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# NBER NATIONAL BUREAU OF ECONOMIC RESEARCH

## BULLETIN ON AGING AND HEALTH

### The Past and Future of the Age Discrimination in Employment Act

The Age Discrimination in Employment Act (ADEA) prohibits employment discrimination on the basis of age. While the original 1967 law covered workers aged 40 to 65, subsequent amendments first raised and then eliminated the upper age limit, ending mandatory retirement for nearly all workers.

How has the ADEA affected U.S. labor markets in the forty years since its passage? Is the ADEA well positioned to meet the challenge of population aging in the coming decades? These questions are the subject of a new working paper by researcher **David Neumark**, “**The Age Discrimination in Employment Act and the Challenge of Population Aging**” (NBER Working Paper 14317).

The author begins with some background information on the ADEA. The Equal Employment Opportunity Commission (EEOC) is responsible for federal enforcement of the ADEA. Individuals with a complaint file a charge with the EEOC, which investigates and may either dismiss the charge, seek a settlement, or file suit against the employer. In 2006, about 23,000 charges were filed under the ADEA, representing 16 percent of all discrimination charges filed with the EEOC.

Among the ADEA-related charges, disputes over terminations were much more common than disputes over hiring or other issues like wages or harassment. The relative paucity of hiring cases could indicate that there are few instances of hiring-related discrimination. Alternatively, it could be that workers are less likely to pursue such cases because they are more difficult to prove or have lower damages than termination cases

or because it would not be appealing to the worker to have the firm forced to hire him or her.

What evidence is there to suggest that there is age discrimination in employment and thus that the ADEA is needed? While reliable evidence is hard to come by, perhaps the most compelling comes from audit (or correspondence) studies, in which matched pairs of applicants (or resumes) with similar characteristics except for age apply for jobs and their labor market outcomes are compared. These studies find worse outcomes for older workers, though one problem is that it is hard to make the applicants similar in all respects except age, since an older applicant will have (or be expected to have) a longer work history. Another study, based instead on survey evidence, finds that older workers who report that their employer favors younger workers have lower wage growth and plan to leave the labor force sooner. Overall, the author interprets the evidence as indicating that even after the passage of the ADEA, labor markets are still characterized by discrimination against older workers.

Are age discrimination laws helpful in combating this phenomenon? One useful way to explore this is to compare the employment rates of older workers in states that did and did not enact age discrimination laws paralleling the ADEA, in the period before the ADEA was enacted. Studies using this approach by the author and others have found that these laws increased the employment rate of workers age 60 and above quite substantially. These studies do not identify the mechanism for higher employment rates, which could include a reduction in ter-

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minations of older workers or an increase in their hiring. Paradoxically, however, the ADEA could in fact deter the hiring of older workers by making it harder to terminate them. The author carefully considers the small literature on this question and concludes that it does not support this theory, though he notes that the logic of the argument and hence the hypothesis may still be correct.

An interesting critique of the ADEA comes from the literature on optimal employment contracts. A seminal paper argues that because of the difficulty of monitoring workers' effort, firms use pay schemes to create incentives to work hard. According to the theory, workers and firms enter into implicit long-term contracts that pay workers less than what their output is worth to the firm when they are young and more than what it is worth when they are old. Firms use mandatory retirement to prevent

workers from working past the point when they have been fully paid for their work. By ending mandatory retirement, the ADEA may have made it more difficult for workers and firms to enter into such contracts and thereby harmed both parties, even if age discrimination laws boost the employment of older workers. However, as the author notes, in the absence of the ADEA, firms could more easily terminate employment before workers had received the full value of their services, and thus the ADEA may have actually strengthened such contracts. The author finds that earning profiles were steeper for cohorts entering the labor force after the passage of the ADEA, which supports the latter view.

