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Relationship between Health Expenditure and Household Incomes

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Abstract
The causality debate surrounding the social health gradient is not a boxing match in which a knockout blow will eventually be delivered. In middle and at older ages, there are pronounced effects of new health events on household income and wealth, but it is an open question how much earlier in the life-cycle such a sweeping statement is true. While economic resources also appear to impact health outcomes, this may be most acute during childhood and early adulthood when health levels and trajectories are being established. Innovative methods that help isolate economic and health shocks would be informative on this vexing issue of causality. Economists have already used 'natural experiments' such as lotteries to isolate wealth effects. On the health side, clinical trials—which often contain tens of thousands of observations—have focused on the efficacy of treatment and on health outcomes. These trials could be expanded to include more economic content so that the impacts of health on economic status can be measured. These issues are important and economists should participate in the verdict that will eventually be rendered.
Keywords: health expenditure, income, relationship, household

1 Introduction

The relationship between income and health has important implications for policy makers and businesses, and will continue to receive attention as healthcare reform takes hold in the U.S. Most existing literature looks at the relationship between income and either health status or health expenditures in isolation. However, in this research, we take advantage of the wealth of data available in the U.S. Department of Health and Human Services' Medical Expenditures Panel Survey (MEPS) to answer two important, related questions regarding the income-health relationship for U.S. adults. First, we seek to determine how much sicker are poorer people than richer people (if at all), both in their perception and in actual terms. Second, we seek to determine if a poorer person is likely to consume more or less care than a richer person for given level of health or condition. To answer the first question, we start by examining the relationship between family income and health status using multiple regression techniques. For both perceived health and actual health, we find a curvilinear relationship between income and health, with diminishing returns associated with membership in successively higher-income groups. Depending on the status metric, the associated health benefits of membership in highincome cohorts tend to flatten once income reaches approximately 500-600% of the federal poverty level (FPL). We also find that marginal income at low income levels tends to be more strongly associated with reduced probability of poor health than increased probability of strong health. Regardless of the dependent variable chosen, we find that the shape of the relationship between income and health status is the same once we normalize the coefficients. Perceived and actual health are strongly related, although some of our results indicate that poorer people may be more pessimistic about their health than richer people. We find similar trends when we examine the relationship between income and health expenditures using the MEPS data. In this case, however, the diminishing returns associated with membership in higher-income cohorts are more accelerated, and the associated reductions in spending for membership in successive cohorts above 200-300% FPL are not significantly different from zero. When we add controls for health status, however, we find that the wealthiest members of the population are most likely to have the highest spending on healthcare, although not drastically so. In addition, we find the poorest members of the population do not have a tendency to over consume care relative to their level of health.

2 The Association between Economic Status and Health

To show some salient aspects of the strong association between health and wealth, lists household median wealth arrayed against the head of household's 1984 self-reported general health status. Thus, the data cell in the first row of the first column implies that median wealth when household heads reported excellent health in 1984 was $68,300 (in 1996 dollars). Across all age groups, those in excellent health in 1984 have 74 percent more wealth than respondents in fair or poor health do. A parallel table showing income rather than wealth would display similar differentials. These differentials rival in size wealth and income differences by schooling, a subject receiving far more attention from economists. Median incomes of 1984 college graduates were $77,000 compared to $28,000 among high school dropouts--virtually the same as the income gradient from excellent to poor health.

There is abundant evidence of a quantitatively large association between many measures of economic status including income and wealth and a variety of health outcomes such as mortality or morbidity. However, considerable and often heated debate remains--especially across disciplines--about the direction of causation and about why the association arises.

