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ABSTRACT

Sliding into Safety Net Participation: A Unified Analysis across Multiple Programs*

Recipients of government transfers are economically disadvantaged, yet little is known about how their circumstances evolve leading up to program receipt. Using twenty-five years of survey data as well as administrative health records, we establish three new stylized facts around enrollment in the largest safety net programs in the United States. While our focus is on SNAP, Medicaid, and Unemployment Insurance, the patterns generalize to nine major programs. First, market incomes decline around enrollment in almost all studied programs. Second, employment rates decline around program receipt and remain lower after receipt, with these patterns coinciding in part with increased disability and worse health. Third, spousal separations begin to increase prior to program enrollment, even for programs without mechanically related eligibility requirements. Taken together, these analyses provide a comprehensive and identically measured look across programs to demonstrate that households "slide" into safety net participation through multiple pathways.

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1. Introduction

Studies of safety net participants frequently summarize their attributes at a point in time following program receipt (Edelstein et al. 2014; Cronquist and Lauffer 2019). Yet, a snapshot of recipient characteristics and eligibility can mask important patterns in how these characteristics evolve over time. Program recipients may be disadvantaged at the time of program receipt, but is their disadvantage a steady-state phenomenon or the result of sudden or gradual changes in their circumstances? To what extent might program eligibility be preceded by changes to employment (e.g., job displacement), household structure (e.g., spousal separations), and other (e.g., health) shocks? To date, we know relatively little about what changes in household circumstances precede program receipt and specifically how these patterns differ across programs. Understanding these changes is crucial for assessing the degree to which government programs reach households during times of economic distress and provide insurance for and beyond their intended design (Deshpande and Lockwood 2022).

In this paper, we provide new results describing the trajectory of incomes, employment, health and disability, and household structure leading up to and around receipt of some of the largest safety net programs in the United States. We focus on three programs that are broadly accessible to those who are low-income or unemployed: the Supplemental Nutrition Program (SNAP), Medicaid, and Unemployment Insurance (UI). We additionally examine the degree to which our results generalize to six other major programs: Social Security Disability Insurance (SSDI), workers' compensation, Veterans' Disability Compensation (VA DC), Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Relying on panel data from the Survey of Income and Program Participation spanning 1996-2020 and administrative health records linked to VA DC applicants between 2004-2020, we establish three stylized facts.

First, market incomes—a salient measure for broad economic circumstances—decline prior to enrolling not only in our three primary programs but also in most social insurance and means-tested transfers. The declines are abrupt for some programs (like SNAP and

Medicaid) and more gradual for others (like UI). Even after accounting for program receipt, incomes for SNAP, Medicaid, and UI recipients continue to be lower at the time of initial enrollment (relative to levels one year prior). This is despite the take-up of *other* transfers helping to partly offset the declines in market income leading up to program receipt. In contrast, for programs targeted to those with disabilities, post-transfer incomes following enrollment significantly exceed pre-receipt income levels.

Second, employment rates fall by 3 to 14 percentage points by the time of SNAP, Medicaid, or UI receipt, relative to levels one year prior to initial participation. More generally, these employment declines are negative and statistically significant for six out of the nine total programs examined. These employment declines are associated in part with increases in self-reported disability status. Moreover, we find evidence of changes to health around program receipt, suggesting that increases in disability reflect increases in inability to work. Focusing on VA DC, a program for which we observe modest changes to work-limiting disability around participation,[1] we find striking evidence of health shocks immediately prior to application. The number of days with an outpatient encounter doubles in the month prior to program application, relative to 12 months prior. The likelihoods of emergency department and inpatient encounters more than triple and quadruple, respectively, and new fills of opioid prescriptions and nonsteroidal anti-inflammatory drugs increase around application and subsequently remain high.

Third, we find statistically significant changes to household structure—namely, having a new child and spousal separations—around enrollment in safety net programs. For means-tested transfers like SNAP and Medicaid, these patterns may be driven in part by eligibility requirements being mechanically looser for single parents and children. However, spousal separations increase even around enrollment in social insurance programs which do not explicitly have household structure requirements. Specifically, separations during the initial quarter of enrollment for three out of the four social insurance programs analyzed are 0.9–3.8

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[1]This is because VA DC is not designed to insure against new disabilities but rather existing disabilities incurred during military service. These disabilities do not necessarily need to be work-limiting. We discuss this in more detail in Section 5.

percentage points higher relative to the year before.

While our results are meant to be interpreted as descriptive rather than causal,[2] they paint a fuller picture of the characteristics of program recipients and highlight the degree to which households slide into safety net participation through multiple pathways. Program eligibility often follows a dynamic process, with households potentially gaining or losing eligibility based on changes to income, labor force participation, health, and household structure—among other factors.[3] The changes to characteristics beyond what is expected from eligibility criteria—such as to disability and health, and spousal separations around most studied programs—speak to the broader value of these programs in insuring risks beyond what they are specifically designed to insure against. The commonalities in certain patterns, such as income declines around enrollment in multiple programs, also imply that researchers and policymakers need to consider the interplay and interaction between multiple programs. Finally, the sudden increase in health care utilization, likely reflecting a timely health shock, immediately preceding VA DC application underscores the potential importance of providing timely access to programs.

Our work contributes to several literatures. First, it relates to a prior literature that finds consistent declines in the earnings of participants in employment programs just prior to participation—famously known as "Ashenfelter's dip" (Ashenfelter 1978; Ashenfelter and Card 1985; Card and Sullivan 1988; Heckman and Smith 1999). Few studies, however, document the degree to which these pre-receipt earnings losses extend to other safety net programs. Various papers also empirically examine the evolution of incomes and well-being around certain events in the U.S., such as slipping into poverty (Bane and Ellwood 1986), job loss (Jacobson et al. 1993; Sullivan and von Wachter 2009), eviction (Collinson et al. 2023), hospital admission (Dobkin et al. 2018), and disability onset (Meyer and Mok 2019).

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[2]The changes we document prior to receipt may not be the only factors that precipitate enrollment. We also do not take a stand on whether any changes in household characteristics we observe following enrollment are a result of behavioral effects stemming from program receipt or a reversion back to pre-receipt levels. A long literature has studied the causal effects of program receipt on labor supply (see Moffitt 2002, for a survey), health (e.g., Almond et al. 2011; Hoynes et al. 2016), and many other outcomes.

[3]This also relates to an extensive literature on the dynamics of poverty and transitions between economic states (e.g., Cellini et al. 2008; Sandoval et al. 2009).

However, there is relatively little empirical work that studies the evolution of these patterns leading up to program application or receipt.[4] Finally, our study relates to a growing literature on the degree to which government transfers insure recipients against earnings shocks (Blundell et al. 2008; Low and Pistaferri 2015; Rothstein and Valletta 2017; Stepner 2019; East and Simon 2022; Deshpande and Lockwood 2022) and income volatility more broadly (Hardy and Ziliak 2014; Bitler et al. 2017; Hardy 2017). Using a unified data source and a novel set of linked VA records, we contribute to these literatures by documenting the trajectory of a diverse set of household characteristics—going beyond just earnings—around the receipt of a wide range of programs in the U.S. In doing so, we show from a variety of angles how government transfers are taken up at a time of economic and personal upheaval.

The rest of the paper is structured as follows. Section 2 provides background information on the safety net programs studied and Section 3 describes our data sources. Section 4 discusses the empirical methods used and Section 5 describes the results. Section 6 concludes.

2. Programs and Institutional Details

This section provides background on the U.S. government transfer programs that we analyze. We start by discussing our primary programs of interest: SNAP, Medicaid, and UI. We focus on these three programs because they are among the most broadly accessible transfers (with eligibility conditional neither on demographic characteristics nor disability) and have rapid turnarounds between initial application and receipt. We secondarily examine six other programs encompassing social insurance benefits (available to eligible individuals who have experienced economic hazards deemed by society to be insurable) and means-tested transfers (available to those with low incomes). All of these programs can be applied for at any point

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[4]Key exceptions are Dague et al. (2017), who find decreases in employment leading up to Medicaid enrollment, and Deshpande et al. (2021), who find that SSDI application coincides with sharp increases in the rates of various adverse financial events. Hastings and Shapiro (2018) and Buchmueller et al. (2021) also document patterns in grocery store consumption around SNAP receipt and access to health care around Medicaid receipt, respectively. A related, but distinct, literature also studies the dynamics of program participation (Blank and Ruggles 1996; Grogger 2004; Ham et al. 2016).

throughout the year and do not have eligibility requirements that primarily depend on age.[5]

2.1 Primary Programs: SNAP, Medicaid, and UI

Of the three primary programs examined, two are in-kind (SNAP and Medicaid) while one is a cash transfer (UI). The first program we focus on is SNAP, whose benefits consist of monthly vouchers that can be used to purchase items from grocery stores and related outlets. Unlike most transfers, SNAP is widely available to all low-income and low-asset households regardless of age, disability status, or presence of children.[6] Prior work has found that benefit amounts typically fall below pre-receipt food consumption levels (Ben-Shalom et al. 2012), suggesting that SNAP benefits can be thought of as close to cash. Able-bodied adults without dependents who are low-income are generally required to work to receive benefits, although states have chosen to waive these requirements during economic downturns (including both the Great Recession and COVID-19 pandemic). Over the past two decades, states have also relaxed eligibility requirements through Broad-Based Categorical Eligibility, with many states increasing (and even eliminating) asset thresholds and raising income thresholds up to 200% of the federal poverty line.

Medicaid is the largest means-tested transfer in the U.S. and provides health insurance to low-income individuals (i.e., those with incomes below 138% of the federal poverty line). Eligible groups historically encompassed low-income families with children and elderly or disabled individuals, but over the past decade—and specifically since the Affordable Care Act—states have begun to expand Medicaid eligibility to childless adults. On the other hand, UI is a state-administered program that provides cash benefits for workers who become unemployed through no fault of their own. Recipients of UI must normally be looking for

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[5]As a result, we do not focus on Social Security Old-Age and Survivors Insurance (OASI) or Medicare, since eligibility for the vast majority of recipients depends on passing an age threshold (62+ for OASI and 65+ for Medicare). We also do not focus on housing assistance, since its lottery/waitlist system results in many recipients getting benefits long after initial application. Finally, we do not focus on means-tested tax credits like the Earned Income Tax Credit (EITC) and Child Tax Credit (CTC), since they can only be received at a relatively fixed point in time (i.e., when filing taxes).

[6]Gross and net incomes must typically fall below 130% and 100% of the federal poverty line, respectively, and countable assets must be below $2,250 ($3,500 if elderly or disabled).

work in order to maintain benefits and can typically only receive UI for a maximum of 26 weeks (although this duration varies across states and has been extended during recessions).

All three of these programs play a particularly important role during economic downturns, due to their countercyclical nature (Bitler and Hoynes 2016; Mitchell 2020). Another key feature of these programs is that the intervals between initial application and benefit receipt tend to be very short. Successful SNAP applicants generally receive benefits one month after initial application, with some households who qualify for expedited payments receiving benefits within a week of application. Medicaid recipients typically gain coverage within 30 to 60 days of application, with enrollment often backdated to the point of initial eligibility. Finally, the average processing period for UI benefits is less than a month. These quick turnarounds between application and receipt are especially important in that they enable us to effectively use changes in outcomes around program *enrollment* as approximations for changes around program *application.*

2.2 Secondary Programs

In addition to our three focal programs of interest, we examine six other major programs. Each of these six programs targets a narrower, yet still important, subgroup of the population, such as disabled individuals or low-income children. Among the three social insurance programs in this group, two have eligibility requirements that are explicitly triggered by work-limiting disability (SSDI and workers' compensation). SSDI, which is administered by the Social Security Administration (SSA), provides cash benefits to individuals that have recently worked long enough (and paid sufficient Social Security taxes on earnings) yet develop a long-term physical or mental disability that prevents them from continuing to work. Similarly, workers' compensation is a state-level program that provides wage replacement and medical benefits to individuals who are injured or fall ill in during employment. On the other hand, VA DC is a monthly transfer paid to disabled veterans with injuries or illnesses that were incurred or aggravated during military service. Unlike all-or-nothing SSDI payments that terminate when one regains the ability to work, VA DC and workers' com-

pensation amounts vary based on each recipient's degree of disability and can be received concurrently with earnings. Furthermore, SSDI benefits are potentially taxable, while VA DC and workers' compensation are non-taxable. We include VA DC because of the size of the program; it is roughly equivalent to SSDI in expenditures as of 2022 (Bruhn et al. 2022; Silver and Zhang 2023).

Turning next to the three means-tested transfers in this secondary group, two are tax-exempt cash transfers (TANF and SSI) while the other is in-kind (WIC). TANF is a cash transfer that is targeted to very low-income families with children, with recipients typically having either single parents or no parents (i.e., children living with other relatives or guardians). Adult recipients of TANF must commonly be working or looking for work to maintain eligibility, and most recipients (with some exceptions) can receive TANF for no more than sixty months over their lifetimes. SSI is a cash assistance program that targets individuals with low incomes/assets and who are also elderly, blind, or disabled. The federal portion of SSI is administered by the Social Security Administration, while states can also administer their own supplementation programs. Finally, WIC is a food assistance program provided to low-income expectant and new mothers and to low-income children under the age of five. The basic eligibility requirement is a family income below 185% of the federal poverty line, though in many states recipients of SNAP, TANF, and Medicaid are automatically eligible for WIC if they also have children below the age of 5.

While the approval processes are relatively rapid for TANF and WIC (i.e., less than a month), they tend to be slower for the four other programs that primarily target those with disabilities. While workers' compensation benefits may be approved as soon as a few weeks after the claims are filed, SSDI, SSI, and VA DC benefits often take a half-year or longer to be approved after initial application. Consequently, a caveat is that an analysis of outcomes around initial receipt may not be as representative of the outcomes around initial application for these programs with longer waiting periods. VA DC is an exception, as we observe application dates in the administrative data and thus center outcomes around them.

3. Data and Outcomes

3.1 Data Sources

To study how economic circumstances change around program receipt, our ideal dataset would consist of panel microdata that track the characteristics of individuals both before and after they enroll in a program. The Survey of Income and Program Participation (SIPP), which is administered by the U.S. Census Bureau, is particularly well-suited for this analysis. This is because it collects detailed information on incomes, participation in government programs, and a wide array of economic and demographic characteristics for a nationally representative sample of households over a period of three to five years. Each panel of the SIPP interviews 25,000-45,000 households (and their individual members) about their monthly characteristics in "waves". We use the 1996, 2001, 2004, 2008, 2014, and 2018 SIPP Panels, which collectively span a twenty-five year reference period starting in 1996 and ending in 2020. SIPP interviews have historically been conducted in four-month waves, although the survey was redesigned starting with the 2014 Panel so that interviews are now conducted in annual waves.

There are a number of features that make the SIPP an ideal dataset for conducting the analyses in this paper. First, its large sample size (compared to other longitudinal datasets like the Panel Study of Income Dynamics) allows for relatively precise estimates of the changes in economic circumstances around program receipt. Second, the SIPP captures economic changes at a granular monthly level, allowing us to distinguish immediate economic shocks from longer-term changes. Third, the SIPP collects information about important household and economic characteristics (e.g., labor force participation, separation/divorce/widower status) that are often unavailable in administrative records.

Furthermore, the SIPP is regarded as having the most accurate information on incomes and program receipt, compared to other major household surveys such as the Current Population Survey or American Community Survey (Meyer et al. 2015). While the SIPP is not immune from measurement error, Meyer and Wu (2018) find that the 2008 SIPP Panel yields

largely accurate estimates of the static poverty reduction effects of six government transfers (compared to linked administrative data). Our estimates would also be biased only if those who misreport program receipt have different *trajectories* in characteristics than those who accurately report program receipt. Prior work has found that those who under-report program receipt tend to have shorter receipt spells and are less connected to the safety net overall (see, e.g., Meyer et al. 2022), but the resulting biases could be offsetting.[7]

While the SIPP provides a comprehensive picture of recipients' incomes and household and economic characteristics, it lacks granular information on other measures—particularly those related to health.[8] To further examine how health outcomes change around take-up of one particular government program, we link high-quality electronic health records from the Veterans Health Administration to VA disability compensation claims from the Veterans Benefit Administration between 2004 and 2020. These data include medical care records (outpatient and inpatient) and pharmaceutical prescriptions provided and filled at over 1,400 VHA clinics across the nation, as well as disability compensation claims by 3.9 million veterans. Unlike in the SIPP where we observe the timing of receipt, we observe only the timing of claims in the VA administrative data; the latter usually precedes the former by several months. Note that it is common for veterans to file multiple claims, as we observe an average of 1.8 claims per veteran over our sample period.

3.2 Outcomes Analyzed

In the SIPP, we analyze changes in two monthly household-level income concepts and four household-level characteristics around program receipt. For each of our two income measures, we divide by the household-level poverty threshold to equivalize the needs of households that vary in their size and composition. The first of our income measures is *market income*, which reflects a household's pre-tax money income excluding government transfer payments.

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[7]On one hand, under-reporters may face sharper shocks prior to receipt if they only rely on the safety net during crises. On the other hand, under-reporters may face smaller economic shocks prior to receipt if those smaller shocks are what lead them to have shorter receipt spells.

[8]As part of its topical modules, the SIPP does ask respondents to report their health status. However, these modules are administered very infrequently (usually once or twice per panel).

Specifically, market income includes earnings, asset income, and a variety of other cash sources outside of social insurance and means-tested transfers.[9]

The second of our income measures is *post-transfer income*, which adds to market income both pre-tax government cash transfers and the monetary value of select in-kind transfers. The cash transfers that we include are Social Security and Railroad Insurance, UI, VA DC and pensions, workers' compensation, SSI, Public Assistance (encompassing TANF and General Assistance), transportation assistance, cash assistance for food and clothing, and short-term cash assistance. The in-kind transfers that we include are SNAP, WIC, free and reduced school lunch, and the Low Income Home Energy Assistance Program (LIHEAP). We use the full monetary values of SNAP, WIC, and LIHEAP, while we estimate the monetary value of school lunch by multiplying the number of children in a household receiving free and reduced meals by the daily (year-specific) reimbursement rate and the average number of school days in a month during the school year (20).[10] We do not include values for housing assistance or medical in-kind transfers (such as Medicaid), as these tend to be less fungible. We also do not incorporate tax liabilities and credits, as we want our income measure to vary at the monthly level and taxes are calculated based on calendar year incomes.

Among the four monthly characteristics examined in the SIPP, the first pertains to whether or not anyone in the household reports being employed (either working a wage/salary job or being self-employed). We also examine whether or not anyone in the household reports having a work-limiting disability. Finally, we examine two more characteristics related to household structure: whether or not there is a child aged 0-4 in the household and whether or not any member is separated, divorced, or widowed.

In the administrative VA data, we focus on changes in six "monthly" (30-day) health outcomes around VA DC claiming. Unlike in the SIPP, we measure these outcomes at

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[9]These additional cash sources include private pensions, private and employer disability payments, foster child care payments, child support payments, alimony, transfers from family and friends, lump sum payments, and miscellaneous cash income. Some prior studies that conduct distributional analyses using market income have also included social insurance programs (CBO 2022) or a subset of such programs (Piketty and Saez 2003) in their definition of market income, but we exclude all government transfers because we are specifically interested in gauging outcome patterns around the take-up of these very transfers.

[10]Note that our estimates are largely unchanged even if we were to exclude school lunch and LIHEAP, given their relatively small role in the overall safety net.

the individual level because their changes are likely to be more relevant for the specific individuals claiming disability and we do not observe household structure in the VA data. These variables include an indicator for whether the veteran utilized any VHA outpatient medical services and the number of days in which they utilized any VHA outpatient services. We also construct indicators for any emergency department and inpatient utilization (acute hospital and residential beds). Finally, we study new prescriptions for two different pain medications: opioid analgesics and nonsteroidal anti-inflammatory drugs (NSAID).[11]

4. Empirical Methods

In this section, we discuss the methods used to assess how economic outcomes change around program receipt. For analyses involving the SIPP, our sample for each program consists of households appearing consecutively in at least 36 interview months and for whom we can observe outcomes over a 16 month window both before and after initially receiving a program. We use households as our units of analysis because household members often share resources and bear economic burdens with one another, and a number of programs (e.g., SNAP) are paid out at the household level.[12]

Given that our analyses are meant to be descriptive, the simplest approach would be to show raw means of a given outcome before and after initial receipt for program participants. Figure A1 shows raw means for income-to-poverty ratios, while Figure A2 and Figure A3 show raw means for other household characteristics in the SIPP. However, we include cohort-fixed effects to account for time-invariant differences between participants enrolling in one year versus another and time-fixed effects to disentangle the economic pat-

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[11]"New" prescription fills are prescriptions that are filled in each 30-day period; a single prescription for 90 days supply would only count as one prescription in the month it was filled. Refills count as separate prescription fills. Note that over-the-counter NSAIDs are not prescribed and thus not included in the data; these are generally the lowest strength NSAIDs.