What does the challenge of population aging mean for the ADEA and how might the ADEA allow the U.S. to better deal with this challenge? The ADEA can encourage the continued employment of older Americans who want to work, resulting in lower public expenditures on health insurance, retirement benefits, and income support. In contrast to other policies that could be used to encourage workers to work longer, such as increasing the eligibility age for Social Security, the ADEA can increase the

welfare of those workers who want to keep working. The greatest potential for boosting employment is among workers over age 65, whose employment rates are currently quite low, so figuring out how the ADEA affects them in particular is of prime policy importance. Many older workers spend a period of time at a non-career or “bridge” job prior to retirement. Since older workers must be hired into these jobs, it will be important to determine whether the ADEA serves to facilitate or discourage the hiring of older workers.

The author closes by touching on two issues related to the ADEA and the employment of older individuals that are likely to become more important in the future. The first concerns the high health care costs of older workers, which can be a deterrent to their continued employment. One option that may be worth considering is changing EEOC rules to make it easier for employers to cover Medicare-eligible workers under a combination of their own group health plan and Medicare, even if that might entail differences in benefits for older and younger workers. The second concerns work-limiting disabilities, which rise with age. Workers with disabilities may file a charge with the

EEOC under either the ADEA or the Americans with Disabilities Act (ADA). The ADA offers greater protection, and this could make employers reluctant to hire older workers. The interaction between the ADA and the ADEA is a fruitful area for future research.

In conclusion, the author notes “the coming decades will witness sizeable increases in the share of the population aged 65 and over, an age range in which many workers leave their long-term career jobs and move into part-time or short-term jobs. As a consequence, potential problems stemming from age discrimination in hiring may become more important than they have been in past decades. The evidence on both the enforcement and effectiveness of the ADEA is troublesome in this regard, because it suggests the ADEA may be relatively ineffective with regard to hiring of older workers. There may be limitations on how effectively the regulatory and legal system addresses discrimination in hiring, and it would be useful to consider whether this effectiveness can be increased.”

*The author gratefully acknowledges support by the AARP.*

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## The Relative (In)Efficiency of the U.S. Health Care System

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The U.S. spends more on health care than other wealthy nations—in 2006, health care expenditures were 15 percent of GDP in the U.S., compared to 11 percent in France and Germany, 10 percent in Canada, and 8 percent in the United Kingdom and Japan. Yet health outcomes in the U.S. are generally no better than those in other countries. This has led to concern that the U.S. health care system may be less efficient than those of other countries.

In “**Is American Health Care Uniquely Inefficient**” (NBER Working Paper 14257), researchers **Alan Garber** and **Jonathan Skinner** examine whether the apparently inferior performance of the U.S. health care system is real, and the reasons for the observed patterns of expenditures and outcomes.

The authors distinguish between two types of efficiency. Productive efficiency refers to the amount of health that is produced from a given bundle of hospital

beds, physicians, nurses, and other inputs. Allocative efficiency refers to whether an additional dollar spent on health care yields benefits that are as valuable to consumers as an additional dollar spent on schools, housing, or other goods. Some degree of allocative inefficiency is inevitable in any health care system, since by shielding consumers from the full cost of medical care, it leads them to consume care whose cost is less than their benefit. The authors ask whether productive and allocative efficiency are lower in the U.S. than in other developed countries.

Turning first to productive efficiency, the authors note that the finding that the U.S. has higher health care spending but similar health outcomes to other countries is consistent with two possible explanations. The first is that the health care production function is quite flat in this range, meaning that consuming additional health care services yields little or no health benefits. The second is that the U.S. is on a lower

health care production function (is less productively efficient) than other countries. Distinguishing between these explanations has important policy implications—the first implies that reducing U.S. health care spending would not adversely affect health outcomes, while the second implies that it would do so.

Comparing health care production functions across countries is challenging because behavior and genetics, along with a host of other factors, in addition to the health systems, are responsible for variation in health outcomes at the national level. The authors use four proxies for the delivery of cost-effective health care and compare these measures across countries. The U.S. is about average in the fraction of the elderly receiving immunizations for influenza (a highly cost-effective treatment), but has the highest fraction of chronically ill patients who skip recommended care because of cost. The U.S. lags behind many other countries in

the fraction of primary care physicians using electronic medical records and has the highest administrative costs per capita. While administrative costs are often blamed for lower health care productivity in the U.S., the authors note that these expenses are not large enough to explain differences in spending between the U.S. and other countries, nor can they explain why expenditures are growing more rapidly in the U.S.

