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## Findings

- Better educated people have lower morbidity rates from the most common acute and chronic diseases, independent of basic demographic and labor market factors.
- Life expectancy is increasing for everyone in the United States, yet differences in life expectancy have grown over time between those with and without a college education.
- Health behaviors alone cannot account for health status differences between those who are less educated and those who have more years of education.
- The mechanisms by which education influences health are complex and are likely to include (but are not limited to) interrelationships between demographic and family background indicators, effects of poor health in childhood, greater resources associated with higher levels of education, a learned appreciation for the importance of good health behaviors, and one's social networks.

## Education and Health

Prepared from a paper by David M. Cutler, Harvard University and Adriana Lleras-Muney, Princeton University

A large and persistent association between education and health has been well-documented in many countries and time periods and for a wide variety of health measures. In their paper, "Education and Health: Evaluating Theories and Evidence," presented at the National Poverty Center conference "The Health Effects of Non-Health Policy,"<sup>1</sup> David M. Cutler and Adriana Lleras-Muney review literature and conduct statistical analyses on the relationship between education and health. They find a clear association between education and health that cannot be fully explained by income, the labor market, or family background indicators. The authors note that the relationship between health and education is a complicated one, with a range of potential mechanisms shaping the connection between education and health.

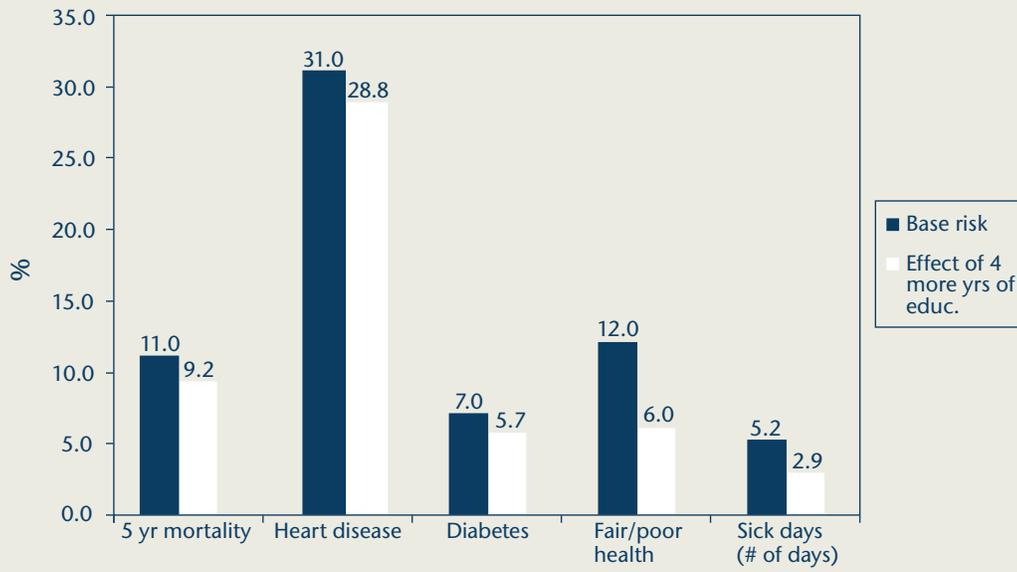
### What is the Relationship between Education and Health?

To test the relationship between education and health, Cutler and Lleras-Muney analyze data from the National Health Interview Survey (NHIS), which includes a large number of health outcomes and behaviors. They restrict their analysis to respondents who are at least twenty-five years or older, since most of these individuals have completed their education. First, Cutler and Lleras-Muney examine individuals' mortality rates. By matching respondents with death

certificates obtained through the National Death Index, they find that individuals with higher levels of education are less likely to die within five years of the interview. An additional four years of education lowers five year mortality by 1.8 percentage points (relative to a base of 11 percent).

