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# Employment Patterns for CalFresh Adults

## Technical Appendices

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# Appendix A. Data and Methods

## Data sources

Our data on CalFresh participation between 2012 and 2019 comes from the SNAP Longitudinal Data Base (LDB), which is produced by the California Department of Social Services (CDSS) from the Monthly Medi-Cal Eligibility Data System Eligibility Files (MEDS MEF). MEDS is a Department of Health Care Services data hub for storing Medi-Cal, CalFresh, and CalWORKs eligibility histories. Throughout, we use data spanning 2012–2019. In this report, we use three components of the LDB:

1. The eligibility file, which contains individual-level records of program receipt by month, as well as basic demographic variables
2. The case number file, which contains individual-level records of case numbers by month.
3. The county file, which contains individual-level records of county of participation by month.

We also use MEDS data stored in SSNSORT files, which are compiled each month with monthly data on county codes and aid codes (including those for CalWORKs, GA, SSI/SSP, and IHSS) for the previous 12 months.<sup>1</sup> These files are used to construct the SNAP and TANF LDBs; we use those created in June and December of each year from 2012 to 2019.

Quarterly wage data are requested by CDSS from the California Employment Development Department (EDD) Base Wage file, and are available for each quarter for each individual for each employer. CDSS requests records of UI-covered earnings for individuals in the six quarters before and after CalFresh, as well as during program participation. We observe these data within the window of July 2012 to June 2019.

To supplement information on CalWORKs participation, we leverage 2014 to 2019 data from the Welfare Data Tracking Implementation Project (WDTIP), which tracks provides work exemption and extension information for CalWORKs participants.

Finally, in regression analyses we supplement administrative data with county-level unemployment rates drawn from unadjusted monthly unemployment rates produced by the California Employment Development Department (EDD).

In supplementary analysis, we leverage data from the Research and Development Enterprise Project (RADEP), a random sample of CalFresh cases collected throughout the federal fiscal year and used to fulfill federal data reporting requirements. We have data spanning from FFY 2015 through FFY 2019.

## Constructing the analysis cohort

In order to examine how employment patterns differ before and after CalFresh, we focus on the cohort of adults in the available data window whom we can observe in wage data for six quarters before and after they are enrolled. As we describe below, following work by members of this cohort requires setting several additional conditions. Although these restrictions ultimately shrink the size of the group substantially, they nonetheless serve to identify the appropriate group of participants for our analysis.

This study focuses on working-age adults who start and end a new CalFresh spell between January 2014 and December 2017 – whose earnings we might observe between July 2012 and June 2019. “Working age” refers to people ages 25 to 54, in their first month of CalFresh. We define a spell as “new” when it begins after 12 or more

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<sup>1</sup> The name “SSNSORT” reflects the initial sorting of records by social security number.

months without CalFresh participation, as ending when it is followed by two or more months without CalFresh participation, and as ongoing if it includes one month without benefits between two months with benefits. Because our analysis window for following employment ranges from 18 months before a new CalFresh spell to 18 months after, we see that a small share of adults starting new spells (11.3 percent) received benefits 13 to 18 months ago, and a larger share (40.5%) return to CalFresh after the new spell ends, between 3 and 18 months later.

