CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

UNDERSTANDING THE LOCAL-LEVEL PREDICTORS OF DISABILITY PROGRAM FLOWS: NEW ADULT AWARDS AND BENEFICIARY WORK ACTIVITY

Jody Schimmel Hyde, Jonathan Schwabish, Paul O'Leary, and Dara Lee Luca

CRR WP 2021-22
December 2021

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
https://crr.bc.edu

Jody Schimmel Hyde is a principal researcher and deputy director at Mathematica's Center for Studying Disability Policy. Jonathan Schwabish is a senior fellow at the Urban Institute's Income and Benefits Policy Center. Paul O'Leary is an economist with the Office of Research, Demonstration, and Employment Support at the U.S. Social Security Administration. Dara Lee Luca is a senior economist at Amazon. The research reported herein was pursuant to a grant from the U.S. Social Security Administration (SSA) funded as part of the Retirement and Disability Research Consortium. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, any agency of the federal government, Mathematica, the Urban Institute, Amazon, or Boston College. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of the contents of this report. Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply endorsement, recommendation or favoring by the United States Government or any agency thereof. This paper benefitted from comments and suggestions from Gina Livermore and Purvi Sevak at Mathematica, Aaron Williams at the Urban Institute, and Carrie Shandra from Stony Brook University. Several reviewers from SSA also provided helpful comments and suggestions including Lynn Fisher, Brad Trenkamp, Stephen Evangelista, Johanna Maleh, and Stephanie Myers. Alex Bryce and Christian Carrillo of Mathematica also provided beneficial programming support.

About the Center for Retirement Research

The Center for Retirement Research at Boston College, part of a consortium that includes parallel centers at the National Bureau of Economic Research, the University of Michigan, and the University of Wisconsin-Madison, was established in 1998 through a grant from the U.S. Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center conducts a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources.

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Ave
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
https://crr.bc.edu/

Affiliated Institutions:
The Brookings Institution
Mathematica – Center for Studying Disability Policy
Syracuse University
Urban Institute

Abstract

This paper examines factors that are associated with area-level benefit awards for Social Security Disability Insurance (DI) and Supplemental Security Income (SSI) as well as the work activity of DI and SSI beneficiaries. Although the Social Security Administration (SSA) cannot directly affect state policies or local economic conditions, there is value in understanding the extent to which these policies and conditions might correlate with application rates, benefit receipt, and beneficiary return-to-work rates.

We conducted our analysis at the level of Public Use Microdata Areas (PUMAs), which are geographic units created by the U.S. Census for statistical purposes. PUMAs are within-state geographies that have a population of at least 100,000 people and are large enough to produce statistics on low-occurrence events such as beneficiary suspensions and terminations for work. We aggregated data from the Social Security Administration's Disability Analysis File, the American Community Survey, and other national sources.

We assess the variation across PUMAs in the rate of new benefit awards and beneficiary work outcomes in 2017. We also consider the association between area-level demographic, economic, health, and health services availability and those beneficiary outcomes from 2005 through 2017. We find that:

- Award rates in both DI and SSI were highest in 2017 in Appalachia (particularly where Kentucky, Virginia, and West Virginia meet) and southern states such as Mississippi and Alabama. They were also relatively high in western states such as New Mexico and Washington. We found that these patterns were relatively consistent across the years of our analysis.
- In a multivariate framework, new benefit awards from 2005 through 2017 were higher in areas with higher shares of the population that were female, did not have a college degree, had a disability, received Supplemental Nutrition Assistance Program (SNAP), or were in poverty and in areas with a higher cost of living (as proxied by wages, rent, and housing values). Most other factors we considered were only weakly associated with new benefit awards.
- Among both DI and SSI beneficiaries, the shares with positive earnings and with cash benefits forgone because of substantial work activity in 2017 were highest in the Great Plains region—with especially high shares of beneficiaries who work in the eastern parts

of North Dakota and South Dakota, the southern and western parts of Minnesota, and the northern part of Iowa. This general pattern held in earlier years of our analysis as well.

- In a multivariate framework, the shares of beneficiaries with positive earnings from 2005 through 2017 were higher in areas with higher concentrations of the population over age 65 and in manual labor or service sector jobs, with a higher employment rates of people with disabilities, and with higher obesity rates. The share with positive earnings in those years was lower in areas where a larger share of the population was female, childless, had a disability, received SNAP, or in poverty and in areas that had higher cost of living. The associations between these factors and beneficiaries whose DI and SSI cash benefits were forgone for substantial work activity generally were in the same direction. Other factors were less strongly associated with beneficiary work outcomes.

The policy implications of the findings are:

- SSA does not directly control policy levers to affect the demographic, economic, health, and health services factors we considered. Nonetheless, knowing which area factors are correlated with better or worse work outcomes among beneficiaries may help targeting mailings for the Ticket to Work program or devoting resources to programs like the Work Incentives Planning and Assistance program to certain areas. Our cross-sectional and longitudinal analyses painted a consistent picture that areas with lower levels of economic opportunity—and areas with reductions in "affluence" over time—might be advantageous areas to target. Using trend data may help predict areas of opportunity before waiting to observe new awards or beneficiary outcomes.
- It is important to note that our analysis is descriptive and we cannot and do not ascribe a causal relationship to observed factors. Ultimately, the intent of our analysis was to shed light on factors that SSA may want to use to target supports or outreach to potential applicants or current beneficiaries. For that purpose, associations between factors may be sufficient.

Introduction

A critical determinant of the decisions made by potential and current disability beneficiaries is the environment in which each beneficiary lives, an idea that is consistent with the social model of disability. Changes in federal policy and strong economic conditions contribute to this environment, but many other factors at the state and local levels might more directly affect beneficiaries' decisions. For example, living in a rural or urban setting can affect access to public transit and the nature of available job opportunities. Areas in which a large share of adults with disabilities are employed might signal either relatively positive social attitudes about individuals with disabilities as productive workers or fewer physical barriers to transportation or employers. Areas with high prevalence of poor health behaviors, such as smoking and obesity, might signal generally poor health in the population. These factors could also affect the rate at which individuals enter disability programs or the likelihood that beneficiaries return to work.

Although the Social Security Administration (SSA) cannot directly affect state policies or local economic conditions, there is value in understanding the extent to which these policies and conditions might correlate with application rates, benefit receipt, and beneficiary return-to-work rates. If certain area-level characteristics predict higher-than-average award rates, it could signal the need for an increase in early intervention or vocational rehabilitation services for workers at risk for leaving the labor force and applying for federal disability benefits. The characteristics of areas with higher-than-average benefit suspensions or terminations for work may signal promising avenues for decreasing dependency on disability benefits, while the characteristics correlated with lower-than-average beneficiary work activity might help to inform policies such as targeted mailings on disability program work incentives such as SSA's Ticket to Work program.

This study adds to the body of evidence on the relationship between local-level factors and disability program outcomes including new awards and beneficiary work activity. Numerous studies have documented the geographic variation in the prevalence of disability and in the receipt of federal disability benefits; they have also documented factors that might be correlated with the claiming of disability benefits (see, for example, Rupp 2012; Nichols et al. 2017; Schwabish 2017; Sevak and Schmidt 2018; and Gettens et al. 2018). Our study adds to

this literature by assessing how these factors are associated with flows into and out of Social Security Disability Insurance (DI) and Supplemental Security Income (SSI) programs.

We conducted our analysis at the level of Public Use Microdata Areas (PUMAs), which are geographic units created by the U.S. Census for statistical purposes. This geographic information allows us to identify benefit and work activity for SSA beneficiaries at the community level. Census uses these PUMA units to release information on the characteristics of communities as derived from the American Community Survey (ACS), allowing us to link community characteristics from the ACS to SSA beneficiaries. We are also able to create PUMA-level data from the Area Health Resources Files (AHRF) and state level information from the Behavioral Risk Factor Surveillance System (BRFSS) to extend the range of community statistics for our analysis beyond the ACS.

PUMAs are within-state geographies that have a population of at least 100,000 people. In some cases, PUMAs are the same as counties, while in others, they aggregate counties or cross county boundaries. PUMAs are larger in less densely populated areas, as the land area necessary to aggregate at least 100,000 people is larger. We determined that PUMAs represent a suitable level of aggregation for our analyses because they are specific enough to provide action-oriented information and large enough (in population terms) for rates of beneficiary work activity to be estimated with reasonable precision and to minimize the share of cells masked by SSA for privacy reasons. PUMAs are redefined with each decennial Census; we aligned our findings to PUMAs based on the 2010 Census. There are just over 2,350 PUMAs in our analysis.

While we have SSA beneficiary data for 2001-2017, we restrict our analysis to 2005-2017 because of the availability of PUMA-level covariates from other public data sources. We find significant geographic variation in the rates of new benefit awards and beneficiary work activity across those years.[1] Award rates are especially high in parts of the South (e.g., Mississippi and Alabama) and in the West (e.g., Washington and Oregon). Higher-than-average

[1] We selected these years based on the availability of data across the sources we considered. The companion data file, described below, contains additional years of DAF data covering the period from 2001-2017. While the DAF18 contains information through 2018, lags in earnings reporting (and therefore STW and BFW) can be significant in the last year in each DAF file, and as such, we excluded data from that year. Earlier years in our file, particular 2017, likely underreport earnings relative to the earnings that will eventually be reported to SSA, but to a lesser degree. We do not have any reason to expect that earnings reporting varies systematically across PUMAs, and year fixed effects in our models should account differential earnings levels across years.

award rates are also observed in certain states, including South Dakota and New Mexico. Work activity rates among both DI and SSI beneficiaries are highest in the north-central states in the Midwest (e.g., Minnesota, North Dakota, South Dakota) and some of the states in the Mountain region (e.g., Colorado, Utah, Wyoming). Despite these regional patterns, we still find substantial cross-state and within-state heterogeneity.

To better understand the determinants of some of the variation across areas, we considered the association between local-level factors and beneficiary outcomes. We find that certain PUMA-level characteristics are associated with new benefit awards and work. For example, we find that lower award rates and higher rates of beneficiary work activity in PUMAs that have higher employment among people with disabilities generally and in PUMAs that have a larger share of workers performing manual labor jobs. We also find that the share of the population without health insurance is positively associated with award rates and negatively associated with beneficiary work activity. Other factors we considered are associated with beneficiary awards and work activity in ways we describe in more detail in what follows.

Measuring DI and SSI Beneficiary Program Flows and Work Activity

We derived information on DI and SSI awardees and beneficiaries from SSA's Disability Analysis File (DAF), which was developed to support research on work activity among disability beneficiaries. The DAF contains expansive monthly information on DI and SSI program status, benefit receipt, and work activity for all beneficiaries with at least one month of benefit receipt since 1996 (see Box 2). It contains measures derived from SSA administrative data that document beneficiaries who forgo their cash benefits as a result of substantial work activity. Because eligibility for DI and SSI programs is predicated on the inability to engage in substantial gainful activity (earnings of $1,260 a month among nonblind individuals in 2020), the measures in the DAF allow us to understand the extent to which beneficiaries exit the disability program because they work to the level of being ineligible for benefits. The DAF is also linked to Internal Revenue Service (IRS) data on annual earnings, which allows us to consider all beneficiaries who have taxable earnings, even if their earnings levels do not result in the loss of cash disability benefits. It also enables us to track earnings for those in suspense or termination status for work who no longer show earnings in SSA system data.

Our analysis sample consists of beneficiaries who were at least 18 years old and under FRA on the first day of the year, and who had at least one month in the year in which the DAF showed current payment status of benefits, or that cash benefits were suspended or terminated for work. We considered the following measures for individuals who were over 18 and under full retirement age (FRA) in at least one month during the year:

- **Prevalence rate of new DI and SSI awards during the calendar year**. The number of new adult DI and SSI awardees in each year, separately by program.[2] We calculate these new awards as the number per 10,000 in the PUMA's working-age population (ages 16-64) during the year, derived from the ACS.[3]

- **Share of beneficiaries who had at least one month during the year with cash benefits suspended or terminated because of their work activity.** The DAF contains a monthly measure indicating the suspense or termination of cash benefits for work (STW). The level of earnings that triggers STW depends on whether the beneficiary receives DI or SSI (see Box 1 for additional information about the STW measure). We identified the number of beneficiaries in each PUMA with at least one month in STW in the year, before dividing by the number of beneficiaries between the ages of 18 and FRA in that PUMA.[4]

- **Share of beneficiaries who had their cash benefits reduced by any amount during the year as a result of their work activity.** Based on DI and SSI program rules, beneficiaries may lose their cash benefits if they work (see Box 1, which explains how earnings affect benefits). We measured the number of beneficiaries who had any amount of positive benefits forgone for work (BFW). In the DI program, this means at least one month in STW. In the SSI program, BFW accrues without STW and at much lower levels of earnings. To calculate the share of beneficiaries with positive BFW, we used the same denominator as we did for the STW measure.

[2] This includes SSI beneficiaries who received benefits as children and were awarded benefits as an adult after the age 18 redetermination.

[3] Beneficiaries include those up to FRA, including in SSI. SSI beneficiaries age 65 and older are generally included with old age programs, but to be consistent with the DI program rules, we included SSI beneficiaries through FRA. The ACS working age population is defined from 16 through 64. As such, the numerator and the denominator are not strictly comparable. We do not believe that this introduces errors in our cross-PUMA comparisons given the relatively narrow age bands between 16 and 18 and 65 and FRA.

[4] DI and SSI beneficiaries are defined as those in current payment status or with cash benefits suspended or first terminated for work, using the STW measure in the DAF. To identify beneficiaries, we used the STW indicator of each program (eg. STWDI for DI beneficiaries, STWSSI for SSI beneficiaries) and selected the sample to be those whose states was STW=0, 1, 2. Excluded from our count are beneficiaries whose benefits were terminated for work in a previous month (STW=3 cases). Comparing beneficiaries in current pay in December of each year (STW=0) to SSA's published statistics, we find that our total beneficiary counts in each year are slightly lower than SSA statistics for SSI and slightly higher on DI. We believe the discrepancies reflect slightly different criteria in selection criteria and the timing of data pulls, and do not believe any observed discrepancies would affect differences by PUMAs.

- **Share of beneficiaries with any earnings during the year.** The DAF is linked to the Master Earnings File, which contains annual earnings data, as reported to the IRS.[5] We identified the number of beneficiaries with positive earnings reported to the IRS during the year, using the same denominator as for the STW and BFW share measures.

BOX 1. WORK AND DISABILITY BENEFITS

DI beneficiaries can test their ability to work with a 9-month Trial Work Period (TWP) and a 3-month grace period. In those months, earnings can be above SGA. After completing the TWP, beneficiaries enter the Extended Period of Eligibility (EPE). In the EPE, DI beneficiaries are in STW with benefits suspended in each month that earnings exceed SGA. In those months, no DI benefits are paid—the so-called "cash cliff." After the EPE and a grace period, DI beneficiaries are in STW (with benefits terminated) in the first month that earnings exceed SGA. In any STW month, DI beneficiaries lose their entire monthly benefit for work (resulting in positive BFW).

