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Article

Health economics

NBER Reporter

Provided in Cooperation with:

Suggested Citation: Grossman, Michael (2015) : Health economics, NBER Reporter, National Bureau of Economic Research (NBER), Cambridge, MA, Iss. 1, pp. 1-9

This Version is available at:
http://hdl.handle.net/10419/113817

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Health Economics

Michael Grossman *

The NBER Program in Health Economics focuses on the determinants and consequences of differences in health outcomes. Program members have continued their long-standing interests in such basic determinants of health as substance use, obesity, and formal schooling, but a substantial number have also diversified their portfolios to include the effects of the business cycle, pollution, and overseas military deployment on health outcomes. During the five-year period covered by this report (2010–14), researchers in the program issued 530 working papers, a 36 percent increase relative to the previous five years.

I begin this report by describing research on these new topics, and then turn to those in areas in which the program has a longer history. Given the many working papers that have appeared in the period covered by my report, I can summarize only a small number of them.

The Great Recession and Health

Studies conducted by Christopher Ruhm and others prior to the Great Recession tended to find that health improved during a recession. In a 1996 study, Ruhm pointed to such contributing factors as increases in the amount of time available to exercise, cook at home, and schedule physician visits due to unemployment; less income to purchase cigarettes, alcohol, and junk food; reductions in fatal motor vehicle accidents due to declines in driving; less job-related stress; reductions in pollution associated with lower levels of industrial activity, and expansions in health insurance coverage as low-wage workers who lose their jobs and lack employer-provided health insurance become eligible for Medicaid.1 He found that a 1 percentage point rise in unemployment led to a 0.5 percent decline in the death rate. Based on these results and similar ones in other studies, Mark L. Egan, Casey B. Mulligan, and Tomas J. Philipson argue

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1. Grossman directs the NBER’s Program in Health Economics and is Distinguished Professor of Economics at the City University of New York Graduate Center.
that since gross domestic product excludes the value of leisure and the value of health, it overstates the severity of recessions. A much less rosy picture emerges from research that includes the Great Recession. Using more recent data than that contained in his 1996 study, Ben-Josef and colleagues find that health, defined broadly, improved over time from being strongly procyclical to being unrelated to macroeconomic conditions.2 This reflects changes in the behavior of specific causes of death. After 2008, rises in the number of motor vehicle accidents continue to be procyclical, while deaths due to cancer and accidental poisonings have become countercyclical. The changing effect of macroeconomic conditions on cancer deaths may be due to the increasing protective effectiveness of financial resources, which can be used to fund sophisticated and expensive treatments that have become available in recent years.3 The behavior of accidental poisoning deaths may have occurred because declines in mental health during economic downturns are increasingly associated with the use of prescribed or illicitly obtained medications that carry risks of fatal overdoses.4

Gregory Colman and Dhar Halav Dave present research suggesting that while becoming unemployed is associated with a small increase in leisure-time exercise, there is a substantial decline in total physical activity. They attribute this to a disproportionate loss of jobs in manual labor, such as construction, during the Great Recession. Hence, even if unemployed people choose to increase their physical activity, they may not be as physically active as they had been at work. The upshot was that body weight increased. This may have resulted in long-term reductions in health, since weight gains will not necessarily be reversed once employment is regained. Moreover, due to the concentration of low-educated workers in manual jobs, the recent recession may have exacerbated health differentials between high and low socioeconomic status groups.

Currie and Eisdor Tovin present the NBER’s research that housing crisis that accompanied the Great Recession likely led to welfare use reductions by society at large. They find that an increase in the number of housing foreclo-

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## Unhealthy Behaviors

Tobacco use, obesity resulting from overeating and lack of exercise, excessive alcohol consumption, and illegal drug use rank first, second, and third, respectively, as the leading causes of premature mortality in the United States and most other countries in the developed world. These behaviors also have substantial effects on morbidity and are associated with such other negative outcomes as child abuse, spouse abuse, fires, crime, and risky sexual encounters. John Cawley and Ruhm present an overview of economic approaches to these behaviors that have been developed by program...
members and other researchers.4 They also summarize empirical evidence concerning the effects of prices, taxes, and government-enforced regulations on unhealthy behaviors from studies conducted prior to 2010. Since consumption of the goods at issue in the present has harmful effects on health in the future, the rate at which people discount the future consequences of their current actions is an important determinant of the consumption choices individuals make, and the greater the rate of time preference for the present, the more likely it is that a person will consume goods that are harmful to his or her health. 

