# What Happens When You Wait? Effects of DI Wait Time on Health and Financial Well-Being

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Abstract

While waiting for a decision, individuals who apply for Social Security Disability Insurance face strong incentives to remain out of the labor force and receive no support from the program. In this paper I use linked survey and administrative data and an instrumental variables approach to estimate the effect of initial wait time on health, health care access, and financial well-being. I find that a longer wait decreases the likelihood that an applicant has benefits terminated at the time of survey and increases the likelihood that they are currently receiving benefits. Wait time also increases the number of conditions causing activity limitations, suggesting that even small increases in wait time can have negative implications for applicants, and that these extend beyond labor force participation.

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## 1. Introduction

In order to qualify for Social Security Disability Insurance (DI) benefits, applicants must demonstrate that they are unable "to engage in any substantial gainful activity (SGA) by reason of a medically determinable physical or mental impairment(s) which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months" (Social Security Act, 1965). Engaging in SGA is defined as earning more than a set amount per month, $1,180 for non-blind individuals in 2018. In 2008, the average DI applicant waited about four months for an *initial* determination. However, because those whose claims are denied can appeal that decision at multiple levels, total waiting time is often much longer. On average, in 2008 applicants waited over a year for a final decision, with around 10 percent of applicants waiting three years or longer (Autor, Maestas, Mullen, & Strand, 2015).

A long wait can mean an extended period out of the labor force as well as delayed benefits and insurance coverage. Applicants who are engaging in SGA are not eligible for benefits, and employment while waiting for a decision can be used as evidence that the applicant is able to work. Beneficiaries are eligible for DI benefits five months after onset or after a favorable decision. Although retrospective payments are made for months when the beneficiary was waiting for a decision, applicants do not know if they will be awarded benefits, or when that award will occur, which may make consumption smoothing difficult for many.[1] Applicants who are still waiting for a decision 29 months after disability onset would also experience a delay in Medicare coverage. For the 16% of DI applicants who apply to Supplemental Security Income (SSI) at the same time, even the average four month wait for an initial decision means delayed financial support and insurance coverage, as they would receive SSI benefits

[1] In a survey of 2008 DI awardees, 80% reported that waiting for benefits had affected their finances. Two thirds of these reported relying on assistance from friends, family, and charity, while 40% took on debt (SSA 2009).

Medicaid eligibility essentially immediately upon acceptance. For those who are ultimately denied there is no compensation for time spent waiting.

Time out of the labor force, delays in receiving benefits and insurance coverage, and uncertainty can all have implications for applicants' well-being by affecting their daily activities, income, and health care access. Staying out of the labor force means time for job skills and labor force attachment to decay. It could lower well-being through a drop in income, which limits both consumption and applicants ability to spend money to improve their health, and loss of employer-based health insurance. However, it could allow applicants to invest more time in their health, which might be particularly important when recovering from an illness or adjusting to new impairments. There is some evidence that receiving DI for a short period of time increases earnings for those who are subsequently removed from the program, which might be explained by this opportunity to invest time in health at a crucial moment (Moore, 2015). Delayed benefits mean lower income, at least temporarily, while delayed Medicare or Medicaid coverage could harm both health care access and financial well-being, as applicants are forced to either forgo insurance coverage or pay for more expensive, and perhaps less comprehensive, coverage (Gross & Notowidigo, 2011).[2] Research suggests that health insurance improves access to health care, as well as some components of health (Currie & Gruber, 1996, Michalopoulos et al., 2011, Finkelstein et al., 2012, Baicker et al., 2013). This may be especially important for DI applicants, who by definition have a serious health care condition.

A well-established literature has estimated the effect of DI on applicants' and beneficiaries' labor force participation and earnings (Bound, 1989, Chen & van der Klaauw, 2008, Maestas Mullen & Strand, 2013, French & Song, 2014, Gelber, Moore & Strand, 2017). Less is known about the effects of DI on other outcomes. In a recent working paper Gelber, Moore & Strand (2018) find that larger benefit

[2] Analyses using a similar data set to that used here found that almost a quarter of beneficiaries were without insurance coverage in the year before application, 37 percent had insurance from their own employer, and 33 percent had insurance through a spouse's employer (Livermore, Stapleton, and Claypool, 2009).

amounts decrease mortality among beneficiaries in the first five years after allowance. As discussed above, research also suggests that, for those who lose eligibility for benefits, having received benefits for about three years can increase earnings compared with those who have been on for a very short time (Moore, 2015). An analysis of changes to the Dutch DI system suggests that changes to income and work can have implications for the health of DI beneficiaries. However, the Dutch systems of DI and social support are quite different from those in the US, so this work provides limited insights into the US system (Garcia-Gomez & Gielen, 2014).

Wait time appears to play a substantial role in the effect of DI - taking wait time into account increases the effect of DI on employment by about 50%, suggesting that the previous consensus understated the impact of the program substantially (Autor et al., 2015). Long waits force applicants to change their behaviors in order to fund consumption. Coe, Lindner, Wong, & Wu (2013) investigate the coping strategies that applicants use, and find that longer waiting times increase SNAP usage while decreasing the use of unemployment insurance and the likelihood of changing addresses. Despite these indications that waiting time is important to well-being, to my knowledge no other research has addressed the effect of DI wait time in a setting that allows for causal inference.

I address this gap in the literature using the restricted 1997-2005 National Health Interview Survey (NHIS) linked to two SSA administrative files – the Master Beneficiary Record (MBR) and 831 File – through 2007 to examine the effects of waiting time on health, health care access, and financial well-being. This linked data combine the relative accuracy and programmatic detail of administrative records with a rich description of well-being available only in survey data.