[12]The sample sizes for our primary programs are 4,835 households, 4,036 households, and 2,647 households receiving Medicaid, UI, and SNAP, respectively. For the secondary programs, sample sizes range from 590 households receiving TANF to 2,466 households receiving DI. Table A1 of the appendix contains more details.

terns around program receipt from structural changes over time.[13] We therefore rely on the following specification for our main results:

$$y_{it} = \mu_c + \lambda_\tau + \sum_{q=-5}^{5} \gamma_q D_{ct}^q + X_{st} + \varepsilon_{it}, \qquad (1)$$

where y_{it} is an outcome for household i in year-month t.

Households are classified into cohorts (indexed by c) based on the calendar year-month when they first receive a program, and cohort- and year-fixed effects are denoted by μ_c and λ_τ. We cannot include year-month fixed effects, as they are collinear with the combination of receipt timing and relative event time. By including year-fixed effects instead, we assume that calendar time fixed effects are identical across months within a year. D_{ct}^q is an indicator variable that equals one if year-month t is q quarters after (or before, if negative) initial receipt for cohort c. By defining event-time indicators at the quarter level, we can mitigate the effects of seam bias—a well-documented caveat of the SIPP where time-varying responses are excessively correlated within an interview wave—while improving statistical power.[14] We also include a covariate X_{st} for the unemployment rate in state s and year-month t, which varies at the annual level and thus takes the same value across all months in a calendar year. This serves as one proxy for time-varying state-level factors that may shape program participation. In addition, we cluster standard errors at the cohort level (to account for errors being serially correlated within cohorts over time) and weight households using their initial survey weights. Finally, in supplementary analyses, we show that our results for each program are robust to the inclusion of a control group consisting of non-recipient households simulated to be eligible (Figure A4-Figure A6).[15]

From Equation 1, the γ_q's are our main coefficients of interest as they measure the

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[13]We could alternatively control for household- rather than cohort-fixed effects—similar to Jacobson et al. (1993)—but we suspect that most of the unobserved time-invariant heterogeneity is across rather than within cohorts. Indeed, we find similar results when using household- rather than cohort-fixed effects.

[14]Numerous studies have employed various methods for circumventing seam bias. Our approach is closest in spirit to approaches that collapse monthly data by wave or some subperiod of the wave (see, e.g., Acs et al. 2003; Ribar 2005; Meyer et al. 2021)

[15]See the appendix for more details on how the control groups are calculated for each program.

change in the outcome q quarters away from initial program receipt, relative to the value four quarters ($q = -4$; omitted period) prior to treatment. For instance, event quarter 0 corresponds to the first, second, and third months of program receipt. When reporting estimates for the continuous income-to-poverty measures, we divide the γ_q's by the mean value of y_{it} in the reference period so that they can be interpreted as percentage changes from a pre-receipt base (see, e.g., Kleven et al. 2021). In Figure A4-Figure A6, we find similar results using a Poisson regression model, which is preferable to log-transforming the dependent variable given that some households may report having zero income (Cohn et al. 2022; Chen and Roth 2023). For all other outcomes, the γ_q's can be interpreted as average changes in levels of y_{it} relative to the reference period base.

We rely on a similar methodological framework for analyses involving the administrative VA data, although there are some differences. Our VA sample consists of 2.15 million veterans who enroll in VHA healthcare for at least 16 months prior to initially claiming disability payments. We continue to use a similar specification as that of Equation 1, although i now indexes individual claimants (rather than households) and event-time indicators are defined at the monthly (rather than quarterly) level because we no longer face issues of seam bias or statistical power in the administrative VA data:

$$y_{it} = \mu_c + \lambda_t + \sum_{m=-12}^{12} \gamma_m D_{ct}^m + \varepsilon_{it}, \tag{2}$$

where y_{it} is a health outcome for individual i in year-month t and cohorts are classified based upon the year-month of initial disability claiming. D_{ct}^m is an indicator variable that equals one if year-month t is m months after (or before, if negative) initial claiming. Our main coefficients of interest are the γ_m's, which measure the change in a health outcome m months away from initial claiming (with $m = -12$ being the reference period).

5. Results

We present our main results as three stylized facts. As a preface, Table 1 shows recipient characteristics for each program measured during the first month of receipt. By providing a snapshot of these recipients at a point in time, these summary statistics reflect how researchers and policymakers typically conceive of recipient circumstances. For example, SNAP and Medicaid recipients tend to have lower income-to-poverty ratios than UI recipients at the time of receipt. Relative to UI recipients, SNAP and Medicaid beneficiaries tend to also have lower rates of unemployment and higher rates of being out of the labor force, disability, and marital separation. Yet, are these static patterns the result of immediate or protracted deviations from steady state characteristics or themselves the steady state patterns? Our results provide some answers to these questions.

Stylized Fact #1: *Market incomes decline prior to program receipt, with transfers providing partial—and in some cases full—insurance against these pre-receipt income losses.*

Figure 1 shows how household-level market and post-transfer incomes change around SNAP, Medicaid, and UI receipt, with estimates corresponding to the γ_q's from Equation 1 divided by mean incomes measured four quarters prior to receipt. The solid (hollow) markers correspond to estimates that are statistically significant (not significant) at the 5% level, the shaded bands reflect 95% confidence intervals, and the means for the reference period can be found in the legend. The estimated coefficients and standard errors corresponding to all figures can be found in Table A2-Table A8 of the appendix.

For each of the three primary programs, we find that market incomes—encompassing mainly earnings—decline substantially leading up to initial receipt (Panel A). The declines are more gradual in the lead-up to SNAP receipt but more abrupt prior to Medicaid and UI receipt. Relative to one year prior, market incomes drop by 19%, 14%, and 11% by the time households initially receive UI, SNAP, and Medicaid, respectively. Each of these reductions are statistically significant at the 1% level. The declines in market income are persistent: over a year after program receipt, market incomes remain approximately 10-20% lower for

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recipients of each program. This paper does not take a stand on the reasons underlying the low market incomes following program receipt, although a long literature has examined the behavioral effects associated with program enrollment.

We next examine post-transfer incomes, which incorporate not only the program in question (in most cases) but also the value of other cash and in-kind transfers (Panel B). Relative to the trajectories in market income, the trends in post-transfer income appear flatter prior to receipt—particularly for SNAP. One reason is that the levels of post-transfer income are higher than those of market income, meaning a given change will have a smaller percentage effect under post-transfer income. Another factor is that the declines in market incomes during the pre-receipt period are offset to some degree by the take-up of *other* programs. We find evidence that SNAP receipt is sometimes preceded by Medicaid and WIC receipt (Figure A7), Medicaid receipt is sometimes preceded by SNAP and WIC receipt (Figure A8), and UI receipt is occasionally preceded by SNAP receipt (Figure A9). These patterns speak to the correlated nature of the changes and shocks that can underlie the take-up of multiple programs. They also point to the complementary nature of eligibility requirements across certain programs and the lower variable costs associated with enrolling in multiple programs. Despite the insurance provided by these three primary programs, the post-transfer income levels at the time of enrollment remain significantly below pre-receipt levels.[16]

Figure 2 goes beyond looking only at SNAP, Medicaid, and UI and summarizes the pre-receipt changes in market and post-transfer incomes for nine programs. The point estimates correspond to γ_0 from Equation 1 divided by mean incomes measured four quarters prior to receipt, meaning they can be interpreted as the percent changes in income in the first quarter relative to a year prior to program receipt.[17] Strikingly, we find statistically significant declines in market income for every program, with the exception of VA DC and TANF. The declines are remarkably homogeneous in percentage terms, falling between 10-20% for six of

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[16]For UI and SNAP, this is presumably due to the less-than-unit replacement rates of the programs. For Medicaid, this is because we do not impute the monetary value of health insurance benefits—meaning the change in post-transfer income does not reflect the take-up of Medicaid.

[17]Figure A14 and Figure A15 show dynamic estimates of the changes in market and full incomes around participation in each of the nine programs.

the nine programs. Turning to post-transfer income, we find more pronounced differences between programs. On one hand, transfers provide only partial insurance for the pre-receipt income losses of SNAP, Medicaid, UI, and WIC recipients. On the other hand, for recipients of DI, workers' compensation, VA DC, and SSI (programs designed to insure against the risk of disability), the monetary value of benefits more than offsets the reduction in market incomes at the time of receipt. Taken together, these results highlight the prevalence of economic shocks leading up to safety net enrollment, and suggest the need for policymakers to consider the interplay between multiple programs which households often begin to receive around the same time.

Stylized Fact #2: *Employment rates decline leading up to program receipt and often coincide with an increase in disability; the health shocks observable for VA DC suggest that these patterns may reflect a decreased ability to work.*

Panel A of Figure 3 displays changes to employment around SNAP, Medicaid, and UI receipt. Relative to a year prior, employment rates decline by 4.5pp (6%), 2.5pp (4%), and 13.7pp (14%) when first receiving SNAP, Medicaid, and UI.[18] For SNAP and Medicaid, the declines in employment are driven by both lower labor force participation as well as increased unemployment. For UI, the employment declines are driven by unemployment—this is by construction, since UI eligibility is dependent on staying in the labor force (Figure A10). The declines in employment are highly persistent and remain below pre-receipt levels even a year after program receipt. We further find evidence that the persistent declines in labor force participation reflect an inability to work for some. Panel B of Figure 3 shows that recipients of SNAP and Medicaid are significantly more likely to report a work-limiting disability at the time of initial receipt (relative to one year prior), while UI recipients experience no changes in disability leading up to receipt.

The declines in employment and increases in disability are striking and common across a

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[18]Our result for Medicaid is qualitatively consistent with Dague et al. (2017), who find significant employment reductions in the quarters leading up to Medicaid enrollment.

wider set of programs (Figure 4).[19] The declines in enrollment are statistically significant at the 1% level for six out of nine programs, with the three exceptions being TANF, VA DC, and WIC. While the magnitude of the employment decline is largest prior to UI receipt, the reductions are noticeably similar (3-5 percentage points) prior to receipt of DI, workers' compensation, SNAP, Medicaid, and SSI. Recipients of each of these five non-UI programs also experience statistically significant increases in disability at the 1% level, with the percentage point increases being most pronounced—unsurprisingly—for DI and workers' compensation.

Using administrative health records linked to VA DC application data, Figure 5 presents evidence consistent with health shocks and hospital admissions preceding program application. Healthcare utilization rapidly increases by roughly 0.4 outpatient visits in the month prior to application, a 110% increase relative to 12 months prior (Panel A).[20] More serious utilizations exhibit an even starker pattern. Emergency department (ED) and inpatient encounters increase by 210% and 302% over the same period. Fills of prescription painkillers exhibit a similar trajectory; opioid analgesics and prescription NSAIDs (nonsteroidal anti-inflammatory drug) increase by 40% and 47%, respectively. Across all measures, the increases are concentrated in the 3-4 months just prior to application. Remarkably, VA DC applicants' healthcare utilization and prescription painkiller use never return to pre-application levels.

Taken together, these findings suggest that the declines in employment rates preceding program receipt may reflect higher rates of disability, with administrative health records providing evidence of real health shocks that go beyond moral hazard.[21] Furthermore, there are reasons to believe that these health shock patterns extend to other safety net programs beyond VA DC. First, the VA DC program is not meant to necessarily provide insurance against new health shocks, but rather to compensate for disabilities incurred during or as a direct result of military service, or conditions that became worse due to service. Second, the

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[19]Figure A16 and Figure A17 show dynamic estimates of the changes in employment and disability around participation in each of the nine programs.

[20]These effects cannot be mechanically driven by enrollment-based eligibility because our sample is defined to only include veterans that are enrolled in VA healthcare at least 16 months prior to program application.

[21]The result that healthcare utilization and adverse health events (e.g., ED and inpatient use) peak immediately before disability application is new, due to the prior lack of data availability linking health records to disability claims. However, using outcomes of applicants to argue against moral hazard dates back to at least Bound (1989).

VA DC program is not well-equipped to provide immediate insurance against sudden shocks, as the claims processing time takes several months. Finally, given that we observe larger changes in self-reported disability around the receipt of other programs (relative to VA DC; see Panel B of Figure 4), we should also expect to observe substantial health changes prior to receiving these other programs, insofar as they are correlated with disability onset.

Stylized Fact #3: *Changes to household structure occur leading up to program receipt, including increases in spousal separations even for programs without mechanically related eligibility requirements.*

Figure 6 displays changes to household structure around the receipt of SNAP, Medicaid, and UI. We find sizable increases in having a young child of 2.9pp (19%) and 4.6pp (55%) leading up to SNAP and Medicaid take-up, respectively, but no statistically significant changes around UI receipt (Panel A). The similarities between SNAP and Medicaid in these effects may stem from the strong complementarities between these programs in eligibility requirements and thus enrollment. Moving to whether any household member has been separated, divorced, or widowed (herein "separated"), Panel B of Figure 6 shows an increase in separation of 3.1pp (6.9%), 3pp (7.5%), and 0.9pp (3.1%) leading up to participation in SNAP, Medicaid, and UI, respectively.

Looking more broadly across all nine programs, we find minimal changes in having a new child around enrollment in social insurance programs, but more pronounced increases leading up to enrollment in means-tested transfers—specifically SNAP, TANF, Medicaid, and WIC (Figure 4).[22] Perhaps remarkably, we also find across-the-board increases in marital separation leading up to participation in 8 of the 9 programs, with the changes statistically significant at the 10% level for 6 programs (DI, VA DC, UI, SNAP, Medicaid, and SSI). While some programs have eligibility requirements tied to having a young child or being a single parent, our findings are not entirely eligibility-related. Having a new child coincides

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[22]Figure A18 and Figure A19 show dynamic estimates of the changes in having a new child and separation around participation in each of the nine programs.

with program receipt even though many households already have young children. For instance, 29% and 26% of households receiving TANF and WIC, respectively, already have a young child one year prior. Moreover, we observe statistically significant increases in spousal separations leading up to enrollment in three of the four social insurance programs, despite these programs imposing no mechanical eligibility requirements on household structure. Together, these descriptive trends suggest that there are likely large changes to poverty—and thus the need for safety net programs—associated with parenthood and separations.[23]

6. Conclusion

A large body of evidence has documented the point-in-time characteristics of safety net program recipients, but less is known about the dynamics of these characteristics leading up to initial take-up. In this paper, we use survey data and administrative health records to document significant and meaningful changes to income, employment, disability and health, and household structure in the months leading up to enrollment in nine social insurance programs and means-tested transfers—with a particular focus on SNAP, Medicaid, and UI. We compare the trajectories of these characteristics across programs and summarize commonalities via three stylized facts, while also highlighting patterns unique to certain programs.

We provide strong evidence that households participate in safety net programs at a time of economic distress and personal upheaval. Market incomes decline prior to program participation, with transfers providing partial—and in some cases full—insurance against these pre-enrollment income losses. Employment rates also decline around program receipt and remain persistently low, with these patterns coinciding with increased disability and worse health. Finally, spousal separations increase leading up to program enrollment, even for programs without mechanical eligibility requirements on household structure. Secondarily, we find suggestive evidence that these changes appear to be more prominent for Hispanic participants than for white and black participants, as well as for those with a high school

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[23]Our results on young children results are broadly consistent with Eichmeyer and Kent (2023), who find causal effects of parenthood on poverty and program take-up.

diploma or more (Figure A11-Figure A13).

Our results highlight the need for researchers and policymakers to increasingly think about program eligibility in terms of not only "which households are eligible" but also "when households are eligible" and the circumstances around this timing. This therefore suggests going beyond merely targeting disadvantaged people to also targeting disadvantaged time periods. A dynamic view of program eligibility can better account for the degree to which safety net programs help to mitigate shocks experienced by households. Additionally, these shocks may take many forms beyond simply shocks to characteristics related to eligibility or each programs' intended design (insured risk). Consequently, such a perspective more fully reflects the insurance value provided by safety net programs and their ability to help smooth consumption during a particularly difficult time. Given the large and sometimes sudden shocks that precede program take-up, our paper further sheds light on the importance of receiving government programs in a timely fashion and thus the importance of reducing administrative burdens.

References

Acs, Gregory, Katherin Ross Phillips, and Sandi Nelson (2003), "The Road Not Taken?: Changes in Welfare Entry during the 1990s." *Urban Institute Assessing the New Federalism Discussion Paper*, 3.

Almond, Douglas, Hilary W. Hoynes, and Diane Whitmore Schanzenbach (2011), "Inside the War on Poverty: The Impact of Food Stamps on Birth Outcomes." *Review of Economics and Statistics*, 93, 387–403.

Ashenfelter, Orley (1978), "Estimating the Effect of Training Programs on Earnings." *Review of Economics and Statistics*, 60, 47–57.

Ashenfelter, Orley and David Card (1985), "Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs." *Review of Economics and Statistics*, 67, 648–660.

Bane, Mary Jo and David T. Ellwood (1986), "Slipping Into and Out of Poverty: The Dynamics of Spells." *Journal of Human Resources*, 21, 1–23.

Ben-Shalom, Yonatan, Robert Moffitt, and John Karl Scholz (2012), "An Assessment of the Effectiveness of Anti-Poverty Programs in the United States." In *The Oxford Handbook of the Economics of Poverty* (Philip N. Jefferson, ed.), Oxford University Press.

Bitler, Marianne and Hilary Hoynes (2016), "The More Things Change, the More They Stay the Same? The Safety Net and Poverty in the Great Recession." *Journal of Labor Economics*, 34, S403–S444.

Bitler, Marianne, Hilary Hoynes, and Elira Kuka (2017), "Do In-Work Tax Credits Serve as a Safety Net?" *Journal of Human Resources*, 52, 319–350.

Blank, Rebecca and Patricia Ruggles (1996), "When Do Women Use Aid to Families with Dependent Children and Food Stamps? The Dynamics of Eligibility Versus Participation." *Journal of Human Resources*, 31, 57–89.

Blundell, Richard, Luigi Pistaferri, and Ian Preston (2008), "Consumption Inequality and Partial Insurance." *American Economic Review*, 98, 1887–1921.

Bound, John (1989), "The Health and Earnings of Rejected Disability Insurance Applicants." *American Economic Review*, 79, 482–502.

Bruhn, Jesse M., Kyle Greenberg, Matthew Gudgeon, Evan K. Rose, and Yotam Shem-Tov (2022), "The effects of combat deployments on veterans' outcomes." NBER Working Paper 30622, https://www.nber.org/papers/w30622.

Buchmueller, Thomas C., Helen Levy, and Robert G. Valletta (2021), "Medicaid Expansion and the Unemployed." *Journal of Labor Economics*, 39, S575–S617.

Card, David and Daniel Sullivan (1988), "Measuring the Effect of Subsidized Training Programs on Movements in and out of Employment." *Econometrica*, 56, 497–530.

CBO (2022), "The Distribution of Household Income, 2019." Report, Congressional Budget Office, https://www.cbo.gov/publication/58781#_idTextAnchor070.

Cellini, Stephanie Riegg, Signe-Mary McKernan, and Caroline Ratcliffe (2008), "The Dynamics of Poverty in the United States: A Review of Data, Methods, and Findings." *Journal of Policy Analysis and Management*, 27, 577–605.

Chen, Jiafeng and Jonathan Roth (2023), "Logs with zeros? some problems and solutions." Working paper.

Cohn, Jonathan B., Zack Liu, and Malcolm Wardlaw (2022), "Count (and Count-Like) Data in Finance ." *Journal of Financial Economics*, 146, 529–551.

Collinson, Rob, John Eric Humphries, Nicholas Mader, Davin Reed, Daniel Tannenbaum, and Winnie van Dijk (2023), "Eviction and Poverty in American Cities." *Quarterly Journal of Economics*.

Cronquist, Kathryn and Sarah Lauffer (2019), "Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2017." Technical report, U.S. Department of Agriculture.

Dague, Laura, Thomas DeLeire, and Lindsey Leininger (2017), "The Effect of Public Insurance Coverage for Childless Adults on Labor Supply." *American Economic Journal: Economic Policy*, 9, 124–154.

Deshpande, Manasi, Tal Gross, and Yalun Su (2021), "Disability and Distress: The Effect of Disability Programs on Financial Outcomes." *American Economic Journal: Applied Economics*, 13, 151–178.

Deshpande, Manasi and Lee Lockwood (2022), "Beyond Health: Non-Health Risk and the Value of Disability Insurance." *Econometrica*, 90, 1781–1810.

Dobkin, Carlos, Amy Finkelstein, Raymond Kluender, and Matthew J. Notowidigdo (2018), "The Economic Consequences of Hospital Admissions." *American Economic Review*, 108, 308–352.

East, Chloe and David Simon (2022), "How Well Insured are Job Losers? Efficacy of the Public Safety Net." *NBER Working Paper 28218*.

