

SNAP Policies and Enrollment during the COVID-19 Pandemic^{*}

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Abstract

Following the onset of the COVID-19 pandemic, the monthly national budget of SNAP doubled to \$10 billion, its caseload grew to nearly 1 in 7 of the U.S. population, and yet its application denial rate increased by nearly 50 percent. This paper investigates the factors behind these enrollment changes, including the economic recession and unprecedented policy changes to benefit amounts and administrative barriers to enroll. States waived interviews, reduced recertification requirements, simplified the application process, increased benefit amounts substantially, and expanded online grocery shopping for SNAP recipients. To identify causal effects, I employ staggered difference-in-difference designs, arguing that state-level policy changes to SNAP are plausibly exogenous conditional on local labor market and pandemic conditions. Among all the policies examined, I find that emergency supplemental payments (“Emergency Allotments”) and policies removing recertifications drove enrollment increases. In line with microeconomic predictions, I find descriptive evidence that relatively higher income households were more likely to apply under the new benefits schedule. Recertification waivers also reduced churn mechanically, thereby cutting off the typical flow of approved applications. Overall, these results suggest government policies can be just as, if not more, influential than economic conditions in determining safety net program caseload size and composition.

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1. Introduction

Enrollment of eligible individuals in social benefit programs is largely co-determined by administrative barriers and benefit generosity (Currie 2006, Kleven and Kopczuk 2011). The U.S. public social safety net remains the least generous among advanced economies, both because of relatively low benefit amounts themselves (Hacker 2002) and because of administrative burdens that limit public spending by reducing caseloads (Herd and Moynihan 2018). Baseline benefit amounts and program implementation procedures are also quite rigid due to political and social reasons (Alesina et al. 2001). This makes it difficult to estimate the extent to which increasing benefit amounts and loosening program implementation rules would impact caseloads of social safety net programs.

Policy changes made at the onset of the COVID-19 pandemic provide an opportunity to understand how a more generous and accessible public safety net would affect caseload size and composition in the U.S. context. In this paper, I focus on the Supplemental Nutrition Assistance Program (SNAP) program both because it is a large safety net program and—despite being funded at the federal level—policy changes were made at the state-level. SNAP is also worth studying because it is the second largest means-tested program in terms of dollars spent and has near-universal eligibility among the poor. Finally, like Unemployment Insurance, its enrollment is already meant to expand during business cycle downturns, even absent policy changes.

The first set of findings describe overall changes in SNAP enrollment and enrollment composition following the onset of the pandemic. Figure 1 shows time series of national SNAP enrollment and issuance totals from 1996-2022. Even more so than previous periods, enrollment remained elevated following the pandemic recession onset despite a relatively quick return of the unemployment rate to pre-pandemic levels. National SNAP enrollment reached a maximum of about 13 percent of the U.S. population in June 2020 compared to 14 percent of the population following the Great Recession. In the average state, I estimate that the number of households and individuals enrolled increased by 11 percent (6.3 households per 1000 individuals in the population) and 8 percent (9.2 individuals per 1000)

since the start of the pandemic, respectively. New enrollees were more likely to be adults in small household sizes. Data available in a few states suggests new enrollees were also more likely to be elderly, disabled, male, Hispanic, and non-White.

Enrollment increases during this period could be explained by several factors, including policy changes, increased economic need, government capacity, and disease avoidance associated with the pandemic. I focus on studying the effects of policy changes on enrollment because understanding how these program design parameters affect caseloads can inform how to set such policies in the future, especially during economic crises.

I first collect new state-month level data on policy changes to SNAP procedures since the onset of the pandemic. SNAP implementation rules were significantly modified at the beginning of the pandemic to respond to both sudden, increased economic need and pandemic-related health concerns. States waived interviews, reduced recertification requirements, simplified the application process, increased benefit amounts substantially, and expanded online grocery shopping for SNAP recipients. These measures were largely unprecedented in the program's history, and nearly all states implemented each of these measures at the beginning of the pandemic. Although many of these policies were meant to be temporary, many states kept these modifications more than two years after their initial implementation.

A key aim of this paper is to evaluate *which* policies were driving enrollment and issuance changes since the recent pandemic crisis. To this end, I group the policies into three main categories of interest: increasing *benefit amounts*, reducing households' costs to *apply*, and reducing costs to *recertify*. Conceptually, households marginal to each of these policies could differ in both number and characteristics (Kleven and Kopczuk 2011; Wu and Meyer 2021). For each margin, I describe overall changes to the relevant outcome: benefits issued, applications, and recertifications, respectively. Then, I present causal evidence of the effect of the relevant group of policies on enrollment. To identify causal effects, I employ staggered difference-in-difference designs (two-way fixed effect specifications) using

variation in policy implementation across states and time. I argue that, conditional on local labor market and pandemic conditions, the timing of these state-level changes to SNAP are plausibly exogenous.

Starting with benefit increases, the Emergency Allotments policy started in March 2020 changed the SNAP program design from phasing out benefits with income to being a *fixed* benefit amount conditional on eligibility and household size. Therefore, benefits increased more for relatively higher-income households close to the eligibility threshold. Using staggered timing of the policy's removal across states, I find that Emergency Allotments led to a 32-58 percent change in total benefits issued. The size of this effect is substantial. SNAP distributed over \$10.3 billion per month at the height of issuance in May 2021: more than double the \$4.5 billion distributed per month in early 2020 and substantially more than the maximum of \$6.3 billion per month distributed following the Great Recession.

The effect of removing Emergency Allotments on benefits issued is a combination of mechanical effects and behavioral responses of households. Mechanical effects are changes to benefits, holding the existing caseload fixed. Behavioral responses occur when households newly apply and enroll (disenroll) in response to benefit increases (decreases). Using a staggered difference-in-difference design, I estimate that Emergency Allotment removal resulted in the disenrollment of 3.4-5.2 households per 1000. The size of this effect makes this policy the most important factor in explaining increased caseloads during this period. In line with microeconomic predictions that households closer to the eligibility threshold are more likely to apply under the new benefits schedule, I find descriptive evidence from a few states that SNAP applicants early in the pandemic had higher incomes on average relative to the pre-period.¹

Moving on to the application channel, I find that, for the average state, the number of applications received peaked two months into the pandemic at a level nearly double the pre-pandemic mean. Just three months later, however, application flows returned to pre-pandemic level. I also find that the application denial rate increased by about 50 percent in the post-pandemic period overall.

¹ A change in the marginal applicant towards relatively higher income households is another likely factor contributing to the observed increase in the application denial rate, discussed below.

How much can policies explain these application trends? I find that policies which simplified application processes are associated with increases in applications received and decreases with the application denial rate, as expected. But for both outcomes, this effect is almost exactly offset by a *decrease* in predicted applications from recertification policies. A candidate explanation for this result is that recertification policies reduce “churn”—exit for a short period of time before reenrolling—and churning households normally contribute to a jurisdiction’s regular flow of (approved) applications. These results suggest that churn is an important factor affecting SNAP caseloads and application flows.

Residual variation in applications received and denial rates—outside of policies and the unemployment rate—can likely be explained by government-side and applicant-side factors specific to this period. On the government-side, there is largely anecdotal evidence of congestion, staffing challenges, and an increase in remote work. On the applicant-side, new applicants were relatively higher income and households on SNAP for the first-time increased, consistent with the idea that the pandemic recession made more households seek economic assistance.

Turning to the recertification channel, policies waiving recertifications removed the possibility of program exits, thereby inflating overall enrollment counts. The key policy driving these effects is extending certification periods. I show first-stage evidence that, indeed, total recertifications fall by the expected amount when recertification requirements are temporarily removed. Then, I also show that, when recertification requirements are brought back, household enrollment decreases by more than 5 households per 1000 individuals in the population. Overall, the recertification waiver was the second-most important factor in increasing SNAP caseloads during this period.

Among all factors, however, Emergency Allotments was the most important, accounting for more than half of the overall increase in SNAP enrollment. While the unemployment rate is positively associated with SNAP enrollment, as expected, the magnitude of the estimated effect of the Emergency Allotment policy well exceeds it. Even a 10-percentage-point increase in the unemployment rate would have a smaller predicted impact on enrollment than implementing Emergency Allotments. Together, these

results demonstrate that policies which increase benefit amounts and entirely removing the possibility of program exits accounted for a majority of the historic increase in SNAP enrollment since the onset of the COVID-19 pandemic.

This paper contributes to three broad strands of literature: the determinants of SNAP enrollment, the causal effects of social safety net implementation policies more broadly, and the effects of the COVID-19 pandemic on social safety net programs. The first strand examines the key determinants of SNAP enrollment trends, including business cycles and state-level policy changes (e.g. Hanson and Oliveira 2012; Oliveira et al. 2018; Stacy et al. 2018). In a paper similar to this one, Ganong and Liebman (2018) conclude that unemployment explains most of the enrollment changes in the late 1990s and early 2010s, while state policy changes are more relevant in the early 2000s. The contributions of this paper are to investigate a new set of largely unprecedented SNAP policies and to examine the external validity of prior results for the pandemic.

Second, this paper contributes to a literature which considers the causal effects of benefit generosity and administrative burdens on social safety net enrollment and targeting. Following Kleven and Kopczuk's (2011) framework, the government has three policy design choices: the eligibility threshold, benefit generosity, and "complexity," which helps the government observe eligibility but imposes costs on applicants. Relative to other papers on means tested programs which investigate only one type of policy change, my setting offers a unique opportunity to examine multiple policy types: complexity at application, complexity at recertification, and benefits.² Adding to the literature on complexity, my study comments on the relative importance of application and recertification channels.

² For the literature on complexity, hassle costs at application have been shown to decrease participation across social programs (Rossin-Slater 2013; Deshpande and Li 2019; Finkelstein and Notowidigdo 2019; Herd and Moynihan 2018; Wu and Meyer 2021). This literature also suggests that reducing recertification costs increases enrollment (Currie and Grogger 2001; Gray 2019; Homonoff and Somerville 2021; Unrath 2021; Wu and Meyer 2021). The only papers to my knowledge which study the effects of complexity *and* benefit generosity on caseloads study the U.S. Disability Insurance (DI) program. Autor and Duggan (2003) find that increases in the real replacement rate of DI alongside reductions in screening stringency likely explain increases in DI application rates and declines in labor force participation among low-skilled workers. Several earlier papers estimate elasticities of DI applications with respect to replacement rates and find estimates around 0.5 (Bound and Burkhauser 1999). Using this estimate,

Finally, this paper contributes to a literature on the COVID-19 pandemic and social safety net programs. Existing papers have examined the pandemic and the Unemployment Insurance program (e.g. Bell et al. 2022), Pandemic-EBT, which replaced school lunches during closures (Bauer et al. 2020), and a combination of multiple programs (e.g. Bitler et al. 2020; Ruffini and Wozniak 2021). To my knowledge, this is the first paper examining SNAP in detail following the pandemic.

The paper is organized as follows. Section 2 discusses the SNAP policy background and discusses how SNAP implementation policies changed during the pandemic. Section 3 describes the data sources collected, including publicly available data on policy changes, enrollment, and applications. Section 4 discusses overall changes in enrollment, including differences by demographic groups. Section 5 discusses changes in recertifications and applications: the two broad changes through which enrollment could have changed. Section 6 discusses the empirical strategy, and Section 7 shows the causal effects of policies on applications and enrollment. Section 8 discusses and concludes.

2. Background

SNAP is the U.S.'s largest nutrition assistance program and helps low-income households purchase food. This section provides context for the dramatic policy changes that occurred to the program during the COVID-19 pandemic.

a. Program overview

i. Eligibility

A household's eligibility for SNAP is determined by three components: a gross income test, a net income test, and an asset test.³ The eligibility criterion for SNAP did not change during the pandemic.

Duggan and Imberman (2009) calculate that replacement rates explain 28 (24) percent of the growth in DI receipt among women (men) from 1984 to 2002. Finally, there is an extensive literature on Unemployment Insurance (UI) estimating the elasticity of unemployment duration with respect to replacement rates (see Schmieder & von Wachter 2016 for a review).

³ Gross income limits are typically 130 percent of the Federal Poverty Line (FPL), although this threshold is set as high as 200 percent of the FPL by some states. The net income limit is 100 percent of the FPL, where net income is determined by taking gross income less allowed deductions such as those for childcare, medical expenses (for the elderly and disabled), earned income, high shelter costs, and a standard deduction. Total household assets must be valued at less than \$2,750, excluding home and retirement accounts and a portion of the primary vehicle. Source: <https://www.cbpp.org/research/food-assistance/a-quick-guide-to-snap-eligibility-and-benefits>

Because the eligibility criterion is fixed, the SNAP eligible population will expand during economic downturns. This characteristic makes SNAP an automatic stabilizer, mechanically stimulating the economy as more households take-up and spend SNAP benefits (Hoynes and Schanzenbach 2019). Given the complexity of determining eligibility and benefit amounts, most households are uncertain about their eligibility status and potential benefit amount when they apply (Daponte et al. 1999).

ii. Application and recertification procedures

Households must fill out an initial application for SNAP benefits and recertify to continue receiving benefits. Both applying and recertifying households must provide documentation of residency, income, and expenses and participate in an in-person or phone interview with a caseworker.⁴ Most households must also complete a shorter semiannual report between recertifications which does not require an interview. Overall, reports are less onerous than recertifications, which are less onerous than initial applications.

Recertifications take place every 3-24 months⁵ and are a key timepoint at which households are likely to disenroll in the program (Currie and Grogger 2001; Gray 2019; Unrath 2021). Disenrollment at recertification occurs either because a household is found to be ineligible or because it fails to complete recertification tasks like the interview. A previous study finds that households quasi-randomly assigned to scheduled interviews later in the month were more likely to disenroll in SNAP (Homonoff and Somerville 2021). These households were also likely to “churn” on the program: fail to recertify but subsequently reapply and reenroll in SNAP, usually within a year. This literature suggests that the recertification is a relatively inefficient screening tool in the SNAP program.

⁴ According to Homonoff and Somerville (2021), the purpose of a recertification interview is less about determining eligibility and more about assisting the household with the recertification process, such as clarifying requirements or helping complete forms.

⁵ More frequent recertifications are required for households whose income is expected to change more often. For example, migrant workers typically have certification periods of 3 months, whereas the elderly and disabled typically have 24-month certification periods. A typical household will recertify every 12 months, with a less onerous reporting requirement at the midpoint of the certification period. Households are also expected to report significant changes to their income or household composition to their SNAP office, even outside recertification cycles.

b. Policy waivers during the pandemic

Because of concerns about disease transmission, an increasing need for benefits, and government capacity constraints, most state agencies adjusted typical SNAP procedures relative to their pre-pandemic operations. These policies were largely unprecedented in the history of SNAP’s implementation. In this project, I consider ten policies in five policy categories listed in Table 1. States increased benefit amounts substantially, simplified application and recertification processes, and expanded online grocery shopping for SNAP recipients.⁶

i. Benefit increases

The initial Emergency Allotments policy increased benefit amounts to the maximum amount based on household size, which affected an estimated 60 percent of SNAP households (Rosenbaum et al. 2020).⁷ Figure 2 shows how benefit amounts changed during Emergency Allotments with respect to net income. Effectively, the Emergency Allotment changes SNAP’s benefit reduction rate from 30 percent to 0 percent, up until the point that a household no longer qualifies for SNAP.⁸ At the eligibility threshold, the implicit benefit reduction rate is infinity: if a household at the threshold received one more dollar in income, its SNAP benefit amount would drop to \$0. Notably, the initial Emergency Allotment policy did not raise benefits for the lowest-income households who were already receiving the maximum amount.