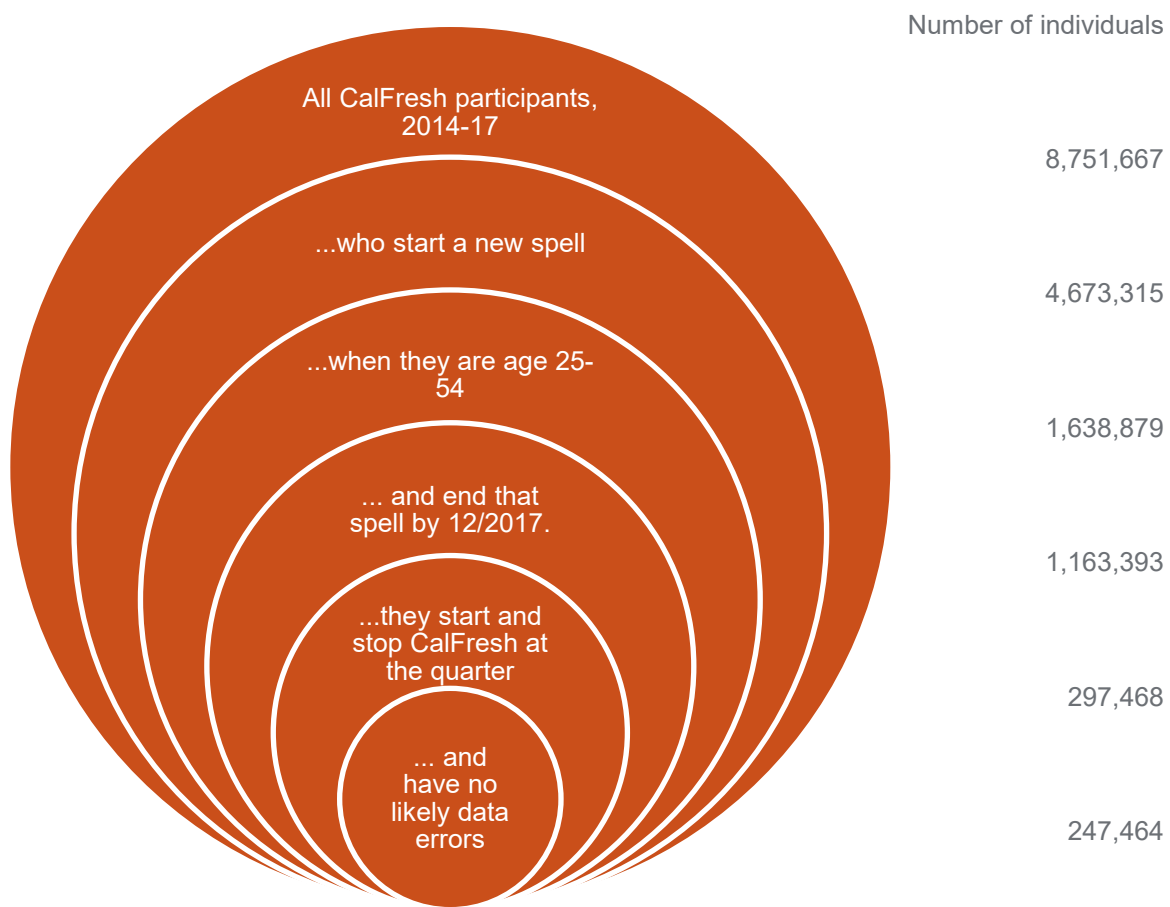
Creating a cohort that starts and ends CalFresh participation during this four-year window means that the cohort includes an outsized share of people with shorter spells, and that those who participate for longer periods of time start that participation early in the window. This is a limitation of imposing a time window upon longitudinal data; we seek to minimize its impact biasing estimated instability rates toward those of people who started CalFresh earlier and left after a shorter period of time by controlling for quarter of CalFresh start and spell length in regressions. However, adults in our analysis cohort typically spend 6 months on CalFresh, compared to working-age adults who are new to CalFresh but not in our cohort, who typically spend 12 months on CalFresh (Table B1). See Figures B1 and B2 for the distributions of spell lengths and the timing of spell starts.

Conditioning cohort inclusion on spending a period of time without CalFresh, as we did with the period of 12 months, has its own impacts. We find that women starting a period of CalFresh after at least two months off during this window of time were more likely than men to have had a CalFresh spell in the last 18 months, although by a decreasing margin as the length of time increased (from 3 months off to 18 months off). Ultimately, our cohort end up being slightly disproportionately male.

We narrow the cohort in several additional ways in order to work with the associated wage records. Given that wage data are quarterly, which could create uncertainty as to whether earnings occur during or outside months of CalFresh participation, we include only those individuals whose participation begins in the first month and ends in the last month of a quarter (consistent with Unrath (2021)). This is a major point of restriction of the cohort, as shown in Figure A1. However, participants frequently exit CalFresh at points when paperwork is due – in multiples of 3 months – which means that we include in our analysis cohort about half of adults ages 25 to 54 who begin new spells at the start of each calendar quarter, from 2014 to the middle of 2016.

**FIGURE A1**

Identifying CalFresh participants for this analysis



Another concern is that we might erroneously flag participants as having no earnings before or after CalFresh participation, when in reality they were not present in California in one of those periods, or were incarcerated, or died. We reduce the chances of this being the case by excluding the 50,000 individuals with no record of either earnings or program participation (using aid codes to identify contact with CalFresh as well as other safety net programs), either before or after CalFresh.