SSI beneficiaries are also able to test their ability to work under a different set of program rules. After disregarding the first $65 of earnings, SSI benefits are reduced by $1 for every $2 of countable earnings., meaning that BFW can accrue ay low earnings levels. Benefits go to zero when earnings minus exclusions are twice the federal benefit rate (FBR; $783 in 2020). Because the $1-for-$2 offset can occur in any month, suspension or termination for work is much less likely for SSI than DI beneficiaries.

More information on the STW and BFW measures in SSI and DI are available in Levere et al. (2018).

The STW and BFW measures produce identical shares for DI beneficiaries because DI program rules require that any month of STW results in the loss of full cash benefits. As a result, BFW is necessarily positive in STW months. This is not the case with the SSI program; relatively few SSI beneficiaries enter STW, but many have positive BFW.

Our earnings measure includes low levels that would not lead to reduced dependence on SSI or DI; many more beneficiaries have earnings than have STW or positive BFW. In fact, this may be true for a significant proportion of beneficiaries with earnings. Mann, Mamun and

[5] The Master Earnings File contains annual earnings data drawn from Forms W-2 and 1040, self-employment tax schedules, and quarterly earnings records. Annual earnings are defined as the maximum of Social Security–taxable wages and self-employment earnings (wages and earnings covered by the Federal Insurance Contributions Act and the Self-Employment Contributions Act), or Medicare-taxable wages and self-employment earnings, minus payments from known third-party sources—such as insurance companies—where payments involve the earnings and tax records described above. Thus, the employment and earnings statistics presented in this article do not reflect the employment and earnings of those whose earnings are not reported to the IRS.

Hemmeter (2015) found that 11 percent of DI beneficiaries and 5 percent of SSI beneficiaries who received at least one cash payment in the year earned more than $1,000 in the year; we found that 15 percent of DI and 11 percent of SSI beneficiaries in current pay in one month of the year had positive earnings.[6] Thus, many of the beneficiaries we identify as having positive earnings are not earning SGA, and may be earning less than the amount needed to earn a quarter of coverage for DI ($1,300 in 2017) or complete a month of the SSDI trial work period ($840 in 2017). Moreover, because our definition of a beneficiary is having at least one month of benefits during the year, and because we cannot tell when the earnings occurred, it is also possible that some or all of the earnings accrued before disability benefits were received. It is also important to note that this measure of earnings only reports values recorded by the IRS and excludes unreported earnings or other cash earnings that are not taxed.

We constructed PUMA-level measures using ZIP code information available in the DAF; we used the value for SSI benefits if it was populated and that for DI benefits if the SSI value was blank.[7] Beneficiaries with missing ZIP codes are not included in our analysis because we could not map them to a PUMA. We found that a minority of beneficiaries were missing ZIP code data. For example, about 16 percent of beneficiaries in the DAF in 2017 did not have a ZIP code that mapped to a PUMA. About 90 percent of those simply had a missing value and the remainder had a value that was not identified in our zip-to-PUMA concordance. We are unaware of the cause of missing ZIP codes and to not have reason to believe that missing ZIP codes are nonrandom.[8] As such, we believe that our results reflect the universe of DI and SSI beneficiaries.

To minimize the risk of identifying particular beneficiaries, PUMAs with fewer than ten observations (1-9) in a particular cell were masked and coded as missing, consistent with SSA

[6] As indicated above, our definition of beneficiary for our main analysis includes beneficiaries in STW. This statistic was calculated on a slightly different population, namely beneficiaries with at least one positive payment while in current payment status during the year. As such, it should be comparable to the sample in Mann et al. (2015).
[7] We do not know the extent to which beneficiaries may have a ZIP code on file with SSA that is outdated. As the processing of monthly disability payments as moved to electronic, it is likely the case that beneficiaries may move and not update SSA. We do not know of any reason to think that outdated ZIP codes would bias out findings.
[8] In subsequent versions of the DAF, the construction method of ZIP code has changed to populate missing values with the last information available for the beneficiary. This propagated value was not available at the time of our analysis.

data privacy guidelines.[9] Across all of our outcome measures, fewer than one-half of one percent of PUMA values from 2001 to 2017 were masked.

Geographic Variation in Beneficiary Outcomes

Like earlier studies on rates of benefit receipt, we found substantial national variation in new awards. Figure 1 shows the number of new DI and SSI adult awards in 2017. Award rates in both programs were highest in Appalachia (particularly where Kentucky, Virginia, and West Virginia meet) and southern states such as Mississippi and Alabama. They are also relatively high in western states such as New Mexico and Washington. We found that these patterns were relatively consistent across the years of our analysis.

The share of beneficiaries who work also varies substantially across the country, as shown in Figure 2. Among both DI and SSI beneficiaries, the share with positive earnings was highest in the Great Plains region—with especially high concentration of high employment rates in the eastern parts of North Dakota and South Dakota, the southern and western parts of Minnesota, and the northern part of Iowa. In these regions, up to 40 percent of beneficiaries had at least some earnings in 2017, relative to the overall shares of 16 percent in DI and 14 percent in SSI. It is important to note that PUMAs in these parts of the country tend to be less populated than in other areas, even covering larger land areas; PUMAs must have at least 100,000 people, but may have many more. As such, these high rates of earnings are concentrated among relatively few beneficiaries compared with PUMAs on the coasts or in urban areas.

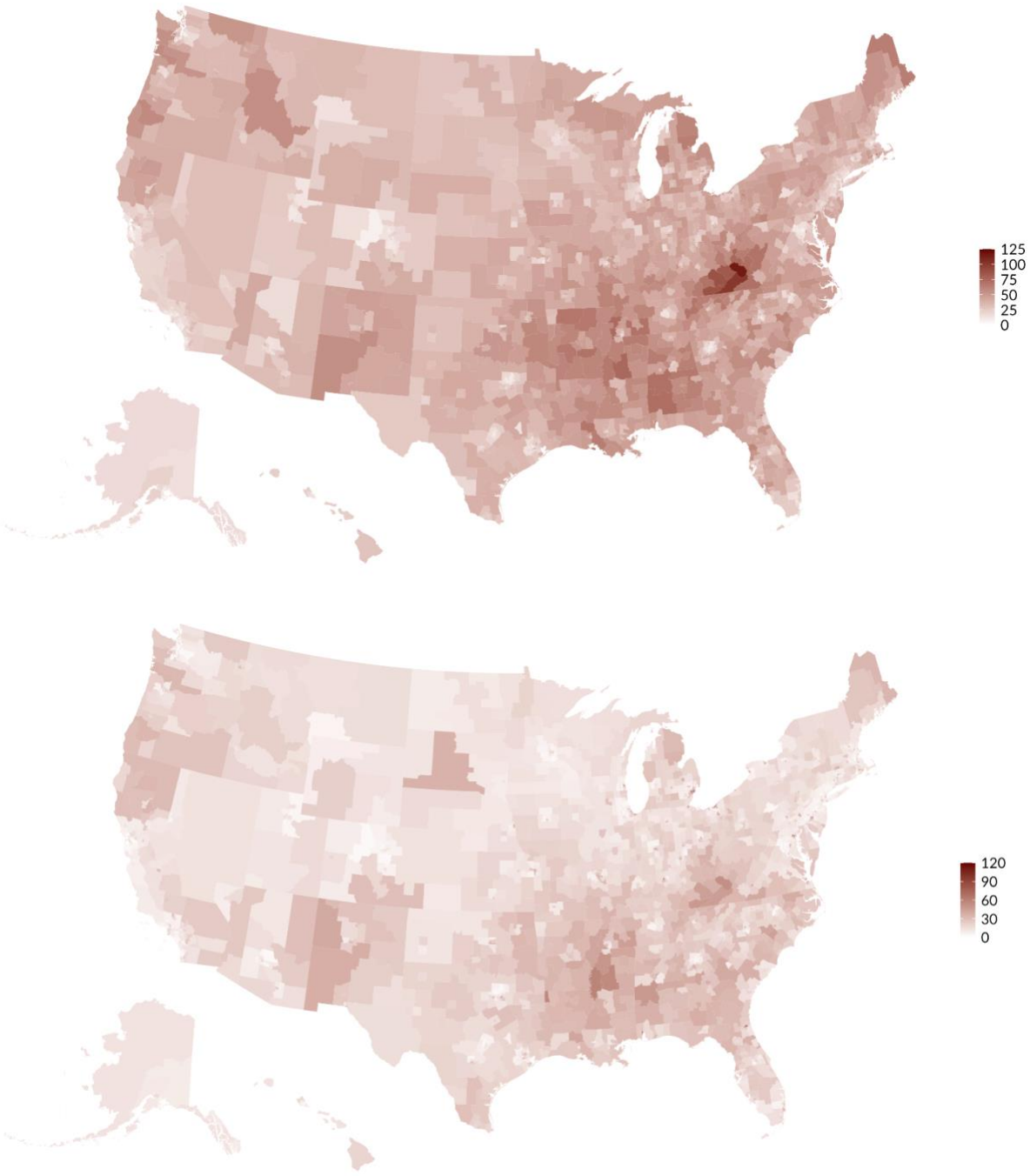
It is notable, however, that areas with high beneficiary employment rates crossed state lines and still varied substantially within state; meaning that state policies alone do not explain the observed variation. For example, in Minnesota, some areas had beneficiary employment rates over 50 percent while other areas had employment rates that were much lower. To a lesser degree, high rates of employment occurred in the surrounding states as well, as far west as Montana and Wyoming and as far south as Kansas. Like award rates, we found that this general pattern held in earlier years of our analysis as well.

As noted previously, having any earnings does not necessarily translate to the loss of cash disability benefits among beneficiaries; low levels of earnings could be reported to the IRS while

[9] Because no cases within a PUMA does not pose a disclosure risk of individual information, we have identified PUMAs without any cases separately from those with fewer than 10 cases.

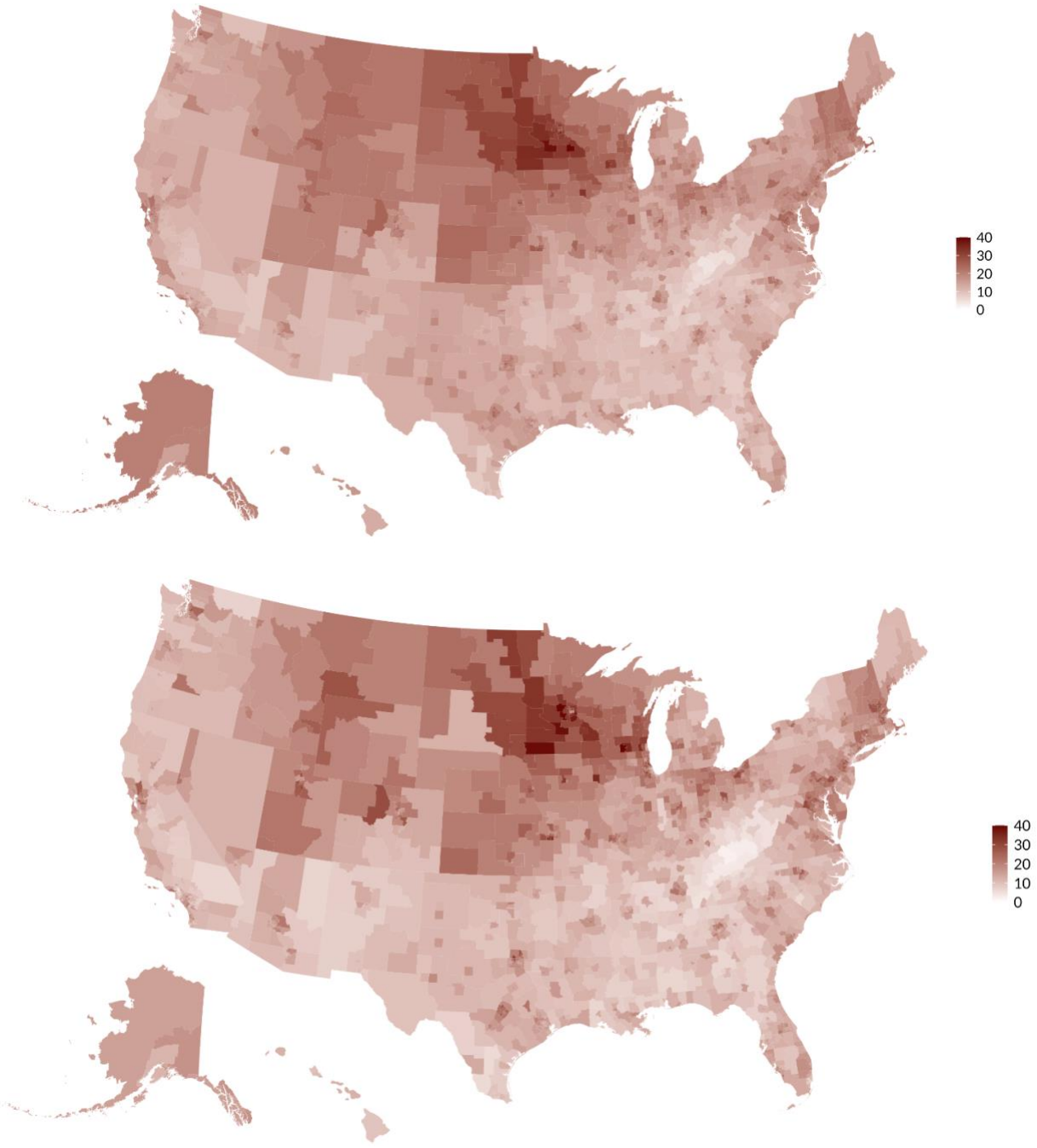
still maintaining the full DI or SSI benefit. Figure 3 shows the share of beneficiaries who had positive BFW in 2017. As described in Box 1, BFW accrues to SSI beneficiaries when countable earnings exceed a $65 earnings disregard, whereas for DI beneficiaries, positive BFW only accrues after completing the TWP and aligns with being in STW. As such, the rates of positive BFW are much lower for DI beneficiaries than SSI, and both rates are substantially lower than the share of beneficiaries with any earnings during the year. Higher rates of positive BFW tend to mirror the overall employment rates in Figure 1, however, with higher BFW in the southern Minnesota and surrounding areas in the northern plains region.