Only later were benefits raised for the lowest-income households, under the “enhanced” Emergency Allotments policy. In April 2021, USDA allowed households whose initial Emergency Allotment payments were less than \$95 per month—including those receiving no supplemental payments—to receive an additional \$95 in benefits (USDA FNS 2021a, April 1; USDA FNS 2021b, April

⁶ There were several other policies implemented during this period that are not studied here because they affect fewer states and/or they don’t affect the key margins of application or recertification. See Appendix A for additional details.

⁷ The maximum allotment for a household size of four was \$835 in Fiscal Year 2022. Appendix Table A1 shows the maximum benefit amounts for all household sizes for 48 states and DC for Fiscal Year 2022.

⁸ The 30 percent benefit reduction rate is with respect to net income. The effective benefit reduction rate with respect to gross income is lower than 30 percent (Hoynes and Schanzenbach 2016).

1). Thus, following this policy change, every household received at least \$95 per month in initial or enhanced Emergency Allotment benefits.^{9 10}

As states rescind their state of emergency declarations, they are ending the Emergency Allotments for SNAP and returning to the original SNAP benefit schedule. As of October 2022, seventeen states removed Emergency Allotments, with removal timing shown in Figure 3. All states with Emergency Allotments still in place will issue their last payments in February 2023 because Congress voted to end the policy in late December 2022. Previously, these states had expected to remove Emergency Allotments when the Federal Public Health Emergency declaration expired.

ii. Reducing program participation costs

A series of policies substantially reduced administrative costs associated with program participation on the application, recertification, and delivery margins.

First, some policies allowed states to simplify the application process. States could waive initial interview requirements, only offer phone interviews, postpone interview requirements for very low-income households, and allow applicants to provide a telephonic signature instead of a physical or online signature.

Second, some policies allowed states to simplify the recertification process or remove recertifications altogether. Policies which simplified recertifications allowed states to waive recertification interview requirements, only offer phone interviews, and use simpler reporting procedures to recertify households. Two policies removed recertification requirements altogether: extended certification periods, which essentially waived recertification requirements temporarily, and suspension of the interim reporting requirement.

⁹ Households already receiving \$95 or more in Emergency Allotments continued to receive the same amount.

¹⁰ This period was not the first time SNAP benefit amounts were raised temporarily in response to an economic crisis. The 2009 American Recovery and Reinvestment Act increased benefits temporarily: maximum allotments by household size were increased by 13.6 percent and average monthly benefits increased by 15 percent (Oliveira et al. 2018). The Emergency Allotments differ in that they were larger nominal increases, and they more drastically changed the design of the SNAP program from phasing-out to creating a benefit “cliff.”

Lastly, USDA allowed for online grocery purchases using SNAP benefits for select retailers. Although pilots began before the pandemic¹¹, the rollout of online purchasing accelerated across states during the pandemic to prevent households from disease exposure while grocery shopping. Overall, many of these policies were entirely unprecedented in the history of the modern administration of SNAP.¹² Additional details on each of these individual policies is in Appendix A.

c. Policy waivers data

I collect new state-month level data on ten SNAP waivers since the beginning of the pandemic, listed in Table 1.¹³ Figure 4 shows the fraction of states with each of the individual policies over time. Application and recertification policies followed generally the same trajectory, while the other policies had their own trajectories. For these policies, states began implementation at the beginning of the pandemic in most states. As September 2020 approached, some states began rescinding these policies in line with FNS's guidance for states to return to pre-pandemic procedures. In September 2020, FNS rejected many states requests for these waivers before allowing these waivers again in October 2020. Since the end of 2020, the fraction of states implementing each of these policies has remained relatively stable around half or less than half of states.

The remaining policies each had slightly different trajectories. The telephonic signature was only ever implemented in less than half of states, but otherwise followed the same general path as the other six policies. The policy of reporting procedures to recertify households only began later in 2020, as an intermediate policy between waiving recertifications altogether and bringing back typical recertification policies. Online purchasing was rolled out across states and, unlike other policies, will not be rescinded. Finally, Emergency Allotments were initially implemented by all states. Some states began removing these benefit supplements in mid-2021. Variation in the timing of Emergency Allotment removal across

¹¹ USDA originally introduced an online purchasing pilot in 2019 in the state of New York.

¹² One exception is face-to-face interviews, which were waived before the pandemic in most states during the Great Recession (ERS USDA 2019 SNAP Policy Database).

¹³ I remove one of the ten policies from the analysis due to potential issues with multicollinearity. See the Data Appendix for additional details.

states is shown in Figure 3. All remaining states will remove Emergency Allotments at the end of February 2023 per an omnibus spending bill passed by Congress in December 2022 (H.R. 2471).

For the purposes of statistical analysis, I group all policies which lessened application costs into a single index (“Simplified Application”) and all policies which lessened recertification costs into another index (“Simplified Recertification”). However, I separate out the increased benefits policy (“Emergency Allotments”) and the policy which waived recertification costs entirely (“No Recertification”).¹⁴ For more details on these groupings, see Table 1.

3. Data

a. Enrollment and issuance data

For state-month level analyses of the outcomes total households enrolled *per capita* and total issuance, I use administrative, SNAP enrollment data from USDA’s SNAP Data Tables (USDA FNS 2022, November 10). Aside from these main outcomes, detailed enrollment outcomes and county-month level data come from digitized records I compiled from individual state websites. Detailed enrollment data includes information on applications, recertifications, and enrollment by certain demographic groups. The main application outcomes are *per capita* total applications received and application denial rates. I also have selected data on total recertifications, recertifications approved, denied, and broad denial reasons (procedural and need-based) at the state-month and county-month levels. Demographic enrollment data includes adults, children, infants, the elderly, the disabled, and enrollment by race and ethnicity. Finally, I have county-month level data which accounts for 69 percent of the U.S. population.¹⁵ Data availability is summarized in Appendix Table A2.¹⁶

¹⁴ I separate No Recertification from Simplified Recertification given their different conceptual roles in the accounting identity from Section 5; No Recertification is expected to mainly affect the recertification rate p , while Simplified Recertification is expected to mainly affect the conditional recertification approval rate r_R .

¹⁵ Geographic coverage of county-level dataset is comparable to that of FNS; the FNS data covers counties accounting for 85 percent of the U.S. population (Ganong and Liebman 2018). This dataset also improves over FNS’s SNAP Data Tables at the county level since it includes every month of enrollment, rather than just enrollment from January and July.

¹⁶ Throughout, *per capita* measures are calculated with respect to total populations counts from the U.S. Census Bureau.

b. Unemployment data

The unemployment rate is a key control for contemporaneous economic conditions: the primary factor besides policy changes which could affect SNAP enrollment. I collect monthly state-level and county-level unemployment rates from the Bureau of Labor Statistics Local Area Unemployment Statistics series.¹⁷

c. COVID-19 pandemic data

Enrollment in SNAP may also be affected by the pandemic itself and associated policies such as lockdowns and other economic relief measures. Therefore, in staggered difference-in-differences analyses, I control for time-varying measures of COVID-19 and pandemic-related policies such as lockdowns. COVID-19 cases and deaths data at the county- or state-level comes from Opportunity Insights' Economic Tracker database, which sources from the New York Times (Chetty et al. 2020). State-level data on pandemic-related policies comes from the COVID-19 U.S. State Policy Database (Raifman et al. 2022). I include indicators for a state of emergency declaration, childcare closures, stay-at-home orders, close-of-business orders, eviction moratoria, utilities shutoff moratoria, Pandemic-EBT, UI extended benefits, and UI pandemic-related federal unemployment benefits program availability.¹⁸

4. Describing SNAP enrollment since the pandemic

In this section, I describe overall changes in enrollment, enrollment composition, and applications at the onset of the pandemic in the average state. The results in this section should be thought of as the joint effect of many, possibly interacting factors present during this period: the pandemic itself and associated disease avoidance, increased economic need, the SNAP policy responses, and associated changes in applicant composition.

Figure 5 describes trends in *per capita* SNAP household enrollment for the average state around the beginning of the pandemic. The number of households increases after a short delay and has remained

¹⁷ I use the seasonally adjusted state-level data and unadjusted county-level data based on availability.

¹⁸ These data end in March 2022, so regression specifications which include these controls omit more recent months from the estimates.

elevated more than two years after the pandemic onset. Overall, Table 2 shows that the pandemic increased the number of households enrolled in the average state by an estimated 6.33 households per 1000 individuals (11 percent) and individuals enrolled by an estimated 9.19 individuals per 1000 (8 percent), both figures statistically significant. The difference in estimates between households and individuals enrolled suggests that marginal households that enrolled since COVID were smaller in size compared to the pre-period.

These overall changes mask changes in the demographic composition of SNAP enrollees since the onset of the pandemic. Table 2 shows that, overall, adult enrollment grew by a statistically significant 10.08 adults per 1000 individuals (15 percent), while children's enrollment increased by only 3.24 per 1000 individuals (6 percent). These changes translate to an increase in the share SNAP of enrollees comprised of adults following the onset of the pandemic from 55.6 to 57.4 percent. Although data on finer age groups is limited, results suggest that enrollment also increased for the elderly and disabled. In contrast, infant enrollment did not change at all. For gender, ethnicity, and race, data is limited to just a couple states; however, Appendix Figure A1 shows that the marginal applicant during the pandemic is more likely to be male, Hispanic, and a non-native racial minority. The relative increase in men enrolled makes the SNAP population more representative of the general population in those states.

Overall, the results suggest that adult men in small household sizes were marginal to enrolling during the pandemic period. There are at least four candidate explanations for this result: new benefits for children, work requirements, low initial take-up rates, and stigma reduction. First, smaller increases for children could be because the Pandemic Electronic Benefits Transfer (P-EBT) program gave households with children benefits to substitute for lost in-school meals. Second, adult males in small households are more likely to be subject to time limits and work requirements in the SNAP program. Because work requirements were suspended for this population nationwide under the national public health emergency, these households were perhaps more likely to enroll and remain enrolled since the pandemic. Third, take-up rates among older adults are smaller compared to other groups to begin with (Eslami 2016). Thus,

enrollment for these groups had more potential to increase following the pandemic shock. Fourth, if stigma around program take-up decreased since the pandemic and stigma reductions affect likely single, adult men more than other groups, this could explain relatively larger enrollment increases.¹⁹

5. Decomposing enrollment changes into application and recertification channels

In this section, I describe the channels through which SNAP enrollment increased. Enrollment changes are determined broadly by the number of existing cases retained and the number of new cases added through applications. The following accounting identity describes a jurisdiction's caseload N at the end of a given month t as a function of several parameters:

$$N_t = A_t \cdot r_A + p \cdot N_{t-1} \cdot r_R + (1 - p) \cdot N_{t-1}$$

The key parameters are:

- A_t : The number of applications received in month t : a flow measure.
- r_A : the application approval rate, conditional on applying ($= 1 - \text{application denial rate}$).
- p : the fraction of households up for recertification in each month, or the inverse of the certification period length in months.
- r_R : the recertification approval rate, conditional on a household facing recertification.
- N_{t-1} : The existing stock of households from the prior month $t - 1$.

In words, the number of cases in a jurisdiction at the end of month t is the result of (1) how many new households are added to the caseload via approved new applications this month, (2) how many households up for recertification last month were approved, and (3) how many households without a recertification due are automatically carried over from the month before. I use this simple framework to organize the channels through which overall enrollment increased during the pandemic period.

a. Applications received

¹⁹ This hypothesis is consistent with the finding that stigma of SNAP enrollees decreased among Republicans when unemployment rose during the pandemic (Anders and Rafkin 2022). Recent qualitative work also suggests a potential mechanism: that perceived stigma lessened during the pandemic as people recognized that social safety net benefit receipt was more common (Amaral & Gonzales 2022; Heath et al. 2022).

Figure 6 shows how the flow of applications changed since the pandemic in the average state where data is available. Panel A shows that applications received peaked toward the beginning of the pandemic to an additional 10 applications received per 1000 individuals (a 192 percent increase). Aside from this peak and a slight increase seven months into the pandemic, the flow of applications received in the post-period is not statistically distinguishable from the omitted period level. In other words, after a short-lived increase in applications received, the flow of applications soon returned to normal levels.

b. Application approval rates

While applications received peaked and returned to pre-pandemic levels, the application denial rate increased and has remained elevated since the onset of the pandemic. Figure 6 Panel B shows that, since the pandemic start, the rate of denials increased initially by 36 percentage points (141 percent) and overall by 12.9 percentage points (50 percent).

To translate regression results on applications (a flow measure) so that they are comparable to enrollment changes (a stock measure), Panel C takes the cumulative sum of regression coefficients over time. The interpretation of the horizontal zero line is the trend of application flows before the pandemic. Likewise, deviations from the zero line show the degree to which application flows increased or decreased relative to previous trends. Details on how Panel C was constructed are in the Data Appendix.

Panel C shows that cumulative applications received was above pre-period trends for over two years following the pandemic onset. However, this result masks diverging stories for applications denied and approved. Echoing results from Panel B, cumulative applications denied steadily increased since the beginning of the pandemic. Meanwhile, after an initial increase, applications approved are below their pre-pandemic trend.

c. Fraction of households facing recertification

Aside from entry through applications, a key factor in determining program caseloads is the presence of recertifications since they allow for program exits. In SNAP and similar programs, governments can influence caseloads by determining how often households face recertification, also

known as setting the certification period length. From an aggregate perspective, this is equivalent to setting the “probability” that the average household faces recertification in a given month.

Recall that a key pandemic policy was extending certification periods, thereby effectively temporarily eliminating recertification requirements. Indeed, total recertifications fall close to zero in most states when recertification requirements are temporarily removed, based on data available in six states. Figure 7 shows this substantial change in recertification frequency. The recertification rate decreased sharply in the first quarter of the pandemic, when all states in the sample removed recertifications. The recertification then rebounded somewhat, as some states brought back recertifications, while others continued to extend certification periods.

These changes in recertification rates are large and economically meaningful. Before the pandemic in these states, an average of 7.4 percent of households per month faced recertification, corresponding to a certification period of 13.6 months.²⁰ Since the pandemic policy extended certification periods for six months, the average household’s new expected certification period is 19.6 months. Equivalently, the new “probability” of facing a recertification in a given month is expected to decrease to 5.1 percent: a 2.3 percentage point change. Empirically, the fraction of households up for recertification in a month decreased by a significant 2.5 percentage points. Overall, in months where the certification policy was in effect compared to not, the recertification rate decreased by 2.8 percentage points.

d. Recertification approval rates

Like applications, a key parameter of determining caseloads is the recertification approval rate—or equivalently, the recertification denial rate (conditional on recertification). Recertification denial rates could have changed since the pandemic for several reasons, based on policy, government capacity, and enrollee composition. First, policies which simplify recertification procedures could decrease the

²⁰ This pre-period average varies quite widely across states. Using the six states with available microdata, pre-period recertification rates are the following: CA (5.1%), CO (8.1%), MA (10.5%), NM (5.0%), NC (8.9%), and TX (7.8%). This is roughly in line with certification period data available from USDA. In 2018, the median states’ average household had a certification period of 13.8 months (range 6.9-21.2), which corresponds to a recertification rate of 7.25 percent of households per month (range 4.72-14.50). (Source: <https://www.fns.usda.gov/snap/characteristics-households-fy-2018>)

recertification denial rate, as households find it easier to complete hassle costs. Second, policies which encourage remote assistance could make recertification more difficult (Wu and Meyer 2021). Third, the policy which extends certifications for some households could change the composition of households still facing recertifications. If remaining households are more likely to have volatile incomes, for example, then the overall recertification denial rate conditional on recertification would increase. Finally, if the population of enrollees becomes higher income on average during a crisis (as the evidence above suggests), then the recertification denial rate should increase because higher income households are more likely to fail recertifications as they become ineligible (Gray 2019). Therefore, an increase in the denial rate should occur with a delay, as these households' incomes recover and they eventually face recertification.