Although medical scientists are often convinced that the dominant if not exclusive pathway is that variation in socioeconomic status produces health disparities, they are increasingly debating among themselves about why low economic status might lead to poor health. At least for modern industrial countries,[1] the old standby arguments– the less well-to-do have access to less or lower quality medical care or a stronger pattern of deleterious personal behaviors--have been rejected as insufficient. Instead, a series of intriguing competing theories have arisen that emphasize long-term impacts of early childhood or even inter-uterine environmental factors, the cumulative effects of prolonged exposures to individual stressful events, or reactions to macro-societal factors such as rising levels of income inequality. A common link is that each theory attempts to document the physiological processes through which low economic status leads to poorer health. While these scientific questions are extremely important, this research has taken place with little input from economists.

Economists are now making contributions about the alternative pathway--the impact poor health may have on economic resources. Poor health may restrict a family's capacity to earn income or to accumulate assets by limiting work or by raising medical expenses. At a minimum, this work should provide a caution against exaggerating the magnitude of causation from economic status to health outcomes. But the potential contribution runs deeper. As people age, the evolving variation in individual health outcomes may offer additional statistical information to estimate parameters of household savings and consumption behavior that so far have proven to be somewhat elusive. Thus, incorporating health uncertainty and risk into economic models should eventually enrich our understanding of basic tenets of household behavior.

The first section of this paper documents the size of the association between health and one prominent economic status measure-household wealth. Section two deals with how health influences economic status by sketching out reasons why health may alter household savings (and eventually wealth) and then providing estimates of the empirical magnitude of these effects. Section three shifts attention to the alternative pathway–the links between economic status and health--and summarizes [2]major controversies and evidence surrounding these issues.

3. The Association between Economic Status and Health

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The wealth-health gradient characterizes all age groups in . Thus, it is not only a middle- or late-life phenomena, but appears for some as their labor force activity begins and emerges for others as their economic resources and health increasingly interact over their lives. The second and third columns of indicate that changes in wealth are also correlated with initial health. Those whose 1984 reported health was worse not only had much lower baseline wealth, but they experienced considerably smaller absolute wealth growth over the ensuing 10 years. Among those 35–44 years old in excellent health in 1984, median wealth grew by almost $100,000 while it increased by less than $10,000 for similarly aged people whose 1984 health was fair or poor.

Changes in health status over time, not shown in , are also associated with changes in wealth. Consider those in very good health in 1984 who had a median wealth of $66,300. If their health remained 'very good' by 1994, median wealth in 1994 was $100,000. If their 1994 health was 'excellent', median wealth was $121,000 while if their health declined to 'fair' or 'poor', median 1994 wealth was only $31,000.

These patterns are corroborated by other salient health outcomes.[3] Between 1979 and 1989, white men with family incomes below $10,000 could expect to live 6.6 fewer years than white men in families with more than $25,000. This life-expectancy differential for black men in the same income groups was even larger--7.4 years longer life. These differences persist when data are arrayed by specific causes of death whether communicable or chronic diseases, accidents, suicides, or homicides. For example, death rates per 10,000 white men ages 25–64 with incomes below $10,000 were 32 for heart disease, 9 for lung cancer and 6 for diabetes. Among similarly aged white men with incomes over $25,000, rates were much smaller--heart disease 13, lung cancer 4, and diabetes 2.

Such differentials may not have been surprising earlier in this century when communicable diseases

were the major causes of death and poor nutrition and inadequate sanitation-with obvious links to economic status- were the principal risk factors. They provide more of a challenge now when death from chronic diseases dominate and the major risk factors (smoking, high fat diet, sedentary life style) do not provide a full explanation.

These risk behaviors do exhibit higher prevalence in lower socioeconomic groups. A good example is smoking, a well-documented risk for lung cancer, respiratory and heart diseases. While cigarette smoking has declined among all groups, it remains more common among those with lower incomes or less schooling. In 1995, 40 percent of men who were not high school graduates smoked; the comparable figure for male college grads was only 14 percent. Similar patterns by socioeconomic status exist for other health risk behaviors--excessive drinking, obesity, and sedentary life-styles to name a few. But the research consensus is that health disparities by economic status are only slightly mitigated when extensive controls are included for health risk behaviors (Marmot, 1999).

