HEALTH

AND ECONOMIC MOBILITY

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KEY FINDINGS:

• While estimates vary, parents' health status accounts for a relatively small share of children's education attainment and income mobility.

• Many studies find a link between good health and positive labor market outcomes (potentially enhancing mobility), but there is little consensus about the magnitude of this connection.

• Studies that link catastrophic health care costs to bankruptcy and wealth dissipation, suggest a negative link to intergenerational mobility.

• Some studies show that poor health conditions in childhood, especially mental and emotional problems, lead to less education and potentially less economic mobility.

• The causal link between health insurance and health outcomes (possibly leading to more or less economic mobility) is difficult to determine because there may be systematic differences between individuals who have health insurance and those who do not.

There is ample evidence that health and wealth are related, and it is possible that health helps drive—or hinder—economic mobility. (The data suggesting this link are summarized in Table 1.) If there is a causal link between health and income, then negative health shocks could affect intragenerational mobility if ill health precipitates income drops. Also assuming that causal link, it is possible that health could affect intergenerational mobility to the extent that health status is passed on from one generation to another. Health also might affect mobility if economic status helps to determine childhood health and gives some children advantages or disadvantages that may continue later in life. Some of the key links established between socioeconomic status and health are highlighted in the table below.

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Link Between SES and Health

- Individuals who report excellent health hold 74 percent more wealth than those who report fair or poor health (Smith 1999).
- Among children up to age three, fewer than 75 percent of those whose family incomes are less than $10,000/year report excellent or very good health compared with 90 percent of children in families with incomes that exceed $100,000 (Case and Paxson 2005). These differences increase with age.
- Among poor children, 9.6 percent have a physical or mental disability that limits their activities, compared with 5.7 percent of nonpoor children (Case and Paxson 2005, citing Newacheck and Halfon 1992).
- For adults in most age groups, having at least a college degree is related to improvements in mortality (Palloni 2006).

Several studies have attempted to address the question of what role health plays in intergenerational mobility (see table below). Using a U.S. data set, Hertz (2006) suggests that health accounts for 8 percent of the *intergenerational correlation of income*. We do not yet know the full connection between health and mobility since many of the studies to date fail to capture the multiple linkages between parental income and children's income in adulthood. For example, Hertz (2006) does not include the effects of early life health conditions, themselves partly a function of low family income on children's income later in life. Thus, the estimates we cite here may understate the true effect of health on income. (See Table 2 for details and examples of studies in other countries.)

Links between Health and Intergenerational Mobility

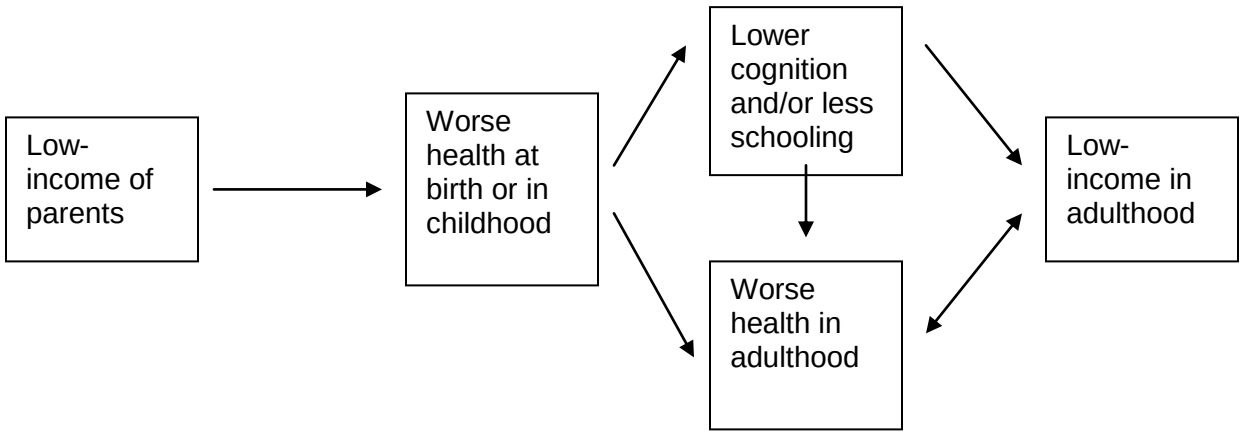
Study (dataset)	*Methods and Key Results*
Hertz 2006 (U.S. - Panel Study on Income Dynamics)	○ Decomposes intergenerational correlation of income per person (total 0.431). ○ Determines health status of parents accounts for 0.035 points, or 8 percent. (For comparison, education accounts for 30 percent, race 14 percent, and unexplained 40 percent.)
Blanden et al. 2006 (British Cohort Study)	○ Decomposes intergenerational transmission of income from father to son (total 0.32). ○ Finds that health explains 0.0052 points or 1.6 percent. (For comparison, early cognitive ability accounts for 6 percent, education 30 percent, and unexplained 47 percent.)
Eriksson et al. 2005 (Danish youth cohort study)	○ Calculates intergenerational earnings elasticity with and without controls for parental health status. ○ Finds elasticity drops by 28 percent for sons and 25 percent for daughters with inclusion of health controls.
Palloni 2006 (British National Child Development Study)	○ Decomposes the *explained* portion of transmission of parental social class to sons' social class. ○ Concludes early childhood health accounts for 9 percent of the parent-child relationship. (For comparison, cognitive performance accounts for 51 percent, son's education for 9 percent.) ○ Monte Carlo simulations show that adding in health status significantly affects likelihood of lower-income individuals experiencing mobility, but effect is not significant for higher income individuals.

Health could affect intergenerational mobility if health plays a causal role in economic status and if health transmits from one generation to another. Health may be passed on from parent to child through **genetics** , **parental behaviors and the home environment** or a combination thereof. There are several mechanisms through which **health could affect earnings and wealth**—either directly if illness limits labor market attachment or restricts job choice, or indirectly if childhood health affects cognition or educational attainment. These patterns can be seen among individuals with **disabilities**. The hypothesis that health can impact future socioeconomic class is known as "health selection" or "social drift."

Health shocks could contribute to intragenerational mobility either because of their effects on ability to work or because of large medical expenses. Hertz (2006) finds that health status was a significant predictor of income change between 1997 and 1998, with self reports of fair or poor health and having a disability associated with modest income declines. However, health did not have significant effects on income mobility in the other two-year time periods Hertz studied—1990–1991 and 2003–2004.

Health also could affect intergenerational mobility if the economic status into which a child is born influences her health, which could, in turn, influence economic status in adulthood. There are different hypotheses about how health at a very young age could affect health—and potentially educational or employment—outcomes later in life. According to the fetal-origins hypothesis, conditions in utero—often reflected in **health at birth**—can alter the "programming" of vital organs, the effects of which may appear many years later. Life course models focus on the role that **childhood health** plays in producing adult health status. In either of these models, parents' socioeconomic status could affect either the likelihood that a child will experience health problems or the consequences of those health conditions, or both. If, consistent with the discussion above, health can help determine income in adulthood, it is possible that a portion of the stickiness at the bottom of the income distribution may reflect a more complex version of one of these patterns, as illustrated below::

Pathways between Health and Income in Adulthood



This still leaves the question of why income might affect health. One theory holds that parents of higher economic status may have the time, resources, and tastes to invest more heavily in **medical care and health insurance** and **good nutrition**. Class may also dictate different living environments, for example, as neighborhoods have different amounts of violence or different levels of exposure to toxins. (See discussion of **asthma** as one example of how pollution could adversely affect health.) Parental education may also play a substantial role in children's health, if less well-educated parents do not know to take preventive measures or are less able to follow medical advice.

It is possible also that the apparent relationship between socioeconomic status and health may be influenced by parental behaviors. For example, Case and Paxson (2002, cited in Case et al. 2002) find that children in lower-income households more often live with cigarette smokers, have irregular bedtimes, and are less likely to wear seat belts. It seems unlikely that these parental behaviors are the direct consequence of lower income. (Although it is possible that they reflect responses to higher stress, less energy or resources for parenting, and lower levels of stability.) Some of these characteristics, as well as factors like maternal weight, are also correlated with children's health. In fact, Case et al. (2002) suggest that if it were possible to control for a full set of parental decisions it may make the income gradient for child's health disappear.