The authors next turn their attention to allocative efficiency, asking whether Americans consume “too much” health care. Comparing several indirect measures of health care consumption across countries, they find mixed results. The U.S. is about average in the number of acute hospital beds and practicing physicians per capita and in prescription drug use. However, the number of MRI machines per capita in the U.S. is about five times higher than in most other wealthy countries, though lower than in Japan. Both the rate of invasive and expensive treatments (such as particular coronary procedures) and the intensity of care per day of hospitalization are higher in the U.S. than in other countries.

To examine whether U.S. health care expenditures represent money well spent, the authors delve into the literature on the cost-effectiveness of health care spending. They conclude that most of the gains in survival over the last few decades in the U.S. came from improvements in health behaviors and from the use of low-cost health interventions, such as treating heart disease with aspirin and beta blockers. By contrast,

more recent gains in survival come from high-tech interventions that are also high cost—the authors estimate the cost at over \$250,000 per life year saved.

To see whether this pattern is unique to the U.S., the authors contrast increases over time in health care costs and outcomes in the U.S. with those in other countries. They find that increases in spending in the U.S. have greatly outpaced those in other countries, while improvements in life expectancy have been similar, if not slightly worse. The authors argue that the diffusion and adoption of new technology, fueled by favorable reimbursement rates, are the most compelling explanation for the more rapid rise in health care costs in the U.S.

Does the production function embodied in the U.S. health care system lie below that for other countries? The current U.S. health care system features dramatic differences in health care utilization by region, socioeconomic status, race, and insurance coverage status. If care were provided more uniformly, the authors argue, population-level health outcomes could improve somewhat, and similarly for the adoption of electronic records or the expansion of universal insurance coverage. While these reforms would likely save some lives and in some cases might enhance productive efficiency, the authors doubt that these reforms would reduce expenditures overall. In order to really address the cost problems, they argue, allocative efficiency should be improved, which is considerably more difficult to effect politically.

How do the benefits of additional health care spending compare to the benefits that could be obtained by increasing spending elsewhere, and is this comparison less favorable for the U.S. than for other countries? The authors suggest that “what sets the U.S. apart is a combination of incentives for the overuse of some services and underuse of others in a predominantly fee-for-service system, coupled with few supply-side constraints.” The dynamic effects of these incentives may be profound, as insurance coverage is extended to technologies without regard to their proven benefits or cost.

The authors conclude “perhaps the greatest hope for improving both allocative and productive efficiency will come from efforts to measure and reward accurately outcome productivity—improving health outcomes using cost-effective management of diseases—rather than rewarding on basis of unit service productivity for profitable stents, caesarian-sections, and diagnostic imaging regardless of their impact on health outcomes. This will require rethinking what we pay physicians and hospitals and most importantly how to measure and pay for outcomes rather than inputs.”

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## Do Discount Rates Affect Behaviors Like Saving and Smoking?

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Researchers have long been interested in understanding how people make decisions about behaviors that have long-term consequences for their well-being, like saving or smoking. These decisions require individuals to consider how they value costs and benefits that occur in the future versus those in the present—for example, saving requires sacrificing consumption today in order to have higher consumption in the future. Economic theory predicts that the discount rate—the rate at which individuals discount future costs and benefits—will be a critical factor in these decisions.

Different people are likely to have dif-

ferent discount rates, since some people are more patient (low discount rate) while others are more impatient (high discount rate). Do individuals’ discount rates help to explain their decisions about behaviors like saving and smoking? This question is examined in a new study, “**Individual Laboratory-Measured Discount Rates Predict Field Behaviors**” (NBER Working Paper 14270), which is authored by an interdisciplinary team of economists and psychologists including researchers **Christopher Chabris, David Laibson, Carrie Morris, Jonathon Schuldt, and Dmitry Taubinsky.**

The authors use a laboratory task to compute an individual-specific discount rate and then estimate the effect of the discount rate and demographic factors on behaviors such as saving and smoking. While other studies have demonstrated a relationship between laboratory measures of discounting and various behaviors, this study is unique for its use of a large, diverse sample to examine a wide range of behaviors (fifteen in all) and compare the predictive strength of the discount rate to that of demographic variables in explaining these behaviors.

