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Health Insurance, Health Care and Labor Supply by Older Adults

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Abstract

This paper examines the effect of elective surgery receipt on Social Security Disability Insurance application and receipt amongst older adults with common chronic conditions. I use panel data from the Health and Retirement Study to follow older adults with work-limiting disabilities who develop new chronic conditions. Comparisons of patients who do and do not receive elective surgery suggest that both angioplasty and joint replacement surgery reduce the probability of applying for Social Security Disability Insurance by up to 22 percentage points and delay the age at which a respondent first claims Social Security benefits. Increasing access to medical care amongst chronically ill workers may help to reduce new SSDI applications. Findings also suggest that there are important economic effects of medical treatment intensity that should be considered in cost-effectiveness analysis.

1 Introduction

In 2008, more than 7.7 million working-aged Americans with work-limiting disabilities received monthly benefits from the Social Security Disability Insurance (SSDI) program. Many of them also received healthcare coverage through the Medicare program, averaging an additional $8,933 in annual utilization (Social Security Administration, 2011). Rapid increase in the proportion of working aged adults receiving SSDI benefits has raised concerns about the ongoing ability to finance benefits for this group, and about the need to support work amongst older adults with disabilities (Autor and Duggan, 2010).

Early workforce exits are publicly costly due to foregone payroll taxes and disability benefit payments, but also costly to workers, whose SSDI benefits are typically lower than their earnings, and who lose the additional contributions to retirement benefits and Social Security earnings credits associated with paid work. Despite a large literature has shown the importance of health status and disability on work and retirement decisions of older workers (see for example, Jones et al., 2009; McGarry, 2004; Bound et al., 1999; Kapteyn et al, 2008 and Currie and Madrian, 1999 for a review of the earlier literature), relatively little is known about the role of healthcare utilization in preventing or delaying workforce exit. Work disability is not necessarily a permanent state; for example Kapteyn et al. (2008) note that half of all Health and Retirement Study respondents surveyed in 1992 who report a disability that limits work in one wave report no disability in subsequent waves.

In this paper, I consider the role of commonly performed elective surgical treatments for chronic illness in older adults decisions to apply for SSDI or claim Social Security Old Age (retirement) benefits prior to full retirement age. I focus on elective joint repair for arthritis patients and angioplasty for heart disease patients. The medical literature suggests that these treatments target patient quality of life rather than length of life. Thus, by improving patients pain and mobility, elective surgical procedures may facilitate increases in recipients' functional status and ability to participate in paid and unpaid work (Sloan et al., 2009; Murphy et al., 2008). A small number of studies in the medical literature find that some patients return to work after hip or knee replacements, but those have lacked national data and have short follow-up periods (Bohm et al., 2010; Mobasheri et al., 2006).

Although medical research points to benefits from these surgeries for appropriate patients, there is controversy about the extent to which these expensive procedures should be used. As policymakers are pressed to expand the role of comparative effectiveness re-

search in the Medicare program, with implications for the healthcare provided to disabled workers and adults working past age 65, greater understanding of the consequences of surgical care for patient economic outcomes is necessary to inform treatment decisions.

I use panel data from the Health and Retirement Study to follow older adults with work-limiting disabilities who develop new chronic conditions. Comparisons of patients who do and do not receive elective surgery suggest that both angioplasty and joint replacement surgery reduce the probability of applying for Social Security Disability Insurance by up to 22 percentage points and delay the age at which a respondent first claims Social Security benefits. Reductions in availability of discretionary treatments designed to save money in the Medicare program may be costly in the long-term if they reduce labor supply from older adults who would otherwise keep working.

2 Background

2.1 Osteoarthritis and Joint Replacements

Osteoarthritis is a degenerative disease of the articular cartilage between bones meeting at joints such as the hip, knee, and hands. Overall cartilage surface declines as the cartilage fragments and ulcerates beyond the body's ability to repair it. This can result in increased pain and stiffness with motion. The Centers for Disease Control estimates that one-third of adults aged 65 and older have osteoarthritis (CDC, 2010). Osteoarthritis can be treated with physical therapy, pain medication, and surgical replacement to alleviate symptoms.

Joint replacement surgeries are common orthopedic procedures performed to alleviate pain. Procedures involve surgically removing diseased or damaged cartilage and bone from the hip or knee joint and replacing them with an artificial joint typically made of metal, plastics and polymers. The medical literature has found that replacements are an effective way of treating arthritis pain and improve mobility for many patients, though there is little consensus about which patients will benefit from surgical intervention (NIH Consensus Development Panel on Total Hip Replacement, 1995; Kane et al., 2003).

