

## **The Rise of Prescription Opioids and Enrollment in Disability Insurance**

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## Abstract

Working age individuals frequently suffer chronic pain, making musculoskeletal impairments the most common reason for new disability insurance awards in the last decade. Little research has asked whether and how medical treatment for such patients might influence entry onto disability insurance, nor do we know whether and how medical advances prevent labor market exit among those suffering from chronic pain. In this preliminary work, we isolated cohorts of adults age 50 to 55 with back pain and followed their labor market participation and disability enrollment over eight years. Over one third of adults in this age group report suffering from back pain. During our period of study, 1996 through 2014, the prescription of opioids to treat chronic pain more than doubled. We examined whether later cohorts of adults with back pain, those exposed to higher volume opioid prescribing for chronic pain, were any less likely to transition to disability insurance, or exit labor market compared with earlier cohorts, unlikely to be treated for pain with opioids. Comparing cohorts of adults with back pain across years, however, the trend towards disability insurance was remarkably similar. In each cohort, individuals increased their enrollment in DI steadily over time. By 8 years from baseline, across all cohorts, 7-10 percent of older adults with back pain had enrolled in DI. A similar stability over time occurred when we examined labor force participation among adults with back pain.

Do increases in pharmaceutical treatment for people with pain reduce enrollment in federal disability insurance (DI)? We address that question in this paper. Specifically, we consider whether people with back pain have experienced reduced enrollment in disability insurance over time, as treatment for back pain has expanded.

Understanding the impact of medication on DI enrollment is motivated by a large literature on the welfare impact of changes in medical technology (Chernew and Newhouse 2012) Technological advances in medicine clearly result in greater spending on the affected disease (Newhouse, 1992, Cutler, 1995). Going from a situation where disease cannot be treated or can be treated only poorly to one where it can be treated well is inevitably associated with greater cost. However, a new treatment for a particular condition may have spending offsets in other areas. For example, treating pain well may prevent subsequent complications – for example, reducing the need for surgery. Indeed, the offsets could extend outside of medical costs. In the case of pain, many people with untreated or unsuccessfully treated pain will leave work and enroll in DI. If better treatment for back pain enables people to work more, the savings in reduced DI enrollment may offset some or all of the costs of the treatment.

Pain is a natural condition to examine when looking for health care offsets. First, back pain is prevalent. In the Health and Retirement Study sample discussed below, about one-third of people aged 50-62 report persistent or troublesome back pain when surveyed.

Second, back pain is a significant cause of disability. Social Security Administration data show that musculoskeletal impairments, including back pain, are the leading disabling condition among new Disability Insurance awards (Social Security Administration 2015). By another metric, the National Health Interview Survey asks people questions of the form: “By yourself, and without using any special equipment, how difficult is it for you to:” walk a quarter of a mile;

climb 10 steps; stand or be on your feet for 2 hours; sit for 2 hours; stoop, bend, or kneel; reach up over your head; use your fingers to grasp or handle small objects; lift or carry 10 pounds; push or pull large objects; go out shopping, to movies, or sporting events; participate in social activities; and do things to relax at home or for leisure. For people who report difficulty with any of these activities, the survey asks what condition caused the impairment. Figure 1 shows the results. Back and neck pain is the most common response, followed by arthritis.

Third, treatment for pain has expanded dramatically over time. Data from IMS tabulated by the National Institutes on Drug Abuse estimates that in 1992, 76 million prescriptions were filled for opioid medications. Over the next two decades, that number nearly tripled to 219 million at its peak in 2011. Opioid medication, including drugs like hydrocodone and oxycodone, are the most commonly prescribed painkillers.

The question we wish to address is whether this revolution in treatment has affected the share of people with pain who enroll in Disability Insurance. The obvious first pass at this question is to relate disability insurance enrollment to use of prescription medications for people who report pain. Do individuals who have musculoskeletal pain and take opioids remain off DI longer than those who do not take prescription medications? In practice, answering this question is hindered by two issues. First, treatment of musculoskeletal pain by medication is a sign that the pain is relatively severe. Thus, people who receive medications will necessarily be more likely to enroll in DI. Second, even among people with similar severity of disease, people treated with opioid medications may differ from other people in unmeasured ways – for example, they may be more likely to have health insurance that covers a greater share of the medical costs. These omitted variables may have their own effect on DI enrollment.

