The Effect of Awarding Disability Benefits on Opioid Consumption

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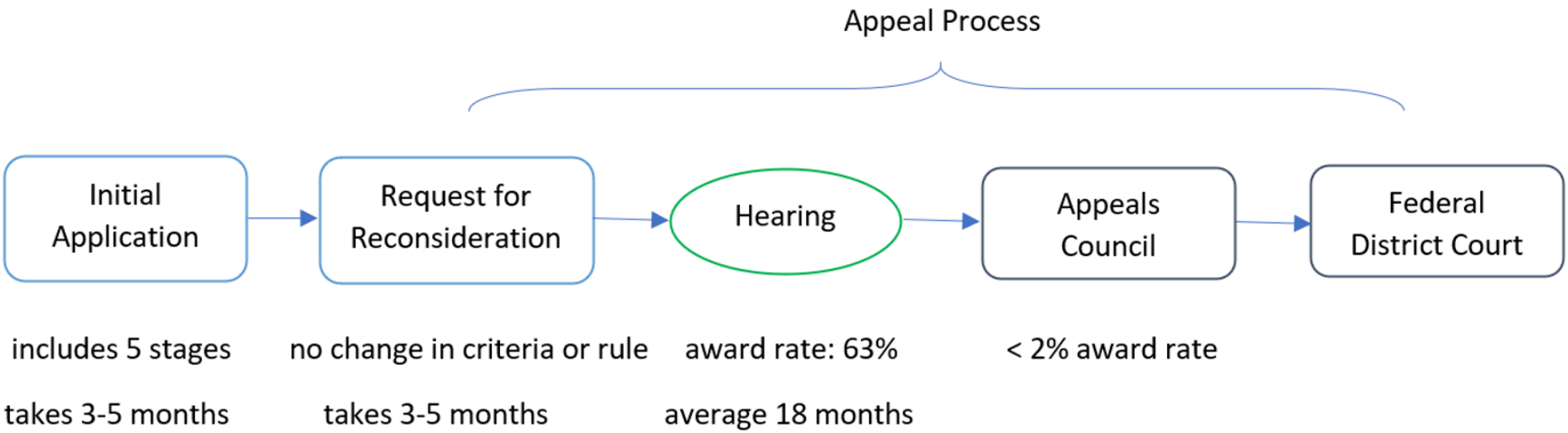
Motivation

- 130 Americans died every day from an opioid overdose in 2017.
- Over 81,000 opioids overdose deaths in 2019-20 – accelerating during COVID.
- Opioid use greater among people with disabilities than the general population (Morden et al., 2014; King et al., 2016; Gebauer et al., 2019; Ghertner, 2020).
- Disability beneficiaries have higher per capita expenditures of opioids (Zhou et al., 2016).