Conventional wisdom, largely based on work from the Dartmouth Atlas Project, suggests that higher levels of use reflect overutilization, though the optimal rate of use is unknown. Medicare spent $3.2 billion in 2000 for hip and knee replacements and demand for joint replacements is projected to increase by 60 percent over the next 30 years in response to the aging of the Baby Boom population (Kane et al., 2003). Replacement

surgeries are safe, low-mortality procedures where risk is derived from surgical complications or hospital-acquired conditions. Operations are generally performed on the "young old;" in the HRS data 11 percent of elective replacements occur before age 56, 35 percent before age 65 and 75 percent by age 75.

2.2 Heart Disease and Angioplasty

Coronary artery (heart) disease results from plaque accumulations along the arteries that supply blood to the heart. These are hardened deposits of fat, cholesterol and other substances in the blood, which can harden along the artery walls and constrict the path of fresh blood. This hardening is associated with chest pain, shortness of breath, heart palpitations or heart attack (NHLBI, 2010). Heart disease is the leading cause of mortality in the United States, and has a considerable financial burden as well; the Centers for Disease Control estimate that the annual cost of heart failure exceeds $400 billion (CDC, 2010b).

Angioplasty, also known as percutaneous coronary intervention, is a surgical treatment to alleviate this arterial constriction. This can include stent placement or inflating a balloon to clear space for blood flow (NHLBI, 2010). Studies have focused on the mortality benefits of angioplasty relative to medical management or more aggressive surgical care and there remains controversy over optimal rates of procedure use (Joseph and Teo, 2011; Brooks et al., 2010). Like joint replacement, angioplasty is often performed in younger patients, 10 percent are performed in patients aged 57 and under; 32 percent by age 65, and 70 percent by 75. While mortality is an important outcome, quality of life and economic outcomes are also relevant for this group.

2.3 Chronic Illness and Disability Insurance

Table 1 compares the prevalence of chronic conditions amongst Health and Retirement Study respondents who are interviewed at ages 65-66 by SSDI status. Rates of many chronic conditions, including arthritis and heart disease, are markedly higher amongst respondents who had previously applied for and received SSDI benefits. Arthritis and heart disease affect the largest proportions of older adults, highlighting the business case for understanding the consequences of medical treatment for disability outcomes.

Table 1: Prevalence of Chronic Health Conditions Amongst Older Adults by Social Security Disability Insurance History

	Never Apply	Applicants	Recipients
Arthritis	0.58	0.81	0.81
	(0.49)	(0.39)	(0.39)
Cancer	0.12	0.16	0.16
	(0.32)	(0.36)	(0.37)
Diabetes	0.18	0.37	0.37
	(0.38)	(0.48)	(0.48)
Chronic Heart Disease	0.20	0.45	0.46
	(0.40)	(0.50)	(0.50)
Back Pain	0.16	0.31	0.31
	(0.37)	(0.46)	(0.46)
Chronic Lung Disease	0.09	0.24	0.24
	(0.29)	(0.43)	(0.43)
Observations	7,811	949	765

Standard deviations in parentheses.
Health and Retirement Study, 1996 - 2008.

3 Data

3.1 Health and Retirement Study

I use survey data from the 1996 - 2008 waves of the Health and Retirement Study (HRS), a nationally representative longitudinal study of more than 20,000 older Americans and their spouses who are typically aged 51-61 at first interview. The HRS is designed to capture demographic, physical and cognitive functioning, work, and family structure variables related to health and retirement through biennial interviews (Juster and Suzman, 1995). The HRS data include detailed information about work, disability, health status and healthcare utilization.

In order to study patients whose decisions about elective surgery may influence decisions to apply for SSDI or to claim Social Security retirement benefits prior to full retirement age, my sample is limited to HRS respondents who report having "any impairment or health problem that limits the kind or amount of paid work you can do?" before age 66. During the study period, the HRS data include 3,156 observations from respondents who report such a limitation, have a maximum of 1 SSDI application episode. This analysis focuses on the 259 respondents in this group who first report developing heart disease, and the 736 new arthritis cases that develop during the study period. Respondents are

followed for between 1 and 6 waves, up to the point where they reach normal retirement age or most recent HRS interview.

