying variation	Effects
Agan & Makowsky (2018)	Recidivism	National Corrections Reporting Program (NCRP)	EITC and minimum wage	\$1 higher minimum wage reduces 1-year recidivism rates by 5.6%.
Fone et al. (2019)	Crime rates	Uniform Crime Report (UCR), National Incident Based Reporting System (NIBRS), National Longitudinal Survey of Youth (NLSY)	Minimum wage	10% higher minimum wage increases property crime rates by 2.1% among people age 16–24.
Gould et al. (2002)	Crime rates	UCR, NLSY	Two-way fixed effects, Bartik instruments	10% higher wages reduce overall crime rates by 5.2%–13.5%.
Yang (2017)	Recidivism	NCRP	Proportional hazard models with county and year fixed effects	10% higher low-skill wage reduces recidivism by 4.4%–4.6%.
Akee et al. (2010)	Minor crime age 16–17	Great Smokey Mountain Survey (GSMS), North Carolina Administrative Office of the Courts	Unconditional cash transfers	\$4,000 higher household income reduces the probability of committing a minor crime by 22%.
Jacob et al. (2014)	Crime rates	Illinois State Police arrest data	Randomized housing voucher lottery	No significant effects on crime rates.
Tuttle (2019)	Recidivism	Florida Dept of Corrections	SNAP benefits ban for drug traffickers	A ban on SNAP benefits receipt increases recidivism by 9 percentage points.
Bailey et al. (2019)	Incarceration	American Community Survey (ACS), Census, Social Security Administration (SSA) Numident data	Differential rollout of SNAP	Access to SNAP before age 5 reduces likelihood of incarceration by 0.5 percentage points.

Note: EITC indicates Earned Income Tax Credit; SD, standard deviation; SNAP, Supplemental Nutrition Assistance Program.

Overall, the evidence suggests that available wages and income are contributing factors to recidivism and crime rates. If we take out the one study showing large pretrends (Fone et al. 2019), six of the seven remaining studies find positive effects of improved wages or incomes on reducing crime, while one finds no effect. The research on recidivism includes studies of changes to the minimum wage and EITC, variation in local labor market conditions, and changes in income unconnected to work by way of SNAP access. This is consistent with the theory that crime is affected by both economic need and opportunity costs. There is also evidence that improved incomes in childhood decrease criminal activity and incarceration later in life, consistent with the evidence on the behavioral effects of income early in life.

We are aware of only two recent studies that consider effects of the EITC and/or the minimum wage on crime. One study looked at the effect of the minimum wage and EITC on recidivism rates of those recently released from prison (Agan & Makowsky, 2018). The authors found that a minimum-wage increase of \$0.50 reduced the probability of a return to prison within a year by 2.8%, for both men and women. A 5-percentage-point increase in the EITC decreased women’s likelihood of returning to prison within three years by 2.25% but was not found to make a difference for men.

These findings contrast with the conclusions of Fone et al. (2019) that higher minimum wages significantly increase crime rates. The authors found that a 10% increase in the minimum wage increased property-crime rates among teens and young adults ages 16–24 by 2.1%. Meanwhile, the authors’ event-study analyses indicate that the estimated effects on property crimes may in part reflect a divergence in underlying crime trends. The authors found that the increases in crime were driven exclusively by large increases in the minimum wage; for moderate increases, they found no effects. However, their estimated event study models found that coefficients in the years leading up to these large increases were consistently negative and significantly different from zero (at the 10% level, the level of significance reported by the authors)—that is, crime rates started to rise several years before states actually implemented the minimum wage. If these diverging trends continue in the years following the minimum-wage increase, estimated effects will be biased upward.

Given the conflicting results from these two studies, we extend the evidence base to consider studies looking at local labor markets and transfers. A study of crime rates in the United States from 1979 to 1997 found that local property crime and violent crime rates respond to the labor market conditions for unskilled men and that wages had a greater effect than the unemployment rate on crime rates (Gould et al., 2002). A 20% decrease in wages of unskilled men led to a 21% increase in property crimes and a 35% increase in violent crimes. Noting that county-level wage trends are potentially endogenous to changes in crime, the authors also estimated two-stage least-square models employing shift-share instruments. These specifications confirm the positive impact of wages on crime: if anything, effects in these models are larger.

More recently Yang (2017), analyzing the effects of local labor markets on recidivism, estimated that 10% higher low-skill wages reduced the recidivism risk by 4.4%–4.6%. Yang showed that the county-level labor market conditions at the time of release were orthogonal to predicted recidivism risk, supporting the assumption that any effect on recidivism is not driven by compositional differences in the population of newly released ex-offenders. While these studies provide compelling evidence that better local labor-market conditions can reduce crime, the estimated effects of wages likely capture the effects of labor market tightness—that is, the research designs are not able to distinguish between the impact of higher offered wages and the increased probability of finding employment. While effects were present across racial groups, they were largest for black ex-offenders (5.4% reduction in odds of recidivism, compared with 3.6% for whites).

It may be useful then to contrast these findings with those from papers studying the effect of nonlabor income. Jacob et al. (2014) analyzed a housing voucher program in Chicago that was randomly assigned to individuals on a waiting list. The program increased family income by an average of 50%. Analyzing arrest data as well as other outcomes for family members of voucher recipients, the authors found no significant effects of voucher receipt on crime or other youth outcomes. They noted that one potential factor in their results may come from their findings of reduction in parental labor supply among the same population following receipt of the housing vouchers. Meanwhile, in the casino income transfer research discussed above, Akee et al. (2010), found that among families that received additional income, the chance of a 16- or 17-year-old committing a minor crime decreased by 22%.

