Parental Behavior And Child Health

Health coverage by itself may not influence some of the health-related family behavior that affects children's health.

by Anne Case and Christina Paxson

ABSTRACT: In this paper we document the ways in which parental behavior and socioeconomic status affect children's health. We examine parental behavior in both the prenatal period and childhood. We present evidence on the correlation of this behavior with income and parents' socioeconomic status, and on the ways in which parents' actions affect children's health. We conclude that while health insurance coverage and advances in medical treatment may be important determinants of children's health, they cannot be the only pillars: Protecting children's health also calls for a broader set of policies that target parents' health-related behavior.

PARENTS, NOT DOCTORS, are the primary gatekeepers of their children's health. Parents make choices about the amount and quality of health care their children receive, the food they eat, the amount of physical activity they engage in, the amount of emotional support they are provided, and the quality of their environments both before and after birth. These choices are conditioned by parents' material resources, parents' knowledge of health practices and programs, their own health and health behavior, and the characteristics of the communities in which they live.

The importance of parental resources and behavior in children's health is evident in the large socioeconomic differences that exist in children's health outcomes. Children in the United States fare less well across a broad range of health outcomes if their parents are poor, less well educated, or in poor health. Children in lower-income families are more likely to develop a variety of serious chronic health problems, and, among children with a given chronic condition, poor children on average have worse health outcomes. The disparities in health status between richer and poorer children increase through childhood, so that poorer children enter adulthood with the disadvantage of worse health. Although many factors unre-

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lated to socioeconomic status also affect health outcomes, these sharp income gradients in health underscore the idea that children's health is heavily influenced by the characteristics of the families into which they are born.

It is tempting to conclude that socioeconomic disparities in children's health are the result of differences in access to health insurance and health care. In fact, much of U.S. policy making in children's health rests on this premise and is dominated by the issue. Medicaid, for which primarily low-income children and their mothers are eligible, paid for 35 percent of U.S. births in 1998 and covers approximately 20 percent of all U.S. children.[1] The Medicaid expansions of the 1980s and the more recent expansions under the State Children's Health Insurance Program (SCHIP) have extended eligibility to children from working families. As these programs expand, even more children are expected to be covered.[2] There is good reason to think that these expansions will have beneficial effects. Expansions in Medicaid eligibility between 1979 and 1990 yielded reductions in fetal and infant mortality and increases in medical care use by some groups of women and their babies.[3]

Although public insurance programs benefit many poor and near-poor children, a sole focus on access to care through insurance is misplaced. First, access alone does not guarantee that children are covered. About 22 percent of Medicaid-eligible children have no health insurance, with take-up rates somewhat lower for older children.[4] Second, even among children who are covered by Medicaid, socioeconomic differences in children's health status persist and, as Carol Korenbrot and Nancy Moss conclude, "Medicaid coverage of pregnant women is inadequate to compensate for socioeconomic deprivation."[5] This may not be surprising, given that socioeconomic differences in children's health are also observed in countries such as Canada and Britain, which have universal coverage.[6]

It is widely acknowledged that the behavior of parents, and in particular mothers, affects their children's health. Of special concern are the effects of behavior during pregnancy—for example, cocaine, nicotine, and alcohol use—on children's health. After the children are born, decisions to take a child to the doctor and the dentist, to supervise children properly, to use seat belts and child safety seats, and to provide healthy food and adequate exercise may have both short- and long-term health implications. Much of this behavior is correlated with socioeconomic status and so could explain at least part of the association between children's health and socioeconomic status. However, we are far from having a clear picture of how behavior affects health and whether behavior that does have adverse health effects is amenable to change through policy.

In this paper we document the ways in which parental behavior and socioeconomic status affect children's health. We begin by reviewing several important features of the relationship between household and parental characteristics and children's health outcomes. We then examine parental behavior in both the prenatal period and childhood. We review evidence on the ways in which this behavior affects children's health and examine how behavior is correlated with income and parents' socioeconomic status. We conclude that while health insurance coverage and advances in medical treatment may be important determinants of children's health, protecting children's health also calls for a broader set of policies that target parents' health-related behavior.