Individual wait time depends in part on the characteristics and choices of applicants. To simply compare the outcomes of those with different wait times would conflate the effect of time waiting for a decision with these factors. Instead, I use information on the number of pending applications and number of decisions made to construct expected wait times by state and month of application, and use

these as instruments for individual wait time. This allows me to isolate the variation in wait time that is caused by factors beyond the individual's control, such as differences in processing speed or backlogs from earlier applications.

I find evidence that wait time increases the likelihood of currently receiving benefits at the time of survey and decreases that of having had benefits terminated. This is broadly consistent with previous findings that wait time decreases employment and earnings, and would be expected if a longer wait makes the return to work more difficult. I find that wait time decreases the likelihood of seeking a reconsideration. I also find evidence that wait time increases the number of conditions causing activity limitations. This may point to one of the ways in which wait times impede return to work, but also demonstrates that wait time has implications for beneficiaries' well-being that are not confined to workforce outcomes. I do not find significant effects of wait time on other outcomes, although point estimates suggest that wait time increases BMI, has no effect on mental health, and increases poverty. Ultimately, I am limited in my ability to identify the effects of wait time by sample size.

My results provide evidence that the effects of DI, and of wait time in particular, are not limited to workforce outcomes. Researchers have so far focused on these work and earnings because they are convenient to study. However, while employment and earnings are important, they are insufficient to characterize well-being or to measure the impact or value of DI.

The rest of this paper proceeds as follows. Section 2 describes the data used and samples constructed. In Section 4 I describe the method used, and in Section 5 the results. Section 6 concludes.

## 2. Data and Sample

### 2.1 Data Sources

I use linked data that includes information from the 1997-2005 National Health Interview Survey (NHIS), the NHIS restricted access mortality file through 2011, and two SSA administrative files – the Master Beneficiary Record (MBR) and 831 File – through 2007. The NHIS is a cross-sectional household

survey that covers the civilian non-instutionalized population of the United States (National Center for Health Statistics, 2006). Respondents are asked to provide their social security numbers and consent to have their survey responses linked to other data. From the survey I draw information on demographics, state of residence, and a host of indicators of health, health care access, and financial well-being. Because many of the indicators of health care access measure similar concepts, I create an index of health care access. To create the index I count the number of questions about health care access with non-missing data for each respondent, as well as the number of questions on which the respondent reported a barrier to access[3]. I then divide latter number by the former number, resulting in an index runs from 0 to 1.

The MBR and 831 files are used by the Social Security Adminstration for program operations. The MBR includes information, in many cases monthly, on all individuals who apply for DI or for retirement benefits from SSA. The 831 file is focused on the determination process for those who apply to either DI or SSI. My extract of these files includes only those individuals who are matched to the NHIS data and appear in both the MBR and the 831 file. Crucially, the files record the dates on which applications were submitted, and decisions made. They also include information on primary disabling conditions, month-by-month program status, and other programmatic details.

**2.2 Sample**

The linked data provides information for all NHIS respondents who provided SSNs and consented to be linked, for whom a successful link was performed, and who applied to DI between 1988 and 2007. From this file I construct a sample that includes those who applied before interview. For my analyses I use an instrument defined using summary statistics on the number of applications received

[3] These questions include: whether the respondent has seen a dentist in the past 12 months; whether prescription medicine, mental health care, dental care, or medical care were needed but could not be afforded; whether care was delayed due to cost; whether the respondent has a usual place for care; whether the respondent has no form of health insurance; and whether the household paid $500 or more out of pocket in the past year.

and processed in each state and month. This information is only available beginning in October 2000, so my sample is further restricted to those with an application on or after that month. For individuals with more than one application I find the most recent initial application at time of survey and consider this as their application of interest[4]. I identify the initial decision as the earliest decision associated with that initial application date, and note all decisions associated with that application date recorded in the 831 file.[5] I drop the handful of applications considered under the Quick Disability Determination program and other special expedited processes. I also drop those for whom the wait time for the initial decision cannot be determined due to missing or inconsistent information, those with negative wait times, and those with wait times in the top 1%. These final two restrictions come from an assumption that implausible wait times are more likely to be reflective of data errors than truth, and that very extreme waits are unlikely to be driven by variation in expected wait times.

The main sample includes 2,155 individuals who applied for benefits from October 2000 to December 2005. On average, they were 47.5 years old at survey and 46 at application, as shown in Table 1. Over a third of applicants had a musculoskeletal primary disabling condition and 22 percent had a mental health condition as their primary diagnosis. On average, they faced a 102 day initial wait time, about 3 ½ months, although this average camouflages the long right tail in wait times. This is more apparent in Figure 1, which depicts the distribution of initial wait times, top coded at 300 days.

Linking survey data to administrative records allows me to evaluate how accurately survey respondents reported their application behavior. Although all sample members had applied for DI at the time of survey, less than 75% reported doing so. A little more than half had applied for SSI at the time of

[4] Applications begin with an initial application and initial decision. Individuals whose claims were rejected could continue to pursue their applications though several levels of appeal. They can also resubmit their claim after a period of time.

[5] Unfortunately, the 831 file does not record detailed information on most appeals beyond the reconsideration step. The MBR contains some information on these decisions, but my extract of the file does not include them in the format needed to accurately trace their path.

survey, but about a third reported doing so. Only around 61 percent correctly reported their SSI application status. These inaccuracies are part of the reason administrative data is crucial to analyzing beneficiary experiences.