We also exclude individuals whose wage records appear to be erroneous. The vast majority (81 percent) of new adults who are new to CalFresh and enter and exit at quarter starts and ends have at most two employers reported per quarter, but among the minority, some appear to have 30 or more. Absent an understanding of how these high counts arise, or what number of employers per quarter should indicate a data error, it is unclear whether these CalFresh participants have earnings. We take a common sense approach, and exclude individuals with seven or more employers listed in a quarter (approximately 700 individuals).

Overall, the analysis cohort is quite small relative to the overall CalFresh adult caseload at any given point. Of about 1.4 million adults ages 25-54 who participated in CalFresh in January 2014, about 20,000, or 1.5 percent, are included in our analysis cohort. And of the similarly large group of working-age adults – nearly 1.2 million – who start and end a new CalFresh spell between 2014 and 2017, 247,464 (21 percent) are in the final analysis cohort.

## Data cleaning and summary variable construction

**Age and sex.** For both age and sex, we use the responses most recently recorded in MEDS data. Note that CalFresh applications offer participants only two options for sex: male and female.

**Case composition.** We describe each person’s CalFresh case in terms of its composition at its largest, so that someone identified as the single adult in their CalFresh case is never in a case with another person during this spell of CalFresh, even if they get a new case number during that time. On the other hand, someone identified as having children under six years old in their CalFresh case might only have those children in their CalFresh case for a few months. This may have the effect of underestimating the number of people in the analysis cohort who spend time in a CalFresh case alone. Table B2 shows the distribution of the cohort across the six case types. Note that adults on a case are described as being 18 and over, so that a case of one person age 26 and one age 24 are not classified as a single adult with an older child.

Notably, while “able-bodied adults without dependents,” or ABAWDs, are a unique population in CalFresh, as described above, they are not specifically identified in these state administrative data. Looking at single, childless adults throughout this report sheds light on the employment experiences of ABAWDs, but casts a wider than realistic net, in part because counties have discretion to waive work requirements when they are in effect for some people in this category.

**Race/ethnicity.** With the aim of investigating differences in employment dynamics that might reflect structural inequality in the labor market – which can be closely tied to race/ethnicity – we take several steps to minimize the number of individuals with no recorded race/ethnicity and account for differences in responses over time. This builds on work done by Danielson, Thorman, and Bohn (2020), and does not create large differences in trends or levels of instability predicted by regression models used in this report. See Tables B3 and B4 for the original and modified race/ethnic distribution of adults in the focal group for this analysis.

In SNAP and TANF administrative data, race/ethnicity can be recorded differently at different points in time. The Longitudinal Data Bases (LDBs) contain just the record most recently reported, while the SSNSORT files from which the LDBs are built can contain multiple responses over time. Among the adults in the analysis cohort for this report, about 15 percent have multiple responses recorded in the SSNSORT files.

Individuals can voluntarily report race/ethnicity on initial applications for CalFresh, CalWORKs, and Medi-Cal, and during CalFresh and CalWORKs recertification interviews ([ACIN I55-18](#)). Since the length of time between certifications differs by population, some participants are more likely than others to have responses solicited regularly. For those who do not respond, eligibility workers could identify them based on “visual determination” until August 2020, which falls out of the scope of this analysis ([ACL 20-96](#)).

In each CalFresh [application](#), a participant has the option to report one race or more, an ethnicity, and Hispanic origin. MEDS data include a single variable with exclusive categories, so that a person can (for example) be either Hispanic or white, but not both. This suggests that original responses are combined to create this variable.

The higher level of detail available on CalFresh applications suggests that using county-level data might be a promising alternative for researchers to better understand differences across race/ethnic groups. At the same time, using SSNSORT files to examine trends in race/ethnicity responses from 2013 to 2020, we see that the rate of reporting “other” or “no response” increased statewide, but the share marked “other” increased at a much higher

rate in CalWIN counties<sup>2</sup> than others. CalWIN counties also consistently maintained a higher rate of individuals having multiple, different responses for race/ethnicity over time during this period.

