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NBER Profile

Kosali Simon

Kosali Simon is the Herman B. Wells Endowed Professor at Indiana University (IU), where she is a Professor in the School of Public and Environmental Affairs and an Adjunct Professor in the economics department and the Kelley School of Business. She is a research associate in the NBER's programs on Health Care, Health Economics, and Children.

Professor Simon's work encompasses many topics in health economics and health policy. Over the most recent several years, she has written extensively on how the Affordable Care Act (ACA) has affected insurance coverage, health care utilization, and health outcomes, as well as on insurer participation and consumer demand in the ACA's health insurance

(continued on page 3)

The Lifetime Medical Spending of Retirees

Older households in the U.S. face the risk of catastrophic medical expenditures during retirement. While Medicare covers some hospital expenses starting at age 65, as well as doctor's visits and prescription drugs for beneficiaries who sign up and pay for Part B and Part D coverage, there remain substantial uncovered costs. For example, Medicare does not cover long hospital or nursing home stays and requires copayments for many medical goods and services. Medicaid provides coverage of long-term care expenses for the poor, but families with significant assets are not eligible (unless they first expend most of their wealth).

Understanding the level and risk of medical spending on retirees is important for households seeking to save adequately for retirement and manage the decumulation of their retirement savings, as well as for policy makers interested in retirement security.

In **"The Lifetime Medical Spending of Retirees,"** (NBER Working Paper No. 24599), researchers John Bailey Jones, Mariacristina De Nardi, Eric French, Rory McGee, and Justin Kirschner estimate the distribution of lifetime medical spending for retired households with a head age 70 or above. Their estimates include out-of-pocket

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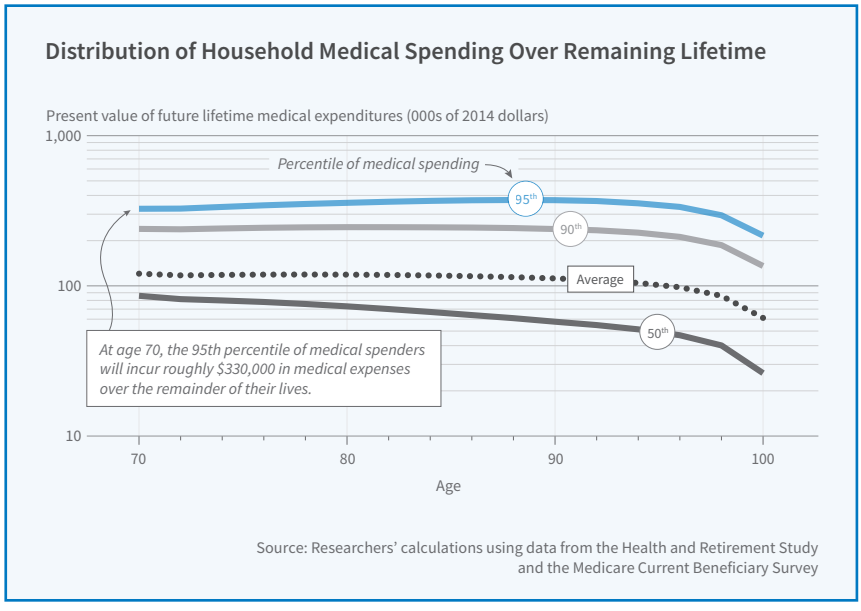

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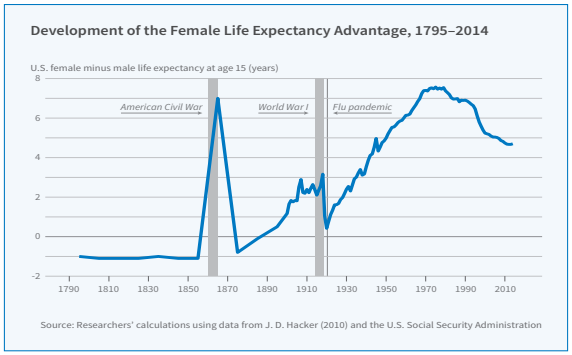

Spending *(from page 1)*

spending as well as Medicaid expenditures, as this represents the risk that wealthier households face, as well as the medical spending risk less wealthy households would face were Medicaid not available.