The Gradient In Children's Health

To document several key features of the relationship between socioeconomic status and children's health for five income groups, we use data from the National Health Interview Survey (NHIS) collected annually from 1986 to 1995 (Exhibit 1). The differences in health across income groups are marked: 90 percent of children in the wealthiest quintile (5) are reported by a parent to have very good or excellent health, in contrast to only 66 percent of the children in the poorest quintile (1). The relationship between income and health does not merely reflect worse health among children in poverty: Health continues to improve with income up into the highest income quintile. Neither does it reflect "reporting bias," in which wealthier children are reported to be in better health by their parents when in fact they are not: Data from physician reports of children's health from the National Health and Nutrition Examination Survey (NHANES) also indicate that poorer children are in worse health.[7]

EXHIBIT 1
Percentage Of Children Ages 0–17 In Excellent Or Very Good Health, By Age, Mother's Education And Health, And Income Level, 1986–1995

		Child's age		Mother's education		Mother's health	
Income quintile	Full sample	0–9	10–17	More than high school	High school or less	Good to excellent	Fair or poor
1	66%	68%	63%	76%	64%	71%	43%
2	77	79	75	83	75	80	50
3	84	85	82	87	82	85	58
4	87	88	86	89	85	88	64
5	90	90	90	91	88	91	67

SOURCE: Authors' analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).
NOTES: Based on a sample of 231,131 children ages 0–17 from the 1986–1995 NHIS, who have a mother present in the household. Health status is reported by a parent (for children ages 0–16) or by a parent or the child (for children age 17). Income quintile 1 is the poorest; 5, the richest.

■ **Income and deterioration of health.** Although children, like adults, generally become less healthy as they get older, higher incomes buffer children against this erosion. As shown in Exhibit 1, among children in the poorest quintile, 68 percent of younger children are in very good or excellent health, compared with 63 percent of older children. This deterioration of health does not appear for children in the richest quintile: 90 percent of children in both the younger and older age groups are in good or excellent health. What cannot be seen in Exhibit 1 is that the gradient (the relationship between income and health) steepens at each age: It is steeper for two-year-olds than for one-year-olds, steeper for three-year-olds than for two-year-olds, and on up the age range. The steepening continues into adulthood, at least up to the age of retirement.[8]

A common explanation for this steepening in adulthood is that poor health leads to lower earnings, and these earnings fall farther behind as those in poor health grow older. However, finding an analogous result in children's gradients makes it unlikely that explanations running from health to income tell the whole story. In addition, these results suggest that the impact of income on health in childhood is cumulative in nature.[9]

■ **Parents' education and health.** Income is only one of the family characteristics associated with children's health. Parental education and health are also important. More-educated parents may be better informed about the availability and use of health care, or have better health behavior that confers benefits to their children. Exhibit 1 indicates that at all income levels, children with more highly educated mothers are more likely to be in excellent or very good health. However, the income gradient in children's health is not entirely explained by higher parental education. Adding controls for education—either in the crude way shown in Exhibit 1 or in the context of more finely detailed regressions that also include controls for fathers' education—reduces but does not eliminate the income gradient in health.

Similar patterns are seen in the relationship between parents' health and the health of their children. Children whose mothers are in good to excellent health are more likely to have good health themselves. Other research finds that children whose parents have specific health problems or behaviors are more likely to have the same health problems.[10] The positive correlation between parents' and children's health could be driven by a number of factors other than income, and we find that the income gradient in children's health persists even after parental health is controlled for.