Edelstein, Sara, Michael R. Pergamit, and Caroline Ratcliffe (2014), "Characteristics of Families Receiving Multiple Public Benefits." Technical report, Urban Institute.

Eichmeyer, Sarah and Christina Kent (2023), "Parenthood in Poverty." *CEPR Discussion Paper No. 17722*.

Grogger, Jeffrey (2004), "Welfare transitions in the 1990s: The economy, welfare policy, and the EITC." *Journal of Policy Analysis and Management*, 23, 671–695.

Ham, John C., Xianghong Li, , and Lara D. Shore-Sheppard (2016), "The Employment Dynamics of Disadvantaged Women: Evidence from the SIPP." *Journal of Labor Economics*, 34, 899–944.

Hardy, Bradley (2017), "Income Instability and the Response of the Safety Net." *Contemporary Economic Policy*, 35, 312–330.

Hardy, Bradley and James P. Ziliak (2014), "Decomposing Trends in Income Volatility: The "Wilde Ride" at the Top and Bottom." *Economic Inquiry*, 52, 459–476.

Hastings, Justine and Jesse M. Shapiro (2018), "How are SNAP Benefits Spent? Evidence from a Retail Panel." *American Economic Review*, 108, 3493–3540.

Heckman, James J. and Jeffrey A. Smith (1999), "The Pre-Program Earnings Dip and the Determinants of Participation in a Social Program: Implications for Simple Program Evaluation Strategies." *Economic Journal*, 109, 313–348.

Hoynes, Hilary, Diane Whitmore Schanzenbach, and Douglas Almond (2016), "Long-Run Impacts of Childhood Access to the Safety Net." *American Economic Review*, 106, 903–934.

Jacobson, Louis S., Robert J. LaLonde, and Daniel G. Sullivan (1993), "Earnings Losses of Displaced Workers." *American Economic Review*, 83, 685–709.

Kleven, Henrik, Camille Landais, and Jakob Egholt Søgaard (2021), "Does Biology Drive Child Penalties? Evidence from Biological and Adoptive Families." *American Economic Review: Insights*, 3, 183–198.

Low, Hamish and Luigi Pistaferri (2015), "Disability Insurance and the Dynamics of the Incentive Insurance Trade-Off." *American Economic Review*, 105, 2986–3029.

Meyer, Bruce D., Nikolas Mittag, and Robert M. George (2022), "Errors in Survey Reporting and Imputation and their Effects on Estimates of Food Stamp Program Participation." *Journal of Human Resources*, 57, 1605–1644.

Meyer, Bruce D., Wallace K. C. Mok, and James X. Sullivan (2015), "Household Surveys in Crisis." *Journal of Economic Perspectives*, 29, 199–226.

Meyer, Bruce D. and Wallace K.C. Mok (2019), "Disability, Earnings, Income and Consumption." *Journal of Public Economics*, 171, 51–69.

Meyer, Bruce D. and Derek Wu (2018), "The Poverty Reduction of Social Security and Means-Tested Transfers." *Industrial and Labor Relations Review*, 71, 1106–1153.

Meyer, Bruce D., Derek Wu, Victoria Mooers, and Carla Medalia (2021), "The Use and Misuse of Income Data and Extreme Poverty in the United States." *Journal of Labor Economics*, 39, S5–S58.

Mitchell, Alison (2020), "Impact of the Recession on Medicaid." Report, Congressional Research Service, https://crsreports.congress.gov/product/pdf/IF/IF11686.

Moffitt, Robert A. (2002), "Welfare Programs and Labor Supply." In *Handbook of Public Economics* (A. J. Auerbach M. Feldstein, ed.), volume 4, 1 edition, chapter 34, 2393–2430, Elsevier.

Piketty, Thomas and Emmanuel Saez (2003), "Income Inequality in the United States, 19131998 ." *Quarterly Journal of Economics*, 118, 1–41.

Ribar, David C. (2005), "Transitions from Welfare and the Employment Prospects of Low-Skill Workers." *Southern Economic Journal*, 71, 514–533.

Rothstein, Jesse and Robert G. Valletta (2017), "Scraping By: Income and Program Participation After the Loss of Extended Unemployment Benefits." *Journal of Policy Analysis and Management*, 36, 880–908.

Sandoval, Daniel A., Mark R. Rank, and Thomas A. Hirschl (2009), "The Increasing Risk of Poverty Across the American Life Course." *Demography*, 46, 717–737.

Silver, David and Jonathan Zhang (2023), "Invisible wounds: Health and well-being impacts of mental disorder disability compensation on veterans." NBER Working Paper 29877, https://www.nber.org/papers/w29877.
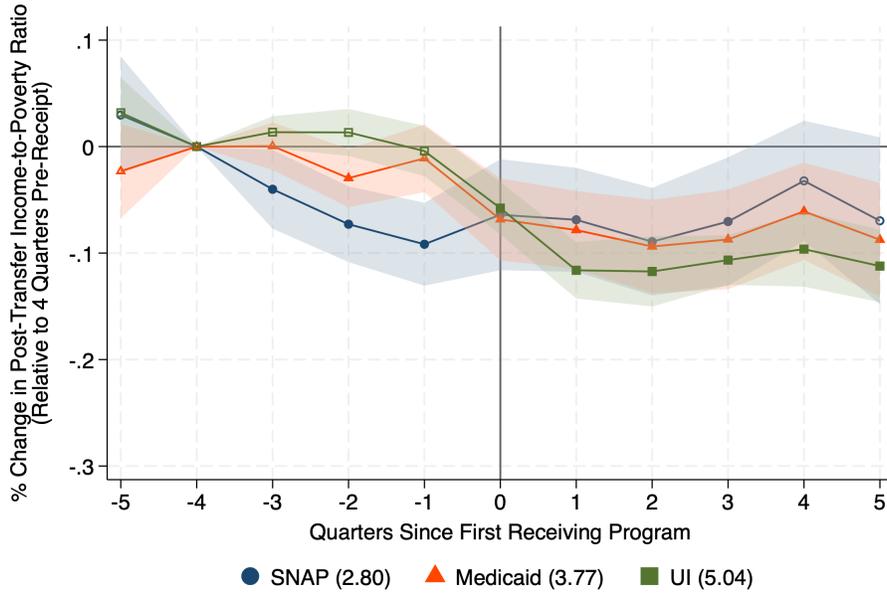
Stepner, Michael (2019), "The Insurance Value of Redistributive Taxes and Transfers."

Sullivan, Daniel and Till von Wachter (2009), "Job Displacement and Mortality: An Analysis Using Administrative Data." *The Quarterly Journal of Economics*, 124, 1265–1306.

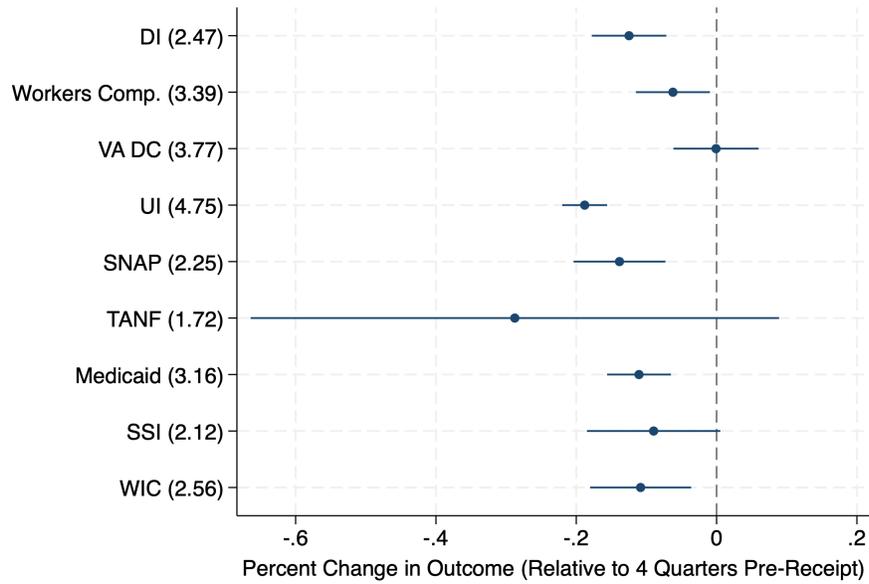Figure 1: Dynamic Changes in Income-to-Poverty Ratios Around Program Receipt
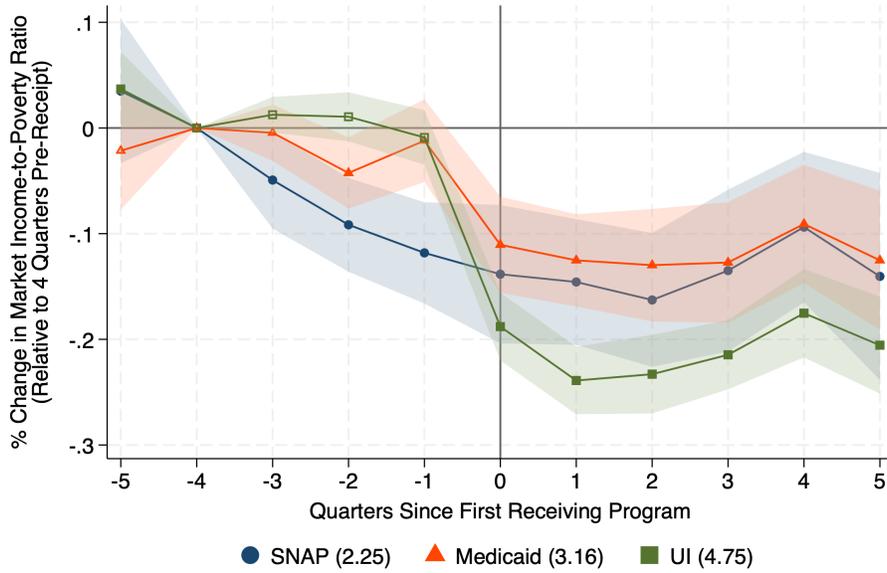
(a) Market Income
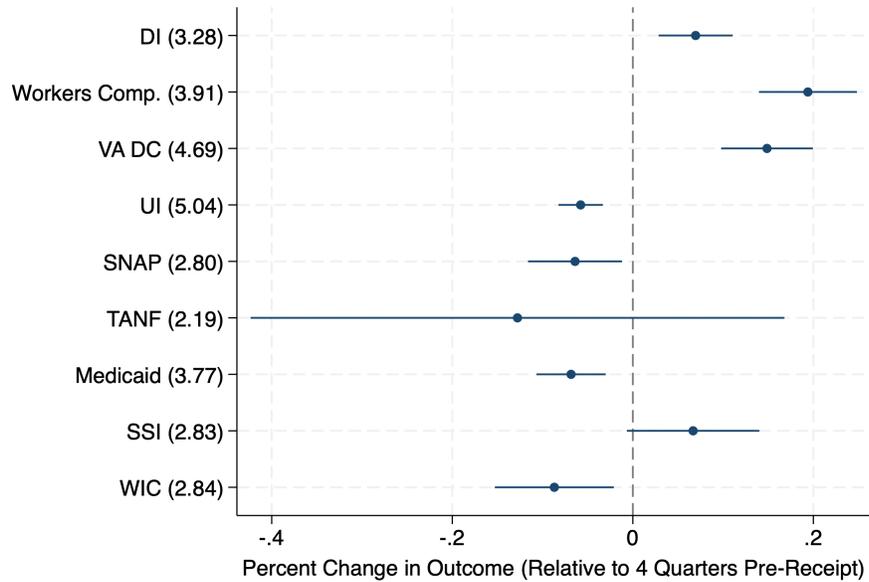

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of the monthly household-level market income-to-poverty ratio (in Panel A) and post-transfer income-to-poverty ratio (in Panel B) on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. Estimates are divided by the mean 12 months prior to initial receipt (whose levels can be found in parentheses in the legends). Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers. Confidence bands are at the 95% level.

Figure 2: Changes in Incomes Leading Up to Receipt for Nine Programs
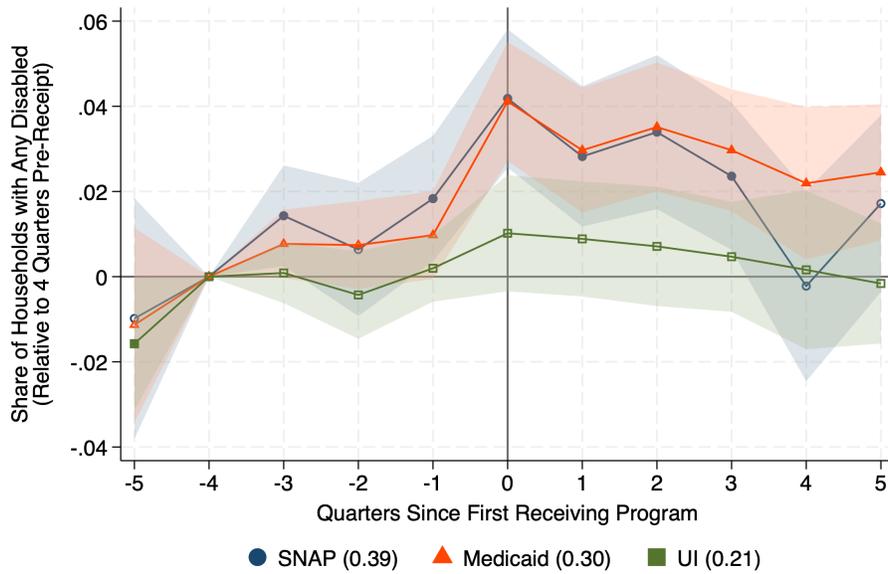

(a) Market Income

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly market and post-transfer income-to-poverty ratios on an event-time indicator for the first quarter of program receipt, following Equation (1). The reference period is 4 quarters prior to receipt. Confidence intervals are at the 95% level.

Figure 3: Dynamic Changes in Employment and Disability Around Program Receipt
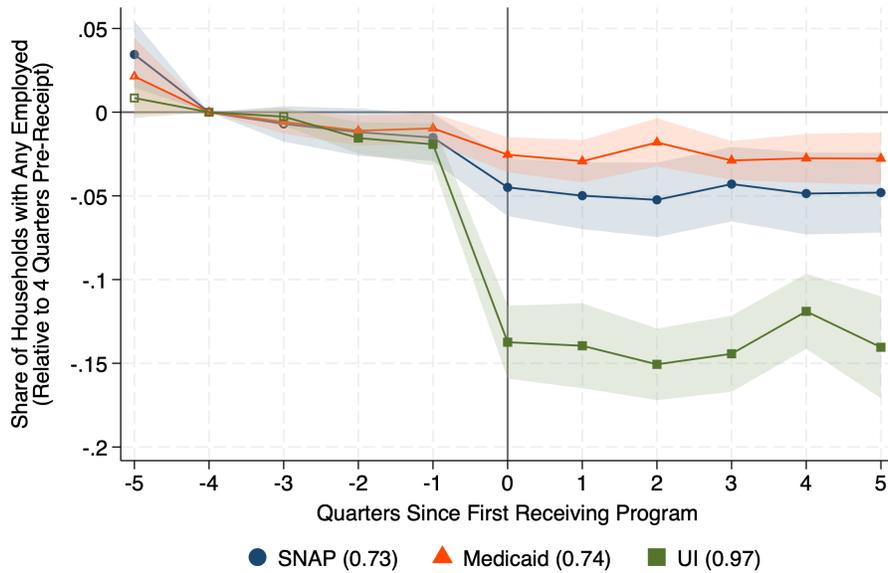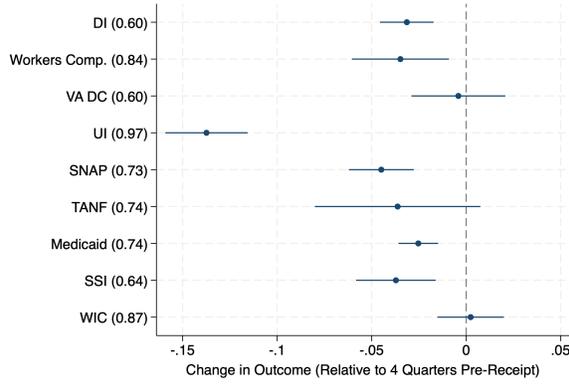

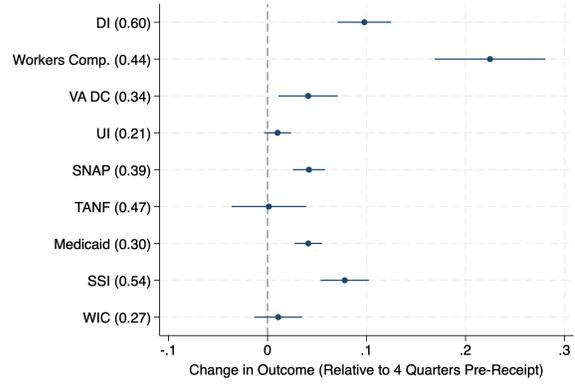(a) Any Employment in Household

(b) Any Work-Limiting Disability in Household

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly characteristics for employment and having a work-limiting disability on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers. Confidence bands are at the 95% level.
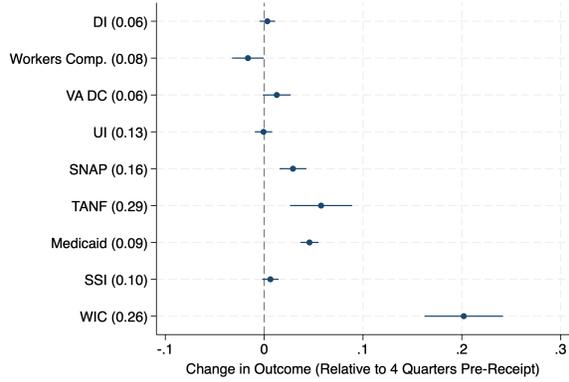
29

Figure 4: Changes in Other Characteristics Leading Up to Receipt for Nine Programs

(a) Employment

(b) Work-Limiting Disability

(c) Has Child Aged 0-4
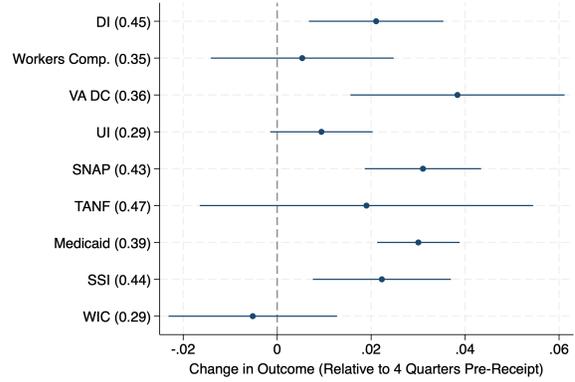
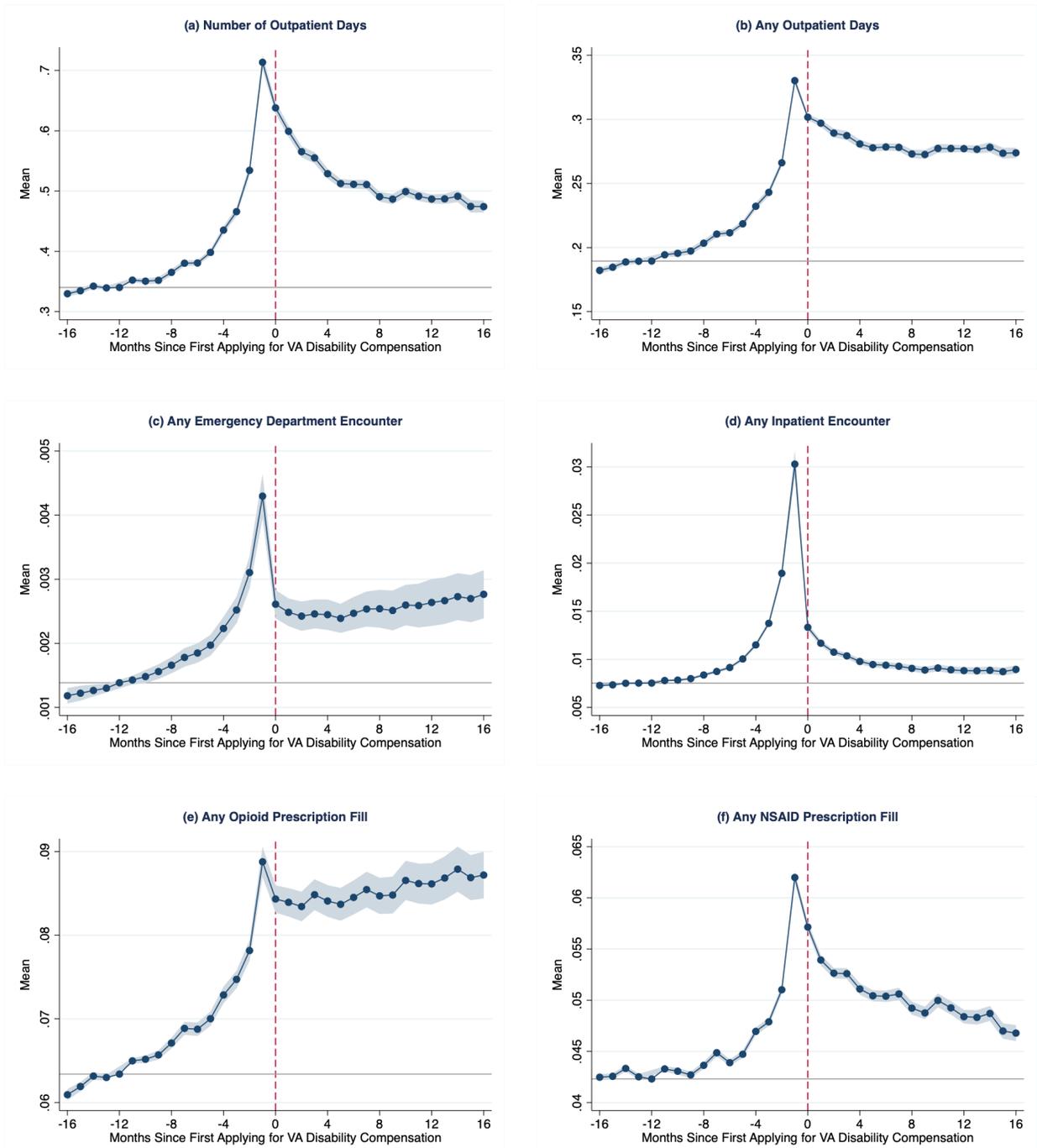(d) Separation

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of various monthly binary characteristics on an event-time indicator for the first quarter of program receipt, following Equation (1). The reference period is 4 quarters prior to receipt. Confidence intervals are at the 95% level.