The natural solution to these omitted variable problems is to find an instrumental variable for receipt of opioid medications. For example, if some people receive medications for reasons other than disease severity or socioeconomic status, such as based on practice patterns in the area where they live, those differences could be used to identify how use of opioid medications affects DI enrollment. We have spent some time searching for appropriate instruments for opioid use, and are continuing to do so. Unfortunately, population rates of opioid use at state and local levels were weakly correlated with use of prescription painkillers in our data. As yet, we are unable to find an instrument with an appropriately strong first-stage relationship with prescription opioid usage.

As a result, we take a different approach to the issue in this paper. In our preliminary research reported here, we examine cohorts of people of a similar age (50-55) starting in different years from the mid 1990's through 2014. We then trace the subsequent DI enrollment of people in each of these cohorts. We know from national opioid prescription data that opioid prescriptions grew rapidly, from 94 million at the start of the period we observe (1996) to its peak in 2011 at 219 million prescriptions (Figure 1), more than doubling the chance of exposure to opioid medications in the population. People in the later cohorts were much more likely to take opioid medications than were people in the earlier cohorts. We thus examine whether the DI enrollment experience of people in the later cohort differed from that of people in the earlier cohort. If DI enrollment declines for people reporting back pain in later cohorts, that would be consistent with a favorable impact of opioid medications on DI enrollment. Given the controversy over use of opioid medications for chronic pain (Volkow and McClellan 2016), an alternative hypothesis is that later cohorts, exposed to more opioid medications, might be more

likely to leave the labor force and enroll in DI, as chronic opioid use has been associated with increased sensitivity to pain in some samples. We also examine the labor force participation of each cohort in subsequent waves to examine whether people with back pain continued to work for longer in more recent cohorts, or whether they may have left the labor force sooner during periods with greater exposure to prescription opioids.

The next section discusses the Health and Retirement Study data we employ. The third section presents our results. To summarize in advance, we find no evidence that DI enrollment trends differed for people with back pain in later years of the survey. Work force participation 2-4 years after baseline declined slightly less in the most recent cohorts, but again this is not a significant change. The final section presents a strategy for future research.

## **II. Data on Back Pain, Disability, and Labor Force Participation**

The data that we employ are from the Health and Retirement Study (HRS). The HRS is a longitudinal survey of elderly and near-elderly individuals. The first wave of the survey, conducted in 1992, enrolled the near-elderly population. That population has been followed biennially since. In addition, new population groups have been added over time, in waves 4 and 10, both at older ages and to replenish younger individuals.

Our primary focus is on how opioid medications in the near elderly affected subsequent labor force participation and disability insurance enrollment. When people reach age 62, they often transition onto Old Age Assistance rather than claim DI. For this reason, we need to stay below the Social Security early retirement age. Our primary sample is people aged 50-55. Because we are interested in transitions onto DI, we sample only those who are not in DI in the year they are observed.

A person can be in the relevant age group in more than one wave. For example, a person may be 52 in one wave of the survey and 54 in the next. We include that person in each of the two waves in which they are eligible. The specific question about back pain is: “[Since we last talked to you in (previous interview month)] Have you had any of the following persistent or troublesome problems? Back pain or problems?” The question was asked using this wording beginning in wave 3 in 1996; we omit data from prior waves with different question wording. The question was asked of everyone in waves 3, 5, 7, 9, and 11 and asked only of new interviewees in waves 4, 6, 8, 10 and 12.