The authors begin by estimating discount rates for over 500 subjects using a

laboratory task. This sample includes participants from three different studies; each study examines a different set of behaviors, but all subjects are given the same laboratory task. Participants are asked to choose between an immediate reward and a long-term reward that would be paid after a specified number of days—for example, whether they would prefer \$40 today or \$55 received in 62 days. They are asked to make 27 such choices, where the size of the immediate and long-term rewards and the number of days of delay are varied for each. To give them an incentive to answer questions honestly, participants have a 1-in-6 chance of receiving one of the rewards they selected. The answers to these questions are used to calculate an individual-specific discount rate. The authors assume a hyperbolic discount function, as this has been shown to predict behavior better than a constant discount rate.

The first study examines health-related variables associated with making tradeoffs between the present and future, including body mass index (BMI), exercise frequency, dieting, and smoking. The authors find that the discount rate is a significant determinant of BMI, exercise, and smoking and that it can explain 15 to 20 percent of the variation (or differences in these variables across people) in each of these measures. Interestingly, no other variable explains as much of the variation as the discount rate. When the authors create an index of these four health variables, the results are even more strik-

ing—the discount rate explains one-quarter of the variation in the index, while no other variable explains more than one-tenth. A second study that looks at BMI and exercise obtains similar results.

The third study examines a much larger set of behaviors, including additional health-related behaviors such as dental check-ups, flossing, and selection of healthy food as well as financial behaviors such as gambling, late payments on credit cards, and saving. This study had the largest sample size, but was administered over the internet rather than in a controlled laboratory setting. The authors find mixed results when they look at the effect of the discount rate on individual behaviors. However, when the behaviors are combined in an index, the discount rate has a significant effect on behavior, though the share of variation explained by the discount rate is smaller than in the other two studies; its effect is smaller than that of age, but larger than that of sex or education.

Next the authors present a theoretical framework to explore how much of the variation in behavior we would expect discounting to explain. Using an example where there are many factors that may have some influence on a behavior (for example, smoking may be affected by exposure to cigarette advertising, seeing celebrities smoke, a desire to use smoking for weight loss, etc.), they show that even if the discount rate was measured perfectly and was a more important determinant of behavior than the other variables, it would still account for only a small

share of the total variation. A second insight of the theoretical model is that discounting will be a stronger determinant of an index of behaviors than of any single behavior.

At first glance, the key findings of the paper appear to be at odds with each other. On the one hand, discount rates are only weakly correlated with individual behaviors—no correlation is above 0.3 and many are close to zero. On the other hand, demographic factors have even less predictive power, despite being measured more precisely, and the relative superiority of the discount rate increases when looking at an index of behaviors rather than individual behaviors. The authors' theoretical results help to reconcile these findings.

The paper's results support two broad conclusions. First, "there exists a domain-general behavioral disposition towards impatience/impulsivity" and second, "a discount rate estimated through a set of intertemporal monetary choice questions constitutes a useful, though noisy, measure of this disposition." The authors suggest that future research could use discount rates as phenotypes in genetic studies designed to identify the molecular mechanisms of intertemporal choice.

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## NBER Profile: Amy Finkelstein

Amy Finkelstein is the Co-Director of the NBER's Public Economics Program and a Research Associate of the NBER's programs in aging, health care, and industrial organization.

Finkelstein is Professor of Economics at the Massachusetts Institute of Technology (MIT). Prior to joining the MIT faculty, she was a Junior Fellow at the Harvard University Society of Fellows.

Professor Finkelstein is a Co-Editor of the *Journal of Public Economics*. She is a member of the National Academy of Social Insurance and has won numerous research awards, including the Elaine Bennett Research Prize, the Distinguished Research Affiliate Award from the Center for European Studies, the TIAA-CREF Paul A. Samuelson Certificate

of Excellence, the Robert Wood Johnson Foundation Scholar in Health Policy Award, and the Ernst Meyer Prize of the Geneva Association.

Professor Finkelstein holds a Ph.D. in Economics from MIT and an M. Phil from Oxford University, where she was a Marshall Scholar. She received her B.A. summa cum laude from Harvard University.

