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Child health as human capital

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Abstract

Child health is increasingly understood to be a critical form of human capital, but only recently have we begun to understand how valuable it is and how its development could be better supported. This article provides an overview of recent work that demonstrates the key role of public insurance in supporting longer term human capital development and points to improvements in child mental health as an especially important mechanism.

KEYWORDS

child health, human capital, mental health, adolescent health, public health insurance

1 | INTRODUCTION

The Oxford dictionary includes two meanings of the term "capital." The first is "Wealth, in the form of money or other assets owned by a person or organization or available for a purpose such as starting a company or investing," and the second is "A valuable resource of a particular kind." Human capital then is a particular form of wealth that is embodied in people. Historically, economic research focused on education as the most important form of human capital because it generates income as well as other "returns." Notwithstanding Grossman's (1972) groundbreaking work conceptualizing health as a form of human capital, child health has traditionally been thought of as something that affected adult outcomes primarily by impacting education. In recent years, however, child health as early as in the prenatal period has increasingly been understood to be a valuable form of human capital in its own right, with its own important contributions to future adult health and productivity.

This article starts with an overview of some of the main conclusions we can draw from the recent literature. It continues with an extended analysis of what we have learned from US expansions of health insurance to low-income women and children, including some comparisons with other countries. Finally, some directions for future research are considered, including the desirability of an increased focus on childhood mental health and on the "missing middle" years of adolescence. So far, economists have paid much less attention to these two topics than to the fetal and early childhood periods.

2 | RECENT CONCLUSIONS AND CONCEPTUAL FRAMEWORK

At this point, the importance of the fetal period for future outcomes is well established. Figure 1 plots the number of articles published in top general interest and field journals with the phrases "fetal origins" or "fetal health" in the title. The figure shows the tremendous growth in economic research in this area beginning with early studies such as Cole and Currie (1993). One reason for this growth is that since the period in utero is short and well-defined, it is relatively easy to develop sharp tests of hypotheses regarding the effects of shocks. Studies starting with Currie and Hyson (1999) and Costa (1998, 2000) show that shocks and interventions during the fetal period often have large and lasting impacts on future outcomes.

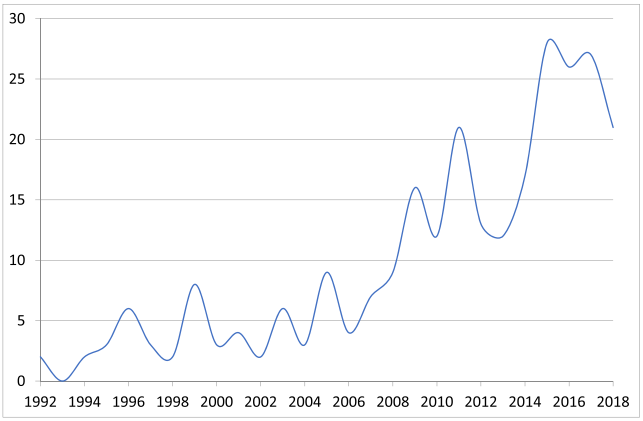

FIGURE 1 Papers with the terms fetal origins/health in Top 5 and top field journals. Figure 1 shows the number of annual publications from January 1993 to October 2015 in the Quarterly Journal of Economics, American Economic Review, Journal of Political Economy, Econometrica, Review of Economic Studies, Journal of Labor Economics, Journal of Econometrics, Journal of the European Economic Association, Review of Economics and Statistics, Journal of Human Resources, Journal of Public Economics, American Economic Journal: Applied Economics, Journal of Development Economics, American Economic Journal: Economic Policy, and Journal of Health Economics. Source: Figure 1 in Almond, Currie, and Duque (2018). © American Economic Association; reproduced with permission of the Journal of Economic Literature [Colour figure can be viewed at wileyonlinelibrary.com]

An important broader conclusion from this literature is that both nature and nurture matter and that they interact in important ways. For example, Currie and Moretti (2007) link birth certificates of mothers and their children in California to examine the impact of maternal birthweight on child birthweight. Not surprisingly, there is a strong correlation: Mothers who were heavier at birth themselves tend to have heavier babies, and this is true even when we compare mothers who are sisters in order to control for some of the genetic and environmental differences between mothers. The surprising finding of their study is that conditions at the time of the child's birth mediate the link between maternal and child birthweight. Conditional on maternal birthweight, children are heavier if their mothers live in a higher income postal code at the time of the child's birth. This finding illustrates the interaction between nature and nurture and the fact that negative circumstances due to "nature" can be offset, at least to some extent, by "nurture." Hence, the old question of "nature or nurture" is ill framed.

