# SNAP Policies and Enrollment following the COVID-19 Pandemic

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#### Abstract

Following the COVID-19 pandemic, the national budget of the Supplemental Nutrition Assistance Program (SNAP) doubled, its caseload increased by 10 percent, and its application denial rate increased by nearly 50 percent. This paper investigates the factors behind these persistent enrollment changes, including economic conditions and policy changes. I compile a new dataset on state policy waivers during the COVID-19 public health emergency, including unprecedented flexibilities in enrollment procedures and increases in benefit amounts, and I use state-level policy variation to understand the effects of each policy on SNAP caseloads. I find that emergency supplemental benefits and recertification waivers drove enrollment increases. I estimate an elasticity of SNAP enrollment with respect to benefit size of 0.09-0.18. Descriptive evidence suggests that application denial rates increased both because recertification waivers cut off the typical flow of approved applications from otherwise churning cases and because relatively higher income households were more likely to apply. These results suggest that government policies can be more influential than economic conditions in determining transfer program caseload patterns.

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# 1 Introduction

Enrollment of eligible individuals in transfer programs is co-determined by administrative barriers and benefit generosity (Currie, 2006; Kleven and Kopczuk, 2011). Knowing how much each of these policy levers affects caseload size and composition is important for predicting program costs and targeting benefits to those who need them the most. However, empirically studying how policy changes to benefit amounts and implementation procedures affect caseloads is difficult, particularly in the U.S. context. Means-tested transfer programs in the U.S. are less generous compared to other high-income countries both because of relatively low benefit levels themselves and because of administrative burdens which limit public spending by reducing caseloads (Herd and Moynihan, 2019).<sup>1</sup> In addition, policies surrounding safety net programs are rigid because of political and social constraints (Alesina, Glaeser and Sacerdote, 2001), and federal programs offer limited policy variation across space (Hoynes and Schanzenbach, 2015).

State-level policy changes made at the onset of the COVID-19 pandemic provide a unique opportunity to understand how a more generous and accessible public safety net would affect caseload size and composition. In this paper, I study the effects of pandemic-induced policy changes to the Supplemental Nutrition Assistance Program (SNAP), including increased benefit amounts and lessened administrative barriers to enroll, on program caseloads. SNAP is an interesting program to study for several reasons. First, it is the second largest meanstested program in terms of dollars spent, behind Medicaid.<sup>2</sup> Second, it has near-universal eligibility among the poor, unlike other means-tested programs whose eligibility is limited to certain demographic groups such as women, children, or the elderly (Hoynes and Schanzenbach, 2015). Third, it is an automatic stabilizer, meaning its caseload is meant to expand during business cycle downturns, even absent policy changes (Hoynes and Schanzenbach,

<sup>&</sup>lt;sup>1</sup>The U.S. public safety net is less generous on many metrics, including government transfer program expenditures as a share of GDP (Hacker, 2002).

<sup>&</sup>lt;sup>2</sup>Annual Medicaid spending was \$615 billion in 2019 (CMS, 2024). Annual SNAP spending was \$60.4 billion in 2019 (FNS, 2024).

2019). Overall, it is a large program with a key role to play in economic downtowns.

Following the COVID-19 pandemic, national SNAP enrollment grew to its largest level since the Great Recession. Figure 1 shows that national SNAP enrollment reached a maximum of nearly 43 million people—or 13 percent of the U.S. population—in September 2020, compared to 46.8 million following the Great Recession. Overall, the national SNAP caseload increased by 10 percent across several years post-pandemic relative to the previous year. Unlike previous periods, enrollment remained elevated following the pandemic recession onset despite a relatively quick return of the unemployment rate to pre-pandemic levels.

Patterns of SNAP applications also changed dramatically during this period. For states where data is available, the number of applications received more than doubled two months into the pandemic before returning to pre-pandemic levels, with similar patterns for total applications approved. Meanwhile, total applications denied increased and remained elevated in the post-pandemic period, increasing the application denial rate by 13 percentage points (50 percent). These complex patterns present a puzzle that could be explained by several factors, including policy changes and increased economic need.

To isolate the effects of policy changes on enrollment, I collect new state-month level data on changes to SNAP procedures since the onset of the COVID-19 pandemic. SNAP implementation rules were significantly modified to respond to both sudden, increased economic need and pandemic-related health concerns. States increased benefit amounts and reduced households' burdens to apply for and recertify enrollment, including waiving interview requirements. 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 until the end of the national public health emergency declaration in June 2023: over three years after their initial implementation.

I then determine how much of the rise in SNAP enrollment is attributable to these policy changes. Decomposing the effect of policies on caseloads is challenging because these policy flexibilities are endogenous to economic need by design, and multiple policies are implemented at the same time. To isolate the causal effects of policies on enrollment, I employ a difference-in-differences design using variation in policy implementation across states and time. Some states were forced to remove policy flexibilities at the end of the federal emergency declaration, while some voluntarily removed them before the emergency declaration expired, and some never implemented the policies at all. States also implemented different combinations of policies. I argue that the presence and timing of state-level changes to SNAP policies are plausibly exogenous conditional on local labor market and pandemic conditions. After controlling for these variables as well as state and time fixed effects, the remaining, identifying variation likely reflects state administrations' political preferences regarding SNAP and other means-tested programs, with Republican-led states implementing fewer policies than Democratic states, on average. I also focus on studying the removal of policies, rather than their introduction, which are less likely to be confounded with the effects of the onset of the pandemic and other pandemic-related policies.

I begin with studying the effects of increased benefit amounts, or Emergency Allotments (EA). EA were supplemental benefits provided to increase all SNAP households' benefits to the maximum level per household size or above. Using staggered timing of EA's removal across states, I find total benefits issued decreased by 32-49 percent. The magnitude of this effect is very large relative to historical SNAP expenditures. Nationally, 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. After adjusting for inflation, total SNAP expenditures roughly doubled following the COVID-19 pandemic, as shown in Figure 1.

The effect of removing EA on SNAP benefits issued is a combination of mechanical effects and behavioral responses of households. Mechanical effects are changes to benefits holding the existing caseload fixed, whereas behavioral responses occur when households newly apply and enroll (disenroll) in response to benefit increases (decreases). Using the staggered removal of EA across states, I estimate that returning to the original SNAP benefit schedule led to the disenrollment of 2.6-4.0 households per thousand people, or about 5 percent of SNAP cases. A back-of-the-envelope calculation suggests this behavioral response accounted for 12 percent of the overall increase in benefits during this period, with mechanical effects accounting for the remaining 88 percent. The estimated effects imply an average enrollment elasticity with respect to benefits between 0.09-0.18. To my knowledge, these represent the first estimates of the elasticity of SNAP enrollment with respect to benefits in the literature, and they are small relative to similar metrics from disability insurance and unemployment insurance. Overall, the Emergency Allotments policy was the most important factor in explaining increased caseloads during this period, accounting for roughly half of the enrollment increase during the pandemic.

These estimates reflect aggregate, average changes, but eligible households at different income levels faced different sized benefit increases under EA. Specifically, EA changed SNAP's design from phasing out benefits as income increased to fixing benefit amounts conditional on eligibility and household size. Benefits increased more for relatively higher-income households close to the eligibility threshold, so these households had more of an incentive to apply or stay enrolled under EA. In line with these differential incentives, I find descriptive evidence that SNAP applicants early in the pandemic were relatively higher-income compared to the pre-period. I also show that when EA was removed, a non-profit's SNAP eligibility screener completions dropped more among higher-income households compared to lowerincome households, suggesting higher-income households became relatively less interested in applying for SNAP. These results suggest that benefit levels can affect safety net program caseloads by both attracting additional applicants and changing the characteristics of marginal applicants.

I then decompose SNAP enrollment changes between recertification and application channels. Caseloads can grow either by increasing the retention rate of existing enrollees or by attracting new applicants. In this period, the retention of existing enrollees was more important to increasing caseload volumes than attracting new applicants, and policy played a key role. Application approvals contributed to less than one-third of enrollment increases during the first few months of the pandemic but cannot account for the enrollment plateau in later months. Policies temporarily waiving recertifications removed the possibility of program exits, thereby inflating overall enrollment counts. When recertification requirements were waived, household enrollment increased by roughly 3-4 percent. The recertification waiver was thus the second most important factor in increasing SNAP caseloads during this period.

Related literature. 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 (Hanson and Oliveira, 2012; Oliveira et al., 2018; Stacy, Tiehen and Marquardt, 2018). In a paper similar to this one but studying an earlier era, 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. A recent paper also looks at the SNAP during COVID but focuses on changes in enrollment due to economic conditions (Bitler, Hoynes and Schanzenbach, 2023). The contributions of my paper are to investigate the role of a set of largely unprecedented SNAP policies alongside the effect of economic conditions and examine the external validity of prior results for the period following the COVID-19 pandemic. I provide novel evidence that policies account for more than half of overall enrollment increases in SNAP following the COVID-19 pandemic, which contrasts with conclusions regarding earlier periods (Ganong and Liebman, 2018).

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 the framework from Kleven and Kopczuk (2011), the government has three policy design choices: the eligibility threshold, benefit generosity, and enrollment requirements or "complexity" which help the government observe eligibility but also impose costs on applicants. One paper considers the effects of the eligibility threshold on take-up (Anders and Rafkin, 2024). Many papers consider the effects of complexity in SNAP application procedures (Finkelstein and Notowidigdo, 2019), recertification requirements (Homonoff and Somerville, 2021; Currie and Grogger, 2001; Gray, 2019; Unrath, 2021), or both (Wu and Meyer, 2021).<sup>3</sup> To my knowledge, existing estimates of the effect of benefit generosity on caseloads focus on disability insurance (Autor and Duggan, 2003; Bound and Burkhauser, 1999) and unemployment insurance (Schmieder and von Wachter, 2016). Relative to these papers, I provide the first estimate of an elasticity of enrollment with respect to benefits for SNAP. My setting also offers a unique opportunity to examine the interaction of multiple policy types: complexity at application, complexity at recertification, and benefit changes.

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 (Bell et al., 2022), Pandemic-EBT, which replaced school lunches during closures (Bauer et al., 2020; Bauer, Ruffini and Schanzenbach, 2024), Medicaid unwinding (Dague and Ukert, 2023), and a combination of multiple programs (Bitler, Hoynes and Schanzenbach, 2020; Ruffini and Wozniak, 2021). Two papers consider SNAP, but look at either the effect of Emergency Allotments on food insufficiency (Schanzenbach, 2023) or the distribution of Emergency Allotment supplemental benefits across demographic groups (Bitler, Hoynes and Schanzenbach, 2023). In contrast, this paper takes a more holistic look at SNAP and its enrollment levels, considering other policy responses to the pandemic in addition to benefit increases.

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

<sup>&</sup>lt;sup>3</sup>Across other social programs, hassle costs at application have been shown to decrease participation (Rossin-Slater, 2013; Deshpande and Li, 2019).

provides a conceptual framework for considering channels of enrollment changes. Section 4 describes the data sources collected. Section 5 discusses overall changes in enrollment, applications, and recertifications. Section 6 discusses the empirical strategy, and Section 7 shows the causal effects of policies on enrollment. Section 8 concludes.

## 2 Background

SNAP is the U.S.'s largest nutrition assistance program and helps low-income households purchase food. Approximately 1 in 8 individuals in the U.S. receives SNAP benefits in any given month (FNS, 2024). This section provides context for the dramatic policy changes that occurred to the program during the COVID-19 pandemic.