Table 2 details sample sizes, means, and standard deviations for program status and the various measures of health, health care access, and financial well-being. At the time of survey about 60 percent were receiving DI benefits, 1 percent had benefits suspended, 6 percent had benefits terminated, and the remainder had never had benefits. About 40 percent reported being in good or better health. About 45 percent reported that they experienced at least one symptom of depression always or often, suggesting that many more than the 22 percent of sample members who had a mental health condition as their primary diagnosis might benefit from mental health care. In the year prior to interview, 46 had seen a dentist, 32 percent had been unable to afford prescription medicine, 15 percent mental health care, and 32 percent dental care. Thirty one percent had had some family member forgo needed medical care because it was too expensive. Thirty five percent had delayed medical care due to cost. About a quarter did not have health insurance at the time of survey. Despite these barriers, only 10 percent did not have a usual place for care. Almost 30 percent had family income at or below the Federal Poverty Level, and about 15 percent had died by the end of 2011.

## 3. Method

Simply comparing the outcomes and characteristics of those with shorter and longer wait times would conflate the true effects of waiting for a decision and the circumstances that cause some to face longer waits than others. Wait times vary across individuals both for reasons associated with that individual's outcomes, such as impairment, job prospects, or choices to pursue initially denied applications, and those that are not, such as examiner speed, determination office staffing, and previous caseloads. In order to identify the causal effect of wait time on outcomes it is necessary to isolate the variation caused by the latter factors. To do so I use publicly available information on the number of

decisions and pending applications for each state for each month from October 2000 to the present to construct the expected wait times for an initial decision that prevailed when and where the application was made, and use these as instruments.

(1) $ExpWait_{sym} = \frac{Pending_{sym-1}}{Decisions_{sym}}$

The expected wait ($ExpWait_{sym}$) for state *s* year *y* and month *m* is the number of pending applications for that state at the end of month *m-1* divided by the number of decisions made in month *m*. This reflects the number of months it would take the Disability Determination Service to process an application submitted at the beginning of month *m*, assuming applications are considered in the order they are received and decisions are made at the rate that prevails in that month.

(2) $Wait_{isym} = \beta_1 X_{isym} + \beta_2 ExpWait_{sym} + \gamma_s + \gamma_y + \gamma_m + Unemp_{sym} + \varepsilon_{isym}$

(3) $Outcome_{isym} = \beta_1 X_{isym} + \beta_2 \widehat{Wait_{isym}} + \gamma_s + \gamma_y + \gamma_m + Unemp_{sym} + \varepsilon_{isym}$

I use this instrument in a standard linear IV framework. In the first stage, wait time for individual *i* who applies in state *s*, year *y*, and month *m* ($Wait_{isym}$) is estimated based on individual demographics ($X_{isym}$), the instrument for expected wait ($ExpWait_{sym}$), state, year, and month fixed effects, the unemployment rate ($Unemp_{sym}$), and a random error. In the second stage, actual individual wait time is replaced by the estimated wait time produced by the first stage ($\widehat{Wait_{isym}}$). I report estimates with and without a control for the expected wait time from the previous month ($ExpWait_{sym-1}$). Standard errors are clustered at the state level.

My estimates reflect the causal effects of wait time if, conditional on controls, individuals who applied in state-months with different expected wait times would have the same outcomes were it not for the wait they face. In addition to demographics, ($X_{isym}$) I control for several other factors that might cause correlation between expected waits and individual outcomes. First, some states, months, and years have higher wait times in general, which may be correlated with unobserved differences in other characteristics. For example, applicants in December may be different from those in other months, and

also face different wait times. I address this concern by including fixed effects for state, month, and year of application.

Second, applicants could know something about wait times and decide when to apply based on that information. This is unlikely to be a major factor for those who are not working just before application, but could be a consideration for disabled workers deciding to leave a job and pursue DI benefits. To address this issue, I make use of the fact that individuals do not know the wait they will face in advance, as summary data cannot be published until after the month has ended. Instead, individuals attempting to time their applications would have to rely on information on previous waits or previous backlogs to form their expectations. I include estimates that control for a 1-month lagged expected wait, reflecting what an applicant's best guess of their own wait time might be.

Third, applications generally increase when employment prospects are poor, lengthening wait times (Autor and Duggan, 2003). This is a problem both because the applicants who are induced to apply by poor economic conditions are probably different from other applicants and because the state of the economy can have independent effects on some of the outcomes I consider. I address this in two ways. First, I include a control for the unemployment rate in the state, year, and month of application to capture month-to-month variation in economic trends. While unemployment does not fully capture applicants' job prospects it should be at least correlated with month-to-month changes in economic conditions. Second, to the extent that economic conditions evolve somewhat smoothly over time, the inclusion of lagged wait time should control for the effect of a similar economic situation, as it is reflected in wait time.

## 4. Results

### 4.1 First Stage

I begin by evaluating the strength of my instrument, with the results displayed in Table 3. Kleibergen-Papp F-statistics appear at the bottom of the table and are greater than 10 for the full

sample. An additional month of expected wait causes 16.87 days of additional wait, as shown in column 1. After controlling for lagged wait, an additional month of expected wait causes 12.15 days of individual wait, reflecting serial correlation in waits.

### 4.2 Effects of Wait Time

Table 4 displays IV estimates of the effect of wait time on program status. The estimates in Panel 2 include a control for the previous month's wait time, while those in Panel 1 do not. An additional day of wait time increases the likelihood of having benefits terminated at the time of survey by 0.14 percentage points, or about 2 percent. Most terminations occur due to death or aging out of the program. No one in my sample has died at the time of survey and the regression controls for age, so these effects must be driven by other terminations, such as those for work or medical recovery. Having benefits terminated for these reasons often takes time, so this could simply reflect the fact that those who face longer initial waits have received benefits for less time. It could also reflect changes to underlying factors, such as health or willingness and ability to work. It is worth noting that the effect of wait time on terminated status is not significant after controlling for lagged wait, although the point estimate is reasonably close, and I find an increased likelihood of having current benefits at the time of survey. This leads me to believe that the loss of significance is result of a loss of power.