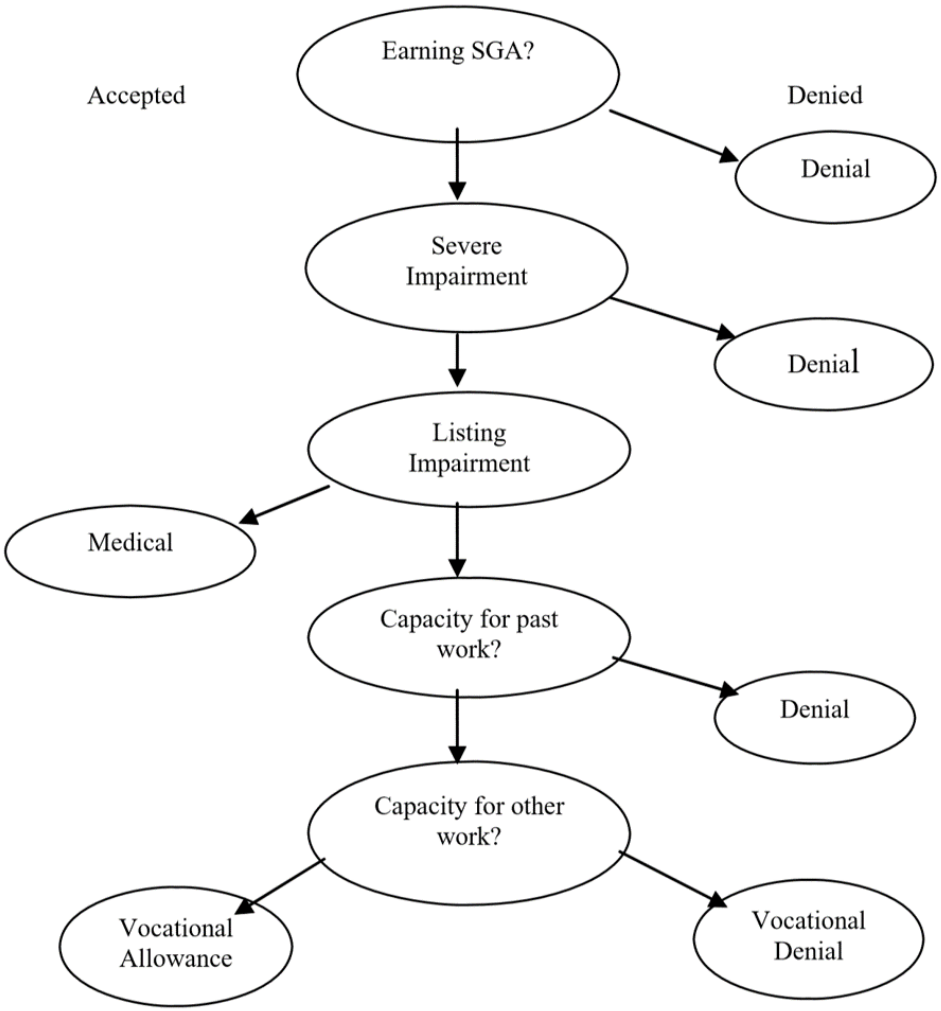
Motivation

- Existing Evidence: Higher use of opioid among disability beneficiaries.
- Research Question: What is the effect of receiving disability benefits (DB) on the consequential use of opioid?
  - DB: Social Security Disability Insurance (SSDI) & Supplemental Security Income (SSI)
  - Applicants for SSDI and SSI face the same application and appeal processes and are subjected to the same medical assessment protocols.

Institutional Background



Institutional Background



Each applicant is classified into one of four age groups (under age 45, 45-49, 50-54, and 55 and over).

Figure: Initial application stage
Source: Chen and Van der Klaaw (2008)

Mechanisms

- DB $\rightarrow$ access to health insurance $\rightarrow$ opioid use increases
- DB $\rightarrow$ labor $\rightarrow$ reduce discipline or concern $\rightarrow$ opioid use increases
- DB $\rightarrow$ labor $\rightarrow$ pain relievers $\rightarrow$ opioid use decreases

Data

2016 & 2018 waves of the Health and Retirement Study (HRS)

- information on the use of opioid
  - Another class of pain medications, called 'opioids', includes such things as Vicodin, OxyContin, codeine, morphine, or similar medications. In the past three months, have you taken any opioid pain medications?
- detailed records about DB applications and outcomes

RAND HRS Longitudinal File

Identification Strategy

Two-stage Fuzzy Regression Discontinuity Design – Following Van der Klaauw (2002) and Chen and Van der Klaauw (2008)

$$E\left[t_i \mid A_i\right] = \Pr\left(t_i = 1 \mid A_i\right) = g\left(A_i\right) + \sum_{j=1}^{3} \gamma_j * 1\left\{A_i \geq \overline{A_j}\right\} + \alpha X \quad (1)$$

where A_i is the decision age, X is a set of covariates, and $g(A) = \varphi_{00} + \varphi_{01}A + \sum_{j=1}^{3} \varphi_{1j}\left(A - \overline{A_j}\right) 1\left\{A_i \geq \overline{A_j}\right\}$

$$y_i = \beta + \delta \widehat{E[t_i \mid A_i]} + k\left(A_i^c\right) + \theta X + v_i \quad (2)$$

where A_i^c is the current age, $k\left(A_i^c\right)$ is a continuous control variable, and X is the same set of covariates.