Tuttle (2019) estimated the effects of SNAP benefit access on recidivism using a regression discontinuity design. Following the passage of welfare reform in 1996, several states implemented lifetime bans on SNAP assistance for people convicted of a drug felony. In Florida, the way the ban was implemented gave rise to a sharp discontinuity where people committing drug trafficking on or after August 23 of that year were banned from ever receiving SNAP, while those who committed similar crimes before that date remained eligible. Exploiting this variation in eligibility, Tuttle found that the ban significantly increased recidivism: drug traffickers who were banned from receiving SNAP were 9 percentage points more likely to return to prison.

Finally, the effects of low income in childhood may have consequences for criminal outcomes later in life. A recent working paper by Bailey et al. (2019) presents long-run effects of SNAP access on a range of child outcomes, including incarceration. Using linked administrative and survey data, the authors exploited the differential rollout of SNAP across counties to estimate long-run effects on children who were exposed at different ages. The authors found that access to the program significantly improved a range of later outcomes, including likelihood of incarceration: full exposure to SNAP benefits in childhood reduced the probability of incarceration by 0.08 percentage points, with effects driven entirely by reduced incarceration rates among nonwhite men.

The Effects of Low Incomes on Civic Participation

With only three credibly causal studies of the relationship between income and voting behavior, summarized in Table 4, it is admittedly difficult to draw any firm conclusions. Still, given the strong cross-sectional correlation between income and voting (Akee 2019), it is notable that only one of the three finds evidence that higher income increases individuals' own voting behavior. There is some evidence, however, that improvements in family income increase voting in the next generation. This is consistent with research finding that voting patterns become locked in early in life (Akee, Copeland, Costello, Holbein, & Simeonova, 2018).

Table 4. Civic participation

Study	Outcome variables	Data	Identifying variation	Effects
Charles & Stephens (2013)	Voting	Bureau of Economic Analysis Regional Economic Information System (REIS), county-level turnout data from the Inter-University Consortium for Political and Social Research (ICSPR)	Oil/coal price shocks	Higher local earnings reduce voter turnout for local, gubernatorial, and senate elections; no effects on presidential elections.
Akee, Copeland, Costello, Holbein, & Simeonova (2018)	Voting	Great Smoky Mountain Study (GSMS), voting records	Unconditional cash transfers	Household income has no effect on parents' voting behavior, significantly increases later voting among children from low-income families.
Markovich & White (2019)	Voting	Municipal employee wage data, public voting records, county-level panel data	Minimum wage	Eight percent increase in the minimum wage is associated with a one-third of one percentage point increase in aggregate voter turnout.

Charles and Stephens (2013) estimated the effects of local labor market conditions on voting behavior. Leveraging shocks to prices of oil, natural gas, and coal, the authors found that higher wages led to reduced turnout in elections for senator and governor but not for presidential elections. In addition, higher wages increased the probability of voters not voting in all down-ballot races. This study then suggests that as voters shift their time from leisure to work, they may access less information, in turn reducing turnout. While the authors present compelling evidence that a stronger local labor market reduces turnout, their identification strategy does not allow us to distinguish the effect of higher wages and income from the effect of increased employment rates.

Using the same natural experiment from casino transfers discussed previously, Akee and co-authors (2018) found that the children of families who received a cash transfer were more likely to vote in adulthood, with the greatest effect found among children in households below the median income. The voting behavior of parents was not changed. Two primary mechanisms for this effect were identified. First was the increase in the children's education levels, which is itself correlated with higher rates of voting. Second, children in low-income households that received cash transfers were found to have improved ability to make friends and were less likely to be considered antisocial. Given the literature linking social networks to civic participation, children's improved social skills could be a second mechanism linking higher childhood income to higher rates of voting in adulthood.

One study looked at the effect of an increase in the minimum wage on voting (Markovich & White, 2019). Using data on municipal employees' wages in New York City, the authors used a difference-in-difference model to compare the change in voting of workers near the minimum wage with workers earning higher wages between the 2012 and 2016 elections and the midterm elections in 2010 and 2014. Preliminary results showed an increase in voting by 2–3 percentage points among employees earning close to the minimum wage. Testing these results with national county-level panel data on elections and minimum-wage increases between 1980 and 2016, they estimated that an 8% increase in the minimum wage would yield about a 0.3% increase in aggregate voter turnout. These results are not necessarily in contradiction with the two studies discussed above. There is no way to differentiate whether raising the minimum wage affects voter turnout through increasing income and available resources or through changing workers' views of the importance of government.

Discussion

The papers analyzed in this review cover a wide range of outcomes from policies that increase the resources available to families for meeting their basic needs through safety-net programs or wage/income increases. Overall, the strongest causal effects are on the children of parents whose economic resources improve. We find strong causal evidence of the effects of parental income on child development and health, including children's test scores, educational attainment, birth weights, mental health, and health in adulthood. There is suggestive evidence that raising parental wages reduces child abuse and neglect, teen birth rates, and crime and arrests in adulthood. Parental stress related to

income appears to be an important causal mechanism in child development. There is also suggestive evidence that when lower-income parents' economic resources increase, their children are more likely to vote in adulthood. A main causal pathway is through improved education. More research is needed on these latter outcomes.