Longer wait times also decreased the likelihood of seeking a reconsideration by 0.24 percentage points when not controlling for lagged wait time, a 0.7 percent change. This is in contrast to the finding that wait time increased reconsiderations in Autor et al. (2015). The source of this difference is unclear, but it may result from differences in instrument. Their instrument identifies the effect of examiner speed, after controlling for average speed in the state, month and year of application. It seems possible that absolute wait time decreases reconsiderations, perhaps because applicants cannot afford to continue, but wait time relative to peers increases reconsiderations, because applicants interpret their long wait as a signal that theirs was a close decision that is likely to be overturned.

I do not find a significant effect on the likelihood of having ever received benefits at the time of survey, or of having benefits suspended. The point estimates are quite small and vary considerably across specifications. Greater precision would be needed to determine the effect of wait time on these outcomes. Estimates using survey weights appear in Table A.1 They are largely similar to those without weights, except that I find a marginally significant effect of wait time on ever having had benefits by the time of survey when controlling for lagged wait.

Table 5 presents estimates of the effect of wait time on health, health care access, and financial well-being, following the same structure as in the previous table. I find that an additional month of wait increases the number of conditions that cause activity limitations by about 0.2. The average respondent reports 1.7 such conditions, so this is a sizable increase, and controlling for 1-month lagged wait time doubles the estimated coefficient. I do not find significant effects of wait time on the number of conditions causing functional limitations, having good or better health, the number of bed days, BMI, or experiencing at least one depression symptom often or always. In some cases these point estimates would be meaningful if more precisely estimated. For example, more precise estimates would allow me to conclude that wait time has a substantial effect on the number of bed days, and no effect on the likelihood of reporting depression symptoms. Instead, I am unable to state with confidence that waiting has any effect on bed days, and cannot rule out changes to depression symptoms as large as 20 percent from an additional month of wait time.

The remainder of Table 5 displays estimates of the effect of wait time on the health care index, receiving SNAP in the previous year, having household income at or below 100% of the Federal Poverty Level, and working in the week previous to survey. None of these results are significantly different from zero. In most cases the point estimates suggest that wait time does not have an economically meaningful effect, but they are too imprecisely estimated to say this with confidence. The exception to this rule is poverty. Focusing on the results with a control for 1-month lagged wait time, the point

estimate suggests that an additional month of waiting increases the likelihood of having a family income at or below FPL by about 6 percentage points, or 20 percent. Unfortunately, this estimate is very imprecise, so I am unable to rule out increases as large as 13 percentage points or decreases as large as 2 percentage points. Using survey weights does not substantively change these results, as shown in Table A.2. I also find a similar pattern for each of the components of the health care access index, results for which appear in Table A.3.

It is likely that wait time matters more for some applicants than for others. For example, ultimately denied applicants never receive any compensation for their time waiting for a decision, while those who eventually receive benefits can receive back payments. Those with a spouse, especially a working spouse, may be better able to cope financially and have an easier time obtaining health insurance. This would be consistent with the finding by Coe et al. (2013) that applicants with employed spouses had longer wait times. Unfortunately, the size of my sample does not provide the power needed to investigate effects of wait time on most subgroups.

## 5. Conclusion

As of February 2018, over 10 million individuals received benefits from the DI program, totaling nearly $11 billion in that month alone (SSA 2018). Little work has addressed the relationship between the DI program and outcomes other than employment, or the effects of the application process.

I use an instrumental variables strategy to estimate the effect of waiting for a decision on health, health care access, and other measures of well-being. I find that wait time decreases the likelihood of having had benefits terminated at the time of survey and increases the likelihood of currently receiving benefits at survey. I also find that a longer wait decreases the likelihood of asking for a reconsideration of a denied claim, and increases the number of conditions causing activity limitations. The sample I use is quite small, resulting in limited power. I find suggestive evidence that wait time

effects some other outcomes, such as poverty and BMI, and does not affect others, such as mental health, but am unable to rule out alternate conclusions with confidence.

My analyses carry several additional limitations. Wait time exhibits a long right tail, but the instrument does not, making it unsuitable to investigate the effects of particularly long waits. I am also unable to address the effect on subsamples, as doing so results in very weak instruments. Finally, the effects captured here are relatively short-term. My sample applied for benefits no earlier than 2000, and were surveyed no later than 2005. If the effect of wait time changes over time, I am unable to comment on that here.

Despite these limitations, my findings highlight the fact that DI, and its wait time, affect more than work and earnings. Many applicants are not marginal workers. Even for those who are, the experience DI is not well summarized by decisions of whether to work and how much to earn. Focusing only on these outcomes makes it impossible to take account of the full value and cost of DI and other programs. It also does not provide answers to why programs have the labor market effects they do, which can be crucial to improving policy.

**References**


Autor, David, and Duggan, Mark (2003). The rise in the disability rolls and the decline in unemployment. The Quarterly Journal of Economics, 118(3), 157-206.

Autor, David, Maestas, Nicole, Mullen, Kathleen, and Strand, Alexander (2015). Does delay cause decay? The effect of administrative decision time on the labor force participation and earnings of disability applicants. NBER Working Paper No. 20840.

Baicker, Katherine, et al. (2013). The Oregon experiment – effects of Medicaid on clinical outcomes. *New England Journal of Medicine, 368*(18), 1713-1722.

Bound, John (1989). The health and earnings of rejected disability insurance applicants. *The American Economic Review, 79*(3), 482-503.

Card, David, Dobkin, Carlos, and Maestas, Nicole (2009). Does Medicare save lives*? Quarterly Journal of Economics, 124*(2), 597-636.

Chen, Susan, and van der Klaauw, Wilbert (2008). The work disincentive effects of the disability insurance program in the 1990s. *Journal of Econometrics, 142*(2), 757-784.