## 2.1 SNAP Overview

Administration of SNAP. The U.S. Department of Agriculture's Food and Nutrition Service (USDA FNS) is the federal agency which oversees implementation of the SNAP program. The agency sets national standards for program implementation such as baseline eligibility standards, which states have some flexibility to modify subject to federal approval. The federal government provides 100 percent of funding for SNAP benefits and 50 percent of funding for states' administrative costs.

State agencies are in charge of administering SNAP. Agencies have some flexibility to set state-specific parameters for eligibility, namely the gross-income eligibility and asset test. States receive applications and recertification documentation and make eligibility determinations. They fund 50 percent of costs associated with administering the program. Each state has its own administrative data system, its own Electronic Benefit Transfer (EBT) system and card, and issues benefits according to its own monthly disbursement schedule.

Eligibility. A household's eligibility for SNAP is determined by three components: a gross income test, a net income test, and an asset test.<sup>4</sup> Federal eligibility criteria for SNAP did not change during the pandemic.<sup>5</sup> Because eligibility criteria are 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, Sanders and Taylor, 1999).

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.<sup>6</sup> Most households must also complete a shorter semi-annual 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 months and are a key timepoint at which households are likely to disenroll in the program (Currie and Grogger, 2001; Gray, 2019; Unrath, 2021).<sup>7</sup>

<sup>&</sup>lt;sup>4</sup>The minimum gross income limit is federally set at 130 percent of the Federal Poverty Level (FPL), although states have the flexibility to set this threshold as high as 200 percent of the FPL. The net income limit is 100 percent of the FPL, where net income is determined by subtracting allowed deductions from gross income. Total household assets must be valued at less than \$2,750, excluding home and retirement accounts and a portion of the primary vehicle (CBPP, 2023). However, many states now waive the asset test (USDA-ERS, 2024).

 $<sup>{}^{5}</sup>$ A few states could have changed their eligibility criteria since the pandemic, but information on statelevel eligibility criteria currently goes through 2020 (USDA-ERS, 2024). These data show that only two states changed their asset test and only three states changed their gross income level between 2018 and 2020. Therefore, any changes to these state-level eligibility criteria following the pandemic are likely limited. The net income test was not affected.

<sup>&</sup>lt;sup>6</sup>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.

<sup>&</sup>lt;sup>7</sup>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

Disenrollment at recertification occurs either because a household is found to be ineligible or because it fails to complete recertification tasks like the interview. Through recertifications, government agencies intend to remove households that are truly ineligible and avoid removals of truly eligible households who will soon return to the program. A important concept in this context is "churn": when likely eligible households fail to recertify but subsequently reapply and reenroll in SNAP, usually within a year. Churn is costly for the government agencies which process SNAP cases (Homonoff and Somerville, 2021): the administrative costs of processing a new application for a churning household were estimated to be twice as large as successfully processing a recertification (Mills et al., 2014).

**Benefit amounts.** SNAP benefit levels are set by the federal government and are the same across the contiguous 48 states.<sup>8</sup> The federal government sets a maximum benefit amount per household size and a fixed phase-out rate. SNAP benefits phase out from the maximum as household income increases at a rate of 30 percent.<sup>9</sup> Together, the maximum benefit amount and phase-out rate determine the SNAP benefit schedule conditional on household size.

Maximum SNAP benefit levels are set using two key parameters: (1) the Thrifty Food Plan (TFP), which uses food consumption patterns and dietary guidelines to develop a benchmark for the budget needed to afford a complete, healthy diet and (2) annual cost of living increases occurring every October. Independent of policies associated with the COVID-19 pandemic, the TFP was updated in 2021 for the first time in several years, increasing SNAP maximum benefits by over 22 percent. Figure A.1 summarizes the policy changes to SNAP benefit levels during the COVID period. A time series of changes in SNAP benefits issued over calendar time, averaged across states is shown in Figure A.2. Table A.1 shows the maximum benefit amounts for all household sizes for 48 states and DC between are also expected to report significant changes to their income or household composition to their SNAP office that occur outside of recertification cycles.

<sup>&</sup>lt;sup>8</sup>Benefit levels are set separately for Hawai'i and urban and rural Alaska.

<sup>&</sup>lt;sup>9</sup>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, 2015).

Fiscal Year 2019 and 2024. The maximum allotment for a household size of four was \$835 in Fiscal Year 2022.

#### 2.2 SNAP Policy Waivers during the COVID-19 Pandemic

Because of concerns about disease transmission, an increasing need for benefits, and government capacity constraints, most state agencies adjusted typical SNAP procedures in the wake of the COVID-19 pandemic relative to their pre-pandemic operations. These policies were largely unprecedented in the history of SNAP's implementation. In this project, I consider policies listed in Table 1. States increased benefit amounts substantially, simplified application processes, and simplified recertification processes.<sup>10</sup>

**Benefit increases.** The initial Emergency Allotments (EA) 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). Figure 2 shows how benefit amounts changed during EA with respect to net income. Effectively, the EA policy changes SNAP's benefit reduction rate from 30 percent to 0 percent, up until the point that a household no longer qualifies for SNAP. At the eligibility threshold, the implicit benefit reduction rate is infinity: if a household at the threshold received one more dollar in income, its benefit amount would drop to \$0.<sup>11</sup> The initial EA policy did not raise benefits for the lowest-income households who were already receiving the maximum amount.

Later, benefits were raised for the lowest-income households. In April 2021 under the "enhanced" EA policy, USDA allowed households whose initial EA payments were less than \$95 per month—including those receiving no supplemental payments—to receive an additional

<sup>&</sup>lt;sup>10</sup>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. See Appendix B for additional details.

<sup>&</sup>lt;sup>11</sup>The EA benefits schedule is based off of the schedule of Disaster SNAP: a program which provides food benefits to households affected by natural disasters (USDA, n.d.). I appreciate staff members at the Food and Nutrition Service for pointing out this connection. Households typically receive Disaster SNAP benefits for one or two months, whereas EA was in place for—perhaps unexpectedly—up to three years.

\$95 in benefits (USDA-FNS, 2021a,b). Thus, following this policy change, every household received at least \$95 per month in initial or enhanced EA benefits.<sup>12</sup>

EA was meant to be a temporary policy, and states could either remove EA on their own accord or could expect to remove them when the federal public health emergency declaration expired. Eighteen states chose to remove EA early, with removal timings shown in Figure 3. All remaining states removed EA at the end of February 2023 per an omnibus spending bill passed by Congress in December 2022 (H.R. 2471). EA ended several months before the other SNAP flexibilities, which expired with the termination of the federal public health emergency declaration at the end of June 2023.<sup>13</sup> Whenever a state ended EA, its SNAP benefits schedule returned to its original phase-out design.

States likely removed EA early for political reasons. EA benefits were fully funded by the federal government and 50 percent of administrative costs were federally funded, so states had little financial incentive to end them before the expiration of the federal public health emergency. If a state rescinded its own state of emergency declaration, it became ineligible for EA. At least one state justified extending its state of emergency declaration with the primary purpose to continue providing EA benefits.<sup>14</sup> Timing of early emergency allotment removal is correlated with political characteristics, and, anecdotally, early EA removal was justified by political reasons.<sup>15</sup>

**Reducing program participation costs.** A series of policies substantially reduced administrative costs associated with program participation on the application and recertification margins. First, some policies allowed states to simplify the application process. States could waive initial interview requirements, only offer phone interviews and not face-to-face interviews, postpone interview requirements for very low-income

 $<sup>^{12}\</sup>mathrm{Households}$  already receiving \$95 or more in Emergency Allot ments continued to receive the same amount.

 $<sup>^{13}\</sup>mathrm{Previously},$  these states had also expected EA to end when the federal public health emergency declaration expired.

<sup>&</sup>lt;sup>14</sup>https://governor.hawaii.gov/wp-content/uploads/2023/01/2301079.pdf

<sup>&</sup>lt;sup>15</sup>https://thecounter.org/states-ending-covid-19-emergency-snap-payments-usda/

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: (1) extended certification periods, which essentially waived recertification requirements temporarily, and (2) the suspension of interim reporting requirements. Overall, many of these policies were entirely unprecedented in the history of the modern administration of SNAP.<sup>16</sup> Additional details on each of these individual policies is in Appendix B.

# 3 Conceptual Framework: Channels of Enrollment Changes

In this section, I describe the channels through which SNAP enrollment can change within a jurisdiction over time. Broadly, enrollment changes are determined 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 a month t: a flow measure.
- $r_A$ : the application approval rate, conditional on applying (= 1-application denial rate).

<sup>&</sup>lt;sup>16</sup>One exception is face-to-face interviews, which were waived before the pandemic in most states during the Great Recession (USDA-ERS, 2024).

- 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 enrolled from the prior month t-1.

In words, the number of cases in a state or county 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.<sup>17</sup> I use this framework to organize the channels through which overall enrollment increased during the pandemic period.

The first channel through which enrollment can change is through new applications. 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, 2019). Second, households may be more likely to apply, particularly during a crisis, conditional on eligibility levels. Possible reasons for increased applications during this period include increased benefit amounts, particularly for relatively higher income households (Daponte, Sanders and Taylor, 1999) or increased need for economic support during the early days of the pandemic. Any of these changes which increase the flow of applications would be captured in the flow of new applications  $A_t$ .

Conditional on applying, households may be more likely to be approved for enrollment if they face fewer application requirements. Thus, governments can influence caseloads by setting application requirements and procedures, which likely affect application approval rates and ultimately total caseloads. Therefore, one could think of the value of the application

<sup>&</sup>lt;sup>17</sup>This framework assumes that households do not actively disenroll, which indeed is rare in practice. For example, less than 3 percent of case closures are voluntary withdrawals in Louisiana.

approval rate  $r_A$  as a function of government decisions regarding the complexity of the application screening process, in the sense of Kleven and Kopczuk (2011).<sup>18</sup>

Aside from entry through applications, a key factor in determining program caseloads are recertifications since they allow for program exits. In SNAP and similar programs, governments can influence caseloads by determining how often households face recertification, equivalent to setting the certification period length. From an aggregate perspective, this is equivalent to setting the "probability," p, that a household faces recertification in a given month.<sup>19</sup>

Governments may also change the recertification requirements, which could affect the likelihood that households successfully recertify. Namely, policies which simplify recertification procedures could increase the recertification approval rate, as households find it easier to complete associated administrative costs. In parallel to application policy parameters, one could think of the recertification approval rate  $r_R$  as a function of government policies regarding the complexity of recertifications.<sup>20</sup>

There are a few key takeaways from this framework. First, the two main channels that influence SNAP enrollment changes are through applications and recertifications. Second, by setting procedural requirements, governments effectively set two complexity parameters specific to the SNAP context: the application and recertification approval rates. Third, governments can influence caseloads by determining the frequency of recertification intervals.

<sup>&</sup>lt;sup>18</sup>In practice, the approval rate may also be a function of the composition of applicants, insofar as the set of applicants changes over time. For the purposes of interpreting the framework, one can reasonably assume that the set of applicants does not change suddenly, or at least not as sharply as government policy parameters. Nevertheless, the accounting identity still holds without this additional assumption.

<sup>&</sup>lt;sup>19</sup>For example, suppose all households have a certification period of exactly 12 months. Then, assuming recerifications are evenly spaced across months, the percent of households facing recertification in a given month would be  $\frac{100}{12} = 8.33\%$ .

 $<sup>^{20}</sup>$ Like applications, the recertification approval rate may also be a function of the composition of house-holds facing recertification.