Figure 5: Changes in Health Outcomes Around VA Disability Compensation Claiming

(a) Number of Outpatient Days

(b) Any Outpatient Days

(c) Any Emergency Department Encounter

(d) Any Inpatient Encounter

(e) Any Opioid Prescription Fill

(f) Any NSAID Prescription Fill

Data Sources: Admin. VHA health records linked to VA disability compensation claims (2004-2020).
Notes: These figures show regression estimates of various monthly health outcomes on event-time indicators for the month relative to initial program receipt as well as cohort and year fixed effects. The omitted period is 12 months prior to application, and all estimates are scaled relative to this baseline. Confidence bands are at the 95% level and robust standard errors are clustered by application cohort. All applicants are continuously enrolled in VHA healthcare in the 16 months pre- and post-application. All outcomes are binary except for the number of outpatient days (which ranges from 0 to 30). See appendix for more details on how the outcomes are defined and the coefficients and standard errors that underlying this figure.

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Figure 6: Dynamic Changes in Household Structure Around Program Receipt
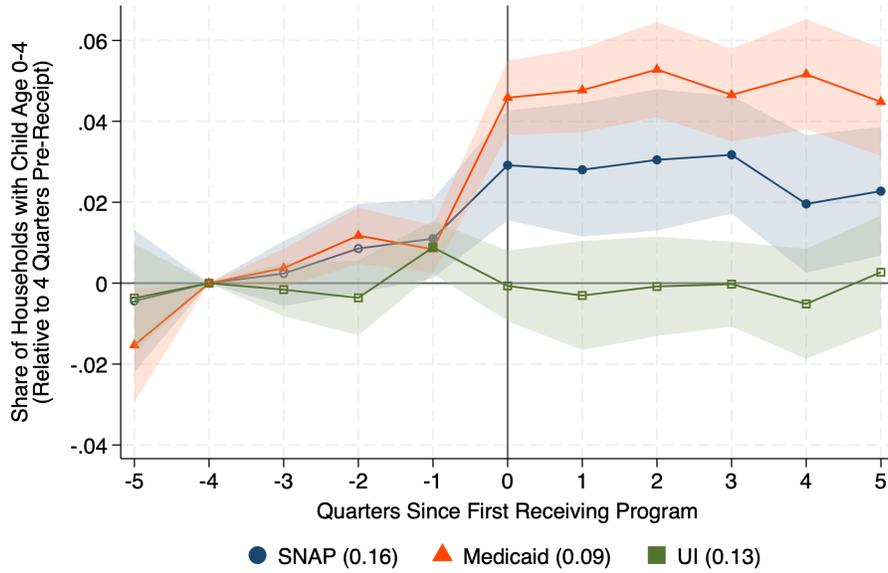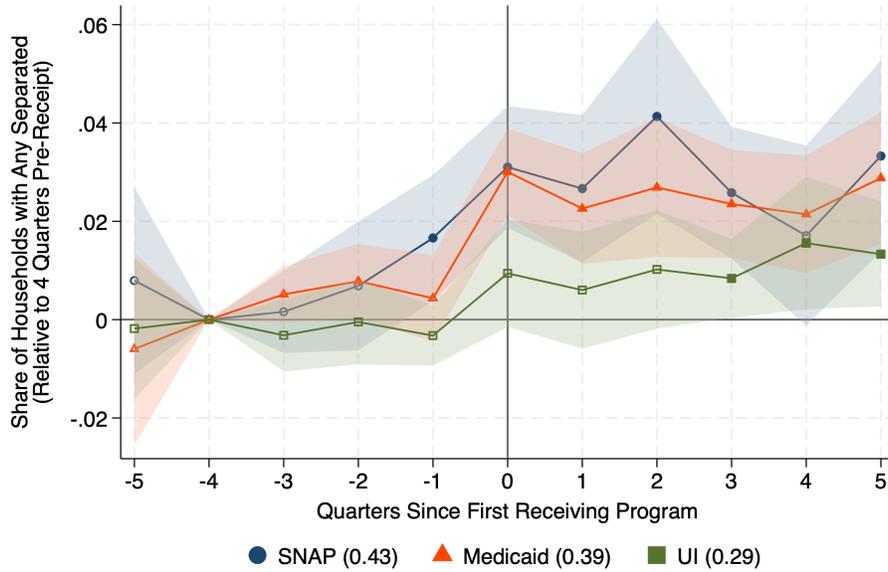
(a) Has Child Aged 0-4 in Household

(b) Anyone Separated, Divorced, or Widowed in Household

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly characteristics for having a child (aged 0-4) and being separated, divorced, or widowed on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers. Confidence bands are at the 95% level.

Table 1: Static Characteristics of Program Recipients (Measured During the First Month of Program Receipt)

VARIABLES	(1) DI	(2) WC	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
	Social Insurance Programs				Means-Tested Transfers				
Characteristics of Household Head									
Age	61.11	54.84	63.13	50.36	53.96	48.98	55.85	56.97	43.96
Female	0.546	0.539	0.414	0.490	0.565	0.635	0.509	0.554	0.551
Household Incomes									
Market Inc.-to-Pov. Ratio	2.281	3.342	3.338	4.168	2.079	1.694	3.022	2.043	2.466
Post-Transfer Inc.-to-Pov. Ratio	3.655	4.645	5.059	4.926	2.729	2.396	3.723	3.135	2.782
Other Household Characteristics									
Unemployed	0.060	0.069	0.055	0.268	0.185	0.215	0.103	0.090	0.144
Out of Labor Force (Age 18-64)	0.353	0.278	0.182	0.139	0.240	0.406	0.215	0.330	0.300
Disabled	0.711	0.657	0.395	0.235	0.474	0.517	0.370	0.662	0.279
Has Child (Age 0-4)	0.051	0.067	0.043	0.129	0.181	0.336	0.138	0.085	0.473
Separated/Divorced/Widowed	0.469	0.349	0.379	0.303	0.481	0.488	0.432	0.479	0.299
Elderly (Age 65+)	0.482	0.300	0.589	0.185	0.322	0.189	0.375	0.413	0.125
Any of Above Characteristics	0.973	0.851	0.878	0.728	0.898	0.914	0.848	0.925	0.820
Program Receipt									
Receives DI	1.000	0.146	0.091	0.055	0.157	0.152	0.137	0.246	0.076
Receives Workers' Comp.	0.025	1.000	0.017	0.018	0.022	0.016	0.022	0.033	0.012
Receives VA Disability	0.064	0.029	1.000	0.019	0.024	0.020	0.037	0.026	0.019
Receives UI	0.033	0.081	0.030	1.000	0.118	0.087	0.071	0.045	0.077
Receives SNAP	0.247	0.127	0.067	0.103	1.000	0.719	0.161	0.346	0.332
Receives TANF	0.018	0.020	0.009	0.011	0.037	1.000	0.015	0.028	0.068
Receives Medicaid	0.400	0.289	0.129	0.230	0.625	0.923	1.000	0.759	0.665
Receives SSI	0.188	0.129	0.051	0.041	0.153	0.213	0.108	1.000	0.112
Receives WIC	0.024	0.041	0.010	0.042	0.134	0.265	0.051	0.056	1.000
Households in Sample	2,466	754	593	4,036	2,647	590	4,835	1,708	1,134

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows the characteristics, incomes, and program receipt rates of recipient households of nine separate programs during the month in which they first receive that program. The samples for each program consist of all households appearing consecutively in at least 9 interview waves and for whom we can observe outcomes over a 16-month window both before and after initially receiving a program. Households are pooled across six SIPP panels (spanning 1996-2020) and are weighted by their survey weights corresponding to the fourth reference month of the first interview wave. See appendix for more details on how these characteristics are defined.

Appendix (For Online Publication Only)

## "Comparison Groups" for Robustness Checks

In the SIPP, our main analysis sample for each program consists of households receiving that program and for whom we can observe outcomes over a 16-month window both before and after initially receiving that program. However, as robustness checks we also conduct analyses for each program that include a control group consisting of non-recipient households that are simulated to be eligible. The comparison group for each program is defined as follows:

- SSDI: Households containing an individual below the age of 62 who reports a work-limiting disability

- Workers' Compensation: Households containing an individual who reports being unable to work because of either a temporary injury or a chronic health condition or disability

- VA DC: Households containing a veteran

- UI: Households containing an individual reporting spending time on layoff

- SNAP: Households with an income-to-poverty ratio below 130%

- TANF: Households with an income-to-poverty ratio below 50% and containing a child under the age of 18

- Medicaid: Households with an income-to-poverty ratio below 133%

- SSI: Households with an income-to-poverty ratio below 100% and containing an individual reporting either a work-limiting disability or aged 65 or over

Figure A1: Raw Means in Income-to-Poverty Ratios Around Program Receipt
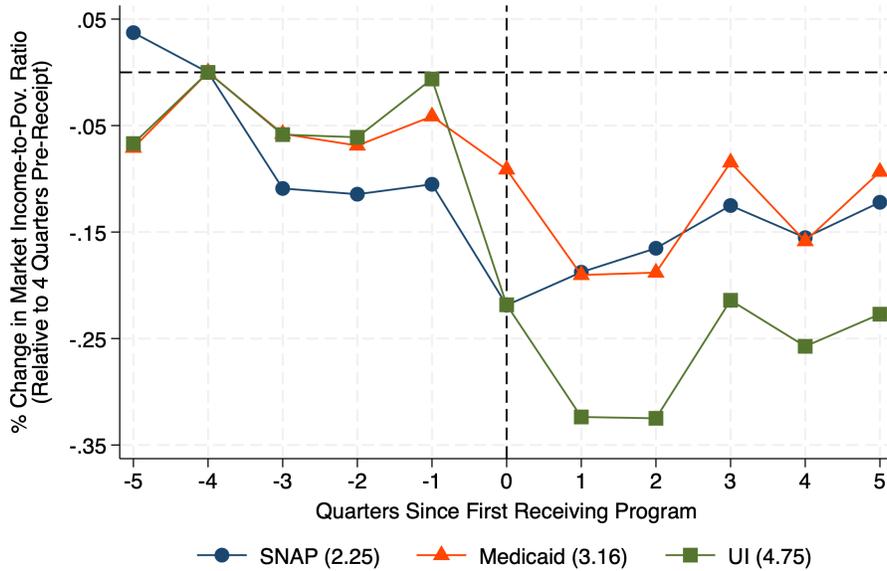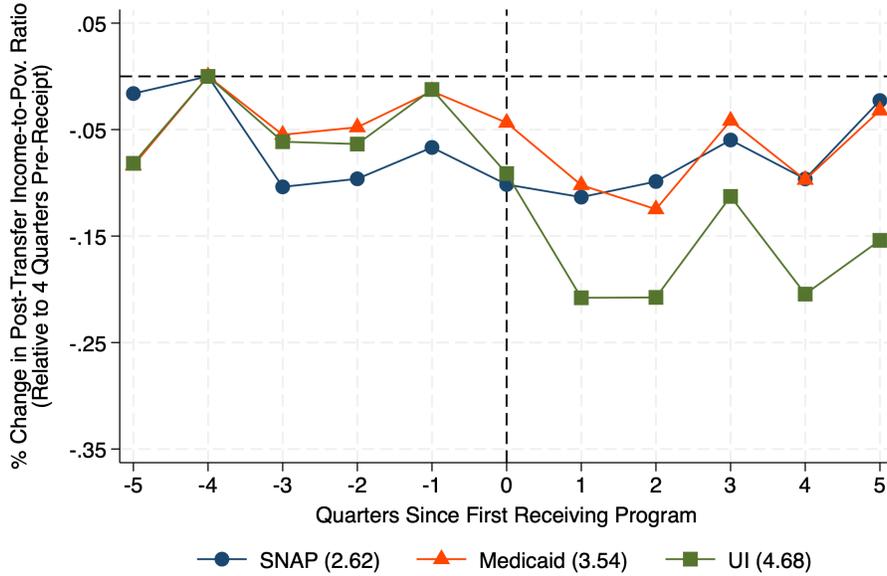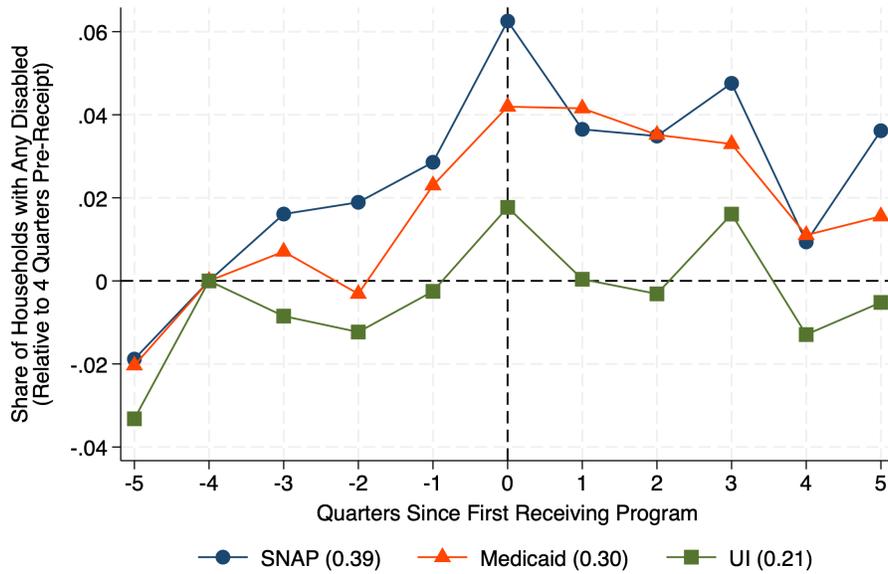

(a) Market Income

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show raw means of the percent change in the household-level market income-to-poverty ratio (in Panel A) and the post-transfer income-to-poverty ratio (in Panel B) in the quarters around initial program receipt relative to 4 quarters prior to receipt. The levels for the mean income-to-poverty ratio measured four quarters prior to initial receipt can be found in parentheses in the legends. The samples for each program consist of all households appearing consecutively in at least 9 interview waves and for whom we can observe outcomes over a 16-month window both before and after initial receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave.

Figure A2: Raw Means in Employment and Disability Changes Around Program Receipt
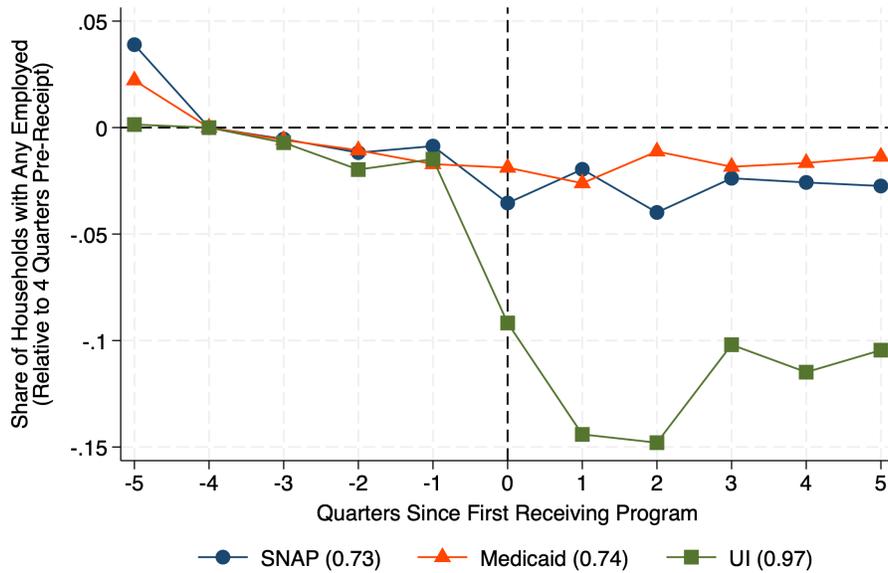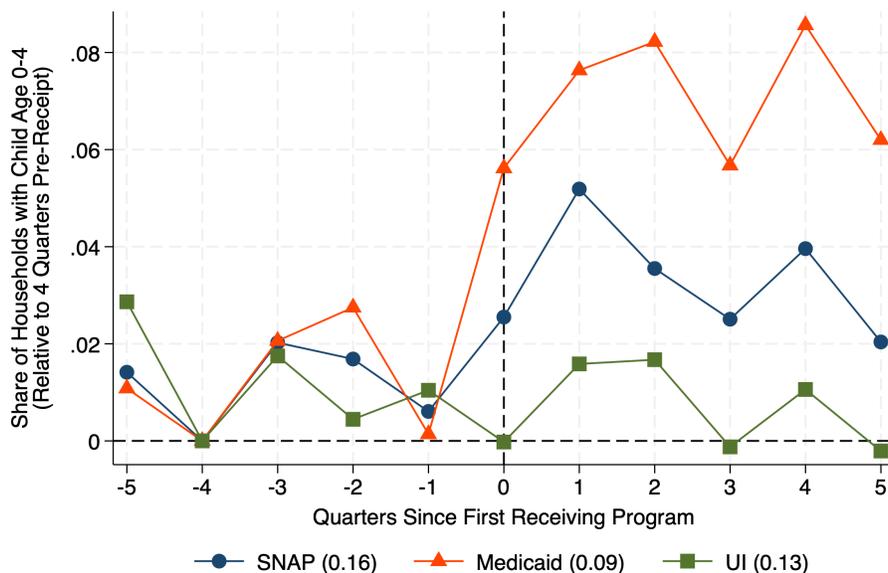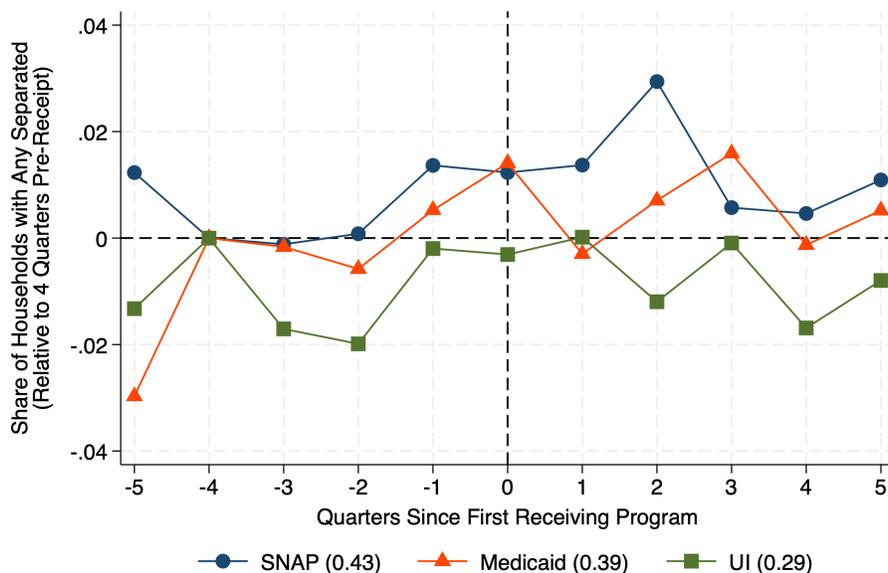

(a) Any Employment in Household

(b) Any Work-Limiting Disability in Household

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show raw means of the percentage point changes in employment and disability in the quarters around initial program receipt relative to 4 quarters prior to receipt. The levels for each mean binary characteristic measured four quarters prior to initial receipt can be found in parentheses in the legends. The samples for each program consist of all households appearing consecutively in at least 9 interview waves and for whom we can observe outcomes over a 16-month window both before and after initial receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave.