Increasingly, economists have turned from the fetal period to analyzing health in early childhood. To do so, it is useful to have a conceptual framework. Therefore, a brief review of the framework from Almond and Currie (2011), which in turn is adapted from Heckman (2007), is helpful:

Let the two-period constant elasticity of substitution production function for child health be given by:

$$h = A\left[\gamma\left(\bar{I}_1 + \mu_{I\gamma}\right)^{\phi} + (1-\gamma)\left(I_2 + \mu_{2\gamma}\right)^{\phi}\right]^{1/\phi},$$

where h is child health, $\bar{I}_1$ is the (predetermined) investment in child health the parents made during the fetal period, I_2 is the investment to be made in the postnatal period, A is a productivity shifter, γ is the weight on first- versus second-period investments, ϕ measures the substitutability of investments, and $\mu_{t\gamma}$ denotes exogenous group-level shocks. A bar indicates that first-period investments have already taken place (perhaps in the fetal period) and that we are therefore considering second-period investments (perhaps childhood).

Parents are assumed to take this production function as given and to maximize utility subject to a budget constraint:

$$maxU = U(C,h)\, s.t. Y = p_c C + p_I I_1 + [p_I I_2/(1+r)],$$

where p is prices and r is a discount factor or interest rate. Suppose $f = 1$ (perfect substitutability of investments) and $U = (1-\alpha)logC + \alpha logh$, where α is the weight that parents place on child health. Then $dI_2^*/d\mu_{1\gamma} = -(1-\alpha)\gamma/(1-\alpha) < 0$. Alternatively, if investments are perfect complements, then $dI_2^*/d\mu_{1\gamma} = \gamma/(1-\gamma) > 0$.

Families can differ in terms of A, α, γ, ϕ, and p_I. Social programs may affect these parameters (e.g., by lowering prices for health inputs). The same investment may also have different effects depending on one's position on the production function (i.e., location on a flatter or steeper portion). Hence, one important insight from this framework is that we should expect heterogeneity in the effects of shocks (e.g., by parental education and income).

Heterogeneous effects of a group-level shock could be due to differences in preferences, constraints, production functions, or initial conditions. It is difficult to estimate any of these underlying constructs without making strong assumptions, but evidence can help. For example, if we are willing to make the relatively mild assumption that neither parental preferences nor production possibilities change rapidly when policy changes, then a strong effect of policy could be interpreted as evidence that constraints on parents' matter, which suggests that policies that relieve these constraints could help.

3 | LESSONS LEARNED

3.1 | Public health insurance, child health, and human capital

Public health insurance is one important determinant of child health that is strongly affected by policy. Yet it is often difficult to identify its causal effects. Expansions of the US Medicaid program—the public health insurance program that covers low-income women and children—provide a valuable opportunity to assess Medicaid's impacts. Medicaid eligibility for pregnant women and children was greatly expanded beginning in the late 1980s and into the 2000s. These expansions had especially large effects on poor and minority women and children, who were most likely to lack coverage prior to the expansions. Because the expansions were implemented at different rates in different states, and states started with very different levels of eligibility, the substantial variation in eligibility can be used to identify its effects.

The fraction of women eligible for coverage of their pregnancies increased from 12% in 1979 to 43% by 1993. It increased more slowly after that point; currently, Medicaid pays for about 50% of births in the United States. Currie and Gruber (1996) study the short-run effects of these Medicaid expansions for pregnant women and find that they led to an 8.5% reduction in infant mortality. This reduction was partially due to more aggressive treatment of neonates, in addition to factors such as a 50% reduction in the probability that the poorest mothers delayed obtaining prenatal care beyond the first trimester.

The cohorts of children whose mothers were covered during pregnancy because of the Medicaid expansions to women and children are now in their thirties. Hence, it is possible to follow them and assess how well they are doing in adulthood. Miller and Wherry (2019) assemble data from a variety of sources to examine a broad array of outcomes. They include data from the National Health Interview Survey to examine chronic conditions, the Kessler Psychological Distress Scale to measure mental distress, the Health Care Utilization Project to examine hospitalization, and the restricted version of the American Community Survey to examine participation in welfare programs, education, and earnings. A striking finding from their study is that there are beneficial effects on so many outcomes. In addition, the impacts are much larger (and more outcomes are significantly affected) for children from the poorest families. The large impact of having been covered in utero on the Kessler six mental distress score is especially noteworthy. The Kessler six is scored from 6 to 30 with a score over 13 indicating distress, so an improvement of more than two points is quite significant. More detailed consideration of mental health is important given that mental health problems are among the most common chronic conditions affecting young adults.