The researchers make use of data from the Health and Retirement Study (HRS), focusing on households age 70 and above at the first interview, who are followed for up to 20 years. The HRS provides information on all out-of-pocket medical spending. These data are supplemented with information on Medicaid spending from the Medicare Current Beneficiary Survey, using characteristics available in the two data sets to estimate Medicaid spending for HRS respondents.

The researchers use these data to estimate the probability that individuals transition over time between being in good health, in poor health, in a nursing home, and deceased, based on the individual's current health status and demographic and socioeconomic characteristics. They also estimate models relating the mean and variance of medical spending to health status and these other factors. Results from the two models are combined to predict how health and medical spending will evolve with age for each household.

Focusing first on annual household spending, the researchers find that this measure rises rapidly with age, with mean out-of-pocket and Medicaid expenditures of $5,100 at age 70, rising to $29,700 at age 100. At the 95th percentile, annual expenditures are $13,400 at age 70 and $111,200 at age 100.

Spending at each age can be aggregated to create an estimate of lifetime medical spending. At age 70 and each age thereafter, the researchers calculate the present discounted value of remaining medical expenditures from that age forward. The resulting values can be considerable. Households who turned 70 in 1992 will on average incur over $122,000 in out-of-pocket and Medicaid spending over the remainder of their lifetime. The top 5 percent of spenders will incur expenditures of over $330,000. This value does not fall with age, as might be expected — older households have fewer remaining years of life but higher annual expenditures, and the latter drives remaining medical spending to continue rising until about age 90.

The researchers uncover a number of other interesting patterns in lifetime medical spending. Women have higher spending than men, as might be expected due to their longer life expectancy. Perhaps more surprisingly, those who are initially in good health have higher spending than those in poor health, since the former tend to live longer and medical expenditures rise with age. An important caveat to this is that individuals who are initially in nursing homes have the highest expenditures, despite having high mortality, due to the high cost of nursing home care. High-income households have higher lifetime expenditures due both to their longer life expectancy and their tendency to spend more at each age. Only 40 percent of the variation in medical expenditures can be explained by factors such as income and health status, indicating that much of the variation in spending is due to idiosyncratic health shocks.

The share of medical expenditures that is covered by Medicaid is highly relevant for retirement planning. This share varies considerably by the household's permanent income level. At the bottom of the income distribution, mean lifetime out-of-pocket expenditures as of age 70 are about 43 percent of mean combined (out-of-pocket and Medicaid) expenditures, implying that Medicaid covers about 57 percent of the total. By contrast, at the top of the income distribution, Medicaid covers 21 percent of lifetime expenditures as of age 70 and 30 percent as of age 100. These figures reflect the fact that, on the one hand, most high-income households do not receive Medicaid; however, those that do have had their assets exhausted by high medical expenses, leading to large Medicaid benefits. At every income level and age, households with higher combined expenditures have a larger share of their expenditures covered by Medicaid.

In concluding, the researchers note that the level and dispersion of medical spending is high and diminishes only slowly with age. While some fraction of medical spending is predictable, a large share is due to unanticipated health shocks. Medicaid covers the majority of health costs for the poor and reduces their risk of medical expenditures; to a lesser extent, it does so for higher-income households as well.

The researchers caution that their analysis does not examine the extent to which medical spending may reflect choices made by the individual, such as when to enter a nursing home or whether to spend more on higher-quality care. They also suggest that future work incorporating spending by Medicare and private insurers would provide a more complete picture of medical spending by the elderly.

The researchers gratefully acknowledge financial support from Norface Grant (TRISP 462-16-120) and from the Economic and Social Research Council (Centre for Microeconomic Analysis of Public Policy at the Institute for Fiscal Studies (RES-544-28-50001) and Inequality and the insurance value of transfers across the life cycle (ES/P001831/1)).

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*The **Bulletin** is edited by Courtney Coile.*

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The Emergence of the Female Advantage in Life Expectancy

In the U.S. and other developed countries, life expectancy at birth for women is four to six years longer than the equivalent figure for men. Recent evidence suggests that this has not always been the case, however. When and why did the female advantage in life expectancy arise?

In **"XX>XY?: The Changing Female Advantage in Life Expectancy,"** (NBER Working Paper No. 24716), researchers Claudia Goldin and Adriana Lleras-Muney explore this issue.