Cawley and Ruhm point out that the time discount factor can vary among consumption choices. For example, individuals may heavily discount the harmful effects of eating junk food, while they give much more weight to the harmful effects of cigarette smoking. Henry Saffer pursues this insight by employing a novel empirical approach to create a single measure of self-regulation (a concept that is closely related to time preference) that can vary across domains.9 This approach allows for the study of how self-regulation is connected across different health choices. The results show that there is a high correlation in self-regulation for smoking, drinking, drug use, and crime. However, self-regulation for body mass index (BMI), defined as weight in kilograms divided by height in meters squared and for obesity (BMI equal to or greater than 30) is different than self-regulation for health outcomes for the other outcomes. The results also show that self-regulation has a significant negative effect on all choices.

Tobacco

Program members have continued to collect evidence on the effects of tobacco excise taxes on the use of tobacco products and related outcomes. Jidong Huang and Frank J. Chaloupka IV examine whether changes in tobacco excise tax increase on the use of cigarettes and smokeless tobacco products among youths ages 14–15.18 The results of this analysis show that this tax increase had a substantial short-term impact. The percentage of students who reported smoking in the past 30 days dropped between 10 and 13 percent, and the percentage of students who reported using smokeless tobacco products dropped between 16 and 24 percent.

The long-term projected number of youths prevented from smoking or using smokeless tobacco that resulted from the 2009 federal tax increase could be much larger, since the higher tobacco prices would deter more and more children from initiating smoking and smokeless tobacco use over time.

Markowitz considers the effects of ciga- rette excise tax hikes on fires, one of the negative consequences of smoking.24 She finds that the effect is quite small, but the increase in excise tax rates on cigarettes is associated with fewer fires. In another study dealing with a negative consequence of smoking, Markowitz, E. Kathleen Adams, Patricia M. Dieter, Vijj Kunnan, and Van Tong report that higher cigarette taxes are associated with small increases in birth weight and gestational weeks for teen age mothers.25 The mechanism here is that maternal smoking during pregnancy leads to poor birth outcomes.

Kevin Callison and Robert Kaestner question the consensus that raising tobacco taxes reduces cigarette consumption across the board.35 They find that for adults the association between state tax hikes and either smoking participation or smoking intensity is not negative and is not statistically significant. These results do not conflict with those that have been observed for teenagers and young adults.

Increased laws and other determinants of tobacco use, Dave and Saffer provide the first estimates of the effects of magazine advertising on smoking tobacco (ST) use.36 While the prevalence of ST use is low relative to smoking, the distribution of use is highly skewed, with consumption concentrated among certain segments of the population, such as rural residents, males, whites, and low-educated individuals. Furthermore, there is suggestive evidence that use has trended upwards recently for groups that traditionally have been at low risk of using ST. Dave and Saffer’s focus on magazine advertising is significant because, they argue, that tobacco manufacturers have been banned from using other conventional media for many years. They find consistent and robust evidence that exposure to ST ads in magazines raises ST use, especially among males. They also present suggestive evidence that both ST taxes and advertising are connected to ST use, indicating contemporaneous complemen- tarity between these tobacco products. Since ST use is less harmful than cigarette smoking, effects from this study inform the debate on the cost and benefits of ST use and its potential to be a tool in overall reduction of tobacco-related harms.