Coe, Norma, Lindner, Stephan, Wong, Kendrew, and Wu, April Yanyuan (2013). How do the disabled cope while waiting for SSDI? Center for Retirement Research at Boston College Working Paper 2013-12.

Currie, Janet and Gruber, Jonathan (1996). Saving babies: The efficacy and cost of recent changes in the Medicaid eligibility of pregnant women. *Journal of Political Economy, 104*(6), 1693-1296.

Finkelstein, Amy et al. (2012). The Oregon health insurance experiment: Evidence from the first year. *Quarterly Journal of Economics, 127*(3), 1057-1106.

French, Eric and Song, Jae (2014). The effect of disability insurance receipt on labor supply. *American Journal of Economics: Economic Policy, 6*(2), 291-337 .

Garcia-Gomez, Pilar and Gielen, Anne (2014). Health effects of containing moral hazard: evidence from disability insurance reform. IZA Working Paper 8386.

Gelber, Alexander, Moore, Timothy and Strand, Alexander (2018). DI benefits save lives. Goldman School of Public Policy Working Paper.

Gelber, Alexander, Moore, Timothy and Strand, Alexander (2018). The Effect of Disability Insurance Payments on Beneficiaries' Earnings. *American Economic Journal: Economic Policy, 9*(3), 229-261.

Gross, Tal and Notowidigdo, Matthew (2011). Health insurance expansion and the consumer bankruptcy decision: Evidence from expansions of Medicaid. *Journal of Public Economics, 95*(7-8), 767-778.

Livermore, G., Stapleton, D., and Claypool, H. (2009). Health Insurance and Health Care Access Before and After SSDI Entry. New York: The Commonwealth Fund.

Maestas, Nicole, Mullen, Kathleen, and Strand, Alexander (2013). Does disability insurance receipt discourage work? Using examiner assignment to estimate causal effects of SSDI receipt. *American Economic Review, 103*(5), 1797-1829.

Michalopoulos, Charles, et al. (2011). The Accelerated Benefits Demonstration and Evaluation Project: Impacts on Health and Employment at Twelve Months. New York: MDRC.

Moore, Timothy (2015). The employment effects of terminating disability benefits. *Journal of Public Economics*, 124, 30-43.

National Center for Health Statistics. Survey Description, National Health Interview Survey, 2005. Hyattsville, Maryland. 2006.

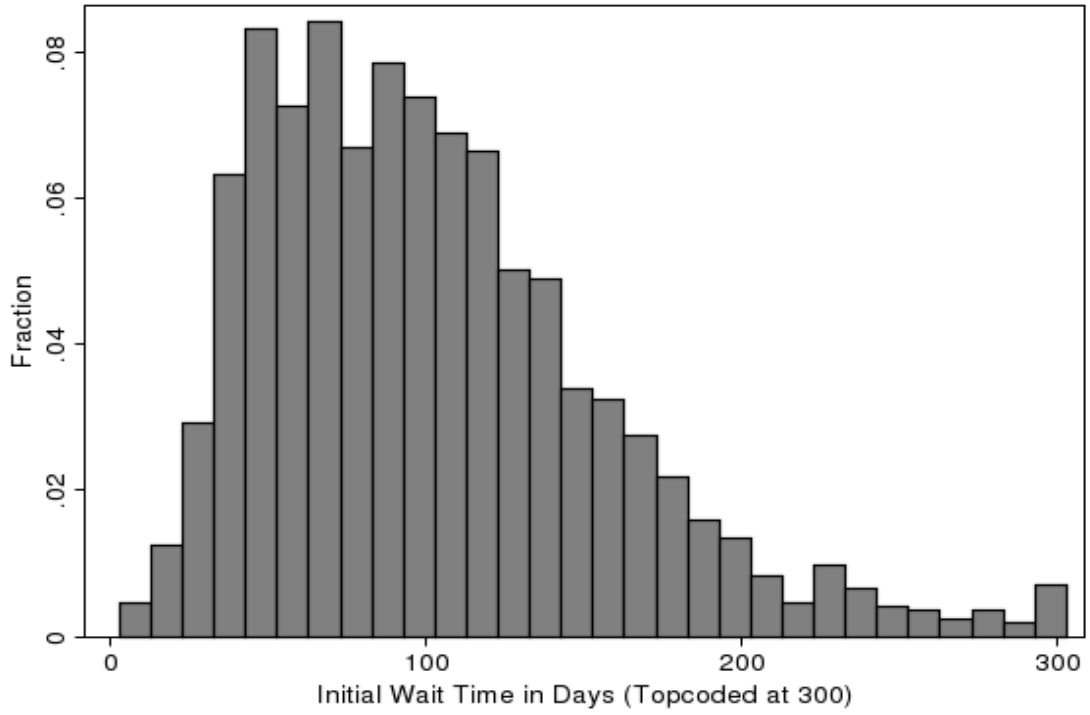
Social Security Administration (2016). Monthly Statistical Snapshot, February 2018. Accessed 4/12/2018 at https://www.ssa.gov/policy/docs/quickfacts/stat_snapshot/

Social Security Administration, Office of the Inspector General (2009). Congressional Response Report: Impact of the Social Security Administration's Claims Process on Disability Beneficiaries. A-01-09-29084. Available at https://oig.ssa.gov/sites/default/files/audit/full/pdf/A-01-09-29084.pdf

The Social Security Act, Title II, § 223(d)(1)(A), 42 U.S.C. § 423 (d)(1)(A) and Title 16, § 1614(a)(3)(A), 42 U.S.C. § 1382c(a)(3)(A).