To illustrate the magnitudes of these effects, we estimate the expected change in test scores and low birth weights for each one-dollar-an-hour increase in income for a full-time worker (\$2,000 a year). Dahl and Lochner's (2012, 2017) estimates of impacts of the EITC on schooling imply that test scores could increase by 5.6% of a standard deviation for each additional \$2,000 increase in income. Similarly, extrapolating from Hoynes et al. (2015), we calculate a 3.8% reduction in the incidence of low birth weight.¹¹ To be clear, there is a limit to how far these extrapolations can reliably be taken. First, these calculations assume that any effects on children are operating solely through changes in incomes. However, as pointed out by the authors of both studies, the estimated effects on child outcomes would potentially include impacts of any changes in maternal labor supply induced by EITC expansions. Second, extrapolating the effects well beyond the magnitudes in the original research requires strong assumptions on the external validity of the findings. For example, the associated effect on incomes in Hoynes et al. (2015) is \$1,172 (expressed in 2018 dollars). Applying the findings to increases in this range are more likely to be reliable, but extrapolating to an increase in income twice this size would require strong assumptions about constant treatment effects (and the authors of the studies make no such claims).

There does not appear to be a significant difference in results for children depending on the form of the increase in family income. Research results on policies that increase wages (minimum wage), supplement wages for working families (EITC), or supplement income regardless of work status (food stamps, casino revenues) all show similar results in terms of direction of effects. There is not enough evidence at this point to determine differences in the scale of the effects between the different sources of income (Hoynes & Schanzenbach, 2018). Several of the studies on EITC found results greater than would be expected from cross-sectional analyses (Nichols & Rothstein, 2015). Since EITC is associated with higher rates of maternal employment, it is possible that there is an additional benefit from increased maternal employment that goes beyond income (Nichols & Rothstein, 2015). More evidence is needed to draw any firm conclusions. Recent research finds similar increases in parental labor-force participation after minimum-wage increases (Godøy et al., 2019).

The evidence of improved health outcomes on adults is less conclusive than for children. We find suggestive evidence of the effects of higher wages on adults' mental health and stress, suicide rates, and absences from work due to illness. More research is needed in this area with research designs that better identify the treatment group and include validity tests.

¹¹ See appendix for details on these calculations.

Research on the effects of wages and income on adult crime is more limited, and outcomes are more difficult to conclude with certainty. The evidence suggests that both available wages and family income are contributing factors in crime rates and recidivism. Despite strong correlations between income and voting, evidence is not conclusive on a causal relationship between higher wages or income and voting for adults. There is some evidence that improved parental income increases their children's civic participation in later life. This is consistent with the research finding that voting behavior is locked in early in life. Increases in the minimum wage may also increase voting, but this could be more related to changing attitudes toward government than increases in earnings.

While not all of the research analyzed differences by race, there is good evidence that increasing resources available to families has strong positive effects for families of all races, with the largest effects on those groups who start with the greatest disadvantages. The studies that did analyze differences by race found the greatest effects—including improvements children's test scores, graduation rates, birth weights, and adult health and longevity—on black and Hispanic families. The effects of wage increases on reducing criminal recidivism was similarly larger for black ex-offenders, who face greater disadvantages in the labor market, and reductions in odds of incarceration was greatest for nonwhite men.

Increasing the economic resources available to low-wage workers will come with some possible trade-offs and costs. How public support programs are financed will be important in determining the overall effect on social welfare. Paying for an increase through progressive taxation, for example, can be expected to have a larger positive effect than if it was paid for through a tax with a high impact on low-income families, such as a sales tax. Other trade-offs might occur with labor-standards policies designed to improve pretax earnings through the private sector. These policies will have less costs to government but could have indirect effects, such as job losses or prices increases, on workers and firms. It will be important to gauge the relative size of these effects compared with the effects of increasing income on the desired outcomes. In the case of the minimum wage, as discussed above, while there is continued debate, the weight of empirical evidence suggests the trade-offs are small relative to the benefits at the level of wage increases we have seen to date (Belman & Wolfson, 2014). Similar analysis will need to be taken into account for other policy interventions designed to improve wages.

The minimum-wage research thus far has focused on relatively modest increases in wages. More recent minimum-wage laws have much higher wage mandates. The value of the income increases from California's state and local minimum-wage laws is expected to surpass current total spending in the state on EITC, SNAP, and cash-assistance programs combined when the state minimum wage is fully implemented in 2023 (Jacobs, 2018). As these higher minimum-wage rates come into effect in cities and states around the country, the policy interventions will give researchers new opportunities to explore the ways in which wages influence social outcomes.

Conclusion

The research discussed in this paper provides evidence that economic resources make a difference in a range of outcomes—including children’s health and educational attainment, adult mental health, and crime—which affect individuals’ well-being, community vitality, and economic growth. While positive effects are found across racial and ethnic groups, the largest effects are found with those who start with the greatest disadvantages. Measures that increase resources available to lower-income families can be expected to improve outcomes for families of all races while also reducing racial disparities.

The main channel through which wages effect societal outcomes is through their contribution to family income. Policies that improve wages and policies that improve nonwage income each have positive net societal outcomes across a range of metrics. There is some evidence that the effect of wages may go beyond income alone, especially with regard to crime, but further research is needed to better understand the relative effects. When jobs pay too little for families to meet their basic needs, there is a cost to society as a whole. There is a cost to the public coffers, as workers and their family members rely on public-assistance programs to make ends meet (Jacobs et al., 2015). Through their effect on family income, wages affect workers’ mental health and economic productivity. One in four children in the United States has a parent who is a low-wage worker; in the absence of a much more robust social safety net, this has long-term negative effects on children’s health, development, educational attainment, and future crime rates and civic participation.