The researchers begin by documenting trends in life expectancy in the U.S. Prior to 1890, male life expectancy at age 15 was about one year longer than female life expectancy, except during the Civil War, when war-related mortality led to a temporary female advantage. Starting around 1890, however, a permanent female advantage emerged. The gap grew throughout most of the 20th century (except for a brief decline due to the 1918 flu pandemic), reaching a peak of over 7 years in the 1970s. The gap has since narrowed to less than 5 years. Interestingly, this pattern of a widening and then narrowing gap is also apparent in post-WWII England, France, and Sweden.

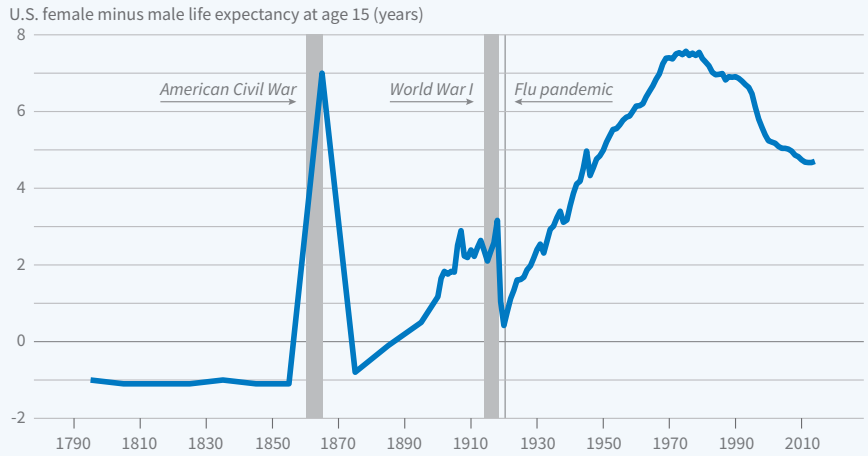
Many of the reasons why women live longer than men relate to having two X chromosomes rather than one X and one Y chromosome — for example, women have less visceral fat, which predicts cardiovascular disease. But the fact that the female advantage in life expectancy widened during the twentieth century suggests that environmental factors, particularly those that interact with biological ones, have disproportionately benefitted women. While previous studies have focused on the roles of maternal mortality and smoking prevalence, the initial appearance and widening of the female mortality advantage started well before maternal mortality declined or smoking increased.

Goldin and Lleras-Muney explore whether the reduction in infectious disease may have contributed to the rise in the female advantage. Using new data from Massachusetts containing information on cause of death starting in the late 1800s, the researchers show that females ages 5 to 25 initially had higher rates of infectious disease mortality than did males of the same age. For example, mortality from the 1918 flu pandemic was higher for girls ages 10 to 15 than for boys. When the burden of infectious disease declined, largely due to public health interventions such as clean water and sewerage systems, young women had more to gain.

Interestingly, the direct effect of declining infectious disease mortality on the male-female life expectancy gap was fairly small. But as infectious disease mortality fell, there were also fewer survivors who carried markers from illness into adulthood. Later cohorts therefore had lower mortality later in life from causes associated with the long-term burden of infectious disease. This phenomenon translated into a greater increase in life expectancy for women because of their initially higher rates of infectious disease.

The researchers caution that with presently available data, it is difficult to rule out the possibility that public and private health innovations were the reasons for

Development of the Female Life Expectancy Advantage, 1795–2014



Source: Researchers' calculations using data from J. D. Hacker (2010) and the U.S. Social Security Administration

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marketplace. Some of her new work also explores the causes, consequences, and potential remedies of opioid misuse.

Simon is a member of the governing board of the Association for Public Policy Analysis and Management and was recently on the board of directors of the American Society of Health Economists and of the Committee for the Status of Women in Economics (CSWEP). She is an associate editor of *Health Economics* and of the *Journal of Health Economics* (JHE) and is on the editorial board of several other health and policy journals. Simon recently served a three-year term as the coordinator of CSWEP's national mentoring program for female economists. She will soon commence terms as an editor of JHE and as a National Institutes of Health study section member.

Simon earned her Ph.D. in Economics at the University of Maryland and her B.A. in Economics and German at Hamilton College. She was previously a faculty member at Cornell University and at Michigan State University.

Simon lives in Bloomington Indiana with her husband, who is also on the faculty at IU, and their six children; in her spare time she enjoys cooking in large quantities.

later-life mortality improvements. But the case for a key role of declining infectious disease is bolstered by studies showing that early life infectious disease can weaken organs, leave a residual virus in the body, or provoke an inflammatory response that later causes disease.