Figure A3: Raw Means in Household Structure Changes Around Program Receipt
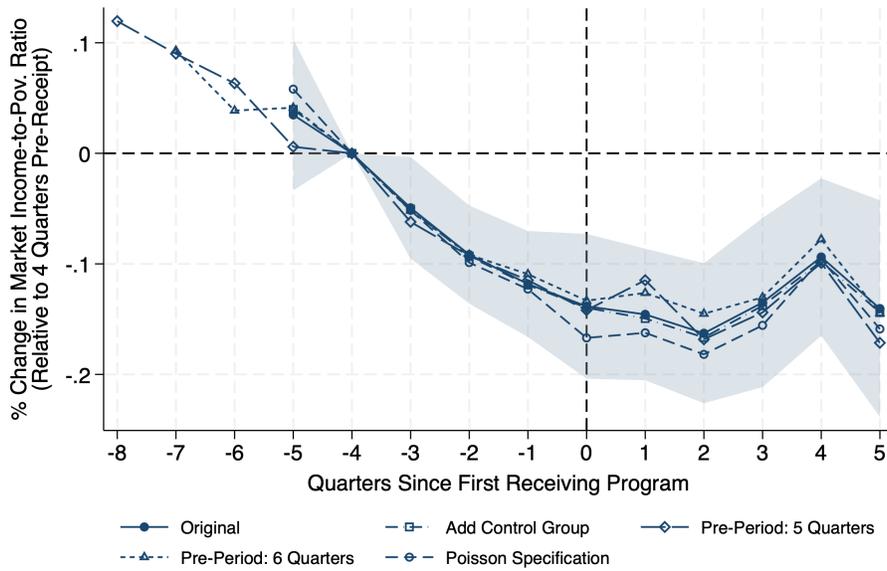

(a) Has Child Aged 0-4 in Household

(b) Anyone Separated, Divorced, or Widowed in Household

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show raw means of the percentage point changes in having a child (aged 0-4) and being separated in the quarters around initial program receipt relative to 4 quarters prior to receipt. The levels for each mean binary characteristic measured four quarters prior to initial receipt can be found in parentheses in the legends. The samples for each program consist of all households appearing consecutively in at least 9 interview waves and for whom we can observe outcomes over a 16-month window both before and after initial receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave.

Figure A4: Changes in Incomes Around Receipt of SNAP (Robustness Checks)
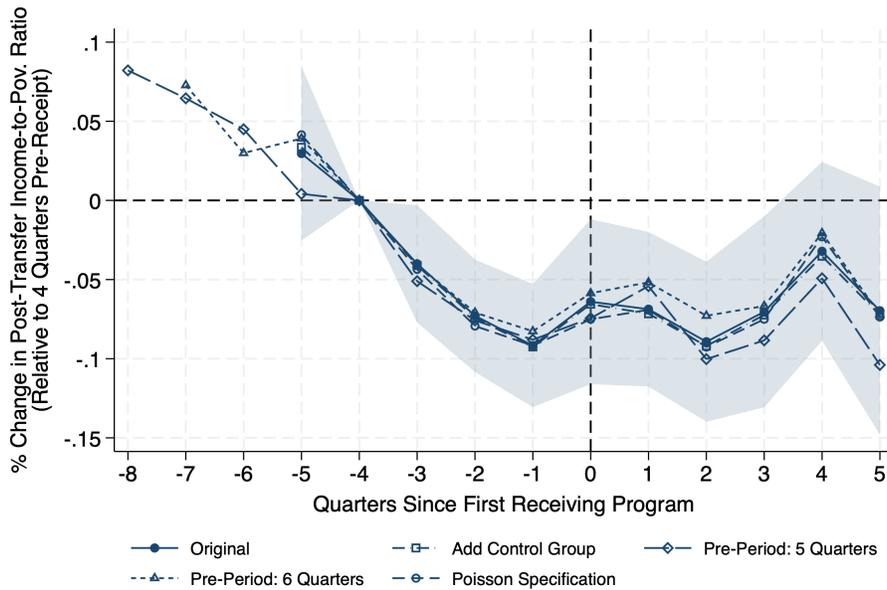
(a) Market Income

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of market and post-transfer income-to-poverty ratios on event-time indicators for the quarter relative to initial receipt of SNAP. Confidence bands are at the 95% level and correspond to the original estimates. Solid circles represent the baseline estimates. Hollow squares represent estimates that include a control group consisting of non-recipients simulated to be eligible. Hollow diamonds and triangles represent estimates over a five- and six-quarter pre-period, covering households for whom we can observe outcomes over a 20- and 24-month window (respectively) before receiving a program. Hollow circles use a Poisson specification for the event study.

Figure A5: Changes in Incomes Around Receipt of Medicaid (Robustness Checks)
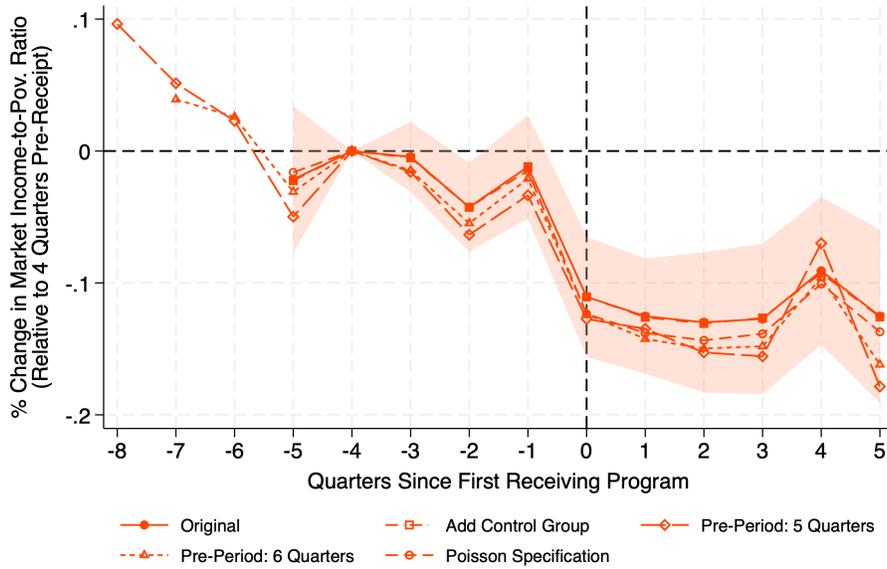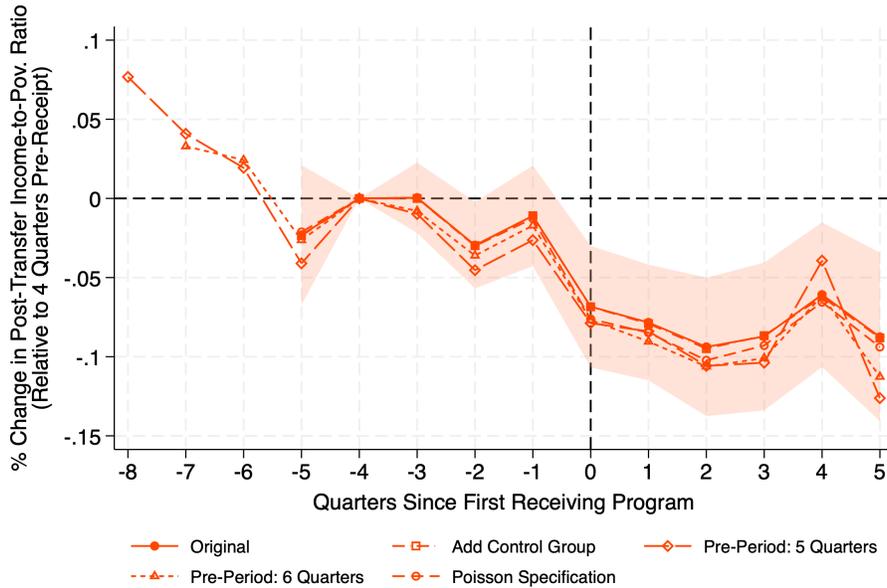

(a) Market Income

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of market and post-transfer income-to-poverty ratios on event-time indicators for the quarter relative to initial receipt of Medicaid. Confidence bands are at the 95% level and correspond to the original estimates. Solid circles represent the baseline estimates. Hollow squares represent estimates that include a control group consisting of non-recipients simulated to be eligible. Hollow diamonds and triangles represent estimates over a five- and six-quarter pre-period, covering households for whom we can observe outcomes over a 20- and 24-month window (respectively) before receiving a program. Hollow circles use a Poisson specification for the event study.

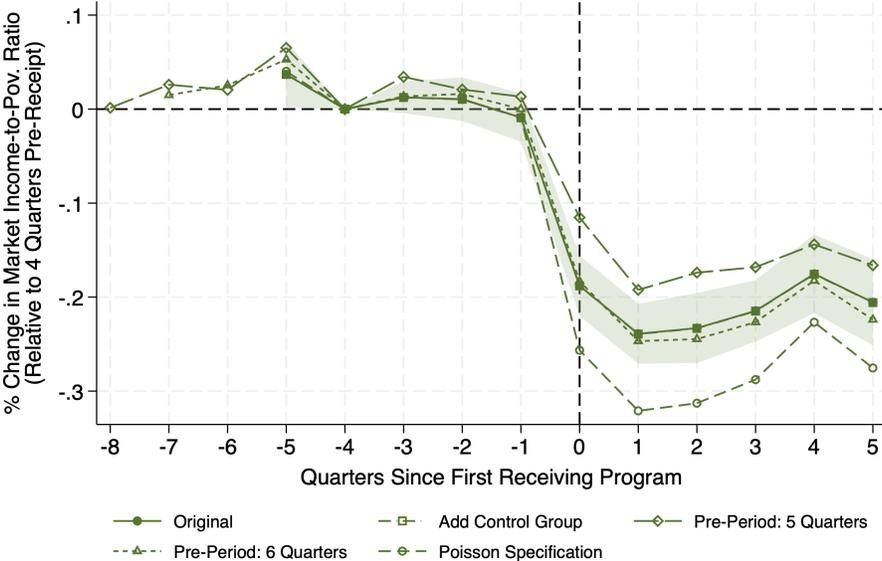Figure A6: Changes in Incomes Around Receipt of UI (Robustness Checks)
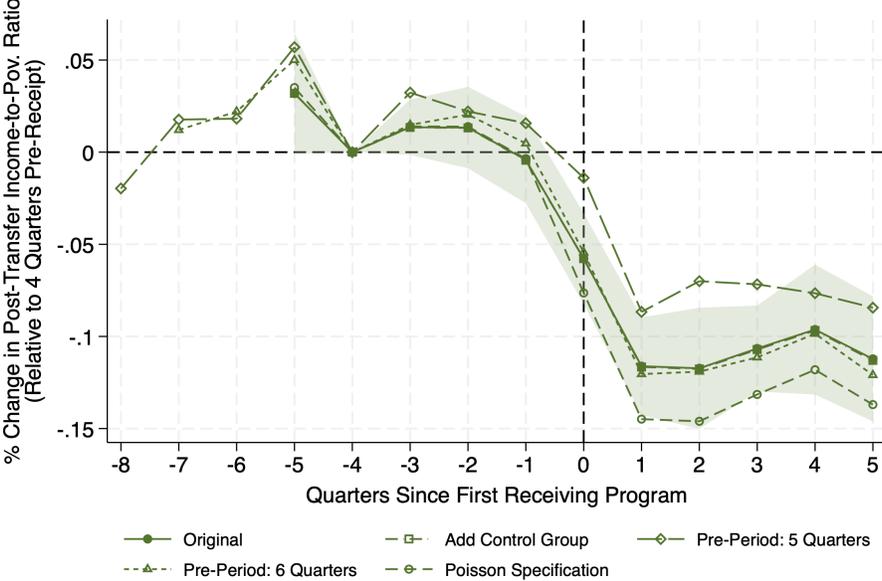

(a) Market Income

(b) Post-Transfer Income

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of market and post-transfer income-to-poverty ratios on event-time indicators for the quarter relative to initial receipt of UI. Confidence bands are at the 95% level and correspond to the original estimates. Solid circles represent the baseline estimates. Hollow squares represent estimates that include a control group consisting of non-recipients simulated to be eligible. Hollow diamonds and triangles represent estimates over a five- and six-quarter pre-period, covering households for whom we can observe outcomes over a 20- and 24-month window (respectively) before receiving a program. Hollow circles use a Poisson specification for the event study.

Figure A7: Changes in Take-Up of Other Programs Around Receipt of SNAP

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This figure shows regression estimates of the receipt of other programs on event-time indicators for the quarter relative to initial receipt of SNAP, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A8: Changes in Take-Up of Other Programs Around Receipt of Medicaid

Notes: This figure shows regression estimates of the receipt of other programs on event-time indicators for the quarter relative to initial receipt of Medicaid, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A9: Changes in Take-Up of Other Programs Around Receipt of UI
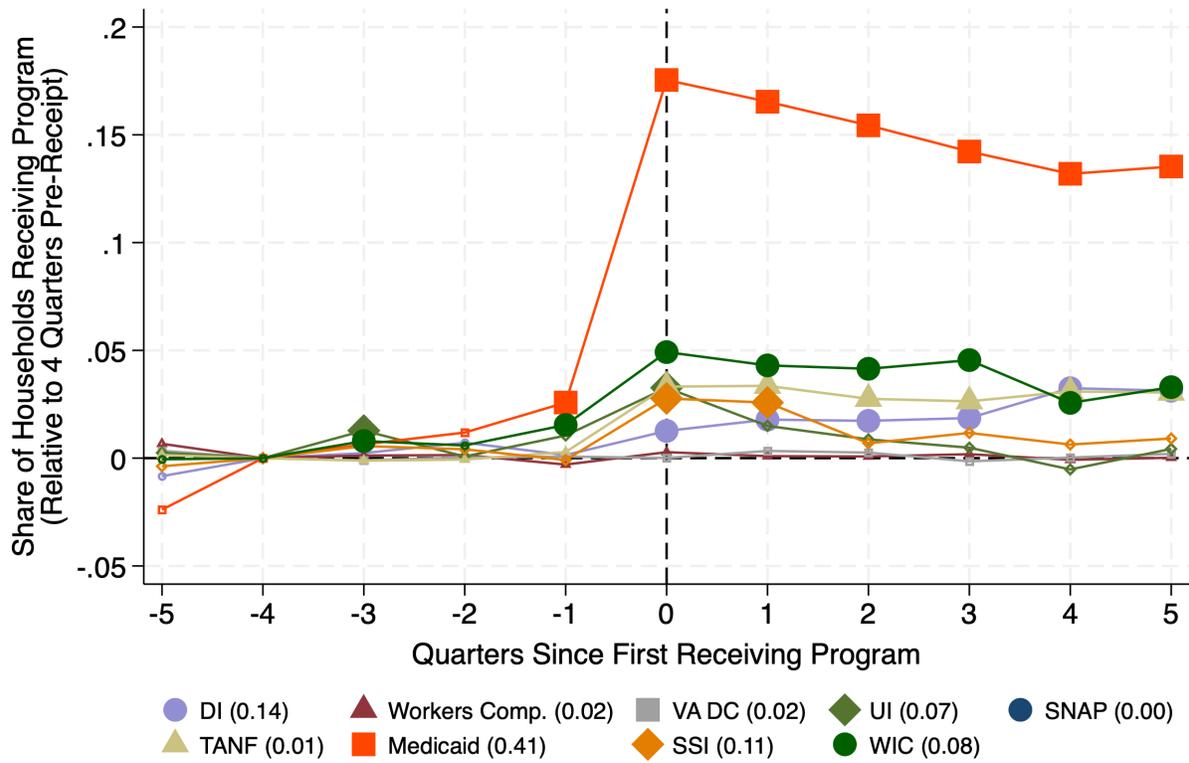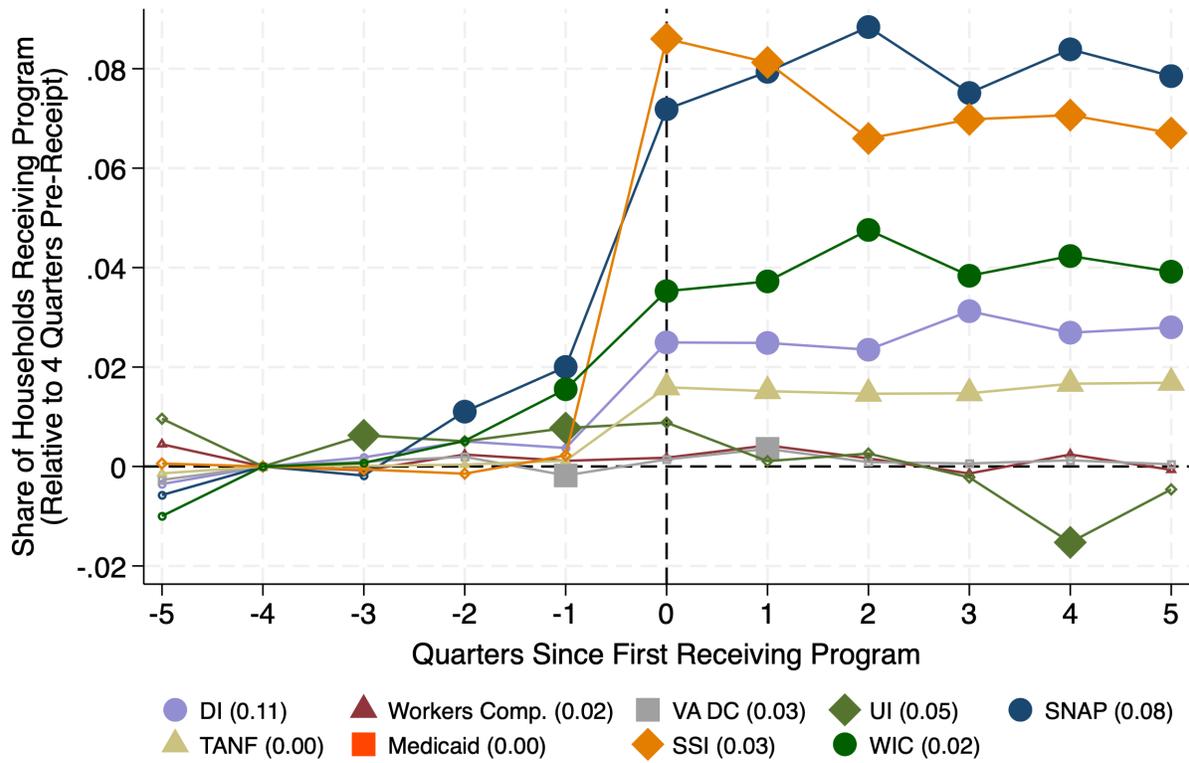
Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This figure shows regression estimates of the receipt of other programs on event-time indicators for the quarter relative to initial receipt of UI, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A10: Dynamic Changes in Unemployment and Labor Force Participation Around Program Receipt

(a) Any Unemployed in Household (but Still in Labor Force)

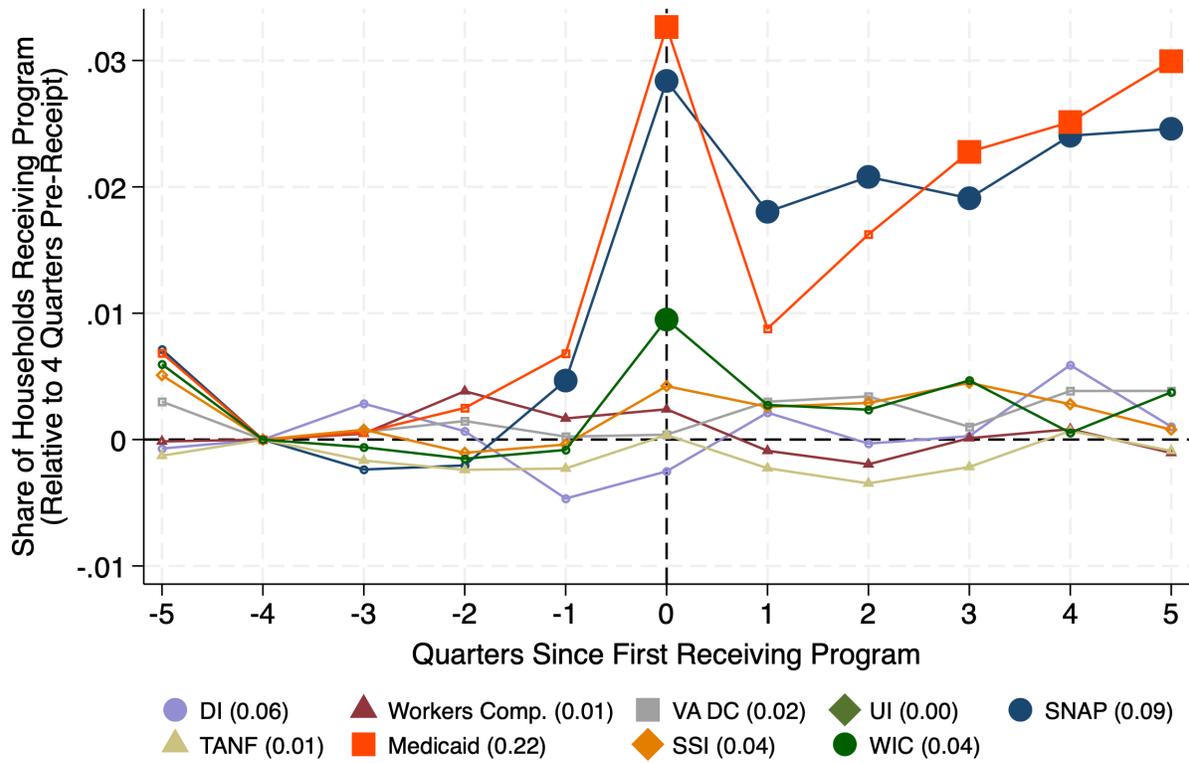(b) Any Out of Labor Force (Aged 18-64) in Household

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly characteristics for unemployment and being out of the labor force on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean levels of each binary outcome measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers. Confidence bands are at the 95% level.