The evidence of the downstream effects of family income has important implications for the evaluation of public policies directed at addressing low-wage work, poverty, wage stagnation, and income inequality. This includes labor-standards programs like the minimum wage; programs to supplement wages, including the EITC and other public-assistance programs; and broader policies that affect wage growth. Although this review does not include studies evaluating the impacts of the COVID-19 crisis, in which lower-income families and racial and ethnic minorities have experienced the greatest impacts, the existing research holds implications for policies aimed at maintaining incomes during the pandemic and efforts to address structural racism that results in lower earnings and incomes for black workers and other workers of color. On the whole, policies that improve wages and family incomes can be expected to have positive effects on a range of social outcomes while reducing racial disparities across many of those outcomes; policies that slow wage growth or otherwise reduce family incomes are likely to do the opposite.

About the Authors



Anna Godøy

Anna Godøy is a researcher at the Norwegian Institute of Public Health. Previously, she was a research economist at the Center for Wage and Employment Dynamics at the University of California, Berkeley, working on topics related to the health and labor market outcomes of low wage workers.

aago@fhi.no



Ken Jacobs

Ken Jacobs is the chair of the University of California Berkeley Center for Labor Research and Education. His areas of specialization include low-wage work, labor standards policies, and health care coverage.

kjacobs9@berkeley.edu

Acknowledgements

The authors would like to thank Jenifer MacGillvary, Garret Strain, Ian Eve Perry, and Sarah Thomason for their assistance on this research. We also wish to thank Jesse Rothstein, Michael Reich, Erin Graves and Marybeth Mattingly for their helpful comments. In addition we would like to thank Anjali Sakaria and Anmol Chaddha for suggesting and encouraging us to do this research, Jefferey Thompson, Paul Osterman, David Weil, and the members of the Federal Reserve Bank of Boston Quality Jobs Research Consortium for their comments on an early draft of this paper, and Amberly Polidor for her careful copy edits.

References

- Agan, A.Y., & Makowsky, M.D. (2018). The minimum wage, EITC, and criminal Recidivism. Rochester, NY: Social Science Research Network. <https://papers.ssrn.com/abstract=3097203>
- Akee, R. (2019, February 7). Voting and Income. *Econofact*. <https://econofact.org/voting-and-income>
- Akee, R., Copeland, W., Costello, E.J., Holbein, J.B., & Simeonova, E. (2018). Family income and the intergenerational transmission of voting behavior: Evidence from an income intervention. National Bureau of Economic Research. <https://doi.org/10.3386/w24770>
- Akee, R., Copeland, W., Costello, E.J., & Simeonova, E. (2018). How does household income affect child personality traits and behaviors? *American Economic Review* 108(3), 775–827. <https://doi.org/10.1257/aer.20160133>
- Akee, R., Copeland, W., Keeler, G., Angold, A. & Costello, E.J. (2010). Parents' incomes and children's outcomes: A quasi-experiment using transfer payments from casino profits. *American Economic Journal: Applied Economics*, 2(1), 86–115. <https://doi.org/10.1257/app.2.1.86>
- Allegretto, S., Dube, A., Reich, M., & Zipperer, B. (2017). Credible research designs for minimum wage studies: A response to Neumark, Salas, and Wascher. *ILR Review*, 70(3), 559–92. <https://doi.org/10.1177/0019793917692788>
- Almond, D., Currie, J., & Duque, V. (2018). Childhood circumstances and adult outcomes: Act II. *Journal of Economic Literature*, 56(4), 1360–1446.
- Almond, D., Hoynes, H.W., & Whitmore Schanzenbach, D. (2011). Inside the war on poverty: The impact of food stamps on birth outcomes. *The Review of Economics and Statistics*, 93(2), 387–403. https://doi.org/10.1162/REST_a_00089
- Angrist, J. D., & Pischke, J-S. (2010). The credibility revolution in empirical economics: How better research design is taking the con out of econometrics. *Journal of Economic Perspectives*, 24(2), 3–30. <https://doi.org/10.1257/jep.24.2.3>
- Athey, S. & Imbens, G.W. (2017). The state of applied econometrics: Causality and policy evaluation. *Journal of Economic Perspectives*, 31(2), 3–32. <https://doi.org/10.1257/jep.31.2.3>
- Bailey, M.J., Hoynes, H., Rossin-Slater, M., & Walker, R. (2019). Is the social safety net a long-term investment? Large-scale evidence from the food stamps program. http://web.stanford.edu/~mrossin/LR_SNAP_BHRSW_042919.pdf
- Baker, K.S. (2008). Do cash transfer programs improve infant health: Evidence from the 1993 expansion of the earned income tax credit. <https://www.semanticscholar.org/paper/Do-Cash-Transfer-Programs-Improve-Infant-Health%3A-of-Baker/a6645edfe78e6156914ff49a9bd36b975d735c6b>
- Bastian, J., & Micheltore, K. (2018). The long-term impact of the earned income tax credit on children's education and employment outcomes. *Journal of Labor Economics*, 36(4), 1127–63. <https://doi.org/10.1086/697477>
- Bayer, P., & Kofi Charles, K. (2018). Divergent paths: A new perspective on earnings differences between black and white men since 1940. *The Quarterly Journal of Economics*, 133(3), 1459–1501. <https://doi.org/10.1093/qje/qjy003>