## 4 Data

**Policy waivers data.** I collect new state-month level data on SNAP waivers since the beginning of the pandemic, listed in Table 1.<sup>21</sup> Figure 4 shows the fraction of states with each of the individual policies over time. Most states began implementing application and recertification polices at the beginning of the pandemic. 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. Following the end of 2020, the fraction of states implementing each of these policies remained relatively stable at less than half of states. The remaining enrollment flexibilities ended at the end of June 2023, with the end of the federal public health emergency. Emergency Allotments were initially implemented by all states. Some states began removing these benefit supplements in mid-2021. At the end of February 2023, no additional EA benefits were issued.

Figure 5 shows the number of policies implemented by each state across four time points during the COVID-19 federal public health emergency. In April 2020, nearly all states implemented most flexibilities. Gradually, many states rescinded these policies over time. By April 2023, most states were not implementing any of these SNAP policies, with some exceptions.

For the purposes of statistical analysis, I group policies based on the conceptual framework from Section 3. Specifically, 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*). *Simplified Application* policies primarily affect the application approval rate  $r_A$ , conditional on application, and *Simplified Recertification* policies primarily affect the recertification approval rate  $r_R$ , conditional on recertification. I separate out the policy which waived recertification costs entirely, *No Recertification*, which

 $<sup>^{21}</sup>$ I remove one of the policies from the analysis due to potential issues with multicollinearity. See Appendix F for additional details.

primarily affects the recertification rate p. I also separate out the increased benefits policy specific to the COVID-19 pandemic, *Emergency Allotments*. For details on these groupings, see Table 1.

**Enrollment and issuance data.** For state-month level analyses of the outcomes total households enrolled per thousand people and total issuance, I use administrative, SNAP enrollment data from USDA's SNAP Data Tables (USDA-FNS, 2023).<sup>22</sup> These data are available from all states.

County-month level data, application information, recertification totals, and supplementary data on detailed enrollment outcomes come from digitized records that I compiled from individual state websites.<sup>23</sup> These variables are not available for all states; data availability is summarized in Table A.2. I have county-month level data on SNAP households enrolled which accounts for 72 percent of the U.S. population.<sup>24</sup> I also use county-level data on SNAP applications and benefits issued. The main application outcomes are total applications received per thousand people and application denial rates. I also use total recertifications completed, expressed as a share of total cases. Finally, I have data from only a few states on recertifications approved, denied, and broad denial reasons (procedural and need-based) at the state-month and county-month levels. Unfortunately, there is not sufficient data to conduct detailed analysis on recertification denial rates.

**Controls: economic and pandemic conditions.** The unemployment rate is a key control for contemporaneous economic conditions: the primary factor besides policy changes

 $<sup>^{22}{\</sup>rm Throughout},$  measures per thousand people are calculated with respect to total population counts from the U.S. Census Bureau.

<sup>&</sup>lt;sup>23</sup>Supplementary detailed enrollment data includes information on enrollment by certain demographic groups, including adults, children, infants, the elderly, the disabled, and enrollment by race and ethnicity. These variables are used in Appendix C.

<sup>&</sup>lt;sup>24</sup>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. Monthly data is useful for studying the enrollment changes that occurred during this relatively short time period of less than four years.

which could affect SNAP enrollment (Ganong and Liebman, 2018). I collect monthly statelevel and county-level unemployment rates from the Bureau of Labor Statistics Local Area Unemployment Statistics series.

Enrollment in SNAP may also be affected by the pandemic itself and associated policies such as lockdowns and other economic relief measures. Therefore, I control for timevarying measures of COVID-19 case intensity and pandemic-related policies such as lockdowns. COVID-19 cases and deaths data at the county or state level come from Opportunity Insights' Economic Tracker database, which sources from the New York Times (Chetty et al., 2024). State-level data on pandemic-related policies comes from the COVID-19 U.S. State Policy Database (Skinner et al., 2022). When available, 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.<sup>25</sup>

# 5 Describing SNAP Enrollment since the COVID-19 Pandemic

In this section, I describe overall changes in enrollment and applications at the onset of the pandemic in the average state. The results in this section are 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 enrollee composition. I organize this section based on key elements of the conceptual framework for factors affecting SNAP enrollment described in Section 3.

**Enrollment.** Figure 6 describes trends in SNAP households enrolled per thousand people for the average state around the beginning of the pandemic. The number of households

<sup>&</sup>lt;sup>25</sup>Data collection of these variables ended in March 2022.

increases after a short delay and has remained elevated more than three years after the pandemic onset. Overall, Table 2 shows that, following the pandemic onset, the number of households enrolled in the average state increased by an estimated 5.63 households per thousand people (9.4 percent) and individuals enrolled by an estimated 7.40 individuals per thousand people (6.6 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.

**Applications received.** Figure 7 shows how the flow of SNAP applications changed since the pandemic in the average state where data is available. Figure 7(a) shows that applications received peaked toward the beginning of the pandemic to an additional 10 applications received per thousand people—a 185 percent increase. Aside from this peak and slight waves of increases, the flow of applications received in the post-period largely 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 pre-pandemic levels. Table 2 shows that applications per thousand people increased by 0.79 in the average post-period month, equivalent to a 14 percent increase.

Application approval rates. While the levels of applications received returned to prepandemic levels, the application denial rate increased and remained elevated for a period following the onset of the pandemic. Figure 7(b) shows that, since the start of the pandemic, the rate of denials increased initially by 36 percentage points (137 percent) and overall in the post-period by 13 percentage points (50 percent), as shown in Table 2.<sup>26</sup>

To translate regression results on applications (a flow measure) so that they are comparable to enrollment changes (a stock measure), Figure 8 takes the cumulative sum of average

<sup>&</sup>lt;sup>26</sup>Figure A.3 shows the same data using counts of applications approved and denied rather than rates. Figure A.4 shows that national Google searches for SNAP follow similar trends as application denial rates: they spike at the beginning of the pandemic and remain elevated post-pandemic. Google searches about unemployment benefits are initially larger and show more volatile patterns compared to SNAP.

applications received over time.<sup>27</sup> The interpretation of the horizontal zero line is the linear 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. Figure 8 shows that cumulative applications received were above pre-period trends for over three years following the pandemic onset. However, cumulative applications denied steadily increased since the beginning of the pandemic while applications approved remained below its pre-pandemic trend. The increase in applications denied was thus a key change during this period. Furthermore, since levels of cumulative approved applications are well below overall levels of enrollment increases, new enrollees can account for only a small share of enrollment increases following the COVID-19 pandemic.<sup>28</sup>

Fraction of households facing recertification. A key pandemic policy was extending certification periods, thereby temporarily removing recertification requirements for some existing SNAP households. Recertifications may not be eliminated entirely because states had discretion on which households would receive the waiver. Therefore, we would expect total recertifications to fall closer to zero—but not completely to zero—when recertification requirements are temporarily removed. Figure 9 shows this expected, substantial change in recertification frequency, based on data available in six states. The recertification rate decreased sharply in the first quarter of the pandemic, when all states removed recertifications. Total recertifications then rebounded somewhat, as some states reinstated regular recertifications for all households, while others continued to extend certification periods. After mid-2024, when states could no longer waive recertification requirements, recertification rates returned to pre-pandemic levels.

The magnitude of these changes in recertifications is large and of the expected size based on the policy change. Before the pandemic in these states, an average of 7.4 percent of

<sup>&</sup>lt;sup>27</sup>Details on how Figure 8 was constructed are in Appendix F.

<sup>&</sup>lt;sup>28</sup>Observed application approvals are also an upper bound on the number of new applicants, since eligible households may be "churning" on the caseload: failing to complete a recertification and later submitting a new application.

households per month faced recertification, corresponding to a certification period of 13.6 months.<sup>29</sup> 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 p of a randomly selected household 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 2.4 percentage points between the pre-period and the post-period. Overall, in months where the certification policy was in effect compared to not, the recertification rate decreased by 2.9 percentage points.

These changes in recertification rates are economically meaningful. With estimates from different contexts, previous papers show that between 20 and 50 percent of recertifications result in program exit.<sup>30</sup> Therefore, these estimates suggest that that, for each month that recertifications are waived, approximately 0.5-1.25 percent of the caseload would be retained rather than exit SNAP due to the policy. Empirical estimates, however, suggest that the effect of the recertification waiver policies on caseloads were even larger: between 3 and 6 percent of cases. The larger estimated effect than predicted could be because of differences in exit rates following recertifications across places (for which there is insufficient data to describe fully), if facing recertifications encourages early exit from SNAP outside of direct effects (e.g. by increasing voluntary exits by households or by increasing stigma), or due to some other factor.

**Recertification approval rates.** A key parameter of determining caseloads is the recertification approval rate or, equivalently, the recertification denial rate. Based on the accounting identity, I consider recertification denial rates conditional on facing recertification. Publicly

<sup>&</sup>lt;sup>29</sup>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

 $<sup>^{30}</sup>$ Gray (2019)'s exit rate at recertification of approximately 20 percent in Michigan (from Figure 3), and the recertification failure rate of 51.7 from San Francisco California (from Homonoff and Somerville (2021) Table 2).

available data on recertification denial rates is scarce but available from New Mexico and California and shown in Figure A.5. In New Mexico, the magnitude of the change in the recertification denial rate at the beginning of the pandemic is large.<sup>31</sup> In the pre-period, 34.7 percent of recertifications were denied statewide. In April 2022—a period when recertifications were not waived—the denial rate conditional on recertification was 86.5 percent and grew even higher later in the year. In both states, need-based recertification denials (i.e. denials because of ineligibility) clearly increased, suggesting the pool of enrollees became higher income on average. There is also a stark increase in the recertification denial rate in New Mexico when recertifications return. This increase is driven by procedural denials: denials because of a household's 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 potentially facing an unexpected return of recertifications and failing to complete related requirements when they are no longer waived.

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 who eventually return ("churn"), and the relative welfare weights on each type of household. A complete welfare analysis would require more detailed data and is outside the scope of this paper. Using available data, however, I find suggestive evidence that in addition to removing ineligible households from the rolls, recertifications normally remove many eligible households who will churn on and off SNAP caseloads.<sup>32</sup> Details on these analyses are in Appendix D.

<sup>&</sup>lt;sup>31</sup>Comparable data in California are not available.

 $<sup>^{32}</sup>$ This is consistent with prior evidence; Gray (2019) shows that households removed at recertification remain disenrolled for several months, although many likely remain eligible.

## 6 Empirical Strategy: Causal Effects of Policy Changes

The next exercise is to determine how much of the rise in SNAP enrollment and applications is due to different policy changes. Decomposing the effect of policies on caseloads is difficult because these policies are endogenous to economic need 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 worsening economic conditions and other policy changes following the onset of the pandemic.

To isolate the causal effects of policies on SNAP enrollment, I employ a staggered difference-in-difference design using variation in policy implementation across states and time, conditioning on local economic and pandemic conditions. Specifically, I use two-way fixed effects (TWFE) specifications in state-level or county-level data:

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

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

The outcome  $Y_{cst}$  is the outcome of interest (enrollment per thousand people, applications per thousand people, the application denial rate, or log issuance) in SNAP in county c, state s, and year-month t. The coefficients of interest are the  $\beta_k$ , which describe the average effect of the corresponding policy k on enrollment. 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 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. Stateor county-level fixed effects 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.

Because the introduction of policies is highly correlated with the onset of the COVID-19 pandemic, I focus on identifying the effects of the policies primarily by their removal. To do so, I set the period of analysis to begin in March 2020 so that the identifying variation primarily comes from the removal of flexibilities rather than their introduction. Occasionally, however, states will introduce or reintroduce flexibilities after March or April 2020. For the TWFE specifications, these changes also contribute to identifying the effects of policies on enrollment.