Figure A11: Changes in Various Outcomes Incomes Leading Up to Receipt of SNAP
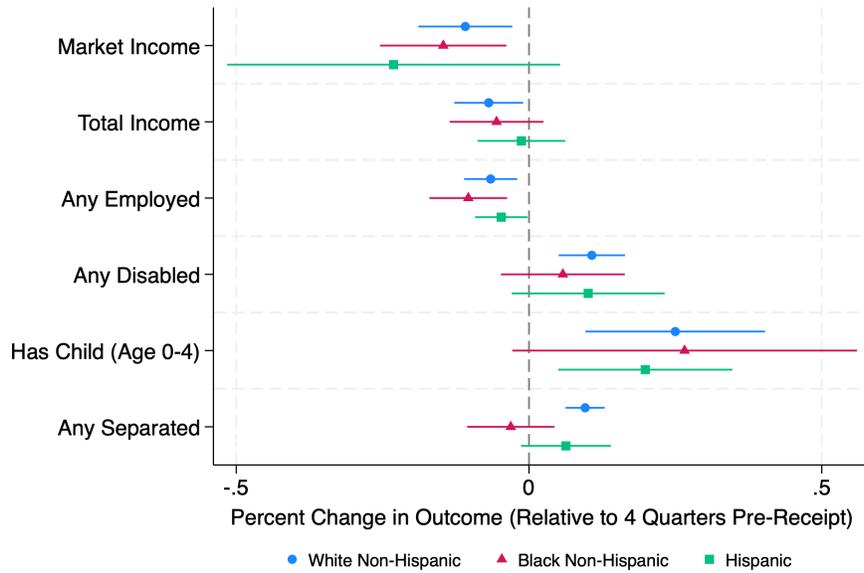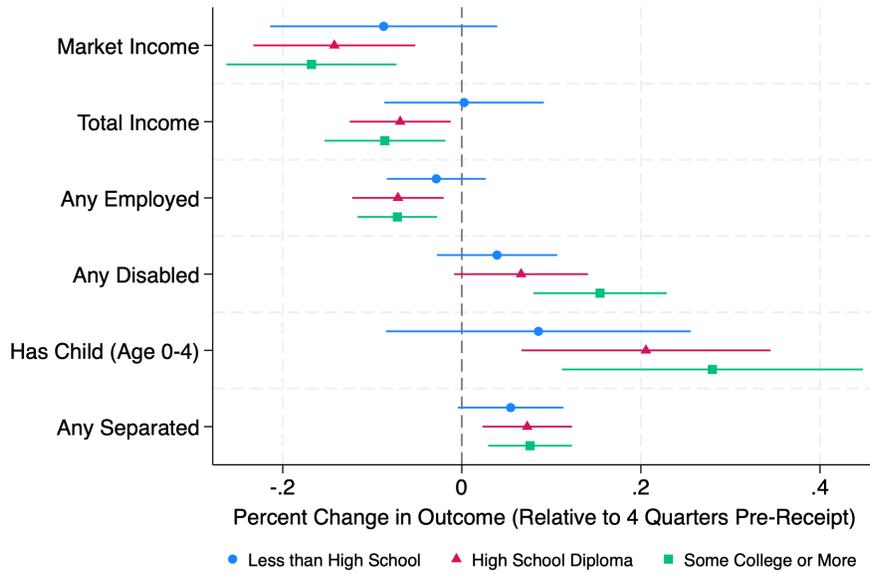
(a) By Race/Ethnicity

(b) By Education Level of Head

Figure A12: Changes in Various Outcomes Incomes Leading Up to Receipt of Medicaid
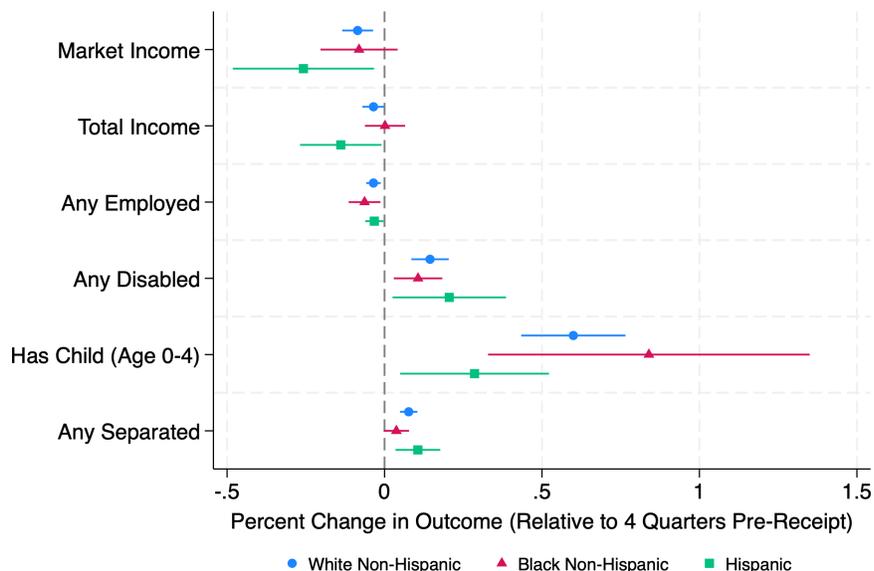
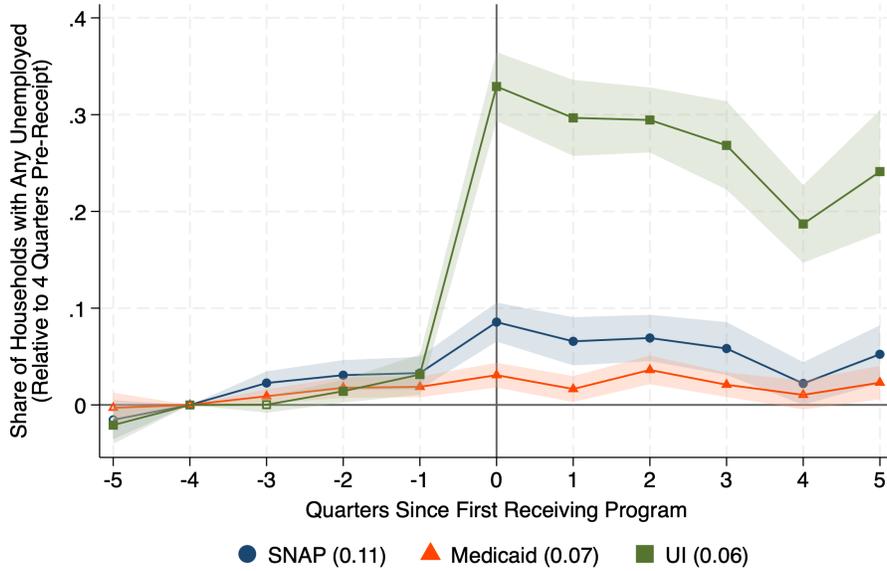(a) By Race/Ethnicity

(b) By Education Level of Head

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of various monthly outcomes on an event-time indicator for the first quarter of Medicaid receipt, following Equation (1), by demographic subgroups. The estimates are all scaled by the mean outcome 4 quarters prior to receipt, so that they can be interpreted as percent changes. Confidence intervals are at the 95% level.

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Figure A13: Changes in Various Outcomes Incomes Leading Up to Receipt of SNAP
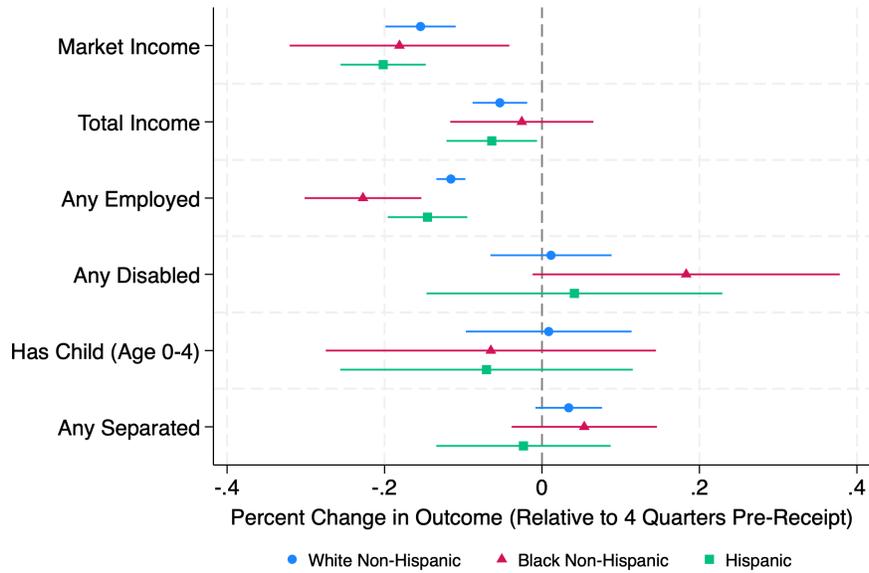
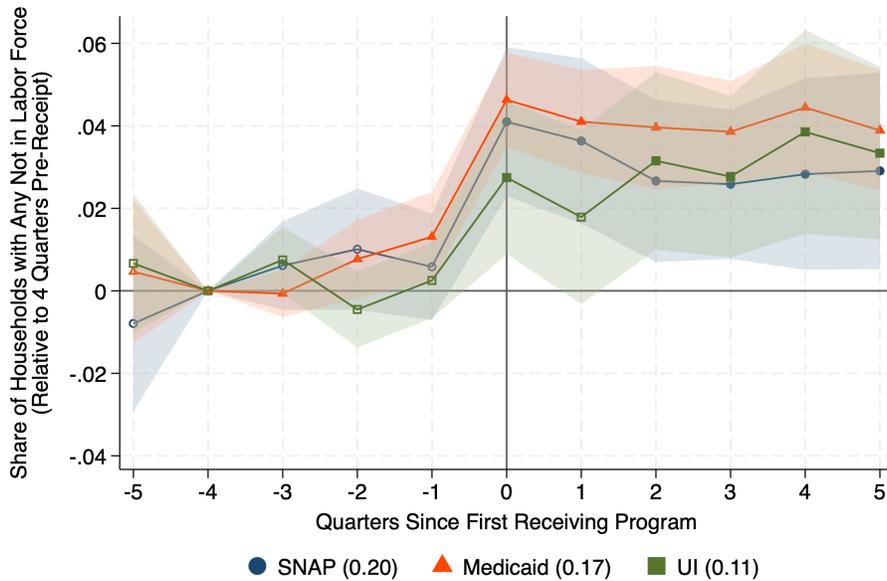(a) By Race/Ethnicity

(b) By Education Level of Head

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of various monthly outcomes on an event-time indicator for the first quarter of UI receipt, following Equation (1), by demographic subgroups. The estimates are all scaled by the mean outcome 4 quarters prior to receipt, so that they can be interpreted as percent changes. Confidence intervals are at the 95% level.

Figure A14: Dynamic Changes in Market Income-to-Poverty Ratios Around Receipt of Nine Programs

(a) Social Insurance Programs

(b) Means-Tested Transfers

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of the monthly household-level market income-to-poverty ratio on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. Estimates are divided by the mean 12 months prior to initial receipt (whose levels can be found in parentheses in the legends). Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A15: Dynamic Changes in Post Transfer Income-to-Poverty Ratios Around Receipt of Nine Programs

(a) Social Insurance Programs

(b) Means-Tested Transfers

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of the monthly household-level post-transfer income-to-poverty ratio on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. Estimates are divided by the mean 12 months prior to initial receipt (whose levels can be found in parentheses in the legends). Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A16: Dynamic Changes in Employment Around Receipt of Nine Programs
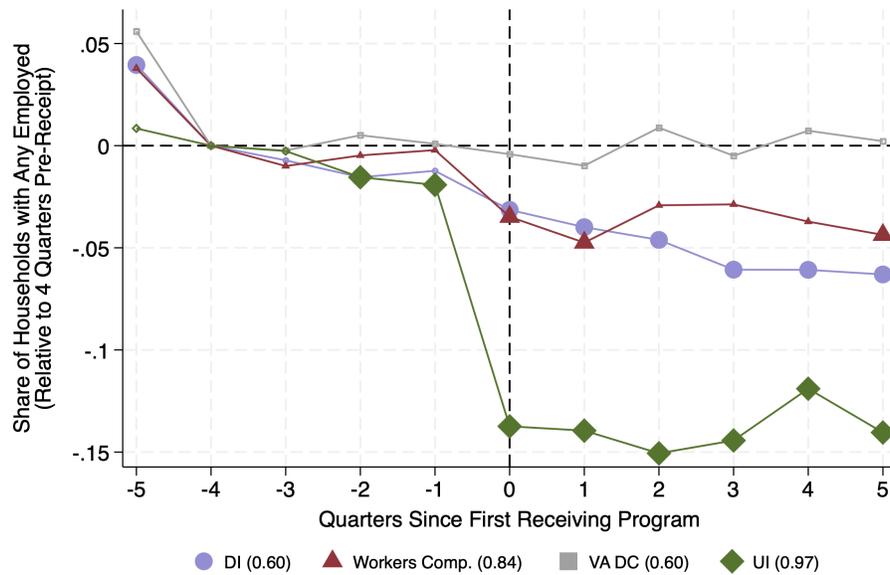
(a) Social Insurance Programs

(b) Means-Tested Transfers

Figure A17: Dynamic Changes in Disability Around Receipt of Nine Programs
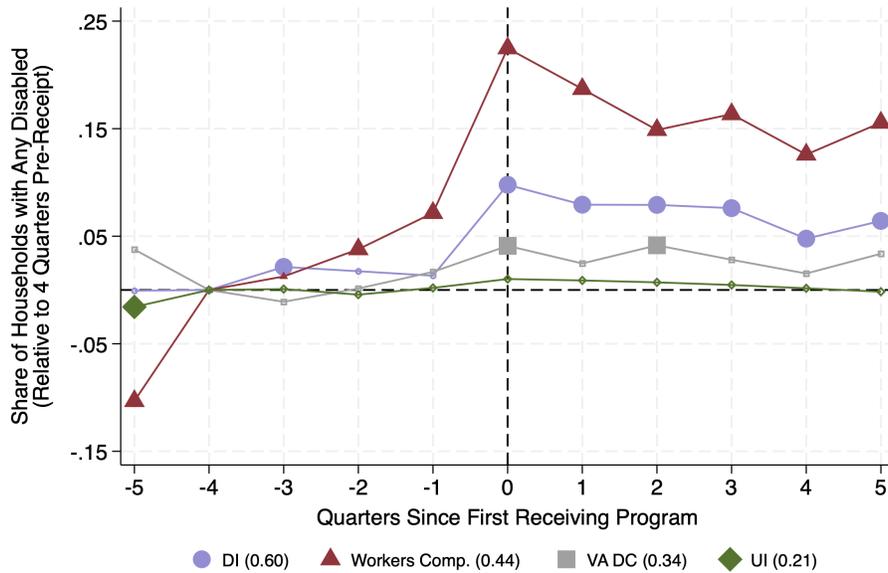
(a) Social Insurance Programs
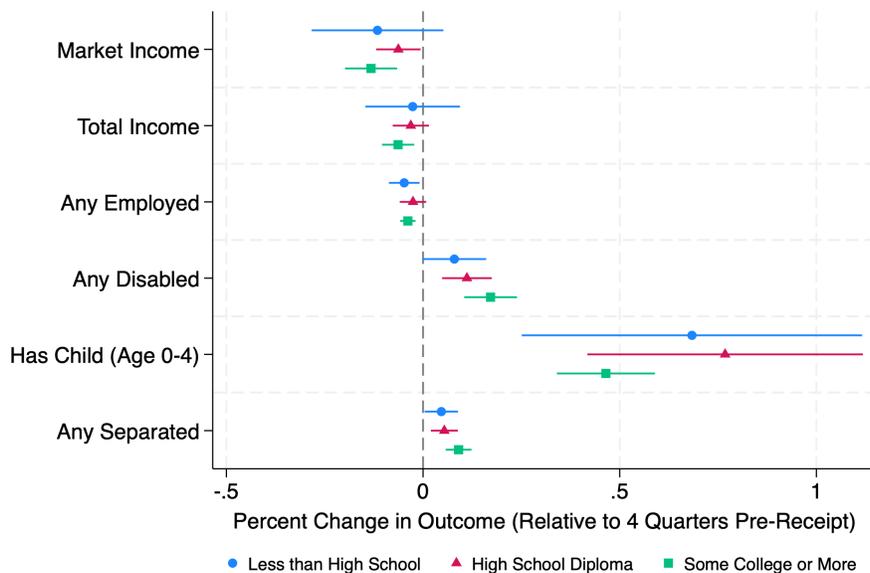

(b) Means-Tested Transfers

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly disability on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean disability levels measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A18: Dynamic Changes in Having Child (Aged 0-4) Around Receipt of Nine Programs
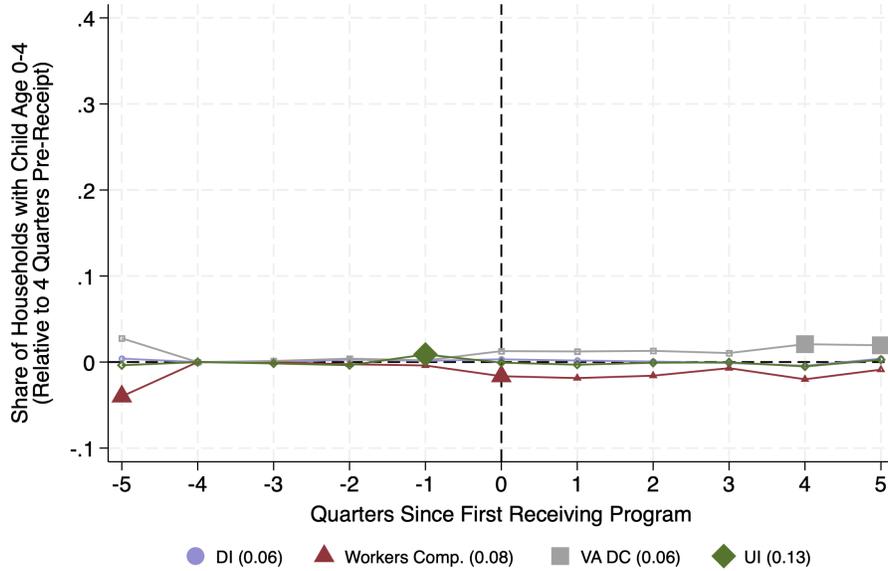
(a) Social Insurance Programs