- Becker, G. S. (1968). Crime and punishment: An economic approach. In *The economic dimensions of crime* (pp. 13–68). Springer.
- Belman, D., & Wolfson, P. J. (2014). *What does the minimum wage do?* W.E. Upjohn Institute for Employment Research.
- Bennett, P., & Ouazad, A. (2019). Job displacement, unemployment, and crime: Evidence from danish microdata and reforms. *Journal of the European Economic Association*. <https://doi.org/10.1093/jeea/jvz054>
- Braveman, P., Cubbin, C., Egerter, S., Williams, D. R., & Pamuk, E. (2010). Socioeconomic disparities in health in the United States: What the patterns tell us. *American Journal of Public Health*, *100*(Suppl 1), S186–96. <https://doi.org/10.2105/AJPH.2009.166082>
- Bullinger, L. R. (2017). The effect of minimum wages on adolescent fertility: A nationwide analysis. *American Journal of Public Health*, *107*(3), 447–52. <https://doi.org/10.2105/AJPH.2016.303604>
- Card, D., Ruta Cardoso, A., Keining, J., & Kline, P. (2016). Firms and labor market inequality: Evidence and some theory. IRLE Working Paper 104–16. Institute for Research on Labor and Employment. <http://www.irle.berkeley.edu/workingpapers/104-16.pdf>
- Carson, E. A. (2020). Bureau of Justice Statistics (BJS) - prisoners in 2018. NCJ 253516. <https://www.bjs.gov/index.cfm?ty=pbdetail&iid=6846>
- Cengiz, D., Dube, A., Lindner, A., & Zipperer, B. (2018). The effect of minimum wages on low-wage jobs: Evidence from the United States using a bunching estimator. Centre for Economic Performance, LSE. <https://econpapers.repec.org/paper/ceprepdps/dp1531.htm>
- Charles, K. K., & Stephens Jr., M. (2013). Employment, wages, and voter turnout. *American Economic Journal: Applied Economics*, *5*(4), 111–43. <https://doi.org/10.1257/app.5.4.111>
- Chaudry, A., & Wimer, C. (2016). Poverty is not just an indicator: The relationship between income, poverty, and child well-being. *Academic Pediatrics*, *16*(3 Suppl), S23-29. <https://doi.org/10.1016/j.acap.2015.12.010>
- Chetty, R., Friedman, J. N., & Rockoff, J. (2011). New evidence on the long-term impacts of tax credits. Internal Revenue Service. <https://www.irs.gov/pub/irs-soi/11rpchettyfriedmanrockoff.pdf>
- Chetty, R., Hendren, N., Jones, M. R., & Porter, S. (2020). Race and economic opportunity in the United States: An intergenerational perspective. *Quarterly Journal of Economics*, *135*(2), 711–783.
- Chetty, R., Stepner, M., Abraham, S., Lin, S., Scuderi, B., Turner, N., Bergeron, A., & Cutler, D. (2016). The association between income and life expectancy in the United States, 2001-2014. *JAMA*, *315*(16), 1750–66. <https://doi.org/10.1001/jama.2016.4226>
- Cooper, K., & Stewart, K. (2017). Does money affect children’s outcomes? An update. Centre for Analysis of Social Exclusion at London School of Economics. <http://sticerd.lse.ac.uk/dps/case/cp/casepaper203.pdf>
- Costello, E. J., Compton, S. N., Keeler, G., & Angold, A. (2003). Relationships between poverty and psychopathology: A natural experiment. *JAMA*, *290*(15), 2023–29. <https://doi.org/10.1001/jama.290.15.2023>

- Dahl, G. B., & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. *American Economic Review*, 102(5), 1927–56. <https://doi.org/10.1257/aer.102.5.1927>
- Dahl, G. B., & Lochner, L. (2017). The impact of family income on child achievement: Evidence from the earned income tax credit: Reply. *American Economic Review*, 107(2), 629–31. <https://doi.org/10.1257/aer.20161329>
- Derenoncourt, E., & Montialoux, C. (2020). Minimum wages and racial inequality. *Quarterly Journal of Economics*, 136(1), 169–228.
- Dow, W. H., Godøy, A., Lowenstein, C. A., & Reich, M. (2019). Can economic policies reduce deaths of despair? National Bureau of Economic Research.
- Doyle, J. M., Ahmed, E., & Horn, R. N. (1999). The effects of labor markets and income inequality on crime: Evidence from panel data. *Southern Economic Journal*, 65(4), 717–38. <https://doi.org/10.2307/1061272>
- Du, J., & Leigh, J. P. (2018). Effects of minimum wages on absence from work due to illness. *The B.E. Journal of Economic Analysis & Policy*, 18(1). <https://doi.org/10.1515/bejeap-2017-0097>
- Dube, A. (2019a). Minimum wages and the distribution of family incomes. *American Economic Journal: Applied Economics*, 11(4): 268-304.
- Dube, A. (2019b). Impacts of minimum wages: review of the international evidence. Independent Report. <https://www.gov.uk/government/publications/impacts-of-minimum-wages-review-of-the-international-evidence>
- Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2017, January). Moving beyond correlations in assessing the consequences of poverty. *Annual Review of Psychology*, 68: 413–34. <https://doi.org/10.1146/annurev-psych-010416-044224>
- Duncan, G. J., Morris, P. A., & Rodrigues C. (2011). Does money really matter? Estimating impacts of family income on young children's achievement with data from random-assignment experiments. *Developmental Psychology*, 47(5), 1263–79. <https://doi.org/10.1037/a0023875>
- Duncan, G. J., Yeung, J. W., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review*, 63(3), 406–23. <https://doi.org/10.2307/2657556>
- Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. *Child Development*, 81(1), 306–25. <https://doi.org/10.1111/j.1467-8624.2009.01396.x>
- East, C. N. (2018a). Immigrants' labor supply response to food stamp access. *Labour Economics*, 51(April): 202–226. <https://doi.org/10.1016/j.labeco.2018.01.003>
- East, C. N. (2018b). The effect of food stamps on children's health: Evidence from immigrants' changing eligibility. *Journal of Human Resources*, 55(2), 387–427. <https://doi.org/10.3368/jhr.55.3.0916-8197R2>
- Evans, W. N., & Garthwaite, C. L. (2014). Giving mom a break: The impact of higher EITC payments on maternal health. *American Economic Journal: Economic Policy*, 6(2), 258–290.
- Ferguson, J.-P., & Koning, R. (2018). Firm turnover and the return of racial establishment segregation. *American Sociological Review*, 83(3), 44574. <https://doi.org/10.1177/0003122418767438>