Restrictions on smoking in public places are the most noticeable non-price tobacco control measures worldwide, yet surprising little is known about their effects on exposure to environmental tobacco smoke (ETS), commonly termed second-hand smoke. Using data for Canada, Christopher Carpenter, and Gayana and Sayley Warman found these laws had no effects on smoking but induced large and statistically significant reductions in ETS expo sure in public places, especially in bars and restaurants.28 They did not find significant evidence of ETS displacement to private

homes. Their results indicate a potential for substantial health improvements from ban ning smoking in public places.

Alcohol

Program members have focused on the effects of alcohol and marijuana on health outcomes and on the effects of regulations of these behav iors on motor vehicle accident mortality, other causes of mortality, and smoking. For Bhattacharya, Christina Guthrie, and Grant Miller show that the end of the 1985– 88 Gorshbeev Anti-Alcohol Campaign, and not Russia’s transition to capitalism, was responsible for a large part of the 40 percent surge in deaths between 1990 and 1994.39 Philip J. Cook and Christine Piette Dumas report on the effects of federal excise tax hikes on beer, wine, and distilled spirits reduced deaths due to crashes and other accidents by approximately 5 percent, or almost 7,000 lives, in that year.40 In addition, the tax increases led to reductions in violent crime and property crime. Hansen finds that increasing punishments and sanctions for repeat drunk-driving offendor makers and making penalties stiffer the higher the offender’s blood-alcohol content (BAC) are much more effective than policies to lower the BAC level required for conviction.37 Hope Corman and Naci H. Mocan employ monthly data over 19 years for New York City and after correcting for policy endoge neity find that alcohol consumption is posi tionally related to assault, rape, and larceny crimes but not to murder, robbery, burglary, or motor vehicle theft.39

Illegal Drugs

As a result of the 2012 and 2014 elec tions, four U.S. states—Alaska, Oregon, Colorado, and Washington—legalized the use of marijuana for recreational purposes. Moreover, laws enacted by an additional 19 states since 1996 have legalized mar ijuana use for medical purposes. Surprised by these seemingly disparate program members have investigated the impacts of these laws on marijuana use, alcohol use, and motor vehicle accident mortality. The laws reduce the price of marijuana and should lead to an increase in its use. They may reduce the use of alcohol if that substance and mari juana are substitutes while they may increase the use of alcohol if the two substances are comple ments. If alcohol and marijuana are substitutes, they also have the potential to reduce motor vehicle accident mortality, because simulator and driver-course stud ies show that impairments due to alcohol increase the risk of a collision, while impair ments due to the use of marijuana do not.50 Drivers under the influence of marijuana reduce their speed, avoid risky maneuvers, and increase “following distances.” Drivers under the influence of alcohol behave in the opposite manner.

Program members have taken a 2013 study by D. Mark Anderson, Hansen, and Daniel I. Rees, completed before Hansen became a Faculty Research Fellow in the Health Economics Program, as the point of departure for their research.37 Using data from the period from 1990 through 2010, their study finds that use of marijuana rose and alcohol-related traffic fatalities fell by 13 percent in the 13 states that legalized medical marijuana laws during the sample period. At the same time consumption of alcohol, including binge drinking (consumption of five or more drinks of alcohol in a row for males and four or more drinks in a row for females) fell. These findings, which pertain especially to adults, are consistent with the notion that the effects of marijuana laws are larger, since the higher tobacco prices would deter more and more children from initiating smoking and smokeless tobacco use over time.
body fat (PBF, defined as body fat as a percentage of total weight) — in a study of the effects of food prices on obesity in youth ages 12 through 18.43 We obtain these measures from bioelectrical impedance analysis and dual energy X-ray absorptiometry conducted during medical examinations, and find that an increase in the real price of fast-food restaurant food leads to a reduction in PBF, while a rise in the real price of fruits and vegetables leads to an increase in this outcome. Finally, we show that nonwhite youths are particularly sensitive to fast-food restaurant prices.