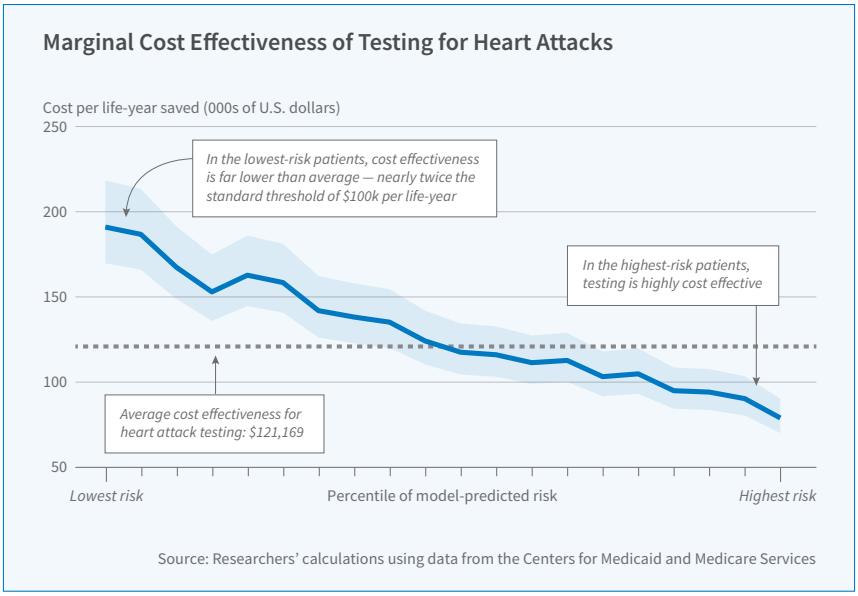
The researchers conclude "our paper has uncovered (or rediscovered) an important change in the health of females in their childhood and teen years. The precise relationship between that improvement and the female longevity advantage is not yet known. But there is good reason to believe that females, more so than males, were greatly advantaged as children and as adults by the sharp reduction in infectious disease in the early twentieth century."

Machine Learning in Health Care

The use of machine learning (ML) in economics is on the rise, including in the analysis of health care questions. In June, the NBER hosted a conference on "Machine Learning in Health Care," organized by David Cutler, Sendhil Mullainathan, and Ziad Obermeyer.

Susan Athey led off the meeting with a discussion of "**The Impact of Machine Learning in Economics**." She offered a "relatively narrow" definition of ML as "a field that develops algorithms designed to be applied to datasets, with the main areas of focus being prediction (regression), classification, and clustering or grouping tasks." She notes that a strength of ML is its ability to estimate and compare many models, which is particularly useful when there are many covariates or when the researcher wishes to estimate the model flexibly. ML works well when the problem is simple, such as a prediction or classification task, where the model can be estimated using one part of the data and tested on another. However, many questions in economics involve causal inference, where there is no unbiased estimate of the truth available for comparison; Athey suggested that more work will be needed to apply an algorithmic approach in such cases. She predicted "the combination of ML and newly available datasets will change economics in fairly fundamental ways, ranging from new questions, to new approaches to collaboration (larger teams and interdisciplinary interaction), to a change in how involved economists are in the engineering and implementation of policies."

Ziad Obermeyer and Sendhil Mullainathan explore the potential of ML to identify low-value health care in their new study, **"Are We Over-Testing? Using Machine Learning to Understand Doctors' Decisions."** The researchers apply ML tools to study testing for heart attack in the emergency setting. Intensive tests such as stress testing or catheterization allow doctors to detect an acute or impending blockage, enabling patients to receive life-saving treatments such as a stent or open-heart surgery. However, these tests cost thousands of dollars and the average yield of the test (share of tested patients with a serious blockage) is often as low as 1 to 2 percent.



The researchers use national Medicare claims, as well as detailed electronic health record data from a large hospital, to compare doctors' testing decisions to individualized, prospective risk estimates obtained via ML. They find a substantial number of patients with very low model-predicted risk ex ante, whom doctors nevertheless decide to test. Tests for these patients have very low yield and would not be considered cost-effective at the standard threshold of $100,000 per life-year saved. Testing is cost-effective for patients in the top quartile of model-predicted risk, yet there are untested patients within this population. Many of these patients go on to develop serious complications, or to die, in the weeks after their emergency visits.