To further isolate variation based on removal, I supplement the two-way fixed effects estimates with event-study plots using the removal of EA. These analyses have event-study specifications analogous to the TWFE regressions and are also run using state-level or countylevel data:

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

The coefficients of interest are the  $\beta_r$ , which describe the effect of the policy r months after its removal. In the Appendix, I also generate event study plots using alternative difference-in-differences methods from Callaway and Sant'Anna (2021) and de Chaisemartin and D'Haultfœuille (2024) to check estimates' robustness to the assumption of heterogeneous treatment effects.

I argue that the presence and timing of state-level changes to SNAP policies are plausibly exogenous conditional on local labor market and pandemic conditions. The remaining identifying policy variation is likely due to political factors. The decision of whether to implement SNAP policy changes following the pandemic onset were responses not only to economic conditions, but also to the demands of the political process at the state and federal levels. At the state level, a combination of political leanings of state administrations and demands of constituents likely led some states to end pandemic-era SNAP flexibilities early or to not implement them at all. States also lost their ability to implement pandemic-specific flexibilities if they rescinded their own state of emergency declaration. At the federal level, the precise timing of both the expiration of the federal public health emergency declaration and the end of Emergency Allotments funding were the result of political negotiations in Congress. Intuitively, 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 causal effects of these policies on enrollment.

At the state level, the origin of residual policy variation across states is likely due to state administrations' political leanings. The presence and timing SNAP flexibility policies are correlated with states' political party in power (results not shown), consistent with the hypothesis that these policies were implemented for political in addition to economic reasons. Specifically, Republican states implemented fewer policies and removed them earlier than Democratic states, on average. This is consistent with other work which shows that local administrations can influence households' ability to access to benefits in order to reflect political or ideological preferences regarding means-tested programs (Fording, Soss and Schram, 2007; Herd and Moynihan, 2019).

For this empirical design, no anticipation is also a required assumption. For Emergency Allotments removal, 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, 2021e).<sup>33</sup> Therefore, some SNAP households likely learned about the benefit decreases by encountering a lower balance at the grocery store or when checking their balance online. Households were likely limited in anticipating other policy changes. They likely learned

 $<sup>^{33}</sup>$ Mass communications include "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 e).

about changes to application and recertification policies by engaging with the processes themselves, receiving state notices about their individual SNAP case weeks or months in advance, or through word of mouth.

## 7 Results

### 7.1 Effects on enrollment

Removal of increased benefit amounts (Emergency Allotments). Figure 10(a) shows the effect of EA's removal on SNAP benefits issued in an event study. The graph shows that EA removal cut states' total benefits issued by roughly half, on average. The immediate change in benefits issued is expected since the policy change should mechanically affect benefits issued as caseloads stay approximately fixed. Table 3 shows that, overall, the removal of EA decreased benefits by a statistically significant 48-49 percent in state-level specifications and 32-40 percent in county-level specifications after including additional controls.

The change in benefits issued because of Emergency Allotments is very large relative to historical SNAP expenditures. Adjusted for inflation to January 2019 dollars, SNAP distributed over \$9.7 billion per month in benefits at its peak in May 2021: more than double the \$4.3 billion distributed per month in early 2020 and substantially more than the maximum of \$6.9 billion per month distributed following the Great Recession.

The effect of removing EA 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, whereas behavioral responses occur when households newly apply and enroll (disenroll) in response to benefit increases (decreases). Behavioral responses through enrollment are expected in this context since changes in SNAP benefit levels due to Emergency Allotments were particularly large, especially for households near the income eligibility threshold. For example, a household with one person could see their monthly benefit drop from the maximum of \$234 to the minimum of \$19: a 92 percent decrease. Following Emergency Allotment removal, all households saw their benefits decrease by at least \$95 per month. Thus, some households might disenroll if the costs associated with completing re-enrollment requirements outweigh the value of lower SNAP benefit levels.

Consistent with behavioral enrollment responses, Figure 10(b) shows that EA removal decreased SNAP enrollment over time. The gradual decline in enrollment is consistent with households failing to renew their SNAP case as they face recertifications, which states stagger over time across their full caseloads.<sup>34</sup> The effects of EA removal on enrollment are large and economically meaningful. Table 3 shows that the removal of EA decreased households enrolled by 2.6-4.0 households per thousand people across specifications, or about 5 percent. This represents the average enrollment effect across households facing different sized changes in monthly SNAP benefits. A back of the envelope calculation suggests this behavioral response accounts for 12 percent of the overall increase in benefits during this period, with mechanical effects accounting for the remaining 88 percent.

**Robustness** One may be concerned that states strategize the timing of Emergency Allotment removal based on anticipated changes to SNAP enrollment, so that effects found for early-removing states are endogenous. In contrast, states that were required to remove Emergency Allotments in March 2023 due to national level policy changes ("late-removing" states) arguably face a more exogenous policy change that is unlikely to be correlated with other changes in SNAP enrollment. To determine if estimated effects are similar for each of these sets of states, Figures A.6 and A.7 show event study plots for SNAP benefits and enrollment, respectively, separating early-removing from late-removing states. Since there is no staggered adoption of EA removal among late-removing states, those specifications include a linear time trend in place of time fixed effects. Figure A.6 shows that EA removal had nearly identical impacts on benefit levels in both sets of states, although with less

 $<sup>^{34}\</sup>mathrm{Households}$  have no incentive to actively end their SNAP case before facing recertification.

power than the full specification. Overall, these checks allay the concern that results are driven by selective timing of policy removal or by selection of early- versus later-removing states.

The estimates are also robust to the assumption of heterogeneous treatment effects across states or counties. Figure A.8 shows event study plots of Emergency Allotment removal on SNAP enrollment and benefits issued using two-way fixed effects (TWFE) specifications, de Chaisemartin and D'Haultfœuille (2024), and Callaway and Sant'Anna (2021) estimators. The results are similar across estimators. Although estimates using Callaway and Sant'Anna (2021) are larger in magnitude across both households enrolled and benefits issued, the resulting elasticity estimates are similar to, if not even larger than, other estimates.<sup>35</sup>

Elasticity of enrollment with respect to benefits. Prior theoretical work on transfer programs considers the prospect that benefit amounts influence caseload size and composition (Kleven and Kopczuk, 2011), yet few studies of public benefit programs estimate enrollment elasticities with respect to benefit levels. To my knowledge, this is the first paper to document enrollment responses to changes in SNAP benefits, likely due to limited prior variation in benefit amounts across states and time. My estimates imply an average elasticity of SNAP enrollment with respect to benefit levels between 0.09-0.18.

For other safety net programs, existing estimates of elasticities of enrollment with respect to benefits focus on disability insurance and unemployment insurance. Bound and Burkhauser (1999) summarize the relevant literature on disability insurance enrollment, and they report elasticities of enrollment with respect to benefits between 0.3-0.4. The literature on unemployment insurance reports slightly different metrics: the elasticity of duration of receiving unemployment insurance with respect to benefits and, more typically, the elasticity of unemployment durations with respect to benefits. This literature finds elasticities of benefit durations between 0.07-0.78, with a median estimate of 0.35, and reports elasticities

 $<sup>^{35}</sup>$ Callaway and Sant'Anna (2021) estimates on households enrolled and benefits issued are likely larger in magnitude likely because, since all states are eventually treated, the estimator uses the last-treated cohort as a comparison cohort.

of unemployment durations from the U.S. ranging between 0.1-1.2, with a median estimate of 0.38 (Schmieder and von Wachter, 2016).

The enrollment elasticity in the SNAP setting may be smaller than the elasticities for disability insurance or unemployment insurance benefits for several possible reasons. First, in the disability insurance setting, the primary enrollment margin is application since the vast majority of enrollees participate for life. Meanwhile, the primary enrollment margin for SNAP and unemployment insurance is exit which typically occurs around recertifications or re-employment. That disenvert in SNAP is more passive than enrollment in disability insurance or unemployment insurance may explain differences in the estimated elasticities across programs. The figures may also differ due to other contextual factors, including compositional differences in the populations applying and differences in the time frames of expected benefits. DI receipt is expected for the rest of one's life, UI receipt is expected for several months, and a typical spell of SNAP benefits is on the order of months to a few years. Overall, baseline benefit levels and benefit changes in DI and UI are larger in magnitude than those in SNAP, so enrollee responses may be larger in turn. Finally, the in-kind nature of SNAP benefits may play a role in relatively smaller enrollment responses. Increases in SNAP benefits earmarked for groceries are only so valuable for households; at some point, increases to SNAP benefits may become so high that household grocery spending is no longer inframarginal to SNAP benefit amounts. Theoretically, households would then value SNAP benefit increases less than equivalent increases in cash benefits. DI and UI benefits do not have this limitation since they impact households' cash income.

Effects of all policies on enrollment. Having documented large SNAP enrollment changes and shown the effects of increased benefit amounts, the next exercise is to estimate the effects of each policy category and the unemployment rate on enrollment. Table 3 shows the full model with SNAP households per thousand people enrolled as the dependent

variable, and Figure 11 shows a visualization of the results.<sup>36</sup> Among all policies and the unemployment rate, EA accounts for the largest increase in SNAP enrollment. The presence of EA is associated with an increase in 2.6-4.0 households per thousand people or nearly half of the overall increase in enrollment during this period. The next most important policy is the recertification waiver, which is estimated to increase caseloads by 2.1-2.5 households per thousand people for each month it was in effect. This accounts for at least 11 percent of the observed increase in enrollment during this period. In contrast, the recertification and application simplification indicies are not statistically significant across 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; Ganong and Liebman, 2018). Figure 11 shows that unemployment rates contributed to SNAP enrollment increases in the early months of the pandemic, with effects decaying in later periods as employment rates recovered. However, the magnitudes of effects due to unemployment are exceeded by those of the EA policy; even a 10-percentagepoint increase in the unemployment rate would be less than the predicted effect of EA on enrollment in most specifications.

While the estimates for economic conditions and policy changes explain roughly 75 percent of observed changes in enrollment, the remaining share of enrollment changes remain unexplained. In particular, that enrollment has remained high even after most states removed pandemic era policy flexibilities is a puzzle. Prior literature has pointed to a similar, unexplained pattern in the slow decay of SNAP enrollment following the Great Recession (Ganong and Liebman, 2018). Understanding the factors contributing to the stickiness of SNAP enrollment following recessions remains open for future work.

Overall, these results demonstrate that policies were more important than economic conditions in accounting for the historic increase in SNAP enrollment since the COVID-19 pandemic. The Emergency Allotments policy and temporary waivers of recertifications

 $<sup>^{36}\</sup>mathrm{The}$  figure uses point estimates only, ignoring standard errors of the estimates, for the sake of visualization.

accounted for a majority of the enrollment increases during this period.

**Evidence that marginal applicants were relatively higher income** Facing higher benefit amounts and an easier process to apply for benefits, characteristics of the marginal SNAP applicant likely changed since the pandemic. Households marginal to apply are expected to be close to the SNAP eligibility threshold since expected benefits changes under Emergency Allotments were largest for this income group. Therefore, the average marginal enrollee and applicant is expected to be relatively higher income compared to the pre-period and compared to the period after Emergency Allotments were removed. In addition, simplified applications and re-certifications reduce expected enrollment costs, making the benefits of enrolling outweigh the newly lowered costs for some households.

In Appendix E, I show descriptive evidence that, indeed, marginal enrollees, applicants, and households interested in SNAP were likely higher income during COVID-19 in the presence of Emergency Allotments and simplified enrollment procedures. Specifically, I show that, at the onset of the pandemic, first-time enrollees increased, applicants were more likely to be found ineligible for SNAP, and states saw relatively fewer very low-income applicants who qualified for expedited application review. I also show that, following Emergency Allotment removal, a non-profit's SNAP eligibility screener completions decreased more among higher-income households compared to lower-income households. Each of these facts is consistent with a common driving factor: that new applicants during this period were relatively higher-income.