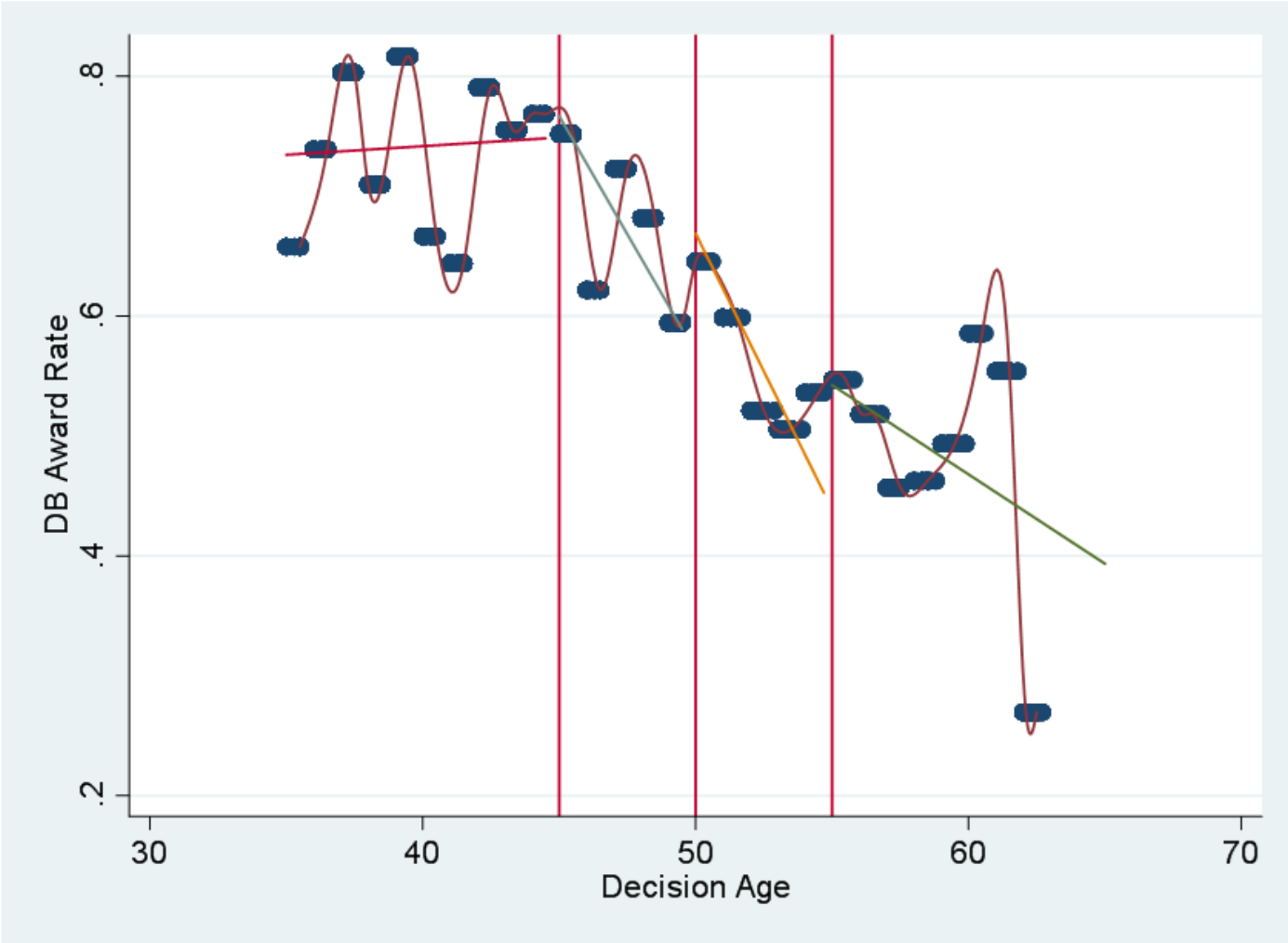
δ: the causal effect of receiving DB on the likelihood of opioid use.