There is substantial variation across doctors in their propensity to test, and doctors who test more than average tend to test more high-risk patients as well as more low-risk patients. This suggests that rather than encouraging high-testing doctors to behave like low-testing doctors, there may be greater gains from using algorithmic decision-making to identify high-risk patients — the researchers estimate that by so doing, doctors could find 55 percent more heart attacks while testing at the rate of low-testing doctors. They conclude, "these results suggest that both under-testing and over-testing are prevalent, and that targeting misprediction is an important but understudied policy priority."

The other papers presented at the conference also showcased the potential of ML for providing key insights on health care questions. In **"Triage Judgments in the Emergency Department,"** David C. Chan Jr. and Jonathan Gruber examine triage nurses' assignment of an emergency severity index (ESI) to emergency department patients. They find that nurses' triage decisions can affect mortality among those patients at risk of dying.

Justine Hastings, Mark Howison, Sarah Inman, and Miraj Shah examine predictors of opioid use among Medicaid patients in Rhode Island in **"Using Big Data and Data Science to Generate Solutions to the Opioid Crisis."** They find that about 4 percent of patients has an adverse event within 5 years, with prison time a particularly strong predictor.

In **"Managing Intelligence: Skilled Experts and AI in Markets for Complex Products,"** Jonathan Gruber, Benjamin Handel, Jonathan Kolstad, and Samuel Kina examine the role of agents in Medicare Part D enrollment decisions. They find that more skilled agents have lower expected consumer costs, but that both agents and consumers overweight premiums when choosing a plan. The introduction of a predictive plan recommendation algorithm reduces expected consumer costs, particularly for clients working with low-skilled agents.

Finally, in **"Use of Care and Cost Exposure: A Story in Heterogeneity,"** Rahul Ladhania, Amelia Haviland, Neeraj Sood, and Ateev Mehrotra illustrate the methodological opportunities and challenges of using large observational data and statistical machine learning methods to generate hypotheses about subgroups with heterogeneous effects. In one case study with exogenous treatment, the authors find that some of the generated hypotheses hold up and many do not.

The organizers of this conference gratefully acknowledge financial support by the National Institute on Aging of the National Institutes of Health under Award Number P30AG012810. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Athey gratefully acknowledges financial support from the Toulouse Network for Information Technology, the Cyber Initiative at Stanford University, the Sloan Foundation, and Office of Naval Research grant 17-1-2131.

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NBER Affiliates' Work Appearing in Medical Journals

Many NBER-affiliated researchers publish some of their findings in medical journals that do not allow pre-publication distribution. This makes it impossible to include these papers in the NBER working paper series. This is a partial listing of recent papers in this category.

Association between Playing American Football in the National Football League and Long-term Mortality
A. S. Venkataramani, M. Gandhavadi, and A. B. Jena, JAMA*, 319(8), February 2018, pp. 800–6.*

Acute Myocardial Infarction Mortality during Dates of National Interventional Cardiology Meetings
A. B. Jena, A. Olenski, D. M. Blumenthal, R. W. Yeh, D. P. Goldman, and J. Romley, Journal of the American Heart Association*, 7(6), March 2018, (published online).*

Reduction in Firearm Injuries during NRA Annual Conventions
A. B. Jena and A. R. Olenski, The New England Journal of Medicine*, 378(9), March 2018, pp. 866–7.*

Infant Health and Future Childhood Adversity
N. E. Reichman, H. Corman, K. Noonan, and M. E. Jiménez, Maternal and Child Health Journal*, 22(3), March 2018, pp. 318–26.*

Physicians' Political Preferences and the Delivery of End of Life Care in the United States: Retrospective Observational Study
A. B. Jena, A. R. Olenski, D. Khullar, A. Bonica, and H. Rosenthal, BMJ*, 361, April 2018, pp. 1161.*

Financial Burden of Healthcare Utilization in Consumer-Directed Health Plans
X. Zhang, E. Trish, and N. Sood, The American Journal of Managed Care*, 24(4), April 2018, pp. e115–21 (published online).*