Young US children also experienced large gains in eligibility for public health insurance, as shown in Figure 2 for four age groups. Overall, eligibility increased from 15–20% of US children to 43–53% of children. Like the expansions for pregnant women, different states phased in the expansions at different rates. In addition, only children born after September 1, 1983 were eligible, which created a sharp cutoff in eligibility by birthdate that also helps to identify the effects of public health insurance eligibility. A great deal of recent research by several teams of authors shows long-term effects on the health of children who became eligible (Brown, Kowalski, & Lurie, 2019; Cohodes, Grossman, Kleiner, & Lovenheim, 2016; Currie, Decker, & Lin, 2008; Goodman-Bacon, 2018; Wherry & Meyer, 2016; Wherry, Miller, Kaestner, & Meyer, 2018). The results of Brown et al. (2019), who use individual US tax data, are particularly striking. They find that Medicaid eligibility in childhood reduces disability and mortality and also increases wages and the amount of income tax paid in young adulthood. Much of the effect on wages appears to be mediated by a higher probability of being in the labor force.

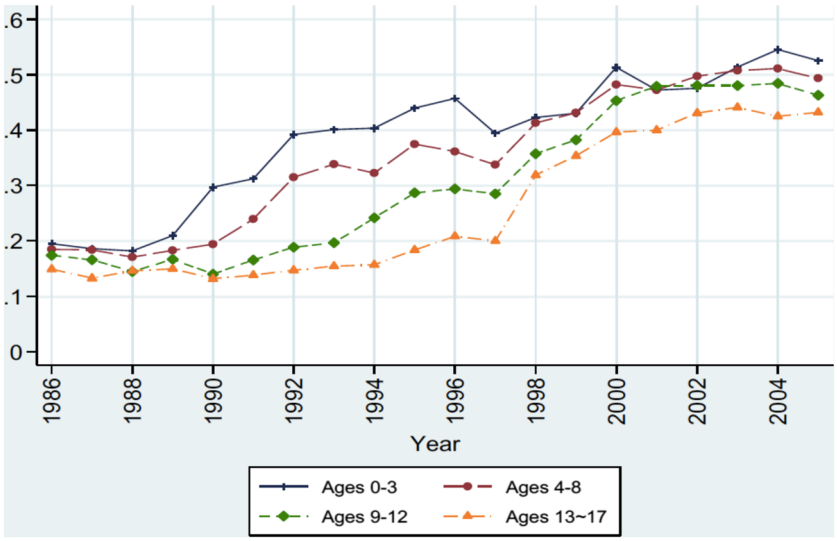

FIGURE 2 Increases in child Medicaid eligibility. This figure illustrates expansions in the generosity of child Medicaid coverage by estimating the fraction of a fixed national sample of children who would have been eligible for Medicaid coverage in each year [Colour figure can be viewed at wileyonlinelibrary.com]

3.2 | An international comparison: The United States versus Canada

Another way to see the impact of the Medicaid eligibility expansions is to conduct an international comparison. Canada is arguably a good comparison country. There are many similarities between the United States and Canada in terms of wealth, available medical technology, vehicle miles driven, and so forth. An important difference, however, is that Canada has had universal public health insurance since the 1970s. In contrast, the United States experienced a large expansion of public health insurance for poor pregnant women and children as discussed above but did not experience an expansion to nonelderly adults until the Affordable Care Act (sometimes known as Obamacare) in 2014. Hence, one might expect to see that the Medicaid expansions were associated with an improvement in the health of US children compared with Canadian children but that there was no similar improvement among adults until quite recently.

Baker, Currie, and Schwandt (2019) develop a method for conducting such a comparison. First, they first rank all counties from richest to poorest within each country, then they group counties into "bins," each representing about 5% of the country's population. This is done separately for the census years closest to 1990, 2000, and 2010. In each census year, they then compare mortality in the different bins, for example, in the poorest 5% of counties and the richest 5% of counties.

Figure 3 shows the results for three age groups. Moving from left to right in each subfigure, one is moving from the places with the lowest to the highest poverty levels. The lines are upward sloping, indicating that poorer places have higher mortality. This is true in both the United States and Canada, although the slopes are much