### 7.2 Effects on applications

The next exercise is to show the effects of each policy category and the unemployment rate on applications received and the application denial rate.<sup>37</sup> Note that these estimates come from a much smaller sample, with less variation, and representing fewer states compared to results

<sup>&</sup>lt;sup>37</sup>Analysis of recertifications and recertification denial rates are not possible due to limited data.

on total enrollment based on the data available, so results should be considered suggestive and should not be generalized nationwide. Nevertheless, key results are presented in Table A.3 and visualized in Figure A.9. The statistical model predicts an increase in applications at the beginning of the pandemic. However, the actual surge in applications was even larger than what the policy changes can explain. The additional surge in applications can likely be explained by the widespread and sudden economic need at the beginning of the pandemic over and above the increase in the unemployment rate. Later, the statistical prediction of applications roughly tracks the flow of observed applications. However, application levels remain steady if not slightly increasing in late 2023 despite the end of policy implementation at the end of the federal public health emergency.

A key takeaway of the statistical model is the offsetting effects of two policies: simplified applications and lessened recertification costs. Policies which simplify application processes are associated with increases in applications received. But these effects are offset by a decrease in applications due to recertification policies.

Why might policies lessening recertifications decrease applications received? 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 the negative association between recertification policies and applications received: when recertifications are removed or simplified, otherwise churning households do not need to newly reapply. These results suggest that churn is an important factor affecting a substantial proportion of SNAP caseloads and application flows. Figure A.10 shows direct evidence of churn reduction in Massachusetts during periods of recertification waivers, supporting this argument.

Across all policy categories, those which simplify applications account for the largest increase in SNAP applications received. Of equal importance are policies that simplify or temporarily remove recertifications, which are estimated to *decrease* applications by roughly the same absolute magnitude. The Emergency Allotment policy change is estimated to have no significant effect on applications received. Finally, the unemployment rate is positively associated with SNAP applications in most specifications, which is expected, but the effects are statistically insignificant.

### 7.3 Effects on Payment Error Rates

One possible concern about implementing policies which simplify application and recertification requirements is that they result in more payment error rates in SNAP. SNAP payment errors occur when a household's initial SNAP allotment differs from what they are ultimately determined eligible for following a Quality Control review. SNAP error rates are not fraud rates; payment accuracy errors in SNAP are largely unintentional and can happen if an applicant is determined eligible when they are not, or if an eligible participant is certified to receive either more or less benefits than they are entitled to.<sup>38</sup>

To conduct analyses on the effects of policies on SNAP payment errors, I use the SNAP Quality Control (QC) database.<sup>39</sup> The QC data represent monthly case reviews that are conducted by state agencies to assess the accuracy of eligibility determinations and benefit calculations for their SNAP caseloads. The underlying data are thus a repeated crosssection of households participating in SNAP.<sup>40</sup> I match households to policy variation based on state of residence and sample month, and I consider two types of outcomes. First, case payment error rates represent the share of cases whose were found to have payment error. Second, payment error rates refer to the difference in dollar amounts for cases with an error. "Overpayment" means a household was initially paid *more* than what they were ultimately determined eligible for, whereas "underpayment" means that the household was initially paid *less* than what they were ultimately determined eligible for. Note that the SNAP benefit amounts analyzed exclude any supplemental benefits from the Emergency Allotments policy. I run regressions similar to those described in Section 6, adding case demographic controls and weighting by the provided monthly sample weights.

<sup>&</sup>lt;sup>38</sup>https://www.fns.usda.gov/snap/qc

<sup>&</sup>lt;sup>39</sup>https://www.fns.usda.gov/snap/qc/database

<sup>&</sup>lt;sup>40</sup>QC data collection was limited due to the COVID-19 pandemic, so I use all available data from June 2020 through September 2023.

I find no evidence that the policies impacted case payment error rates. Table A.4 shows the estimated effects; none of the estimates are statistically significant and all are 2 percentage points or less.<sup>41</sup> Therefore, there is no evidence to suggest that any of the policies led to more "mistakes" in SNAP eligibility or benefit amount determinations.

If anything, I find some evidence that simplified application policies *reduced* SNAP benefits allotted to households. Table A.5 shows the estimated effects on payment error rates in dollar terms. Generally, simplified application policies are associated with lower overpayment amounts and higher underpayment amounts (in absolute value), although only the former effects are statistically significant. Together, simplified application policies are associated with an estimated \$10-11 *lower* benefit amount issued per case. This is consistent with the prospect that, during application interviews, caseworkers may help households navigate the complex SNAP application process (Cook and East, 2023). For example, caseworkers may help households identify all deductions that they are eligible for, which would decrease their reported net income and increase their SNAP benefit amount. In the presence of simplified application policies, which sometimes waive interview requirements, households may not receive such guidance from caseworkers and, thus, may not maximize the SNAP benefits they are eligible for. Caseworker assistance may be particularly relevant for households applying for SNAP for the first time.

Meanwhile, policies lessening recertification requirements are generally associated with higher overpayment amounts and lower underpayment amounts (in absolute value), although effects are largely insignificant. This is consistent with policies allowing recertification waivers or simplifications leading to less frequent updates of household information that could affect the benefit amount.

<sup>&</sup>lt;sup>41</sup>Higher unemployment rates are associated with higher correct payment rates, which is driven by a reduction in overpayment rates. However, the magnitude of the estimate is small: a 1 percentage point change in overpayment case rates over a pre-period average of 23 percent.

# 8 Conclusion

Policy changes made to SNAP at the onset of the COVID-19 pandemic provide a unique opportunity to understand how a more generous and accessible public safety net would affect caseload size and composition. In this paper, I study the effects of economic conditions and pandemic-induced policy changes to SNAP on program caseloads. I find that policies had a large role in explaining increasing caseloads during this period. The two most important policies were increased benefit amounts (Emergency Allotments) and temporary waivers of recertification requirements. Emergency Allotments contributed both to higher enrollment numbers for eligible households who would otherwise receive smaller benefit amounts. Temporary waivers of recertifications were also important for increasing caseloads since they kept already enrolled households from churning on the program rolls.

Overall, these results suggest government policies can be just as, if not more influential than economic conditions in determining caseloads. Thus, policy choices are indeed powerful levers for determining the reach and composition of U.S. safety net programs. These drastic changes occurred in response to an unprecedented set of pandemic-related concerns and economic need, but they offer the opportunity to inform future policy decisions during and outside of a crisis. Future work using this set of natural policy experiments also presents the opportunity to study the impacts of various SNAP policy changes on poverty, children and families' well-being, fertility, and labor supply. The long-run, impacts of a more generous safety net during the pandemic period remain open for future work.



Figure 1: SNAP Enrollment and Benefits Issued, 1996-2024

*Notes*: Shaded areas indicate recessions declared by the National Bureau of Economic Research. Totals of benefits issued adjusted for inflation to January 2019 dollars. Data aggregated from SNAP Data Tables (FNS, 2024).


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

*Notes*: This graph shows a stylized representation of the effect of Emergency Allotments on the SNAP benefit schedule. The original SNAP program design has benefit levels start at the maximum level per household size and phase out as a household's net income increases. Emergency Allotments, implemented in March 2020, provided supplements to increase SNAP benefits up to the maximum amount per household size for all households. Enhanced Emergency Allotments, implemented in April 2021, provided supplements of \$95 per month to those households not already receiving at least \$95 in Emergency Allotment supplements. Beginning in 2021, states began to remove Emergency Allotments and move back to the original SNAP benefit schedule. See the text for additional details.



Figure 3: Timing of Emergency Allotment Removal by State

*Notes:* The map shows the timing of removal of the Emergency Allotment supplemental benefits across states. For instance, "April 2021" means that March 2021 was the last month that households issued Emergency Allotment supplements. Alaska removed Emergency Allotments in September 2022 and Hawai'i removed Emergency Allotments in March 2023 (not pictured). Policies hand-collected by the author from USDA's website.



Figure 4: SNAP Policy Variation during the COVID-19 Pandemic

*Notes*: Figure shows share of states with various policies in effect during the federal public health emergency following the COVID-19 pandemic. See policy descriptions in Table 1. This graph includes all 50 states and the District of Columbia. Policies hand-collected by the author from USDA's website. For details, see Appendix F.



Figure 5: State Variation in Implementation of SNAP COVID-19 Policies

*Notes*: Maximum number of policies implemented is seven, including: (1) postpone expedited service interviews, (2) telephonic signature, (3) waive interviews, (4) not offer face-to-face interviews, (5) periodic reporting procedures to recertify households, (6) extend certification periods and temporarily waive periodic reports, and (7) Emergency Allotments. For additional details on policies, see Table 1. Dates chosen to represent the range of the COVID-19 federal public health emergency, which ran from March 2020 through June 2023.



Figure 6: Change in SNAP Enrollment (per thousand people) since the COVID-19 Pandemic

Notes: Figure shows average changes in SNAP enrollment at the state level following the COVID-19 pandemic. Coefficients come from the following regression:  $Y_{st} = \sum_{r \in [r, \bar{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$ , where  $Y_{st}$  is enrollment per thousand people in state s and year-month t. The coefficients plotted are the  $\beta_r$ , 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. Pre-period mean is 57.09.



Figure 7: Changes in SNAP Applications since the COVID-19 Pandemic

Notes: Panel (a) shows average changes in SNAP applications received at the state level following the COVID-19 pandemic using available data from six states (CA, LA, MD, MO, NM, and NC). The pre-period mean is 5.9 SNAP applications per thousand people. Panel (b) shows average changes in the denial rate for SNAP applications at the state level following the COVID-19 pandemic using available data from the same six states. The pre-period mean is 26.5 percent. Coefficients come from the following regression:  $Y_{st} = \sum_{r \in [r, \bar{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$ , 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.



Figure 8: SNAP Applications Approved Cannot Account for Enrollment Increases

*Notes*: This figure suggests that cumulative applications approved can account for only a small share of enrollment increases following the COVID-19 pandemic. To make application magnitudes comparable to enrollment magnitudes, the figure shows cumulative, average SNAP applications received, approved, and denied (per thousand people) relative to their pre-period trend and compares them to enrollment changes (also per thousand people). The underlying data is at the state level and includes six states where application data is available (CA, LA, MD, MO, NM, and NC). See Appendix F for details on constructing figure.



Figure 9: Changes in SNAP Recertifications since the COVID-19 Pandemic

*Notes*: Figure shows changes in the percent of SNAP cases facing a recertification following the COVID-19 pandemic. Sample includes six states where data is available: CA, CO, MA, NM, NC, and TX. The pre-period mean is 7.4 percent, which corresponds to an average certification period of 13.6 months. The post-period mean is 5.0 percent, which corresponds to an average certification period of 20 months.



(a) Change in Log of SNAP Benefits Issued



(b) Change in SNAP Enrollment (per thousand people)



*Notes*: Figures show event-study plots for the effect of Emergency Allotments (EA) removal on log of SNAP benefits issued, in Panel (a), and SNAP households enrolled per thousand people in Panel (b). Controls include state fixed effects, time fixed effects, and state unemployment rate and other SNAP policies.