- Fone, Z. S., Sabia, J. J., & Cesur, R. (2019). Do minimum wage increases reduce crime? National Bureau of Economic Research.
- Gabe, T., Abel, J. R., and Florida, R. (2018). Can low-wage workers find better jobs? Federal Reserve Bank of New York. https://www.newyorkfed.org/research/staff_reports/sr846
- Gertner, A. K., Rotter, J. S., & Shafer, P. R. (2019). Association between State minimum wages and suicide rates in the US. *American Journal of Preventive Medicine*, 56(5), 648–654.
- Godøy, A., Reich, M. & Allegretto, S. (2019). Parental labor supply: Evidence from minimum wage changes. University of California Berkeley Center for Wage and Employment Dynamics. <https://irle.berkeley.edu/files/2019/04/Parental-Labor-Supply-Evidence-from-Minimum-Wage-Changes.pdf>
- Gould, E., & Wilson, V. (2020). Black workers face two of the most lethal preexisting conditions for coronavirus—racism and economic inequality. <https://www.epi.org/publication/black-workers-covid/>
- Gould, E. D., Weinberg, B. A. & Mustard, D. B.. 2002. Crime rates and local labor market opportunities in the United States: 1979–1997. *The Review of Economics and Statistics*, 84(1), 45–61. <https://doi.org/10.1162/003465302317331919>
- Grogger, J. (1998). Market wages and youth crime. *Journal of Labor Economics*, 16(4), 756–791. <https://doi.org/10.1086/209905>
- Hamad, R., & Rehkopf, D. H. (2016). Poverty and child development: A longitudinal study of the impact of the earned income tax credit. *American Journal of Epidemiology*, 183(9), 775–84. <https://doi.org/10.1093/aje/kwv317>
- Heller, S. B., Jacob, B. A., & Ludwig, J. (2011). Family income, neighborhood poverty, and crime. In *Controlling crime: Strategies and tradeoffs*, pp. 419–59. University of Chicago Press. <http://www.nber.org/chapters/c12088>
- Holzer, H. J. (2004). Encouraging job advancement among low-wage workers: a new approach. *Welfare Reform & Beyond*. Brookings Institution. <https://www.brookings.edu/research/encouraging-job-advancement-among-low-wage-workers-a-new-approach/>
- Horn, B. P., Maclean, J. C., & Strain, M. R. (2017). Do minimum wage increases influence worker health? *Economic Inquiry*, 55(4), 1986–2007.
- Hotz, V. J., & Scholz, J. K. (2001). The earned income tax credit. National Bureau of Economic Research. <https://doi.org/10.3386/w8078>
- Hoynes, H., Miller, D., & Simon, D. (2015). Income, the earned income tax credit, and infant health. *American Economic Journal: Economic Policy*, 7(1), 172–211. <https://doi.org/10.1257/pol.20120179>
- Hoynes, H., Whitmore Schanzenbach, D., & Almond, D. (2016). Long-run impacts of childhood access to the safety net. *American Economic Review*, 106(4), 903–934. <https://doi.org/10.1257/aer.20130375>
- Hoynes, H. W., & Whitmore Schanzenbach, D. (2018, March 8). Safety net investments in children. Brookings Institution. <https://www.brookings.edu/bpea-articles/safety-net-investments-in-children/>
- Hoynes, H. W., & Schanzenbach, D. W. (2012). Work incentives and the food stamp program. *Journal of Public Economics*, 96(1), 151–162. <https://doi.org/10.1016/j.jpubeco.2011.08.006>