Table 1 shows the resulting sample size in each wave. The first column shows the number of people aged 50-55 who were asked the back pain question. The second column shows the number of people who report having back pain, which ranged from 30 percent to 43 percent over the time period for the waves with sufficient sample size for us to consider. Also, in the waves with available data on use of prescription painkillers, the trends among 50-55 year olds with back pain are consistent with national trends in Figure 1. Use rises rapidly between 2008 and 2010, growing from 39 to 46 percent of older adults with back pain, and use grows more slowly until 2012 when the same figure was 49 percent.

The third column shows that, excluding waves 6, 8, and 12, the number of people with back pain and not on DI ranges from 423 in wave 9 to 1,329 in wave 10. All of these sample sizes seem large enough for reasonable estimates.

### **III. Results**

Figure 3 shows the trend in DI enrollment for cohorts based on year of first reporting back pain. The line in the left on the figure is the trend in DI enrollment for the 1996 cohort. By

definition, none of those individuals were enrolled in DI in 1996, so that data point is not shown. In 1998, 1.9 percent of the cohort was enrolled in DI. By 2004, eight years after first observation, 6.8 percent of the cohort was on DI.

The lines to the right show the trends for later cohorts of individuals. The question that we address is whether later cohorts of people, who are more likely to receive opioid prescriptions for back pain, are less likely to go on DI. Figure 3 shows no evidence that this is the case. The share of people with back pain who wind up on DI is slightly higher in later cohorts of individuals than earlier cohorts, though the rates are approximately equal. On average, about 7 to 10 percent of people with back pain wind up on DI within eight years, and that is roughly true across cohorts.

Figure 4 shows corresponding figures for labor force participation. Since the sample was selected independent of labor force status in the initial year, we show labor force participation rates in the first year the individual is observed as well as in subsequent years. For the 2008 and 2010 cohorts, labor force participation declined slightly less in the first 2 years after baseline than in other cohorts. This effect was small and could reflect delayed retirement due to the Great Recession of 2007 to 2009.

#### **IV. Implications and future plans**

Working age individuals frequently suffer chronic pain, and with this rise in pain, musculoskeletal impairments have become the most common reason for new DI awards in the last decade. Among adults reporting functional limitations, nearly one third report back and neck pain, arthritis, or both. Little research has asked whether and how medical treatment for such patients might influence entry onto DI or labor market exit among those suffering from pain. In



this preliminary work, we found that over one third of older adults in the HRS suffered back pain. Comparing cohorts of adults with back pain across years, however, the trend towards disability insurance was remarkably similar. Within 2 years, 2-3 percent had enrolled in DI, and within 8 years, 7-10 percent had enrolled in DI. This pattern looked remarkably similar comparing cohorts with relatively low opioid prescribing to periods of high opioid prescribing. If prescribing more opioids made back pain less debilitating, that change did not translate into changes in DI participation rates. The converse situation, in which opioid prescribing might accelerate the move towards disability enrollment, also seems unlikely.

Our estimates of labor force participation paint a similar picture in which older adults with back pain show a common trajectory of labor force exit regardless of the cohort. Back pain cohorts from periods with low opioid prescribing had similar labor force exit patterns over 8 years compared with cohorts from periods when prescribing volumes had doubled in 2004, for example. Labor market exit occurred steadily over an eight-year period within each cohort of adults with back pain, falling 15 to 18 percentage points. Two cohorts stand out, however. For cohorts newly reporting back pain in years around the Great Recession, labor market exit was less likely. It is not yet clear whether the delayed labor market exit reflects a response to the recession (working longer amid concerns that housing wealth and other sources of savings had diminished), or whether this story is consistent with higher opioid use. The fact that the 2004 cohort, one exposed to twice as many opioid prescriptions as the 1996 cohort, does not show this pattern, suggests these later cohorts differ due to the influence of the recession.