Publicly available data on recertification denial rates is scarce but is available from New Mexico and California and is shown in Appendix Figure A6. In New Mexico, the magnitude of the change in the recertification denial rate is large; in the pre-period, 34.7 percent of recertifications were denied statewide in New Mexico.²¹ In April 2022—a recent period where recertifications were not waived—the denial rate conditional on recertification was 86.5 percent. In both states, need-based recertification denials (i.e. denials because of ineligibility) clearly increase, suggesting the pool of enrollees is higher income on average. Also noteworthy is the stark increase in the recertification denial rate in New Mexico when recertifications return. This increase is driven by procedural denials: denials because of households' failure to complete recertification requirements. Collectively, these data are consistent with the following factors for increased denials: changing composition of households facing recertifications towards those more likely to become ineligible, an increase in average incomes of enrollees, and additional households caught off guard and failing to complete their recertifications when they are no longer waived.

²¹ This magnitude is between two previous estimates from the literature: Gray's exit rate at recertification of approximately 20 percent in Michigan (from Figure 3), and Homonoff and Somerville's (2021) recertification failure rate of 51.7 from San Francisco California (from Table 2).

Overall, the welfare effects of recertification waiver policies depend on the relative magnitudes of removals due to true ineligibility, avoidance of (procedural) removals of truly eligible households or “churn”, and the relative welfare weights on each type of household. Using available data, I find evidence that the recertification waiver policy both (1) delayed the removal of relatively higher income or economically recovered households from caseloads and (2) substantially reduced churn. Details on these analyses are in Appendix B. Therefore, it appears that in addition to removing ineligible households from the rolls, recertifications normally remove many *eligible* households who will churn on the rolls. The latter effect appears to be magnified when recertifications are brought back after a hiatus. However, a complete welfare analysis would require more detailed data to determine true eligibility and is outside the scope of this paper.

e. Caseload initial conditions

Following the onset of the COVID-19 pandemic, the SNAP national caseload grew to nearly 1 in 7 of the U.S. population: the second largest caseload since the aftermath of the Great Recession. Higher initial caseloads beget larger caseloads going forward. This can occur through several mechanisms, the first being mechanical. As reflected in the accounting identity, once on the rolls, a household will likely not be disenrolled until it faces recertification.²² In addition, higher initial caseloads can also increase caseloads through knowledge acquisition. Applying and enrolling once may make it easier to enroll in the future because of familiarity with the enrollment process (Lemieux & MacLeod 2000) or because of stigma reduction (Moffitt 1983). Households already receiving program benefits can also increase enrollment among their social network by sharing information about the program or by shifting social norms regarding benefit receipt, reducing the stigma costs associated with program take-up (Bertrand et al. 2000; Chetty et al. 2013). Given the large and swift increase in households enrolled during the pandemic, it is likely that caseloads will remain somewhat elevated in future months.

²² A household can disenroll sooner if it reports income changes or voluntarily disenrolls, although this is not very common in practice.

6. Empirical Strategy

Determining the portion of the rise in SNAP enrollment and applications attributable to policy changes is difficult because these policies are endogenous by design. Thus, obtaining credible estimates of the effect of the pandemic era policy changes requires a strategy for distinguishing the effect of policies from the confounding influence of increased demand for benefits during the economic recession.

To identify causal effects of policies, I use Two-Way Fixed Effects (TWFE) specifications in state-level or county-level data:

$$Y_{st} = \sum_{k \in \{EA, NR, SR, SA\}} \beta_k \cdot k_{st} + Z_{st}\boldsymbol{\gamma} + \alpha_s + \delta_t + \varepsilon_{st}$$

$$Y_{cst} = \sum_{k \in \{EA, NR, SR, SA\}} \beta_k \cdot k_{st} + Z_{st}\boldsymbol{\gamma} + X_{cst}\boldsymbol{\pi} + \alpha_{cs} + \delta_t + \varepsilon_{cst}$$

The outcome Y_{cst} is the outcome of interest (*per capita* enrollment, *per capita* applications, the application denial rate, or log issuance) in SNAP in county c , state s , and year-month t . The coefficients of interest are the β_k , which describe the average effect of the corresponding policy, where EA is “Emergency Allotments,” NR is “No Recertification,” SR is an index for “Simplified Recertification,” and SA is an index for “Simplified Application.” Z_{st} are state-level, time-varying covariates, including dummy variables for the implementation of online shopping and other pandemic-related policies. In state-level specifications, Z_{st} also includes COVID-19 case levels and unemployment rates. X_{cst} are county-level, time-varying covariates, which include COVID-19 case levels and unemployment rates in the county-level specification. The unemployment rate (at the state- or county-level) is the main time-varying control to proxy for changing economic conditions. Calendar time fixed effects control flexibly for other factors affecting national trends in SNAP caseloads. Geography fixed effects (either at the state- or county-level) control for time-invariant, level differences in SNAP enrollment rates across jurisdictions. Standard errors are clustered at the state level: the level of the policy treatments.

For the Emergency Allotments and No Recertification policies, I supplement the TWFE estimates with “event-study” style graphs using the policies’ removal to visually test the identifying assumption of parallel trends. Emergency Allotments were implemented in all states at the onset of the pandemic but have been removed by a subset of states at different times, as shown in Figure 3. In order to accommodate the fact that the No Recertification policy switched on and off in some states, I restrict visualizations to a window of event time which roughly maximizes the tradeoff between length of the time window and sample size.

This staggered timing of policy changes justifies using the following specification in state-level or county-level data:

$$Y_{st} = \sum_{r \in [\bar{r}, \underline{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = R_{st}) + Z_{st}\boldsymbol{\gamma} + \alpha_s + \delta_t + \varepsilon_{st}$$

$$Y_{cst} = \sum_{r \in [\bar{r}, \underline{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = R_{st}) + Z_{st}\boldsymbol{\gamma} + X_{cst}\boldsymbol{\pi} + \alpha_{cs} + \delta_t + \varepsilon_{cst}$$

The coefficients of interest are the β_r , which describe the effect of the policy r months after the policy removal. A test of the identifying assumption is that trends in the outcomes are parallel conditional on labor market and pandemic-related covariates in the pre-period; in other words, that $\beta_r \approx 0$ for $r < -1$.

For all policies, I argue that, conditional on local labor market and pandemic conditions, the timing of these state-level changes to SNAP are plausibly exogenous. The residual variation, orthogonal to determinants of eligibility, allows for the analysis of the causal impacts of SNAP policies on enrollment. The origin of this residual variation is likely state administrations’ political leanings. Changes to the SNAP program were responses not only to economic conditions, but also to the exigencies of the political process. These political idiosyncrasies in SNAP implementation policies break the link between

economic conditions and the amount and accessibility of available benefits, allowing for the study of the effect of these policies on enrollment.²³

7. Causal Effects

a. Effects on applications received and the application denial rate

The number of applications received could increase during a crisis due to an increase in the number of eligible households or an increase in the likelihood of applying *conditional* on eligibility. First, with fixed eligibility criteria without rationing, more households become eligible during a recession: the intentional, automatic stabilizing design of SNAP (Hoynes and Schanzenbach 2016). Second, households may be more likely to apply during a crisis *conditional* on eligibility levels. Possible reasons for increased applications include lessened transaction costs and increased benefit amounts (Daponte, Sanders and Taylor 1999) during this period (particularly for relatively higher income households), reduced stigma of receiving benefits during a recession (Anders and Rafkin 2022), or an increase in the perceived likelihood of acceptance during an application surge. These factors are difficult to disentangle empirically, however, because many factors were changing at the beginning of the pandemic: benefits increased, application requirements were relaxed, and the economic environment worsened all at once.

To attempt to disentangle eligibility expansion from other possible factors driving increased applications received, I analyze results from TWFE regressions of *per capita* applications received on all four policy types and the unemployment rate, shown in Table 3. Key results are visualized in Figure 8. A key takeaway of the statistical model is the offsetting effects of two policies: simplified applications and lessened recertification costs. In particular, the presence of policies which simplified application processes is associated with increases in applications received and decreases with the application denial rate, as expected. But for both outcomes, this effect was almost exactly offset by a *decrease* in predicted applications from recertification policies. Why might policies lessening recertifications decrease

²³ For this design, no anticipation is also a required assumption. For Emergency Allotments, a maximum of a couple months of anticipation is also expected as states make decisions for the next month or so. However, states were not required to inform households of Emergency Allotment changes besides through mass communications (USDA FNS 2021, May 21).

applications received and increase *application* denial rates? A candidate explanation is that recertification policies reduce churn, and churning households normally contribute to a state’s regular flow of (approved) applications. This could explain both the negative association between recertification policies and applications received (when recertifications are removed, otherwise churning households do not need to newly reapply), and the positive association between recertification policies and the application denial rate (when households no longer churn, they no longer contribute to flows of approved cases, so denial rates conditional on applying increase). These results suggests that churn is an important factor affecting SNAP caseloads and application flows. Appendix Figure A4 shows direct evidence of churn reduction in Massachusetts during periods of recertification waivers.

Deviations from the predictions—especially the initial increase in applications—could be explained by changes among applicants or changes in government agencies’ administration of the SNAP program unaccounted for by the statistical model. These factors also likely contributed to increased denials of applications. On the applicant side, I find evidence that first-time enrollees increased, and new applicants were relatively higher income. Appendix Figure A2 shows that the fraction of households on SNAP for the first time peaked at more than doubled from about 1.26 percent to over 3 percent of households at the pandemic onset in one state where data is available. If the increase in first-time households enrolled is mirrored by an increase in first-time applications, and first-time applicants are more likely to make mistakes that lead to denials, then the application denial rate could increase even absent a change in the income composition of applicants. Second, in line with economic predictions that households closer to the eligibility threshold may be newly attracted to apply by higher benefit amounts and lower application costs, I find suggestive evidence that SNAP applicants during the pandemic had higher incomes on average relative to the pre-period. In two states, the proportion of applications denied based on ineligibility—as opposed to procedural reasons like being incomplete—increased from about 10 percent to 25 percent of all applications received in the early months of the pandemic (Appendix Figure A3 Panel A). I also find that in California, applicants were less likely to qualify for expedited reviews

which are limited to especially low-income households (Appendix Figure A3 Panel B). These patterns are likely driven by a common confounder: new applicants during this period were relatively higher income on average.

On the government side, agencies faced staffing shortages, remote application processing increased, and agencies had an incentive to increase denials to meet federal timeliness benchmarks for application processing. To help deal with the application influx, at least one state trained staff from other departments to review SNAP applications for the first time. If Type I error rates—denying a household that is truly eligible—decreases with reviewer experience, then this could have been another contributing factor to increased denials. The amount of application processing done remotely during this period also increased substantially. For example, applications processed online increased from 50-60 to around 90 percent in two states at the beginning of the pandemic (See Appendix Figure A5). Lack of in-person assistance with the application process could have led to increased denials, particularly for elderly and homeless populations who typically rely on in-person assistance (Karter 2021). Evidence also suggests that increased remote assistance can increase administrative burdens for participants and decrease enrollment, with desirable targeting effects on the application margin but less desirable targeting effects on the recertification margin (Wu and Meyer 2021).

b. Effects on enrollment

i. Benefit generosity

Figure 9 shows the effect of Emergency Allotments on benefits issued.²⁴ This is essentially a validity check of the empirical design, since the policy change should mechanically affect benefits issued.

²⁴ Benefits *issued* correspond nearly one-to-one with benefits *redeemed*. For context, unused SNAP benefits are allowed to carry over month to month for active cases, although most households exhaust their monthly SNAP benefits before the end of the month (Wilde & Ranney 2000). When comparing state-year level totals, SNAP households are estimated to spend nearly all of their SNAP benefits within the calendar year in most years since 2010. In 2020, however, households are estimated to have redeemed approximately 92 percent of their benefits. The fact that households left SNAP benefits on the table during this period suggests that the Emergency Allotment benefit increase made SNAP benefit amounts exceed grocery budgets for some households. Source: Author's calculation from SNAP Data Tables (USDA FNS 2022, May 13) and retailer annual reports (USDA FNS 2010-2021).

Panel A shows the effect of their introduction, while Panel B shows the effect of their removal. Both graphs suggest that Emergency Allotments result in an immediate change in benefits issued of 50 percent. Aside from the initial mechanical effect, the change in issuance grows with time following the introduction of Emergency Allotments. Fourteen months later, benefits issued increased approximately 79 percent relative to the pre-period. This further increase is due to a combination of the second benefit increase—enhanced Emergency Allotments—and enrollment growth.

The introduction of Emergency Allotments is a less credible design than their removal since its timing was not staggered across states and this policy coincided with many other factors during the beginning of the pandemic. Turning to the more valid staggered difference-in-differences design using the removal of Emergency Allotments, Panel B shows that, in the nine months after the removal of Emergency Allotments, total benefits issued are reduced by a flat amount. Table 3 shows that, overall, the removal of Emergency Allotments decreased benefits by a statistically significant 50 percent in state-level specifications and 32 percent in county-level specifications. This estimate is robust to including controls for the contemporaneous unemployment rate, dummies for other policies in place, and COVID disease levels. The size of this effect is substantial: SNAP distributed over 10.3 billion dollars at the height of issuance in May 2021, compared to 4.5 billion in early 2020.

The overall effect on issuance is a combination of mechanical effects of Emergency Allotments and behavioral responses on the extensive margin. Behavioral responses in this case refer to households applying and enrolling in SNAP in response to increased benefits or, conversely, failing to reenroll in response to decreased benefits. Event studies of Emergency Allotment removal with households enrolled as an outcome can be used to study the magnitude of this response. Figure 10 shows that, following Emergency Allotment removal, *per capita* households enrolled decreased relative to the placebo group. The gradual decline could be explained by households losing benefits at staggered recertification timings

or learning about benefit decreases over time.²⁵ Table 3 shows that, in state-level specifications, the removal of Emergency Allotments decreased households enrolled by about 3.4 households per 1000 individuals when controlling for other policies and about 4.2 households per 1000 with all but those controls. These estimates are approximately the same in county-level specifications. These findings indicate that a decrease in benefits associated with the removal of Emergency Allotments led to a statistically significant and economically meaningful reduction in SNAP enrollment.

Emergency Allotment removal decreased benefits through a combination of a mechanical effect and behavioral responses of households exiting the program. The mechanical effect is the benefit reduction amount assuming the caseload remains fixed. However, enrollment also decreased because of some households' behavioral responses. Assuming a discrete fixed cost to participating, reducing benefit amounts should make enrolling in the program less attractive than disenrolling for some households.²⁶ In other words, some households should no longer find it “worth it” to renew their participation when comparing reduced benefits to total enrollment costs. This should also extend to new application flows, although I have insufficient data to test this.²⁷ Households marginal to enrolling are likely to be close to the SNAP eligibility threshold since benefits changes are largest for this income group. Therefore, the average marginal enrollee and applicant is expected to be less needy compared to the pre-period. While this paper found suggestive evidence of an increase in the average income of applicants during this

²⁵ Because Emergency Allotments were considered a mass change under federal code (7 CFR 273.12(3)), states were not required to notify households through mailings either when Emergency Allotments were put in place or when they were removed. States were encouraged to publicize benefit changes through, “the news media; posters in certification offices, issuance locations, or other sites frequented by certified households; or general notices mailed to households” (USDA FNS 2021, May 21). Changes in benefit amounts were also promoted by outreach organizations; higher benefit amounts were talking points for advocacy groups to encourage eligible individuals to enroll, alongside describing how it was easier to apply (Massachusetts Law Reform Institute 2021).