I focus on three outcomes related to Social Security benefit claiming; whether a respondent applies for SSDI benefits anytime after developing the chronic condition; whether a respondent receives SSDI benefits after condition onset; and age Social Security benefits first claimed, which is age at SSDI benefits began for the disabled and age at which retirement benefits were claimed for those who never receive SSDI. This measure is only observed for respondents who have started receiving some form of Social Security benefit.

Table 2 describes the arthritis and heart disease cohorts. One-fifth of respondents with these chronic conditions apply for SSDI during the observation period, and about 15% ultimately receive benefits. I observe 60% of arthritics and 65% of the heart disease patients claim SSDI or Social Security benefits; on average these beneficiaries initiate benefits at age 60.8. More than half of respondents are currently working for pay at the time of the interview where they first report the chronic condition (arthritis, 57%; heart disease 54%). The samples are predominantly female (arthritis, 65%; heart disease 54%).

Respondents in both the arthritis and heart disease cohorts report difficulties with large muscle (averaging 1.6 - 1.7 out of 4 limitations with sitting, getting up from a chair, stooping, and picking up large objects) and gross motor (averaging 0.47 -0.56 out of a possible 5 difficulties walking several blocks, walking or running 1 mile, climbing a flight of stairs, getting in and out of bed and bath) mobility. These limitations can make it difficult for workers with many types of jobs to travel to an office, complete physically demanding tasks, or even to remain seated at a desk for a full work day. 7% of the arthritis cohort and 34% of the heart disease cohort have elective surgery (i.e. not associated with a hip fracture or heart attack, acute medical events that could necessitate surgical repair) for their condition during the study period.

3.2 Medicare Claims

Annual age, race, sex standardized rates of elective hip and knee replacements amongst Medicare beneficiaries reported by the Dartmouth Atlas of Health Care are used to classify hospital referral regions. Rates of procedure rates are averaged across the two years corresponding to HRS interview waves. HRRs are ranked by quartile of utilization, with high-intensity regions exhibiting the highest adjusted rates of elective surgery per 1,000 Medicare beneficiaries. HRS respondents are linked by zipcode and wave to the intensity

Table 2: Summary Statistics: Arthritis and Heart Disease Cohorts

	Arthritis	Heart Disease
Apply for Disability Insurance	0.20	0.19
	(0.40)	(0.39)
Receive Disability Insurance	0.14	0.15
	(0.35)	(0.36)
Age Start DI or Social Security	60.8	60.7
Benefits	(4.9)	(4.8)
Receive Surgery	0.07	0.34
	(0.25)	(0.48)
Live in High-Surgery Region	0.12	0.18
	(0.32)	(0.38)
Ever Uninsured After Onset	0.30	0.28
	(0.46)	(0.45)
Working at Onset	0.57	0.54
	(0.50)	(0.50)
Respondent Age	57.37	58.57
	(4.95)	(4.92)
Black	0.18	0.14
	(0.38)	(0.35)
Hispanic	0.13	0.10
	(0.33)	(0.31)
Female	0.65	0.54
	(0.48)	(0.50)
Years of Education	11.83	11.93
	(3.32)	(2.99)
Large Muscle Limitations Index	1.69	1.57
	(1.33)	(1.36)
Gross Motor Limitations Index	0.47	0.56
	(0.97)	(1.14)
Cancer	0.12	0.13
	(0.33)	(0.33)
Diabetes	0.20	0.21
	(0.40)	(0.41)
Chronic Lung Disease	0.13	0.16
	(0.33)	(0.36)
Separated/Divorced	0.16	0.15
	(0.37)	(0.36)
Widowed	0.08	0.07
	(0.27)	(0.26)
Total Wealth Less IRA	204,369	181,852
	(518,345)	(314,253)
Observations	736	259

Standard deviations in parentheses.

characteristics of the HRR in which they live. This paper focuses on comparisons between patients in the highest utilization HRRs and those in the other three quartiles.

4 Methods

I analyze the effect of elective surgery receipt on Disability Insurance application and Social Security claiming behavior amongst older adults in the years following initial arthritis or heart condition diagnosis. I first estimate linear probability models (ordinary least squares regressions) of SSDI application and receipt (age at SS benefit onset) on an indicator of whether patient$_i$ receives joint replacement surgery or angioplasty in the period between onset and most recent interview or full retirement age. For the arthritis and heart disease cohorts separately, I estimate regressions of the form

$$D_{it-t_0} = \alpha Surg_{it-t_0} + \beta X_i + T + \epsilon_i \tag{1}$$

where D_{it-t_0} is an indicator for the SSDI outcomes or age at first benefit receipt, $Surg_{it-t_0}$ is an indicator of angioplasty (joint replacement) receipt, and X is a vector of respondent baseline characteristics reported in Table 2 including sex, race, age at condition onset, other comorbid health conditions, education, marital status, decile of household wealth, and number of waves observed. T is a vector of year of condition onset dummy variables.