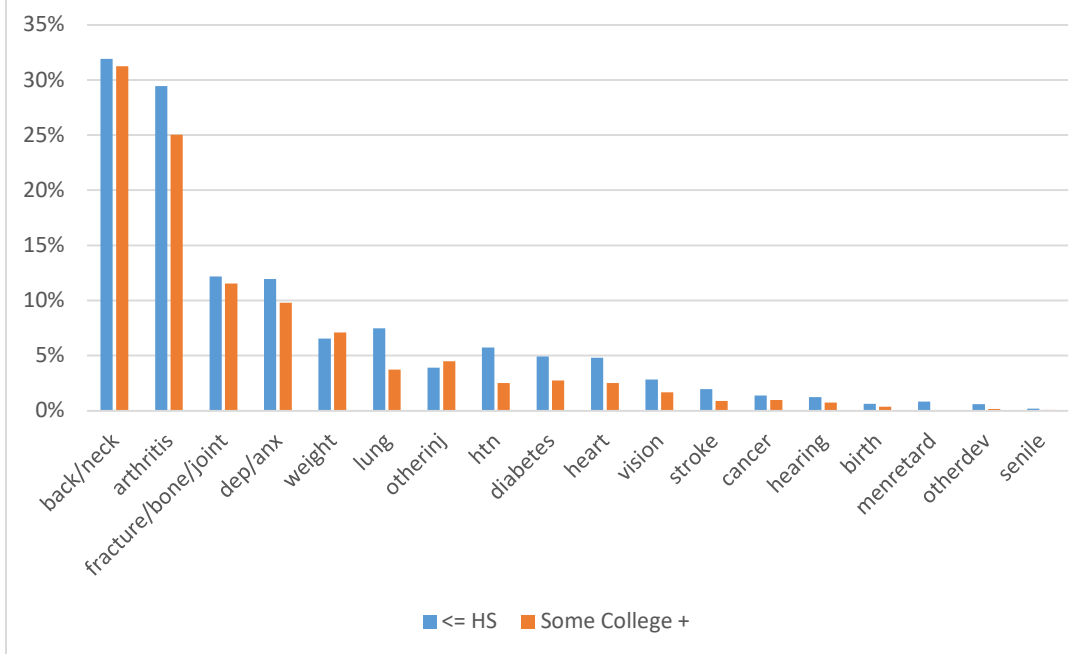
Future research on this topic will explore two avenues. First, we will continue to experiment with stronger sources of plausibly random variation in opioid prescribing to better understand whether prescription painkillers play a role in the lead-up to labor force exit or

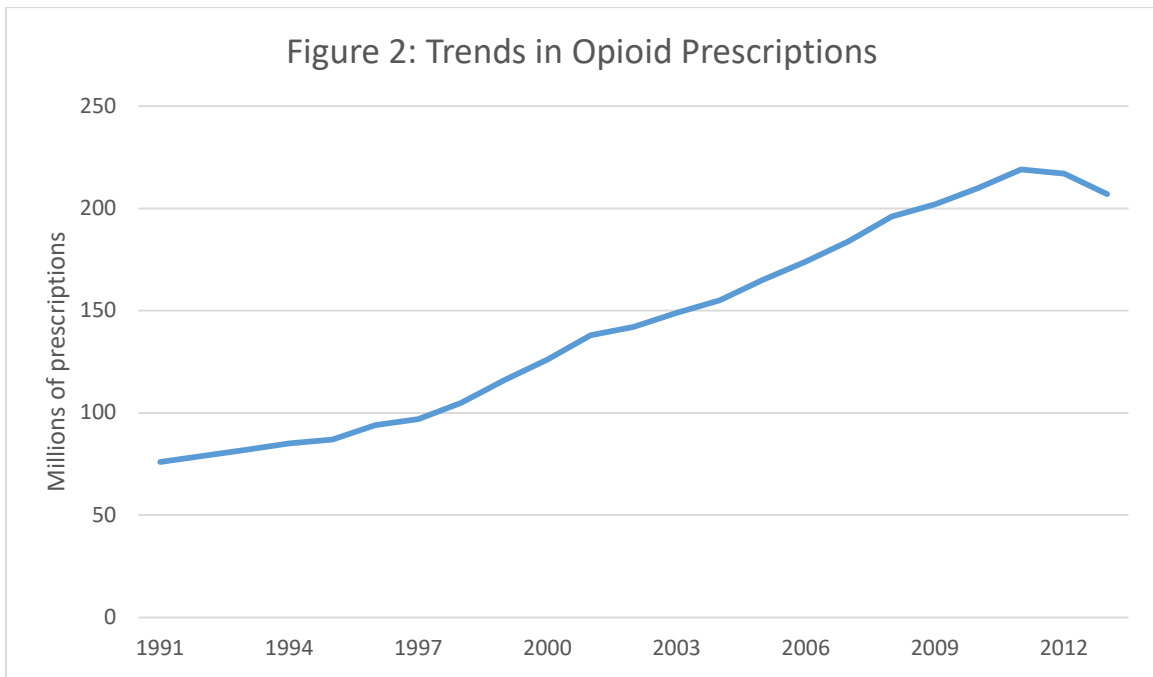
disability enrollment. With a better source of random variation in opioid prescribing patterns, we can learn more about paths onto disability insurance. This research can explore other labor market outcomes such as hours worked, to reflect changes in work intensity, or job separation in relation to back pain. Second, we will use state and time variation in prescribing over time linked to data on DI applications and awards to better understand these trends at a population level, rather than in a narrow age band. This future work will elucidate whether and how medical treatment influences often ignored dimensions like labor market outcomes and entry onto DI.