²⁶ Adopting a simple discrete choice model as in Moffitt (1983), reducing benefit amounts will make enrolling a net utility loss for some households. Assuming only fixed costs to participation, and not variable costs, the disutility of participation for marginal households must be bounded above by the utility change induced by the benefit change. In Moffitt's notation, $U(Y+B_h) - U(Y+B_l) > \phi$ for households who disenroll (enroll) in response to a benefit decrease (increase), where $\phi > 0$ is the fixed cost (in utils) of participation.

²⁷ Only two states both experience Emergency Allotment removal and have application data available during the study period, so this test is likely underpowered.

period, access to administrative data containing income could allow for further testing of these predictions in future work.

ii. Recertification waiver policy

As seen in Section 5, recertifications declined substantially during the pandemic.²⁸ This first stage of the effect of the certification period extension policy on recertifications translates into reduced form effects of the policy on households enrolled. Using a staggered difference-in-difference design of the removal of recertification extensions, I find that enrollment decreases by more than 5 households per 1000 individuals after six months—results in Figure 11. The gradual decline could be explained by the state recertifying households as they come up for recertifications, staggered over time. This shows that the recertification waivers were likely a substantial contributor to elevated caseloads.

iii. Effect of all policies on enrollment

Table 4 shows the full model with per capita households enrolled as the dependent variable, and Figure 12 Panel shows a visualization. Among all policies and the unemployment rate, Emergency Allotments accounts for the largest increase in SNAP enrollment. In particular, the presence of Emergency Allotments is associated with an increase in 3.3-5.7 households per 1000 individuals or more than half of the overall increase in households enrolled during this period. The next most important factor was the recertification waiver, which is estimated to increase caseloads by 1.5-2.5 households per 1000 for each month it is in effect. In contrast, the recertification and application simplification indices switch signs and are not statistically significant across different specifications. Finally, the unemployment rate is positively associated with SNAP enrollment, which is expected since SNAP enrollment is meant to increase during economic recessions (Hoynes and Schanzenbach 2019). However, the magnitude of this coefficient is well-exceeded by the Emergency Allotment policy; even a 10-percentage-point increase in the unemployment rate would be less than the effect of Emergency Allotments on enrollment. Together,

²⁸ A limited sample of states with recertification data available precludes showing an event-study style graph of this first-stage effect.

these results demonstrate that policies which increase benefit amounts and entirely removed the possibility of program exits accounted for a majority of the historic increase in SNAP enrollment since the COVID-19 pandemic.

In Figure 12 Panel B, I use the statistical model to implement a counterfactual exercise: if all states implemented the maximum amount of the policy groups, what would the predicted enrollment be? The visualization shows that SNAP enrollment could have increased by as much as 11 households per 1000 in the population if all states had implemented all policies. At the other extreme, the model predicts that, if no policies were implemented and only economic need (as proxied by the unemployment rate) contributed to enrollment increases, SNAP enrollment would have increased by no more than 3 households per 1000. Thus, the observed increase in SNAP enrollment was mainly due to the unprecedented policy changes, but could have been even higher if more states had implemented them.

8. Conclusion

I find that SNAP enrollment increased sharply following the COVID-19 pandemic onset. This initial increase was driven by a combination of an initial application surge and retention of existing cases due to temporary waivers of recertification requirements. The application surge was likely driven not only by increased economic demand for benefits during the crisis, but also due to increased benefit amounts. It appears that the Emergency Allotments policy attracted relatively higher income, but still eligible households to the program who would have otherwise received small benefit amounts. Results on the recertification side also highlight the key role program exits usually play in determining case flows. However, further work is needed to determine if recertifications avoided were net welfare improving (by reducing churn) or worsening (by leaving newly ineligible households on the rolls).

Overall, these results suggest government policies can be just as, if not more influential than economic conditions in determining caseloads. This contrasts with Ganong and Liebman's (2018) conclusions about SNAP from earlier periods. I provide the first empirical evidence to my knowledge for the SNAP program that benefit amounts can influence overall enrollment and application denial rates.

This is complementary to existing empirical evidence on the Disability Insurance program. Furthermore, governments' setting of application and recertification procedures can influence caseloads. Of particular interest in the coming months will be overall enrollment in the Medicaid program in the face of the return of redeterminations after more than three years (Cohen 2023). For all programs, whether the experimentation of loosening program requirements during the pandemic remains will be a determining factor of caseloads and take-up rates among eligible households in the future.

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Figures

Figure 1. SNAP Enrollment and Issuance, 1996-2022

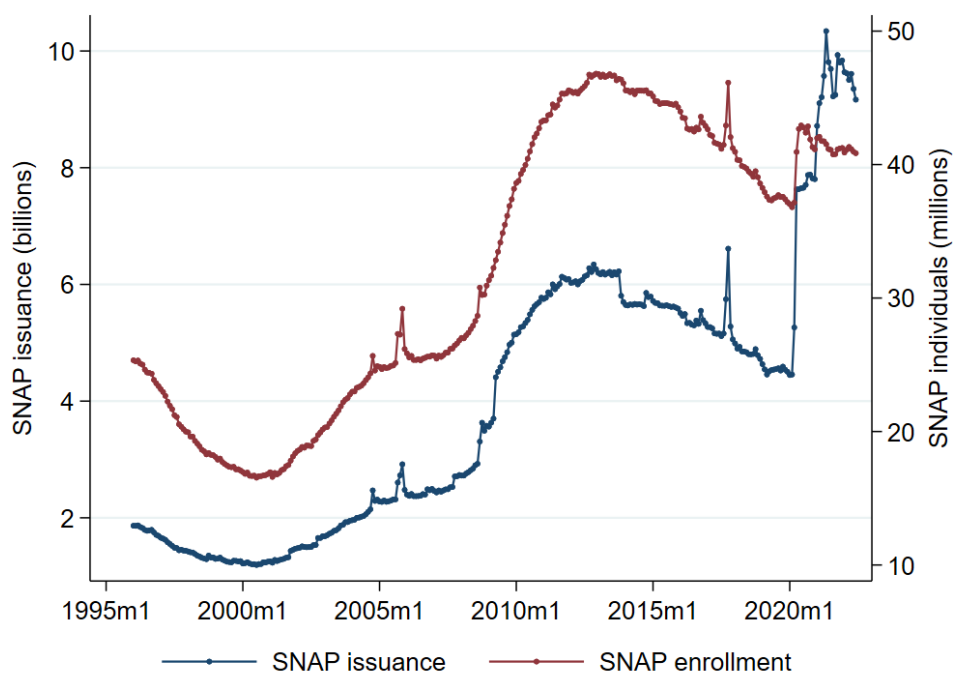


Figure notes: Issuance totals do not adjust for inflation.

Figure 2. SNAP benefit size before, during, and after Emergency Allotments

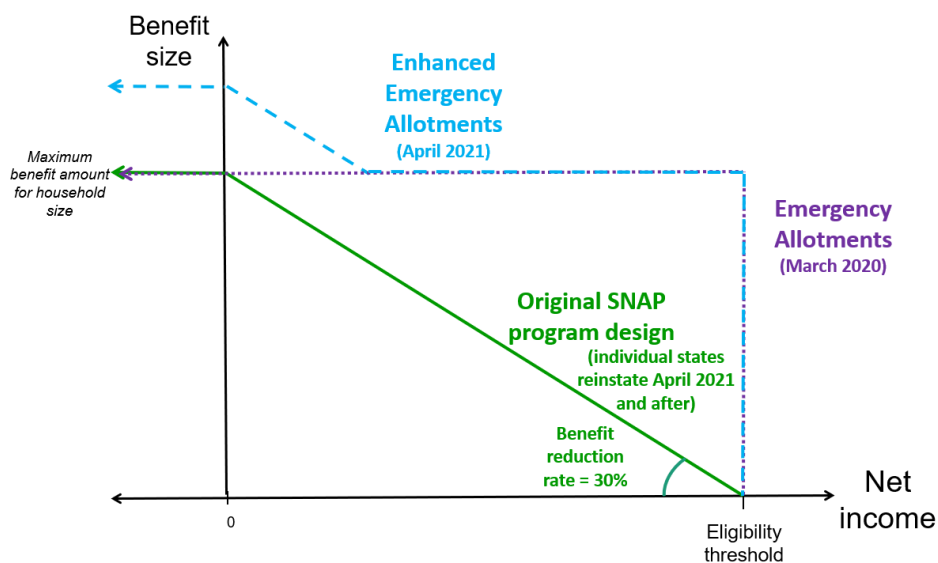


Figure 3. Rollout of Emergency Allotment Removal

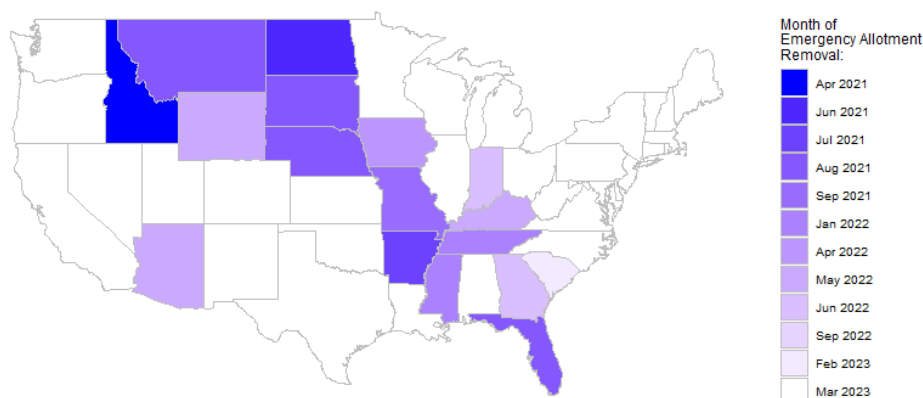


Figure notes: Source: Policies hand-collected by the author from USDA's website.

Figure 4. SNAP Policy Variation during the Covid-19 Pandemic

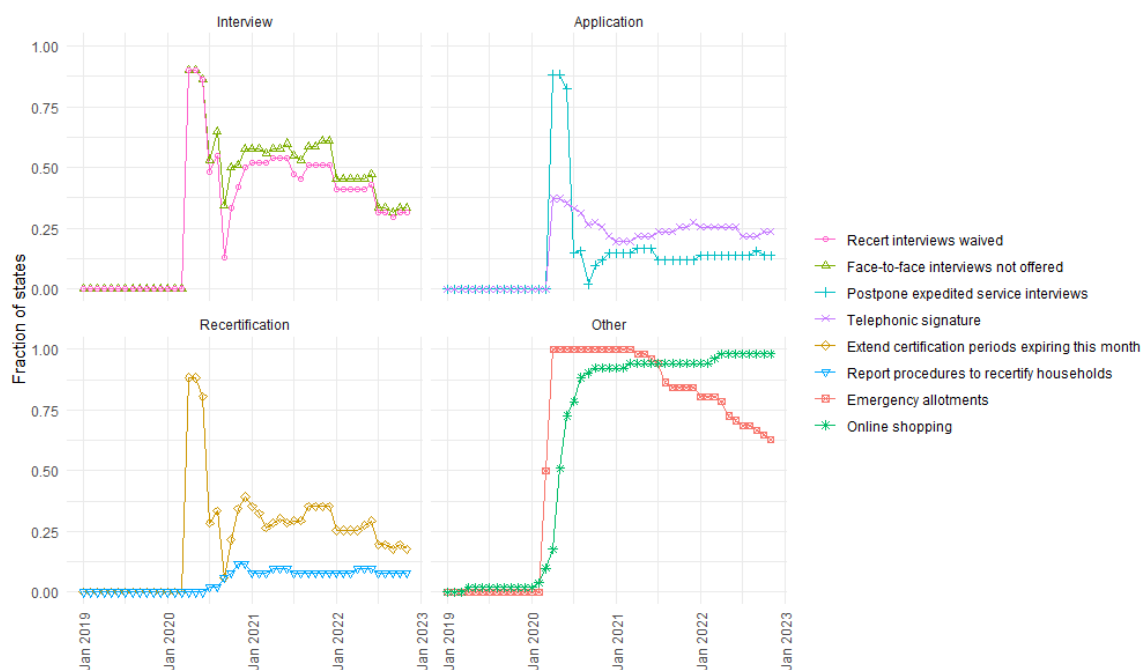


Figure notes: Partial treatment is coded as one-half, see the Data Appendix. This graph includes all 50 states and the District of Columbia. Source: Policies hand-collected by the author from USDA's website.

Figure 5: Trends in SNAP Households Enrolled Since the COVID-19 Pandemic

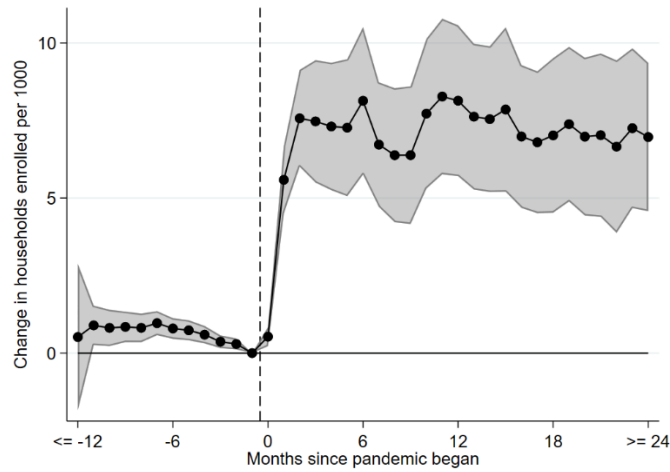


Figure notes: Coefficients come from the following regression: $Y_{st} = \sum_{r \in [\bar{r}, \underline{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$, where Y_{st} is *per capita* enrollment in state s and year-month t . I define $r = 0$ as March 2020. The coefficients of interest are the β_r , which describe the effect on the outcome r months after the onset of the pandemic in the average state. Standard errors are clustered at the state level. The analysis covers January 2019 through August 2022, inclusive.

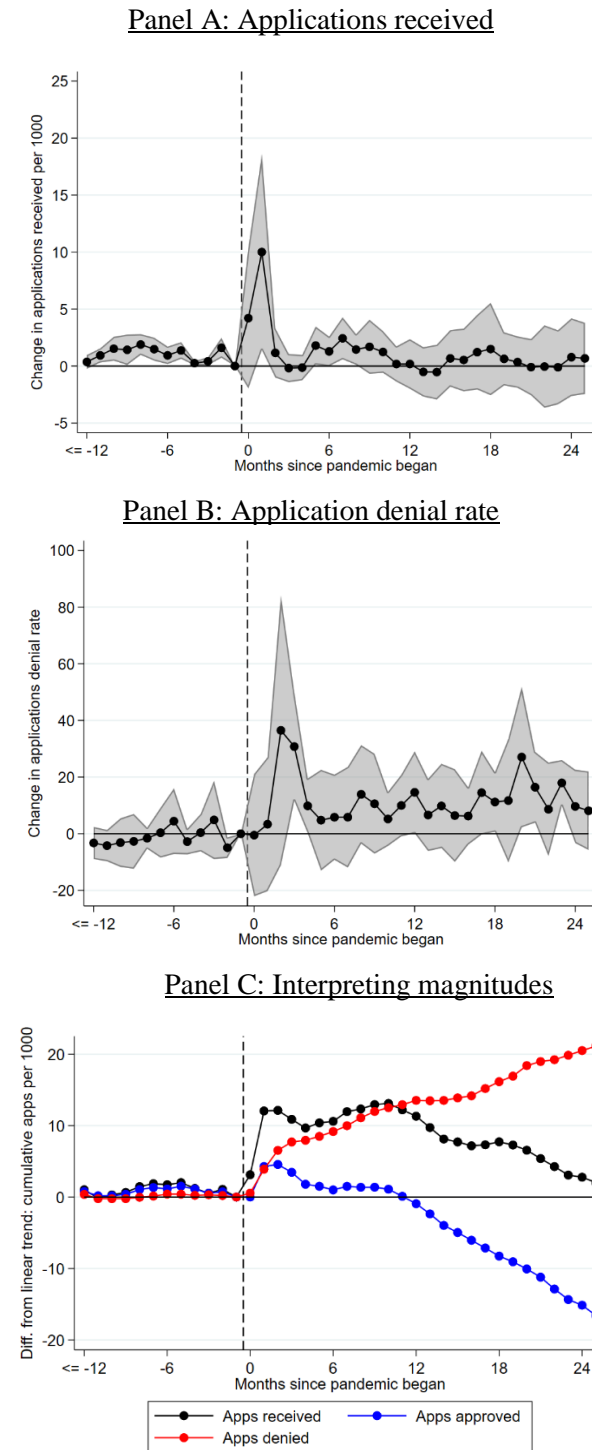
Figure 6: Trends in SNAP Applications Since the COVID-19 Pandemic

Figure notes: Coefficients come from the following regression: $Y_{st} = \sum_{r \in [\bar{r}, \underline{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$, where Y_{st} is the outcome in state s and year-month t . I define $r = 0$ as March 2020. Standard errors are clustered at the state level. The analysis covers January 2019 through August 2022, inclusive. Sample for applications includes six states where data on applications approved and denied is available: CA, LA, MD, MO, NM, and NC. Underlying data is at the state-level. See Data Appendix for details on constructing Panel C.