■ **Other health measures.** The positive relationship between income and health appears for a variety of other health measures

(Exhibit 2). Children who are poorer miss more days of school because of illness and experience more hospitalization episodes. They are also more likely to have weighed less at birth. In addition, a number of serious chronic health problems, including heart conditions, hearing problems, mental retardation, and asthma (among younger children) are more prevalent among poorer children. Some chronic conditions are not related to income. However, Paul Newacheck argues that, on balance, the most serious chronic conditions are more common for poor children.[11] In addition, in a previous study we found that among children with specific chronic conditions, those from poorer families have worse overall health status, spend more days in bed, and experience more hospitalization episodes.[12] Money not only appears to protect children from having a number of serious health problems but also appears to buffer them from the adverse consequences of health problems.

■ **Why health and income are related.** Although family income is positively associated with children's health status, it is clear that dollars are not, by themselves, antidotes for illness. Policies designed to improve children's health must be based on an understanding of why health and income are related. A variety of mechanisms may underlie the relationship. It could be that higher incomes buy more and better-quality health care, or that richer parents are able to allocate more resources to other goods (such as better food or cleaner home environments) that improve health. It also may be that income is not the direct source of better health among wealthier children. Instead, parents who are more productive in the labor market may also adopt behavior that results in better health for their children.

EXHIBIT 2
Health Indicators Among Children, By Income, 1986–1995

Income quintile	Days missed from school (ages 5–17)[a]	Annual hospital episodes (ages 1–17)[b]	Percent with asthma	Percent with heart condition	Percent with hearing problem	Percent with mental retardation	Percent 5.5 lbs. or less at birth
1	.234	.048	7.2%	2.3%	2.1%	2.2%	9.6%
2	.197	.039	5.9	2.3	1.9	1.4	7.8
3	.176	.034	5.6	1.9	1.8	0.9	6.5
4	.170	.032	6.0	2.0	1.6	0.9	5.4
5	.164	.025	6.4	1.7	1.3	0.7	4.8
N	192,044	255,210	43,892	44,921	45,098	45,098	12,219

SOURCE: Authors' analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).
NOTES: Columns 1–6 are based on samples of children ages 0–17 from the 1986–1995 NHIS, which asks each family about only a subset of chronic conditions (accounting for the smaller numbers of observations for columns 3 through 6). The information on birthweight is from the 1988 Child Health Supplement of the NHIS, which collected information on one child age 0–17 in each household with children. Income quintile 1 is the poorest; 5, the richest.
[a] Average number of days missed from school over a two-week period.
[b] Average number of annual hospital episodes.

Impact Of Parental Behavior In The Prenatal Period

The health status of infants at birth is influenced by a wide variety of factors, including the health and nutritional status of mothers, the medical care they receive during pregnancy, and their use of substances that affect fetal development. U.S. policy toward children's health has focused on prenatal care, with the specific goals of reducing infant mortality and low birthweight. In 1985 the Institute of Medicine (IOM) published an influential report that documented large disparities in birthweight across socioeconomic and demographic groups and established the reduction of low birthweight (2,500 grams or less) as a national priority.[13] This report argued that the cornerstone of policies to counter low birthweight should be improved access to high-quality and early prenatal care, as well as a public information campaign about how to remedy low birthweight. The Medicaid expansions of the past several decades have been judged largely by their effects on birth outcomes, and a large and growing literature examines the effects of these expansions on health care use, infant mortality, fetal death, and birthweight.[14]

Our concern here is not with medical care but with the effects of behavioral factors that influence the health of newborns. In many cases, especially in cases of preterm birth, the underlying cause is simply unknown. However, several risk factors for poor health at birth can, in principle, be managed. Among these are three behavioral factors: use of tobacco, alcohol, and illegal drugs during pregnancy. These actions also have been implicated as sources of long-term physical and developmental problems. In addition, since use of these substances during pregnancy is more common among poorer and less well educated women, they may be key sources of the socioeconomic gradient in children's health at birth.[15] Ellen Meara argues that up to half of the socioeconomic disparities in birthweight for white children, and one third for black children, can be explained by smoking alone.[16]