Figure 1. *DI (Top Panel) and SSI (Bottom Panel) Award Rates per 10,000 Working-Age Population, by PUMA, 2017*



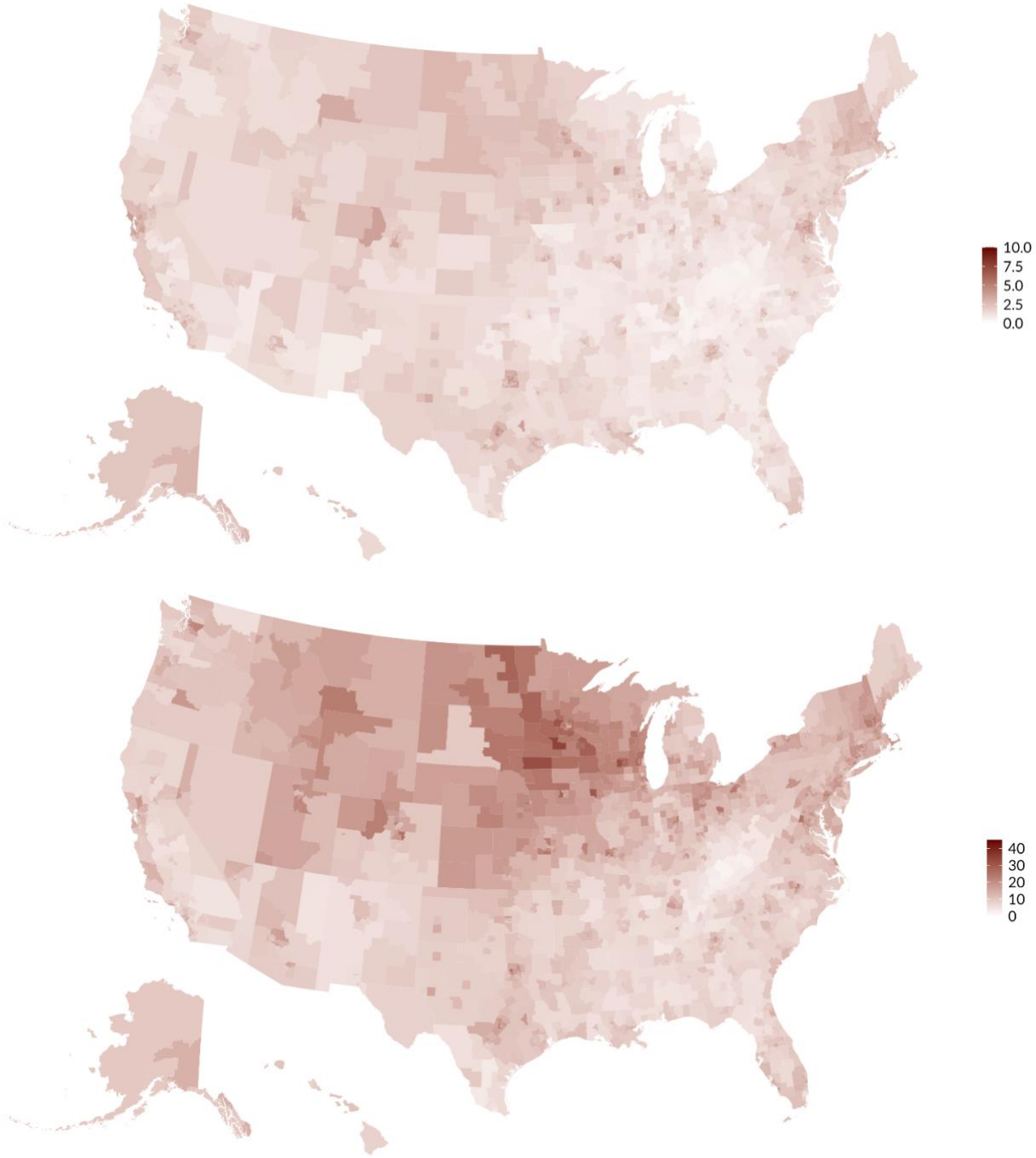
Note: Award rates are calculated as a share of the working-age population (in 10,000) in the PUMA.
Source: Authors' calculations using SSA's DAF18.

Figure 2. *Share of DI (Top Panel) and SSI (Bottom Panel) Beneficiaries with Positive Earnings, by PUMA, 2017*



Note: Positive earnings are based on reports to the IRS in 2017.
Source: Authors' calculations using SSA's DAF18, using measures described in the text.

Figure 3. *Share of DI (Top Panel) and SSI (Bottom Panel) Beneficiaries with Positive BFW, by PUMA, 2017*



Note: The meaning of positive BFW varies in DI and SSI and is described in Box 1.
Source: Authors' calculations using SSA's DAF18 using measures defined in the text.

Measuring Factors Potentially Associated with Disability Benefit Receipt and Beneficiary Work Activity

We are interested in understanding the factors that might explain the geographic patterns in award rates and beneficiary work activity. To do this, we combined data from the DAF with demographic, socioeconomic, and other local-area characteristics that could potentially influence beneficiary outcomes from the ACS. The ACS is collected by the U.S. Census Bureau and its sample is described in more detail in Box 2. PUMA information was not available for the years 2001 through 2004, so all measures we derived from the ACS are available for the years 2005 through 2017 only.

Using the ACS from 2005-2017, we derived local-level characteristics including:

- **Demographics:** the distribution of the population across age, sex, race, ethnicity, foreign-born status, veteran status, and disability status[10]
- **Socioeconomic status:** average wage and salary incomes, rate of receipt of Supplemental Nutrition Assistance Program (SNAP), and poverty rate
- **Local economic factors:** unemployment rate, share of people with disabilities who are employed, and the share of workers in the manual labor and retail industries
- **Cost of living:** average monthly rent and house value
- **Urbanicity:** population density, and the percent of the population living in a metropolitan statistical area
- **Commuting information:** share of workers who take public transportation to work, share of workers who work from home, and average commute times

Local variation in health and health behaviors might also be important correlates of benefit receipt but not measurable at the PUMS level while using the ACS. We therefore included two such measures at the state level: smoking prevalence (the percent of adults who are

[10] Note that the measure of disability we use is not the same as the ACS "six question series," which the Census Bureau modified in 2008. We created a binary disability measure that is coded to 1 if the respondent answered yes to any of the 5 disability questions asked in the ACS consistently from the period from 2001 through 2017, including whether the respondent has (1) serious difficulty with concentrating, remembering, or making decisions, (2) a condition that substantially limits one or more basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying, (3) a chronic condition making it difficult or impossible to perform basic activities outside the home alone, (4) a chronic condition making it difficult for them to take care of their own personal needs, such as bathing, dressing, or getting around inside the home, (5) has a long-lasting condition of blindness, deafness, or a severe vision or hearing impairment. Note that the 2000-2007 questionnaires stipulated that the causative health condition must have persisted for at least six months, but the post-2008 questionnaires dropped any mention of time. To the extent that the change in questionnaire wording was uniform across PUMAs, any changes in the composite disability measure due to the change would be captured by the year fixed effects included in all regression models.

current smokers) and share of the adult population that is overweight or obese, both measures estimated from the BRFSS from 2001 through 2017.

We also obtained data from the AHRF, collected by the U.S. Health Resources & Services Administration, to consider metrics around health care availability and utilization from 2005 through 2017. These include:

- **Number of physicians (MDs) per 10,000 residents**, which could signal the availability of primary health care in the area and the likelihood that disabling conditions are diagnosed
- **Share of non-federal MDs who are orthopedists**, which could be correlated with the high share of musculoskeletal conditions among SSDI beneficiaries (given a high share of musculoskeletal diagnoses, to be used with the measure above to calculate a percent)
- **Share of non-federal MDs who are in psychiatry**, which could be correlated with the high share of mental health conditions among SSDI and SSI beneficiaries
- **Hospital beds per 10,000 residents,** signaling the availability of acute healthcare in the PUMA
- **Total number of inpatient days per 10,000 residents,** which could signal the overall level of health in the PUMA and acute healthcare needs
- **Share of the working-age population without health insurance coverage,**[11] which may signal the extent to which individuals may have increased demand for disability benefits because of the health insurance conferred through those programs.[12]

Assessing the Association Between Beneficiary Outcomes and Local-Level Factors

We use a simple multivariate model to identify factors associated with disability program awards and beneficiary work outcomes from 2005 through 2017. We used a linear probability model with the specification:

$$(1) \qquad y_{jt} = \alpha + \beta_1 DEMOG_{jt} + \beta_2 SES_{jt} + \beta_3 OTHER_{jt} + \delta_t + \eta_j + \varepsilon_{jt}$$

where y_{jt} is the share of working-age beneficiaries with positive earnings or with cash disability benefits suspended for work. $DEMOG_{jt}$, SES_{jt}, and $OTHER_{jt}$ are the vectors of demographic, socioeconomic, and other characteristics derived from the ACS, BRFSS, and AHRF. We

[11] The ACS contains information on health insurance at the PUMA level, but only for 2008 onward. These measures are included in the accompanying data file. For our analysis, we used information from the AHRF because it spanned a longer period. Because of not having permission to share, as documented in the previous endnote, the measure we use is not included in that file.

[12] Of course, a higher share of the PUMA already receiving SSA disability benefits will reduce the share of the PUMA's population without health insurance. If anything, this will reduce the likelihood of a statistically significant association between health insurance coverage and the outcomes of interest.

express both outcomes and explanatory factors in logarithmic terms to interpret coefficients as elasticities, that is, the coefficient can be interpreted as the effect of a one-percent change in the variable on the outcome (also in percent terms). δ_t are time-fixed effects to control for national trends in program participation and beneficiary outcomes. η_j are PUMA-fixed effects that capture time-invariant differences across areas; we incorporate these when considering the role of changing local-level factors over time (see below) but not in our model considering the cross-sectional correlation between local-level factors and beneficiary outcomes.

Which Local-Level Factors Are Correlated with Beneficiary Outcomes?

We first examine cross-sectional correlations between local-level factors and beneficiary outcomes. In these analyses, all regression models include year fixed effects to control for national trends in the beneficiary outcome over time. Figure 4 provides a high-level summary of the magnitude and significance of results for new benefit awards, while Figure 5 shows a similar set of results for the share of beneficiaries with positive earnings. The full set of cross-sectional models and covariates are contained in the appendix.

Focusing on some demographic characteristics to start, we found that holding other characteristics of the PUMA constant, DI and SSI award rates are higher in PUMAs that have a higher share of the population that is female, Black, or has less than a college education (Figure 4, Appendix Table 1). A higher share of the PUMA's population that is over age 65 is associated with a lower SSI award rate but a higher DI award rate. We also found that DI award rates (but not SSI award rates) are higher in PUMAs that have a higher share of the population that is a veteran, but lower in PUMAs that have a higher share of the population who is childless, or born abroad.

We found that holding other PUMA characteristics constant, beneficiary work activity is higher in PUMAs with a higher share of the population that is over age 65 or a veteran (Figure 5). We found that work activity was higher across all three of our measures (positive earnings, STW, and positive BFW) and for DI and SSI beneficiaries, though the effects of population distribution were larger for DI than SSI beneficiaries (Appendix Tables 2 and 3). Conversely, we found that beneficiary work activity was lower in PUMAs with a higher share of the population that is married, childless or not college educated. These effects were again consistent across measures of work and disability programs, with the exception of the share that has a

college education. A higher share of the PUMA with a college education is associated with decreased likelihood of positive earnings among DI beneficiaries, but an increased likelihood of STW and positive BFW (Appendix Table 2).

The findings of significant associations between demographic subgroups and outcomes at the PUMA level are notable because they are independent of other socioeconomic and health factors. For example, our findings show that areas with higher shares of the population who are Black are associated with higher award rates for disability benefits, even holding constant many other factors. It is beyond the scope of this paper to determine whether these findings are an outcome of the structural inequalities in US society or its health system (e.g., differences in mobility/mortality across demographic groups), or are a feature of missing covariates or other aspects of SSA or government policy, but it is worth noting that some of these estimates are large (relative to other point estimates) and statistically significant.

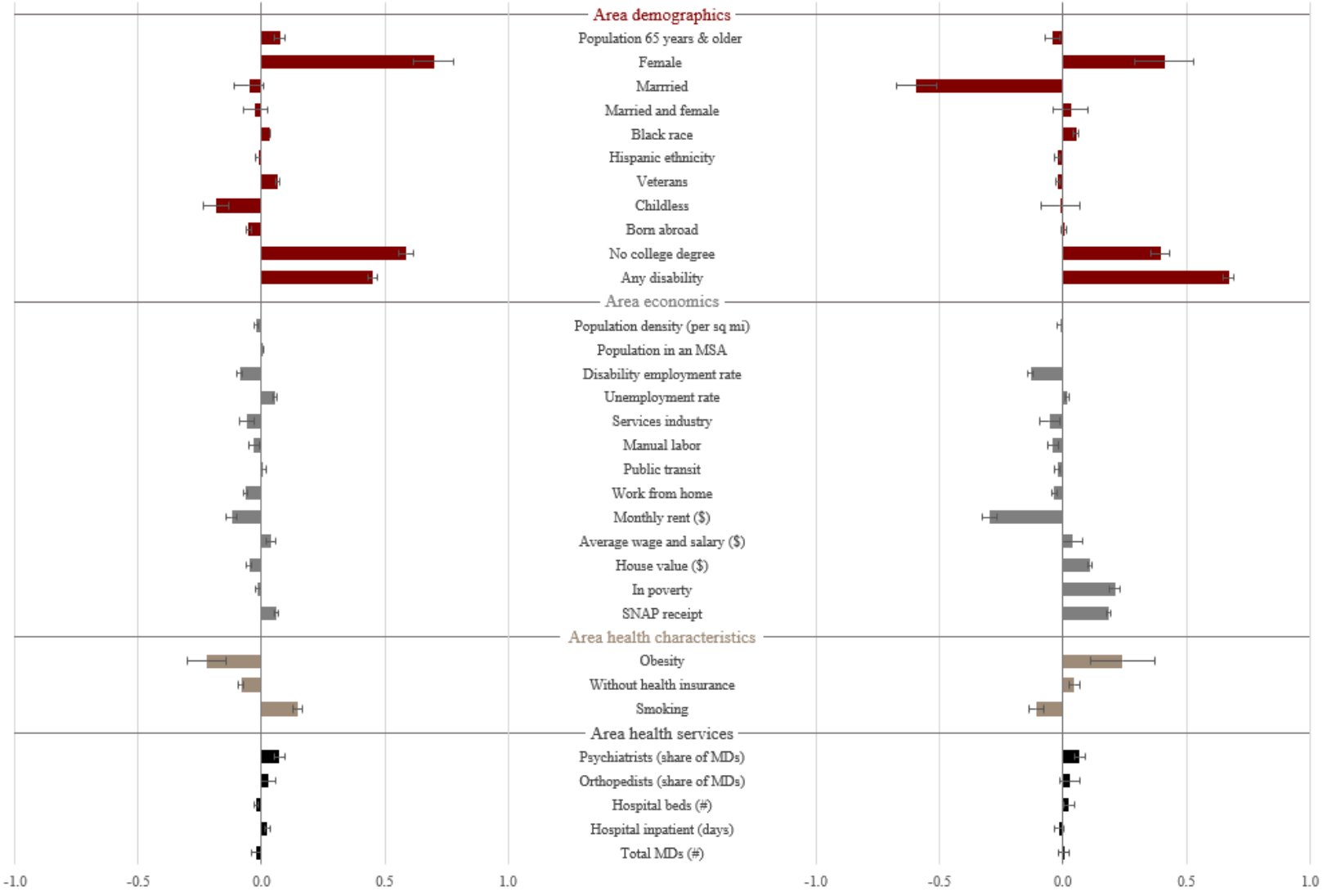
We also found that obesity rates are strongly positively associated with new SSI awards, but negatively associated with new DI awards; smoking has the opposite relationship in each program (Figure 4). For both programs, PUMAs with a higher share of the population that is obese have higher beneficiary employment rates, while a higher share who smokes is associated with lower employment rates (Figure 5). The opposite direction of these effects is surprising given that both can lead to worse overall health. These are also the only two state-level factors in our model, so it is possible that these measures are capturing other state-level effects not otherwise accounted for in our model. The estimated elasticities in the models with PUMA fixed effects, which consider the effect of a change in obesity prevalence, are in fact much smaller than in the model with year fixed effects, suggesting that these associations are indeed capturing broader factors.