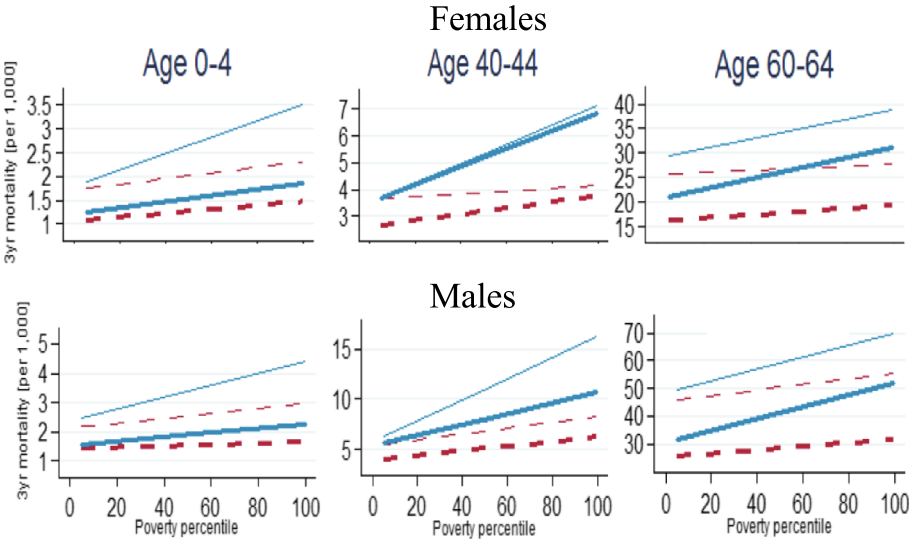

FIGURE 3 Mortality in 1990/91 (thin) vs. mortality in 2010/11 (thick) by county poverty percentile. Canada (red) versus the United States (blue). Source: The figures for 0–4 year olds appeared as part of Figures 6 and 7 in Baker, Currie, and Schwandt (2019). © 2017 by University of Chicago press

flatter in Canada, indicating greater equality in mortality. Moreover, the Canadian lines are below the US lines, virtually everywhere and for all age groups suggesting that Canadians are healthier when judged by this very important metric.

Although the lines shift downward between 1990 (the fainter lines) and 2010 (the darker lines) in both countries, they remain noticeably lower and flatter in Canada. Turning to differences in the comparisons by age, we see that among young US children (age 0–4), mortality fell more in the poorest places between 1990 and 2010 than in the richer places. As a consequence, the US mortality profiles flattened appreciably for this age group, and the child mortality profile approached the lower 2010 Canadian level. Although this flattening of the gradient happened in some adult age groups, among adults, the US mortality rates remained much more unequal and also much higher than in Canada, particularly in the poorest places. Hence, among children, the figure shows that US mortality rates converged to the lower and more equal Canadian profile, whereas there was little convergence towards the lower Canadian death rates among adults. These results suggest the Medicaid expansions made US child mortality rates more similar to Canadian child mortality rates. Medicaid eligibility for adults other than pregnant women was not expanded appreciably until the Affordable Care Act in 2014, which may explain why there was no convergence in Canadian and US adult death rates in the period up to 2010.

3.3 | Other interventions that impact child health and adult wages

Children who gained eligibility for Medicaid either prenatally or in early childhood live longer, healthier lives, and earn more. The results discussed above demonstrate the importance of access to medical care. But are there other shocks and interventions that have been demonstrated to impact adult earnings through their effects on child health? Almond et al. (2018) review a range of interventions that have demonstrated long-term effects on wages. In most cases, the effects are identified using administrative data to examine the wages of cohorts that were affected by a shock or intervention and compare their wages to those of surrounding cohorts.

In rich countries, several interventions have been shown to have long-term effects. For example, Nilsson (2017) examines a change in alcohol policy that affected binge drinking, Schwandt (2017) examines the impact of contracting influenza during pregnancy (which is preventable by vaccination), and Isen, Rossin-Slater, and Walker (2017) examine the long-term effect of having been exposed to higher levels of particulate air pollution in utero or in early childhood. In a developing country context, several authors have demonstrated the effects of reducing infectious disease (Baird, Hamory Hicks, Kremer, & Miguel, 2016; Beach, Ferrie, Saavedra, & Troesken, 2016; Bhalotra & Venkataramani, 2015) and improving nutrition (Adhvaryu, Bednar, Molina, Nguyen, & Nyshadham, 2016). In an important study, Gertler et al. (2014) examined the importance of attending to psychological needs by training mothers to provide psychosocial stimulation.

3.4 | The importance of mental health in the labor market

Some of these gains in wages may be intermediated by effects on mental health, because mental health is one of the most important determinants of adult working days lost (Currie & Madrian, 1999). Figure 4 demonstrates that mental health problems are extremely common. The figure plots responses to a question that has been posed to employed respondents by the US General Social Survey since 2002 as follows: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" Remarkably, 40–50% of respondents said they had at least 1 day in the past month when their mental health was not good and, approximately 15% said that they had 10 or more days in the past 30 days when their mental health was not good.

A less subjective measure of the burden of poor mental health can be obtained using data from the US Health Care Utilization Project on the diagnoses of patients arriving at the emergency room in 2014. The data for six states indicated that there were 390 emergency room visits per 1,000 persons. Of these, 13.4% listed a mental health indication for the current visit, including 5% that listed a mood disorder such as depression and 4.9% that listed an anxiety disorder.