- Jacob, B. A., Kapustin, M. & Ludwig, J. (2014). The impact of housing assistance on child outcomes: evidence from a randomized housing lottery. *The Quarterly Journal of Economics*, 130(1), 465–506.
- Jacobs, K. (2018). Governing the market from below: setting labor standards at the state and local levels. In *No one size fits all*, pp. 241–65. Labor and Employment Relations Association, University of Illinois at Urbana-Champaign.
- Jacobs, K., Perry, I., and Jenifer MacGillvary, J. (2015). The high public cost of low wages." UC Berkeley Center for Labor Research and Education. <http://laborcenter.berkeley.edu/the-high-public-cost-of-low-wages/>
- Jarosz, B., & Mather, M. (2018). Low-income working families: rising inequality despite economic recovery. The Working Poor Families Project. http://www.workingpoorfamilies.org/wp-content/uploads/2018/04/Spring-2018_WPFP-Policy-Brief.pdf
- Johnson, R. (2017, May 12). evaluating the impact of minimum wage increases on child neglect. *Chicago Policy Review*. <http://chicagopolicyreview.org/2017/05/12/evaluating-the-impact-of-minimum-wage-increases-on-child-neglect/>
- Kaplan, G. A. (2009). The poor pay more: poverty's high cost to health. https://www.frbsf.org/community-development/files/poor_pay_more.pdf
- Komro, K. A., Livingston, M. D., Markowitz, S., & Wagenaar, A. C. (2016). the effect of an increased minimum wage on infant mortality and birth weight. *American Journal of Public Health*, 106(8), 1514–1516.
- Komro, K. A., Markowitz, S., Livingston, M. D., & Wagenaar, A. C. (2019). Effects of state-level earned income tax credit laws on birth outcomes by race and ethnicity." *Health Equity*, 3(1), 61–67. <https://doi.org/10.1089/heap.2018.0061>
- Krieger, N., Rehkopf, D. H., Chen, J. T., Waterman, P. D., Marcelli, E., & Kennedy, M. (2008). The fall and rise of US inequities in premature mortality: 1960–2002. *PLOS Medicine*, 5(2), e46. <https://doi.org/10.1371/journal.pmed.0050046>
- Leigh, J. P., & Du, J. (2012). Are low wages risk factors for hypertension? *European Journal of Public Health*, 22(6), 854–859. <https://doi.org/10.1093/eurpub/ckr204>
- Leigh, P. J., Leigh, W. A., & Du, J. (2019). Minimum wages and public health: a literature review." *Preventive Medicine*, 118(January): 122–134. <https://doi.org/10.1016/j.ypmed.2018.10.005>
- Levin-Waldman, O. (2012). Rising income inequality and declining civic participation. *Challenge*, 55(3), 51–70. <https://doi.org/10.2753/0577-5132550303>
- Løken, K. V., Mogstad, M., & Wiswall, M. (2012). What linear estimators miss: the effects of family income on child outcomes. *American Economic Journal: Applied Economics*, 4(2), 1–35. <https://doi.org/10.1257/app.4.2.1>
- London School of Economics. (2017, July 12). Income directly affects children's outcomes, says new report. *Science Daily*. <https://www.sciencedaily.com/releases/2017/07/170712084747.htm>
- Long, H., Van Dam, A., Fowers A., & Shapiro, L. (2020, September 30). The Covid-19 recession is the most unequal in modern U.S. history. *The Washington Post*. <https://www.washingtonpost.com/graphics/2020/business/coronavirus-recession-equality/>

- Lu, M. C., & Halfon, N. (2003). Racial and ethnic disparities in birth outcomes: a life-course perspective. *Maternal and Child Health Journal*, 7(1), 13–30. <https://doi.org/10.1023/a:1022537516969>
- Magnuson, K., & Waldfogel, J. (Eds.) (2008). *Steady gains and stalled progress: Inequality and the black-white test scores gap*. Russell Sage Foundation. <https://www.russellsage.org/publications/steady-gains-and-stalled-progress-0>
- Manoli, D., & Turner, N. (2018). Cash-on-hand and college enrollment: evidence from population tax data and the earned income tax credit. *American Economic Journal: Economic Policy*, 10(2), 242–271. <https://doi.org/10.1257/pol.20160298>
- Marinescu, I. (2018). No strings attached: the behavioral effects of U.S. unconditional cash transfer programs. National Bureau of Economic Research. <https://doi.org/10.3386/w24337>
- Markovich, Z., & White, A. (2019). More money, more turnout? Minimum wage increases and voting. https://arwhite.mit.edu/sites/default/files/images/MinWage_draft1forweb.pdf
- Markowitz, S., Komro, K. A., Livingston, M. D., Lenhart, O. & Wagenaar, A. C. (2017). Effects of state-level earned income tax credit laws in the U.S. on maternal health behaviors and infant health outcomes. *Social Science & Medicine*, 194 (December), 67–75. <https://doi.org/10.1016/j.socscimed.2017.10.016>
- Marr, C., Huang, C.-C., Sherman, A., & DeBot, B. (2015). EITC and child tax credit promote work, reduce poverty, and support children’s development, research finds. Center on Budget and Policy Priorities. <https://www.cbpp.org/sites/default/files/atoms/files/6-26-12tax.pdf>
- Maxfield, M. (2013). The effects of the earned income tax credit on child achievement and long-term educational attainment. Job Market Paper. Michigan State University. <https://msu.edu/~maxfiel7/20131114%20Maxfield%20EITC%20Child%20Education.pdf>
- Meltzer, D. O., & Chen, Z. (2011). The impact of minimum wage rates on body weight in the United States. In *Economic aspects of obesity*, pp. 17–34. University of Chicago Press.
- Miller, J., & Garran, A. M. (2007). The web of institutional racism. *Smith College Studies in Social Work*, 77(1), 33–67. https://doi.org/10.1300/J497v77n01_03
- Muennig, P., Fiscella, K., Tancredi, D., & Franks, P. (2010). The relative health burden of selected social and behavioral risk factors in the United States: Implications for policy. *American Journal of Public Health*, 100(9), 1758–1764. <https://doi.org/10.2105/AJPH.2009.165019>
- Neumark, D., Ian Salas, J.M., & Wascher, W. (2013). Revisiting the minimum wage-employment debate: throwing out the baby with the bathwater? National Bureau of Economic Research. <https://doi.org/10.3386/w18681>
- Nichols, A., & Rothstein, J. (2015). The earned income tax credit (EITC). National Bureau of Economic Research. <https://www.nber.org/papers/w21211.pdf>
- Osterman, P. (2008). Improving the quality of low-wage work: the current American experience. *International Labour Review*, 147(2–3), 115–34. <https://doi.org/10.1111/j.1564-913X.2008.00028.x>