■ **Tobacco use.** An increasingly large and clear body of evidence, based on both human and animal studies, finds that smoking during pregnancy has serious adverse health consequences for infants. It is a moderate risk factor for preterm delivery, is a major risk factor for intrauterine growth retardation, and is also related to sudden infant death syndrome (SIDS). Smoking during pregnancy also has been implicated as a source of behavioral and cognitive problems among older children, including lower IQ and attention deficit hyperactivity disorder (ADHD).[17] It is difficult to assess whether these behavioral and cognitive differences are attributable solely to prenatal tobacco use or also are influenced by family and environmental char-

acteristics associated with prenatal tobacco use. However, animal models support the idea that prenatal nicotine exposure affects brain development and may have long-lasting effects.[18]

■ **Alcohol consumption.** Alcohol consumption during pregnancy can result in fetal alcohol syndrome (FAS) in infants, characterized by low birthweight, small head circumference, and neurodevelopmental and facial anomalies. Children with FAS at older ages display small stature; continued small head circumference; and a wide variety of cognitive, social, and behavioral problems.[19] There has been much debate over the quantity and timing of alcohol consumption and the damage done. It is clear that heavy drinking during pregnancy, and especially binge drinking, greatly elevates the risk of FAS. However, there is only weak and mixed evidence that moderate or "social" drinking has adverse effects.[20]

■ **Illegal drug use.** The effects of cocaine use on children's health are less well established. Despite a large literature on the subject, it is difficult to identify a core set of physical, cognitive, or behavioral problems that can be directly attributed to prenatal cocaine exposure. A recent review by Deborah Frank and colleagues of thirty-six research studies finds that "after controlling for confounders, there was no consistent negative association between prenatal cocaine exposure and physical growth, developmental test scores, or receptive or expressive language."[21] Because cocaine use is correlated with a variety of other risk factors, such as smoking, drinking, and economic deprivation, it is difficult to identify how prenatal cocaine use affects fetal development in humans. For example, the studies reviewed by Frank and her colleagues that do not control for prenatal alcohol and tobacco use typically find that cocaine is associated with lower weight in infancy and smaller head circumference at birth. However, the studies they review that include those controls do not reach this conclusion. This does not mean that prenatal cocaine use is harmless. Indeed, the animal research reviewed by Theodore Slotkin in 1998 and more recent research indicate that cocaine does affect fetal brain development.[22] However, Slotkin argues that the spectrum of effects of cocaine is more limited than is that of nicotine, and that the developmental consequences of cocaine are likely to be more subtle.

■ **Prevalence rates.** The three types of substance-use behavior discussed above have different prevalence rates. Evidence from the Behavioral Risk Factor Surveillance System (BRFSS) indicates that 11.8 percent of pregnant women reported being smokers in 1996, 4.5 percentage points lower than the rate in 1987.[23] Other studies indicate that the rate is somewhat higher, perhaps in the range of 20 percent. Heavy and "binge" drinking is much less common than

smoking. Evidence from the late 1980s and early 1990s presented by the IOM indicates that although approximately 20 percent of women consumed any alcohol during pregnancy, 0.3 percent of pregnant women reported consuming more than sixty drinks in the previous month, and 1.3 percent reported an episode of binge drinking while pregnant.[24] Cocaine use during pregnancy, although difficult to measure, appears to be fairly rare. A 1994 National Institute of Drug Abuse (NIDA) survey indicates a rate of 0.9 percent.[25]

■ **Policy issues.** Over the past three decades the United States has seen substantial gains in the health of infants. Between 1975 and 1997 the rate of infant mortality declined from more than fifteen deaths per thousand live births to 7.2 deaths per thousand.[26] A large share of these improvements are attributable to new medical technologies. For example, neonatal intensive care units (NICUs) produced marked declines in infant mortality during the 1970s; and the introduction in the early 1990s of synthetic surfactants, which prevent respiratory distress syndrome among preterm infants, produced additional gains.