Identification Strategy (Threats)

- Random sorting around the cutoffs – McCrary Density test
- Continuity of observable variables – Balancing Test (scatter plots & first stage regressions)

Result

Figure 1: Award rate in the combined 2016 & 2018 waves



Result

Table 1: First Stage Results on the Disability Benefits Award

	(A) 2016 wave			(B) 2016 & 2018 waves		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Decision Age	0.003	0.002	0.001	0.001	0.001	-0.000
	(0.009)	(0.009)	(0.009)	(0.006)	(0.006)	(0.006)
Age45	0.020	0.022	0.027	0.018	0.017	0.028
	(0.067)	(0.067)	(0.065)	(0.050)	(0.049)	(0.048)
Age50	0.111*	0.114*	0.126*	0.099**	0.102**	0.112**
	(0.067)	(0.067)	(0.065)	(0.050)	(0.049)	(0.048)
Age55	0.109**	0.116**	0.115**	0.103**	0.109***	0.107***
	(0.054)	(0.054)	(0.052)	(0.041)	(0.041)	(0.040)
Year2018				0.007	0.008	-0.012
				(0.017)	(0.017)	(0.017)
Individual Characteristics		X	X		X	X
Health Problem			X			X
Observations	1,867	1,867	1,867	3,265	3,265	3,265
R-squared	0.049	0.062	0.109	0.049	0.064	0.106

Notes: Data is obtained from the 2016 and 2018 waves of the Health and Retirement Study dataset. Sample of observations restricted as described in section 3. Panel (A) reports results from the data in 2016 wave. Panel (B) reports results from the data in the combined 2016 and 2018 waves. The variables are defined as presented in section 3. Age45 takes value 1 if the individual was 45 years or older at the time of the last decision on a disability benefits application, and 0 otherwise. Age 50 and Age 55 are defined similarly. All regressions are estimated using the model in equation (2). The dependent variable takes value 1 if the individual had ever had a disability benefits application accepted, and 0 otherwise. Standard errors are reported in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Result

Table 2: Second Stage Results on Opioid Use

	(A) 2016 wave			(B) 2016 & 2018 waves		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Current Age	-0.002	-0.001	-0.000	-0.002	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
$E[\widehat{t_i \mid A_i}]$	0.272**	0.283**	0.287***	0.274***	0.300***	0.302***
	(0.112)	(0.114)	(0.110)	(0.083)	(0.085)	(0.081)
Year2018				-0.058***	-0.061***	-0.066***
				(0.017)	(0.017)	(0.017)
Individual Characteristics		X	X		X	X
Health problem			X			X
Observations	1,867	1,867	1,867	3,265	3,265	3,265
R-squared	0.005	0.015	0.091	0.009	0.019	0.035

Notes: Data is obtained from the 2016 and 2018 waves of the Health and Retirement Study dataset. Sample of observations restricted as described in Section 3. Panel (A) reports results from the data in 2016 wave. Panel (B) reports results from the data in the combined 2016 and 2018 waves. The variables are defined as presented in Section 3. All regressions are estimated using the model in equation (4). The dependent variable takes value 1 if the individual took any opioid pain medication during the 3 months prior to the interview date, and 0 otherwise. Standard errors are reported in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Result