They also find that better educated individuals are less likely to self-report a past diagnosis of an acute or chronic disease, less likely to die from the most common acute and chronic diseases, and are less likely to report anxiety or depression. The magnitude of the relationship between education and health varies across conditions, but it is generally large. More education reduces the risk of heart disease by 2.2 percentage points (relative to a base of 31 percent) and the risk of diabetes by 1.3 percentage points (relative to a base of 7 percent). An additional four more years of schooling lowers the probability of reporting being in fair or poor health by 6 percentage points (the mean is 12 percent), and reduces lost days of work to sickness by 2.3 days each year (relative to 5.2 on average). Figure 1 presents these results. Individuals with an additional four years of education also report more positive health behaviors. As shown in Figure 2, they are less likely to smoke (11 percentage points relative to a mean of 23 percent), to drink a lot (7 fewer days of 5 or more drinks in a year, among those who drink, from a base of

**Figure 1: Effect of an Additional 4 Yrs of Education on Health Outcomes**



11), to be overweight or obese (5 percentage points lower obesity, compared to an average of 23 percent), or to use illegal drugs (0.6 percentage points less likely to use other illegal drugs, relative to an average of 5 percent). Despite the difference in health behaviors between better educated and less educated individuals, health behaviors alone can not explain all of the disparities in health outcomes between these two groups.

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**Differential Impact of Education: Level of Schooling, Age, Gender, Race, and Poverty**

For many health outcomes, there are positive health consequences related to increased education. For example, an almost linear negative relationship exists between mortality and years of schooling and between self-reported fair/poor health status and years of schooling. For some health outcomes, such as functional limitations and obesity, the impact of education appears to be even more positive once individuals have obtained education beyond a high school degree. The effects of education on health vary by age, with the education effect falling between the ages of 50 and 60. There are several possible reasons for this: 1) less educated people are less likely to survive into older age, but those who do are relatively healthy and hence less different from the more educated; 2) education may have become more important to health outcomes in recent years; and/or 3) the relationship between education and health may be less significant once adults retire.

The effect of education seems to be the same for both men and women across most out-

comes, with a few exceptions such as depression. Where the effect of education does differ by gender, it is unclear whether these differences are caused by biological sex differences or differences in the behavior of men and women. Similarly, there are few racial differences in the impact of education on health. For outcomes that do reveal differences between Whites and Blacks, such as being in fair or poor health, Whites tend to experience more positive health benefits from educational advancement, compared to Blacks with the same level of education. Lastly, the authors find that additional years of education have a

larger impact on health for those not living in poverty compared to those who are poor.

**Explaining the Relationship between Education and Health**

Cutler and Lleras-Muney suggest three broad explanations for the association between health and education, although they recognize that these do not represent an exhaustive list. The first is that poor health leads to lower levels of schooling, since poor health in childhood is linked to poor health in adulthood. However, it is unlikely that the correlation between child health and adult health fully explains the relationship between adult health and completed education. Because few children in the U.S. fail to attend school solely because of illness, one would anticipate the relationship between education and health to weaken over time. However, this relationship has strengthened, suggesting that poor health alone cannot explain the relationship between education and health.

The second potential explanation is that additional factors, such as family background or individual differences, both

increase schooling and improve health. Some researchers suggest that the relationship between education and health can be explained by unobserved factors and skills, such as the ability to delay gratification, that make better educated individuals healthier. Cutler and Lleras-Muney, however, assert that evidence related to this explanation has been mixed at best. In their own models, adding family background factors decreases the effect of education, although it does not explain all of the association between health and education.

The third potential explanation for the link between education and health is that increased education directly improves health. Quasi-natural experiments have demonstrated causal influences of various changes in educational policies and of maternal education on health outcomes and also that increasing own education improves one's own health. However these natural experiments have not considered the quality of schooling. Furthermore, experiments tend to use study participants whose characteristics differ from those of the rest of the population, making it difficult to generalize the findings

beyond the research samples. The authors conclude that one should apply caution when considering this account as the full explanation for the relationship between health and education.

Cutler and Lleras-Muney also explore potential mechanisms that could affect the relationship between health and education. One important mechanism is income, as greater financial resources may enable more access to health care. The authors note, however, that while this may partially explain the relationship between health and education, when they hold income constant, the impact of education on health does not disappear.