- Pager, D. (2007). The use of field experiments for studies of employment discrimination: contributions, critiques, and directions for the future. *Annals of the American Academy of Political and Social Sciences*, 609(January):104–33.
- Pager, D., & Shepherd, H. (2008). The sociology of discrimination: racial discrimination in employment, housing, credit, and consumer markets. *Annual Review of Sociology*, 34(1), 181–209. <https://doi.org/10.1146/annurev.soc.33.040406.131740>
- Pitts, S. (2018). The National Black Worker Center Project: Grappling with the power-building imperative. In *No one size fits all: Worker organization, policy, and movement in a new economic age*, pp. 83–105. Labor and Employment Relations Association, University of Illinois at Urbana-Champaign.
- Raissian, K. M., & Bullinger, L. R. (2017). Money matters: Does the minimum wage affect child maltreatment rates? *Children and Youth Services Review*, 72(January), 60–70. <https://doi.org/10.1016/j.childyouth.2016.09.033>
- Rehavi, M. M., & Starr, S. B. (2014). Racial disparity in federal criminal sentences. *Journal of Political Economy*, 122(6), 1320–1354. <https://doi.org/10.1086/677255>
- Sabia, J. J., Pitts, M. M., & Argys, L. M. (2018). Are minimum wages a silent killer? New evidence on drunk driving fatalities. *The Review of Economics and Statistics*, 101(1), 192–199. https://doi.org/10.1162/rest_a_00761
- Schmitt, J., Gould, E., & Bivens, J. (2018). America’s slow-motion wage crisis: four decades of slow and unequal growth. Economic Policy Institute. <https://epi.org/153535>
- Stainback, K., & Tomaskovic-Devey, D. (2012). *Documenting desegregation: Racial and gender segregation in private sector employment since the civil rights act*. Russell Sage Foundation.
- Stevens, A. H., & Schaller, J. (2011). Short-run effects of parental job loss on children’s academic achievement. *Economics of Education Review*, 30(2), 289–299. <https://doi.org/10.1016/j.econedurev.2010.10.002>
- Strully, Kate W., David H. Rehkopf, and Ziming Xuan. 2010. “Effects of Prenatal Poverty on Infant Health: State Earned Income Tax Credits and Birth Weight.” *American Sociological Review* 75 (4): 534–62.
- Sullivan, D., & von Wachter, T. (2009). Job displacement and mortality: an analysis using administrative data. *The Quarterly Journal of Economics*, 124(3), 1265–1306. <https://doi.org/10.1162/qjec.2009.124.3.1265>
- Tuttle, C. (2019). Snapping back: food stamp bans and criminal recidivism. *American Economic Journal: Economic Policy*, 11(2), 301–327. <https://doi.org/10.1257/pol.20170490>
- Wehby, G., Dave, D., & Kaestner, R. (2016). Effects of the minimum wage on infant health. National Bureau of Economic Research. <https://doi.org/10.3386/w22373>
- Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: evidence and needed research. *Journal of Behavioral Medicine*, 32(1), 20–47. <https://doi.org/10.1007/s10865-008-9185-0>
- Wolf, S. H., & Braveman, P. (2011). Where health disparities begin: the role of social and economic determinants—and why current policies may make matters worse. *Health Affairs* 30 (10): 1852–59. <https://doi.org/10.1377/hlthaff.2011.0685>

- Wursten, J., & Reich, M. (2020). Reducing racial wage gaps: do minimum wages still help? Working Papers. University of California Berkeley: Institute for Research on Labor and Employment.
- Yang, C. S. (2017). Local labor markets and criminal recidivism. *Journal of Public Economics*, 147(March), 16–29. <https://doi.org/10.1016/j.jpubeco.2016.12.003>
- Zipperer, B. (2018, June 13). The erosion of the federal minimum wage has increased poverty, especially for black and Hispanic families. Economic Policy Institute. <https://www.epi.org/publication/the-erosion-of-the-federal-minimum-wage-has-increased-poverty-especially-for-black-and-hispanic-families/>

Appendix: Calculating Effect Sizes

To illustrate the magnitudes, we perform the following calculations using the estimates from Hoynes et al. (2015) and Dahl and Lochner (2012, 2017) to calculate the implied effects of a \$2,000 increase in income on infant health (low birth weight) and test scores. We focus on these two studies because they are (1) influential, as measured by number of citations, and (2) they report estimates scaling effects by increase in family income.

We let *IncGap* denote the gap in income (\$2,000 in 2018 dollars). To calculate the scaled effect, we perform the following calculation, adjusting nominal amounts for inflation.

$$EffectScaled_{study} = \left(\frac{IncGap}{\$1000 \times CPI_{study}} \right) \times EffectOriginal_{study}$$

Table A1. Scaled effects

Outcome	Effect size (original)	Source	Consumer Price Index adjustment	Scaled effect
Low birth weight	2.2%	Hoynes et al. (2015), table 4	1.17	3.8%
Test scores	0.0411	Dahl & Lochner (2017), Online Appendix table 2	1.46	0.056