Estimates of Equation (1) may be biased if unmeasured factors drive both the decision to receive surgery and to apply for SSDI. For example, highly motivated workers or those with more accommodating employers may be more likely to undergo surgery to alleviate disabling symptoms in order to continue working. I use geographic variation in practice patterns to identify the effect of surgery. As Table 3 shows, rates of elective procedure use vary considerably in the Medicare population, and this variation does not appear to be driven by the underlying health of patients residing in different regions of the country.[1]

This variation in practice patterns suggests that physicians in high-intensity regions operate on patients at different levels of need than those in low-intensity regions. In related work, I demonstrate that patients with arthritis are more likely to receive joint replacement if they live in a high-treatment region, and that patients in these regions on average report lower levels of arthritis disability prior to surgery than patients in other

[1]Researchers at the Dartmouth Atlas Project have classified the United States into 306 Hospital Referral Regions, a unit of health geography defined at the zip code level and based on empirically observed patient commuting patterns to hospitals (Fisher et al., 2003a,b).

Table 3: Rates of Elective Procedure Use Across Hospital Referral Regions

	Highest-Intensity	Lowest-Intensity
Elective Hip Replacements/1,000	6.52	3.08
	(0.70)	(0.59)
Elective Angioplasty	12.3	5.5
	(4.0)	(2.0)
Hip Fractures/1,000	5.3	5.2
	(2.2)	(2.6)
Death Rate (Overall)	0.05	0.05
	(2.8)	(2.9)

Standard deviations in parentheses.
Hospital Referral Region of residence classified by rates of elective procedures in Medicare fee-for-service. Highest and lowest quartiles of utilization shown.
Summary statistics based on 100% Medicare claims.

regions of the country (Nicholas, 2011). While my samples are too small to support an instrumental variables approach, I modify Equation (1) by adding an indicator for patients living in hospital referral regions in the highest quartile of procedure use and an interaction between region and surgical treatment:

$$D_{it-t_0} = \alpha Surg_{it-t_0} + \gamma High_i + \delta High * Surg_{it-t_0} + \beta X_i + T + \epsilon_i \tag{2}$$

Hospitalizations for the elective procedures considered in this paper, as well as the associated rehabilitation care, are expensive, and health insurance status can be an important confounding variable, both because of its frequent link to employment status in the United States and as a measure of access to care. As Table 2 illustrates, nearly 30% of respondents in both chronic condition cohorts experience periods without health insurance. I test whether the probability of surgical treatment differs for patients who do and do not experience any periods without insurance coverage following the onset of their chronic condition:

$$Surg_{it-t_0} = \lambda Uninsured_{it-t_0} + \beta X_i + T + \epsilon_i \tag{3}$$

Equation (3) is estimated with and without an indicator of whether the respondent was working for pay at chronic condition onset. All models are estimated with robust standard errors to account for arbitrary heteroskedasticity.

5 Results

5.1 Elective Surgery and SSDI

Table 4 presents the estimates from Equations (1) and (2). The first specification ignores geographic heterogeneity and presents the relationship between surgery and SSDI application (receipt) for all patients. There is no relationship between receipt of a joint replacement and the decision to apply for SSDI (α = -0.08, se = 0.05), though receiving surgery is associated with a 7 percentage point decline in the probability of receiving SSDI (α = -0.07, se = 0.04)and of working an additional 1.29 (se = 0.53) years prior to receipt of any form of Social Security benefits.

The Equation (1) estimates indicate that angioplasty is associated with lower likelihood of applying for SSDI (α = -0.12, se = 0.06) and an additional 3.5 year delay before claiming benefits. There is no relationship between angioplasty and probability of receiving SSDI benefits, however.