In the remainder of our discussion of results, we focus mostly on local-level factors that may potentially be affected by policy levers rather than demographic patterns, as the former are arguably more under the control of national, state or local policymakers. To the extent possible based on existing literature, we hypothesize about the possible relationship between the local-level factors and beneficiary awards and work outcomes. While the effects we discuss in this section are multivariate, we also present univariate scatterplots to highlight the associations observed between the outcomes that were meaningful in the multivariate models. In Figures 6 and 7, we show the univariate associations between selected dependent variables and new benefit

awards as well as the share of beneficiaries with positive earnings. The plots are shown separately by program.

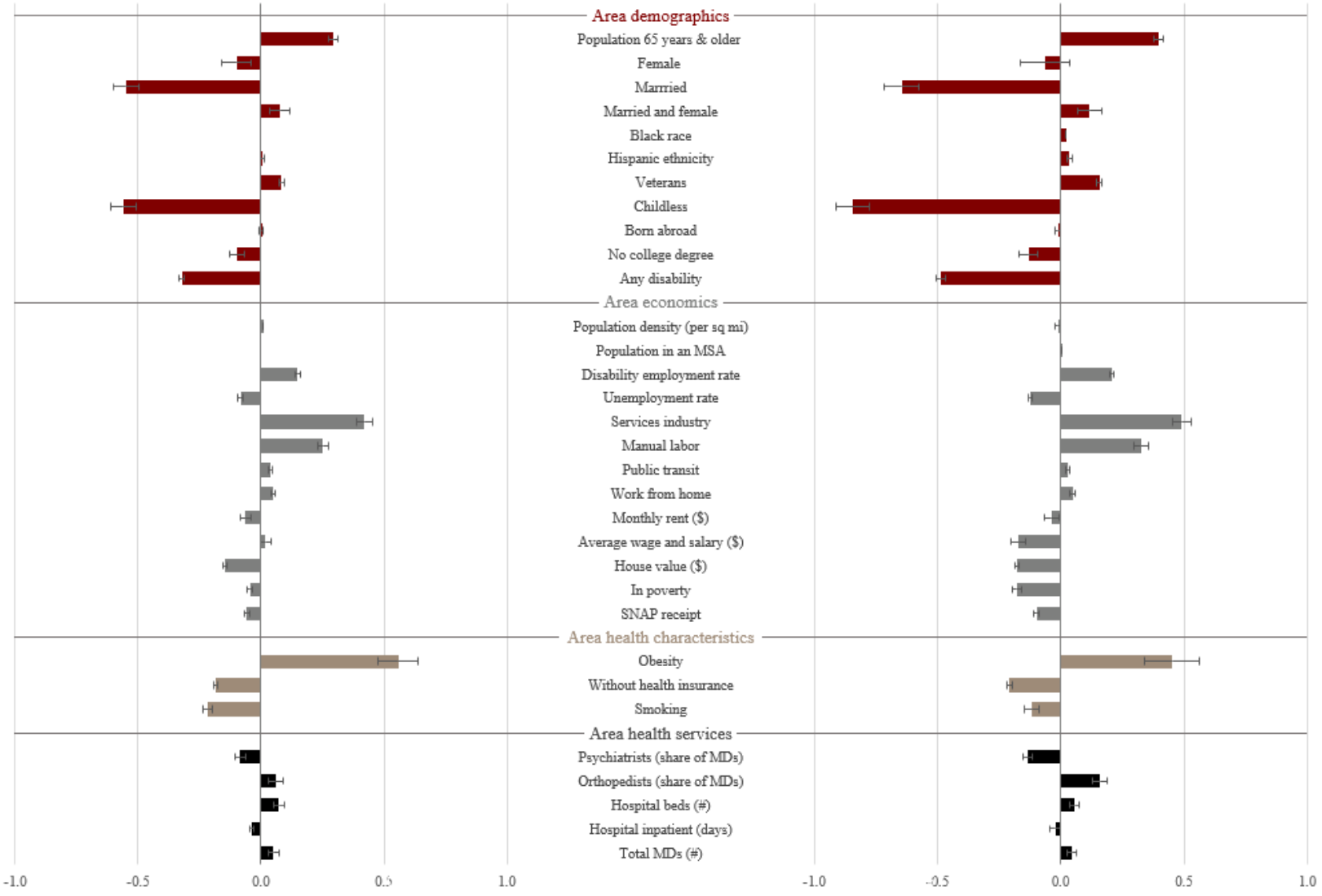
Disability Prevalence. Areas with higher disability prevalence have higher rates of benefit award and lower beneficiary work activity. Areas with higher disability prevalence might have generally worse health and functioning among the population, which would result in increased demand for disability benefits. This is consistent with Gettens et al. (2016), who found that variation in disability prevalence accounts for a large portion of the variation in DI/SSI participation, although the reasons for the wide geographic variation in disability prevalence across areas are not known.

Figure 4. *Regression Coefficients in Models for DI (Left) and SSI (Right) Award Rates (per 10,000 Working-Age Population)*



Notes: All variables in log terms, so that the coefficient is interpretable as an elasticity. Whiskers show the 95 percent confidence interval on the coefficient estimate. Models include data from 2005-2017 and include year fixed effects. All covariates measured in percentages, unless otherwise noted. See text for more details and appendix tables for full set of estimates.
Source: Author's calculations using merged DAF, ACS, BRFFS, and AHRF data.

Figure 5. *Regression Coefficients in Models for the Share of DI (Left) and SSI (Right) Beneficiaries with Positive Earnings*



Notes: All variables in log terms, so that the coefficient is interpretable as an elasticity. Whiskers show the 95 percent confidence interval on the coefficient estimate. Models include data from 2005-2017 and include year fixed effects. All covariates measured in percentages, unless otherwise noted. See text for more details and appendix tables for full set of estimates.

Source: Author's calculations using merged DAF, ACS, BRFFS, and AHRF data.

Availability of Public Transit and Proportion of Workers Who Work from Home. We find that the share of the working population who use public transit to commute to work has only a weak association with the outcomes we consider, in both univariate and multivariate contexts. Public transit availability is negatively associated with SSI award rates, and positively associated with both SSI and DI beneficiary work activity. We find that areas with a higher share of workers who work from home have slightly higher work activity among beneficiaries in both programs.

Poverty and Public Benefit Receipt. Unsurprisingly, areas with higher poverty and increased SNAP receipt also have higher SSI awards, given that SSI is a means-tested program. Higher rates of SNAP receipt are also associated with higher DI award rates. Higher SNAP recipiency rates and poverty rates are associated with lower levels of beneficiary work activity.

Share of the Working-Age Population without Health Insurance. Areas with lower health insurance coverage rates (or, higher uninsurance rates) have higher SSI award rates but lower DI award rates, as well as lower beneficiary work activity in both programs.

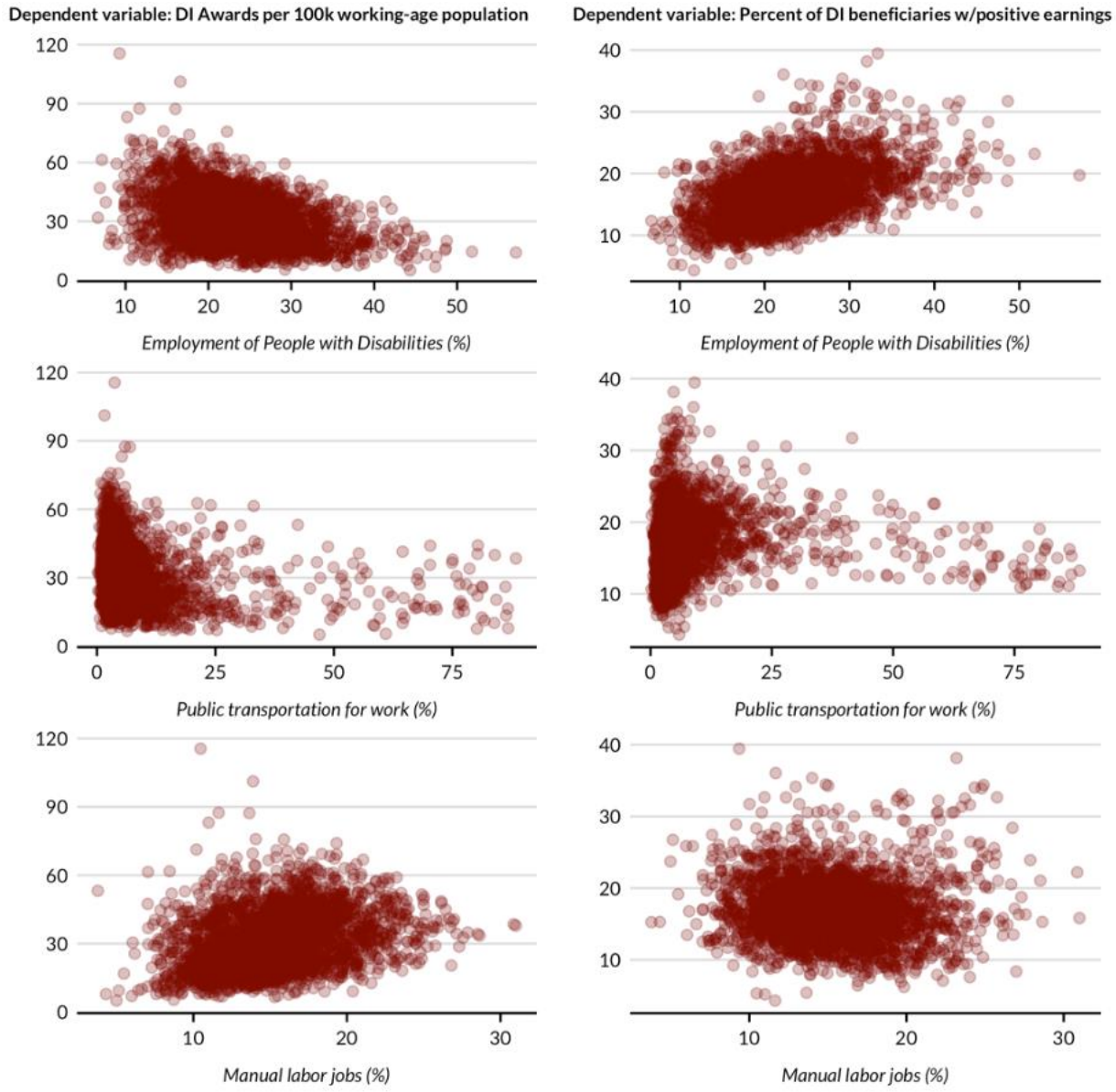
Employment of People with Disabilities. Areas with higher rates of employment of people with disabilities have lower DI and SSI award rates and higher rates of beneficiary work activity. Future research investigating what local factors drive high levels of work among people with disabilities generally would shed light on policies that ultimately assist beneficiary and non-beneficiary workers.

Composition of Jobs. The composition of jobs in an area is not strongly associated with or SSI or DI award rates holding other factors constant, though there is a weak positive association between the share of jobs in manual labor and DI award rates (Figure 6). We found that holding constant other PUMA characteristics, that work activity is higher among beneficiaries in areas with higher shares of jobs in service and manual industries. This relationship does not seem strong in the univariate plots, however (Figures 6 and 7).

Availability of Health Services. There was a weak and mixed association between the availability of health services such as the number of doctors and hospital beds and the availability of psychologists and orthopedists and beneficiary outcomes. The number of psychologists was slightly positively associated with higher DI and SSI awards, but lower beneficiary employment rates. The number of total doctors as well as the share who were orthopedists were positively associated with beneficiary work outcomes. The number of hospital

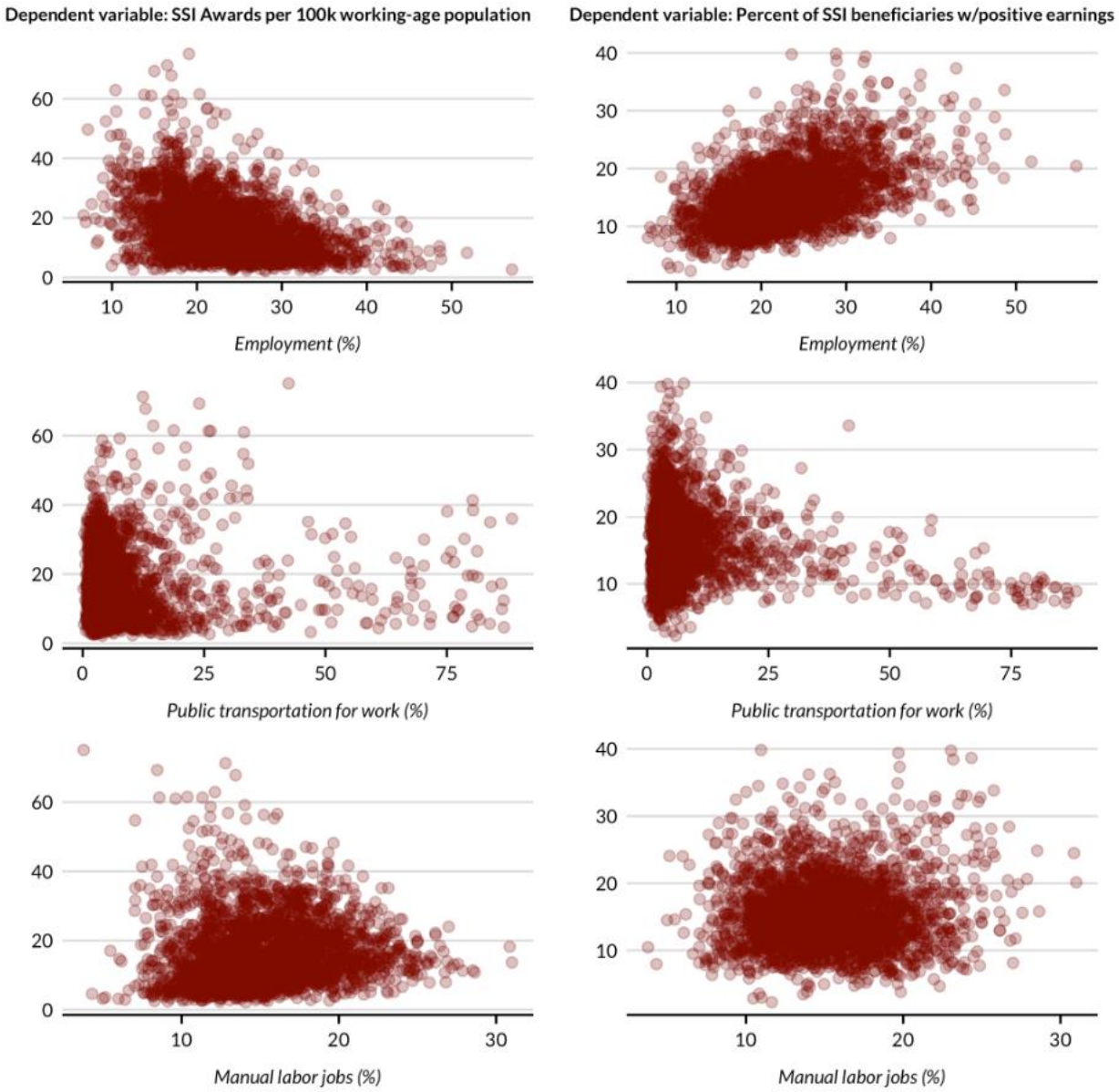
beds were slightly positively associated with beneficiary work activity, while more inpatient hospital days were associated with less beneficiary work activity.