Professor Finkelstein's research is in the area of public finance and health economics. Her two primary research interests are market failures and government intervention in insurance markets, and the impact of public policy on the health care sector.

Finkelstein lives in Cambridge with her (economist) husband Ben Olken and their (as yet non-economist) one year old son Sam.



## Abstracts of Selected Recent NBER Working Papers

14053

**Dora Costa, Matthew Kahn**

### **Health, Stress, and Social Networks: Evidence from Union Army Veterans**

We find that veterans of the Union Army who faced greater wartime stress (as measured by higher battlefield mortality rates) experienced higher mortality rates at older ages, but that men who were from more cohesive companies were statistically significantly less likely to be affected by wartime stress. Our results hold for overall mortality, mortality from ischemic heart disease and stroke, and new diagnoses of arteriosclerosis. Our findings represent one of the first long-run health follow-ups of the interaction between stress and social networks in a human population in which both stress and social networks are arguably exogenous.

14078

**Olivia S. Mitchell, John Piggott, Cagri Kumru**

### **Managing Public Investment Funds: Best Practices and New Challenges**

Large publicly-held pools of assets are playing an increasingly prominent role in the global investment arena. We compare three distinct forms of such public funds, namely foreign exchange reserve funds, sovereign wealth funds, and public pension funds, to highlight their differences and similarities. We review previous studies on ways to better secure prudent and economically sound public fund management practices in these funds, as well as how to evaluate their governance and investment policies and how to better protect the assets from political interference. Drawing from the pension and corporate finance literature, we also link their management to governance practices and country-specific characteristics, and contrast those with empirical findings on linkages with corporate governance.

14089

**Amy Finkelstein, Erzo F.P. Luttmer,**

**Matthew J. Notowidigdo**

### **What Good Is Wealth Without Health? The Effect of Health on the Marginal Utility of Consumption**

We estimate how the marginal utility of consumption varies with health. To do so, we develop a simple model in which the impact of health on the marginal utility of consumption can be estimated from data on permanent income, health, and utility proxies. We estimate the model using the Health and Retirement Study's panel data on the elderly and near-elderly, and proxy for utility with measures of subjective well-being. We find robust evidence that the marginal utility of consumption declines as health deteriorates. Our central estimate is that a one-standard-deviation increase in the number of chronic diseases is associated with an 11 percent decline in the marginal utility of consumption relative to this marginal utility when the individual has no chronic diseases. The 95 percent confidence interval allows us to reject declines in marginal utility of less than 2 percent or more than 17 percent. Point estimates from a wide range of alternative specifications tend to lie within this confidence interval. We present some simple, illustrative calibration results that suggest that state dependence of the magnitude we estimate can have a substantial effect on important economic problems such as the optimal level of health insurance benefits and the optimal level of life-cycle savings.

14095

**Mark Pauly, Fredric E. Blavin, Sudha Meghan**

### **Is There a Market for Voluntary Health Insurance in Developing Countries?**

In many developing countries the proportion of health care spending paid out of pocket

is about half of all spending or more. This study examines the distribution of such spending by income and care type, and the variation in spending about its expected value, in order to see whether voluntary private health insurance that reduces variation in spending might be able to be supplied. Using data from the World Health Survey for 14 developing countries, we find that out of pocket spending varies by income but that most spending usually occurs in income quintiles below the topmost quintile. We use estimates of the variance of total spending, hospital spending, physician spending, and outpatient drug spending about their means to generate estimates of the risk premia risk averse consumers might pay for insurance coverage. For hospital spending and total spending, these risk premia as a percent of expenses are generally larger than reasonable estimates of private health insurer loading as a percent of expenses, suggesting that voluntary insurance might be feasible. However, the strong relationship between spending and income suggests that insurance markets may need to be segmented by income.