Figure 7: Trends in SNAP Recertifications Since the COVID-19 Pandemic

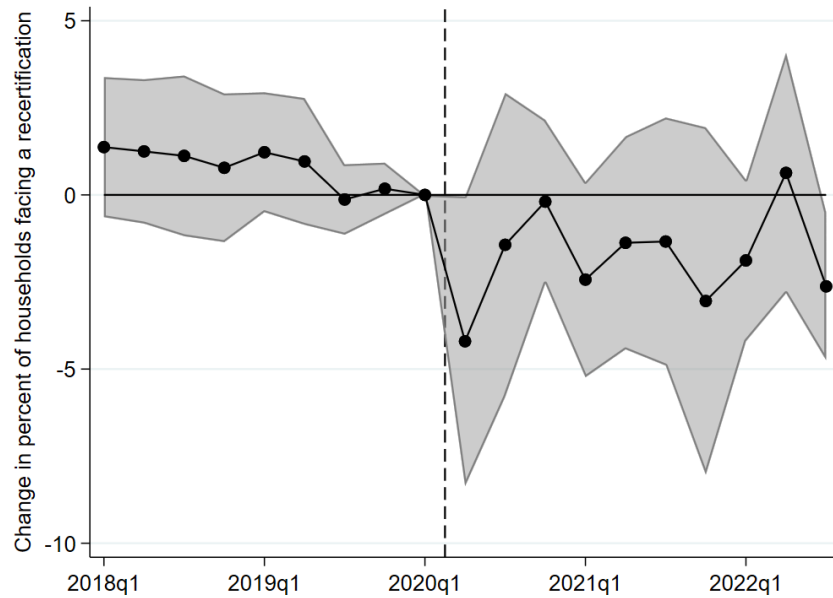


Figure notes: Sample includes six states where data is available: CA, CO, MA, NM, NC, and TX. Pre-period mean is 7.4 percent.

Figure 8. Accounting for Aggregate SNAP Applications (Actual Policies)

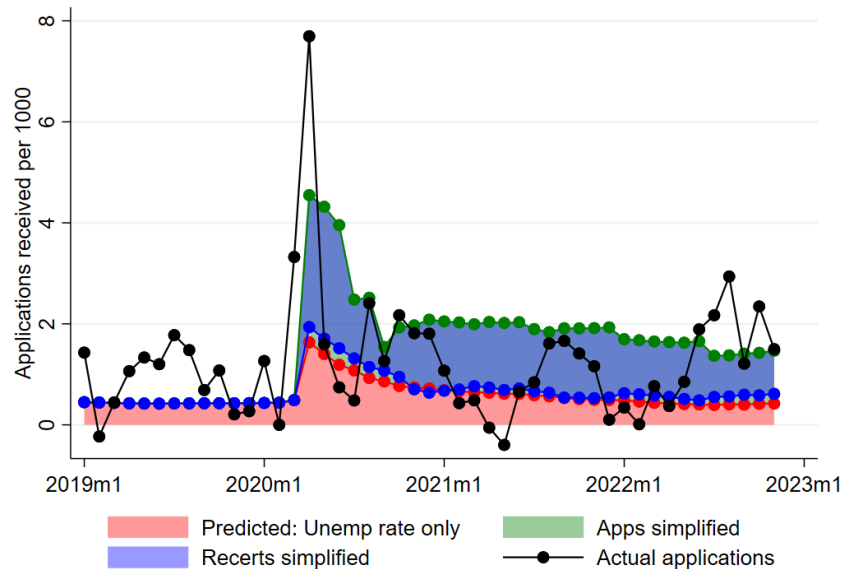


Figure notes: The figure takes coefficients from the third column of Table X and predicts SNAP enrollment for the average state. Panel A uses observed policy implementation. Each line adds a new policy, with its corresponding contribution shaded in the indicated color. “Recertifications simplified” includes No Recertifications and Simplified Recertification estimates. Recertifications simplified is negative, so it subtracts from the green line. The black line shows observed SNAP applications in the average state as a point of comparison.

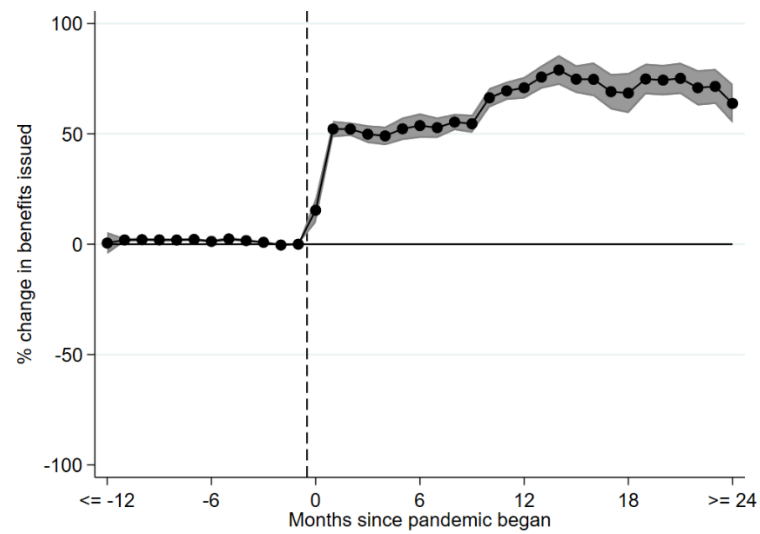
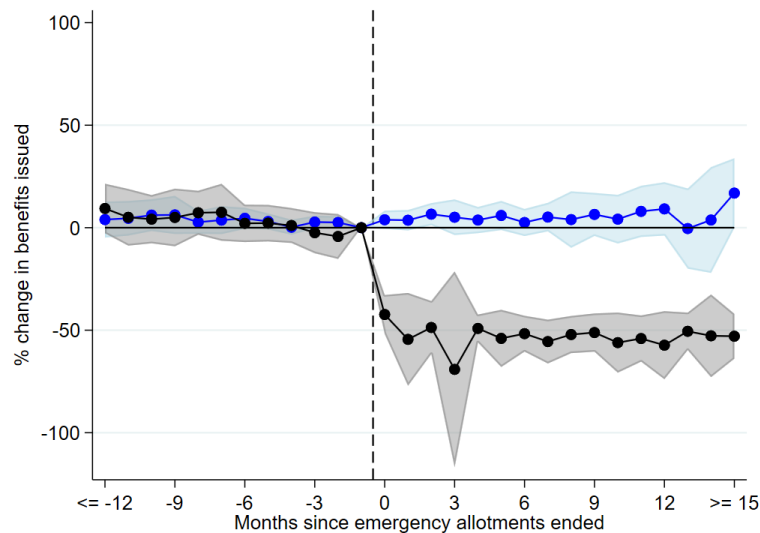
Figure 9: Effects of Emergency Allotment on Benefits Issued**Panel A: Policy Introduction****Panel B: Policy Removal**

Figure notes: Because emergency allotments were introduced all at the same time, the underlying regression in Panel A only includes state fixed effects, like the specification describing trends in household enrollment (see Figure 5 notes). In this panel, time 0 corresponds to March 2020. All states are included. Panel B includes time fixed effects since emergency allotments removals were staggered. In Panel B, the black line includes only states which removed emergency allotments during the study period. The blue line includes other states, a placebo group where the (false) event timing is randomly imputed for each state, drawn uniformly from the range of the observed, real event timings. Outcome is log of benefits issued. Shaded regions indicate 95 percent confidence intervals.

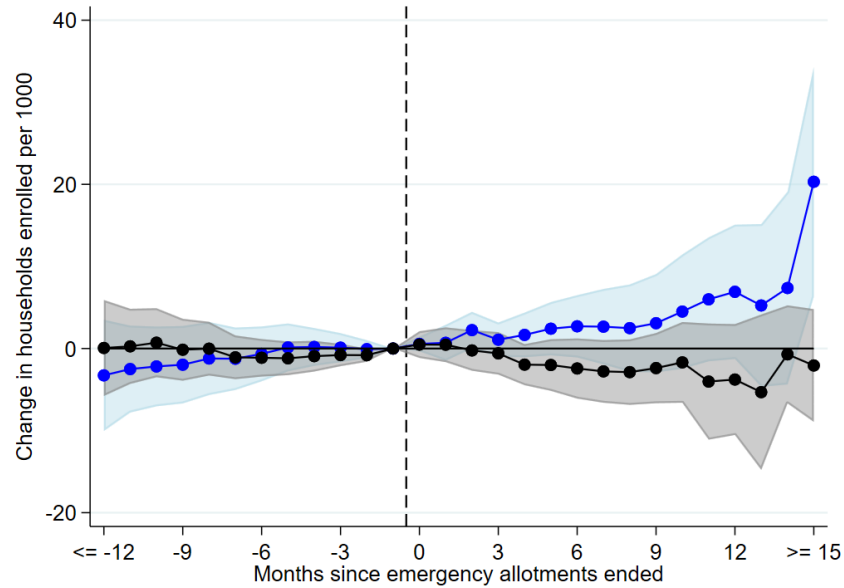
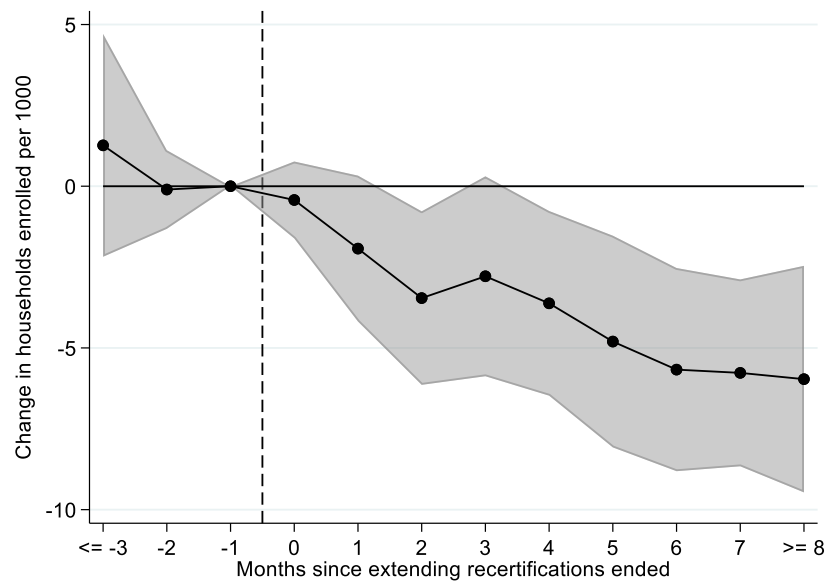
Figure 10: Effects of Emergency Allotment Removal on Households Enrolled

Figure notes: Black line includes states which removed emergency allotments during the study period. The blue line includes other states, a placebo group where the (false) event timing is randomly imputed for each state, drawn uniformly from the range of the observed, real event timings. Outcome is households enrolled per 1000 individuals. Shaded regions indicate 95 percent confidence intervals.

Figure 11. Effects of Recertifications Return on Households Enrolled

Graph shows event-study of the removal of recertification extensions. Includes events which have a pre-period of at least 3 months, and a post-period of at least 9 months. There could be multiple events for a single state. $N = 655$.

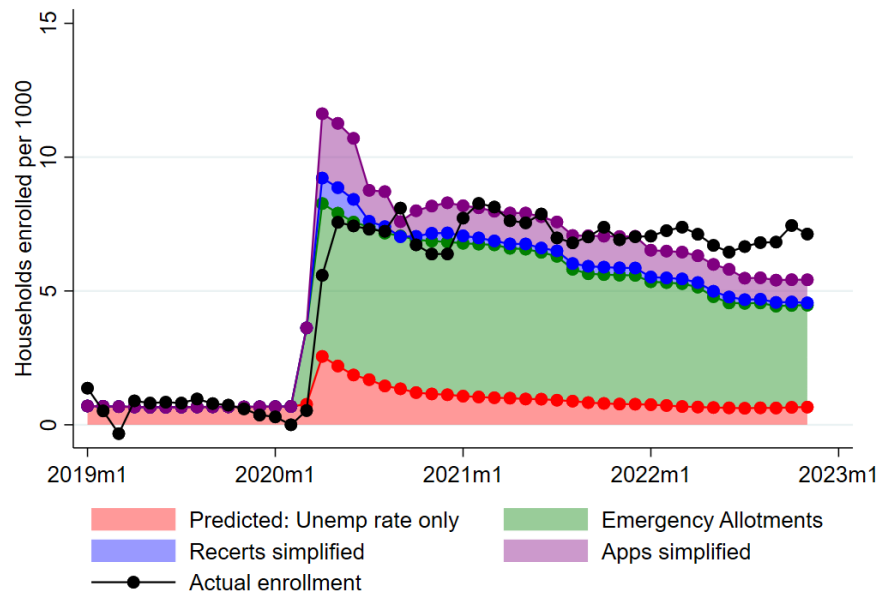
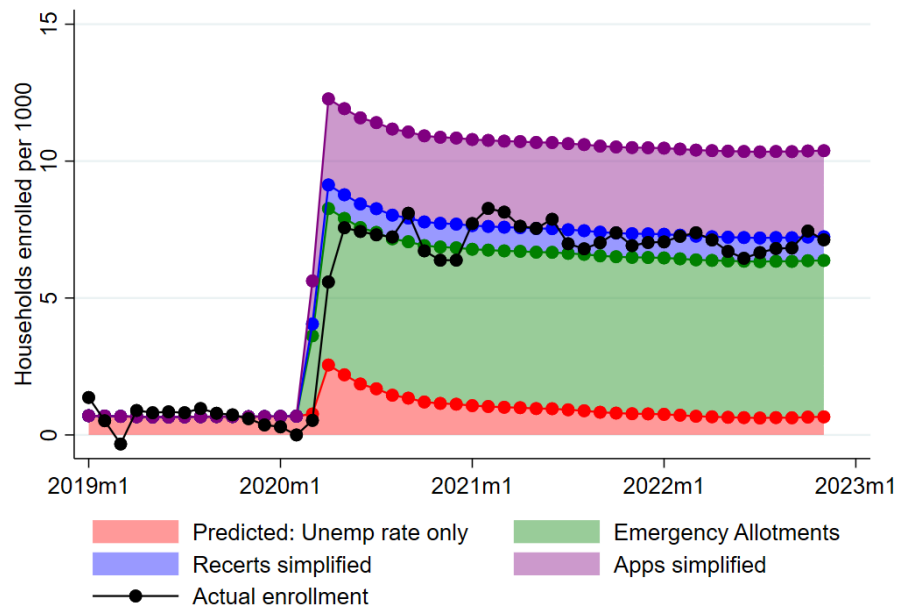
Figure 12. Accounting for Aggregate SNAP Enrollment**Panel A: Unemployment Rate + Actual Policies****Panel B: Unemployment Rate + Maximum Policies**

Figure notes: The figure takes coefficients from the third column of Table X and predicts SNAP enrollment for the average state. Panel A uses observed policy implementation, while Panel B assumes all states implemented the most generous policies for all months following the pandemic onset. Each line adds a new policy, with its corresponding contribution shaded in the indicated color. “Recertifications simplified” includes No Recertifications and Simplified Recertification estimates. The black line shows observed SNAP enrollment in the average state as a point of comparison.