Moreover, many "noncognitive skills" that economists have linked to success in the labor market can be directly affected by mental health problems. For example, Edin, Fredriksson, Nybom, and Ockert (2017) consider social maturity, focus, internal motivation, and stress tolerance All of these attributes can be impaired in people

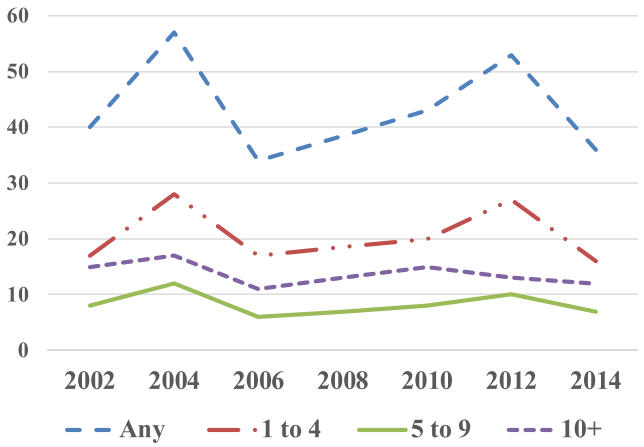

FIGURE 4 Number of days in past 30 when mental health was not good as percent of employed US General Social Survey respondents. The question asked was: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" [Colour figure can be viewed at wileyonlinelibrary.com]

with autism spectrum disorders, attention deficit hyperactivity disorder (ADHD), depression, and anxiety, respectively.

3.5 | Mental health conditions often begin in the fetal or childhood period and have long-term consequences

There is increasing evidence that conditions in the fetal period can affect future mental health. For example, fetal exposure to the Dutch "Hunger Winter" during World War II, or to the Six-Day War in Israel, have been linked to schizophrenia (Susser, Hoek, & Brown, 1998; Malaspina et al., 2008). Pettersson et al. (2015) use a large administrative sample of Danish twins and find a strong association between birth weight and ADHD, even in identical (monozygotic) twins.

Persson and Rossin-Slater (2018) use Swedish registry data and find that the death of a close maternal relative during pregnancy has negative effects relative to a death in the months just after birth. By linking together population registries that record births and deaths and allow researchers to identify family members, with registries that record all prescription drug purchases, they are able to examine the impact of in utero exposure to maternal stress on the consumption of prescription drugs many years later. They find that the probability that the child uses an ADHD drug increases by 25% and that the probability that the child uses prescription drugs to treat anxiety or depression in adulthood rises by 13% and 8%, respectively.

Currie and Stabile (2006, 2009) and Currie, Stabile, Manivong, and Roos (2010) provide further evidence that mental health problems that begin in childhood can have long-term effects on child outcomes. Currie et al. (2010) use administrative data from the Canadian province of Manitoba on 50,000 children and their siblings. Like Sweden, Canada has public health insurance that tracks all of a child's contacts with the medical system. They link health records to registries with information about high school performance and welfare use after age 18 and compare affected children with their own siblings. They examine the impact of having been diagnosed or treated for mental health problems in four different age ranges, 0–3, 4–8, 9–13, and 14–18, and they compare the impact of mental health problems with those of having been diagnosed or treated for asthma and injuries, two of the most common physical health problems children face. Strikingly, mental health conditions have more serious consequences than the physical health conditions examined. Moreover, the impact of having the conditions in the teenage years is greater than that of having them in early childhood, and having the conditions over multiple periods has the greatest impact. Figure 5 illustrates the pattern of effect sizes for the outcome of whether the child went on welfare at age 18.

3.6 | Can early intervention prevent future mental health problems?

The discussion above suggests that some types of shocks during pregnancy do seem to cause long-term effects on the mental health of affected individuals. There is less clarity about the types of postbirth events that cause mental health problems in growing children and how widespread these effects are, though there is certainly evidence from