(b) Means-Tested Transfers
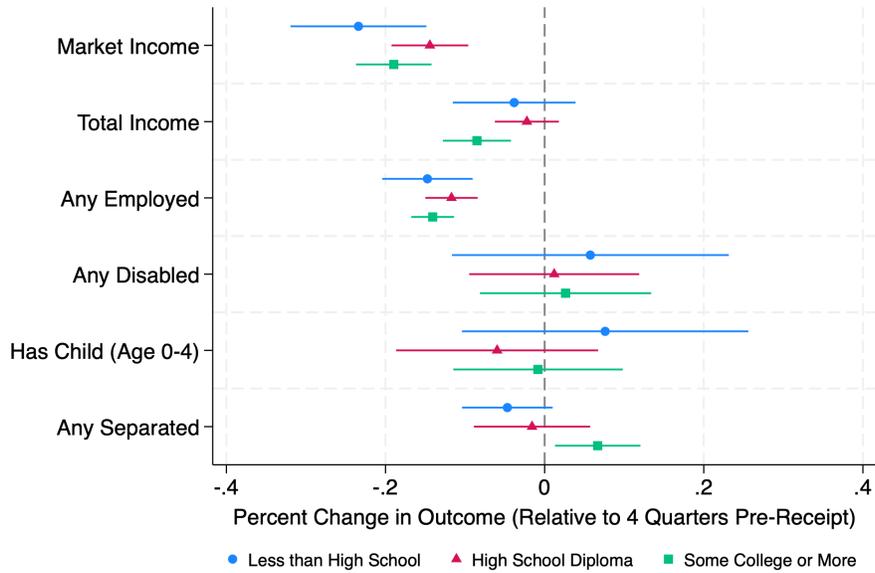
Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly indicators for having a child (aged 0-40) on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean outcome levels measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Figure A19: Dynamic Changes in Separation Around Receipt of Nine Programs
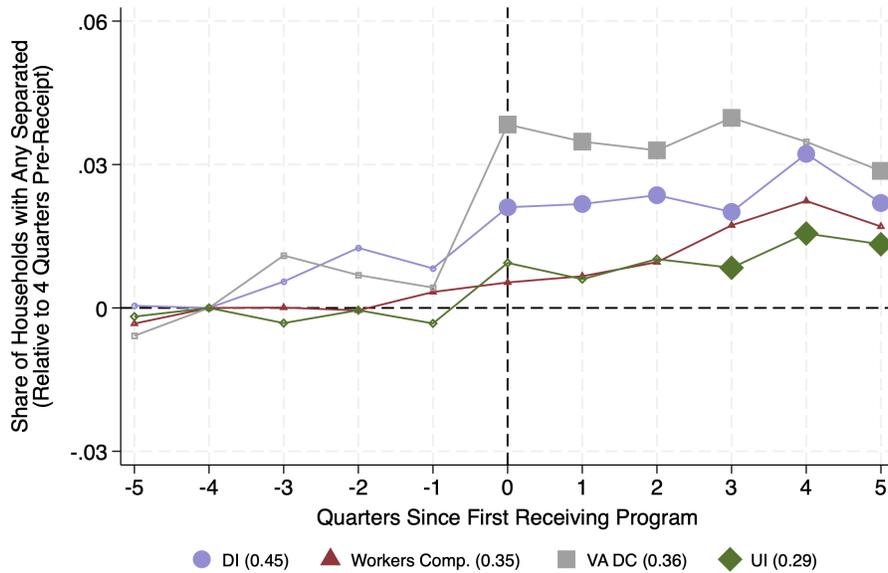
(a) Social Insurance Programs

(b) Means-Tested Transfers
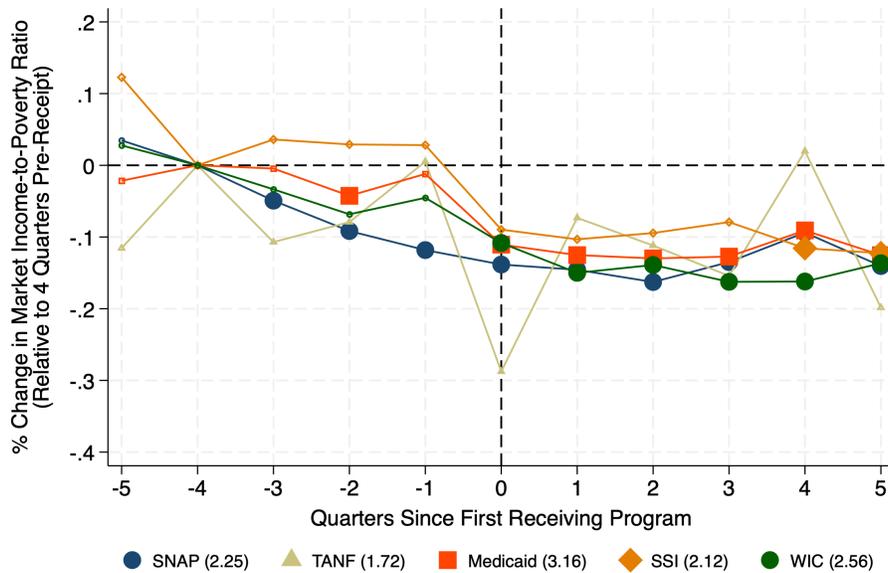
Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: These figures show regression estimates of monthly separation on event-time indicators for the quarter relative to initial program receipt, following Equation (1). The omitted period is 4 quarters prior to receipt. The mean separation levels measured four quarters prior to initial receipt can be found in parentheses in the legends. Estimates that are statistically significant (insignificant) at the 95% confidence level are represented by solid (hollow) markers.

Table A1: Sample Sizes of Households in the SIPP

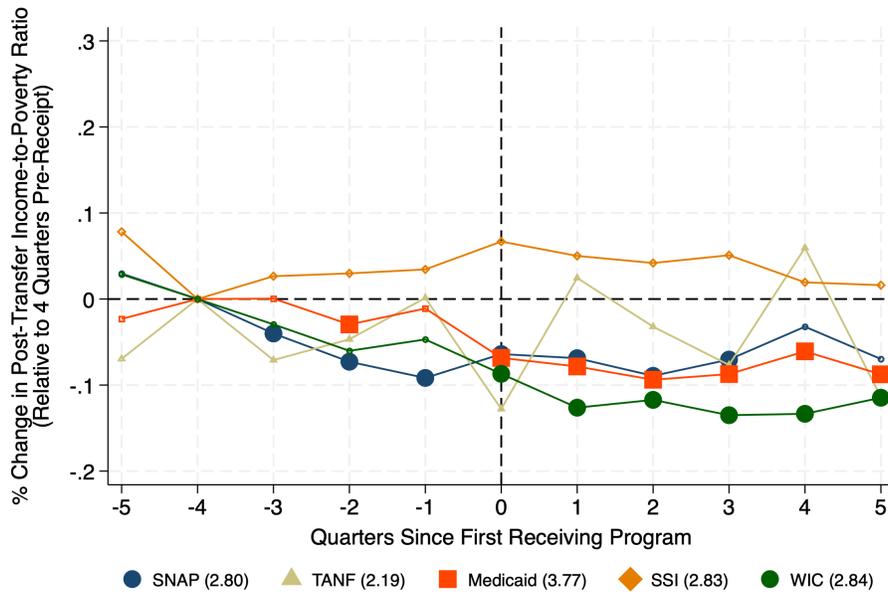| Programs	(1) 1996 Panel	(2) 2001 Panel	(3) 2004 Panel	(4) 2008 Panel	(5) 2014 Panel	(6) 2018 Panel	(7) Total
DI	541	112	256	858	330	259	2,466
Workers Comp.	211	72	71	179	141	80	754
VA DC	119	62	51	182	114	65	593
UI	772	378	339	1,419	372	756	4,036
SNAP	322	171	231	1,034	595	294	2,647
TANF	165	41	76	193	87	28	590
Medicaid	886	443	598	1,514	939	455	4,835
SSI	249	133	166	560	428	172	1,708
WIC	266	78	124	375	226	65	1,134

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows the raw sample sizes (by panel) of households in the SIPP for which we examine changes in incomes and characteristics around initial program receipt. The samples for each program consist of all households appearing for at least nine consecutive interview waves of a given panel and for whom we can observe outcomes over a 16-month window before initially receiving a program as well as a 16-month window after initial receipt.

Table A2: Regression Estimates of Market Income-to-Poverty Ratios on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	7.405	-10.84	2.409	17.51**	7.828	-19.84	-6.792	26.06	7.120
	(13.30)	(17.88)	(17.89)	(8.525)	(7.829)	(26.18)	(8.968)	(24.49)	(13.58)
3 Qtrs Pre-Receipt	-5.479	1.294	-13.20**	5.943	-11.09**	-18.37	-1.413	7.652	-8.579
	(4.162)	(6.230)	(6.546)	(4.093)	(5.274)	(22.99)	(4.291)	(5.428)	(8.018)
2 Qtrs Pre-Receipt	-14.10*	-2.512	-18.99**	5.037	-20.61***	-13.58	-13.45**	6.188	-17.47*
	(7.550)	(7.732)	(8.500)	(5.612)	(5.087)	(18.38)	(5.431)	(4.653)	(9.839)
1 Qtr Pre-Receipt	0.565	-2.673	-3.201	-4.245	-26.59***	0.878	-3.789	5.983	-11.59
	(5.877)	(7.089)	(13.10)	(6.241)	(5.497)	(9.370)	(6.309)	(6.027)	(9.246)
Qtr of Receipt	-30.84***	-21.12**	-0.290	-89.20***	-31.13***	-49.35	-34.92***	-19.05*	-27.71***
	(6.695)	(9.131)	(11.69)	(7.758)	(7.511)	(32.98)	(7.336)	(10.30)	(9.402)
1 Qtr Post-Receipt	-32.66***	-30.03***	1.549	-113.4***	-32.78***	-12.57	-39.56***	-21.92*	-38.38***
	(7.159)	(7.823)	(16.22)	(7.723)	(6.828)	(13.22)	(7.031)	(11.28)	(8.524)
2 Qtrs Post-Receipt	-28.10***	-25.10***	-1.131	-110.5***	-36.61***	-19.19	-41.01***	-20.06*	-35.57***
	(7.118)	(8.905)	(15.99)	(8.995)	(7.264)	(18.45)	(8.573)	(10.63)	(9.128)
3 Qtrs Post-Receipt	-35.36***	-28.39***	-17.32	-101.9***	-30.35***	-26.47	-40.21***	-16.82	-41.59***
	(7.977)	(9.338)	(15.74)	(7.917)	(8.782)	(24.87)	(9.191)	(11.78)	(9.936)
4 Qtrs Post-Receipt	-32.51***	-16.64	14.01	-83.17***	-21.10**	3.400	-28.70***	-24.55*	-41.47***
	(8.257)	(10.49)	(22.33)	(10.12)	(8.166)	(16.18)	(9.014)	(12.49)	(11.78)
5 Qtrs Post-Receipt	-34.15***	-25.58**	-20.09	-97.54***	-31.59***	-34.05	-39.56***	-26.03**	-34.96***
	(8.012)	(11.22)	(20.70)	(11.10)	(11.24)	(29.87)	(10.59)	(10.48)	(12.32)
R-squared	0.056	0.099	0.088	0.047	0.075	0.325	0.041	0.112	0.210
Mean (4 Qtrs Pre)	247.2	339.4	377	474.5	224.9	171.6	315.9	212.3	255.9
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1
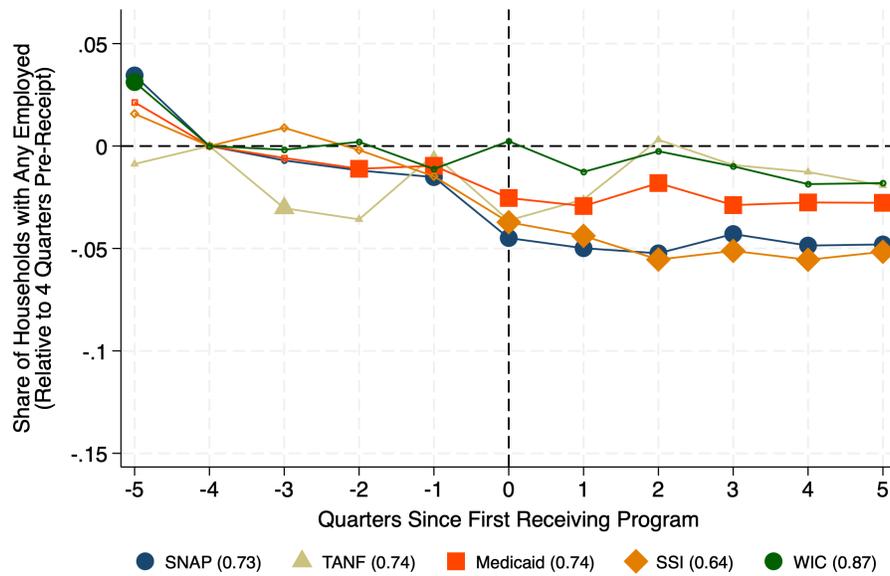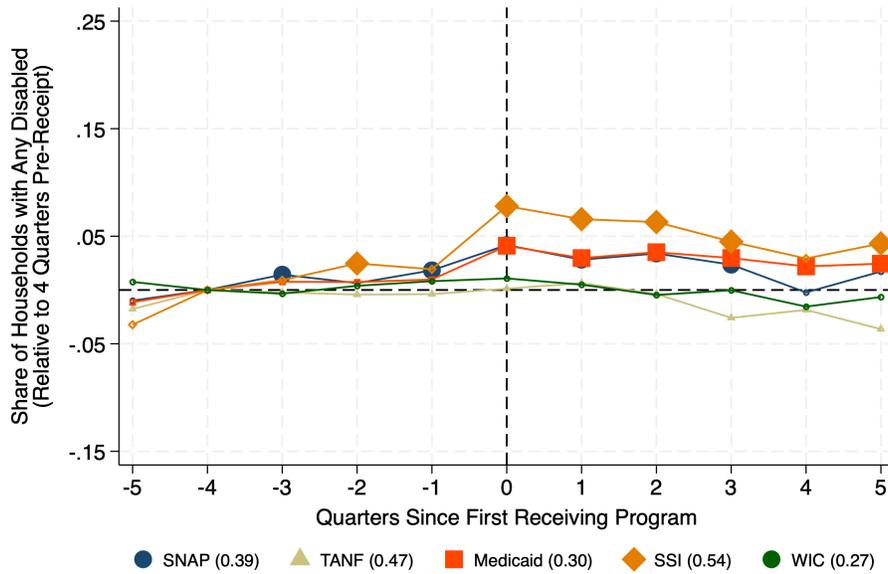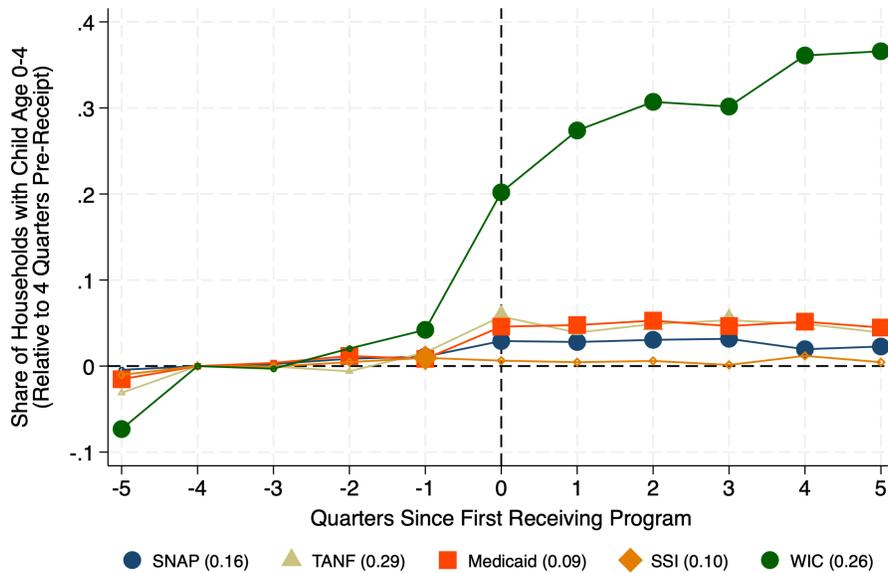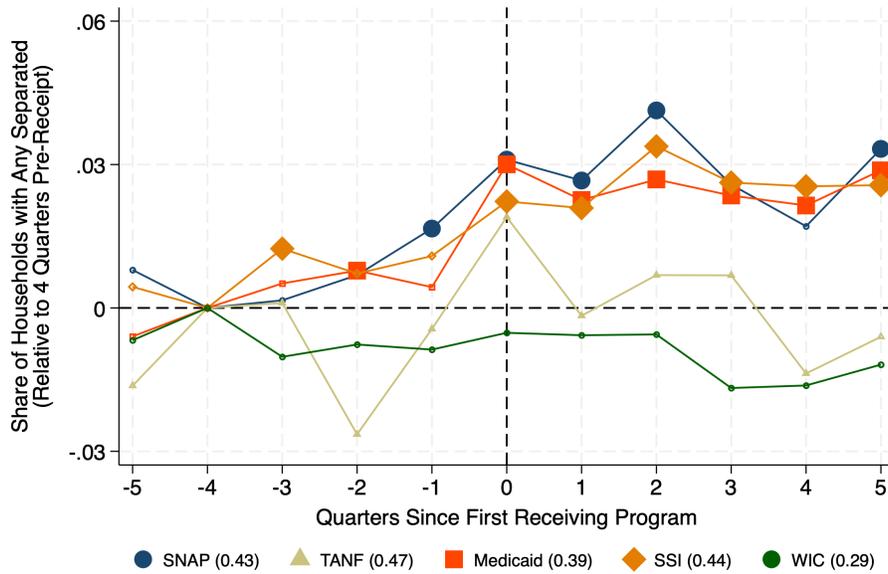
Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows regression estimates of the monthly household-level market income-to-poverty ratio (multiplied by 100) on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. Market income is defined as pre-tax money income excluding government transfer payments. The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A3: Regression Estimates of Post-Transfer Income-to-Poverty Ratios on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	-6.481	-14.43	-5.005	16.05*	8.289	-15.22	-8.703	22.16	8.127
	(12.83)	(14.77)	(17.58)	(8.420)	(7.839)	(25.81)	(8.488)	(24.29)	(14.04)
3 Qtrs Pre-Receipt	-5.365	3.253	-11.51*	6.824*	-11.21**	-15.52	0.182	7.515	-8.351
	(4.519)	(6.117)	(6.243)	(3.861)	(5.292)	(22.85)	(4.284)	(5.413)	(8.078)
2 Qtrs Pre-Receipt	-12.62*	0.245	-16.61**	6.720	-20.39***	-10.23	-11.15**	8.444*	-17.08*
	(7.564)	(8.486)	(7.834)	(5.682)	(5.074)	(18.37)	(5.252)	(4.780)	(9.847)
1 Qtr Pre-Receipt	-1.185	-0.313	-0.881	-2.097	-25.66***	0.281	-4.149	9.761*	-13.33
	(6.082)	(8.500)	(13.16)	(6.054)	(5.556)	(9.137)	(6.103)	(5.635)	(9.181)
Qtr of Receipt	22.84***	75.90***	69.71***	-29.11***	-17.90**	-27.95	-25.78***	18.94*	-24.68**
	(6.875)	(10.84)	(12.16)	(6.321)	(7.436)	(33.02)	(7.381)	(10.62)	(9.549)
1 Qtr Post-Receipt	16.30**	56.88***	68.53***	-58.54***	-19.24***	5.359	-29.55***	14.20	-35.85***
	(7.045)	(10.71)	(16.17)	(6.813)	(6.971)	(13.65)	(7.040)	(11.49)	(8.641)
2 Qtrs Post-Receipt	18.94***	31.11**	49.59***	-59.11***	-24.98***	-7.028	-35.37***	11.87	-33.28***
	(6.905)	(11.94)	(15.24)	(8.451)	(7.215)	(18.41)	(8.412)	(10.72)	(9.027)
3 Qtrs Post-Receipt	9.039	33.92**	35.78**	-53.71***	-19.69**	-16.77	-32.88***	14.43	-38.33***
	(8.203)	(13.14)	(14.89)	(5.993)	(8.606)	(24.90)	(8.975)	(11.42)	(9.959)
4 Qtrs Post-Receipt	13.88*	30.15**	60.94***	-48.52***	-8.999	13.01	-22.93**	5.501	-37.87***
	(8.359)	(13.59)	(22.01)	(9.058)	(8.063)	(16.41)	(8.789)	(12.54)	(11.72)
5 Qtrs Post-Receipt	10.54	33.14**	35.64*	-56.54***	-19.50*	-24.88	-32.99***	4.568	-32.57***
	(8.125)	(14.51)	(18.68)	(8.724)	(11.19)	(29.85)	(10.24)	(10.41)	(12.23)
R-squared	0.055	0.093	0.096	0.045	0.081	0.314	0.044	0.112	0.209
Mean (4 Qtrs Pre)	328.3	391.3	468.8	503.9	279.9	218.8	377.1	283.4	284
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows regression estimates of the monthly household-level post-transfer income-to-poverty ratio (multiplied by 100) on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. Post-transfer income adds to market income both pre-tax government cash transfers and the monetary value of select in-kind transfers (SNAP, WIC, free and reduced school lunch, and LIHEAP). The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A4: Regression Estimates of Employment on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	0.0395**	0.0379	0.0560	0.00846	0.0345***	-0.00875	0.0214*	0.0158	0.0312***
	(0.0162)	(0.0352)	(0.0377)	(0.00612)	(0.0102)	(0.0264)	(0.0116)	(0.0180)	(0.0110)
3 Qtrs Pre-Receipt	-0.00717	-0.00997	-0.00237	-0.00263	-0.00702	-0.0303**	-0.00580	0.00887	-0.00179
	(0.00480)	(0.00866)	(0.00749)	(0.00269)	(0.00538)	(0.0137)	(0.00356)	(0.00571)	(0.00689)
2 Qtrs Pre-Receipt	-0.0154**	-0.00477	0.00513	-0.0154***	-0.0119	-0.0358*	-0.0111**	-0.00194	0.00206
	(0.00662)	(0.0121)	(0.0102)	(0.00480)	(0.00721)	(0.0184)	(0.00457)	(0.00779)	(0.00966)
1 Qtr Pre-Receipt	-0.0123*	-0.00216	0.000909	-0.0192***	-0.0151**	-0.00424	-0.00964**	-0.0148*	-0.0112
	(0.00726)	(0.0137)	(0.0119)	(0.00644)	(0.00713)	(0.0170)	(0.00460)	(0.00797)	(0.0101)
Qtr of Receipt	-0.0314***	-0.0348***	-0.00414	-0.137***	-0.0449***	-0.0363	-0.0253***	-0.0372***	0.00237
	(0.00723)	(0.0131)	(0.0127)	(0.0111)	(0.00876)	(0.0223)	(0.00536)	(0.0107)	(0.00898)
1 Qtr Post-Receipt	-0.0399***	-0.0475***	-0.00978	-0.140***	-0.0499***	-0.0260	-0.0293***	-0.0438***	-0.0126
	(0.00941)	(0.0166)	(0.0162)	(0.0129)	(0.0102)	(0.0229)	(0.00642)	(0.0114)	(0.0116)
2 Qtrs Post-Receipt	-0.0461***	-0.0292	0.00880	-0.151***	-0.0524***	0.00308	-0.0181**	-0.0554***	-0.00253
	(0.0102)	(0.0183)	(0.0202)	(0.0109)	(0.0113)	(0.0253)	(0.00735)	(0.0131)	(0.0107)
3 Qtrs Post-Receipt	-0.0607***	-0.0287*	-0.00491	-0.144***	-0.0430***	-0.00929	-0.0288***	-0.0512***	-0.00990
	(0.00922)	(0.0155)	(0.0158)	(0.0116)	(0.0113)	(0.0260)	(0.00588)	(0.0132)	(0.0107)
4 Qtrs Post-Receipt	-0.0608***	-0.0372	0.00732	-0.119***	-0.0486***	-0.0127	-0.0275***	-0.0555***	-0.0186
	(0.0123)	(0.0242)	(0.0202)	(0.0114)	(0.0125)	(0.0284)	(0.00746)	(0.0149)	(0.0131)
5 Qtrs Post-Receipt	-0.0630***	-0.0437**	0.00220	-0.140***	-0.0480***	-0.0193	-0.0277***	-0.0516***	-0.0181
	(0.0119)	(0.0204)	(0.0210)	(0.0155)	(0.0122)	(0.0321)	(0.00793)	(0.0130)	(0.0132)
R-squared	0.079	0.177	0.126	0.060	0.070	0.177	0.039	0.062	0.122
Mean (4 Qtrs Pre)	0.586	0.824	0.577	0.965	0.707	0.734	0.716	0.618	0.872
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows regression estimates of whether or not anyone in a household is employed in a given month on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A5: Regression Estimates of Disability on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	-0.000619	-0.103**	0.0376	-0.0157*	-0.00981	-0.0176	-0.0113	-0.0322	0.00754
	(0.0171)	(0.0436)	(0.0303)	(0.00796)	(0.0144)	(0.0325)	(0.0116)	(0.0209)	(0.0161)
3 Qtrs Pre-Receipt	0.0215***	0.0126	-0.0110	0.000873	0.0143**	-0.00231	0.00769*	0.00917	-0.00342
	(0.00672)	(0.0100)	(0.00832)	(0.00361)	(0.00603)	(0.0148)	(0.00409)	(0.00655)	(0.00518)
2 Qtrs Pre-Receipt	0.0175*	0.0379**	0.00137	-0.00430	0.00637	-0.00421	0.00741	0.0247***	0.00392
	(0.0102)	(0.0159)	(0.0125)	(0.00525)	(0.00797)	(0.0210)	(0.00526)	(0.00944)	(0.00825)
1 Qtr Pre-Receipt	0.0133	0.0717***	0.0169	0.00197	0.0183**	-0.00382	0.00974*	0.0193	0.00820
	(0.00881)	(0.0253)	(0.0133)	(0.00400)	(0.00752)	(0.0181)	(0.00526)	(0.0117)	(0.0102)
Qtr of Receipt	0.0978***	0.225***	0.0411***	0.0102	0.0418***	0.00131	0.0411***	0.0780***	0.0108
	(0.0138)	(0.0285)	(0.0153)	(0.00696)	(0.00829)	(0.0192)	(0.00712)	(0.0125)	(0.0124)
1 Qtr Post-Receipt	0.0793***	0.187***	0.0247	0.00887	0.0282***	0.00640	0.0297***	0.0659***	0.00497
	(0.0155)	(0.0284)	(0.0158)	(0.00689)	(0.00840)	(0.0214)	(0.00746)	(0.0117)	(0.0134)
2 Qtrs Post-Receipt	0.0791***	0.149***	0.0415**	0.00712	0.0339***	-0.00370	0.0351***	0.0632***	-0.00459
	(0.0144)	(0.0262)	(0.0190)	(0.00714)	(0.00923)	(0.0265)	(0.00771)	(0.0128)	(0.0137)
3 Qtrs Post-Receipt	0.0761***	0.164***	0.0281*	0.00468	0.0236***	-0.0259	0.0297***	0.0450***	-0.000220
	(0.0132)	(0.0263)	(0.0164)	(0.00660)	(0.00882)	(0.0223)	(0.00730)	(0.0120)	(0.0129)
4 Qtrs Post-Receipt	0.0477***	0.126***	0.0153	0.00160	-0.00222	-0.0185	0.0219**	0.0293*	-0.0154
	(0.0149)	(0.0341)	(0.0211)	(0.00950)	(0.0114)	(0.0285)	(0.00914)	(0.0151)	(0.0139)
5 Qtrs Post-Receipt	0.0642***	0.156***	0.0337*	-0.00160	0.0172	-0.0363	0.0245***	0.0433***	-0.00649
	(0.0139)	(0.0268)	(0.0180)	(0.00719)	(0.0106)	(0.0242)	(0.00817)	(0.0114)	(0.0153)
R-squared	0.148	0.128	0.166	0.028	0.087	0.191	0.051	0.081	0.125
Mean (4 Qtrs Pre)	0.606	0.442	0.342	0.216	0.404	0.497	0.314	0.553	0.274
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1