This poses a challenge to understanding the extent to which CalFresh is implemented equitably across race/ethnic groups. Better understanding how consortia practices for recording race/ethnicity differed in this time period is an important step for future research. Recognizing that “other” does not appear to hold a consistent meaning across counties, and that an outsized share of individuals in CalFresh data are identified as “other” relative to in survey data, we err on the side of replacing that response with a more specific one where possible, and using “other” as an indicator of being multiracial.

We use a three step approach to reconciling responses over time and updating non-response.

1. If a person has two differing responses, and one of them is “other” or “no response,” select the response that identifies a specific race/ethnicity.
2. If a person has two or more differing responses, and two or more are a category other than “other” or “no response,” assign the person to the category “other.”
3. If a person’s response is “no response,” and they are in a CalFresh case with others, assign the person to the category of the oldest person in the case whose recorded race/ethnicity is not “no response.”

The result of this process is to reduce by half the share of the analysis cohort with no response for race/ethnicity, slightly decrease the share who are Latino, and slightly increase the share who are in every other race/ethnic group (see Table B4).

**Language of case materials.** Most CalFresh cases receive materials in English – 85.5 percent of participants, in our analysis cohort – although California Poverty Measure data show that English is the primary language spoken at home for a smaller share of households where anyone receives CalFresh (about 60 percent). This makes language of preferred written communication with the county at best a loose proxy for English proficiency, and for immigrant status. A small minority receive materials in Spanish or another language (see table B5). In this report, we use a binary variable to highlight differences for people who do not receive CalFresh materials in English.

**Geography.** Throughout, we describe geography in terms of the county in which a participant’s new CalFresh spell begins, although some individuals move to other counties without interrupting their CalFresh spell (8.1 percent of those in the cohort), and others likely move either before or after that spell.

We largely discuss geography in terms of 9 regions of the state, delineated by counties. The Northern region includes Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, and Trinity counties. The Sacramento area includes El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties. The Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties. The Central Valley and Sierra region includes Alpine, Amador, Calaveras, Fresno, Inyo, Kern, Kings, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tulare, and Tuolumne counties. The Central Coast region includes Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura counties. The Inland Empire includes Imperial, Riverside, and San Bernardino counties. Los Angeles, Orange, and San Diego Counties are presented as individual regions.

Figure B3 shows the distribution of people in the focal group across the region in which their new CalFresh spell begins.

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<sup>2</sup> Alameda, Contra Costa, Fresno, Orange, Placer, Sacramento, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Tulare, Ventura, and Yolo Counties.

**Participation in and significance of other safety net programs.** We use aid code records from SSNSORT files and CalWORKs exemption and extension codes from WDTIP to control for additional factors that influence or describe both CalFresh participation and employment patterns. For example, we construct flags for participation in CalWORKs during CalFresh, and for participation in GA, SSI/SSP, and IHSS at any point in the analysis window. SSI/SSP and IHSS participation serve as proxies for disability—we can assume that someone who establishes eligibility for either program will likely have health barriers to employment. With CalWORKs, we identify the lowest-income parents or guardians, who might face child care barriers to work.

WDTIP provides additional insight into work for CalWORKs participants, by identifying CalWORKs adults who are exempt from meeting certain work requirements, and thus unlikely to be working. Since the goal of this study is to describe employment dynamics with those likely to be able to work, we use CalWORKs work exemptions, like participation in SSI/SSP and IHSS, to further restrict the reference group in regressions. Specifically, we flag as unable to work those who are exempt because they are pregnant, caregiving or a second adult in the household, disabled, in school (participating in CalLearn), American Indian or Alaska Native in an area with greater than 50 percent unemployment, or participating in VISTA or workfare. We also flag those not meeting work requirements for good cause (including domestic violence, and lack of supportive services from the county), and those given additional time on CalWORKs because of age, disability and SSI/SSP application, domestic violence, caregiving, inability to maintain work, enrollment in education or treatment, or barriers to labor market participation.

**Quarterly wages.** As noted in text, 83.7 percent of people in cohort can be matched to an EDD wage record at some point in the 6 quarters before or after their new CalFresh spell, or while it is ongoing. In quarters where there is no match, we assign \$0 in earnings.

We take several measures to prepare wage data for analysis. First, we adjust dollar values for inflation to quarter 4 of 2020, using the [R-CPI-U-RS](#) and averaging values at the quarterly level. We also adjust dollar amounts to reflect the size of the CalFresh case using the 3-factor California Poverty Measure (CPM) equivalence scale, based on case size in the month of CalFresh entry.