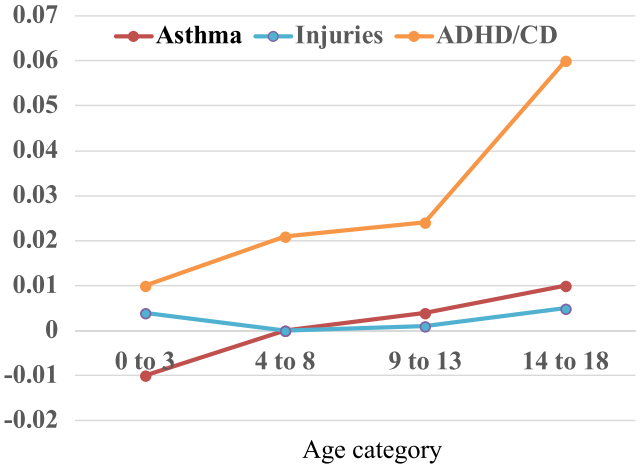

FIGURE 5 Estimated effect of condition on receipt of social assistance after age 18, by age (sibling FE models). The figure shows the estimated percentage point effect from sibling fixed effects models of the effects of having the indicated condition at various ages. For example, having attention deficit hyperactivity disorder (ADHD) or conduct disorder (CD) at age 14 to 18 increases the probability of going on welfare at age 18 by 0.06 percentage points on a baseline of 0.055. The underlying coefficients that are plotted here are from Currie et al. (2010)

retrospective data that adverse events in childhood are related to adult outcomes including adult mental health (Chang, Jiang, Mkandarwire, & Shen, 2019). Given that this is the case, what can we say about the types of interventions that might be protective? We saw above, for example, that Miller and Wherry found evidence that children whose mothers were eligible for Medicaid coverage of their pregnancies (most of whom would have received such coverage if they were otherwise uninsured) had lower mental distress scores in young adulthood.

Chorniy, Currie, and Sonchak (2018) examine the impact of maternal participation during pregnancy in the Supplemental Feeding Program for Women, Infants, and Children (WIC) program. As its name suggests, WIC is primarily thought of as a nutrition program, but it is often administered through maternal and child health clinics, and WIC centers are charged with facilitating access to medical care. Another link between WIC and medical care is that mothers on WIC are automatically adjunctively eligible for Medicaid. The authors examine prenatal WIC participation and the mental health of South Carolina children aged 6–11. The children were born between 2004 and 2009 and could be followed up to 2015 in the South Carolina administrative Medicaid data. They can be compared with their own siblings to identify the effects of prenatal WIC participation.

Table 1 summarizes their findings. Relative to siblings who are close in age but did not participate, prenatal WIC participation is associated with a 5.0% lower probability of being diagnosed with ADHD and a 5.1% lower probability of being diagnosed with several other mental health conditions that are commonly diagnosed in early childhood. The children were also 7.9% less likely to repeat a grade. These effects were concentrated among African-Americans and the lowest income category of Medicaid recipients—groups that are at higher risk of negative birth outcomes. The use of mother fixed effects estimates raises the question of why one child received WIC prenatally whereas the other did not. They show that in their sample, birth order is the most important participation predictor, with mothers who already had a young child at home being less likely to participate. The authors control for these observable factors in their models.

TABLE 1 Prenatal women, infants, and children and mental health at ages 6 to 11

	All	African-American	Low income
Mental Conditions	**FE**	**FE**	**FE**
ADHD	−0.0083*(0.0050)	−0.0148**(0.0069)	−0.0165**(0.0076)
Childhood mental, excl. ADHD	−0.0095*(0.0054)	−0.0193**(0.0076)	−0.0145*(0.0079)
Mean of dependent variable	0.0301	0.0214	0.0347

Note. Each coefficient is from a separate regression model that included a mother fixed effect. The table shows the estimated coefficient from a linear probability model where the dependent variable is the presence of the condition at some point between age 6 and 11, and the independent variable is child participation in WIC prenatally. By comparing the coefficient estimate with the mean of the dependent variable for that group, one can calculate the percentage effect. Standard errors are given in parentheses and are clustered at the household level. This table shows some of the estimates from Chorniy, Currie, and Sonchak (2020).

* denotes statistical significance at the 90% level of confidence.

** indicates significance at the 95% level of confidence

Abbreviations: ADHD, attention deficit hyperactivity disorder; FE, fixed effects.

3.7 | If access to care is making child mental health better, why does it seem like it is getting worse?

Some important indicators, like teen suicide rates, do suggest that teen mental health in the United States has gotten worse since around 2010, with a sharp uptick in the last few years. Prior to that, teen suicide rates had actually been declining fairly continuously in the 20 years since 1990 (Ruch et al., 2019). Hence, over the same period that child mortality rates were dropping and inequality in child mortality was falling, teen suicides were also falling. The causes of the recent upturn in teen suicides are not understood and represent an urgent topic for research.

There is evidence that trends in many other measures of mental health are affected by changes in screening and diagnostic criterion. Simply put, if children have more access to medical care and receive more screenings for a range of conditions, including mental illnesses and neurodevelopmental conditions such as ADHD and autism spectrum disorders, then more cases will be diagnosed and treated.