The Equation (1) results may be biased upward if only workers who are highly motivated to remain in the workforce seek out treatment. Alternatively, it may be biased downward if patients get surgery after their disease has progressed to a point where return to full functioning is unlikely. Equation (2) represents the effect of surgery for the *marginal* patient who receives surgery in a high-intensity region, but likely would not if he lived elsewhere. Although neither the surgery main effect or surgery*high interaction term are statistically significant in the arthritis sample, the combined effect, $\alpha Surg_{it-t_0} + \delta + High * Surg_{it-t_0}$ is economically and statistically significant. The marginal patient is 22 percentage points less likely (se = 0.08) to apply for and 13 percentage points less likely (se = 0.06) to receive SSDI. There were too few (10) patients receiving joint surgery in high-intensity regions who had already claimed Social Security benefits to obtain reliable estimates of the effect on delayed claiming.

Equation (2) results also suggest a large effect of surgery in delaying workforce exit and preventing SSDI application for heart disease patients. As Table 4 shows, the marginal (high-intensity region) surgery recipient is 19 percentage points less likely to apply for SSDI (se = 0.10) and first claims benefits 4.5 years later than those who do not receive surgery. The heart disease results also indicate a significant main effect of surgery for all recipients that is unchanged from the values in the Equation (1) specification; a 12 percentage point decline in the probability of applying for SSDI and a 3.5 year delay in claiming any Social Security benefits.

Table 4: Elective Surgery and Social Security Disability Insurance Decisions for Disabled Workers

	Apply for DI		Receive DI		Age Claim SS/SSDI	
Arthritis						
Joint Repair	-0.08	-0.07	-0.07*	-0.05	1.29**	
	(0.05)	(0.06)	(0.04)	(0.05)	(0.53)	
High-Intensity Region		0.23		0.20		
		(0.15)		(0.15)		
Surgery in High-Intensity		-0.15		-0.07		§
Region		(0.10)		(0.08)		
Surgery+Surgery*High		-0.22***		-0.13**		§
Interaction Term		(0.08)		(0.06)		
N	737	737	737	737	438	
R^2	0.11	0.11	0.05	0.07	0.33	

§ There are insufficient observations to estimate Surgery*High-Intensity.

Heart Disease

Angioplasty	-0.12**	-0.12*	-0.09	-0.09	3.5***	3.5***
	(0.06)	(0.06)	(0.05)	(0.06)	(0.98)	(1.11)
High-Intensity Region		-0.09		-0.14		-1.15
		(0.11)		(0.11)		(1.5)
Surgery in High-Intensity		-0.07		-0.05		1.0
Region		(0.12)		(0.12)		(2.2)
Surgery+Surgery*High		-0.19*		-0.13		4.5**
Interaction Term		(0.10)		(0.10)		(1.9)
N	259	259	259	259	168	168
R^2	0.22	0.23	0.16	0.18	0.46	0.46

Robust standard errors in parentheses. * p $<$ 0.10, ** $<$ 0.05, *** p $<$ 0.01.
OLS regression coefficients indicate probability of applying for (receiving) SSDI benefits after condition onset or age respondent first claimed Social Security disability or retirement benefits controlling for characteristics in Table 2.
Health and Retirement Study respondents reporting a work-limiting disability and arthritis or heart disease prior to full retirement age, 1996 - 2008.

5.2 Use of Elective Surgery

These results suggest that surgical treatments can play an important role in enabling chronically ill older adults to avoid transitioning to SSDI or early Social Security benefit claiming. However, periods of uninsurance can be a barrier to receipt of surgery since these procedures are costly and elective surgery typically requires multiple physician office visits to determine appropriateness and prepare for surgery. In Table 2, I showed that 30 percent of patients in both condition cohorts experienced a spell of uninsurance between condition onset and age 65, when Medicare provides near-universal coverage. This total includes patients who are in the two-year waiting period for Medicare benefits following SSDI receipt. Table 5 shows the results of descriptive regressions of surgery receipt on an indicator of whether the patient was ever uninsured after condition onset and other patient characteristics.

There is no significant relationship between elective joint surgery and uninsurance across models that do and do not control for whether the respondent was working at arthritis onset. Surgery is more likely for arthritics who report higher levels of mobility limitation and amongst more educated patients. For heart disease patients, on the other hand, experiencing a period of uninsurance is associated with a 12 - 14 percentage point lower probability of receiving angioplasty, a large effect compared to the mean of 0.34, and compared to the potential additional years until benefit claiming reported for heart disease patients in Table 4.