Access to care also varies by economic status. But again, there is growing scepticism that differential access is the smoking gun behind the health gradient. Some of this skepticism flows from doubts that medical care has all that much to do with health outcomes. For example, more widespread availability of health insurance in Britain under the National Health Service and in the United States after the passage of Medicare apparently failed to make much of a dent on health disparities by economic status. More concretely, the RAND health insurance study, which used a careful experimental design to investigate how people reacted to different patterns of co-payments and deductibles, found that lower payments for health care do increase utilization of health care services, but result in only minor effects on most health outcomes (Newhouse, 1993).

The possibility of mutually reinforcing interactions have made conclusions about the relation of income, wealth and health difficult to pin down. Are healthier households wealthier ones simply because higher incomes lead to better health? Or does poor health restrict a family's ability to accumulate assets by limiting work or through rising medical expenses? Or perhaps some unobserved factor makes some people healthier and wealthier. Despite its size, the relation between better health and more wealth or larger changes in wealth depicted in is uninformative about causality. Equally plausible stories can be told justifying either causal direction. Wealth could grow more rapidly among those who started in better health because good health enhances future earnings capacity and facilitates savings. Alternatively, additional economic resources could help protect individuals from the ravages of age so that their subsequent health is better.

These issues can be illustrated with a few concepts derived from the standard economic model of health (Grossman, 1972). This model starts with the health production function in which health at any given time is a result of a set of factors, including health in the previous time period, medical care received, the adoption of good personal health behaviors like exercise, the avoidance of unhealthy behaviors like smoking, and a vector of other personal and environmental levels factors. Family background or genetic endowments may also matter by creating temporal links between early and later life health outcomes and by making the preservation of good health easier.

A fundamental insight of an economic approach is that health is a stock where current inputs and behaviors chosen are investments producing increments to that stock. If these increments are affected by current choices, solving sequentially, today's health stock will be a function of the entire history of all current and past prices, incomes, health behaviors and initial health endowments. Since a lifetime budget constrains choices, a corollary implication is that additional current economic resources may not have a quantitatively large impact on the current stock of health, especially at older ages. Additional economic resources may increase health care utilization or induce good health behaviors, but even if behaviors were altered instantaneously, they can only directly impact on health investments and not health capital.

An important consideration is that economic resources may also be affected by the stock of health. Healthier people can work longer hours in a week and more weeks in year leading to higher earnings, or poor health may trigger the receipt of means-tested government transfer income. Health then enters the model in two ways, producing possible two way multiple feedbacks between health and income. Contemporaneous feedback exists when current health status affects current income. But eliminating current health feedbacks is only part of the problem. Prior health conditions may alter past incomes which then may affect current income. Periods of poor health in middle age by reducing earnings could have negative implications for pension and social security income during retirement. Since health status is positively correlated even across quite distant ages, a correlation of retirement income and current health may flow from past health to current retirement income.

4 Conclusion

There is abundant evidence of a quantitatively large association between many measures of economic status including income and wealth and a variety of health outcomes such as mortality or morbidity. However, considerable and often heated debate remains--especially across disciplines--about the direction of causation and about why the association arises.

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variation in socioeconomic status produces health disparities, they are increasingly debating among themselves about why low economic status might lead to poor health. At least for modern industrial countries,[1] the old standby arguments– the less well-to-do have access to less or lower quality medical care or a stronger pattern of deleterious personal behaviors--have been rejected as insufficient. Instead, a series of intriguing competing theories have arisen that emphasize long-term impacts of early childhood or even inter-uterine environmental factors, the cumulative effects of prolonged exposures to individual stressful events, or reactions to macro-societal factors such as rising levels of income inequality. A common link is that each theory attempts to document the physiological processes through which low economic status leads to poorer health. While these scientific questions are extremely important, this research has taken place with little input from economists.

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