Cost of technology. These successful medical advances have come at great expense: David Cutler and Meara have estimated that treatment for a single infant's stay in an NICU can cost as much as $131,000 in 1996 dollars.[27] This amount does not include the costs of treating long-term health problems that are associated with low birthweight, or special education costs that are often incurred for low-birthweight children.[28] Although Cutler and Meara conclude that these costs are well worth the gains in life expectancy and quality of life they produce, finding lower-cost ways to prevent poor birth outcomes is a priority.

Misplaced focus. One promising strategy is to develop policies that improve behavior that results in low birthweight and other poor infant health outcomes. Principles of cost-benefit analysis imply that resources should be directed to programs that yield the greatest improvement in health per dollar spent. Similarly, the focus of public health education efforts should be on behavior that can be altered and that (if altered) will have the biggest health impacts.

A review of past practice suggests that these principles have not always been followed. The case of FAS provides a useful example. Elizabeth Armstrong and Ernest Abel argue that the concern over FAS has been exaggerated, to the detriment of good policy making. Specifically, a "moral panic" has led to the vapid and diffuse policy response of warning all women to abstain from drinking during pregnancy, instead of focusing on the relatively small group of heavy drinkers who are at risk of having FAS babies.[29] Unfortunately, universal public education campaigns, such as warning labels on alco-

"Household characteristics affect children's health status whether a child has health insurance coverage or not."

hol bottles, appear to reduce alcohol consumption only among light drinkers.[30] An IOM report on FAS states that "while universal prevention activities in isolation may have had some effects, there has been no data found that demonstrates a change in FAS in response to such efforts."[31] Gains in this area are instead likely to come from the more systematic identification of pregnant women who are heavy drinkers, along with focused interventions.

The public policy response to cocaine use during pregnancy provides another example of misplaced focus. Despite the low rate of cocaine use during pregnancy and the limited amount of scientific evidence on its harmful effects, prenatal cocaine use has elicited a strong policy response. During the crack epidemic of the 1990s, many states passed legislation that made illegal drug use (and in some cases alcohol abuse) during pregnancy a form of child maltreatment. Large numbers of "crack babies" have been moved into foster care, and, in some cases, their mothers have been subject to criminal prosecution or the termination of parental rights.[32]

These harsh responses have been criticized on the grounds that they may deter pregnant women with drug problems from seeking treatment and prenatal care. At the same time, researchers have argued that the focus on cocaine—possibly another case of "moral panic"—has drawn public attention and funding away from the more important problems of heavy drinking and smoking during pregnancy.[33] The IOM report on FAS notes that demonstration projects for services for substance-abusing pregnant women have favored the study of cocaine.[34] Frank and colleagues also have questioned policymakers' emphasis on cocaine. They attribute the annual costs of low birthweight due to smoking at around $263 million (in 1995 dollars). Yet, unlike cocaine, "there are no sterilization campaigns for mothers who use tobacco. No pregnant women have been charged with child abuse for tobacco use...Teachers do not dread having a 'tobacco kid' assigned to their class."[35]

Parental Behavior During Childhood

We turn now to household-related nonmedical determinants of health status in childhood. Household characteristics affect children's health status independently of whether a child has health insurance coverage or not. Using an indicator that takes a value of 1 if children are reported to be in excellent or very good health, we

find that for children covered by private insurance or Medicaid or not insured at all, higher household income is associated with better health status, and the predicted improvement in health status upon the receipt of additional income is equally large for each of the three groups (Exhibit 3). This is consistent with a model of children's health in which household income matters not for the quality of medical care it ensures children, but for other benefits associated with higher incomes. As is also clear in Exhibit 3, all else held equal, children raised in larger households are at risk for poorer health, and the effect of additional siblings on any given child's reported health status is not significantly different for children with or without coverage. Parents' education is also significantly correlated with children's reported health status, with better-educated parents significantly more likely to report their children as being in excellent or very good health—again, independent of insurance status.