Notes: This table shows regression estimates of whether or not anyone in a household has a work-limiting disability in a given month on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A6: Regression Estimates of Having New Child on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	0.00404	-0.0399**	0.0276	-0.00369	-0.00439	-0.0311	-0.0153**	-0.0102	-0.0732***
	(0.00892)	(0.0165)	(0.0228)	(0.00682)	(0.00895)	(0.0244)	(0.00716)	(0.00973)	(0.0216)
3 Qtrs Pre-Receipt	-0.000638	-0.000211	0.00131	-0.00159	0.00238	-0.000546	0.00371	-0.000495	-0.00305
	(0.00211)	(0.00398)	(0.00570)	(0.00336)	(0.00409)	(0.0107)	(0.00244)	(0.00246)	(0.01000)
2 Qtrs Pre-Receipt	0.00303	-0.00256	0.00400	-0.00363	0.00856	-0.00605	0.0118***	0.00458	0.0204
	(0.00365)	(0.00490)	(0.00702)	(0.00471)	(0.00562)	(0.0162)	(0.00353)	(0.00399)	(0.0129)
1 Qtr Pre-Receipt	0.00149	-0.00397	0.00202	0.00885***	0.0110**	0.0159	0.00836***	0.00959**	0.0421***
	(0.00464)	(0.00535)	(0.00629)	(0.00336)	(0.00499)	(0.0137)	(0.00300)	(0.00422)	(0.0144)
Qtr of Receipt	0.00324	-0.0164**	0.0127*	-0.000674	0.0291***	0.0576***	0.0458***	0.00630	0.202***
	(0.00406)	(0.00818)	(0.00720)	(0.00444)	(0.00693)	(0.0160)	(0.00468)	(0.00421)	(0.0203)
1 Qtr Post-Receipt	0.00176	-0.0186*	0.0123	-0.00306	0.0280***	0.0389*	0.0477***	0.00452	0.274***
	(0.00444)	(0.00954)	(0.00769)	(0.00689)	(0.00843)	(0.0207)	(0.00530)	(0.00485)	(0.0210)
2 Qtrs Post-Receipt	0.000676	-0.0158*	0.0130	-0.000809	0.0305***	0.0489**	0.0528***	0.00602	0.307***
	(0.00499)	(0.00892)	(0.0109)	(0.00627)	(0.00891)	(0.0197)	(0.00601)	(0.00589)	(0.0249)
3 Qtrs Post-Receipt	-0.00109	-0.00709	0.0105	-0.000250	0.0317***	0.0533***	0.0465***	0.00134	0.302***
	(0.00436)	(0.00907)	(0.00664)	(0.00535)	(0.00740)	(0.0183)	(0.00584)	(0.00560)	(0.0233)
4 Qtrs Post-Receipt	-0.00431	-0.0200	0.0208**	-0.00512	0.0196**	0.0491**	0.0516***	0.0119*	0.361***
	(0.00488)	(0.0138)	(0.00985)	(0.00694)	(0.00868)	(0.0237)	(0.00696)	(0.00706)	(0.0241)
5 Qtrs Post-Receipt	0.00393	-0.00879	0.0195**	0.00270	0.0227***	0.0390*	0.0448***	0.00453	0.366***
	(0.00590)	(0.0113)	(0.00963)	(0.00714)	(0.00811)	(0.0227)	(0.00681)	(0.00631)	(0.0253)
R-squared	0.055	0.119	0.111	0.037	0.062	0.173	0.043	0.055	0.195
Mean (4 Qtrs Pre)	0.0481	0.0786	0.0512	0.128	0.152	0.282	0.0835	0.0899	0.267
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows regression estimates of whether or not the household has a child aged 0-4 in a given month on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A7: Regression Estimates of Being Separated on Event-Time Indicators Around Program Receipt

VARIABLES	(1) DI	(2) Workers Comp.	(3) VA DC	(4) UI	(5) SNAP	(6) TANF	(7) Medicaid	(8) SSI	(9) WIC
5 Qtrs Pre-Receipt	0.000456	-0.00328	-0.00584	-0.00181	0.00795	-0.0163	-0.00597	0.00441	-0.00675
	(0.0110)	(0.0301)	(0.0225)	(0.00729)	(0.00968)	(0.0248)	(0.00997)	(0.0157)	(0.0121)
3 Qtrs Pre-Receipt	0.00551	7.25e-05	0.0110*	-0.00318	0.00160	0.00103	0.00513*	0.0124**	-0.0102*
	(0.00378)	(0.00770)	(0.00654)	(0.00375)	(0.00427)	(0.0103)	(0.00291)	(0.00481)	(0.00537)
2 Qtrs Pre-Receipt	0.0126*	-0.000517	0.00686	-0.000472	0.00686	-0.0264*	0.00781**	0.00719	-0.00765
	(0.00644)	(0.00811)	(0.00806)	(0.00439)	(0.00669)	(0.0155)	(0.00387)	(0.00571)	(0.00683)
1 Qtr Pre-Receipt	0.00827	0.00333	0.00425	-0.00324	0.0166**	-0.00440	0.00435	0.0109*	-0.00871
	(0.00528)	(0.00760)	(0.00927)	(0.00312)	(0.00652)	(0.0150)	(0.00447)	(0.00594)	(0.00633)
Qtr of Receipt	0.0211***	0.00533	0.0384***	0.00941*	0.0310***	0.0190	0.0300***	0.0223***	-0.00520
	(0.00730)	(0.00993)	(0.0116)	(0.00556)	(0.00632)	(0.0181)	(0.00448)	(0.00750)	(0.00915)
1 Qtr Post-Receipt	0.0217***	0.00664	0.0348**	0.00601	0.0267***	-0.00164	0.0226***	0.0209***	-0.00571
	(0.00782)	(0.0119)	(0.0134)	(0.00608)	(0.00763)	(0.0215)	(0.00574)	(0.00743)	(0.0102)
2 Qtrs Post-Receipt	0.0236***	0.00957	0.0330**	0.0102*	0.0413***	0.00686	0.0269***	0.0338***	-0.00554
	(0.00815)	(0.0125)	(0.0164)	(0.00614)	(0.0101)	(0.0219)	(0.00720)	(0.00997)	(0.0114)
3 Qtrs Post-Receipt	0.0201**	0.0173	0.0398***	0.00839**	0.0258***	0.00682	0.0235***	0.0262***	-0.0168
	(0.00770)	(0.0114)	(0.0129)	(0.00409)	(0.00684)	(0.0178)	(0.00560)	(0.00804)	(0.0108)
4 Qtrs Post-Receipt	0.0322***	0.0224	0.0348*	0.0156**	0.0171*	-0.0137	0.0214***	0.0254**	-0.0162
	(0.00860)	(0.0174)	(0.0181)	(0.00686)	(0.00934)	(0.0211)	(0.00609)	(0.0103)	(0.0101)
5 Qtrs Post-Receipt	0.0220**	0.0170	0.0287**	0.0133**	0.0333***	-0.00604	0.0288***	0.0257**	-0.0119
	(0.00884)	(0.0148)	(0.0141)	(0.00543)	(0.00991)	(0.0239)	(0.00680)	(0.0101)	(0.0124)
R-squared	0.074	0.114	0.137	0.032	0.055	0.194	0.041	0.078	0.139
Mean (4 Qtrs Pre)	0.443	0.359	0.349	0.303	0.449	0.486	0.401	0.454	0.301
Households	2466	754	593	4036	2647	590	4835	1708	1134

Cohort-clustered standard errors in parentheses
*** p<0.01; ** p<0.05; * p<0.1

Data Sources: Survey of Income and Program Participation (1996, 2001, 2004, 2008, 2014, & 2018 Panels)
Notes: This table shows regression estimates of whether or not anyone in a household is separated, divorced, or widowed in a given month on event-time indicators for the quarter relative to initial program receipt as well as cohort and year fixed effects. The omitted period is 4 quarters prior to receipt. Households are weighted by their survey weights corresponding to the fourth reference month of the first interview wave, and standard errors are clustered at the cohort level.

Table A8: Regression Estimates of Health Outcomes Around VA DC Application

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Outpat Count		Any Outpat		Any ED		Any Inpat		Opioid		NSAID	
Event Month:	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE	Coef	SE
-16	0.3298	0.0023	0.1822	0.0011	0.0012	0.0001	0.0073	0.0001	0.0609	0.0003	0.0425	0.0002
-15	0.3347	0.0024	0.1846	0.0012	0.0012	0.0001	0.0074	0.0001	0.0619	0.0003	0.0426	0.0001
-14	0.3423	0.0022	0.1888	0.0012	0.0013	0.0000	0.0075	0.0001	0.0632	0.0002	0.0433	0.0001
-13	0.3394	0.0016	0.1894	0.0009	0.0013	0.0000	0.0075	0.0001	0.0630	0.0002	0.0425	0.0001
-12	0.3401	-	0.1895	-	0.0014	-	0.0075	-	0.0634	-	0.0423	-
-11	0.3523	0.0016	0.1944	0.0009	0.0014	0.0000	0.0078	0.0001	0.0650	0.0002	0.0433	0.0001
-10	0.3506	0.0024	0.1955	0.0013	0.0015	0.0001	0.0078	0.0001	0.0652	0.0002	0.0431	0.0002
-9	0.3519	0.0027	0.1973	0.0014	0.0016	0.0001	0.0080	0.0001	0.0657	0.0003	0.0427	0.0002
-8	0.3652	0.0027	0.2034	0.0013	0.0017	0.0001	0.0084	0.0001	0.0671	0.0003	0.0436	0.0002
-7	0.3803	0.0025	0.2105	0.0012	0.0018	0.0001	0.0087	0.0001	0.0689	0.0004	0.0449	0.0002
-6	0.3807	0.0023	0.2115	0.0011	0.0018	0.0001	0.0092	0.0001	0.0688	0.0004	0.0439	0.0002
-5	0.3983	0.0026	0.2185	0.0012	0.0020	0.0001	0.0100	0.0001	0.0700	0.0004	0.0447	0.0002
-4	0.4352	0.0032	0.2322	0.0013	0.0022	0.0001	0.0115	0.0001	0.0729	0.0005	0.0470	0.0002
-3	0.4659	0.0037	0.2431	0.0014	0.0025	0.0001	0.0137	0.0001	0.0747	0.0005	0.0479	0.0002
-2	0.5343	0.0044	0.2661	0.0015	0.0031	0.0001	0.0189	0.0002	0.0782	0.0006	0.0510	0.0002
-1	0.7135	0.0060	0.3302	0.0013	0.0043	0.0002	0.0303	0.0007	0.0888	0.0009	0.0620	0.0003
0	0.6379	0.0052	0.3017	0.0011	0.0026	0.0001	0.0133	0.0002	0.0843	0.0008	0.0571	0.0002
1	0.5991	0.0048	0.2970	0.0014	0.0025	0.0001	0.0117	0.0002	0.0839	0.0009	0.0539	0.0003
2	0.5652	0.0047	0.2893	0.0017	0.0024	0.0001	0.0107	0.0001	0.0834	0.0009	0.0526	0.0003
3	0.5550	0.0047	0.2873	0.0018	0.0025	0.0001	0.0104	0.0002	0.0848	0.0009	0.0526	0.0003
4	0.5287	0.0043	0.2808	0.0017	0.0024	0.0001	0.0098	0.0001	0.0841	0.0010	0.0511	0.0003
5	0.5124	0.0038	0.2778	0.0015	0.0024	0.0001	0.0095	0.0001	0.0837	0.0010	0.0504	0.0003
6	0.5112	0.0037	0.2784	0.0014	0.0025	0.0001	0.0094	0.0002	0.0845	0.0010	0.0504	0.0003
7	0.5107	0.0040	0.2782	0.0015	0.0025	0.0001	0.0093	0.0002	0.0855	0.0011	0.0506	0.0003
8	0.4905	0.0042	0.2730	0.0017	0.0025	0.0002	0.0091	0.0002	0.0847	0.0011	0.0492	0.0003
9	0.4867	0.0043	0.2726	0.0018	0.0025	0.0002	0.0089	0.0002	0.0848	0.0011	0.0488	0.0003
10	0.4991	0.0044	0.2773	0.0018	0.0026	0.0002	0.0091	0.0002	0.0865	0.0012	0.0500	0.0003
11	0.4915	0.0040	0.2773	0.0016	0.0026	0.0002	0.0089	0.0002	0.0862	0.0012	0.0493	0.0003
12	0.4868	0.0038	0.2771	0.0013	0.0026	0.0002	0.0088	0.0002	0.0861	0.0013	0.0484	0.0003
13	0.4871	0.0043	0.2766	0.0016	0.0027	0.0002	0.0088	0.0002	0.0868	0.0013	0.0483	0.0004
14	0.4913	0.0049	0.2781	0.0020	0.0027	0.0002	0.0089	0.0002	0.0879	0.0014	0.0487	0.0004
15	0.4745	0.0052	0.2736	0.0022	0.0027	0.0002	0.0087	0.0002	0.0869	0.0014	0.0470	0.0004
16	0.4742	0.0050	0.2739	0.0021	0.0028	0.0002	0.0090	0.0002	0.0872	0.0014	0.0468	0.0004

Data Sources: VHA health records linked to administrative VA DC application data from the VBA (2004-2020).

Notes: This table shows regression estimates of health outcomes in a month relative to initial application for the VA DC program, as well as cohort and year fixed effects. The omitted period is 12 months prior to application. Health outcomes are (at the 30 day level): counts of outpatient medical encounter days (columns 1-2), any outpatient medical encounter (columns 3-4), any emergency department (ED) encounter (columns 5-6), any inpatient medical encounter (columns 7-8), any filled opioid prescription (columns 9-10), any filled nonsteroidal anti-inflammatory drugs (NSAID) prescription (columns 11-12). Standard errors are clustered at the cohort-level.