(a) Predictors of SNAP Enrollment: Unemployment Rate and Policies





Figure 11: Predicted SNAP Enrollment Changes by Policies and Unemployment Rates

*Notes*: The figure takes coefficients from the fourth column of Table 3 and predicts changes in SNAP enrollment for the average state due to each policy category and economic conditions (as proxied by changes in local unemployment rates). Panel (a) shows predicted and observed enrollment time series using observed policy implementation across states. Each line adds a new policy, with its corresponding contribution shaded in the indicated color. "Simplified Recerts" is negative, so it *subtracts* from the previous line. The black line shows observed SNAP enrollment in the average state as a point of comparison. Panel (b) summarizes the contribution of each factor to observed enrollment changes, averaged across the months of the COVID-19 federal public health emergency (March 2020 through June 2023).

Policy category	Policy	Description		
Benefit increases	1. Emergency allotments	Increased benefit amounts to the maximum amount based on household size		
Simplified Application	2. Initial interviews waived	Interview requirements for initial applica- tions removed entirely		
	3. Not offering face-to-face interviews	No face-to-face interviews offered		
	4. Postpone expedited service interviews	Allows states to enroll qualified households without completing an interview		
	5. Telephonic signature	Assists the state and outreach agencies in processing applications, by allowing for ver- bal attestation to submit applications		
No Recertification	6. Extend certification periods	Lengthen certification periods, usually for up to 6 months and sometimes less. In other words, temporarily removes recertifi- cation requirements.		
	7. Temporarily waive periodic reports <sup>*</sup>	Removes requirement of providing a status update		
Simplified Recertification	8. Recertification interviews waived	Interview requirements for recertifications re- moved entirely		
	9. Periodic reporting procedures to recertify households	Effectively lessens the requirements to recer- tify		
	10. Not offering face-to-face interviews	No face-to-face interviews offered		

 Table 1: SNAP Policies during the COVID-19 Pandemic

Notes: \*Omitted from analyses due to high correlation with extended certification periods.

	Individuals	Households	Issuance	Applications	App denial rate	Recerts
Post-pandemic	7.40***	5.63***	12,411***	0.79**	13.33***	-2.38**
	(1.99)	(1.15)	(863)	(.35)	(3.04)	(.80)
Pre-period mean	112.81	57.09	13,706	5.41	26.46	7.08
Percent impact	6.56%	9.86%	90.55%	14.6%	50.38%	-33.62%
R-squared	0.925	0.932	0.758	0.469	0.303	0.327
Ν	2,754	2,754	2,752	602	318	281
Num. states	51	51	51	13	6	6

Table 2: The COVID-19 Pandemic and SNAP Enrollment

*Notes*: Sample sizes change across columns based on data availability; see Table A.2 for details. Underlying data includes January 2019 through June 2023. Outcomes are per thousand people unless otherwise specified. Application denial rate is in raw percent terms. Recerts refers to the share of cases facing a recertification in a given month. Data is at the state level. Standard errors are clustered at the state level.

	SNAP Enrollment per 1,000 People				Log(Total SNAP Benefits Issued)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Emergency Allotment	2.61***	3.54**	3.68***	4.02**	0.48***	0.49***	0.40***	0.32***	
	(0.96)	(1.45)	(1.10)	(1.47)	(0.02)	(0.04)	(0.09)	(0.11)	
No Recertifications	$3.58^{***}$	$2.49^{***}$	$2.15^{**}$	2.29***	$0.05^{***}$	0.04**	0.05	0.04	
	(0.98)	(0.74)	(0.96)	(0.76)	(0.02)	(0.02)	(0.05)	(0.03)	
Simplified Recertification	3.25	1.69	2.01	-2.04	0.03	-0.03	-0.04	-0.01	
	(2.77)	(1.93)	(2.07)	(1.63)	(0.04)	(0.03)	(0.10)	(0.08)	
Simplified Application	-4.06	-0.90	-3.56	4.03	-0.05	0.06	0.01	0.04	
	(3.28)	(2.48)	(3.84)	(2.96)	(0.04)	(0.05)	(0.10)	(0.14)	
Unemployment Rate	0.205	$0.556^{**}$	0.214	$0.344^{*}$	-0.007	0.003	0.000	0.003	
	(0.275)	(0.223)	(0.175)	(0.168)	(0.005)	(0.004)	(0.006)	(0.004)	
Total effect of SNAP policies	5.38	6.82	4.28	8.30	0.50	0.56	0.42	0.39	
Geographic level of analysis	State	State	County	County	State	State	County	County	
Num. states	51	51	21	21	50	50	17	17	
Time period	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	
	$Mar \ 2024$	Mar 2022	$Mar \ 2024$	Mar 2022	Mar 2024	Mar 2022	Mar 2024	Mar 2022	
Geography fixed effects	Х	Х	Х	Х	Х	Х	Х	Х	
Year-month fixed effects	Х	Х	Х	Х	Х	Х	Х	Х	
COVID controls		Х		Х		Х		Х	
R-squared	0.9614	0.9741	0.9681	0.9772	0.9818	0.9922	0.9928	0.9954	
Ν	2,499	1,275	$75,\!950$	38,750	$2,\!450$	1,250	63,844	$32,\!575$	

Table 3: Effects of Policies on SNAP Enrollment and Total Benefits Issued

*Notes*: COVID controls include other pandemic related policies and COVID case controls. Sample sizes are smaller when COVID policy controls are included because these controls are only collected through March 2022. Number of states is smaller when using county-level data due to data availability; see Table A.2 for details. "Total effect of SNAP policies" sums the four policy coefficients in the column. Standard errors are clustered at the state level.

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# A Appendix Figures and Tables



Figure A.1: Changes to SNAP Benefit Levels since the COVID-19 Pandemic

*Notes*: Graphic summarizes various policies changes to SNAP benefit amounts between 2021-2023. Changes include the removal of Emergency Allotments (EA), which some states began removing in 2021. "COLA" refers to annual Cost Of Living Adjustments, which adjust SNAP benefit amounts based on inflation. "TFP re-evaluation" refers to a revision of the Thrifty Food Plan, which sets SNAP benefit levels based on the estimated cost of eating a healthy diet with food-at-home consumption. "SSA COLA' refers to Social Security Administration Cost of Living Adjustments. The source of the graphic is https://www.fns.usda.gov/snap/2023-benefit-changes



Figure A.2: Effects of Emergency Allotments on Benefits Issued

Notes: Figure shows average changes in the log of SNAP benefits issued at the state level following the COVID-19 pandemic. Coefficients come from the following regression:  $Y_{st} = \sum_{r \in [\underline{r}, \bar{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$ , where  $Y_{st}$  is log SNAP benefits issued in state s and year-month t. I define r = 0 as March 2020. The coefficients plotted are the  $\beta_r$ , 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.



(c) Applications denied per thousand people

Figure A.3: Changes in SNAP Applications since the COVID-19 Pandemic

Notes: Figure shows average changes in SNAP applications received (Panel (a)), applications approved (Panel (b)), and applications denied (Panel (c)) at the state level following the COVID-19 pandemic using available data from six states (CA, LA, MD, MO, NM, and NC). The pre-period means are 5.9, 4.2, and 1.5 SNAP applications per thousand people, respectively. Coefficients come from the following regression:  $Y_{st} = \sum_{r \in [\underline{r}, \overline{r}] \setminus \{-1\}} \beta_r \cdot \mathbf{1}(r = t) + \alpha_s + \varepsilon_{st}$ , 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.



Figure A.4: Google Trends for SNAP and Unemployment Benefits

*Notes*: The figure shows national Google Trends data in the United States for two search "topics": the Supplemental Nutrition Assistance Program (SNAP) and Unemployment Benefits. The y-axis scale is benchmarked at 100 for the month of largest search volume across both topics.





Notes: Gray shaded areas indicate months when recertifications were waived.

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(b) States Removing Emergency Allotments on March 2023

Figure A.6: Effects of Emergency Allotment Removal on Benefits Issued: Early vs. Late Removing States

*Notes*: Event plots for the effect of Emergency Allotments (EA) removal on issuance for states removing Emergency Allotments before March 2023 in Panel (a) and states removing Emergency Allotments on March 2023 in Panel (b). Controls in Panel (a) include state fixed effects, time fixed effects, state unemployment rate, and controls for other SNAP policies. Note: reporting procedures controls omitted due to insufficient variation. Controls in Panel (b) include state fixed effects, a linear time trend, state unemployment rate, and controls for other SNAP policies (including reporting procedures).



(b) States Removing Emergency Allotments on March 2023

Figure A.7: Effects of Emergency Allotments Removal on Enrollment: Early vs. Late Removing States

*Notes*: Event plots for the effect of Emergency Allotments (EA) removal on issuance for states removing Emergency Allotments before March 2023 in Panel (a) and states removing Emergency Allotments on March 2023 in Panel (b). Controls in Panel (a) include state fixed effects, time fixed effects, state unemployment rate, and controls for other SNAP policies. Note: reporting procedures controls omitted due to insufficient variation. Controls in Panel (b) include state fixed effects, a linear time trend, state unemployment rate, and controls for other SNAP policies (including reporting procedures).



Figure A.8: Effects of Emergency Allotment Removal: Robustness

*Notes*: Figure shows estimates of the effects of Emergency Allotment Removal on log of SNAP benefits issued and SNAP enrollment per thousand. Two-way fixed effects (TWFE) estimates in blue; estimates using methods from de Chaisemartin and D'Haultfœuille (2024) in orange; estimates using methods from Callaway and Sant'Anna (2021) in green. Estimates generated using state- and county-level data. Regressions include controls for other SNAP policies and local unemployment rates.







(b) Predictors of SNAP Applications during COVID-19 Pandemic Emergency

Figure A.9: Predicted SNAP Application Changes by Policies and Unemployment Rates

Notes: The figure takes coefficients from the fourth column of Table A.3 and predicts SNAP applications for the average state due to each policy category and economic conditions (as proxied by changes in local unemployment rates). Panel (a) shows predicted and observed application time series using observed policy implementation across states. Each line adds a new policy, with its corresponding contribution shaded in the indicated color. "No Recerts" and "Simplified Recerts" are negative, so they subtract from the previous line. The black line shows observed SNAP applications in the average state where data is available as a point of comparison. Panel (b) summarizes the contribution of each factor to observed application changes, averaged cross the months of the COVID-19 federal public health emergency (March 2020 through June 2023). 62



Figure A.10: Churn rates and recertifications

*Notes:* Gray shaded areas indicate months when recertifications were waived. California did not waive recertifications during the period that data on churn are available. Massachusetts calculates churn by comparing new applications received to the active caseload in the previous 90 days. California's definition of churn is the share of applications from households with an active case within the previous four calendar months. The secondary definition of churn in California limits to applications from households that had a recertification or interim report (SAR 7 or RRR) due within the prior four full calendar months. Here, "recerts" for California includes cases with a recertification or interim report (SAR 7 or RRR) due that month.