As noted above, it is possible to see more than seven employers per person per quarter, and we drop those above that number. However, there are earnings outliers even among those with few employers per quarter. We adjust for these by top-coding earnings from a single job to the 99<sup>th</sup> percentile (within our sample of ever-CalFresh recipients) of all job-level earnings in each quarter – generally between \$23,000 and \$25,000. This ends up impacting one or more quarters of earnings for 3.5 percent of people in the entire cohort. Table B4 shows additional detail on the income distribution for all adults with earnings in each quarter, relative to CalFresh start.

The ways we measure employment dynamics are based on the EDD quarterly wage records, and described briefly in the report.

The wage data present several challenges. First, not all earnings are covered by UI; self-employment and informal work are two notable omissions.<sup>3</sup> For this reason, although we describe quarters with UI-covered earnings as having “employment” and quarters without earnings as having “unemployment,” there are likely some quarters in which participants are working, but in jobs not covered by UI. We estimate that about 7 percent of people who appear to experience unemployment each quarter while enrolled in CalFresh have earnings that are not covered by UI, with methods described below.

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<sup>3</sup> As described in CDSS All County Letter (ACL) No. 19-40, “self-employed persons not electing disability insurance, federal employees, casual labor paid less than \$50, working less than 24 days per quarter, employees of some non-profit organizations, students working for a school, college, or university, railroad employees, workers on small farms, etc. Additionally, wages earned in states outside of California are not reflected in EDD data.”

Second, wage data collected at the calendar quarter level mean we cannot identify which months during a quarter individuals are employed, how long a job that spans quarters lasts, and how these elements relate to a mid-quarter entry to or exit from CalFresh. We address this by using a subset of participants who enter and exit CalFresh at quarter starts and ends, as described above, and taking a conservative approach to defining job stability and instability. Throughout, we describe employment changes from quarter to quarter, since this is the interval at which wage data are stored.

## Measuring instability with quarterly wage data

The primary measure of instability in this report is the single-quarter job, which starts and ends in the same quarter (following Hyatt and Spletzer (2017)). Although single-quarter employment is by no means the only way that people experience job instability, it clearly marks an incidence of short-term change in family resources—whether it provided the primary or secondary source of income.<sup>4</sup> Further, single-quarter jobs are associated with low earnings, and are more prevalent in industries with high shares of low-wage jobs, including agriculture, and accommodation and food services (Hyatt and Spletzer 2017). We focus on this metric as one angle of understanding unstable employment, understanding that it does not fully capture the types of instability that participants experience in the labor market.

We likely underestimate the true incidence of single-quarter employment among CalFresh adults. We identify these jobs by flagging times when a person has earnings from an employer in one quarter, but not the quarters before or after. Because this requires observing the quarters before and after the quarter measured, we cannot count single-quarter jobs in the first or last quarters of a person’s analysis window. Similarly, we cannot capture jobs lasting less than three months that start and end in different quarters. And finally, we count single-quarter jobs in terms of the entire quarter, so that a person who holds two jobs that both start and end in the same quarter is flagged as having at least one short-term job that quarter.

To look at periods of job stability, we take a similar approach, and focus on one aspect of stability: an ongoing connection with a single employer. Following Bailey and Spletzer (2021), we identify full-quarter jobs, where when a person has earnings from the same employer appear in three consecutive quarters, we assume that the middle quarter is one in which the employee had three full months in the same job.

This may be a conservative metric of stability, in that it cannot capture employment that lasts three or more months by spanning across quarters. As with the idea of a single-quarter job, it requires observing a quarter before and after the one measured, meaning that we lose the ability to measure occurrence in the first and last quarters of the analysis window. On the other hand, it may overstate stability if it also captures episodic employment within three consecutive quarters. Table B8 shows average incidence of single- and full-quarter jobholding among cohort adults with any earnings, across demographic groups.

These measures point toward quarterly job instability and stability, but neither fully describes the experience. For this reason, we supplement our discussion of employment dynamics with other descriptive metrics, like multiple job-holding, and job separations.