Another possible mechanism is differential access to the health care system. Again, this cannot fully account for the relationship between education and health because there are differences in health outcomes across education groups in both the incidence of disease and in risk factors, such as smoking, which occur even before the health system becomes a factor in shaping health. Cutler and Lleras-Muney also find that better jobs, higher incomes, opportunities for health

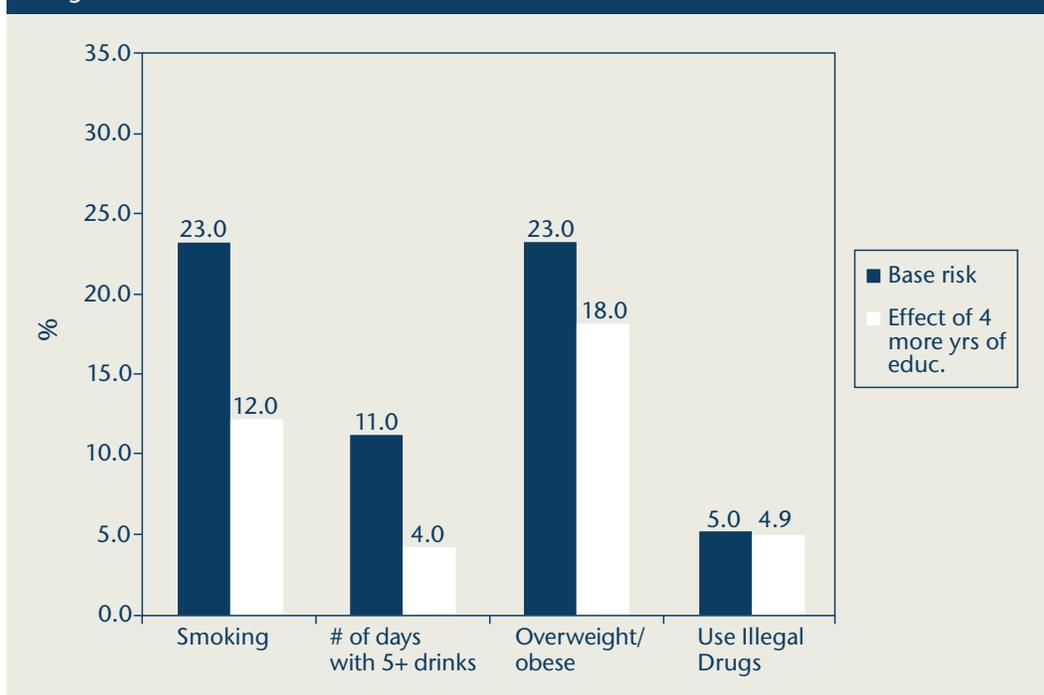
insurance, safer work environments and other job attributes cannot fully explain the relationship.

The authors also evaluate group differences in valuing the future, access to health information, general cognitive skills, individual characteristics, rank in society, and social networks. They conclude that each factor alone insufficiently explains the relationship between education and health. For example, although better educated people tend to be more informed about health issues, it is unlikely that group differences in access to information can sufficiently explain the impact of education on health. Similarly, there is little empirical evidence on the impact of cognitive skills on the relationship between education and health, nor is there evidence that social networks or individual differences in psychological factors such as risk aversion explain a sizeable proportion of the health differentials by education. Cutler and Lleras-Muney conclude that more complex models are needed to explore potential mechanisms for the association between education and health.

### Policy Implications

There is a direct relationship between education and health—better educated individuals have more positive health outcomes. This association remains substantial and significant even after controlling for job characteristics, income, and family background. This suggests that educational policies have the potential to substantially improve health. Cutler and Lleras-Muney suggest that policies that promote college attendance would be particularly beneficial. They also suggest a role for improving the quality of schools. ■

Figure 2: Effect of an Additional 4 Yrs of Education on Health Behaviors



## The National Poverty Center

### About the NPC

The National Poverty Center is charged with promoting high-quality research on the causes and consequences of poverty, evaluating and analyzing policies to alleviate poverty, and training the next generation of poverty researchers.

Rebecca M. Blank and Sheldon H. Danziger, Co-Directors

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### Endnote

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