Tables

Table 1. SNAP Policies during the COVID-19 Pandemic

Policy category	Policy	Description
Benefit increases	<i>Emergency allotments</i>	Increased benefit amounts to the maximum amount based on household size
Simplified Application	<i>Initial interviews waived</i>	Interview requirements for initial applications removed entirely
	<i>Not offering face-to-face interviews</i>	No face-to-face interviews offered
	<i>Postpone expedited service interviews</i>	Allows states to enroll qualified households without completing an interview
	<i>Telephonic signature</i>	Assists the state and outreach agencies in processing applications, by allowing for verbal attestation to submit applications
No Recertification	<i>Extend certification periods</i>	Lengthen certification periods, usually for up to 6 months and sometimes less. In other words, temporarily removes recertification requirements.
	<i>Temporarily waive periodic reports*</i>	Removes requirement of providing a status update
Simplified Recertification	<i>Recertification interviews waived</i>	Interview requirements for recertifications removed entirely
	<i>Periodic reporting procedures to recertify households</i>	Effectively lessens the requirements to recertify
	<i>Not offering face-to-face interviews</i>	No face-to-face interviews offered
Delivery of benefits	<i>Online purchasing</i>	Allows participants to pay for their groceries online for select retailers
* Omitted from analyses due to high correlation with extended certification periods.		

Table 2. Effects of Pandemic on SNAP Enrollment

	Individuals	Households	Issuance	Adults (% of individuals enrolled)	Adults	Children	Elderly	Infants	Disabled
Post-pandemic	9.19	6.33	12,566	1.79	10.08	3.24	2.21	-0.13	2.47
	(1.88)	(1.10)	(817)	(.32)	(2.22)	(1.10)	(.77)	(.88)	(.31)
State FE	X	X	X	X	X	X	X	X	X
Control mean	112.89	57.13	13,716	55.64	67.57	52.18	16.45	16.33	30.83
R-squared	0.927	0.932	0.772	0.966	0.964	0.966	0.963	0.733	0.993
N	2244	2244	2244	524	524	524	216	111	105

Table notes: Outcomes are per 1000 individuals in the population, unless otherwise specified. Sample is state-level data January 2019 through November 2022.

Table 3. Effects of Policies on Applications

	Applications per 1000 individuals				Application denial rate			
Emergency Allotment	0.3362	0.0676	0.1472	0.4141	0.0800	-3.4214	-2.5115	-4.0702
	(0.4991)	(0.6630)	(0.5341)	(0.3565)	(3.3247)	(5.6702)	(1.9916)	(6.7870)
Recertification waiver	-0.2708	-0.0932	-1.4889	-0.2600	-0.2775	-0.1483	4.4027	8.0916
	(0.3582)	(0.3309)	(0.3224)	(0.7787)	(3.3682)	(4.3111)	(1.3131)	(1.1112)
Recertification simplified	-2.6600	-2.3655	-2.1582	-3.1228	12.4983	13.0804	6.5107	8.8665
	(0.8443)	(1.1233)	(0.7629)	(0.9372)	(3.8742)	(7.4726)	(3.2468)	(5.7821)
Application simplified	2.6057	2.2595	3.8109	4.8444	-6.2985	-4.7052	-9.9023	-20.6637
	(1.3850)	(1.1469)	(1.5075)	(1.4707)	(7.9111)	(10.7849)	(4.8816)	(10.3373)
Unemployment rate	-0.1149	-0.1373	0.1203	0.1041	-0.0306	0.3829	-0.7971	-0.7506
	(0.3691)	(0.2629)	(0.0660)	(0.0832)	(1.3177)	(2.3345)	(0.6259)	(0.3966)
Total effect of SNAP policies	0.0111	-0.1315	0.3111	1.8757	6.0023	4.8054	-1.5004	-7.7757
Controls for other policies	X	X	X	X	X	X	X	X
Geography FE	X	X	X	X	X	X	X	X
Year-month FE	X	X	X	X	X	X	X	X
COVID case controls	X	X	X	X	X	X	X	X
COVID policy controls		X		X		X		X
Geographic level of analysis	State	State	County	County	State	State	County	County
R-squared	0.6788	0.7537	0.4459	0.4509	0.4974	0.5788	0.4270	0.5048
N	310	241	13,974	10,863	186	147	12,060	9,411

Table notes: Underlying data includes March 2020 through November 2022. Sample sizes are smaller when COVID policy controls are included because these controls are only collected through March 2022. “Total effect of SNAP policies” sums the four policy coefficients in the column. Standard errors are clustered at the state level throughout.

Table 4. Effects of Policies on Issuance and Enrollment

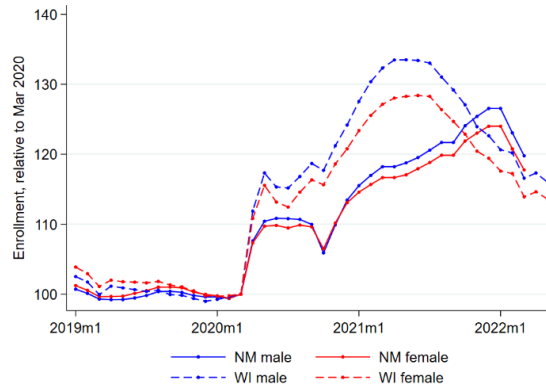
	Log Issuance				Households per 1000 individuals			
Emergency Allotment	0.5345	0.4922	0.4288	0.3240	4.3970	3.3483	5.7111	3.4468
	(0.0379)	(0.0345)	(0.1037)	(0.1053)	(1.2835)	(1.4242)	(1.6825)	(1.4067)
Recertification waiver	0.0337	0.0364	0.0458	0.0512	2.5475	2.4830	1.5399	1.9778
	(0.0156)	(0.0160)	(0.0389)	(0.0248)	(0.7894)	(0.6846)	(0.8183)	(0.7055)
Recertification simplified	0.0318	-0.0256	-0.0468	-0.0023	3.8834	1.5968	-0.6757	-0.7648
	(0.0398)	(0.0327)	(0.0804)	(0.0546)	(2.5403)	(1.9088)	(2.4638)	(1.5957)
Application simplified	-0.0123	0.0566	0.0520	0.0320	-1.7626	-0.4218	3.1436	2.4658
	(0.0500)	(0.0458)	(0.1023)	(0.1088)	(3.0365)	(2.4653)	(3.5772)	(2.5025)
Unemployment rate	-0.0014	0.0027	0.0027	0.0046	0.3419	0.5160	0.1882	0.3053
	(0.0041)	(0.0044)	(0.0044)	(0.0038)	(0.2589)	(0.2534)	(0.1879)	(0.1447)
Total effect of SNAP policies	0.5876	0.5595	0.4798	0.4049	9.0654	7.0063	9.7190	7.1256
Controls for other policies	X	X	X	X	X	X	X	X
Geography FE	X	X	X	X	X	X	X	X
Year-month FE	X	X	X	X	X	X	X	X
COVID case controls	X	X	X	X	X	X	X	X
COVID policy controls		X		X		X		X
Geographic level of analysis	State	State	County	County	State	State	County	County
R-squared	0.9855	0.9922	0.9950	0.9956	0.9701	0.9755	0.9760	0.9795
N	1,681	1,273	47,278	36,192	1,683	1,275	62,527	47,829

Table notes: Underlying data includes March 2020 through November 2022. Sample sizes are smaller when COVID policy controls are included because these controls are only collected through March 2022. “Total effect of SNAP policies” sums the four policy coefficients in the column. Standard errors are clustered at the state level throughout.

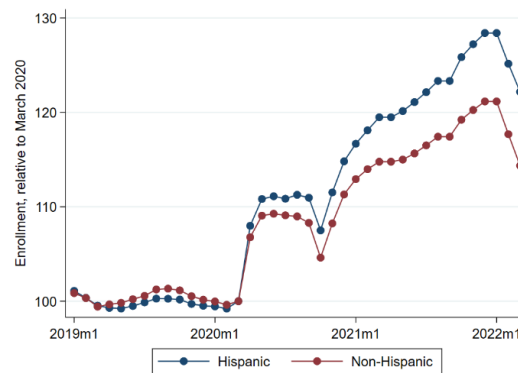
Appendix Figures

Appendix Figure A1. Enrollment by Demographic Groups

Panel A: Gender



Panel B: Ethnicity (New Mexico only)



Panel C: Race (New Mexico only)

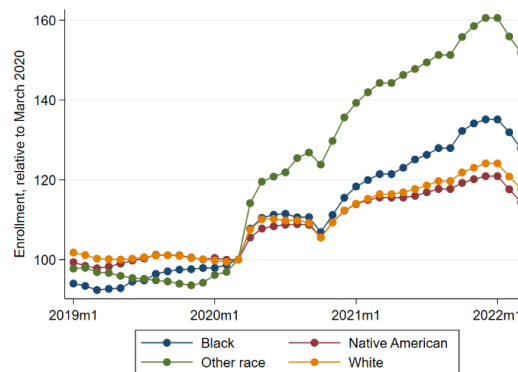


Figure notes: The figure shows counts by category normalized so that the value for March 2020 equals 100.

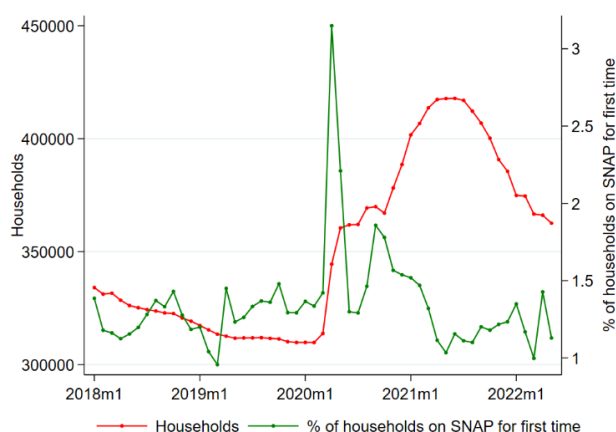
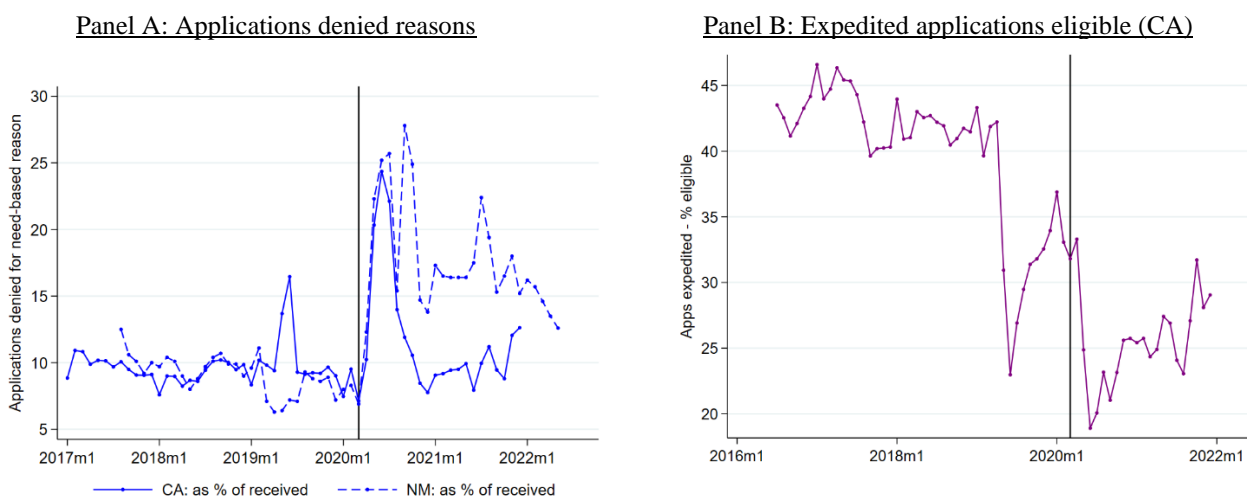
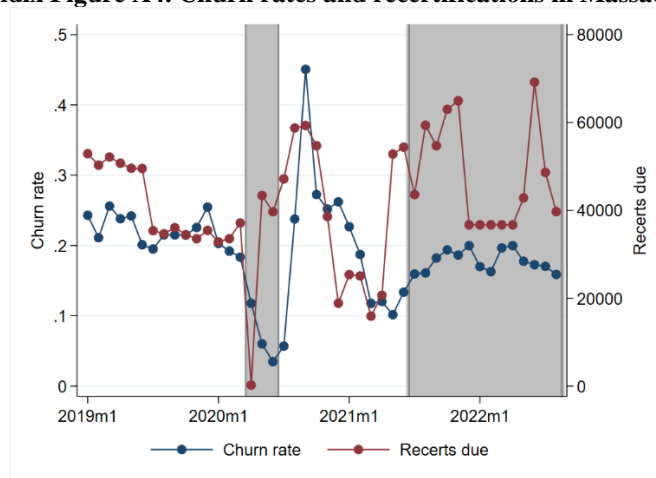
Appendix Figure A2. First-time SNAP households in Wisconsin**Appendix Figure A3. Evidence of higher average incomes of applicants: applications denied reasons.****Appendix Figure A4. Churn rates and recertifications in Massachusetts**

Figure notes: Gray shaded areas indicate months when recertifications were waived. Massachusetts calculates churn by comparing new applications received to the active caseload in the previous 90 days.