Bailey and Spletzer (2021) build on the concept of full-quarter employment in quarterly wage data with their definition of multiple job-holding. In this situation, we assume that two jobs are simultaneously if one is a full-quarter job. This too measures conservatively for the reasons mentioned above, and because it does not capture

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<sup>4</sup> In our analysis cohort, 91% of people who hold single-quarter jobs hold that job as their main job – that is, the single-quarter job does not fall during a quarter of multiple job holding.



multiple job-holding in cases when both are held for relatively short periods of time. We also consider this in terms of the number of quarters in which it occurs, rather than the number of jobs a person holds at once.

Finally, we look at job separations by identifying quarters in which the employer paying the largest share of a person's earnings is not the same as the employer paying the largest share in the following quarter. In other words, this measure of job separations could be more lengthily described as quarter-to-quarter changes in primary earnings source. This may understate the frequency of separations in some of the same ways that other metrics conservatively estimate instability; for example, it is measured in the number of quarters rather than the number of separations that could occur each quarter, and cannot be measured for the last quarter in the analysis window. It might also capture a different type of volatility: variability in hours from quarter to quarter that leads a person to appear to switch between jobs when both are ongoing.

## Notable omissions and additional policy context

**Other income.** One source of concern as we examine employment dynamics using quarterly wage data is the extent to which work that we cannot observe in UI-related data, particularly gig, informal, and other self-employment work, alters the picture of instability that we see. One approach we take to investigating this problem is to leverage the annual SNAP Quality Control sample data, or RADEP. Table B7 shows that in 2019, 5.4 percent of all CalFresh adults ages 25 to 54 had some income from self-employment. For this group, that income made up nearly all – 93.0 percent – of their earnings. This suggests that our analysis entirely misses employment dynamics for a subset of the cohort, who are likely either among those for whom we have either no record of earnings, or among those who appear to have little or infrequent earnings. However, it also suggests that we might have complete information to characterize instability for those for whom we do have some record of earnings.

Another approach to this question of unobserved earnings is to take the angle of maximum benefits. Inasmuch as a CalFresh case with zero income should be assigned the highest possible benefit amount, we can assume that a case with no UI-covered earnings in a quarter that never receives the maximum benefit amount for its size does have income from another source. We find that among adults with no UI-covered earnings who are the single adult in their CalFresh case in a given quarter, on average 7.3 percent never receive more than 90 percent of the maximum CalFresh benefit *and* never have a missing month of issuance (which we read as a data error). The share who apparently have income from other sources increases over our window of analysis, from about 5 percent at the start of 2014 to about 11 percent at the end of 2017. When we expand this cohort to include adults who are the single adult on a case in a quarter, but have children under 18 in the case, the share who apparently have another income source is higher – growing from 12 percent in 2014 to 27 percent in 2017.

**Education levels.** Another element not present in MEDS data that can be supplemented with the SNAP RADEP is education level. Inasmuch as education can be highly correlated with employment and earnings, it would be ideal to include in this analysis. Again looking in the 2019 RADEP data, we find that 81.5 percent of all CalFresh adults ages 25 to 54 have a high school education or less (another 8.5 percent have no response recorded). Among that group, nearly three quarters (73.1 percent) have a high school education. Thus, while individual information on level of education would doubtless contribute to our analysis, the similarly low levels of education shared across this group suggest that missing this information is not as problematic as it would be in a population with more diverse education backgrounds.

## Policy changes

One policy that has had the potential to impact adults in the focal group for this analysis is the time limit introduced for able-bodied adults without dependents (ABAWDs) by PRWORA: 3 months of benefits in a 36-

month period if not working at least 80 hours a month or otherwise exempt. In this context, **disability status is conferred if** a SNAP participant receives federal or state (SSI/SSP) disability benefits, or meet other criteria, and dependents do not include noncustodial children – though participants can also have disability status conferred temporarily or if they are determined unable to work for a set of other reasons established by the state agency. “Working” can include paid employment, community service, state-approved workfare programs, and certain education and training activities.

A 2005 California law requires CDSS to seek waivers on behalf of all counties that may be eligible to rescind time limits for ABAWDs. These waivers are based on economic conditions, but not necessarily the local labor markets that SNAP participants face.