Figure 6. *Univariate Associations Between DI Award Rates and the Share of DI Beneficiaries with Earnings and Selected Covariates, 2017*



Notes: The dependent variable is shown on the vertical axis and the label shown at the top of each column of graphs applies to the full column. The independent variable is labeled under each horizontal axis. Each dot represents a PUMA value in 2017. Employment on the x-axis in the top panel is the share of people with disabilities employed in the PUMA in the year.
Source: Author's calculations using merged DAF and ACS data.

Figure 7. *Univariate Associations Between SSI Award Rates and the Share of SSI Beneficiaries with Earnings and Selected Covariates, 2017*



Notes: The dependent variable is shown on the vertical axis and the label shown at the top of each column of graphs applies to the full column. The independent variable is labeled under each horizontal axis. Each dot represents a PUMA value in 2017. Employment on the x-axis in the top panel is the share of people with disabilities employed in the PUMA in the year.
Source: Author's calculations using merged DAF and ACS data.

Are Changes Over Time in Local-Level Factors Correlated with Changes in Beneficiary Outcomes?

We also sought to understand whether changes over time in features of an area were associated with changes in beneficiary awards or outcomes, as this more closely resembles the effects of a state or local policy change. In this version of our results, we included PUMA fixed effects, which control for characteristics that do not change over time that may affect an area's outcomes. For example, these could include the willingness of employers to hire workers with disabilities, which may not change much over time, cannot be easily observed, and would not be captured by other variables in our model. Again, we focus our discussion on factors that might be subject to policy changes; the full set of regression results is contained in the appendix (Appendix Tables 4, 5, and 6).

In general, the models that accounted for PUMA-level unobserved factors were quite similar to the cross-sectional results; factors that explained variation across PUMAs during the same period led to increases or decreases over time within the same PUMA as those factors changed. As such, we focus in this section on factors for which the cross-sectional and PUMA fixed effects results differed or where there was meaningful change over time that make the results notable.

Disability Prevalence. An increase in disability prevalence is associated with an increase in DI and SSI awards. However, we found no relationship between disability prevalence and most work outcomes, though a weakly positive association with STW and BFW among DI beneficiaries.

Availability of Public Transit and Proportion of Workers Who Work from Home. An increase in the share of workers who use public transit is associated with lower SSI and DI award rates, but we found no relationship with beneficiary work activity. We also did not find a relationship between the share of workers who work from home and beneficiary outcomes. These results stand in contrast to the results based on models that excluded PUMA fixed effects, suggesting that those results were likely picking up unobserved cross-PUMA differences.

Share of Population without Health Insurance. An increase in the share of uninsured population is associated with higher award rates and lower beneficiary work activity. The variable included in our model is the share uninsured, where an increase in uninsured population translates to a decrease in the share of the population with health insurance. Extrapolating, our

findings suggest that an increase in the share of the population *with* health insurance coverage (a reduction in uninsurance) is associated with reduced award rates and increased beneficiary work activity. This alternate framing is important during the period of our analysis because the Affordable Care Act (ACA) was implemented in 2010 and led to increases in insurance coverage among people with disabilities and specifically workers with disabilities (Kennedy et al. 2017, Hill and Schimmel Hyde 2020). Despite coverage gains, there has not been conclusive evidence that those changes translated into changes in work among people with disabilities (Hall et al. 2017, Hall et al. 2018, Sevak and Schimmel Hyde 2020) nor applications and awards for disability benefits (Anand et al. 2018, Burns and Dague 2017; Soni et al. 2017). Our results stand in contrast to these other more rigorous investigations and should be interpreted only as associations.

Wage Income, Rent, and Cost of Housing (Rent and Value of Homes). Areas that are becoming more affluent–as measured by higher rents, housing values and wage income–tend to have reduced DI and SSI award rates. They also are more likely to have an increased likelihood of beneficiaries who work. In many cases, housing prices proxy for other economic changes in the area, including the availability of high-paying jobs. Like the employment rate of people with disabilities, we do not know which policy changes or other factors would be leading to areas becoming more or less affluent over time.

Composition of Jobs. An increase in the share of jobs in manual and service occupations is associated with a reduction in award rates. An increase in manual occupations is associated with increased beneficiary work activity, while increases in service occupations is associated with reduced work activity. These changes may signal overall changes in the area rather than simply the composition of jobs—for example, more service sector jobs may be correlated with a growing urban area.

Availability of Health Services. Increases in the availability of health care providers (total doctors, psychiatrists, orthopedists and hospital beds) over time within the PUMA were associated with an increase in the number of disability benefit awards, while increases in inpatient stays were associated with reductions in awards. Increases over time within the PUMA in the total number of doctors were associated with increases in the share of DI and SSI beneficiaries with positive earnings, as well as the share of DI beneficiaries with STW and BFW. There was not a consistent pattern of the availability of other health services on beneficiary work

outcomes; some associations were positive while others were negative or statistically insignificant.

Conclusions and Implications for Policy Development

We find considerable variation in award rates and beneficiary work activity across PUMAs, across and within state. Our results are generally consistent with other existing literature examining the geographic determinants of disability program rolls and entry using state or county-level data. For example, we find that disability prevalence is an important determinant of program applications, which is consistent with Gettens et al. (2016). Like our study, Gettens et al. (2016) also find that areas with higher proportions of workers in services and manual labor industries such as manufacturing and construction have higher levels of DI participation.

A common theme that emerges across studies, including ours, is that the availability and access to economic opportunity may be important factors in explaining beneficiary outcomes. To our knowledge, our work is the first to consider how local level factors might be associated with beneficiary work activity. A number of other studies using state-level data have found that DI application rates are negatively affected with unemployment rates, including Coe et al. (2011) and Rupp (2012), which is consistent with what we find, though we focused in our discussion on employment of people with disabilities more specifically. Similar to our findings, other studies focusing on the SSI program, such as Nichols et al (2017), Schmidt and Sevak (2017), and Rupp (2012), have found that economic conditions, including poverty rates and unemployment rates, are positively associated with SSI application rates (and negatively with allowance rates).

Our study also suggests that the availability of health services, particularly the number of physicians, may be associated with both increased benefit awards and better beneficiary work outcomes. On the award side, more physicians may mean increased diagnostics and documentation necessary for the disability benefit application process. Of course, it could also be that more physicians reflect the health status of an area and may reflect more need for health care. For work outcomes, it may be that a higher number of physicians means that beneficiaries can access the medical care they need to maintain employment. Our analysis only assesses correlations across these measures, but suggest an avenue that may be worthy of additional exploration.

It is important to note that our analysis is descriptive and we cannot and do not ascribe a causal relationship to observed factors. Knowing which factors are correlated with relative success of work among people with disabilities may be useful to policymakers in considering policies such as the targeting of ticket mailings or Work Incentives Planning and Assistance to certain areas. Our cross-sectional and longitudinal analyses painted a consistent picture that areas with lower levels of economic opportunity—and areas with reductions in "affluence" over time—might be advantageous areas to target. Using trend data may help predict areas of opportunity before waiting to observe new awards or beneficiary outcomes.

Our analysis of employment outcomes focused on award and employment rates, where the denominator was the number of beneficiaries in the area. We took the beneficiary count as given, but know from other work that the number of beneficiaries in an area can be affected by many policies, including those under direct control of the SSA. In particular, Deshpande and Li (2019) documented a significant increase in SSA field office closings from 2011 through 2014 which resulted in a decline in the number of disability recipients in surrounding areas. The largest declines were for applicants with moderately severe conditions and low education levels, meaning that the resulting beneficiary population in those areas may have had less severe disabilities and higher education levels after the closings. As a result, the work activity among those beneficiaries may have been higher as a result of the compositional shift of the applicant pool. While we accounted for some of the characteristics of the PUMA, we did not control for this type of policy change in our analysis as it was beyond the scope of our data collection efforts.

In addition to rates, it is possible that levels of those outcomes may also be important to consider; areas with high numbers of new awardees or low levels of beneficiary work activity may also paint a picture about important local level factors to those outcomes that may differ from the ones we identified. We expect that the dataset we developed for this paper with PUMA-level statistics on the SSA measures we presented will be made available on SSA's website with documentation explaining the measures in more detail. Those data may be useful for other researchers interested in the determinants of disability program flows and beneficiary work activity, and further exploration might be fruitful.

BOX 2. CONSTRUCTING THE PUMA-LEVEL DATASET

The **DAF** is built from multiple SSA master program files and other administrative files to provide static, monthly, and summary information on demographics, disability status and benefit receipt, and work related activities for all beneficiaries with at least one month of DI and/or SSI benefits from March 1996 onward. More information about the DAF is available here. We used the DAF18, with data through December of 2018. Given lags in work activity being reported to the SSA, we include data through 2017 in our analysis. We aggregated monthly information into annual measures to align with other data sources. To construct PUMA-level measures, we mapped the latest ZIP code available for the beneficiary each year in the DAF to PUMAs. SSA records the ZIP code of beneficiaries for purposes of processing applications and administering benefits.

The **ACS** is an ongoing annual survey administered by the Census Bureau that gathers information in the 50 U.S. states, the District of Columbia, and Puerto Rico. We accessed it through IPUMS USA at the University of Minnesota (Ruggles et al. 2020). The ACS provides an annual snapshot of U.S. population, including social, economic, housing and population data. The survey is sent to approximately 3.5 million addresses per year and is the largest household survey that the Census Bureau administers. This study uses the 1-percent microdata samples of the ACS datasets and sample weights provided by IPUMS to create population estimates that are representative at the PUMA-level.

The **BRFSS** is an ongoing annual survey administered by the Centers for Disease Control and Prevention that collects data from US residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. Issues addressed in the BRFSS include tobacco use, health care coverage, HIV/AIDS knowledge and prevention, physical activity, and fruit and vegetable consumption. Established in 1984, the survey is administered in all 50 states, Puerto Rico, the U.S. Virgin islands, and Guam. The survey covers U.S. civilian noninstitutionalized population aged 18 years and older residing in households, and the sample is designed to be representative of the population of each state. We downloaded the data from the BRFSS website

The **Area Health Resources Files (AHRF)** is an annual county-level data set maintained by the Health Resources and Services Administration that is comprised of data collected from more than 50 sources and contains information on health care access and supply. It includes information on health professions supply and demographics; health facility numbers and types; hospital utilization; population characteristics and economic data; land use and housing density; and health professions training resources. The AHRF integrates data from numerous data sources including (but not limited to): the American Hospital Association, the American Medical Association, the US Census Bureau, the Centers for Medicare & Medicaid Services, Bureau of Labor Statistics, and the Veteran's Administration.

We used a publicly available concordance from the Missouri Census Data Center, Geocorr to map ZIP codes in the SSA files and county-level AHRF data to PUMAs. The Census Bureau redefined PUMA boundaries for ACS samples from 2012 onwards. We used the PUMA mapping and allocation factors from Geocorr to align the PUMAs from 2005 through 2011 with the later years We also used Geocorr mapping and allocation factors to convert county-level measures to the PUMA-level.

References

Anand, Priyanka, Jody Schimmel Hyde, Maggie Colby, and Paul O'Leary. 2018. "The Impact of Affordable Care Act Medicaid Expansions on Applications to Federal Disability Programs." *Forum for Health Economics and Policy* 21(2): 1-20.

Coe, Norma B., Kelly Haverstick, Alicia H. Munnell, and Anthony Webb. 2011. "What Explains State Variation in SSDI Application Rates?" Working Paper 2011-23. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Deshpande, Manasi and Yue Li. 2019. "Who Is Screened Out? Application Costs and the Targeting of Disability Programs." *American Economic Journal: Economic Policy* 11(4): 213-248.

Gettens, Jack, Pei-Pei Lei, and Alexis Henry. 2018. "Accounting for Geographic Variation in Social Security Disability Program Participation." *Social Security Bulletin* 78(2): 29-47.

Hall, Jean P., Adele Shartzer, Noelle Kurth, and Kathleen C. Thomas. 2017. "Effect of Medicaid Expansion on Workforce Participation for People with Disabilities." *American Journal of Public Health* 107: 262-264.

Hall, Jean P., Adele Shartzer, Noelle Kurth, and Kathleen C. Thomas. 2018. "Medicaid Expansion as an Employment Incentive Program for People with Disabilities." *American Journal of Public Health* 108: 1235-1237.

Hill, Anna and Jody Schimmel Hyde. 2020. "Health Insurance and Access to Care of Workers with Disabilities, 2001-2017." *Disability and Health Journal* 13(1): 1-8.

Kennedy, Jae, Elizabeth G. Wood, and Lex Frieden. 2017. "Disparities in Insurance Coverage, Health Services Use, and Access Following Implementation of the Affordable Care Act: A Comparison of Disabled and Nondisabled Working-Age Adults." *Inquiry* 54: 1-10.