Socioeconomic status continues to contribute to **health in adulthood**, potentially through education or stress levels. Pathways models suggest that stress arising from low economic status can lead to health problems later in life. In this hypothesis, health in childhood does not directly affect health in adulthood, but affects economic status which then affects health. One provocative variation of this theme is that inequality in income, rather than low income, leads to deteriorating health. The complex interplay between health and socioeconomic status makes it difficult to make a definitive determination on the role health plays in driving intergenerational mobility. If adult health is in part determined by adult socioeconomic status, then health could be a symptom of economic mobility rather than, or in addition to, being a driver of it.

These complicated relationships can be observed in the cases of **obesity**, **substance abuse**, and **mental illness**. In each of these paradigms, there is evidence suggesting that

1) the condition is passed on from one generation to the next either genetically or through the family environment;
2) lower economic status could exacerbate the condition; and
3) the condition could contribute to lower earnings.

Some public programs, like **Medicaid**, **prenatal care**, and nutrition programs, try to improve health outcomes, but they are unable to overcome the link between socioeconomic status and health. It is possible, however, that government transfer programs, like Social Security Disability Insurance and Supplemental Security Income, that are designed to protect individuals from the worst effects of health shocks may indirectly protect children's health. For example, if a parent becomes disabled and is no longer able to work, the government program may prevent that person from falling into deep poverty. Cushioning the parents" fall may not only mediate large drops in intragenerational mobility, but may also help protect the child from some of the health (and related educational and income consequences) that may stem from childhood poverty. An interesting question for further research would be to consider how health-related governmental social insurance programs affect intergenerational mobility.

As a general caveat, in addition to the difficulties of interpreting causality, any attempt to determine the role health plays in economic mobility will likely be hindered by the data. Different studies assess health in different ways. Many rely on self-reported health status. Others use easily

measurable variables as proxies for more complex underlying conditions—for example, birth weight is often used as a stand in for in utero conditions. Finally, there are few U.S. data sets that contain detailed health information and follow the same individuals over a long period of time. For that reason, many of the studies discussed here either use data from other countries or they study limited measures of health and socioeconomic status.

PATHS THROUGH WHICH POOR HEALTH COULD AFFECT EARNINGS AND WEALTH

1. Health and Labor Market Activity

Ill health can affect earnings by reducing wages or limiting participation in the labor force. Currie and Madrian (1999) find that many studies have detected a link between health and the labor market, but that little consensus has emerged about the magnitude of that connection. They identify three ways in which wages could be damped by poor health: through reductions in productivity; costs for the employer to accommodate the individual; or discrimination. However, in an extensive literature review, they conclude that in general the negative relationship between earnings and health is not primarily the result of differences in wages, but in amount of time worked. As an example of the ability of health to restrict labor force participation and hours worked, Smith (1999) analyzed data on individuals in the Health and Retirement Study. He finds that people who experience a severe new health problem between two waves of the survey reduced their weekly hours of work by four hours; further, their likelihood of staying in the workforce declines by 15 percentage points. Additionally, if, over time, less healthy individuals have more spells out of the workforce, their income may reflect this decline in cumulative workforce experience. (See also, discussion of **disability**.)

2. Health Costs and Wealth

Health can affect economic well-being in ways outside of the labor market. For one, health crises can be very expensive. In a study of families who filed for bankruptcy in 2001, 28 percent of individuals surveyed cited illness or injury as the specific reason for their bankruptcy (Himmelstein et al. 2005). Furthermore, among those who stated illness as the cause, the average out-of-pocket costs since the start of the condition were $11,854, even though three-quarters of those individuals had health insurance when their condition began. Savings behavior may also change (Smith 1999, Adams et al. 2003). Savings could increase either because marginal utility of consumption may be reduced when individuals are ill, or out of a desire to ensure adequate resources for a potential surviving spouse. Alternatively, assets may be spent down to cover other medical and nonmedical costs associated with illness. Health conditions may also increase resources if they trigger new government transfers.

3. Childhood Health and Cognition

Poor health earlier in life may have an adverse effect on later earnings, indirectly, by limiting cognition or educational attainment. Palloni (2006) finds that early cognitive ability is correlated both with health status and adult cognition—a trait that the labor market rewards. Additionally, he finds that in the British National Child Development Study cognition at age 11 is strongly associated with low birth weight and health status at age seven. (See Currie and Madrian (1999) for a discussion of some of the other literature on this topic.)

4. Childhood Health and Education

In their review of the literature, Currie and Madrian (1999) state that many researchers have suggested that poor childhood health is correlated with less education (for example, Grossman 1975, Perri 1984, Wolfe 1985, Wadsworth 1986). An evaluation of British data finds that after controlling for parental and household traits, each adverse health condition at age seven is related with a 0.3 drop in the number of 0-level exams passed, and each condition at age 16 is associated with an additional 0.2 decline (Case et al. 2005). The study also finds that different conditions had different effects, with mental and emotional problems at either age related to educational outcomes, as are “systems” conditions (including lung, heart, blood, and neurological conditions) at age seven. On the other hand, physical impairment had no significant effect. Grossman and Kaestner (1997, cited in Currie and Stabile 2003) also review this literature and suggest that

health-related school absence explains a portion of this effect (See also the discussion of **asthma** for an example of a condition that contributes to school absence.). Currie (2008, forthcoming) reviews the links between parent socioeconomic status and child health and between child health and future outcomes like educational attainment. She documents strong links between each pair above, but she points out that the size of the effect of child health on subsequent outcomes is difficult to measure in part due to the fact that health is multi-dimensional and not easily quantified in single-index measures.

5. Childhood Health and Social Status

Case et al. (2005) present compelling evidence that childhood health can have lasting effects on social status in adulthood. For each chronic condition at age 16, the probability of employment at age 42 is reduced by 5 percentage points. This relationship exists even when taking into account the individual's education, and his health and socioeconomic status at ages 23 and 33. Each additional chronic condition at age seven is also associated with a reduction in social status, measured on a six-point scale of employment type (ranging from professional to unskilled labor).

6. Interactions between Health and Labor Market, Education and Cognition

Several authors attempt to determine the extent to which the health effects on employment work directly through health or through education or cognition. When decomposing the path model, Palloni (2006) suggests that early health affects social class later in life only through cognitive ability and a rating of maladjustment at age 11, not through direct health effects. Palloni's inclusion of what he terms "unconventional market traits" stems from his insight that some factors that are associated with poor health may also help shape personality. He refers to a study by Stormer and Harrison (2003), which suggests that food insecurity—a potential signal of stress, anxiety, or family disorganization—influences social skills. When Blanden et al. (2006) decompose their measure of intergenerational income persistence, they find that of the total health effect, only a small portion (10.5 percent) comes through passage of 0-level exams.

Caveats

Because it is possible for decreased income to adversely affect **health in adulthood**, some of the correlation between labor force participation and health noted above may result from reverse causality. Additionally, individuals who chose not to participate in the labor force may have reason to report poor health in order to be eligible for government transfer programs such as disability insurance.

In addition to the link from child health to education explored elsewhere in this review, it is also possible for education to affect long-term health (Mazumder, 2008 forthcoming). For *cohorts* born in the early twentieth century, Census data suggest that increased education accounts for much of the decline in mortality rates during the 1960s and 1970s (Lleras-Muney, 2005). While these findings are not robust to the inclusion of state-specific time trends[1] (to control for simultaneous reforms in, for example, child nutrition), SIPP data on *individuals* affected by those early reforms reveal significant reductions in mortality due to compulsory education (Mazumder 2008, forthcoming). The author cautions, however, that the mechanisms theorized to explain the causal link between education and health do not appear to be relevant, suggesting either that our theories are insufficient or that compulsory schooling laws are poor instruments.

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[1] Mazumder's IV model with state-specific time trends suggests a 25 percent reduction in mortality due to compulsory schooling laws compared with the roughly 60 percent reduction suggested by Lleras-Muney. Further decomposing the results, he finds that the gains are concentrated among the earliest birth cohorts, actually finding an insignificant *increase* in mortality among later cohorts due to compulsory education.