Chorniy et al. (2020) focus on prescribing for ADHD and find children on Medicaid account for almost all of the 20% increase in prescribing that occurred in the U.S. between 2003 and 2013. This statistic leads us to ask what changes in the Medicaid program could have led to this large increase in treated cases. The most obvious change in the Medicaid program over time has been the shift of patients from "fee-for-service" coverage, in which the state reimburses providers for all covered services, to managed care. In a managed care plan, private insurance companies offer coverage to Medicaid patients in return for a fixed capitated payment from the state. Normally, a capitated payment system creates incentives for providers to do less rather than to do more. To counteract this tendency, Medicaid managed care plans often include two additional provisions. First, plans may receive a higher fixed payment for covering children with chronic conditions. Second, managed care plans may be directly evaluated using metrics, such as whether all children have received a developmental screening.

Chorniy et al. (2020) examine the effects of switching from a fee-for-service to managed care in the state of South Carolina. South Carolina switched children's "default" plan to managed care over a 6-month period between October 2007 and May 2008. Using a 60% random sample of all children less than 17 years old who were enrolled in Medicaid at any time between 2004 and 2015, we were able to explore the effects of this change using two different identification strategies. The first was an event study that included all children sampled at any time in a 2-year window before and after the switch to managed care. The second followed individual children over time and asked whether they were more likely to be diagnosed or screened after they were enrolled in Medicaid managed care.

There is a striking correspondence between being covered by managed care and receiving a well-child or developmental screening. For example, the event study illustrated in Figure 6 found a 16.2% increase in the number of children receiving a well-child screening on a baseline of 44% of children. The number of children being treated for ADHD follows a remarkably similar pattern. It is notable that although all Medicaid-covered children were mandated to receive these screenings, compliance with this mandate was clearly less than 100%, indicating great room for improvement in these programs. Figure 7 follows the same children over time, before and after an individual child went on Medicaid managed care. Figure 7 shows that in the 12 months after the switch, there was an 11.6% increase in the number of children were who were diagnosed or treated for ADHD on a baseline of 6.1% of children. Similarly, there was an 11.3% increase in depression diagnoses. By way of comparison, there were also increases in the diagnoses of common physical health conditions, including an 8.2% increase in asthma, a 12.8% increase in mild infections, an 8.6% increase in autoimmune conditions, and a 5.8% increase in ear, nose, and throat conditions. It is worth noting that managed care companies did not receive higher reimbursements for treating mild infections or ear, nose, and throat complaints, so the higher diagnoses rates for these conditions suggest that children really were experiencing improved access to care (rather than "upcoding" of their conditions, for example).

3.8 | What works in terms of mental health treatment?

As we saw in South Carolina, many more US children are being diagnosed and treated for mental health conditions, as well as for other chronic conditions. Yet this expansion of treatment may be a mixed blessing. There is currently little evidence of the effectiveness of mental health treatments in children in either the short run or the long run. For example, use of antidepressants is widespread among 10- to 19-year-olds in the United States and varies considerably across geographic areas both in terms of the likelihood that an antidepressant will be prescribed and in terms of what

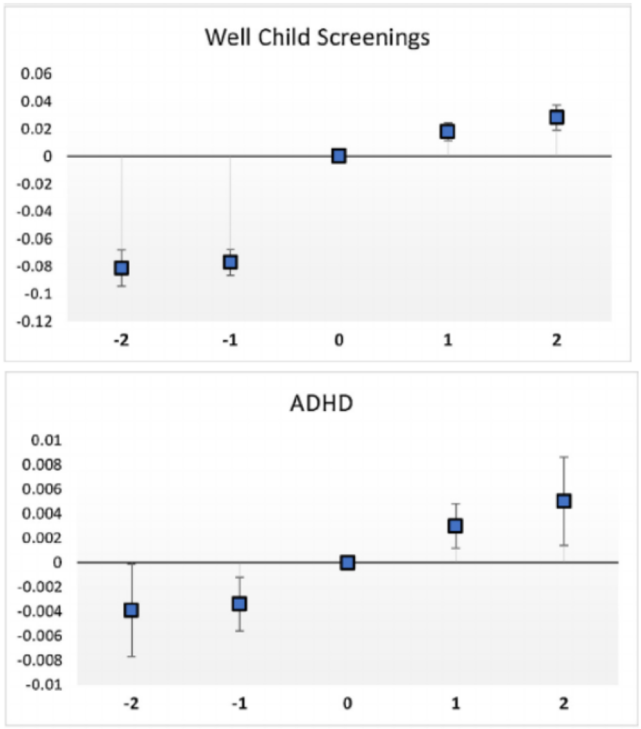

FIGURE 6 Event studies with county fixed effects. This figure reproduces parts of Figure 6 in Chorniy et al. (2018), who include children from the 2 years before to the 2 years after the change to managed care in a South Carolina county. © Elsevier 2018 [Colour figure can be viewed at wileyonlinelibrary.com]