Table A15: Second Stage Results on Medicaid Participation

	(A) 2016 wave			(B) 2016 & 2018 waves		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Current Age	0.003	0.002	0.002	0.005**	0.003	0.003
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
$\hat{E}[t_i \mid A_i]$	0.414***	0.404***	0.389***	0.535***	0.521***	0.497***
	(0.106)	(0.109)	(0.105)	(0.085)	(0.087)	(0.084)
Year2018				-0.093***	-0.090***	-0.084***
				(0.017)	(0.017)	(0.017)
Individual Characteristics		X	X		X	X
Health problem			X			X
Observations	896	896	896	1,733	1,733	1,733
R-squared	0.017	0.024	0.027	0.035	0.044	0.047

Notes: Data is obtained from the 2016 and 2018 waves of the Health and Retirement Study dataset. Sample of observations restricted as described in section 3. Panel (A) reports results from the data in 2016 wave. Panel (B) reports results from the data in the combined 2016 and 2018 waves. The variables are defined as presented in section 3. All regressions are estimated using the model in equation (4) from the main article. The dependent variable takes value 1 if the individual is covered by Medicaid at the time of the interview, and 0 otherwise. Standard errors are reported in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Result

Table A16: Second Stage Results on Insurance Pay for Prescription Medications

	(A) 2016 wave			(B) 2016 & 2018 waves		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Current Age	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$\hat{E}[t_i \mid A_i]$	0.410***	0.417***	0.410***	0.443***	0.447***	0.437***
	(0.079)	(0.080)	(0.078)	(0.062)	(0.063)	(0.061)
Year2018				-0.052***	-0.053***	-0.048***
				(0.013)	(0.013)	(0.013)
Individual Characteristics		X	X		X	X
Health problem			X			X
Observations	1,677	1,677	1,677	2,988	2,988	2,988
R-squared	0.017	0.025	0.029	0.020	0.031	0.036

Notes: Data is obtained from the 2016 and 2018 waves of the Health and Retirement Study dataset. Sample of observations restricted as described in section 3. Panel (A) reports results from the data in 2016 wave. Panel (B) reports results from the data in the combined 2016 and 2018 waves. The variables are defined as presented in section 3. All regressions are estimated using the model in equation (4) from the main article. The dependent variable takes value 1 if the individual reported that insurance paid for any prescription medication, and 0 otherwise. Standard errors are reported in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Result

Table A17: Second Stage Results on the Use of OTC Pain Killers

	(A) 2016 wave			(B) 2016 & 2018 waves		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Current Age	-0.006**	-0.005*	-0.005*	-0.005**	-0.004*	-0.004*
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
$\hat{E}[t_i \mid A_i]$	-0.191*	-0.180	-0.171	-0.228***	-0.211**	-0.202**
	(0.112)	(0.115)	(0.111)	(0.085)	(0.086)	(0.084)
Year2018				-0.001	-0.004	-0.008
				(0.017)	(0.017)	(0.017)
Individual Characteristics		X	X		X	X
Health problem			X			X
Observations	1,867	1,867	1,867	3,265	3,265	3,265
R-squared	0.003	0.015	0.021	0.003	0.021	0.021

Notes: Data is obtained from the 2016 and 2018 waves of the Health and Retirement Study dataset. Sample of observations restricted as described in section 3. Panel (A) reports results from the data in 2016 wave. Panel (B) reports results from the data in the combined 2016 and 2018 waves. The variables are defined as presented in section 3. All regressions are estimated using the model in equation (4) from the main article. The dependent variable takes value 1 if the individual took any over-the-counter pain medication during the 3 months prior to the interview date, and 0 otherwise. Standard errors are reported in parenthesis. *** p<0.01, ** p<0.05, * p<0.10.

Conclusions

- We contribute the literature by first analyzing the causal effect of SSDI and SSI on opioids use.
- The likelihood of consuming opioid increases by 27-30 percentage points following the receipt of DB.

Future Works

- Larger dataset, more powerful predictors
- Unintended effect of DB – other concerning drugs
- Long-run effect
- Distinguish opioid abuse from medical opioid use

Questions?
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