Many parental characteristics affect children's health status through their effects on health-related behavior. Here we focus on three types of behavior that protect health generally: whether a child wears a seat belt most or all of the time, whether someone in the household smokes, and whether the child has a regular bedtime. Seat belt use both reduces the probability of accidents and, in our work, represents a class of risky behavior.[36] Research has shown that young children whose mothers smoke are much more likely to develop wheezing and to have diminished pulmonary function, which may predispose them to asthma and chronic bronchitis.[37] Among children with asthma, exposure to cigarette smoke can lead to acute exacerbation of the illness.[38] We use a regular bedtime as an indica-

EXHIBIT 3
Household Characteristics And Children's Health Status, By Health Coverage

	Child is covered by private insurance		Child is covered by Medicaid		Child is uninsured	
Explanatory variable	**Value**	**SE**	**Value**	**SE**	**Value**	**SE**
Log (household income)	.035	.006	.037	.014	.053	.010
Log (family size)	–.032	.014	–.085	.036	–.053	.031
Mother's education	.010	.002	.008	.005	.009	.004
Father's education	.011	.002	.016	.006	.013	.004
N	11,097		1,771		2,282	

SOURCE: Authors' analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).
NOTES: SE is standard error. The dependent variable is 1 if the child's health status is excellent or very good, 0 otherwise. Probit estimates; numbers reported are the change in the probability of excellent or very good health, given a change in the corresponding explanatory variable. Also included in all probits are a complete set of child age indicators; race and sex indicators; indicators that the child's health respondent was the child's mother, father, other female adult, or other male adult; mother's and father's ages if present; and indicators that mother figure and father figure are present. Mother's and father's education is equal to years of completed schooling, if parent is present, and is equal to zero otherwise. Data are for children ages 0–17 in the 1988 NHIS Child Health Supplement.

tor that the child follows a routine; predictable family routines have been associated with more cooperative and compliant behavior among preschoolers.[39] We found that children who wear seat belts are reported to be in much better health (Exhibit 4). It is unlikely that this is due to seat belts' having saved children from harm during car accidents; rather, seat belt use is one of many precautions parents can take to protect their children's health. Collectively, such precautions pay off in better health for children. Children who live with a cigarette smoker are reported to be in worse health. Finally, the health of older children is significantly correlated with the report that children have a regular bedtime. Again, regular bedtimes may signal household routines that promote health.

■ **Household characteristics and health behavior.** Household characteristics, in particular, income, are associated with parents' health behaviors. Children in higher-income households are significantly more likely to wear seat belts and to have a regular bedtime, and are significantly less likely to live with a cigarette smoker (Exhibit 5). Also, the impact of income on health-related behavior becomes more pronounced at higher ages. The positive association between income and seat belt use, and the negative one between income and smoking, are twice as large for older children as for younger children. These health-related behaviors are correlated with income, but it is not possible to tell whether income has a causal effect: Neither buckling children in nor refraining from smoking costs money. However, it is possible that parents who are stretched by a lack of money may have less energy to wrestle children into seat belts or may smoke because of stress.

Part of the effect of income also may reflect omitted household

EXHIBIT 4
Household Behavior And Children's Health Status, By Age Group

	Ages 0–8		Ages 9–17	
Explanatory variable	**Value**	**SE**	**Value**	**SE**
Log (household income)	.034	.006	.039	.007
Child wears seat belt most or all of the time	.038	.012	.035	.010
Someone in household smokes	−.021	.009	−.016	.010
Child has regular bedtime	.015	.012	.031	.013
F-test: joint significance of household behaviors	18.84		24.52	
p-value	.0003		.0000	
N	7,596		7,105	

SOURCE: Authors' analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).
NOTES: SE is standard error. The dependent variable is 1 if the child's health status is excellent or very good, 0 otherwise. Probit estimates; numbers reported are the change in the probability of excellent or very good health, given a change in the corresponding variable. Also included in all probits are indicators that the child is covered by private insurance or by Medicaid; log of household size; mother's and father's education; and all variables listed in the Notes to Exhibit 3. Data are for children ages 0–17 in the 1988 NHIS Child Health Supplement.