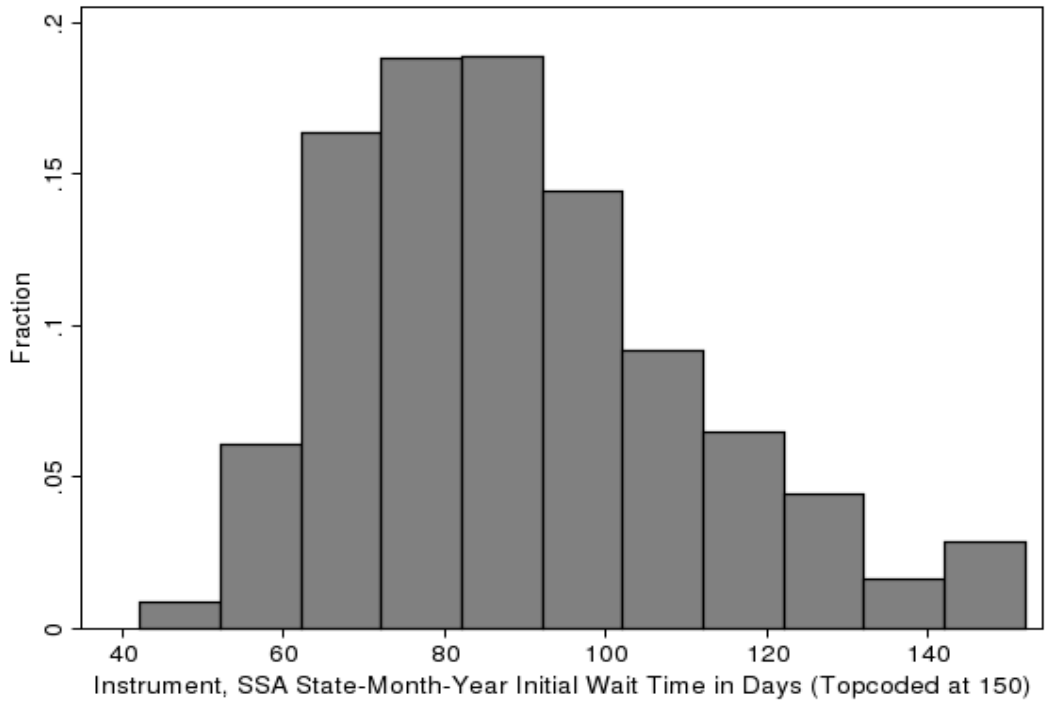
Wixon, B. and Strand, A., 2013. Identifying SSA's sequential disability determination steps using administrative data. Research and Statistics Note No. 2013-01. Available at http://www.ssa.gov/policy/docs/rsnotes/rsn2013-01.html.

Figure 1. Distribution of Initial Wait Times




Notes: Figure displays the fraction of applicants who fall into 10-day initial wait bins, with the top bin containing those whose waits were 300 days or longer.

Figure 2. Distribution of Expected Wait Time Instrument




Notes: Figure displays the fraction of applicants whose expected wait time instrument falls into 10-day initial wait bins, with the top bin containing those whose expected waits were 150 days or longer.

Table 1. Descriptive Statistics – Demographics and Wait Time

| | N | Mean | SD |
|---|---|---|---|
| Age at Survey | 2,143 | 47.455 | 11.907 |
| Age at Application | 2,143 | 45.914 | 11.836 |
| Male | 2,148 | 0.476 | 0.500 |
| Race/Ethnicity | | | |
| White | 2,155 | 0.477 | 0.500 |
| African American | 2,155 | 0.177 | 0.382 |
| Hispanic | 2,155 | 0.162 | 0.369 |
| Other | 2,155 | 0.183 | 0.387 |
| Education | | | |
| < HS | 2,155 | 0.220 | 0.414 |
| HS or GED | 2,155 | 0.325 | 0.468 |
| > HS | 2,155 | 0.237 | 0.425 |
| Unknown | 2,155 | 0.219 | 0.413 |
| Marital Status | | | |
| Married/Partnered | 2,155 | 0.578 | 0.494 |
| Widowed | 2,155 | 0.049 | 0.216 |
| Divorced/Separated | 2,155 | 0.208 | 0.406 |
| Never Married | 2,155 | 0.162 | 0.368 |
| Unknown | 2,155 | 0.002 | 0.048 |
| Primary Disabling Condition | | | |
| Musculoskeletal | 2,155 | 0.345 | 0.476 |
| Senses and Speech | 2,155 | 0.026 | 0.159 |
| Respiratory | 2,155 | 0.045 | 0.208 |
| Cardiovascular | 2,155 | 0.095 | 0.293 |
| Digestive | 2,155 | 0.022 | 0.148 |
| Genito-urinary System | 2,155 | 0.013 | 0.113 |
| Endocrine | 2,155 | 0.050 | 0.217 |
| Neurological | 2,155 | 0.075 | 0.263 |
| Mental | 2,155 | 0.222 | 0.416 |
| Neoplastic | 2,155 | 0.032 | 0.175 |
| Immune | 2,155 | 0.017 | 0.130 |
| Other | 2,155 | 0.046 | 0.210 |
| Initial Wait | 2,155 | 102.357 | 56.627 |
| Reconsideration | 2,155 | 0.361 | 0.481 |
| Initial + Reconsideration Wait | 2,155 | 146.339 | 102.442 |
| Reports Applying for SSDI | 2,134 | 0.724 | 0.447 |
| Reports Applying for SSI | 2,131 | 0.363 | 0.481 |
| Applied for SSI | 2,155 | 0.550 | 0.498 |
| Correctly Reports SSI application | 2,131 | 0.618 | 0.486 |

Notes: Table presents descriptive statistics on analytic sample constructed from the 1997-2005 NHIS linked to 1989-2005 SSA administrative records.