Levere, Michael, Jody Schimmel Hyde, Su Liu, and Francoise Becker. 2018. "Disability Beneficiary Work Activity, 2002–2014: Evidence from the Social Security Administration's Disability Analysis File (DAF)." Disability Research Consortium Working Paper 2018-02. Washington, DC: Mathematica Policy Research.

Li, Zhe. 2018. "Trends in Social Security Disability Insurance Enrollment." Washington, DC: Congressional Research Service. Available at https://fas.org/sgp/crs/misc/R45419.pdf. Accessed 7/7/2020

Mann, David R., Arif Mamun, and Jeffrey Hemmeter. 2015. "Employment, Earnings, and Primary Impairments Among Beneficiaries of Social Security Disability Programs." *Social Security Bulletin* 75(2): 19-40.

Nichols, Austin, Lucie Schmidt, and Purvi Sevak. 2017. "Economic Conditions and Supplemental Security Income Application." *Social Security Bulletin* 77(4): 27-44.

Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek. IPUMS USA: Version 10.0. Minneapolis, MN: IPUMS. Available at https://doi.org/10.18128/D010.V10.0

Rupp, Kalman. 2012. "Factors Affecting Initial Disability Allowance Rates for the Disability Insurance and Supplemental Security Income Programs: The Role of the Demographic and Diagnostic Composition of Applicants and Local Labor Market Conditions." *Social Security Bulletin* 72(4): 11-35.

Schmidt, Lucy and Purvi Sevak. 2017. "Child Participation in Supplemental Security Income: Cross- and Within-State Determinants of Caseload Growth." *Journal of Disability Policy Studies* 28(3): 131-140.

Schwabish, Jonathan. 2017. "Geographic Patterns in Disability Insurance Receipt: Mental Disorders in New England." Research Report. Washington, DC: Urban Institute. Available at: https://www.urban.org/research/publication/geographic-patterns-disability-insurance-receipt

Sevak, Purvi, John O'Neill, Andrew Houtenville, and Debra Brucker. 2018. "State and Local Determinants of Employment Outcomes Among Individuals with Disabilities." *Journal of Disability Policy Studies* 29(2): 119-128.

Sevak, Purvi and Jody Schimmel Hyde. 2020. "The Impact of Affordable Care Act Medicaid Expansions on the Employment of Adults with Disabilities." *Journal of Disability Policy Studies.* Online ahead of print: doi/10.1177/1044207320943554

Soni, Aparna, Marguerite E. Burns, Laura Dague, and Kosali I. Simon. 2017. "Medicaid Expansion and State Trends in Supplemental Security Income Program Participation." *Health Affairs* 36: 1485-1488.

Appendix Table 1. Regression results of recipiency rates and award rates

Dependent variable (log):	SSI recipiency rate		SSI award rate		DI recipiency rate		DI award rate	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	**-0.126*** **	**(0.03)**	**-0.061** **	**(0.03)**	**0.137*** **	**(0.02)**	**0.066*** **	**(0.02)**
Female	**0.480*** **	**(0.13)**	**0.473*** **	**(0.12)**	**0.565*** **	**(0.09)**	**0.727*** **	**(0.08)**
Marrried	**-0.552*** **	**(0.09)**	**-0.482*** **	**(0.08)**	**-0.187*** **	**(0.06)**	-0.021	(0.06)
Married and female	**0.123***	**(0.07)**	0.039	(0.07)	0.070	(0.05)	-0.025	(0.05)
Childless	-0.067	(0.10)	0.027	(0.08)	-0.006	(0.06)	**-0.185*** **	**(0.05)**
Black race	**0.043*** **	**(0.01)**	**0.061*** **	(0.01)	**0.037*** **	**(0.00)**	**0.035*** **	**(0.00)**
Hispanic ethnicity	**-0.018***	**(0.01)**	**-0.018** **	(0.01)	-0.010	(0.01)	**-0.012***	**(0.01)**
No college degree	**0.590*** **	**(0.05)**	**0.481*** **	(0.04)	**0.571*** **	**(0.03)**	**0.619*** **	**(0.03)**
Veterans	**-0.082*** **	**(0.02)**	-0.006	(0.02)	**0.056*** **	**(0.01)**	**0.069*** **	**(0.01)**
Born abroad	**-0.083*** **	**(0.01)**	-0.001	(0.01)	**-0.074*** **	**(0.01)**	**-0.052*** **	**(0.01)**
Population in an MSA	**-0.013*** **	**(0.00)**	-0.002	(0.00)	**0.005** **	**(0.00)**	**0.007*** **	**(0.00)**
Public transit	0.006	(0.01)	**-0.023*** **	**(0.01)**	-0.006	(0.01)	0.009	(0.01)
Work from home	**-0.078*** **	**(0.01)**	**-0.038*** **	**(0.01)**	**-0.057*** **	**(0.01)**	**-0.064*** **	**(0.01)**
Population density (per sq mi)	**0.017** **	**(0.01)**	-0.006	(0.01)	**-0.029*** **	**(0.01)**	**-0.020*** **	**(0.01)**
Any disability	**0.833*** **	**(0.03)**	**0.670*** **	**(0.02)**	**0.557*** **	**(0.02)**	**0.456*** **	**(0.02)**
Smoking	**-0.431*** **	**(0.04)**	**-0.114*** **	**(0.03)**	**0.102*** **	**(0.03)**	**0.148*** **	**(0.02)**
Obesity	0.191	(0.15)	**0.229***	**(0.13)**	**-0.499*** **	**(0.11)**	**-0.228*** **	**(0.08)**
Total MDs (#)	0.014	(0.03)	0.002	(0.02)	**-0.031***	**(0.02)**	-0.019	(0.02)
Psychiatrists (share of MDs)	**0.141*** **	**(0.03)**	**0.068*** **	**(0.02)**	**0.117*** **	**(0.02)**	**0.073*** **	**(0.02)**
Orthopedists (share of MDs)	**-0.122*** **	**(0.05)**	0.029	(0.04)	-0.005	(0.03)	0.025	(0.03)
Hospital beds (#)	**0.068*** **	**(0.02)**	0.023	(0.02)	-0.021	(0.02)	**-0.023***	**(0.01)**
Hospital inpatient (days)	-0.013	(0.01)	-0.015	(0.02)	**0.034*** **	**(0.01)**	**0.023*** **	**(0.01)**
Without health insurance	**-0.104*** **	**(0.02)**	**0.039** **	**(0.02)**	**-0.115*** **	**(0.01)**	**-0.084*** **	**(0.01)**
In poverty	**0.412*** **	**(0.02)**	**0.292*** **	**(0.02)**	**0.081*** **	**(0.01)**	0.015	(0.01)
Monthly rent ($)	**-0.325*** **	**(0.04)**	**-0.316*** **	**(0.03)**	**-0.166*** **	**(0.03)**	**-0.130*** **	**(0.02)**
Average wage and salary ($)	0.021	(0.04)	**0.063***	**(0.04)**	**0.053***	**(0.03)**	**0.045** **	**(0.02)**
Unemployment rate	**0.027** **	**(0.01)**	**0.017***	**(0.01)**	**0.044*** **	**(0.01)**	**0.056*** **	**(0.01)**
Disability employment rate	**-0.189*** **	**(0.01)**	**-0.125*** **	**(0.01)**	**-0.122*** **	**(0.01)**	**-0.087*** **	**(0.01)**
SNAP receipt	**2.197*** **	**(0.19)**	**2.360*** **	**(0.17)**	**0.443*** **	**(0.13)**	**0.592*** **	**(0.12)**
Manual labor	**-0.067** **	**(0.03)**	-0.010	(0.02)	-0.034	(0.02)	-0.024	(0.02)
Services industry	-0.059	(0.04)	0.013	(0.04)	**-0.064** **	**(0.03)**	-0.041	(0.03)
House value ($)	**0.197*** **	**(0.02)**	**0.109*** **	**(0.02)**	**-0.024** **	**(0.01)**	**-0.052*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)								
2006	**-0.144*** **	**(0.01)**	**-0.159*** **	**(0.01)**	**-0.035*** **	**(0.00)**	**-0.073*** **	**(0.00)**
2007	**-0.113*** **	**(0.01)**	**-0.132*** **	**(0.01)**	**0.028*** **	**(0.01)**	**-0.042*** **	**(0.01)**
2008	**-0.046*** **	**(0.01)**	**0.023** **	**(0.01)**	**0.125*** **	**(0.01)**	**0.107*** **	**(0.01)**
2009	**-0.068*** **	**(0.01)**	**0.073*** **	**(0.01)**	**0.164*** **	**(0.01)**	**0.186*** **	**(0.01)**
2010	**-0.098*** **	**(0.02)**	**0.071*** **	**(0.01)**	**0.207*** **	**(0.01)**	**0.238*** **	**(0.01)**
2011	**-0.035** **	**(0.02)**	**0.062*** **	**(0.01)**	**0.209*** **	**(0.01)**	**0.194*** **	**(0.01)**
2012	-0.028	(0.02)	0.005	(0.02)	0.256***	(0.01)	**0.167*** **	**(0.01)**
2013	**-0.046** **	**(0.02)**	**-0.064*** **	**(0.02)**	**0.274*** **	**(0.01)**	**0.096*** **	**(0.01)**
2014	**-0.074*** **	**(0.02)**	**-0.181*** **	**(0.02)**	**0.268*** **	**(0.01)**	0.004	(0.01)
2015	**-0.099*** **	**(0.02)**	**-0.204*** **	**(0.02)**	**0.265*** **	**(0.02)**	**-0.032** **	**(0.01)**
2016	**-0.098*** **	**(0.03)**	**-0.235*** **	**(0.02)**	**0.267*** **	**(0.02)**	**-0.063*** **	**(0.02)**
2017	**-0.051***	**(0.03)**	**-0.200*** **	**(0.02)**	**0.289*** **	**(0.02)**	**-0.033** **	**(0.02)**
Constant	-0.102	(1.07)	**-3.616*** **	**(0.92)**	**3.221*** **	**(0.70)**	-0.418	(0.60)
Observations	30,549		30,551		30,550		30,551	
R-squared	0.81		0.79		0.84		0.82	

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.01

Appendix Table 2. Regression results of beneficiaries with positive earnings, positive BFW, or positive STW

Dependent variable (log):	Percent of SSI beneficiaries with positive earnings		Percent of SSI beneficiaries with positive BFW		Percent of SSI beneficiaries with at least one month in STW	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	**0.406*** **	**(0.02)**	**0.378*** **	**(0.02)**	**0.277*** **	**(0.02)**
Female	-0.098	(0.10)	-0.045	(0.09)	0.095	(0.09)
Marrried	**-0.699*** **	**(0.07)**	**-0.607*** **	**(0.06)**	**-0.374*** **	**(0.07)**
Married and female	**0.114** **	**(0.05)**	**0.110** **	**(0.05)**	0.051	(0.05)
Childless	**-0.856*** **	**(0.07)**	**-0.865*** **	**(0.07)**	**-0.469*** **	**(0.07)**
Black race	**0.018*** **	**(0.00)**	**0.009** **	**(0.00)**	**0.014*** **	**(0.00)**
Hispanic ethnicity	**0.032*** **	**(0.01)**	**0.026*** **	**(0.01)**	**0.023*** **	**(0.01)**
No college degree	**-0.177*** **	**(0.04)**	**-0.190*** **	**(0.04)**	**-0.088** **	**(0.04)**
Veterans	**0.149*** **	**(0.01)**	**0.142*** **	**(0.01)**	**0.169*** **	**(0.01)**
Born abroad	-0.009	(0.01)	-0.016	(0.01)	**0.029*** **	**(0.01)**
Population in an MSA	0.004	(0.00)	-0.004	(0.00)	-0.003	(0.00)
Public transit	**0.029*** **	**(0.01)**	**0.051*** **	**(0.01)**	**0.069*** **	**(0.01)**
Work from home	**0.050*** **	**(0.01)**	**0.052*** **	**(0.01)**	**0.047*** **	**(0.01)**
Population density (per sq mi)	**-0.013** **	**(0.01)**	-0.007	(0.01)	**-0.018*** **	**(0.01)**
Any disability	**-0.488*** **	**(0.02)**	**-0.468*** **	**(0.02)**	**-0.453*** **	**(0.02)**
Smoking	**-0.116*** **	**(0.03)**	**-0.085*** **	**(0.03)**	**0.101*** **	**(0.03)**
Obesity	**0.458*** **	**(0.11)**	**0.236** **	**(0.11)**	0.010	(0.11)
Total MDs (#)	**0.044***	**(0.02)**	**0.041***	**(0.02)**	**0.067*** **	**(0.02)**
Psychiatrists (share of MDs)	**-0.133*** **	**(0.02)**	**-0.117*** **	**(0.02)**	**-0.146*** **	**(0.02)**
Orthopedists (share of MDs)	**0.159*** **	**(0.03)**	**0.113*** **	**(0.03)**	**0.103*** **	**(0.03)**
Hospital beds (#)	**0.057*** **	**(0.02)**	**0.064*** **	**(0.02)**	**0.057*** **	**(0.02)**
Hospital inpatient (days)	-0.023	(0.02)	**-0.021***	**(0.01)**	**-0.026***	**(0.01)**
Without health insurance	**-0.204*** **	**(0.01)**	**-0.212*** **	**(0.01)**	**-0.192*** **	**(0.01)**
In poverty	**-0.221*** **	**(0.02)**	**-0.209*** **	**(0.01)**	**-0.217*** **	**(0.02)**
Monthly rent ($)	-0.027	(0.03)	**-0.083*** **	**(0.03)**	**-0.103*** **	**(0.03)**
Average wage and salary ($)	**-0.183*** **	**(0.03)**	**-0.212*** **	**(0.03)**	**-0.087*** **	**(0.03)**
Unemployment rate	**-0.124*** **	**(0.01)**	**-0.154*** **	**(0.01)**	**-0.202*** **	**(0.01)**
Disability employment rate	**0.204*** **	**(0.01)**	**0.202*** **	**(0.01)**	**0.214*** **	**(0.01)**
SNAP receipt	**-1.154*** **	**(0.16)**	**-0.876*** **	**(0.15)**	0.143	(0.14)
Manual labor	**0.309*** **	**(0.03)**	**0.301*** **	**(0.02)**	**0.177*** **	**(0.02)**
Services industry	**0.458*** **	**(0.04)**	**0.511*** **	**(0.04)**	**0.488*** **	**(0.04)**
House value ($)	**-0.176*** **	**(0.01)**	**-0.169*** **	**(0.01)**	**-0.226*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)						
2006	**0.075*** **	**(0.00)**	**0.087*** **	**(0.00)**	**0.108*** **	**(0.00)**
2007	**0.073*** **	**(0.01)**	**0.120*** **	**(0.01)**	**0.153*** **	**(0.01)**
2008	-0.014	(0.01)	**0.063*** **	**(0.01)**	**0.086*** **	**(0.01)**
2009	**-0.079*** **	**(0.01)**	**0.039*** **	**(0.01)**	**0.021***	**(0.01)**
2010	**-0.104*** **	**(0.01)**	-0.006	(0.01)	-0.014	(0.01)
2011	**-0.102*** **	**(0.01)**	-0.019	(0.01)	**-0.093*** **	**(0.01)**
2012	**-0.149*** **	**(0.01)**	**-0.053*** **	**(0.01)**	**-0.152*** **	**(0.01)**
2013	**-0.141*** **	**(0.01)**	**-0.041*** **	**(0.01)**	**-0.142*** **	**(0.01)**
2014	**-0.176*** **	**(0.02)**	**-0.065*** **	**(0.02)**	**-0.131*** **	**(0.02)**
2015	**-0.194*** **	**(0.02)**	**-0.066*** **	**(0.02)**	**-0.091*** **	**(0.02)**
2016	**-0.190*** **	**(0.02)**	**-0.045** **	**(0.02)**	**-0.041** **	**(0.02)**
2017	**-0.202*** **	**(0.02)**	**-0.071*** **	**(0.02)**	**-0.042** **	**(0.02)**
Constant	**11.478*** **	**(0.83)**	**11.808*** **	**(0.77)**	**7.364*** **	**(0.83)**
Observations	30,547		30,545		30,486	
R-squared	0.64		0.64		0.62	