14105

### **Alan L. Gustman, Thomas Steinmeier** **How Changes in Social Security Affect Recent Retirement Trends**

According to CPS data, men 65 to 69 were about six percentage points less likely to be retired in 2004 than in 1992. CPS and Health and Retirement Study (HRS) data indicate a corresponding difference of 3 percentage points between 1998 and 2004. Simulations with a structural retirement model suggest changes in Social Security rules between 1992 and 2004 increased full time work of 65 to 67 year old married men by a little under 2 percentage points, about a 9 percent increase, and increased their labor force participation by between 1.4 and 2.2 percentage points, or

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2 to 4 percent, depending on age. Social Security changes account for about one sixth of the increase in labor force participation between 1998 and 2004, for married men ages 65 to 67. These rule changes encourage deferring retirement from long term jobs, returning to full time work after retiring, and increasing partial retirement. Although married men in their fifties decrease their participation in the labor force over this period, this is not due to changes in Social Security, but may reflect other factors, including changes in disability.

**14125**

**Ellen Meara, Meredith Rosenthal, Anna Sinaiko, Katherine Baicker**  
**State and Federal Approaches to Health Reform: What Works for the Working Poor?**

We compare and contrast the labor market and distributional impact of three common approaches to state and federal health insurance expansion: public insurance expansions, refundable tax credits for low income people, and employer and individual mandates. We draw on existing estimates from the literature and individual-level data on the non-institutionalized population aged 64 and younger from the 2005 Current Population Survey to estimate how each approach affects (1) the number of people insured; (2) private and public health spending; (3) employment and wages; and (4) the distribution of subsidies across families based on income in relation to the federal poverty level and work status of adult family members. Employer mandates expand coverage to the largest number of previously insured relative to public insurance expansions and individual tax credits, but with potentially negative labor market consequences. Medicaid expansions could achieve moderate reductions

in the share of the uninsured with neutral labor market consequences, and by definition, they expand coverage to the poorest groups regardless of work status. Tax credits extend coverage to relatively few uninsured, but with neutral effects on the labor market. Both Medicaid expansions and tax credits offer moderate redistribution to previously insured individuals who are poor or near-poor. None of the three policies significantly expand insurance coverage among poor working families. Our findings suggest that no single approach helps the working poor in exactly the ways policy makers might hope. To the extent that states are motivated to help the uninsured in poor working families, health reforms must find ways to include those unlikely to take up optional policies, and states must address the challenge of the many uninsured likely to be excluded from policies based on part-time work status, firm size, or immigration status.

**14153**

**M. Kate Bundorf, Jonathan D. Levin, Neale Mahoney**  
**Pricing and Welfare in Health Plan Choice**

Pricing in government and employer-sponsored health insurance markets only partially reflect insurers' expected costs of coverage for different enrollees. This can create inefficient distortions when consumers self-select into plans. We develop a simple model to study this problem and estimate it using new data on small employers. In the markets we observe, the welfare loss compared to the feasible efficient benchmark is around 2-11% of coverage costs. Three-quarters of this is due to restrictions on risk-rating employee contributions; the rest is due to inefficient contribution choices. Despite the inefficiency, we find substantial benefits from plan choice relative to single-insurer options.

**14156**

**Pinka Chatterji, Sara Markowitz**  
**Family Leave after Childbirth and the Health of New Mothers**

In the United States, almost a third of new mothers who worked during pregnancy return to work within three months of childbirth. Current public policies in the U.S. do not support long periods of family leave after childbirth, although some states are starting to change this. As such, it is vital to understand how length of family leave during the first year after childbirth affects families' health and wellbeing. The purpose of this paper is to examine the association between family leave length, which includes leave taking by mothers and fathers, and behavioral and physical health outcomes among new mothers. Using data from the Early Childhood Longitudinal Study - Birth Cohort, we examine measures of depression, overall health status, and substance use. We use a standard OLS as well as an instrumental variables approach with county-level employment conditions and state-level maternity leave policies as identifying instruments. The results suggest that longer maternity leave from work, both paid and un-paid, is associated with declines in depressive symptoms, a reduction in the likelihood of severe depression, and an improvement in overall maternal health. We also find that having a spouse that did not take any paternal leave after childbirth is associated with higher levels of maternal depressive symptoms. We do not find, however, that length of paternal leave is associated with overall maternal health, and we find only mixed evidence that leave length after childbirth affects maternal alcohol use and smoking.

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