Table 2. Descriptive Statistics – Program Status, Health, and Well-being

| | N | Mean | SD |
|---|---|---|---|
| Benefit Status at Survey | | | |
| Current | 2,155 | 0.591 | 0.492 |
| Suspended | 2,155 | 0.009 | 0.094 |
| Terminated | 2,155 | 0.064 | 0.244 |
| Never Benefits | 2,155 | 0.337 | 0.473 |
| # of Activity Limitations | 2,155 | 1.698 | 1.914 |
| # of Functional Limitations | 2,155 | 1.048 | 1.689 |
| Good or Better Health | 2,151 | 0.397 | 0.489 |
| >20 bed days | 1,073 | 0.333 | 0.471 |
| Number MH symptoms | 1,130 | 1.325 | 1.924 |
| Any MH symptoms | 1,130 | 0.443 | 0.497 |
| BMI | 1,139 | 36.337 | 20.134 |
| Dentist Past 12 Months | 1,124 | 0.459 | 0.499 |
| Unable to afford needed: | | | |
| Prescription medicine | 1,129 | 0.324 | 0.468 |
| Mental health care | 1,127 | 0.147 | 0.355 |
| Dental Care | 1,128 | 0.318 | 0.466 |
| Needed Medical Care | 2,151 | 0.313 | 0.464 |
| Delayed Care - Financial | 2,152 | 0.346 | 0.476 |
| Has a Usual Place for Care | 1,116 | 0.899 | 0.302 |
| No Health Insurance | 2,143 | 0.247 | 0.431 |
| Working Last Week | 2,144 | 0.171 | 0.376 |
| SNAP | 2,142 | 0.208 | 0.406 |
| >$500 out of pocket | 2,110 | 0.580 | 0.494 |
| < 100% FPL | 1,735 | 0.285 | 0.451 |
| Dead by 12/31/2011 | 2,155 | 0.146 | 0.353 |

Notes: Table presents descriptive statistics on analytic sample constructed from the 1997-2005 NHIS linked to 1989-2005 SSA administrative records.

Table 3. First Stage

| | (5) | (6) |
|---|---|---|
| Instrument | 16.87** | 12.15** |
| | (3.566) | (2.622) |
| Lagged Instrument | | 9.982** |
| | | (2.575) |
| N | 1,757 | 1,700 |
| F-Stat | 33.12 | 41.41 |
| Lagged Wait Time | N | Y |

Notes: Table reports results from 2 linear regressions of individual initial wait time on instruments. Each regression includes controls for age, age squared, sex, education, race/ethnicity, marital status, primary diagnosis, and the unemployment rate in the state and month of application. Standard errors are clustered at the state level. The Kleibergen-Paap F-statistic on the instrument is reported at the bottom of the table. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.

Table 4. Effects of Wait Time on Program Status

| | Benefit Status at Survey | | | | | |
|---|---|---|---|---|---|---|
| | Ever SSDI | Current | Suspended | Terminated | Never Benefits | Any Re-consideration |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel 1 – No Lag | | | | | | |
| Wait | -0.00027 | 0.0013 | 0.00023 | -0.0014* | -0.00014 | -0.0024* |
| | (0.00073) | (0.0010) | (0.00026) | (0.00058) | (0.00078) | (0.0010) |
| F-statistic | 33.12 | 33.12 | 33.12 | 33.12 | 33.12 | 33.12 |
| N | 2132 | 2132 | 2132 | 2132 | 2132 | 2132 |
| Panel 2 – 1 Month Lag | | | | | | |
| Wait | 0.00026 | 0.0026* | 0.000050 | -0.0011 | -0.0015 | -0.0032* |
| | (0.0011) | (0.0012) | (0.00038) | (0.00080) | (0.00095) | (0.0013) |
| F-statistic | 41.41 | 41.41 | 41.41 | 41.41 | 41.41 | 41.41 |
| N | 2065 | 2065 | 2065 | 2065 | 2065 | 2065 |

Notes: Table reports the estimates of the effect of wait time on outcomes, from 12 IV regressions. The second panel controls for 1-month lagged wait time. Standard errors are clustered at the state level. Kleibergen-Paap F-statistic on the instrument is reported at the bottom of each panel. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.

Table 5. Effects of Wait Time on Health and Well-Being

| | Activity Limitations (1) | Functional Limitations (2) | Good or Better Health (3) | Bed Days (4) | BMI (5) | Mental Health Symptoms (6) | Health Care Access Index (7) | SNAP (8) | <= 100% FPL (9) | Working Last Week (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Panel 1 – No Lag | | | | | | | | | | |
| Wait | 0.0077* | 0.0052 | -0.00076 | 0.25 | 0.026 | 0.00013 | -0.0010 | -0.00033 | 0.00061 | -0.00028 |
| | (0.0035) | (0.0040) | (0.0018) | (0.69) | (0.020) | (0.0016) | (0.00091) | (0.00091) | (0.0012) | (0.00080) |
| F-statistic | 33.12 | 33.12 | 32.40 | 10.40 | 8.286 | 10.33 | 7.576 | 30.45 | 29.58 | 31.29 |
| N | 2132 | 2132 | 2128 | 1131 | 969 | 1122 | 1079 | 2120 | 1718 | 2121 |
| Panel 2 – 1 Month Lag | | | | | | | | | | |
| Wait | 0.014** | 0.0049 | -0.0013 | -0.040 | 0.030 | 0.00066 | -0.00075 | -0.000034 | 0.0019 | 0.000036 |
| | (0.0037) | (0.0060) | (0.0018) | (1.32) | (0.030) | (0.0026) | (0.0014) | (0.0015) | (0.0013) | (0.0010) |
| F-statistic | 41.41 | 41.41 | 40.50 | 9.513 | 7.814 | 9.379 | 6.013 | 37.87 | 34.45 | 37.53 |
| N | 2065 | 2065 | 2061 | 1089 | 933 | 1080 | 1038 | 2053 | 1663 | 2055 |

Notes: Table reports the estimates of the effect of wait time on outcomes, from 20 IV regressions. The second panel controls for 1-month lagged wait time. Standard errors are clustered at the state level. Kleibergen-Paap F-statistic on the instrument is reported at the bottom of each panel. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.