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.01

Appendix Table 3. Regression results of beneficiaries with positive earnings, positive BFW, or positive STW

Dependent variable (log):	Percent of DI beneficiaries with positive earnings		Percent of DI beneficiaries with positive BFW		Percent of DI beneficiaries with at least one month in STW	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	**0.301*** **	**(0.02)**	-0.024	(0.02)	-0.022	(0.02)
Female	**-0.115***	**(0.07)**	**0.116** **	**(0.06)**	**0.113***	**(0.06)**
Marrried	**-0.585*** **	**(0.05)**	**-0.483*** **	**(0.04)**	**-0.482*** **	**(0.04)**
Married and female	**0.076** **	**(0.04)**	-0.028	(0.04)	-0.029	(0.04)
Childless	**-0.575*** **	**(0.05)**	**-0.268*** **	**(0.05)**	**-0.272*** **	**(0.05)**
Black race	-0.005	(0.00)	**0.022*** **	**(0.00)**	**0.022*** **	**(0.00)**
Hispanic ethnicity	0.005	(0.01)	**0.012** **	**(0.00)**	**0.012** **	**(0.00)**
No college degree	**-0.122*** **	**(0.03)**	**0.054** **	**(0.02)**	**0.051** **	**(0.02)**
Veterans	**0.078*** **	**(0.01)**	**0.083*** **	**(0.01)**	**0.082*** **	**(0.01)**
Born abroad	0.003	(0.01)	**0.043*** **	**(0.01)**	**0.043*** **	**(0.01)**
Population in an MSA	-0.003	(0.00)	**-0.009*** **	**(0.00)**	**-0.009*** **	**(0.00)**
Public transit	**0.040*** **	**(0.01)**	**0.027*** **	**(0.00)**	**0.027*** **	**(0.00)**
Work from home	**0.050*** **	**(0.01)**	**0.025*** **	**(0.01)**	**0.025*** **	**(0.01)**
Population density (per sq mi)	**0.009** **	**(0.00)**	-0.002	(0.00)	-0.001	(0.00)
Any disability	**-0.320*** **	**(0.01)**	**-0.125*** **	**(0.01)**	**-0.125*** **	**(0.01)**
Smoking	**-0.214*** **	**(0.02)**	**-0.253*** **	**(0.02)**	**-0.252*** **	**(0.02)**
Obesity	**0.559*** **	**(0.08)**	**0.433*** **	**(0.08)**	**0.436*** **	**(0.08)**
Total MDs (#)	**0.052*** **	**(0.02)**	**0.036*** **	**(0.01)**	**0.037*** **	**(0.01)**
Psychiatrists (share of MDs)	**-0.084*** **	**(0.02)**	-0.020	(0.02)	-0.020	(0.02)
Orthopedists (share of MDs)	**0.060** **	**(0.03)**	-0.037	(0.02)	-0.038	(0.02)
Hospital beds (#)	**0.073*** **	**(0.02)**	**0.057*** **	**(0.02)**	**0.058*** **	**(0.02)**
Hospital inpatient (days)	**-0.038*** **	**(0.01)**	**-0.030** **	**(0.01)**	**-0.030** **	**(0.01)**
Without health insurance	**-0.181*** **	**(0.01)**	**-0.045*** **	**(0.01)**	**-0.047*** **	**(0.01)**
In poverty	**-0.069*** **	**(0.01)**	**-0.056*** **	**(0.01)**	**-0.056*** **	**(0.01)**
Monthly rent ($)	**-0.058*** **	**(0.02)**	**0.081*** **	**(0.02)**	**0.080*** **	**(0.02)**
Average wage and salary ($)	0.011	(0.02)	**0.124*** **	**(0.02)**	**0.122*** **	**(0.02)**
Unemployment rate	**-0.082*** **	**(0.01)**	**-0.084*** **	**(0.01)**	**-0.084*** **	**(0.01)**
Disability employment rate	**0.146*** **	**(0.01)**	**0.083*** **	**(0.01)**	**0.083*** **	**(0.01)**
SNAP receipt	**-0.777*** **	**(0.12)**	**-0.176***	**(0.10)**	**-0.180***	**(0.10)**
Manual labor	**0.241*** **	**(0.02)**	0.015	(0.01)	0.017	(0.01)
Services industry	**0.399*** **	**(0.03)**	**0.213*** **	**(0.02)**	**0.214*** **	**(0.02)**
House value ($)	**-0.147*** **	**(0.01)**	**-0.026*** **	**(0.01)**	**-0.025*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)						
2006	**0.028*** **	**(0.00)**	**0.006***	**(0.00)**	**0.006***	**(0.00)**
2007	**0.016*** **	**(0.00)**	**0.025*** **	**(0.00)**	**0.025*** **	**(0.00)**
2008	**-0.046*** **	**(0.01)**	**0.013** **	**(0.01)**	**0.013** **	**(0.01)**
2009	**-0.087*** **	**(0.01)**	-0.010	(0.01)	-0.010	(0.01)
2010	**-0.101*** **	**(0.01)**	**-0.087*** **	**(0.01)**	**-0.087*** **	**(0.01)**
2011	**-0.086*** **	**(0.01)**	**-0.100*** **	**(0.01)**	**-0.100*** **	**(0.01)**
2012	**-0.130*** **	**(0.01)**	**-0.142*** **	**(0.01)**	**-0.142*** **	**(0.01)**
2013	**-0.152*** **	**(0.01)**	**-0.156*** **	**(0.01)**	**-0.156*** **	**(0.01)**
2014	**-0.201*** **	**(0.01)**	**-0.148*** **	**(0.01)**	**-0.148*** **	**(0.01)**
2015	**-0.239*** **	**(0.01)**	**-0.128*** **	**(0.01)**	**-0.129*** **	**(0.01)**
2016	**-0.238*** **	**(0.02)**	**-0.104*** **	**(0.01)**	**-0.106*** **	**(0.01)**
2017	**-0.245*** **	**(0.02)**	**-0.107*** **	**(0.01)**	**-0.108*** **	**(0.01)**
Constant	**7.379*** **	**(0.58)**	0.441	(0.53)	0.500	(0.53)
Observations	30,548		30,532		30,532	
R-squared	0.65		0.63		0.63	

Standard errors in parentheses
* p<0.10; ** p<0.05; *** p<0.01

Appendix Table 4. Regression results of recipiency rates and award rates (with PUMA fixed effects)

Dependent variable (log):	SSI recipiency rate		SSI award rate		DI recipiency rate		DI award rate	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	**0.234*** **	**(0.01)**	**0.260*** **	**(0.02)**	**0.200*** **	**(0.01)**	**0.216*** **	**(0.01)**
Female	**0.088***	**(0.05)**	**0.156*** **	**(0.06)**	**0.051***	**(0.03)**	**0.110*** **	**(0.04)**
Marrried	-0.020	(0.02)	**0.135*** **	**(0.04)**	-0.024	(0.02)	**0.131*** **	**(0.03)**
Married and female	-0.013	(0.02)	**-0.097*** **	**(0.03)**	-0.010	(0.02)	**-0.071****	**(0.03)**
Childless	**-0.190*** **	**(0.02)**	**-0.177*** **	**(0.04)**	**-0.152*** **	**(0.02)**	**-0.121*** **	**(0.03)**
Black race	**0.030*** **	**(0.00)**	**0.030*** **	**(0.01)**	**0.028*** **	**(0.00)**	**0.021*** **	**(0.00)**
Hispanic ethnicity	**0.029*** **	**(0.00)**	**0.058*** **	**(0.01)**	**0.024*** **	**(0.00)**	**0.034*** **	**(0.01)**
No college degree	**-0.107*** **	**(0.02)**	**-0.319*** **	**(0.03)**	-0.001	(0.02)	**-0.135*** **	**(0.02)**
Veterans	**0.051*** **	**(0.00)**	**0.063*** **	**(0.01)**	**0.052*** **	**(0.00)**	**0.040*** **	**(0.01)**
Born abroad	0.007	(0.00)	**0.017****	**(0.01)**	0.002	(0.00)	0.004	(0.01)
Population in an MSA	**0.007***	**(0.00)**	**0.008***	**(0.00)**	0.004	(0.00)	0.006	(0.00)
Public transit	**-0.014*** **	**(0.00)**	**-0.017*** **	**(0.00)**	**-0.013*** **	**(0.00)**	**-0.018*** **	**(0.00)**
Work from home	**0.007*** **	**(0.00)**	0.002	(0.00)	0.002	(0.00)	-0.005	(0.00)
Population density (per sq mi)	-0.003	(0.01)	-0.013	(0.01)	-0.000	(0.00)	-0.010	(0.01)
Any disability	**0.042*** **	**(0.01)**	**0.054*** **	**(0.01)**	**0.021*** **	**(0.01)**	**0.029*** **	**(0.01)**
Smoking	**0.197*** **	**(0.02)**	**0.390*** **	**(0.03)**	**0.183*** **	**(0.01)**	**0.269*** **	**(0.02)**
Obesity	**0.601*** **	**(0.05)**	**0.335*** **	**(0.08)**	**0.270*** **	**(0.04)**	**0.254*** **	**(0.06)**
Total MDs (#)	**0.142*** **	**(0.03)**	**0.100****	**(0.04)**	**0.110*** **	**(0.03)**	**0.075****	**(0.03)**
Psychiatrists (share of MDs)	**0.071*** **	**(0.02)**	0.023	(0.03)	**0.095*** **	**(0.02)**	**0.070*** **	**(0.02)**
Orthopedists (share of MDs)	**0.073*** **	**(0.02)**	**0.110*** **	**(0.03)**	**0.073*** **	**(0.02)**	**0.107*** **	**(0.02)**
Hospital beds (#)	**0.066*** **	**(0.01)**	**0.051*** **	**(0.02)**	**0.063*** **	**(0.01)**	**0.057*** **	**(0.01)**
Hospital inpatient (days)	**-0.016*** **	**(0.00)**	**-0.017****	**(0.01)**	**-0.021*** **	**(0.00)**	**-0.021*** **	**(0.01)**
Without health insurance	**0.150*** **	**(0.01)**	**0.185*** **	**(0.01)**	**0.095*** **	**(0.01)**	**0.105*** **	**(0.01)**
In poverty	**-0.016*** **	**(0.01)**	0.008	(0.01)	**-0.011***	**(0.01)**	0.012	(0.01)
Monthly rent ($)	**-0.105*** **	**(0.01)**	**-0.163*** **	**(0.02)**	**-0.091*** **	**(0.01)**	**-0.086*** **	**(0.01)**
Average wage and salary ($)	-0.023	(0.02)	**-0.053****	**(0.02)**	0.020	(0.01)	-0.008	(0.02)
Unemployment rate	**-0.024*** **	**(0.00)**	-0.006	(0.01)	**-0.015*** **	**(0.00)**	**0.017*** **	**(0.00)**
Disability employment rate	**-0.006****	**(0.00)**	**-0.019*** **	**(0.00)**	-0.003	(0.00)	**-0.015*** **	**(0.00)**
SNAP receipt	-0.022	(0.06)	0.140	(0.10)	-0.051	(0.05)	0.057	(0.07)
Manual labor	**-0.052*** **	**(0.01)**	**-0.087*** **	**(0.01)**	**-0.048*** **	**(0.01)**	**-0.073*** **	**(0.01)**
Services industry	**-0.056*** **	**(0.01)**	**0.017**	**(0.02)**	**-0.060*** **	**(0.01)**	**-0.011**	**(0.01)**
House value ($)	**-0.104*** **	**(0.01)**	**-0.193*** **	**(0.01)**	**-0.081*** **	**(0.01)**	**-0.132*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)								
2006	**0.007*** **	**(0.00)**	**-0.029*** **	**(0.00)**	**0.021*** **	**(0.00)**	**-0.036*** **	**(0.00)**
2007	**0.024*** **	**(0.00)**	-0.005	(0.01)	**0.059*** **	**(0.00)**	**-0.021*** **	**(0.00)**
2008	**0.072*** **	**(0.00)**	**0.139*** **	**(0.01)**	**0.117*** **	**(0.00)**	**0.097*** **	**(0.01)**
2009	**0.102*** **	**(0.00)**	**0.218*** **	**(0.01)**	**0.167*** **	**(0.00)**	**0.170*** **	**(0.01)**
2010	**0.124*** **	**(0.01)**	**0.254*** **	**(0.01)**	**0.208*** **	**(0.00)**	**0.210*** **	**(0.01)**
2011	**0.124*** **	**(0.01)**	**0.191*** **	**(0.01)**	**0.220*** **	**(0.00)**	**0.160*** **	**(0.01)**
2012	**0.145*** **	**(0.01)**	**0.146*** **	**(0.01)**	**0.260*** **	**(0.00)**	**0.126*** **	**(0.01)**
2013	**0.158*** **	**(0.01)**	**0.105*** **	**(0.01)**	**0.279*** **	**(0.01)**	**0.056*** **	**(0.01)**
2014	**0.190*** **	**(0.01)**	**0.032*** **	**(0.01)**	**0.307*** **	**(0.01)**	-0.001	(0.01)
2015	**0.219*** **	**(0.01)**	**0.051*** **	**(0.01)**	**0.332*** **	**(0.01)**	-0.006	(0.01)
2016	**0.230*** **	**(0.01)**	**0.033****	**(0.01)**	**0.339*** **	**(0.01)**	**-0.032*** **	**(0.01)**
2017	**0.216*** **	**(0.01)**	**0.029***	**(0.02)**	**0.325*** **	**(0.01)**	**-0.030****	**(0.01)**
Constant	**3.734*** **	**(0.42)**	**3.504*** **	**(0.57)**	**4.980*** **	**(0.29)**	**3.013*** **	**(0.41)**
PUMA Fixed Effects	Included		Included		Included		Included	
Observations	30,549		30,551		30,550		30,551	
R-squared	0.50		0.48		0.71		0.55	