DISABILITY

Individuals with disabilities fare worse financially than their nondisabled peers. For example, in 2003, 23 percent of individuals with at least one disability were living in poverty, compared with 9 percent of individuals without disabilities (Stapleton et al. 2006, citing data from the American Community Survey). Part of this gap reflects lower earnings and higher unemployment rates among Americans with disabilities. The economic status of people with disabilities may improve when taking into account government transfer programs like Supplemental Security Insurance (SSI) and Disability Insurance (DI)—particularly among those of lower socioeconomic status who are more likely to receive the benefits and who have higher replacement rates (benefits relative to pre-disability earnings). Yet even with these transfers and other forms of household income, the gap remains (Bound and Burkhauser 1999). Also, public programs entail work disincentives, which, some argue, may help trap people with disabilities in or near poverty.

Following the onset of disability, many individuals who continue to work see their income drop, primarily due to a reduction in hours. Charles (2003) observed in the Panel Study of Income Dynamics data set that working age men with severe disabilities (who reported disability all years following onset) see a decline in annual earnings of 23 percent below expected levels in the year of disability onset. Although these men go through an initial recovery over the next several years, they continue to see lower earnings, so that 10 years after onset they are earning 15 percent less than would have been expected. On the other extreme, men who report a disability in only one year eventually regain their expected earnings. Intermediate results occur for individuals who report disability only sporadically after the year of initial onset.

Age at Onset of Disability

Older workers in the Charles (2003) study experienced larger initial drops after onset and did not see an annual upward trend in earnings following the initial two-year recovery period. Charles argues that older workers may have accumulated more human capital stock and therefore may see it drop more dramatically after a disability if some of that stock has diminished usefulness when disabled. Furthermore, younger workers, because they will have more time to benefit from further investment in capital stock, may be more likely to take actions that will help them to recover. As support to this hypothesis, Charles notes that younger men are more likely to switch industries after onset of disability and this behavior helps account for their better recovery. Not only are younger adults more likely to switch occupations and recover compared to older adults, Charles finds, but white men and men with at least some college education are more likely to change occupations, relative to nonwhite men and less well educated ones.

The decline in earnings and, in some instances, recovery among working individuals following onset of disability could explain some instances of *intragenerational mobility*. Additionally, many individuals exit the workforce (or fail to enter it) because of disability. The disparity in employment rates between disabled and non-disabled individuals of working ages has been shown in many different national surveys. For example, the 2003 American Community Survey finds that 38 percent of working-aged adults who reported at least one disability were employed, compared to 78 percent of individuals without disabilities (Stapleton et al. 2006). Similar to the impact of age at onset among disabled workers, Loprest and Maag (2003) find that people with late onset of disability (after age 22) were significantly less likely to be employed than those whose disability first created limitations prior to age 22, when controlling for demographics, education, severity of disability, and receipt of benefits. The authors suggest that this could be because people who first experience disability early in life have more time to adjust or to select career paths that will be more accommodating.

Work and Disability

Throughout the 1990s, a greater share of people with disabilities report being unable or unavailable to work. Burkhauser and Stapleton (2003) consider some of the potential reasons for this pattern such as changes in job characteristics, the demographics of population with disabilities, or the severity of disabilities. Other theories have more direct policy implications. For example, individuals with disabilities who require costly care may seek public disability and health benefits rather than working for an employer with limited or no health insurance. Alternatively, employers may limit job opportunities for those with disabilities fearing the expenses of accommodation associated with the Americans with Disabilities Act. (See Bound and Burkhauser 1999 for a discussion of this literature.) Some research suggests that between 30 to 40 percent of people who apply for Social Security Disability Insurance would work if there were no disincentives imposed by the program. (See Stapleton et al. 2006 for overview.)

Job Characteristics and Disability

Another potential contribution to the correlation between low-income and disability is that certain jobs may both pay lower wages and contribute to the likeliness of disability. Occupation could directly lead to disability if the disabling condition arose from a workplace injury; one study finds that more than a third of disabled people ages 51 to 61 attribute their disability to injuries and illnesses on the job (Reville and Schoeni 2003/4). Lower educational attainment is identified as a determinant of nonfatal work injuries (Oh and Shin 2003). Additionally, some theorize that lower income individuals may have fewer skills that allow them to change jobs, leading them to stay in high risk jobs longer (Hayward et al. 1989).

Childhood Disability

Childhood disability may hinder educational outcomes. For example, Loprest and Maag (2003) find that individuals with limitations by the age of 22 graduate from high school less often than people without disabilities (33 percent compared to 13 percent). They estimate that 13 percent of the difference in employment rates between disabled and nondisabled individuals can be attributed to educational differences. However, they caution that it is not clear whether the disability impairs educational attainment or if other environmental factors increase the probability of both disability and poorer school outcomes. Charles (2003) finds that prior to reported onset of limitations, individuals who eventually report a disability have less education than those who remain non-disabled throughout the course of their study. This raises the possibility either that poor health preceding manifestation of the limitation could account for lower educational attainment or that other factors related to lower educational or economic status lead to higher rates of disability. Loprest and Maag (2003) find that young people with disabilities have a greater likelihood of coming from households living below the federal poverty level than their non-disabled peers.

PRENATAL CONDITIONS AND HEALTH AT BIRTH

Studies show that low birth weight (LBW)[2] negatively influences educational attainment, health, and income in later life. Evidence also suggests that parents who were LBW themselves more often have LBW children. Furthermore some researchers posit that both the risk of having a LBW child and the adverse consequences of LBW status may be greater among poorer families, implying that LBW may create a particular obstacle for some children to move up from poverty.

Link between Low Birth Weight (LBW) and Health

Many studies link LBW to higher mortality rates. For example, a study of 16,000 individuals born in Hertfordshire between 1911 and 1930 finds that those with lower birth weights are twice as likely to experience fatalities in adulthood due to coronary heart disease as are those at the top of the birth weight distribution. The Nurses Study in the United States provides similar evidence (Barker 1997). Other studies show that the rate of fetal growth, perhaps a better measure of distress in utero than birth weight, affects death from heart disease in a large Swedish cohort. (See Rasmussen 2001 for summary of this and other studies.)

Additionally, signs of poor fetal environments, such as maternal smoking or LBW, correlate with poor health in adulthood, with the relationship strengthening as individuals age (Case et al. 2005). A series of indicators of in utero conditions, including maternal smoking, remain a jointly significant predictor of health at age 42, on top of the impact on reported health status at age 42 of health at ages 23 and 33. In an analysis of data from the Panel Study on Income Dynamics, Johnson and Shoeni (2007) find a gradient of increasingly worse health among LBW children. For example, they find that the effect of being LBW on adult health is similar to the effect of being 8.7 years older. They also find that, although the impact on child health declines when they control for shared sibling characteristics, LBW still has a modest effect on childhood health.

According to the fetal-origins theory, shocks that occur in utero can have health effects that appear years later. Barker (1997) explains that an inadequate supply of nutrients or oxygen can slow the process of cell division. Depending on the timing of those deprivations, the number of cells in particular organs may be reduced, or under-nutrition can change the amount of hormones including insulin and growth hormone. According to Barker, this lack of nutrition can permanently alter or "program" the body. Barker has refined his theory to indicate different risks related to different periods of gestation. For example, fetal growth slowed during the first trimester may contribute to stroke through elevated blood pressure; coronary heart disease may reflect complications with insulin arising in the second trimester. (See Rasmussen 2001 for a summary.) Others propose that adult-onset diabetes is linked to ways that infants who have retarded growth may adapt to ensure survival (Rasmussen 2001, citing Cianfarani et al. 1999).

The notion that "programming" organs in the beginning of life can have lasting effects has also been widely demonstrated in studies with other species (Rasmussen 2001). Almond (2006) uses the dramatic variation in exposure to the influenza pandemic to estimate the long-term effects of exposure to influenza *in utero*. The pandemic struck suddenly and subsided quickly, with infections concentrated between October 1918 and January 1919, and there was great geographic variation in exposure rates. Nearly one-third of pregnant women contracted the virus. Decennial census data from 1960 to1980 reveal that educational attainment is a quarter year lower for the

[2] LBW is typically defined as below 2,500 grams (5 lbs., 8 oz.). In developed countries most infants who are LBW are delivered preterm (do not complete 37 weeks of gestation). LBW is commonly used as a general proxy for adverse prenatal conditions because data on gestational age, as well as measures of size relative to gestational age, are not as commonly available. (See Rasmussen 2001 for fuller discussion.)

cohort that was pre-natal during the pandemic and incomes are 6 percent lower. These results are corroborated by SIPP data in Almond and Mazumder (2005).