Adherence to Guidelines for Screening and Medication Use: Mortality and Onset of Major Macrovascular Complications in Elderly Persons with Diabetes Mellitus
A. P. Yashkin and F. Sloan, Journal of Aging and Health*, 30(4), April 2018, pp. 503–20.*

Identifying the Causes of Changes in Prevalence of Diabetes in Older Adults: A New Trend Partitioning Approach
I. Akushevich, A. P. Yaskin, J. Kravchenko, F. Fang, K. Arbeev, F. Sloan, and A. I. Yashin, Journal of Diabetes and its Complications*, 32(4), April 2018, pp. 362–7.*

Health Care Employment Growth and the Future of U.S. Cost Containment
J. Skinner and A. Chandra, JAMA*, 319(18), May 2018, pp. 1861–2.*

Productivity Growth of Skilled Nursing Facilities in Treating Post-Acute-Care-Intensive Conditions
J. Gu, J. A. Romley, and N. Sood, Value in Health*, 21, May 2018, pp. s104.*

Adverse Selection into and within the Individual Health Insurance Market in California in 2014
V. Fung, C. G. K. Peitzman, J. Shi, C. T. Liang, W. H. Dow, A. M. Zaslavsky, B. H. Fireman, S. F. Derose, M. E. Chernew, J. P. Newhouse, and J. Hsu, Health Services Research*, May 2018, (published online).*

Provider and Patient Satisfaction with the Integration of Ambulatory and Hospital EHR Systems
C. D. Meyerhoefer, S. A. Sherer, M. E. Deily, S. Y. Chou, X. Guo, J. Chen, M. Sheinberg, and D. Levick, Journal of the American Medical Informatics Association*, 25(8), May 2018, pp. 1054–63.*

Patterns of Potential Opioid Misuse and Subsequent Adverse Outcomes in Medicare, 2008 to 2012
C. M. Carey, A. B. Jena, and M. L. Barnett, Annals of Internal Medicine*, 168(12), June 2018, pp. 837–45.*

Predictive Modeling of U.S. Health Care Spending in Late Life
L. Einav, A. Finkelstein, S. Mullainathan, and Z. Obermeyer, Science*, 360(6396), June 2018, pp. 1462–5.*

Not All Insurance Is Equal: Differential Treatment and Health Outcomes by Insurance Coverage Among Nonelderly Adult Patients With Heart Attack
M. J. Niedzwiecki, R. Y. Hsia, and Y. C. Shen, Journal of the American Heart Association*, 7(11), June 2018, (published online).*

Suicide and Additional Homicides Associated with Intimate Partner Homicide: North Carolina 2004-2013
S. Smucker, R. E. Kerber, and P. J. Cook, Journal of Urban Health*, 95(3), June 2018, pp. 337–43.*

Gun Theft and Crime
P. J. Cook, Journal of Urban Health*, 95(3), June 2018, pp. 305–12.*

Do Incentives Undermine Intrinsic Motivation? Increases In Intrinsic Motivation Within An Incentive-Based Intervention For People Living With Hiv In Tanzania
N. L. Czaicki, W. H. Dow, P. F. Njau, and S. I. McCoy, PLoS ONE*, 13(16), June 2018, (published online).*

Cash Incentives versus Defaults for HIV Testing: A Randomized Clinical Trial
J. C. C. Montoy, W. H. Dow, and B. C. Kaplan, PLoS ONE*, 13(7), July 2018, (published online).*

Odds Ratios—Current Best Practice and Use
E. C. Norton, B. E. Dowd, and M. L. Maciejewski, JAMA*, 320(1), July 2018, pp. 84–5.*

High-Impact and Transformative Science (HITS) Metrics: Definition, Exemplification, and Comparison
J. Staudt, H. Yu, R. P. Light, G. Marschke, K. Börner, and B. A. Weinberg, PLoS ONE*, 13(7), July 2018, (published online).*

Is Inpatient Volume Or Emergency Department Crowding A Greater Driver Of Ambulance Diversion?
R. Y. Hsia, N. Sarkar, and Y. C. Shen, Health Affairs*, 37(7), July 2018, pp. 1115–22.*

The Association of Firearm Caliber with Likelihood of Death from Gunshot Injury in Criminal Assaults
A. A. Braga and P. J. Cook, JAMA Network Open*, July 2018, (published online).*

Constant Lethality of Gunshot Injuries from Firearm Assault: United States, 2003–2012
P. J. Cook, A. E. Rivera-Aguirre, M. Cerdá, and G. Wintemute, American Journal of Public Health*, 107(8), August 2018, pp. 1324–8.*