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.01

Appendix Table 5. Regression results of beneficiaries with positive earnings, positive BFW, or positive STW (with PUMA fixed effects)

Dependent variable (log):	Percent of SSI beneficiaries with positive earnings		Percent of SSI beneficiaries with positive BFW		Percent of SSI beneficiaries with at least one month in STW	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	-0.009	(0.01)	-0.002	(0.01)	-0.022	(0.01)
Female	0.029	(0.03)	0.030	(0.03)	0.028	(0.04)
Marrried	**-0.186*** **	**(0.02)**	**-0.167*** **	**(0.03)**	**-0.201*** **	**(0.03)**
Married and female	**0.125*** **	**(0.02)**	**0.118*** **	**(0.02)**	**0.138*** **	**(0.03)**
Childless	-0.031	(0.02)	**-0.065*** **	**(0.02)**	-0.003	(0.03)
Black race	**0.008** **	**(0.00)**	**0.008** **	**(0.00)**	0.007	(0.00)
Hispanic ethnicity	**-0.015*** **	**(0.00)**	**-0.021*** **	**(0.00)**	**-0.028*** **	**(0.01)**
No college degree	**0.030***	**(0.02)**	0.010	(0.02)	**0.132*** **	**(0.02)**
Veterans	**-0.021*** **	**(0.01)**	**-0.031*** **	**(0.01)**	**-0.034*** **	**(0.01)**
Born abroad	0.007	(0.00)	0.002	(0.00)	-0.005	(0.01)
Population in an MSA	-0.002	(0.00)	-0.002	(0.00)	**-0.005** **	**(0.00)**
Public transit	-0.000	(0.00)	0.003	(0.00)	0.003	(0.00)
Work from home	0.001	(0.00)	0.003	(0.00)	-0.005	(0.00)
Population density (per sq mi)	**0.012***	**(0.01)**	0.009	(0.01)	0.003	(0.01)
Any disability	-0.002	(0.01)	0.002	(0.01)	-0.014	(0.01)
Smoking	-0.006	(0.02)	-0.023	(0.02)	**-0.114*** **	**(0.02)**
Obesity	**-0.181*** **	**(0.05)**	**-0.130*** **	**(0.05)**	**-0.774*** **	**(0.06)**
Total MDs (#)	**0.142*** **	**(0.02)**	**0.125*** **	**(0.02)**	**0.149*** **	**(0.03)**
Psychiatrists (share of MDs)	-0.017	(0.02)	-0.007	(0.02)	0.005	(0.02)
Orthopedists (share of MDs)	**-0.061*** **	**(0.02)**	-0.015	(0.02)	**-0.060** **	**(0.03)**
Hospital beds (#)	**-0.019** **	**(0.01)**	**-0.028*** **	**(0.01)**	**-0.031** **	**(0.01)**
Hospital inpatient (days)	**0.011** **	**(0.00)**	**0.018*** **	**(0.00)**	0.009	(0.01)
Without health insurance	**-0.034*** **	**(0.01)**	**-0.040*** **	**(0.01)**	**-0.124*** **	**(0.01)**
In poverty	**-0.020*** **	**(0.01)**	**-0.028*** **	**(0.01)**	**-0.037*** **	**(0.01)**
Monthly rent ($)	**0.038*** **	**(0.01)**	**0.056*** **	**(0.01)**	**0.079*** **	**(0.01)**
Average wage and salary ($)	**0.027** **	**(0.01)**	0.011	(0.01)	**0.035** **	**(0.02)**
Unemployment rate	**-0.053*** **	**(0.00)**	**-0.056*** **	**(0.00)**	**-0.071*** **	**(0.00)**
Disability employment rate	**0.009*** **	**(0.00)**	**0.013*** **	**(0.00)**	**0.014*** **	**(0.00)**
SNAP receipt	-0.029	(0.06)	0.017	(0.06)	**0.195** **	**(0.08)**
Manual labor	**0.073*** **	**(0.01)**	**0.080*** **	**(0.01)**	**0.091*** **	**(0.01)**
Services industry	-0.018	(0.01)	-0.009	(0.01)	-0.024	(0.02)
House value ($)	**0.058*** **	**(0.01)**	**0.080*** **	**(0.01)**	**0.098*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)						
2006	**0.012*** **	**(0.00)**	**0.018*** **	**(0.00)**	**0.023*** **	**(0.00)**
2007	**0.019*** **	**(0.00)**	**0.049*** **	**(0.00)**	**0.069*** **	**(0.00)**
2008	**-0.030*** **	**(0.00)**	**0.021*** **	**(0.00)**	**0.021*** **	**(0.01)**
2009	**-0.148*** **	**(0.00)**	**-0.067*** **	**(0.00)**	**-0.106*** **	**(0.01)**
2010	**-0.194*** **	**(0.01)**	**-0.138*** **	**(0.01)**	**-0.164*** **	**(0.01)**
2011	**-0.231*** **	**(0.01)**	**-0.177*** **	**(0.01)**	**-0.222*** **	**(0.01)**
2012	**-0.250*** **	**(0.01)**	**-0.187*** **	**(0.01)**	**-0.269*** **	**(0.01)**
2013	**-0.249*** **	**(0.01)**	**-0.186*** **	**(0.01)**	**-0.275*** **	**(0.01)**
2014	**-0.238*** **	**(0.01)**	**-0.168*** **	**(0.01)**	**-0.254*** **	**(0.01)**
2015	**-0.212*** **	**(0.01)**	**-0.131*** **	**(0.01)**	**-0.207*** **	**(0.01)**
2016	**-0.182*** **	**(0.01)**	**-0.090*** **	**(0.01)**	**-0.152*** **	**(0.01)**
2017	**-0.178*** **	**(0.01)**	**-0.106*** **	**(0.01)**	**-0.139*** **	**(0.01)**
Constant	**2.331*** **	**(0.33)**	**1.749*** **	**(0.32)**	**3.002*** **	**(0.46)**
PUMA Fixed Effects	Included		Included		Included	
Observations	30,547		30,545		30,486	
R-squared	0.65		0.57		0.57	

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.01

Appendix Table 6. Regression results of beneficiaries with positive earnings, positive BFW, or positive STW (with PUMA fixed effects)

Dependent variable (log):	Percent of DI beneficiaries with positive earnings		Percent of DI beneficiaries with positive BFW		Percent of DI beneficiaries with at least one month in STW	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Population 65 years & older	-0.003	(0.01)	**-0.057*** **	**(0.01)**	**-0.057*** **	**(0.01)**
Female	0.008	(0.02)	-0.007	(0.03)	-0.008	(0.03)
Marrried	**-0.091*** **	**(0.02)**	**-0.202*** **	**(0.03)**	**-0.202*** **	**(0.03)**
Married and female	**0.043*** **	**(0.01)**	**0.068*** **	**(0.02)**	**0.067*** **	**(0.02)**
Childless	-0.010	(0.01)	**-0.044***	**(0.03)**	**-0.044***	**(0.03)**
Black race	**0.005** **	**(0.00)**	**0.015*** **	**(0.00)**	**0.015*** **	**(0.00)**
Hispanic ethnicity	0.000	(0.00)	-0.008	(0.00)	-0.008	(0.00)
No college degree	**0.052*** **	**(0.01)**	**0.149*** **	**(0.02)**	**0.146*** **	**(0.02)**
Veterans	**-0.015*** **	**(0.00)**	-0.006	(0.01)	-0.005	(0.01)
Born abroad	0.004	(0.00)	**0.011** **	**(0.00)**	**0.011** **	**(0.00)**
Population in an MSA	-0.001	(0.00)	-0.002	(0.00)	-0.002	(0.00)
Public transit	-0.001	(0.00)	-0.001	(0.00)	-0.001	(0.00)
Work from home	-0.000	(0.00)	**-0.007*** **	**(0.00)**	**-0.007*** **	**(0.00)**
Population density (per sq mi)	-0.000	(0.00)	-0.000	(0.01)	0.000	(0.01)
Any disability	0.001	(0.00)	**0.013***	**(0.01)**	**0.013***	**(0.01)**
Smoking	**-0.053*** **	**(0.01)**	-0.020	(0.02)	-0.018	(0.02)
Obesity	**-0.083*** **	**(0.03)**	**0.352*** **	**(0.05)**	**0.358*** **	**(0.05)**
Total MDs (#)	**0.034*** **	**(0.01)**	-0.006	(0.02)	-0.010	(0.02)
Psychiatrists (share of MDs)	-0.007	(0.01)	**0.037** **	**(0.02)**	**0.039** **	**(0.02)**
Orthopedists (share of MDs)	-0.007	(0.01)	**-0.062*** **	**(0.02)**	**-0.062*** **	**(0.02)**
Hospital beds (#)	**-0.026*** **	**(0.01)**	-0.003	(0.01)	-0.002	(0.01)
Hospital inpatient (days)	**0.009*** **	**(0.00)**	0.001	(0.00)	0.000	(0.00)
Without health insurance	-0.004	(0.00)	**-0.014** **	**(0.01)**	**-0.013***	**(0.01)**
In poverty	**-0.010*** **	**(0.00)**	**-0.037*** **	**(0.01)**	**-0.037*** **	**(0.01)**
Monthly rent ($)	**0.055*** **	**(0.01)**	**0.093*** **	**(0.01)**	**0.092*** **	**(0.01)**
Average wage and salary ($)	**0.036*** **	**(0.01)**	**0.051*** **	**(0.01)**	**0.051*** **	**(0.01)**
Unemployment rate	**-0.021*** **	**(0.00)**	**-0.037*** **	**(0.00)**	**-0.037*** **	**(0.00)**
Disability employment rate	**0.007*** **	**(0.00)**	**0.008** **	**(0.00)**	**0.008** **	**(0.00)**
SNAP receipt	**-0.196*** **	**(0.04)**	**-0.264*** **	**(0.06)**	**-0.267*** **	**(0.06)**
Manual labor	**0.044*** **	**(0.01)**	**0.054*** **	**(0.01)**	**0.055*** **	**(0.01)**
Services industry	**-0.018** **	**(0.01)**	**-0.058*** **	**(0.01)**	**-0.057*** **	**(0.01)**
House value ($)	**0.069*** **	**(0.01)**	**0.132*** **	**(0.01)**	**0.132*** **	**(0.01)**
Year Fixed Effects (2005 as reference group)						
2006	**-0.007*** **	**(0.00)**	0.003	(0.00)	0.003	(0.00)
2007	-0.003	(0.00)	**0.027*** **	**(0.00)**	**0.027*** **	**(0.00)**
2008	**-0.030*** **	**(0.00)**	**0.044*** **	**(0.00)**	**0.044*** **	**(0.00)**
2009	**-0.105*** **	**(0.00)**	**0.013** **	**(0.01)**	**0.013** **	**(0.01)**
2010	**-0.130*** **	**(0.00)**	**-0.052*** **	**(0.01)**	**-0.052*** **	**(0.01)**
2011	**-0.151*** **	**(0.00)**	**-0.096*** **	**(0.01)**	**-0.097*** **	**(0.01)**
2012	**-0.164*** **	**(0.00)**	**-0.111*** **	**(0.01)**	**-0.112*** **	**(0.01)**
2013	**-0.181*** **	**(0.00)**	**-0.119*** **	**(0.01)**	**-0.120*** **	**(0.01)**
2014	**-0.182*** **	**(0.01)**	**-0.094*** **	**(0.01)**	**-0.094*** **	**(0.01)**
2015	**-0.173*** **	**(0.01)**	**-0.061*** **	**(0.01)**	**-0.061*** **	**(0.01)**
2016	**-0.146*** **	**(0.01)**	**-0.026*** **	**(0.01)**	**-0.026*** **	**(0.01)**
2017	**-0.144*** **	**(0.01)**	**-0.029*** **	**(0.01)**	**-0.030*** **	**(0.01)**
Constant	**1.979*** **	**(0.21)**	**-2.347*** **	**(0.35)**	**-2.351*** **	**(0.35)**
PUMA Fixed Effects	Included		Included		Included	
Observations	30,548		30,532		30,532	
R-squared	0.62		0.39		0.39	

Standard errors in parentheses

* p<0.10; ** p<0.05; *** p<0.01

RECENT WORKING PAPER FROM THE CENTER FOR RETIREMENT RESEARCH AT BOSTON COLLEGE

Do Retirees Want Constant, Increasing, or Decreasing Consumption?
Anqi Chen and Alicia H. Munnell, December 2021

How Do Households Adjust Their Earnings, Saving, and Consumption After Children Leave?
Andrew G. Biggs, Anqi Chen, and Alicia H. Munnell, November 2021

How Will COVID-19 Affect Pensions for Noncovered Workers?
Jean-Pierre Aubry, Kevin Wandrei, and Laura D. Quinby, November 2021

Is Demand for Older Workers Adjusting to an Aging Labor Force?
Damir Cosic and C. Eugene Steuerle, November 2021

How Does Debt Shape Health Outcomes for Older Americans?
Stipica Mudrazija and Barbara A. Butrica, November 2021

The Relationship Between Disability Insurance Receipt and Food Insecurity
Barbara A. Butrica, Stipica Mudrazija, and Jonathan Schwabish, November 2021

How to Increase Usage of SSA's Online Tools
Jean-Pierre Aubry and Kevin Wandrei, November 2021

Work-Related Overpayment and Benefit Suspension Experiences of Federal Disability Beneficiaries
Marisa Shenk and Gina Livermore, November 2021

How Has COVID-19 Affected the Labor Force Participation of Older Workers?
Laura D. Quinby, Matthew S. Rutledge, and Gal Wettstein, October 2021

The Impact of Claimant Representation Fee Schedules on the Disability Applicant Process and Recipient Outcomes
Cody Tuttle and Riley Wilson, September 2021

Can the Drawdown Patterns of Earlier Cohorts Help Predict Boomers' Behavior?
Robert L. Siliciano and Gal Wettstein, September 2021

Does Media Coverage of the Social Security Trust Fund Affect Claiming, Saving, and Benefit Expectations?
Laura D. Quinby and Gal Wettstein, September 2021

All working papers are available on the Center for Retirement Research website (https://crr.bc.edu) and can be requested by e-mail (crr@bc.edu) or phone (617-552-1762).