There are other potential explanations as to why LBW may be associated with adverse health effects. For example, the same genetic endowment that may result in LBW may cause other health effects later in life (Behrman and Rosenzweig 2004). Alternatively, LBW may signal other factors—maternal behaviors, medical care, and demographic characteristics—that may themselves contribute to poor health later in life. Additionally, Conley and Bennett (2000) raise the possibility that LBW children may suffer stigma or have fewer resources allocated to them within the family with subsequent adverse health effects later in life.

The health consequences of LBW may vary according to economic status. For example, Case et al. (2002, p. 1323) write that their estimates are "consistent with the hypothesis that wealthier children are less affected by poor health at birth, and recover more quickly." Some research suggests that having health insurance mitigates the effects of LBW, even after controlling for childhood poverty (Johnson and Shoeni 2007).

Recent research calls into question the magnitude of the costs associated with LBW. Almond, Chay, and Lee (2005) control for a number of confounding factors that may overstate earlier LBW results. Using data that include all twins born in the United States between 1983 and 2000, the authors control for maternal characteristics that are not influenced by policy—like race—as well as for genetics by comparing identical twins and fraternal twins. Their results suggest an impact of LBW on hospital costs, health outcomes (APGAR scores and use of ventilators), and mortality that are smaller than earlier estimates by a factor between 4 and 20. Royer (forthcoming) finds smaller effects of LBW on educational attainment than shown in most previous studies (see below). Oreopoulos et al. (forthcoming) use data from Manitoba, Canada, and find results for infant mortality that are similar to Almond, Chay, and Lee (2005). They also find a lasting effect of poor infant health (low APGAR scores) on mortality through age 17.

Predictors of Low Birth Weight

The prevalence of LBW decreases as income increases. For example, National Health Interview Survey data reveal that 9.3 percent of children whose family incomes are below $30,000 (in 2000 dollars) are born at LBW, compared with 6.9 percent for households with income between $30,000 and $60,000, and 5.6 percent for families with more than $60,000 (Case and Paxson 2006). Johnson and Shoeni (2007) find that incremental increases in income decrease the probability of low-weight birth only among low-income families, not among more well-off families.[3]

Others show that race predicts LBW, with black babies having about twice the probability of LBW relative to white babies, even after controlling for some measures of socioeconomic status (Conley and Bennett 2000).[4]

[3] Although others replicate the finding that LBW is associated with low socioeconomic status, even with other demographic controls (Currie and Moretti 2007), Conley and Bennett (2001) conclude that the income-to-needs ratio is associated with an increase in the child's birth weight *only* if the mother was herself born LBW.

[4] Johnson and Schoeni (2007) note that the difference in LBW rates helps account for some of the race differential in adult health status as well.

Case and Paxson (2006) link mothers' education to behaviors that affect infant health, such as smoking, which the Surgeon General has determined is causally related to LBW and shortened gestation (CDC 2004). The authors also note that less well educated pregnant women less often seek prenatal care in their first trimester than those with some college education (68 percent compared to 91 percent, in the National Vital Statistics numbers they cite). Although some studies identify significant differences in LBW rates among mothers receiving inadequate levels of prenatal care compared with those who receive adequate care (Devaney et al. 1992), there is some ambiguity about the impact of prenatal care. (See Box "Can Prenatal Care Help Bridge the Socioeconomic Divide in Childhood Health Outcomes" below.

Low-income women may also have inadequate nutrition during pregnancy. Although Rasmussen (2001) concludes that few studies identify a significant causal link between maternal nutritional status and LBW among women in developed countries, poor nutrition could contribute to other complications. Lack of knowledge of or access to nutritional supplements could cause spina bifida and other neural tube defects (Case and Paxson 2006).

Of particular relevance for a discussion of economic mobility is the fact that parental birth weight status is a strong predictor of LBW in the next generation. For example, Conley and Bennett (2000) find that infants are four times more likely to be LBW if their mothers were LBW and six times more likely if their fathers were. Currie and Moretti (2007) say their "findings suggest that some of the intergenerational transmission of economic status could be due to intergenerational transmission of low birth weight."

Effects on Education and Income

LBW and prenatal shocks may have consequences for cognition and educational attainment. Conley and Bennett (2001) provide an overview of some studies that have detected effects of LBW on psychological and intellectual development. Some of these deficiencies may translate into different levels of success in schooling. Maternal smoking during pregnancy and LBW are tied to poorer performance on O-level exams in Britain (Case et al. 2005). Johnson and Shoeni (2007) find that reading comprehension and math scores are lower among LBW children. When they control for sibling fixed effects, the impact of birth weight becomes marginally significant. Conley and Bennett (2000) find that the probability of graduating from high school by age 19 is reduced by 74 percent for LBW children compared with their siblings. Behrman and Rosenzweig (2004) note that studies that simply use cross-sectional data without controls for genetics or family background may underestimate the adverse effect of birth weight on schooling by as much as 50 percent.

Royer (forthcoming) uses a sample of mothers who are twins born in California between 1960 and 1982 to test for the impact of LBW on educational attainment. She finds that "[f]or a 200 gram increase in birthweight, likely an achievable policy manipulation, education would rise by roughly 0.04 of one year." This is roughly one-third to one-fourth the size of the Behrman and Rosenzweig (2004) estimate of one-third of a year of education for a one-pound increase in birthweight.

There is some evidence for relationship between LBW and earnings or socioeconomic status in adulthood. Currie and Moretti (2007) find that if two sisters are born in the same neighborhood, the one who weighed less at birth has a greater probability of living in a neighborhood that is lower income when she herself gives birth. Johnson and Shoeni (2007) find that LBW has an effect on earnings that increases with age. Case and Paxson (2006) estimate that being born LBW may be associated with lowering earnings by 4 percent at age 33.

There are also some interactions between socioeconomic status at birth and socioeconomic outcomes. One study finds that interacting LBW with income increases the effects of LBW on education and the effect of the income-to-needs ratio, while the interaction term itself has borderline significance (Conley and Bennett 2001). This suggests that families with higher socioeconomic status can compensate for LBW. Yet, Currie and Hyson (1999) do not find that LBW has an additional negative effect for people of lower economic status. In fact, it is LBW boys who are high socioeconomic status who do less well in the British O-Level exams than their peers of the same social status—being LBW removes most of the advantage that high socioeconomic status boys usually have over their low socioeconomic class peers.

Can Prenatal Care Help Bridge the Socioeconomic Divide in Childhood Health Outcomes?

Although access to prenatal care has increased substantially in this country, there is mixed evidence about its effectiveness (Fiscella 1995). For example, while infant mortality has declined, the rates of LBW have remained steady or, in some cases, increased slightly (McCormick 2001). Modest increases in LBW tend to be found only among infants who have around normal gestation periods; prenatal care does not appear to greatly reduce the risk of premature birth or the slower growth among those who are born prematurely (Currie and Groger 2002). Currie and Groger find that increases in Medicaid caseloads increases prenatal care some. Yet birth weights do not increase. Fetal death among black women and disadvantaged white women, on the other hand, do decline, possibly because of better technology available at delivery. Currie and Groger speculate that part of the reason that prenatal care does not always have much success is that it often fails to come with smoking cessation, stress reduction or proper foods and vitamins—factors expected to improve birth outcomes.

HEALTH IN CHILDHOOD

Health in childhood may have lasting impacts on health later in life. For example, if a child develops a chronic condition at age 7 that continues through age 16, she is more likely to report poorer health at age 42, even after accounting for negative health events earlier in adulthood (Case et al. 2005). A 50-year study finds that early childhood events can predict cardiovascular, respiratory, and neurological health in adulthood (Smith 1999 citing Wadsworth and Kuh 1997).