Abstracts of Selected Recent NBER Working Papers

w24311

How Persistent Low Expected Returns Alter Optimal Life Cycle Saving, Investment, and Retirement Behavior

Vanya Horneff, Raimond Maurer, and Olivia S. Mitchell

This paper explores how an environment of persistent low returns influences saving, investing, and retirement behaviors, as compared to what in the past had been thought of as more "normal" financial conditions. Our calibrated lifecycle dynamic model with realistic tax, minimum distribution, and Social Security benefit rules produces results that agree with observed saving, work, and claiming age behavior of U.S. households. In particular, our model generates a large peak at the earliest claiming age at 62, as in the data. Also in line with the evidence, our baseline results show a smaller second peak at the (system-defined) full retirement age of 66. In the context of a zero return environment, we show that workers will optimally devote more of their savings to non-retirement accounts and less to 401(k) accounts, since the relative appeal of investing in taxable versus tax-qualified retirement accounts is lower in a low return setting. Finally, we show that people claim Social Security benefits later in a low interest rate environment.

w24347

Effects of Expanding Health Screening on Treatment — What Should We Expect? What Can We Learn?

Rebecca Mary Myerson, Darius Lakdawalla, Lisandro D. Colantonio, Monika Safford, and David Meltzer

Screening interventions can produce very different treatment outcomes, depending on the reasons why patients had been unscreened in the first place. Economists have paid scant attention to these complexities and their implications for evaluating screening programs. In this paper, we propose a simple economic framework to guide policy-makers and analysts in designing and evaluating the impact of screening on treatment uptake. We apply these insights to several salient empirical examples that illustrate the different kinds of effects screening programs might produce. Our empirical examples focus on contexts relevant to the top cause of death in the United States, heart disease. We find that currently undiagnosed patients differ from currently diagnosed patients in important ways, leading to lower predicted uptake of recommended treatment if these patients were diagnosed. Additionally, changes in the composition of diagnosed patients can produce misleading conclusions during policy analysis, such as spurious reductions in measured health system performance as screening expands.

w24405

The Retirement-Consumption Puzzle: New Evidence from Personal Finances

Arna Olafsson and Michaela Pagel

This paper uses a detailed panel of individual spending, income, account balances, and credit limits from a personal finance management software provider to investigate how expenditures, liquid savings, and consumer debt change around retirement. The longitudinal nature of our data allows us to estimate individual fixed-effects regressions and thereby control for all selection on time-invariant (un)observables. We provide new evidence on the retirement-consumption puzzle and on whether individuals save adequately for retirement. We find that, upon retirement, individuals reduce their spending in both work-related and leisure categories. However, we feel that it is difficult to tell conclusively whether expenses are work related or not, even with the best data. We thus look at household finances and find that individuals de-lever upon retirement by reducing consumer debt and increasing liquid savings. We argue that these findings are difficult to rationalize via, for example, work-related expenses. A rational agent would save before retirement because of the expected fall in income, and dissave after retirement, rather than the exact opposite.

w24528

Do Opioids Help Injured Workers Recover and Get Back to Work? The Impact of Opioid Prescriptions on Duration of Temporary Disability

Bogdan Savych, David Neumark, and Randall Lea

We estimate the effect of opioid prescriptions on the duration of temporary disability benefits among workers with work-related low back injuries. We use local opioid prescribing patterns to construct an instrumental variable that generates variation in opioid prescriptions but is arguably unrelated to injury severity or other factors affecting disability duration. Local prescribing patterns have a strong relationship with whether injured workers receive opioid prescriptions, including longer-term prescriptions. We find that more longer-term opioid prescribing leads to considerably longer duration of temporary disability, but little effect of a small number of opioid prescriptions over a short period of time.