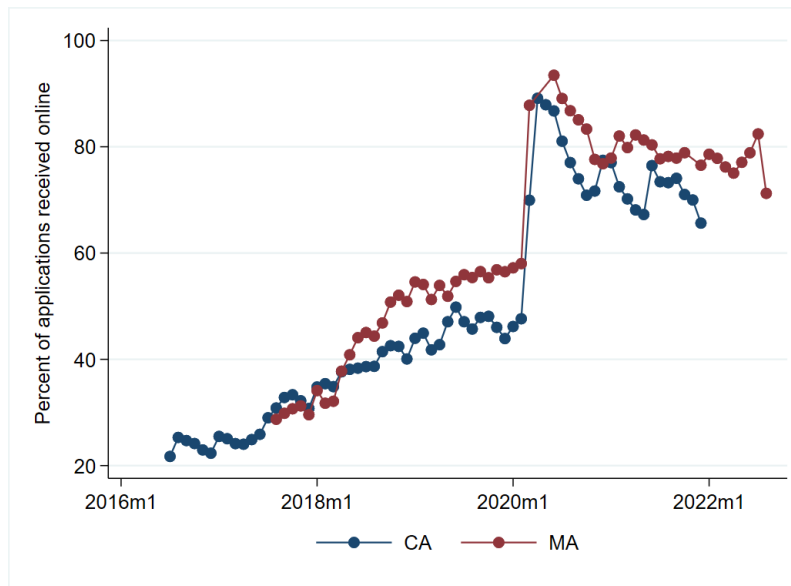
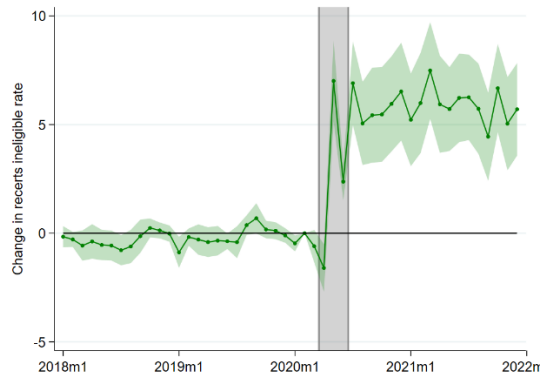
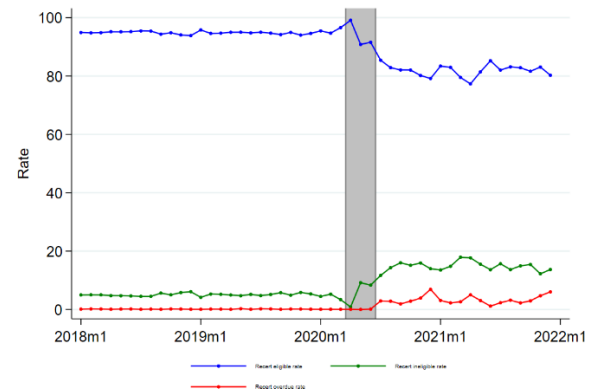
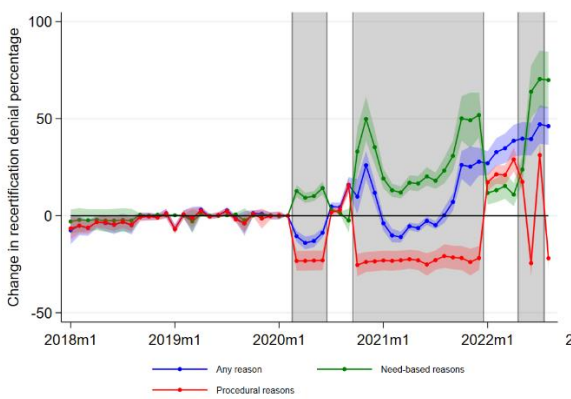
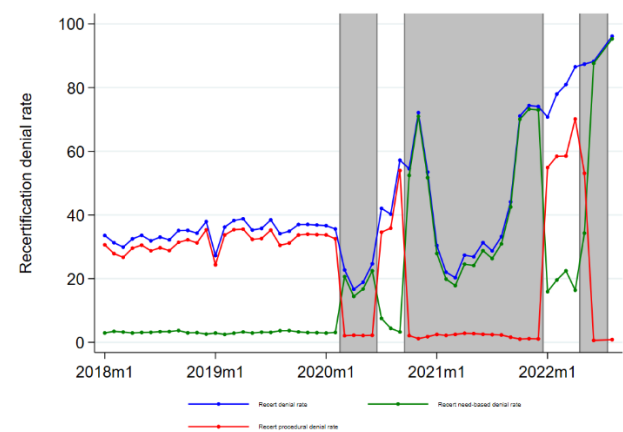
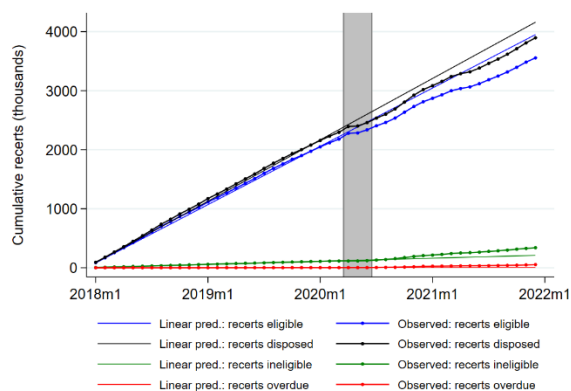
Appendix Figure A5. Online Applications**Appendix Figure A6. Recertification Denial Rates****Panel A: California county-level****Panel B: California state-level****Panel C: New Mexico county-level****Panel D: New Mexico state-level**

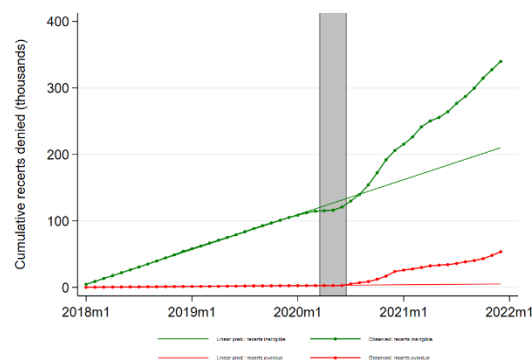
Figure notes: Gray shaded areas indicate months when recertifications were waived.

Appendix Figure A7. Cumulative recertification denial reasons from three states

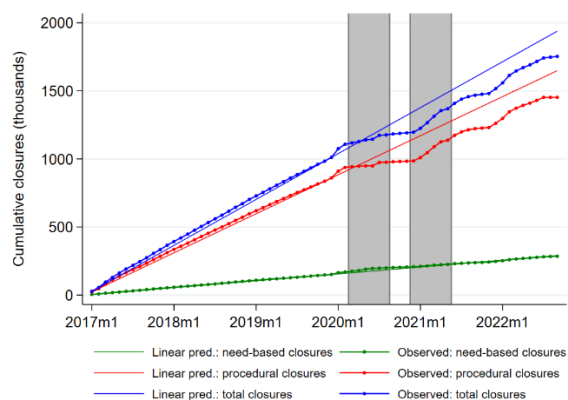
Panel A: California



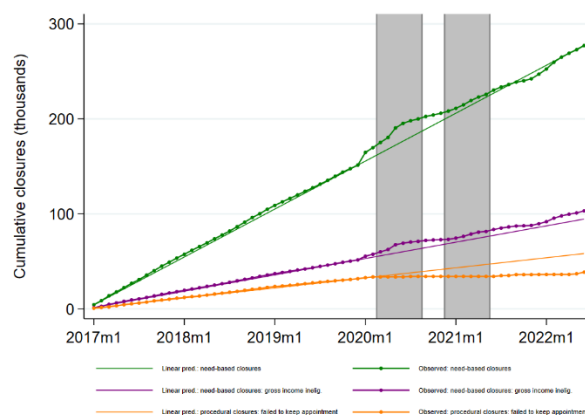
Panel B: California detail



Panel C: Louisiana



Panel D: Louisiana detail



Panel E: New Mexico

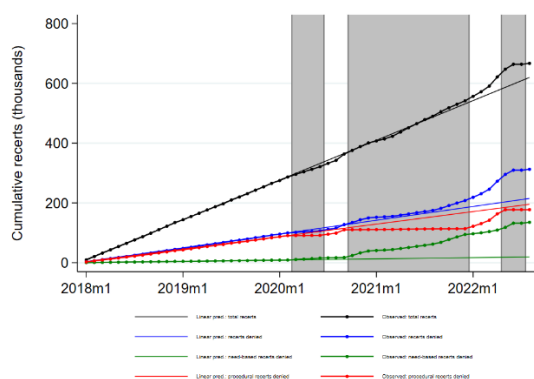


Figure notes: Gray shaded areas indicate months when recertifications were waived.

Appendix Tables

Appendix Table A1. Maximum benefit amounts by household size, FY 2022

Household size	Maximum monthly benefit amounts
1	\$250
2	\$459
3	\$658
4	\$835
5	\$992
6	\$1,190
7	\$1,316
8	\$1,504
Each additional person	\$188

Table notes: 48 states and DC. Fiscal Year 2022 is October 1, 2021 – September 30, 2022. Source: <https://fns-prod.azureedge.us/sites/default/files/resource-files/2022-SNAP-COLA-%20Maximum-Allotments.pdf#page=2>. Accessed 05/20/2022

Appendix Table A2. Data availability.

Outcome	State level availability	County level availability
Households	All 50 states + DC	AL AZ AR CA FL IL IA KS LA ME MD MA MI MN MO MT NJ NM NY NC OH OR SC SD TN TX VA WI
Individuals	All 50 states + DC	AL AZ AR CA FL ID IL IA KS ME MD MA MI MN MO MT NJ NY NC OH OR PA SC SD TN TX VA WI
Benefits issued	All 50 states + DC	AL AZ AR CA FL IA ME MI MN MO MT NY OH PA SC SD TN TX VA WI
Adults and children	AZ KS LA MA MI MO NJ NM OH OR SD TX WI	AZ KS LA MI NJ OH OR SD TX
Infants	OR TX WI	OR TX
Elderly	MA MO NJ OR TX WI	NJ OR TX
Disabled	MA OR NJ	NJ
Males and females	NM WI	
Race and ethnicity	NM	
Applications received	AR^ CA CO* IN* LA MD MA* MO MT* NM NC TN* TX*	AR^ CA LA MD MO MT* NM NC
Applications approved and denied	AR^ CA LA MD MO NM NC	AR^ CA LA MD MO NM NC
Applications denied, reasons	CA NM	CA NM
Applications expedited	AR CA CO MO NM NC	AR CA MO NM NC
Applications expedited, detail	CA	CA
First-time households	WI	
Case flows	CA	CA
Recertifications, total	CA CO MA NM NC TX	CA NM NC
Recertifications approved, denied, denied reasons	CA NM	CA NM
Case closure details	LA	
Churn rate	MA	
Government agency statistics: office walk-in counts & reasons, call statistics, applications received by source (e.g. phone, web, etc.)	CA° MA	
* Data not used in order to match sample of applications approved and denied.		
^ Data not used because not fully available during the study period.		
° Limited data available		

Appendix A. SNAP waiver implementation background

In this section, I discuss how waivers were granted in the SNAP program before and during the study period and provide additional detail on specific policies implemented during the pandemic.

a. Waiver implementation

Although SNAP is a federal program, it is run by individual states. Practically, this means that the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) provides states with guidance on how to administer the program but gives states some flexibility by allowing them to request waivers of procedural requirements.¹ To request waivers, state officials usually must provide justification in a request letter, sometimes supported by statistics.² FNS regional offices review waiver requests with respect to explicit federal code, so waiver decisions are likely applied consistently across states. Therefore, one can think of variation in waivers across states as primarily reflective of state officials' decisions, rather than as the result of discretion at the federal level.³

During the pandemic, the usual process for reviewing waivers continued with some modifications. First, at the onset of the pandemic to respond to sudden economic need, FNS allowed for all states to waive some requirements without review of individual state's requests under a "blanket approval" (USDA-FNS 2020, April 11). Therefore, most states implemented these waivers. A few months into the pandemic, however, FNS began requiring individual state requests again on a month-to-month

¹ Formally, "waivers," "adjustments," and "options" differ based on which circumstances and under which corresponding federal authority FNS can grant flexibilities. Waivers are granted under federal code 7 CFR 272.3(c)(1)(i), which "allows FNS to authorize temporary waivers to deviate from specific regulatory provisions when they cannot be implemented due to extraordinary temporary situations." Meanwhile, the Families First Coronavirus Response Act (FFCRA) gives FNS the authority to "adjust SNAP issuance methods, applications, and reporting requirements when a public health emergency is declared and a State issues an emergency or disaster declaration based on a COVID-19 outbreak." (Source: <https://fns-prod.azureedge.us/sites/default/files/resource-files/SNAP-COVID-QA-3.pdf>) There is a third category of changes is called "CR Options." These policies don't require review and approval by FNS. States simply are "required to notify FNS that they will be using these adjustments" (Source May 2021 and Beyond USDA letter). The telephonic signature was an FFCRA adjustment throughout the study period. Most policies I review were originally CR Options, but became FFCRA adjustments: extending certification periods, temporarily waiving periodic reports, using periodic reporting procedures to recertify households, waiving interviews, and not offering face-to-face interviews. Emergency allotments and online purchasing were separate policies not included in this categorization. Throughout this paper, I do not distinguish between waivers, adjustments and options.

² States submit requests through the SNAP Waiver Information Management System (WIMS) (USDA-FNS 2021, May 21)

³ This is even moreso the case for "CR options" policies, which do not require review or approval by FNS.

basis (USDA-FNS 2021, April 30). A state's justification for a waiver request could include projected impacts the waiver on recipients and the state as well as "information on COVID-19 transmission rates, office closures, SNAP caseloads, and other evidence that helps illustrate the need" (USDA-FNS 2021, December 8).

Throughout this period, FNS strongly encouraged states to return to pre-pandemic procedures. In September 2020, FNS rejected many requests for waivers, particularly regarding policies around waiving interviews and adjusting recertification requirements. However, it must have been that many states desired to continue using waivers, because many waiver rejections were soon overturned and the number of waivers across states remained elevated for several months after this period. As it became expected that states would continue needing the flexibilities that waivers provided, FNS standardized and streamlined the process to request waivers for states. So long as a state accepted the standardized terms and conditions and provided a brief description of how the state planned to transition to full regulatory compliance, they did not need to provide additional documentation (May 2021 source). For May 2021, FNS also adjusted their guidance, allowing for waiver approvals for up to 8 months.⁴ For January 2022, FNS adjusted their guidance to approve waivers for up to 3 calendar months at a time (USDA-FNS 2021, December 8).

Discussions about the timing of removing these waivers remained an important policy discussion. In its guidance released in December 2021, FNS tempered expectations by stating it "does not expect to approve these COVID-19 flexibilities beyond the duration of the Federal public health emergency" (USDA-FNS 2021, December 8).

ii. Interview policies

Policy description. Three policies are related to interview implementation. One policy waives interviews for initial determination of benefits, while another policy waives recertification interviews. A third policy is not offering face-to-face interviews.

⁴ So long as "the State confirm[ed] the presence of a State emergency or disaster declaration (State declaration) at 3-month intervals, or until the end of the month subsequent to the month in which the public health emergency declaration related to COVID-19 is lifted by the Secretary of Health and Human Services, whichever comes first." (Source May 2021 letter)

iii. Application procedure policies

Two policies affected procedures for new applicants: postponing expedited service interviews and telephonic signatures. Expedited service refers to the practice of providing benefits to a household within 7 days of application regardless of verification completion, compared to the usual 30-day timeframe. This practice is reserved for especially needy households. Previously, households eligible for expedited services required an interview (USDA FNS, 2006, February 17). Postponing expedited service interviews meant that households with especially low levels of income no longer had the potential to lose benefits quickly based on missing the initial interview. Therefore, states could get benefits out to households quickly during a time of immediate economic need.

The telephonic signature policy streamlined application processing by allowing applicants to give verbal consent to submit applications over the phone. Specifically, the policy made it easier for outreach workers to help complete applications for clients. Previously, outreach workers could fill out an online application over the phone with an applicant but would have to stop at the signature page. Then, the client would have to sign into the application portal online themselves to sign and submit the application. The telephonic signature allowed outreach workers to complete the application in its entirety by receiving a verbal attestation from clients in lieu of an electronic signature (Karter 2021).

iv. Policies affecting recertifications and reporting

Three policies affected recertifications and reporting: extending certification periods, using periodic reporting procedures to recertify households, and temporarily waiving periodic reports.

Extending certification periods delayed case recertifications. Certification periods were typically extended for 6 months. In guidance, FNS clarified to states that certifications should only be extended up to 6 months per case, under the justification that “back-to-back extensions of certification periods of over 6 months reduce the opportunity for a State to obtain a full understanding of a household’s circumstances and make necessary adjustments” (USDA FNS 2021, December 8).