Fiscal Year									
Household size	2019	2020	$\begin{array}{c} 2021:\\ 10/2020-\\ 12/2020 \end{array}$	$\begin{array}{c} 2021;\\ 01/2021;\\ 09/2021 \end{array}$	2022	2023	2024		
1	192	194	204	234	250	281	291		
2	353	355	374	430	459	516	535		
3	505	509	535	616	658	740	766		
4	642	646	680	782	835	939	973		
5	762	768	807	929	992	1116	1155		
6	914	921	969	1114	1190	1339	1386		
7	1011	1018	1071	1232	1316	1480	1532		
8	1155	1164	1224	1408	1504	1691	1751		
+1	144	146	153	176	188	211	219		

Table A.1: Maximum benefit amounts (\$) by household size

Notes: +1 refers to amount for each additional person after 8 individuals. FY 2021 has two amounts because the Consolidated Appropriations Act of 2021 increased SNAP benefits by raising maximum allotments to 115 percent of the June 2020 value of the Thrifty Food Plan (TFP). Source: https://www.fns.usda.gov/snap/allotment/COLA

Variable	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
		VAWI
Benefits issued	All 50 states $+$ DC	AL AZ CA CO FL IA ME MI MN MO MT NY PA
		SC SD TN TX VA WI
Adults and children	AZ KS LA MA MI MO NJ NM OH OR	AZ KS LA MI NJ OH OR SD TX
	SD TX WI	
Infants	OR TX WI	OR TX
Elderly	MA MO NJ OR TX WI	NJ OR TX
Disabled	MA OR NJ	NJ
Males & females	NM WI	
Race & ethnicity		
Applications received	AR CA CO* CT* IN LA MD MA*	AR <sup>**</sup> CA CO <sup>*</sup> LA MD MO MT <sup>*</sup> NM NC
	MO MT* NM NC TN* TX*	
Applications approved & denied	AR CA LA MD MO NM NC	AR <sup>*</sup> 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
First-time households	W1 CA	
Case flows		CA CA NIM NC
Recertifications total	CA CO MA NM NC TX	CA NM NC
Recertifications detail		CA NM
Classe closure details		
Courn rate		
Government agency statistics	UA MA	

Table A.2: Data availability

\*Data sometimes 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

	SNAP Applications per 1,000 People				Application denial rate (%)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Emergency Allotment	0.05	0.05	-0.32	0.53	1.1	-5.0	-0.8	-2.6	
	(0.20)	(0.57)	(0.27)	(0.48)	(3.5)	(9.6)	(1.3)	(8.9)	
No Recertifications	-0.38	-0.08	-1.05**	0.00	3.8	-3.4***	5.2	6.5	
	(0.28)	(0.23)	(0.30)	(0.67)	(3.9)	(0.5)	(2.5)	(3.2)	
Simplified Recertification	-0.60	-1.44	-0.25	-1.74	$19.4^{*}$	-3.4	6.7	-15.0	
	(1.15)	(1.39)	(0.96)	(1.09)	(7.0)	(5.3)	(5.6)	(10.6)	
Simplified Application	0.90	0.88	1.13	2.32**	-22.1**	35.1	-13.4	18.3*	
	(0.99)	(1.85)	(0.91)	(0.81)	(3.9)	(16.6)	(8.9)	(6.7)	
Unemployment Rate	0.122	-0.014	0.086	0.077	-1.406	-0.564	-0.644	-0.444	
	(0.222)	(0.249)	(0.059)	(0.087)	(3.721)	(3.158)	(0.857)	(0.582)	
Total effect of SNAP policies	-0.03	-0.59	-0.49	1.10	2.2	23.3	-2.3	7.3	
Geographic level of analysis	State	State	County	County	State	State	County	County	
Num. states	7	7	6	6	4	4	4	4	
Time period	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	Mar 2020-	
	$Mar \ 2024$	Mar 2022	$Mar \ 2024$	Mar 2022	$Mar \ 2024$	Mar 2022	Mar 2024	Mar 2022	
Geography fixed effects	Х	Х	Х	Х	Х	Х	Х	Х	
Year-month fixed effects	Х	Х	Х	Х	Х	Х	Х	Х	
COVID controls		Х		Х		Х		Х	
R-squared	0.6543	0.7688	0.5385	0.4749	0.4826	0.7492	0.4223	0.5798	
Ν	343	175	19,208	9,800	196	100	14,847	7,575	

### Table A.3: Effects of Policies on SNAP Applications

*Notes*: COVID controls include other pandemic related policies and COVID case controls. Sample sizes are smaller when COVID policy controls are included because these controls are only collected through March 2022. Childcare closure variable omitted due to collinearity. Number of states is smaller when using county-level data due to data availability; see Table A.2 for details. "Total effect of SNAP policies" sums the four policy coefficients in the column. Standard errors are clustered at the state level.

	Overpayment		Underp	ayment	Correct payment	
	(1)	(2)	(3)	(4)	(5)	(6)
Emergency Allotment	-0.01	-0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
No Recertifications	0.01	0.01	-0.01	-0.01	0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Simplified Recertification	0.01	0.01	-0.02	-0.02	0.01	0.01
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)
Simplified Application	-0.02	-0.01	0.02	0.02	-0.01	-0.01
	(0.03)	(0.03)	(0.02)	(0.01)	(0.04)	(0.04)
Unemployment Rate	-0.012**	-0.012**	0.001	0.001	$0.012^{**}$	$0.011^{**}$
	(0.006)	(0.005)	(0.002)	(0.003)	(0.005)	(0.005)
Total effect of SNAP policies	-0.01	-0.01	0.00	0.00	0.01	0.01
Pre-period mean	0.23	0.23	0.13	0.13	0.64	0.64
Num. states	51	51	51	51	51	51
State fixed effects	Х	Х	Х	Х	Х	Х
Year-month fixed effects	Х	Х	Х	Х	Х	Х
Household controls		Х		Х		Х
Weighted	Х	Х	Х	Х	Х	Х
R-squared	0.0127	0.0385	0.0090	0.0277	0.0140	0.0700
Ν	102,748	102,748	102,748	$102,\!748$	102,748	102,748

Table A.4: Effects of Policies on Case Payment Error Rates

*Notes*: Data from SNAP Quality Control Files. Underlying data is a repeated cross-section of households. Households are matched to policy variation based on state of residence and sample month. Case error rates represent the share of cases whose initial SNAP allotments were different than what they were ultimately determined eligible for following a Quality Control review. "Overpayment" is an indicator variable for whether a household was initially paid *more* than what they were ultimately determined eligible for. "Underpayment" means that the household was initially paid *less* than what they were ultimately determined eligible for. "Correct payment" means that the household was paid exactly what they were ultimately determined eligible for. Regressions weighted using provided monthly sample weights. Pre-period mean takes the mean of the outcome variable for calendar year 2019. Regressions estimated using available data from June 2020 through September 2023. Household controls include number of: children aged 0-4, aged 5-17, elderly, disabled, non-disabled adults in childless households; indicators for: any non-citizens, TANF receipt; and dummies for household size.

	Dollar error (net)		Dollar e	error (abs)	Overpayment (\$)		Underpayment (\$)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Emergency Allotment	-2.53	-2.57	-0.74	-0.93	-1.64	-1.76	0.90	0.83
	(1.81)	(1.80)	(2.88)	(2.82)	(2.29)	(2.25)	(0.75)	(0.72)
No Recertifications	2.09	$2.28^{*}$	-0.33	-0.12	0.88	1.08	-1.21*	-1.20*
	(1.40)	(1.35)	(1.28)	(1.31)	(1.15)	(1.14)	(0.69)	(0.70)
Simplified Recertification	$7.63^{*}$	7.20	-0.38	-0.44	3.62	3.37	-3.98	-3.79
	(4.55)	(4.41)	(3.25)	(3.24)	(2.68)	(2.73)	(2.90)	(2.75)
Simplified Application	-10.71**	$-10.28^{**}$	-2.38	-2.27	-6.54**	-6.27**	4.14	3.99
	(4.80)	(4.70)	(2.97)	(3.03)	(2.78)	(2.88)	(2.87)	(2.71)
Unemployment Rate	-0.439	-0.510	-0.695	-0.712	-0.569	-0.613	-0.125	-0.098
	(0.648)	(0.643)	(0.569)	(0.584)	(0.541)	(0.547)	(0.281)	(0.280)
Total effect of SNAP policies	-3.52	-3.36	-3.84	-3.76	-3.69	-3.58	-0.14	-0.18
Pre-period mean	8.13	8.13	16.72	16.72	12.43	12.43	4.30	4.30
Num. states	51	51	51	51	51	51	51	51
State fixed effects	Х	Х	Х	Х	Х	Х	Х	Х
Year-month fixed effects	Х	Х	Х	Х	Х	Х	Х	Х
Household controls		Х		Х		Х		Х
Weighted	Х	Х	Х	Х	Х	Х	Х	Х
R-squared	0.0063	0.0149	0.0100	0.0562	0.0085	0.0358	0.0062	0.0295
Ν	102,748	102,748	102,748	102,748	102,748	102,748	102,748	102,748

Table A.5: Effects of Policies on Payment Error Rates (\$)

*Notes*: Data from SNAP Quality Control Files. Underlying data is a repeated cross-section of households. Households are matched to policy variation based on state of residence and sample month. Payment error rates refer to the difference in dollar amounts between households' initial SNAP allotments and what they were ultimately determined eligible for following a Quality Control review. "Dollar error (net)" equals the difference between the initial benefit issued and the final ("correct") benefit amount, so that positive values are overpayments and negative values are underpayments. "Dollar error (abs)" equals the absolute value of the difference between the initial benefit issued and the final ("correct") benefit amount, so that positive values are overpayments and negative values are underpayments. "Dollar error (abs)" equals the absolute value of the difference between the initial benefit issued and the final ("correct") benefit amount, so both overpayments and underpayments are positive. "Overpayment (\$)" equals the absolute value of the difference for overpayments only, and is zero otherwise. "Underpayment (\$)" equals the absolute value of the difference for underpayments only, and is zero otherwise. Regressions weighted using provided monthly sample weights. Pre-period mean takes the mean of the outcome variable for calendar year 2019. Regressions estimated using available data from June 2020 through September 2023. Household controls include number of: children aged 0-4, aged 5-17, elderly, disabled, non-disabled adults in childless households; indicators for: any non-citizens, TANF receipt; and dummies for household size.

## **B** 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.

### **B.1** 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.<sup>42</sup> To request waivers, state officials usually must provide justification in a request letter, sometimes supported by statistics.<sup>43</sup> 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.<sup>44</sup>

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

<sup>&</sup>lt;sup>42</sup>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." (USDA-FNS, 2020b) 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" (USDA-FNS, 2021 d). 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 was a separate policy not included in this categorization. Throughout this paper, I do not distinguish between waivers, adjustments and options.

 $<sup>^{43}</sup>$ States submit requests through the SNAP Waiver Information Management System (WIMS) (USDA-FNS, 2021*e*).

<sup>&</sup>lt;sup>44</sup>This is even moreso the case for "CR options" policies, which do not require review or approval by FNS.

under a "blanket approval" (USDA-FNS, 2020a). 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 basis (USDA-FNS, 2021d). 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, 2021c).

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, many states desired to continue using waivers, so 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 (USDA-FNS, 2021*d*). For May 2021, FNS also adjusted their guidance, allowing for waiver approvals for up to 8 months. For January 2022, FNS adjusted their guidance to approve waivers for up to 3 months at a time (USDA-FNS, 2021*c*).

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, 2021c). Indeed, the flexibilities were allowed until the end of the federal public health emergency, which was removed at the end of June 2023.

### **B.2** Interview policies

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.

### **B.3** 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 low-income households. Previously, households eligible for expedited services required an interview (USDA-FNS, 2006). 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).
# **B.4** 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. Certifications 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, 2021c).

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. This policy only began later in 2020, as an intermediate policy between waiving recertifications altogether and bringing back typical recertification policies. FNS requested that this policy should be applied only to cases that had not received another recertification extension or adjustment.

# **B.5** 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), waiving fair hearing timeframes (9 states), and expanding online grocery purchasing using SNAP benefits (eventually all 50 states).

# C Enrollment Results by Demographic Groups

Overall enrollment changes mask changes in the demographic composition of SNAP enrollees since the onset of the pandemic. Table C.1 shows that, overall, adult enrollment grew by 13 percent, while children's enrollment increased by only 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 57.5 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, Figure C.1 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 (Bauer et al., 2020). 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. Recent qualitative work suggests a potential mechanism: that perceived stigma may have lessened during the pandemic as people recognized that social safety net benefit receipt was more common (Amaral and Gonzales, 2022; Heath, Holcomb and Pukelis, 2022).