An explanation of the last result is that the “full” price of fast-food consumption consists of the money price and the monetary value of the future health consequences of that consumption. A 1 percent change in the money price results in a larger percentage change in the full price when future health consequences are small than when they are large. Future costs are likely to be less important to parents who reside in the poorer, less-educated families in which a substantial proportion of nonwhite youths reside; because of the importance of PBF associated with higher rates of time preference for the present. Charles J. Courtemanche, Garth Heath, and Patrick McEchron provide direct evidence in support of the argument just made.44 They find that the body mass index of people around the age of 45 who discount the future heavily based on overweight and obese children, revealing detectable effects for a vulnerable group. Turning to one of the important consequences of obesity, Casley and Chad Meyerhoefer exploit genetic variation in weight as a source of variation and find that weight’s impact on medical costs is approximately 4 times greater than suggested by estimates that do not control for endogeneity.45 They estimate the annual cost of treating obesity in the U.S. at $168 billion, or 16 percent of national spending on medical care. The upshot is that the previous literature has underestimated the cost effectiveness of anti-obesity interventions.

Schooling and Health

Years of formal schooling completed and health are the two most important components of the stock of human capital, and it is natural to examine complementarities between them. This task is challenging because causality may run both from more schooling to better health and from better health to more schooling. In addition there may be omitted “third variables” that cause both schooling and health to vary in the same direction. Program members have employed quasi-natural experiments, instrumental variables techniques, temporal ordering, and nonrandom assignment of third variables to study this relationship.

Ming-Jen Lin and Elaine M. Liu test the effects of education on physical outcomes. In particular, they show that in utero conditions affect long-run developmental outcomes, using the 1918 influenza pandemic in Taiwan as a natural experiment.” They find that increases in body mass index of other consumers. 

Ming-Jen Lin and Elaine M. Liu test the effects of education on physical outcomes. In particular, they show that in utero conditions affect long-run developmental outcomes, using the 1918 influenza pandemic in Taiwan as a natural experiment. U.S. children/adolescents and less educated as adults compared to other birth cohorts. They also find that they are more likely to have serious health problems including kidney disease, circulatory and respiratory problems, and diabetes in old age. Gabriella Coni and James J. Heckman show that pre-school interventions in low-income populations of U.S. children have positive effects on a variety of measures of well-being in adulthood, including formal schooling completed and health.46 They also provide evidence of the causal effects of the educational attainment on health in a British panel data set. Using insights from psychology, they emphasize the “big five personality traits” (conscientiousness, openness, extraversion, agreeableness, and neuroticism) and temporal order to measure factors that influence both health and schooling. Controlling for these measures, cognitive ability, and health, all at age ten, they find that the positive effects of education on self-rated health at age 30, and the negative effects of this variable on smoking and obesity at that age are positively associated with cognitive ability and negatively associated with noncognitive ability.

David Card, Robert G. Atkinson, and the National Center for Education Statistics explore whether the increase in the number of hospitals and clinics affecting the health of the poor, including some that were located in rural areas, resulted in a greater reduction in maternal mortality. They also find that the increase in women’s schooling was associated with a decline in abortion rates of 3 percent. They also found a positive and robust association between distance to the nearest abortion provider and test birth rates, but less-consistent estimates for other ages. Their results suggest that even if some states lost all abortion providers due to legislative policies, the impact on aggregate birth and abortion rates would be small, as most women would travel to states with abortion services.

Turning finally to studies that consider the determinants of infant and child health, Mocan, Christiane Raschke, and Bulent Kucukcan (2009) use skill-based technology shocks as an instrument to show that an increase in weekly earnings of low-skill mothers prompts an increase in prenatal care and has a small positive effect on the birth weight and gestational age of these mothers’ newborns.47 Clive Bird and Kelly report that breastfeeding at birth raises the probability that infants will be in excellent health at nine months, and is protective against obesity at 24 and 54 months.48 Brian A. Jacob, Daron Acemoglu, and the National Bureau of Economic Research find that legalized abortion in all states was associated with a decline in abortion rates of 3 percent. They also found a positive and robust association between distance to the nearest abortion provider and test birth rates, but less-consistent estimates for other ages. Their results suggest that even if some states lost all abortion providers due to legislative policies, the impact on aggregate birth and abortion rates would be small, as most women would travel to states with abortion services.

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