## References

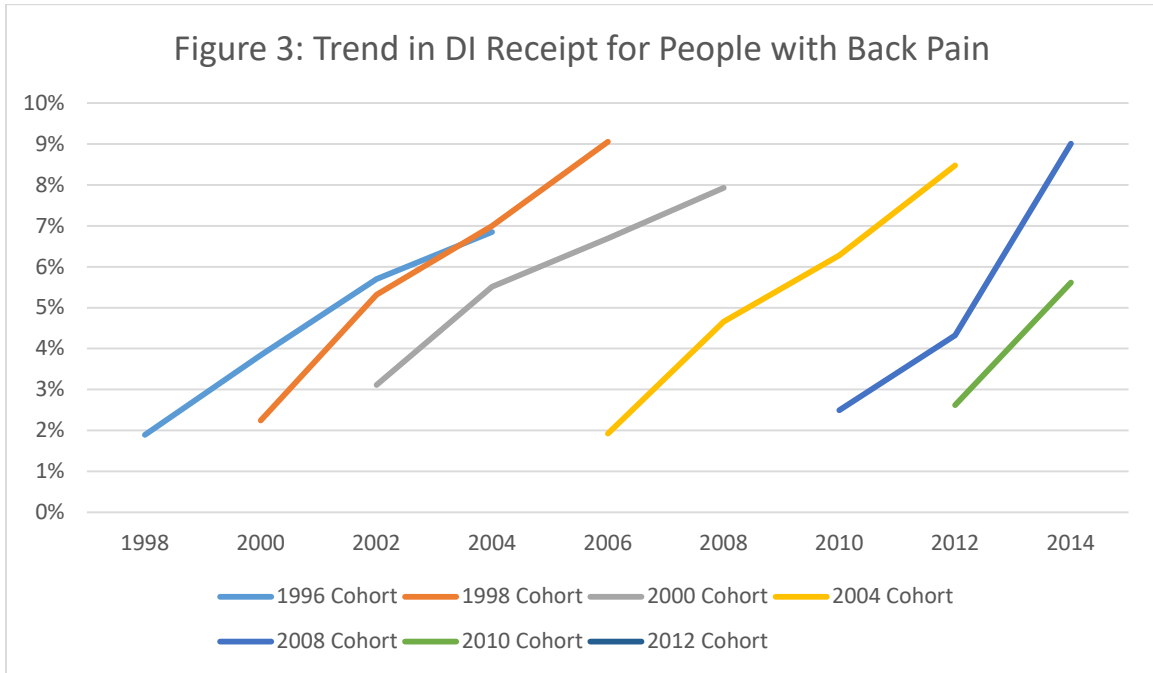
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Figure 1: Problems Associated with Physical Activity Limitation, National Health Interview Survey, Ages 25-62