6 Conclusions and Policy Implications

Although health status and chronic health conditions are viewed as important determinants of retirement decisions, relatively little is known about the role for specific medical interventions to enable chronically ill workers to remain in the workforce longer. Using longitudinal survey data from the Health and Retirement Study, I find evidence that elective surgical treatments for both arthritis and heart disease reduce the probability of applying for Social Security Disability Insurance and delay claiming of Social Security benefits. These results have important implications for beneficiary well-being, Social Security financing, and expansion of comparative effectiveness research.

Expansion of workplace policies to promote use of surgical procedures that would allow employees to return to their jobs could help to extend work lives. While the current SSDI program does not provide access to medical care for the first 27 months, alternative

Table 5: Uninsurance and Elective Surgery Use

	Joint Surgery		Angioplasty	
Ever Uninsured	-0.028	-0.028	-0.123*	-0.142**
	(0.018)	(0.018)	(0.069)	(0.069)
Working at Onset		-0.009		0.130**
		(0.022)		(0.065)
Age at Onset	-0.003*	-0.004*	-0.023***	-0.020***
	(0.002)	(0.002)	(0.007)	(0.007)
Black	-0.011	-0.011	-0.044	-0.038
	(0.025)	(0.025)	(0.093)	(0.093)
Hispanic	-0.008	-0.008	-0.074	-0.088
	(0.025)	(0.025)	(0.110)	(0.110)
Female	-0.008	-0.009	-0.163**	-0.159**
	(0.020)	(0.019)	(0.067)	(0.067)
Years Education	0.010***	0.010***	-0.017	-0.023*
	(0.003)	(0.004)	(0.012)	(0.013)
Large Muscle Limitations	-0.003	-0.003	-0.033	-0.038
	(0.008)	(0.008)	(0.028)	(0.027)
Gross Motor Limitations	0.025*	0.024*	-0.021	-0.013
	(0.013)	(0.013)	(0.040)	(0.040)
Seperated/Divorced	-0.032	-0.032	-0.065	-0.054
	(0.022)	(0.022)	(0.087)	(0.086)
Widowed	-0.017	-0.015	-0.077	-0.053
	(0.029)	(0.029)	(0.128)	(0.126)
Single	-0.05	-0.05	0.439***	0.403***
	(0.045)	(0.044)	(0.149)	(0.152)
n	736	736	259	259
R^2	0.097	0.097	0.216	0.23

Robust standard errors in parentheses. * p $<$ 0.10, ** $<$ 0.05, *** p $<$ 0.01.
OLS regression coefficients indicate probability of elective surgery after onset. Health and Retirement Study respondents reporting a work-limiting disability and arthritis or heart disease prior to full retirement age, 1996 - 2008.
Models also control for wealth decile, comorbidities and onset year.

programs could be created to provide temporary benefits to workers using unpaid leave for surgery and rehabilitation under the Family and Medical Leave Act, for example. Alternatively, the program could provide targeted healthcare benefits for uninsured or underinsured workers to reduce or eliminate their share of out-of-pocket spending on the surgical episode.

Preventing new SSDI applications and delaying workforce exits through elective surgery is beneficial for Social Security financing on two dimensions as workers remaining at work continue to make Social Security payroll tax contributions and they do not draw SSDI benefits. However, the cost of a surgical episode (including the hospitalization, surgical procedure, and follow-up care) can approach $40,000 for some cardiac procedures (Birkmeyer et al., 2009), and should be counter-balanced with the expected gains of worker productivity. Programs that help to increase surgery take-up without assuming the full cost of care may be most practical for the SSDI program.

Findings also suggest that changes to the Medicare program may have important consequences for OASI outlays. Although this paper demonstrates a link between medical care utilization and economic outcomes, comparative effectiveness analyses often fail to consider these endpoints. Provisions in the Affordable Care Act aim to reduce variation in rates of elective procedure utilization in Medicare. This may have adverse effects on work and Social Security claiming behavior amongst younger beneficiaries, including those qualifying though SSDI. Further research on these program interactions can help to inform policymakers about the consequences of changes to Medicare policy for OASDI financing.

Findings should be interpreted in light of several limitations. Although based on a large, nationally representative study, sample sizes were small and may have precluded estimating important effects in some cases. Furthermore, the analytic sample was restricted to respondents who developed a new chronic condition and reported a disability that limited their functioning prior to full retirement age, which is a subjective measure and may create a sample that does not generalize to all patients with arthritis or heart disease.

Despite these limitations, this research highlights areas where policy changes or demonstration programs targeted at specific subgroups of workers with chronic health conditions may enable them to remain in the workforce.

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