FNS also allowed states to temporarily waive periodic reports. Periodic reports, usually required every six months in between recertifications, allow state agencies to verify continuing eligibility.

Temporarily waiving periodic reports meant that households did not have to submit verification information to continue receiving benefits. In other words, households which failed to submit periodic reports would not have their cases closed and could continue receiving benefits when this waiver was in place.

For cases where certifications were not adjusted in either of the ways above, FNS allowed state agencies to simplify recertifications by using periodic report procedures for recertification. The periodic reporting requirements typically differ from recertifications by requiring less information and not including an interview. FNS requested that this policy should be applied only to cases that had not received another recertification extension or adjustment.

v. Other policies

There were several other policies implemented during this period that are not studied here because they affect fewer states and/or they do not affect the key margins of application or recertification. These policies include amending good cause procedures for specific work requirements (1 state), extending administrative disqualification hearing timeframes (3 states), extending SSN good cause periods (3 states), revising authorized representative requirements (4 states), suspending claims activity (5 states), suspending in-person application and verification submissions for ongoing households (4 states), and waiving fair hearing timeframes (9 states).

Appendix B. Recertification case studies

Recertifications can be “good” for social welfare if they remove benefits for households who become ineligible, “bad” if they increase churn, and “neutral” if households would always successfully recertify, regardless of recertification costs. To suggest whether there are more good or bad recertifications—which are then avoided when recertifications are waived during the pandemic—I use two approaches: a case study of recertification denials from three states, and checking whether observed flows of approved applications are consistent with churn.

i. Three states’ case studies

Overall, the welfare effects of recertification waiver policies depend on the relative magnitudes of removals due to ineligibility (“good” closures), avoidance of (procedural) removals of truly eligible households (“bad” closures), and the relative welfare weights on each type of household. In Louisiana, New Mexico, and California data, I interpret case closures or recertifications denied for a “need-based” reason as a proxy for “good” recertifications and case closures for a “procedural” reason as a proxy for “bad” recertifications. Failing the gross income test is an example of a need-based closure, whereas failing to provide verification documents is an example of a procedural closure. A limitation of this interpretation is that households who expect to be denied because of a need-based reason may purposefully fail to provide verification documentation, and thus appear in the data as denied for a procedural reason. These definitions also differ across states, so analysis of each state should be considered self-contained.

Appendix Figure A7 shows cumulative recertifications in California, Louisiana, and New Mexico broken down into categories. The straight lines show the counterfactual trend cumulative recertifications would have taken if they continued along a linear path during the pandemic. The dotted lines show the observed data, and shaded regions show the times recertifications were waived. If a dotted line is below its corresponding solid line, then closures or recertification types are “missing” relative to the pre-period trend. If a dotted line is above its corresponding solid line, then recertifications exceed their pre-period

trend. Finally, if a dotted line is first below but later “catches up” to the linear prediction, this suggests intertemporal substitution of closures.

The blue lines on the graphs show that the pandemic led to fewer total recertifications denied in California and Louisiana, but more recertifications in New Mexico. In both Louisiana and New Mexico, where data is available, procedural closures were virtually eliminated when the recertification waiver policies were in effect. This can be seen by noticing that the red lines remain flat in the gray shaded areas for both states. Providing further detail, Appendix Figure A6 Panel D shows that recertifications denied for procedural reasons decreased to zero during periods when certifications were automatically extended in New Mexico. In Louisiana, “missing” procedural closures were the overall driver of total “missing” case closures.

The avoidance of procedural closures appears good for social welfare at first glance; however, it is possible that some procedural closures are really need-based closures. For example, a household may not turn in their recertification paperwork because they know they are no longer eligible. This would then be counted as a procedural closure in the data even though it is for an underlying need-based reason. To investigate this further, Figure A6 Panel C shows how recertification denials changed since the pandemic for the average county in New Mexico. The decrease in procedural denials was someone offset by denials for need-based reasons (i.e. households found to be ineligible), but still resulted in a reduction of recertification denials overall. In conclusion, the positive welfare effect of reducing procedural closures is *somewhat* diminished because some “procedural” closures actually remove ineligible households from the rolls.

Another question worth asking is whether there was intertemporal substitution of recertifications. In other words, would recertifications that normally have taken place in 2020 taken place in 2021 instead, for example? Or were those recertifications avoided altogether? In the short-term, this matters since larger caseloads increase program budgets. In the long-term, this matters for the longer run effects of the pandemic on caseloads. Recall that there were “missing” case closures in California and Louisiana following the pandemic. This means that caseloads will remain higher in these states going forward. If

this was driven by avoidance of closures which would have churned—as Louisiana’s data suggests—then this policy will increase take-up primarily among truly eligible households.

Key to this conclusion is the tradeoff with Type II errors: allowing newly ineligible households to remain on the rolls. Across all three states, need-based closures increased during recertification waiver periods, resulting in a (weak) surplus at the end of the study period. The surplus of need-based closures—particularly growing later in the sample—could be the result of an enrollee population with higher average incomes. This potential mechanism is consistent with prior results that applicants were relatively higher income during the pandemic, who are then removed as their income recovers and they become ineligible.

To provide further evidence on mechanisms, Figure A7 Panel D shows cumulative case closures for all need-based closures again, for gross income closures (a subset of all need-based closures), and for closures due to a failure to keep an appointment (a subset of all procedural closures). This breakdown is only available in Louisiana. (The Data Appendix shows the top closure reasons in Louisiana in the pre-period. Gross income closures are the most common type of need-based closure in the pre-period.) The figure suggests that there was some intertemporal substitution within the gross income test category, even though this does not hold for the need-based category overall. Failure to keep an appointment is analyzed since it suggests that a household *tried* to recertify but failed to do so. This overcomes the aforementioned data limitation of total procedural closures data. Therefore, if the pattern observed among all procedural closures also holds among this subcategory, then we should be more convinced that the mechanism for changes in case closures in response to the policy is driven by the avoidance of administrative burdens. Indeed, the figure shows that case closures were foregone due to a failure to keep an appointment. These results provide further evidence that the recertification waiver policy led to the avoidance of churn due to a reduction in administrative burdens.

Finally, the switching of regimes with and without recertifications appears to independently increase procedural denials. Appendix Figure A6 Panel C shows that when recertification requirements are brought back, denials increase sharply, driven by an increase in procedural denials. The fact that

procedural denials are above pre-period levels suggests households are caught off guard by the return of recertifications in this period in particular. By the end of the period in New Mexico, the cumulative recertification denial rate well exceeds its pre-period trend.

Overall, data from New Mexico are consistent with the following factors for increased denials: changing composition of households facing recertifications towards those more likely to become ineligible, an increase in average incomes of enrollees, and households caught off guard and missing their recertifications when they are no longer waived. Similarly, the rate of recertifications ending in ineligibility increased in California following the pandemic onset. Given the lack of data on other factors, these data only support the mechanisms of a changing composition of households facing recertifications, although the other factors cannot be ruled out. Overall, the data suggest there is a nontrivial tradeoff between need-based denials and procedural closures avoided, although a quantitative welfare analysis is outside the scope of this paper.

ii. Churn and observed application flows

In the presence of recertification requirements, some households would fail their recertification—due to a missed interview, for example—only to reenroll in the program a short time later. In this case, “churning” cases would normally account for a substantial fraction of incoming application flows. In particular, all of these cases would result in *approved* applications, since households churn, by definition, if they remain likely eligible for the program.⁵ When households are not required to recertify, however, households that would otherwise churn remain on the program, thereby reducing the flow of approved applications and overall applications. If this were the only channel by which applications were changing at the beginning of the pandemic, this would predict a relative decrease in approved applications.

Appendix Figure A4 shows direct evidence from Massachusetts that churn rates fall mechanically reduced when recertifications are removed during the pandemic. Massachusetts defines the monthly churn rate as the percentage of applicants that were active clients within 90 days prior. Churn rates begin around

⁵ Some households no longer eligible could also be removed from the program during recertification and remain off the program. However, these households do not churn, by definition, so they will not affect future application flows.

23 percent in the pre-period. Churn rates declined significantly when the state removed recertification requirements at the start of the pandemic. When recertification requirements returned, churn rates peaked at a rate double the pre-pandemic mean before falling again. In the post-period while recertifications are still waived, churn rates remain below 20 percent. This provides direct evidence that recertification waivers reduced churn in one state.

In order to gather further evidence from other states without microdata, I show that observed overall changes in flows of approved applications is consistent with some churn reduction. In particular, I perform back-of-the-envelope calculations of bounds of applications approved (as fraction of the total caseload) using external estimates of churn rates from Homonoff and Somerville (2021) and internal estimates of application and case flows. Details about these calculations are available upon request. Observed applications approved as a percent of total caseloads are within or very close to the bounds before and after the pandemic onset. This means that application flows are roughly consistent with Homonoff and Somerville's churn rates: 48.3 percent of cases up for recertification successfully recertify, 23.7 percent churn within 1-90 days, 5.7 percent churn within 91-365 days, and 22.4 percent are discontinued (fail to recertify for 12 months or more).

Data appendix

1. Data descriptions

a. Policy waivers data

I collect new state-month level data on ten SNAP waivers since the beginning of the pandemic. This information is found on the USDA website. In some cases, I use the Wayback Machine to fill in information, including documenting the rollout of the online purchasing pilot. I code up each waiver as a modified indicator variable. There are several cases in which a state month was partially treated: either only certain geographies in the state were covered by the waiver, only certain household types were covered, the state was only covered part of the month, or some combination of the three. In these cases, I code the observation as partially treated, equal to one-half for the purpose of descriptive analyses, and as fully treated for the purpose of event studies. These account for a small fraction of state-month observations. I also consider a state to be treated the first month online purchasing is available with any retailer and all months thereafter. All states and DC except Alaska rolled out online purchasing during the study period.

I collect policy information beginning March 2020 for all policies except online purchasing, which began in April 2019. I impute all policies as zero before March 2020. This is reasonable for most policies. Based on the SNAP Policy Database, which runs through 2016, none of the policies studied here were implemented before the pandemic except waiving face-to-face interviews.

I omit one of the ten policies to avoid issues of multicollinearity. The policies of extending certification periods and waiving periodic reporting requirements are not distinguished in my data sources after mid-2021. Therefore, I only include policy data on extending certifications periods, and drop information about waiving periodic reporting requirements. Similarly, the policies of waiving initial interviews and recertification interviews are also not distinguished in my data sources after mid-2021. For these policies, however, I include them in their respective indices separately, since they are each expected to simplify applications and recertifications, respectively.

b. Enrollment for demographic groups

Adults and children. Publicly available data from certain state websites contains the number of adults and children enrolled at the state-month and county-month levels. Where some states provide age groups, I calculate totals of adults and children based on age. The age cutoff for adults varies slightly across states based on availability, between approximately 18-21. Therefore, the definition of adult varies slightly by state.

Special groups. I calculate enrollment for a few special groups: infants, the elderly, and the disabled in a few states. Infant, elderly, and disabled individual totals are available in very few states.

Race, ethnicity, and gender. Data on gender is available in two states. Publicly available monthly data from New Mexico's state website contains a breakdown of SNAP enrollees by race and by ethnicity separately. For race, I collapse to four racial categories: White, Native American, Black, and other races.

c. Benefits redeemed

I digitize state-year-level data available on SNAP benefit redemptions from publicly available annual reports (USDA FNS 2010-2021). Benefits redeemed at retailers may differ from benefits issued if SNAP households do not spend all their benefits within the month. I use these data to verify that data on benefits *issued* reflects benefits *redeemed* by households, approximately one-for-one.

d. Application and case flow data

Publicly available data from certain state websites contains information on applications at the state-month and county-month levels. These data contain applications received, applications approved, applications denied, reasons for denied applications, and applications expedited. Applications can be denied for “procedural” reasons, like missing an interview, or for “need-based” reasons, as in the household is found to be ineligible. Wisconsin also has a count of first-time SNAP households available, and California has detailed breakdowns of case flows.

e. Recertification and case closure data

Publicly available data from certain state websites contains information on recertifications at the state-month and county-month levels. These data contain total recertifications, recertifications approved, denied, and broad denial reasons: procedural and need-based. Louisiana has similar, very detailed data on

reasons for case closures at the state-month level, although this is not separated out into recertifications directly.

2. Figure 6 Panel C construction

The black line in Figure 6 Panel C shows the result of the following exercise:

- Take the cumulative sum of the event study coefficients from Panel A, beginning with the first period (Jan. 2019).
- Run a regression on a constant and calendar time using pre-period data
- Use those coefficients to predict cumulative applications in the pre- and post- periods
- Take the difference between the actual cumulative applications and the regression prediction, and plot the difference.

3. Recertification definitions

- **Recertification totals**
 - **CA:** Recertifications disposed of during the month + overdue recertifications (caused by CWD) during the month
 - **CO:** redeterminations
 - **NM:** renewal resulting in approvals + renewals resulting in closures.
 - “Renewal dispositions based on COVID-19 extensions for period reviews are not included in total.” This will result an undercounting of total recertifications during this period, and an overestimate of recertification denial rates (since the denominator is not large enough). Even though the magnitudes will be off, the qualitative results are still interpretable.
 - **NC:** Recertifications
 - “The [month] Recertification Timeliness Report data is only reflective of cases that were not included in the automatic certification extensions as a result of COVID-19.”

- **TX:** Redeterminations disposed
- **Recertifications approved**
 - **CA:** recertifications disposed of during the month, determined eligible
 - **NM:** renewals resulting in approvals
- **Recertifications denied**
 - **CA:** Recertifications disposed during the month, minus recertifications disposed of during the month, determined ineligible. Note that “Recertifications disposed of during the month, determined ineligible” accounts for only part of all denials.
 - **NM:** renewals resulting in closures
 - **LA:** includes case closures for all the following reasons: earned income [too high], unearned income [too high], other eligibility reason, other reasons (mainly client request to end case), voluntary withdrawal of case, procedural reasons, and sanction reasons.
- **Recertifications denied reasons**
 - **CA:**
 - recertifications denied need-based = recertifications disposed of during the month, determined ineligible
 - overdue recertifications (caused by CWD) during the month. (Not really denied for procedural reasons)
 - **NM:**
 - recertifications denied need-based = renewals resulting in need-based closures
 - recertifications denied procedural = renewals resulting in procedural closures
 - **LA:**
 - recertifications denied need-based = includes case closures for all the following reasons: earned income [too high], unearned income [too high], other eligibility reason, other reasons, and voluntary withdrawal of case. “Other reasons” are

mainly “client request”. I am placing this category and voluntary withdrawal under need-based, assuming client does not need benefits anymore.

- recertifications denied procedural = includes case closures denied for a procedural reason or a sanction reason. Sanctions are a substantial factor in 2018-2019 and are driven by failure to comply with work requirements. ("LWC" = Louisiana Workforce Commission and HiRE).

Table. Top case closure reasons in Louisiana (2017-2019)

Rank	Reason	Broad category	Percent of closures
1	Failed to provide complete semi-annual report by due date	Procedural	38.22
2	Failed to Timely Reapply	Procedural	26.73
3	Failed/Refused to Provide Verification	Procedural	13.51
4	Gross Income Ineligible	Earned Income (Need-based)	5.11
5	Other	Other Eligibility (Need-based)	3.55
6	Failed to keep appointment	Procedural	3.15
7	Refused to comply with eligibility requirement	Procedural	2.78
8	Failed to comply with LWC	Sanction (Procedural)	2.41
9	Failed Net Income Test	Earned Income (Need-based)	1.87
10	Gross Inc. Eligibility Net Exceeds Limit	Earned Income (Need-based)	1.67
11	Moved out of state	Other eligibility (Need-based)	1.39
12	Death of applicant/head of household	Other eligibility (Need-based)	1.32