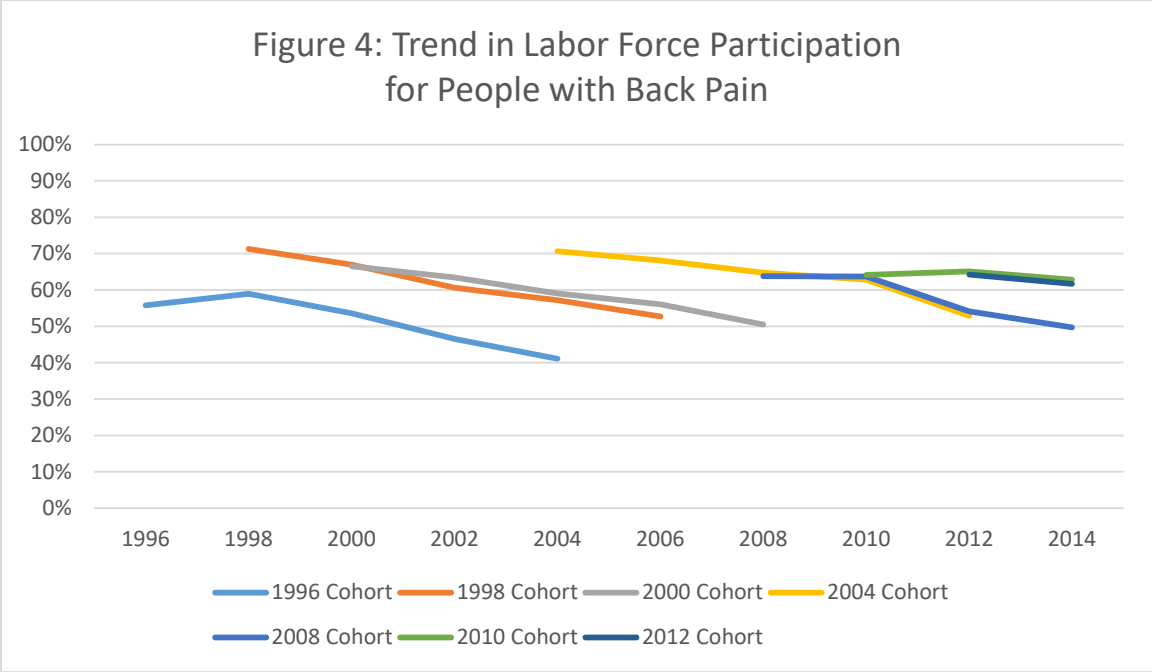




Source: Senate testimony to Senate Caucus on International Narcotics Control, presented by Nora Volkow, May 14, 2014. Available at <https://www.drugabuse.gov/about-nida/legislative-activities/testimony-to-congress/2016/americas-addiction-to-opioids-heroin-prescription-drug-abuse>.



Source: calculations using the Health and Retirement Study, respondents aged 50 to 55, with back pain, not receiving DI during cohort year.



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**Table 1: Sample Size for HRS Analysis**

Year	Wave	Number of People Aged 50-55			Of adults with back pain, using prescription painkillers
		Asked about Back Pain	With Back Pain (percent)	With Back Pain and Not on DI	
1992	1	---	---	---	---
1994	2	---	---	---	---
1996	3	2,136	668 (31%)	584	---
1998	4	1,197	737 (38%)	633	---
2000	5	2068	659 (32%)	573	---
2002	6	44	17 (39%)	16	---
2004	7	3,182	1,204 (38%)	1,050	---
2006	8	40	12 (30%)	10	---
2008	9	1,342	485 (36%)	423	39%
2010	10	3,762	1,635 (43%)	1,329	46%
2012	11	3,063	1,199 (39%)	965	49%
2014	12	18	19 (49%)	18	---

Note: Data are from the Health and Retirement Study. Back pain was asked with consistent wording beginning in wave 3. Prescription painkiller questions were asked of sufficient sample size starting in wave 9.