Child health is also strongly related to household income (both before the child is born and throughout childhood) and parental education (Case et al. 2002). Further, evidence from the United States and Canada (Case et al. 2002, Currie and Stabile 2003) indicate the existence of a health gradient showing that health status becomes more highly correlated to their economic status as children age. For example, after accounting for parental education, a doubling of household income is associated with a 4.0 percent increase in the likelihood of excellent or very good health at ages 0-3. The percentage increases to 4.9 for children ages 4 to 8, and up to 7.2 percent for children ages 13 to 17 (Case et al. 2002).

The higher prevalence of chronic conditions among children in households with lower income provides one explanation for this gradient. With the exception of hay fever and sinusitis, one analysis of U.S. data finds that all the chronic conditions measured have a negative relationship with income in at least some age groups (Case et al. 2002). Similarly, in a Canadian study (Currie and Stabile 2003) low social status children have higher rates of new health conditions, relative to high social status children at all ages.

The severity of the condition, as well as the ability to manage it, could also account for part of the gradient. For example, Case et al. (2002) find statistically significant interactions between all health conditions except for kidney disease with income, suggesting that additional income can have a protective effect for children. The strongest evidence for this interaction comes from chronic conditions with the largest average effect on health status—asthma, diabetes, and epilepsy. The differential occurs for severity of disease and not prevalence, supporting the health gradient hypothesis. In contrast, Currie and Stabile's (2003) analysis of Canadian data does not find that income buffers the impact of specific health shocks over the long run. Instead, their study suggests that the gradient results from children of lower socioeconomic status suffering more health shocks, without the double jeopardy of suffering more from a given shock. It is not clear whether Canada's universal health care contributes to the different results in the two studies. Little evidence is found of the gradient or of the link between parents' income and child health in England, at least not when using health measured from nurse examinations and blood tests (Currie et al. 2007, Doyle et al. 2005).

It is important to note that this income gradient does not appear to simply result from passing on health status from parent to child. Case et al. (2002) find evidence of the gradient remained statistically significant even when they include controls for parental health. To determine the role of genetics the gradient, they compare gradients of adopted children with those living with their biological parents (available in the National Health Interview Survey on Child Health). They do not find significant differences, implying that more than simply genetics is at play. The income gradient for childhood health also does not appear to be the sole result of differences in birth weight. Although health at birth predicts later health and economic outcomes, it does not, in Case et al. (2002), eliminate the gradient.

One caveat is that it is possible that children in ill health may reduce household income, reversing the causality implied above. Case and Paxson (2006) discuss potential ways in which sick

children could depress income: parents of sick children may work less, or a child's health crisis may disturb family relationships and potentially contribute to divorce.

MEDICAL CARE AND HEALTH INSURANCE

Socioeconomic status is highly correlated with the likelihood of having health insurance. There is evidence suggesting that people with insurance receive more medical care. However, some controversy remains about whether having insurance actually leads to better health outcomes and therefore health insurance may not have much to do with economic mobility. This causal link is difficult to determine for several reasons, including the fact that there may be systematic differences between individuals who have health insurance and those who do not. In theory, uninsured people might be healthier than the insured—if less healthy people are more motivated to purchase health insurance—or vice versa—if people who are less healthy are also less likely to have jobs that offer health insurance. Research attempting to determine the direct effects of health insurance must disentangle factors related to the decision to obtain insurance. Additionally, all health insurance is not alike. For example, some studies fail to find a large positive effect from Medicaid. This may result from a lower quality of care or may reflect the characteristics of the program's enrollees.

Health insurance status varies dramatically with socioeconomic class with over one-third of nonelderly people living below the federal poverty level in 2005 being uninsured compared with 9 percent of people above three-times poverty (Kaiser Commission 2006). Many other studies have documented the relatively low levels of health insurance coverage among low-income individuals. (See Institute of Medicine (IOM) 2001). Striking differences in insurance coverage also exist by race. (See Box "Racial Disparities and Health Care" below.) To assess the effect of health insurance coverage on economic mobility, it is important to determine if insurance makes a difference in the amount of health care consumed and, ultimately, health outcomes. Substantial evidence suggests that individuals who do not have insurance less often have a usual source of care, have fewer doctor visits in a year, and have a smaller probability of any physician visit within the last year. (See IOM 2001 for an overview.) Surveys reveal that uninsured individuals are more likely to forgo preventive care,[5] and treatment for serious chronic conditions (Ayanian et al. 2000, Baker et al. 2000).

Some studies further document that the lack of care leads to poorer health outcomes. A 2002 IOM report finds that cancer patients who lack insurance die sooner on average than insured patients, and they attribute this in large part to delay in diagnosis.[6] Additionally, quality of care may differ by insurance status. In reviewing studies of trauma care for appendicitis and automobile accidents—both of which are typically considered exogenous shocks with little correlation with the individual's decision to purchase insurance—Hadley (2003) presents some evidence that uninsured patients are more likely to die in the hospital.

Other studies examine the links between the costs of medical care and health outcomes. Goldman et al. (2007) report that studies examining patients with chronic conditions like congestive heart failure, lipid disorders, diabetes, and schizophrenia, find an association between individuals facing higher costs for prescription drugs and higher use of inpatient and emergency care. This finding suggests that individuals may not have been taking needed medication and faced health

[5] Lack of dental care also can potentially affect economic mobility by interfering with education and employment outcomes. (See Currie and Lin 2007 for brief discussion.)

[6] Some researchers are not convinced of the link between insurance, screenings, and good health outcomes. Ross and Mirowsky (2000) point out that other factors may be important. For example, education may dictate whether an individual receives necessary screenings and appropriate follow up. They also suggest that the data are not conclusive that general screenings, such as routine check-ups, have a significant positive effect on health.

consequences. On the other hand, studies broader in scope find ambiguous results on the effect of health insurance on health. Ross and Mirowsky (2000) use longitudinal data and find that individuals with health insurance did not have better health outcomes three years later than did uninsured individuals, after controlling for initial health conditions. In general, researchers are divided about the effectiveness of medical care, and, in particular, of health insurance. Several studies find that accounting for health insurance does not eliminate the entire difference in health across socioeconomic status. (See Case et al. 2002, Newacheck et al. 2003, Ross and Mirowsky 2000).

Public health insurance programs do not appear to eliminate health disparities. On a cross-country basis, Ross and Mirowsky (2000) note that there are socioeconomic class differentials in mortality rates in countries with national health care. Findings on how effectively Medicaid improves health are also mixed. For example, Kaestner et al. (1999) find "at best weak support" for the theory that Medicaid has positive effects on children's health. Hadley (2003) offers potential explanations for why studies often do not find positive impacts of Medicaid on health, and indeed many find a negative correlation. In addition to citing some data problems,[7] he discusses the fact that people who enroll in Medicaid may be in worse health, particularly because individuals are often enrolled in the program upon arrival at a hospital. Medicare, on the other hand, may eliminate the link between socioeconomic status and death from acute, sudden-onset diseases among people ages 70 and older (Adams et al. 2003). However, a correlation still exists between socioeconomic status and mortality for conditions that may have a more gradual development. Adams et al. note that even with Medicare, affordability of care for less acute conditions may still be a limiting factor.

Some of the difference in rates of insurance across socioeconomic status may reflect the fact that the majority of nonelderly Americans receive health insurance through employers, which is not equally available to all workers. Workers who are below the poverty level are much less likely to work in firms that sponsored health plans than workers with incomes above 400 percent of the poverty level (Clemans-Cope and Garrett 2006).

Racial Disparities and Health Care

An extensive literature details disparities in self-reported health and disease-specific mortality rates across racial and ethnic categories. Although the gap in self-reported health between whites and blacks is reduced when comparing individuals in the same income categories, it does not disappear (Kaiser Family Foundation 2007).

Insurance status differs by race and ethnicity, with approximately one third of Hispanics being uninsured, 20 percent of blacks, and 13 percent of whites (Kaiser Commission 2006). Public programs may help bridge some gaps in access to care. One small sample in New York reveals that racial and ethnic disparities affecting a usual source of care and unmet health needs among children disappear after enrollment in the State Children's Health Insurance Program (Shone et al. 2005).

Racial disparities in care—perhaps because of differences in quality of care or in different funding levels for hospitals—may have spillover effects (Deaton 2003). One study finds that mortality rates of older white people are positively associated with the proportion of blacks in the community (Fuchs et al. 2001).