Table A1. Effects of Wait Time on Program Status, with Survey Weights

| | | Benefit Status at Survey | | | | |
|---|---|---|---|---|---|---|
| | Ever SSDI | Current | Suspended | Terminated | Never Benefits | Any Re-consideration |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel 1 – No Lag | | | | | | |
| Wait | -0.000020 | 0.0021+ | 0.00021 | -0.0019** | -0.00042 | -0.0018 |
| | (0.00092) | (0.0012) | (0.00027) | (0.00066) | (0.0011) | (0.0013) |
| F-statistic | 24.04 | 24.04 | 24.04 | 24.04 | 24.04 | 24.04 |
| N | 2131 | 2131 | 2131 | 2131 | 2131 | 2131 |
| Panel 2 – 1 Month Lag | | | | | | |
| Wait | 0.00088 | 0.0039** | -0.00017 | -0.0014 | -0.0024+ | -0.0028+ |
| | (0.0015) | (0.0015) | (0.00041) | (0.00089) | (0.0014) | (0.0016) |
| F-statistic | 23.22 | 23.22 | 23.22 | 23.22 | 23.22 | 23.22 |
| N | 2064 | 2064 | 2064 | 2064 | 2064 | 2064 |

Notes: Table reports the estimates of the effect of wait time on outcomes, from 12 IV regressions. The second panel controls for 1-month lagged wait time. Standard errors are clustered at the state level. Kleibergen-Paap F-statistic on the instrument is reported at the bottom of each panel. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.

Table A2. Effects of Wait Time on Health and Well-Being, with Survey Weights

| | Activity Limitations (1) | Functional Limitations (2) | Good or Better Health (3) | Bed Days (4) | BMI (5) | Mental Health Symptoms (6) | Health Care Access Index (7) | SNAP (8) | <= 100% FPL (9) | Working Last Week (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Panel 1 – No Lag | | | | | | | | | | |
| Wait | 0.010* | 0.0070 | -0.00068 | -0.081 | 0.042+ | 0.0018 | -0.00060 | -0.00029 | 0.00045 | -0.00075 |
| | (0.0041) | (0.0051) | (0.0015) | (1.06) | (0.025) | (0.0018) | (0.0012) | (0.0011) | (0.0015) | (0.0010) |
| F-statistic | 24.04 | 24.04 | 23.41 | 7.32 | 6.92 | 7.25 | 5.74 | 22.66 | 23.08 | 22.70 |
| N | 2131 | 2131 | 2127 | 1131 | 969 | 1122 | 1079 | 2119 | 1717 | 2120 |
| Panel 2 – 1 Month Lag | | | | | | | | | | |
| Wait | 0.017** | 0.0061 | -0.0019 | -0.14 | 0.051 | 0.0037 | -0.00034 | 0.00058 | 0.0025 | -0.00050 |
| | (0.0055) | (0.0068) | (0.0018) | (1.91) | (0.039) | (0.0034) | (0.0020) | (0.0017) | (0.0016) | (0.0012) |
| F-statistic | 23.22 | 23.22 | 22.43 | 4.60 | 4.72 | 4.56 | 3.37 | 21.50 | 21.10 | 20.99 |
| N | 2064 | 2064 | 2060 | 1089 | 933 | 1080 | 1038 | 2052 | 1662 | 2054 |

Notes: Table reports the estimates of the effect of wait time on outcomes, from 20 IV regressions. The second panel controls for 1-month lagged wait time. Standard errors are clustered at the state level. Kleibergen-Paap F-statistic on the instrument is reported at the bottom of each panel. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.

Table A3. Effect of Wait Time on Components of Health Care Access Index

| | | | Forewent due to cost: | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Dentist Past 12mo | Prescription Medicine | Mental health Care | Dental Care | Medical Care | Delayed for Cost | Usual Place for Care | No Insurance | > $500 Out of Pocket |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Panel 1 – No Lag | | | | | | | | | |
| Wait | 0.00035 | -0.00064 | -0.0025 | 0.0011 | -0.00074 | -0.00095 | 0.00020 | -0.0013 | 0.00029 |
| | (0.0014) | (0.0015) | (0.0017) | (0.0015) | (0.00098) | (0.00088) | (0.0012) | (0.0012) | (0.00091) |
| F-statistic | 8.60 | 8.07 | 8.00 | 8.07 | 33.30 | 33.25 | 8.476 | 31.61 | 30.04 |
| N | 1116 | 1121 | 1119 | 1120 | 2128 | 2129 | 1108 | 2121 | 2087 |
| Panel 2 – 1 Month Lag | | | | | | | | | |
| Wait | -0.0035 | 0.0011 | -0.0029 | 0.0017 | -0.0013 | -0.0012 | 0.0011 | -0.0011 | 0.0018 |
| | (0.0030) | (0.0023) | (0.0032) | (0.0024) | (0.0016) | (0.0014) | (0.0017) | (0.0019) | (0.0015) |
| F-statistic | 7.52 | 7.44 | 7.33 | 7.53 | 41.55 | 41.17 | 7.781 | 39.16 | 37.17 |
| N | 1075 | 1079 | 1077 | 1078 | 2061 | 2062 | 1066 | 2054 | 2020 |

Notes: Table reports the estimates of the effect of wait time on outcomes, from 18 IV regressions. The second panel controls for 1-month lagged wait time. Standard errors are clustered at the state level. Kleibergen-Paap F-statistic on the instrument is reported at the bottom of each panel. + denotes significance at the 0.1 level, * at the 0.05 level, and ** at the 0.01 level.