w24595

Developing Novel Drugs

Joshua L. Krieger, Danielle Li, and Dimitris Papanikolaou

We analyze the economic tradeoffs associated with firms' decisions to invest in incremental and radical innovation, in the context of pharmaceutical research and development. We develop a new, ex ante, measure of a drug candidate's innovativeness by comparing its chemical structure to that of previously developed drug candidates: this allows us to better distinguish between novel and so-called "me-too" drugs. We show that, on average, novel drug candidates 1) generate higher private and social returns conditional on approval (as measured by revenues, stock market returns, clinical value added, and patent citations) but 2) are riskier in that they are less likely to be approved by the FDA. Using variation in the expansion of Medicare prescription drug coverage, we show that firms respond to a plausibly exogenous positive shock to their net worth by developing more chemically novel drug candidates, as opposed to more "me-too" drugs. This pattern suggests that, on the margin, firms perceive novel drugs to be more valuable ex-ante investments, but that financial frictions may hinder their willingness to invest in these riskier candidates.

w24623

Pauvreté, Egalité, Mortalité: Mortality (In)Equality in France and the United States

Janet Currie, Hannes Schwandt, and Josselin Thuilliez

We develop a method to compare levels and trends in inequality in mortality in the United States and France in a similar framework. The comparison shows that while income inequality has increased in both the United States and France, inequality in mortality in France remained remarkably low and stable. In the United States, inequality in mortality increased for older groups (especially women) while it decreased for children and young adults. These patterns highlight the fact that despite the strong cross-sectional relationship between income and health, there is no necessary connection between changes in income inequality and changes in health inequality.

w24642

Genetic Endowments and Wealth Inequality

Daniel Barth, Nicholas W. Papageorge, and Kevin Thom

We show that genetic endowments linked to educational attainment strongly and robustly predict wealth at retirement. The estimated relationship is not fully explained by flexibly controlling for education and labor income. We therefore investigate a host of additional mechanisms that could help to explain the gene-wealth gradient, including inheritances, mortality, savings, risk preferences, portfolio decisions, beliefs about the probabilities of macroeconomic events, and planning horizons. The associations we report provide preliminary evidence that genetic endowments related to human capital accumulation are associated with wealth not only through educational attainment and labor income, but also through a facility with complex financial decision-making. Our study illustrates how economic research seeking to understand sources of inequality can benefit from recent advances in behavioral genetics linking specific observed genetic endowments to economic outcomes.

w24686

Air Pollution and Mental Health: Evidence from China

Shuai Chen, Paulina Oliva, and Peng Zhang

A large body of literature estimates the effect of air pollution on health. However, most of these studies have focused on physical health, while the effect on mental health is limited. Using the China Family Panel Studies (CFPS) covering 12,615 urban residents during 2014 – 2015, we find significantly positive effect of air pollution — instrumented by thermal inversions — on mental illness. Specifically, a one-standard-deviation (18.04 μg/m3) increase in average PM2.5 concentrations in the past month increases the probability of having a score that is associated with severe mental illness by 6.67 percentage points, or 0.33 standard deviations. Based on average health expenditures associated with mental illness and rates of treatment among those with symptoms, we calculate that these effects induce a total annual cost of USD 22.88 billion in health expenditures only. This cost is on a similar scale to pollution costs stemming from mortality, labor productivity, and dementia.

w24691

Does Prenatal WIC Participation Improve Child Outcomes?

Anna V. Chorniy, Janet Currie, and Lyudmyla Sonchak

Large literatures document positive effects of WIC on birth outcomes, and separately connect health at birth and future outcomes. But little research investigates the link between prenatal WIC participation and childhood outcomes. We explore this question using a unique data set from South Carolina which links administrative birth, Medicaid, and education records. We find that relative to their siblings, prenatal WIC participants have a lower incidence of ADHD and other common childhood mental health conditions and of grade repetition. These findings demonstrate that a "WIC start" results in persistent improvements in child outcomes across a range of domains.

w24753

Childhood Health Shocks, Comparative Advantage, and Long-Term Outcomes: Evidence from the Last Danish Polio Epidemic

Miriam Gensowski, Torben Heien Nielsen, Nete Munk Nielsen, Maya Rossin-Slater, and Miriam Wüst

A large literature documents that childhood health shocks have lasting negative consequences for adult outcomes. This paper demonstrates that the adversity of childhood physical disability can be mediated by individuals' educational and occupational choices, which reflect their comparative advantage. We merge records on children hospitalized with poliomyelitis during the 1952 Danish epidemic to census and administrative data, and exploit quasi-random variation in paralysis incidence. While childhood disability increases the likelihood of early retirement and disability pension receipt at age 50, paralytic polio survivors obtain higher education and are more likely to work in white-collar and computer-demanding jobs than their non-paralytic counterparts.