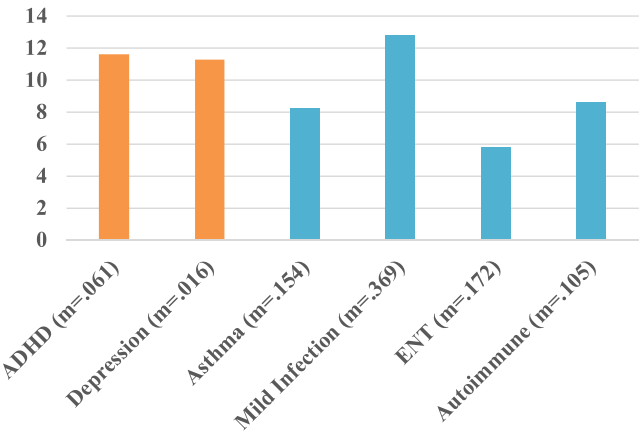

FIGURE 7 Percent increase in diagnoses in 12 months after switch to managed care. This figure illustrates estimates that are taken from Chorniy et al. (2018), who follow the same child over time and ask what happens to the probability of being diagnosed or treated with a condition following the child's enrollment in Medicaid managed care [Colour figure can be viewed at wileyonlinelibrary.com]

antidepressant will be prescribed. In some US counties, annual rates of antidepressant prescribing are as high as one (30-day) prescription per teen.

Much of this prescribing is commonly being done by family doctors and general practitioners who may not have any expertise in the treatment of mental health problems. This is especially likely to be the case in areas with few or no psychiatrists who treat children. It is concerning given that only two drugs have been approved by the Food and Drug Administration for the treatment of depression in children, which makes the majority of the prescribing (approximately 70%) "off label." Moreover, all antidepressants carry a mandatory "black-box" warning that they may increase, rather than decrease, the risk of suicidality in people under the age of 24. Hence, a large-scale uncontrolled experiment is being conducted on American children, with little evaluation of its effects. Although the United States is exceptional in terms of the fraction of the population being treated with antidepressants, rates are rising in European countries as well, suggesting that the lack of reliable information about the consequences of large-scale prescribing is not only an American problem.

3.9 | The problem of the missing middle

Lack of economic research on the effects of treating depression in teenagers may in part be a consequence of a general lack of focus on the teen years. The studies of teens that do exist tend to focus on "risky behaviors" rather than on the mental health problems that often manifest in such behaviors. Instead, researchers have focused on the fetal period and early childhood, perhaps because there have been many prominent interventions aimed at this age group (home visiting, early childhood programs, and maternal and infant health programs) and fewer high-profile programs serving teens. Teens may also have been neglected due to a belief that intervention is more likely to be effective earlier in childhood. Yet recent reevaluations of the literature that cast a wider net in terms of which programs and studies they include in their evaluations suggest that it may be just as cost-effective to intervene in adolescence, particularly since at that age, it may be possible to more closely target intervention to the children who need it (Hendren & Sprung-Keyser, 2019; Rea & Burton, 2018). Even if a specific intervention in adolescence had a smaller "bang for the buck" per child, a targeted intervention might still prove more cost-effective than a universal early childhood initiative.

In addition to learning more about what types of interventions are most effective with adolescents and how to target them, learning more about which measures of adolescent health accurately predict adult outcomes could speed up the evaluation of early childhood programs. That is, instead of waiting until adulthood to see the effects of early childhood interventions on adult outcomes, we might be more able to draw accurate inferences with shorter follow-up periods.

4 | SUMMARY AND CONCLUSIONS

In the past 20 years, there has been an explosion of research demonstrating that child health is an important form of human capital. Healthier children live longer and healthier lives, get more education, and earn higher wages. Moreover, the available evidence shows that public policy can relax constraints on families and promote better child health in multiple ways, although guaranteeing access to health care and preventive health screenings remains especially important. Although improvement of physical health remains a priority, there is new understanding of the key role of child mental health for future outcomes. Economists have recognized the importance of "noncognitive skills" but have not always recognized that deficits in these skills can reflect underlying mental health issues. Mental health diagnoses in children have been increasing at a rate that many people find alarming. However, this increase is at least partly due to improvements in screening, diagnosis, and treatment. This trend toward greater awareness and treatment of mental health may be a good thing, although we currently have little evidence about the short- term or long-term effectiveness of much of the treatment, making the study of mental health treatment in adolescents an urgent topic for research. Going forward, it will be important to pay more attention to the adolescence years—the "missing middle" years—when many mental health problems are first diagnosed.

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