[7] For example, many studies that consider effects of Medicaid expansions and contractions do not identify specific individuals who gain or lose eligibility but look more broadly at potentially affected populations.

NUTRITION AND OBESITY

Although few children in the United States are malnourished, a larger share may not follow a nutritional diet, which could have health consequences and potentially hinder educational development. Social class may influence diets either if parents are not aware of or do not have the resources necessary to provide healthy meals for their children. Poor nutritional choices may lead to obesity, which has been linked to many health problems throughout the life span and, in some instances, to lower wages in adulthood.

Emerging research suggests that diet may contribute to a host of conditions including anemia, dental disease, hypertension, non-insulin dependent diabetes, coronary artery disease, cerebrovascular disease, some cancers, and bone density problems. (See James et al. 1997 for an overview.) One estimate attributes 365,000 deaths in 2000 to poor diet or lack of physical activity (Mokdad et al. 2004). Additionally, pregnant women who do not consume adequate amounts of some nutrients may risk having shorter pregnancies and delivering babies with lower birthweights. (Read about the consequences of **low birthweight**.) Currie et al. (2007) find that one nutritional choice—eating vegetables regularly—is significantly associated with better childhood health, even when controlling for family income.

A child's nutrition can also affect academic achievement, which in turn may be critical for future earnings. The Centers for Disease Control and Prevention (CDC) notes that when children are chronically undernourished they perform less well on standardized achievement tests, perhaps in part because they may be more prone to infections and miss more school (CDC 1996). Iron deficiency, which can result from inadequate amounts of iron and vitamin C and lead to anemia, is linked to fatigue, shorter attentions spans, and poorer intellectual performance (CDC 1996). Not eating breakfast may also hamper academic performance. One study finds that participants in the School Breakfast Program attend school more often and do better on standardized tests than students who qualify for the program but do not participate (CDC 1996, citing Meyers et al. 1989). Some evidence suggests ties between food insecurity and behavioral problems. However, it is not clear whether the behavioral problems result directly from poorer nutrition or the psychosocial effect of uncertainty about food availability (Olson 1999).

Children at lower ends of the socioeconomic spectrum more often experience food insecurity. One study finds that households living below the federal poverty line are more than 3.5 times as likely to have insufficient food supplies compared with those above the poverty threshold (Rose 1999). Poorer families are also more likely to alter their food purchasing in response to changing financial conditions. For example, during particularly cold months, poor families spend less on food, while richer families do not decrease their grocery expenditures (Bhattacharya et al. 2002). Although Bhattacharya et al. (2002) conclude that Food Stamps and other related social programs are not sufficient to buffer poor families from some budget shortfalls, Rose (1999) argues that Food Stamps do make a significant difference.

Although the research is not entirely consistent, several studies find that lower income households are also less likely to make food consumption choices that are in line with nutritional recommendations (James et al. 1997, Turrell et al. 2002). Palloni (2006) notes a socioeconomic status gradient for macronutrient intake among adults in the United States and Canada (citing Dubois and Girard 2001). Some evidence suggests that children are often spared the worse of food shortages. For example, although food insufficient adults tend to have low nutrient intakes (less than 50 percent of the recommended daily allowance) relative to non-insufficient individuals, their children did not exhibit such patterns (Rose 1999).

Several factors could compound budgetary constraints in accounting for differences in nutritional intakes by socioeconomic class. Low-income households tend to face slightly higher (about 1 percent) prices for the same food products as more well-off families, primarily because they are less likely to live near and shop at large grocery stores (Kaufman et al. 1997). Yet, lower-income families also spend less per unit of food in almost all categories than higher income individuals (Kaufman et al. 1997). It is not clear whether those savings come at a cost of selecting foods with lower nutritional content. Perhaps because of these types of barriers, coupled with financial instability, some researchers suggest that efforts to educate families about better nutrition and more healthful habits may have more of an effect on higher income individuals than lower-income ones (Turrell et al. 2002). Kawachi and Marmot (1998) comment on a similar phenomenon related to efforts to promote more exercise. They explain that people of higher socioeconomic status may face fewer barriers—fear of crime, constraints on time particularly if child care must be arranged, inability to afford membership to or living farther away from recreational facilities—than poorer families.

Poor nutritional choices can also lead to overweight or obesity. Some evidence suggests that food insecurity is associated with overweight. Olson (1999) finds a borderline statistically significant relationship between food insecurity and body mass index (BMI), even after controlling for income, education, single parent status, and employment status. In a review of literature, Burns (2004) finds a consistent link between the risk of obesity for women and food insecurity throughout Australia, Europe, and the United States. Burns provides an overview of theories about how food insecurity and obesity could coexist, although there is little definitive evidence for these pathways. For example, some suggest that the stress of food insecurity and lower economic status contribute to obesity through either enodcrinological pathways or disordered eating patterns. Townsend et al. (2001, cited in Burns 2004) theorize that people who receive Food Stamps have greater supplies of food in the first three weeks of the month and run low at the end of the month. This cycle of eating too much and then too little could lead to greater weight gains—a theory that has not been tested in humans, but has been found in animals.

Different nutritional patterns by socioeconomic class may be related to the greater risk of overweight for lower income children. For example, Strauss and Knight (1999) use the National Longitudinal Survey of Youth to follow over a six year period children who start out at normal weight. They find that when controlling for initial height and weight and maternal BMI, being in the bottom 15th percentile of family income significantly increases the risk of the child being obese. Strauss and Knight also find that the maternal obesity is greatest predictor of childhood. Research on twins and adopted families suggests that heredity may count for between 5 and 40 percent of the risk of obesity, and **genetics** may play an even greater influence on BMI (U.S. Department of Health and Human Services, "Childhood Obesity").

In addition to health consequences, some studies link obesity to poorer academic outcomes. Datar et al. (2004) find that overweight children fall behind their peers in math and reading test scores starting as early as kindergarten. Several studies tie weight to poorer employment and income outcomes in adulthood. There are several potential explanations: high body weight could lead to lower income because of discrimination or lower productivity or academic achievement; lower income status could lead to obesity, perhaps through some of the nutritional pathways discussed above; or there could be a third factor responsible for both body weight and educational or occupational outcomes. Cawley (2004) finds that overweight white females earn on average 4.5 percent less than those of normal weight, and obese white women earn 11.9 percent less than normal weight women. He argues that the magnitude of the second effect is comparable to the impact of 1.8 years of education or 3.8 years of work experience. Obese black and Hispanic females also earn less than their peers with healthy weight, but the effect size is smaller. Conley

and Glauber (2005) find that although a women's body mass does not seem to have a direct effect on her labor market earnings, her weight is highly correlated with her family income. Body weight 13 to 15 years earlier is a good predictor of a women's probability of being married, both her and her husband's occupational prestige, and her spouse's earnings.

This discussion points to several ways that nutrition and overweight may be mechanisms through which economic status is passed on through the generations. Just as in the discussion of children's health in general, if poorer children consume worse nutrition it could make it harder for them to succeed in school and cause health problems that eventually lead to declines in earnings. In addition, the strong genetic component of overweight may be transmitted from one generation to the next.

ASTHMA

Asthma plays a particularly important role in explaining the income gradient in health.[8] According to Case et al. (2002), the greater frequency of occurrence of the respiratory condition and its greater severity among poorer children accounts for 20 percent, or the largest share, of that gradient. Although there is no association between asthma and socioeconomic class for older children or teenagers, asthma is more prevalent among lower-income children (Case et al. 2002, Neidell 2004 quoting American Academy of Pediatrics 2000). Asthma has deleterious effects on health both among children and adults. It is the most common reason for children's emergency hospital visits and hospital admissions (Neidell 2004 citing National Institute of Environmental Health Sciences 2000). It also is associated with conditions later in life such as lung cancer (Neidell 2004 citing Ernster 1996).

Several studies suggest that differences in rates of asthma diagnoses and severity of the condition may be linked to exposure to toxins. Prevalence of indoor allergens may contribute to these patterns (Milton et al. 2004 citing Kitch et al. 2000; Rauh et al. 2002). Neidell (2004) shows that lower socioeconomic communities (defined by zip codes with a high share of adults over age 25 without a high school diploma) have higher average levels of all pollutants. He finds that exposure to carbon monoxide significantly affects asthma-related hospitalizations for children.[9] Neidell (2004) further finds an interaction between SES and pollution exposure for some age groups, supporting the theory that the same amount of pollution may have a greater negative impact on poor children than on non-poor children.