EXHIBIT 5
Household Characteristics And Types of Behavior Influencing Child Health

	Child wears seat belt all or most of the time [0.697]		Someone in household smokes [0.406]		Child has regular bedtime [0.751]	
Explanatory variable	**Ages 0–8**	**Ages 9–17**	**Ages 0–8**	**Ages 9–17**	**Ages 0–8**	**Ages 9–17**
Log (household income)	.030	.057	−.017	−.032	.017	.007
	(.006)	(.010)	(.008)	(.009)	(.009)	(.007)
Log (family size)	−.150	−.098	−.028	.006	.034	−.008
	(.017)	(.003)	(.022)	(.023)	(.025)	(.018)
Mother's education	.010	.009	−.018	−.010	.020	.007
	(.002)	(.003)	(.003)	(.003)	(.003)	(.002)
Father's education	.014	.019	−.033	−.027	.008	−.001
	(.002)	(.003)	(.003)	(.003)	(.003)	(.002)
N	7,670	7,161	7,670	7,161	7,670	7,161

SOURCE: Authors' analysis of data from the National Health Interview Survey (NHIS), 1986–1995 (all years combined).
NOTES: Results in square brackets are the means of the dependent variables. Results in parentheses are standard errors. Probit estimates; numbers reported are the change in the probability of the event, given a change in the corresponding variable. Also included in all probits are indicators that the child is covered by private insurance or by Medicaid and all variables listed in the Notes to Exhibit 3. Data are for children ages 0–17 in the 1988 NHIS Child Health Supplement.

characteristics that are correlated with income and that drive health-related behavior. For example, children's nutritional intake may be an important determinant of health status and may well be correlated with household income. The same may be true of parent-to-child education on health habits. In addition, family structure, such as whether a child lives with a stepparent, also may affect the child's health status, and may be correlated with family income and health behavior.[40] We do not yet know enough about what happens in families to parcel out the effect of income to the underlying determinants of children's health status.

■ **Policy implications.** Our discussion leads us to three conclusions. First, while public policy has been tightly focused on increasing the access of low-income children to insurance coverage, such coverage by itself may not influence the important health-related household behavior that affects children's health. The health-related problems associated with parents' high levels of stress and low levels of educational attainment may be as critical to children's health outcomes as are those associated with insurance.

Second, U.S. policy toward children's health has focused on health in the prenatal period and early infancy. Yet our research shows that older children and adolescents are those most at risk for poor health behavior and health outcomes and that socioeconomic gradients in health problems become more pronounced as children get older. There is some evidence that the health of older children is drawing more attention. For example, the focus area on "Maternal and Infant Health" in *Healthy People 2000* was expanded to "Maternal, Infant, and Child Health" in *Healthy People 2010*. We applaud moves to more systematically track the health status of older children and

attend to their health needs.

Finally, we note that one of the reasons the focus has been on insurance and on the prenatal period is that we do not have off-the-shelf advice for changing the health-related behavior of parents with children. Shoring up the incomes of households at the bottom of the income distribution may improve children's health. However, as discussed earlier, while household income is significantly correlated with children's health, whether and how income plays a causal role is not well understood. Additional research is needed, if we are to understand the mechanisms by which income, or behavior correlated with income, protects children's health.

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NOTES

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9. An alternative explanation is that economically less successful parents, whose incomes remain low as their children grow older, are less able to maintain their children's health than are parents who are also initially poor but whose incomes grow over time. Although plausible, this hypothesis is not consistent with the evidence in Case et al., "Economic Status and Health in Childhood," which indicates that the relationship between children's health and income earned by the family early in the child's life (and even before the child is born) becomes stronger as the child ages.
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