	Adults $(\%)^*$	Adults	Children	Elderly	Infants	Disabled
Post-pandemic	1.89***	9.59***	2.49**	2.53**	-0.53	2.14*
	(.35)	(2.34)	(1.12)	(.93)	(1.00)	(.64)
Pre-period mean	55.64	67.52	52.14	16.43	16.31	30.82
Percent impact	3.40%	14.20%	4.78%	15.40%	-3.25%	6.94%
R-squared	0.966	0.966	0.966	0.946	0.668	0.991
Ν	640	640	640	262	125	137
Num. states	13	13	13	6	3	3

Table C.1: Effects of Pandemic on SNAP Enrollment by Demographic Groups

Notes: Adults (%) refers to adults as a percent of all individuals enrolled. Outcomes are per thousand people, unless otherwise specified. Sample is state-level data. Sample sizes differ because not all states provide demographic-specific enrollment information. For additional detail on data availability, see Table A.2.



Figure C.1: Enrollment by Demographic Groups

*Notes*: The figures show counts by category normalized so that the value for March 2020 equals 100. Data available only from New Mexico and Wisconsin for gender, and New Mexico only for ethnicity and race.

# D 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.

Recertification denial rates could have changed since the pandemic for several reasons, including policy, government capacity, and enrollee composition. First, policies which simplify recertification procedures could decrease the 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, then the recertifications as they become ineligible (Gray, 2019). In this case, an increase in the denial rate should occur with a delay, as these households' economic standing recovers and they eventually face recertifications. Looking at the timing of changes in recertification denial rates can point to which of these factors is likely to dominate.

## D.1 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.

Figure D.1 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, Figure A.5(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; how-

ever, 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 A.5(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 D.1(d) shows cumulative case clo-

sures 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. (Appendix F 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. Figure A.5(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.



(e) New Mexico

Figure D.1: Cumulative Recertification Denial Rates

Notes: Gray shaded areas indicate months when recertifications were waived.

# D.2 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. 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.

Figure A.10(a) 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 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.

Data from California confirms that churn rates are a similar level in at least one other state, shown in Figure A.10(b). However, data on churn rates are not available during the short period that California extended certification periods, so the relationship between that policy and churn cannot be studied in this context.

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).

# E Evidence that marginal applicants were relatively higher income

Facing higher benefit amounts and an easier process to apply for benefits, characteristics of the marginal SNAP applicant likely changed since the pandemic. Households marginal to apply are expected to be close to the SNAP eligibility threshold since expected benefits changes under Emergency Allotments were largest for this income group. Therefore, the average marginal enrollee and applicant is expected to be relatively higher income compared to the pre-period and compared to the period after Emergency Allotments were removed. In addition, simplified applications and re-certifications reduce expected enrollment costs, making the benefits of enrolling outweigh the newly lowered costs for some households. In this section, I show evidence that marginal enrollees, applicants, and households interested in SNAP were likely higher income during COVID-19 in the presence of Emergency Allotments and simplified enrollment procedures.

# E.1 Descriptive facts from state case studies

More first-time SNAP enrollees. First, I find evidence that first-time enrollees in SNAP increased at the onset of the COVID-19 pandemic. Figure E.1 shows that the fraction of households on SNAP for the first time more than doubled from about 1.26 percent to over 3 percent of households at the pandemic onset in Wisconsin, where data is available. First-time enrollees may be relatively higher income and pushed to apply in the face of worsening economic conditions following COVID-19. Aside from signaling a change in applicant composition, an increase in first-time applicants may help explain initial surges in the application denial rate—either if first-time applicants are more likely to be relatively higher income or if they are less likely to successfully complete the application process given a lack of familiarity.

Applicants were more likely to be found ineligible. 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 where data is available, 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 (Figure E.2(a)). This suggests that the average household applying during this period was relatively higher income, at least in these two states.

**Fewer expedited, very low income applicants.** If the income of a household applying for SNAP is sufficiently low, the state agency must review its application within 7 days rather than the typical 30 day window. Eligibility for such "expedited" application reviews are reserved for especially low-income households. Therefore, a decrease in the share of applicants that qualify for expedited reviews would suggest that the applicant pool is higher income, on average. Indeed, I find evidence that in California, where data is available, applicants were less likely to qualify for expedited reviews following the onset of the COVID-19 pandemic. Figure E.2(b) shows that the share of applications eligible for expedited review dropped from around 33 percent to 20 percent in early 2020, before steadily climbing back to nearly 30 percent.

Each of these descriptive facts is likely driven by a common confounding factor: new applicants during this period were relatively higher income on average. However, each of these changes occurred at the onset of the COVID-19 pandemic, making it difficult to disentangle whether they are due to the Emergency Allotment benefit increase, simplified enrollment procedures, changes in household economic conditions, or behavior associated with the COVID-19 pandemic. To determine whether changes in enrollee or applicant composition are related to changes in benefit amounts, it is useful to consider instead the removal of Emergency Allotments and, ideally, look beyond single state case studies.

# E.2 Evidence from SNAP eligibility screeners

Aside from changes in applicant and enrollee composition, I provide some evidence that those marginally interested in applying for SNAP were relatively higher income under increased benefit amounts. To show this, I turn to data on engagement with an online SNAP eligibility screener from the non-profit mRelief.

mRelief SNAP Eligibility Screeners Data The non-profit organization mRelief aims to connect households across the country to SNAP benefits. One way they accomplish this is by providing a streamlined, online SNAP eligibility screener available for all 50 states. The eligibility screener is available online.<sup>45</sup>

Individuals are typically routed to the screener through web advertising on social media (e.g. Facebook), from community outreach partners, or, less commonly, by directly visiting the site. Individuals can complete the screener online or on a mobile-friendly device. The eligibility screener asks basic questions about household demographics, and assesses eligibility based on categorical eligibility and gross income from the last month. Following the eligibility screener, respondents can click on a link to start an application, either on the non-profit's website, where they can access a streamlined version of the application and then submit it to the state, or on their state's website directly. Around late 2023, mRelief offered its own version of the SNAP application in at least six states.

Aggregate data on screeners was provided by mRelief. The data source from mRelief's screeners is available for all 50 states, but accounts for a very small share of SNAP applicants and is unlikely to be representative of all SNAP applicants. This is a unique data source, as it provides some information on the characteristics of households interested in applying for SNAP across all 50 states. This information is otherwise not available in existing datasets,

<sup>&</sup>lt;sup>45</sup>https://apply.mrelief.com/screener

such as surveys conducted by the Census Bureau or data readily available from state agencies, which typically capture only characteristics of SNAP enrollees or, occasionally, applicants. A key limitation, however, is that it captures a very small fraction of SNAP enrollees who are likely a selected, non-representative sample. Selection of the type of households engaging with this online platform may also change over time, so results should be interpreted with caution.

**SNAP eligibility screener completions decrease more among higher-income households following EA removal** Figure E.3(a) shows the count of mRelief online SNAP eligibility screeners completed over time, with color shadings indicating different categories of household income. Total screener completions roughly track key time points: screeners increase at the beginning of the pandemic and decrease when most states remove Emergency Allotments. Moreover, fluctuations in screener completions appear to be driven by relatively higher income groups, whereas completions among households reporting no income remain quite steady over time.

To show this pattern more clearly, Figure E.3(b) plots state-level changes in log screener completions for low and high income groups relative to the timing of Emergency Allotment removal. If EA indeed attracted relatively higher income households to SNAP, then upon EA removal, we would expect to see a larger drop in screeners for high compared to low income households. This is exactly what Figure E.3(b) shows, although the effect is somewhat noisy and short-lived. Nevertheless, these data provide some suggestive evidence that the marginal household interested in SNAP—and therefore likely the marginal applicant—was relatively higher income during the pandemic. Furthermore, results suggest that the structure of Emergency Allotments increasing benefits most for households close to the SNAP eligibility threshold may have contributed to this change in applicant composition.



Figure E.1: First-time SNAP households

Notes: Graph from Wisconsin only.



(b) Share of expedited applications (CA)

Figure E.2: Evidence of higher average incomes of applicants

*Notes*: Panel (a) shows applications denied for a need-based reason as a percent of all applications received for California and New Mexico. Panel (b) shows expedited applications as a share of all applications found to be eligible for SNAP for California. Expedited applications must be processed within 7 days instead of the typical 30 days. Expedited status is reserved for high-need households.



(a) Eligibility Screener Completions by Household Income



(b) Eligibility Screener Completions by Income, relative to Emergency Allotment Removal

Figure E.3: Trends in SNAP Application Eligibility Screeners Completed Since the COVID-19 Pandemic

Notes: Data are SNAP eligibility screener completions through the nonprofit mRelief completed online or SMS. Panel (a) shows total screener completions over time and by income group. Income groups refer to gross income eligibility for SNAP specific to the respondent's state. Elig = household is gross-income eligible. No inc = household reports no income. Inc range 1 = household reports non-zero income in lowest income range. Inc range 2 = household reports non-zero income in the second lowest income range. Inc range 3 = household reports non-zero income in the third lowest income range. Inc range 4 = household reports non-zero income in the fourth income range: the highest range for which a household is still gross-income eligible for SNAP. Inc over limit = household reports non-zero income in an income range above its state's gross-income eligibility limit. Inc missing = Income data not provided or not available. Panel (b) shows the log of within-state eligibility screener completions relative to the timing of the state's removal of Emergency Allotment for two groups: "low" and "high" income groups. The "low" income group reported no income in their eligibility screener and the "high" income group reported income over the gross-income eligibility limit.

# F Data Appendix

# F.1 Data descriptions

# F.1.1 Policy waivers data

I collect new state-month level data on 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. 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 collect policy information beginning March 2020 for all policies. I impute all policies as zero before March 2020. This is reasonable for most policies. Based on the SNAP Policy Database, none of the policies studied here were implemented before the pandemic except waiving face-to-face interviews.

I omit one of the 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.

#### F.1.2 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.

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.

#### F.1.3 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.

#### F.1.4 Controls

I collect monthly state-level and county-level unemployment rates from the Bureau of Labor Statistics Local Area Unemployment Statistics series. I use the seasonally adjusted statelevel data and unadjusted county-level data based on availability.

# F.2 Figure 8 construction

The gray line in Figure 8 shows the result of the following exercise:

- Take the cumulative sum of the event study coefficients from 7(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.

The result is a cross-state average cumulative applications (received, approved, or denied) relative to the pre-period. The figure also plots average enrollment changes for the same set of states. Enrollment magnitudes and cumulative application magnitudes are comparable in the sense that they both reflect changes in the *stock* of possible SNAP cases in a given month.

# F.3 Recertification definitions

#### F.3.1 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

# F.3.2 Recertifications approved

- CA: recertifications disposed of during the month, determined eligible
- NM: renewals resulting in approvals

## F.3.3 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.

## F.3.4 Recertifications denied, need-based reasons

- CA: recertifications disposed of during the month, determined ineligible
- NM: renewals resulting in need-based closures
- LA: 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.

### F.3.5 Recertifications denied, procedural reasons

- CA: overdue recertifications (caused by CWD) during the month. (Not really denied for procedural reasons)
- NM: renewals resulting in procedural closures
- LA: 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).

Rank	Reason	Broad category	% 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 house- hold	Other eligibility (Need-based)	1.32

Table F.1: Top case closure reasons in Louisiana (2017-2019)