In addition to affecting health, childhood asthma may impede children's education. Asthma is one of the leading causes of children missing school (Neidell 2004 citing National Institute of Environmental Health Sciences 2000). Yet, despite consistent findings that children with asthma have higher absence rates, a review of the literature finds no studies revealing a difference in academic performance between asthmatic children and asymptomatic ones (Milton et al. 2004). On the other hand, some evidence suggests that asthma has a more negative impact on children in lower-income families. For example, Fowler et al. (1992) conclude that for children living in families with less than $20,000 in income, asthmatic children had twice the odds of grade failure than their non-asthmatic peers. A limiting factor among earlier studies of asthma and school readiness /or behavior is that asthma is more prevalent among poor and minority children Currie (2008, forthcoming). Furthermore, these children are less likely than other asthmatic children to receive regular treatment. The small number of studies that examine whether the impacts of childhood asthma extend to the working world, find a small decrease in labor market participation associated with childhood asthma (Milton et al. 2004).[10]

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[8] Environmental toxins also influence health through mechanisms other than asthma. For example, higher amounts of air pollution correlate with community-level mortality rates (Fuchs et al. 2001 and Mokdad et al. 2004). Currie (2008) provides a more complete review of this literature.

[9] Opponents of this view point out that asthma hospitalizations have increased, even as pollution has decreased. Neidell, however, finds a significant relationship between asthma and pollution when he takes into account the fact that individuals may avoid exposure to pollution—for example by reducing outdoor time on days that have smog warnings.

[10] One study only finds an effect for women; the other focuses on severe cases of asthma.

HEALTH IN ADULTHOOD

As with **childhood health**, a gradient can be observed by which mortality declines and self-reported health status improves with greater income.[11] The correlation between the logarithm of family income and self-reported health peaks between ages 50 and 60 with a value of about -0.4 (Deaton and Paxson 1998).[12] Some evidence suggests that this gradient has increased over time. Several factors could contribute to this relationship. For one, health could influence labor force participation or earnings. Although some economists doubt that causality could flow from economic status to health (see Ericksson et al. 2005, for example), others find support for the notion that lower income in adulthood could contribute to worse health—either as a direct effect on the ability to purchase **medical care** and other healthful resources, or because lower income is correlated with stresses and occupational attributes that are deleterious to health. Another possibility is that inequities in income may contribute to poor health. If both lower socioeconomic status in adulthood leads to poor health and poor health leads to lower socioeconomic status, the health-socioeconomic status cycle in adulthood could affect *intragenerational mobility*. Individuals may experience more stickiness in their relative socioeconomic position if their health status helps reinforce that position. Additionally, *intergenerational mobility* could be hampered if parents' socioeconomic status and genetics help determine a child's health. Childhood health, directly or through education, might help determine adult health, which could influence income.

Case et al. (2005) provide some evidence suggesting that health in childhood can have a direct effect on health in adulthood. For example, both parental health and chronic conditions at age 16 help predict health in middle age, even after controlling for education, health, and economic status as a young adult. Alternatively, pathways models hold that the resemblance between health in childhood and health in adulthood occurs because poor childhood health lowers socioeconomic status in early adulthood, which in turn contributes to deteriorating health. Childhood health may, for example, impact educational achievement. Researchers hypothesize that education influences adult health if greater education allows individuals to better chose health resources, follow medical advice, or become more "future oriented." Currie and Madrian (1999) note that the means by which education might contribute to health are uncertain. Grossman and Kaestner (1997) conclude that such a causal relationship likely does exist. It is also possible that individuals with better education or more financial resources may be better able to take measures to promote health—such as getting more regular exercise (Kawachi and Marmot 1998).

Others hypothesize that stress from lower economic status reduces health. Smith (1999) describes a physiological process by which stress releases adrenalin, which may over time affect blood pressure, heart rate, and the immune system. Animal models supply some support for this notion (see discussion in Marmot et al. 1997).

Evidence from the Whitehall studies of British social servants falls in line with the hypothesis that occupational status and related stress might contribute to a health gradient. Men with the lowest grade (clerical and office-support) have an age-adjusted odds ratio of developing coronary heart disease of 1.5 relative to men at the highest grade (Marmot et al. 1997). This study finds

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[11] Health status is an ordinal variable with better health conditions taking on lower values than worse health conditions, leading to the negative correlation coefficient in the Deaton and Paxson 1998 study mentioned below.

[12] Deaton and Paxson (1998) note that after age 60, income is less able to predict self-reported health status. The authors hypothesize this could reflect both participation in Medicare and a shift of income from labor earnings to pension.

that the largest contributing factor to explaining this gradient was the amount of control individuals had over their work.

Additionally, Wilkinson (1994) discusses research suggesting that friendships and social support may benefit health and in particular may be protective in economic hardship; yet poorer individuals and those in occupations with lower status often have less social contact. In another study, individuals who eventually lost their jobs because of a factory closure began to experience deteriorating health after the announcement was made, but before they were actually unemployed (Wilkinson 1994, citing Beale and Nethercott 1985). In their longitudinal study, Ross and Mirowsky (2000) also find that change in employment is more likely to have a significant impact on health than baseline employment.

A controversial extension to the notion that status-related stress may lead to health problems is that greater income inequality may account for differences in health in cross-country comparisons. Wilkinson (1994) argues that relative deprivation has a larger impact on mortality rates among developed countries than absolute living standard; countries with the most narrow income distributions and the fewest people living in relative poverty have the highest life expectancies. Deaton (2003) reviews this literature and concludes that although stress may play a role in deteriorating health, it is not necessarily because of differences in income per se. Other studies find that controlling for other factors can explain away much of the apparent income-inequity health disparity.

The correlation between health in adulthood and economic status may also be partially attributed to the physical demands of some jobs. For example, Case et al. (2005) find that having a manual labor position helps explain the health deficit among people of lower economic status. (See also discussion of **disability**.)

SUBSTANCE USE

Smoking and alcohol abuse lead to adverse health effects, and some evidence suggests that the behaviors are transmitted from one generation to the next. In addition, some evidence suggests that these behaviors can lead to declines in socioeconomic status. Also, exposure to the stresses of lower social class may increase the behavior in future generations.

The health effects of smoking and excessive drinking are well established. Numerous Surgeon General's reports identify tobacco use as the largest cause of avoidable disease, disability, and death in this country (CDC 2007). The most recent says the "evidence is sufficient to infer a causal relationship between smoking" and 10 forms of cancer, coronary heart disease, chronic obstructive pulmonary disease, and a host of other conditions (CDC 2004). Tobacco use can also have severe consequences for nonsmokers, as demonstrated by increased morbidity and mortality for individuals exposed to secondhand smoke (CDC 2006). Of particular interest in the question of economic mobility is the long-term effects on the health of children who were exposed to maternal second hand smoke during gestation. (See discussion on **health at birth**.) Alcohol use also has the potential to reduce health: not only can excessive use in the short term contribute to traffic accidents, other unintentional injuries, and potentially fatal alcohol poisoning, but over time it is linked to depression, cancers, and liver disease (CDC "General Information on Alcohol and Health").

Alcoholism and smoking behavior can be transmitted from one generation to the next through a combination of genetic pathways and cultural and environmental ones. A review of studies finds that alcoholics have a four-fold increased risk of having a first-degree relative who is alcoholic, compared with the general population (Agarwal 2001). A meta-analysis of twin studies finds that genetics accounts for about 37 percent of the determination of smoking initiation in male adults and 55 percent in female adults (Li et al. 2003). Genetics may play an even more prominent role in the progression of smoking behavior and the strength of nicotine dependence (Vink et al. 2005, Fowler et al. 2007). Additionally, specific gene mutations may increase not only susceptibility to smoking behavior, but also the likelihood of suffering adverse health risks such as cancer (Munafò et al. 2004). (See Kronstadt literature review on **genetics and economic mobility**.) For a nongenetic explanation, Duncan et al. (2005) suggest that role modeling may play a role—if children observe their parents drinking heavily or using drugs, they may determine that it is acceptable for them as well.

There is also evidence of a greater prevalence of substance dependence and smoking among people of lower socioeconomic class. For example, college graduates have lower rates of substance dependence or abuse than non-high-school-graduates[13] and data show that 17.6 percent of unemployed adults show substance dependence or use compared with only 10.2 percent of adults with full-time work (SAMHSA). For smoking, being below 200 percent of the poverty line, having less than a college degree, and being a blue collar worker are all associated with significantly higher odds of being a current smoker (Barbeau et al. 2004). One hypothesis that seeks to explain why lower economic status might lead to more risk behaviors, is that children growing up in low-income households may be more likely to use substance abuse as a mechanism for coping with stress. For example, one study finds that among children whose parents had divorced by age 15 (a non-economic stress), girls have higher rates of smoking and boys have higher rates of alcohol consumption (Smith 1999 citing Wadsworth and Kuh 1997).

[13] Current college students have higher rates.

Some evidence supports the hypothesis that these risky behaviors might lead to lower income by reducing the amount of time individuals spend at work. The Surgeon General's report points out a consistent pattern of higher rates of absenteeism among cigarette smokers compared with nonsmokers (2004). Another study tracks individuals over time to determine the sequel to a hospitalization for an alcohol-related condition (Romelsjo et al. 2004). This study concludes that following the hospitalization, individuals of all socioeconomic classes have a significantly higher probability of leaving the workforce compared with individuals in the general population. Research by Mullahy and Sindelar (1993) indicates that alcoholism may adversely affect income, largely by reducing the likelihood of working. However, the authors caution that the correlation between alcoholism and earnings may stem from another problem that influences both working and drinking behavior. Alternatively, lower earnings may contribute to alcoholic behavior.

However, risky behaviors are unlikely to explain the entire gap in health status across the income spectrum. Smith (1999, p. 148) notes that "research consensus is that health disparities by economic status are only partially mitigated when extensive controls are included for health risk behaviors."

MENTAL HEALTH

A number of epidemiological studies identify an association between mental illness and socioeconomic status, measured using education, income, or occupation. Hudson and Dohrenwend (1992) provide a brief overview of this literature. There is no consensus yet on the causal direction behind this relationship—whether low socioeconomic status contributes to mental illness (causation) or whether mental illness may limit the ability of individuals to get ahead by limiting educational attainment and employment (selection).

The causation theory suggests that factors more common in low socioeconomic status environments may help precipitate mental illnesses. According to Miech et al. (1999) some of the factors examined include stress, weaker coping resources, and less control (occupational or otherwise). For example, Hudson (2005) finds that signs of economic stresses, including unemployment, affordability of housing, and poverty rates, help explain the mental illness.

In contrast, selection theories suggest that mental illness leads to lower socioeconomic status. Selection process may help explain downward *intragenerational mobility* if adults have difficulty maintaining their employment because of mental illness. About 27 percent of recipients of Social Security Disability Insurance have mental conditions other than retardation (Social Security Administration 2006). Bartel and Taubman (1986) find that mental illness has a strong negative effect on earnings of working age men. Another study finds that psychiatric disorders reduce the likelihood of employment by approximately 11 percentage points (Ettner et al. 1997). Although researchers try to account for reverse causality, it is difficult to rule out the possibility that poorer labor force outcomes contribute to mental illness. Bartel and Taubman (1986) examine the effect of mental illness on marriage and find signs of causality running in both directions. They conclude that some diagnoses make it more likely that individuals never marry, whereas divorce and death of a spouse are also associated with new diagnoses of mental illness.

As Miech et al. (1999) explain, selection may also work across generations because there is evidence that **genetic** and environmental factors help transmit disorders. For example, Ritscher et al. (2001) explain that individuals with a family history of major depressive disorder are at increased risk of the condition. It is also quite possible that selection and causation work together. For example, if socioeconomic class-related stresses cause individuals to slip into a lower class, the stresses from being in that class might further exacerbate the mental condition (Miech et al. 1999). Extending this to two generations, it is possible that living with a parent who is unable to provide a stable environment may "cause" a child to develop a mental disorder. **(See Childrearing in Families by Kronstadt and Favreault.)** This effect could be exacerbated if the parent passes along a genetic predisposition for the condition.

Several studies examine whether *intergenerational mobility* differs for seriously mentally ill individuals compared with the general population. This evidence is mixed and seems to depend on methodological differences. For example, Fox (1990, cited in Rodgers and Mann 1993) finds little evidence of statistically significant differences between the two populations. However, Rodgers and Mann (1993) find significantly greater downward mobility among patients with psychiatric disorders when analyzing the same data sets with a different approach.

Socioeconomic pathways associated with mental illness appear to vary by condition. For example, schizophrenia often supports theories of selection, suggesting that genetics may play a more important role than stresses in transmitting this condition from one generation to the next (Dohrenwend et al. 1992). Research consistently finds that schizophrenics have a lower level of occupational attainment than would be predicted by their level of education, implying that the

disorder prevents them from reaching their income potential (Link et al. 1986). However, the relationship may be more complicated. When Link et al. (1986) examine the first jobs of schizophrenics, they find no deficit in prestige given their educational level. Yet a higher proportion of schizophrenics are exposed to what they term "noisome" conditions—such as extreme temperatures, loud noises, or dangers—in that first job relative to individuals who do not have schizophrenic episodes. These authors interpret their study as suggesting that at least among individuals who might be susceptible to schizophrenia, some individuals from lower socioeconomic status families may end up in jobs that expose them to stresses that may help trigger the disorder. It is also possible that the precursors of the mental illness select them into lower education outcomes, which then increase their likelihood of landing a first job that further exacerbates the condition.

In contrast, more evidence appears to support causation theories for depression. One study finds that children of parents with low parental socioeconomic status have more than triple the risk of having a major depressive disorder even after controlling for a history of depression among the parents (Ritscher et al. 2001). Yet these researchers find no evidence that either having a parent with depression or the respondents' own depression links to failure to succeed in terms of income, occupational status, or education. Other research finds that holding a job involving control and direction helps protect against depression (Hudson 2005, citing Link et al. 1993). Furthermore, wealth seems to be negatively associated with depression even when controlling for job prestige. Marmot (2002) suggests that this could be causal—if having more wealth, for example, makes people feel more optimistic. Alternatively, wealth may reflect past advantages, or may be a signal for another trait altogether.

Some evidence suggests that adolescents with depression do not succeed as well in school, which might be consistent with selection models. Twenge and Nolen-Hoeksema (2002) review literature suggesting that children with chronic, moderate depression do not perform as well in school and may have some interpersonal impairments. Other research shows that conduct disorder leads to lower education attainment. Miech et al. (1999) find that New Zealander adolescents who meet a clinical criteria for conduct disorder are 4.5 times less likely to earn a school certificate, when controlling for family socioeconomic status. In their longitudinal study, they find failing to achieve academic success further exacerbates their condition several years later—indicating that both selection and causation might be at play.

Attention Deficit and Hyperactivity Disorder (ADHD) is also associated with poorer academic achievement (Miech et al. 1999, also Barkley et al. 1990, cited in Currie and Lin 2007). Currie and Lin (2007) find ADD more prevalent among poor children, and they are more likely to be limited by the condition. The authors suggest the importance of helping poor families better manage these types of mental conditions. They also mention research showing that premature birth may increase the risk of ADHD (Currie and Lin 2007, citing Linnet et al. 2006).

GLOSSARY

Intrageneraional Mobility measures the change in one's economic situation over a period of years within a single generation, or one lifetime. By measuring the evolution of an individual's or family's income over time, one can determine intragenerational mobility in absolute or relative terms.

Intergenerational Mobility refers to mobility from one generation to the next and captures the extent to which a child's economic success is independent from that of his or her parents. A society will have greater intergenerational mobility when there is a weaker correlation between a child's income and his or her parents' income.

Intergenerational Correlation of Income is one way of measuring intergenerational economic mobility and describes the strength of the relationship between parents' and children's income. The correlation can range from 0 to 1; the higher the correlation the stronger the association between parents' and child's incomes.

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