California waived all time limits between 2009 and 2018, but **time limits were reinstated** in September 2018 for Santa Clara, San Mateo, and San Francisco Counties, and in September 2019 for Alameda, Contra Costa, and Marin Counties. In April 2020, federal law waived time limits for all ABAWDs nationally and through the end of the coronavirus pandemic public health emergency. This overlaps with our analysis only for individuals in Santa Clara, San Mateo, and San Francisco in the period after they have ended the new CalFresh spell we are observing.

In February 2019, the USDA began a process of changing regulations to restrict the number of areas that could qualify for a waiver. By USDA estimates, the proposed rule change could have reduced the number of waived areas by 75 percent. In 2020, this regulatory change **was officially rescinded**, reverting the language of the regulations amended by the 2019 rule to that which existed before the 2019 rule.

Currently, the USDA FNS has approved California’s statewide ABAWD time limit waiver request effective July 1, 2022 through June 30, 2023. The statewide waiver was approved based on California’s qualifying for extended unemployment benefits based on Department of Labor metrics.

## Appendix B. Summary Tables

**TABLE B1**

Cohort summary statistics

	Adults in analysis	New CalFresh adults not in analysis cohort
Total number of individuals	247,464	1,391,415
Average age	37.3	37.9
Percent who are male	51.6%	49.6%
Percent receiving non-English case materials	14.5%	16.0%
Any CalWORKs before, during, or after CalFresh	10.9%	17.3%
Any GA before, during, or after CalFresh	9.0%	10.0%
Any SSI before, during, or after CalFresh	1.6%	3.2%
Any IHSS before, during, or after CalFresh	0.6%	1.2%
Percent who move between counties during CalFresh	8.1%	9.3%
Median length of new CalFresh spell (months)	6	12
Average length of new CalFresh spell (months)	10.7	18.7
Percent returning to CalFresh in next 18 months	40.5%	32.2%
Percent who participated in CalFresh 12-18 months before new spell	11.3%	n/a

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Table compares adults included in analysis for this report with those in the same age range who began and ended a new CalFresh spell in the same time frame, but were omitted from analysis, largely because their participation began or ended mid-quarter. See Appendix A for details of analysis cohort construction.

**TABLE B2**

Case compositions

	Number	%
One adult 18+, no children	119,480	48.3%
One adult 18+, any children ages 0-5	24,028	9.7%
One adult 18+, only children ages 6-17	22,633	9.1%
Multiple adults 18+, no children	16,989	6.9%
Multiple adults 18+, any children ages 0-5	37,607	15.2%
Multiple adults 18+, only children ages 6-17	26,727	10.8%
Total	247,464	100.00%

SOURCES: Authors' analysis of SNAP LDB and SSNSORT files, 2012-2019.

NOTES: Case composition defined inclusively, so that a person who ever has a child age 0-5 in their CalFresh case is identified in that category, and a person who never has any others in their CalFresh case is identified as in a case alone. The focal sample is adults ages 25-54 at the start of their first CalFresh spell, but we define other adults on the case to be those ages 18 and older.

**TABLE B3**

Comparing the distribution of all new CalFresh adults with those included in analysis sample, across unadjusted detailed race/ethnic groups

Broader group	Detailed race/ethnic group	New CalFresh adults not in analysis cohort	%	Adults in analysis	%
No response		78,057	5.6%	13,975	5.6%
	No valid data reported	153	0.0%	<30	0.0%
	Declined to state	77,904	5.6%	13,975	5.6%
White	White	415,078	29.8%	72,163	29.2%
Black	Black	162,468	11.7%	27,911	11.3%
Hispanic	Hispanic	483,696	34.8%	89,563	36.2%
Asian/Pacific Islander		102,503	7.4%	17,733	7.2%
	Asian/Pacific Islander	25,437	1.8%	5,093	2.1%
	Filipino	21,720	1.6%	4,121	1.7%
	Amerasian	97	0.0%	<30	0.0%
	Chinese	11,258	0.8%	1,735	0.7%
	Cambodian	4,026	0.3%	669	0.3%
	Japanese	1,453	0.1%	257	0.1%
	Korean	4,520	0.3%	641	0.3%
	Samoan	3,036	0.2%	573	0.2%
	Asian Indian	6,519	0.5%	946	0.4%
	Hawaiian	1,555	0.1%	258	0.1%
	Guamanian	875	0.1%	166	0.1%
	Laotian	3,467	0.2%	537	0.2%
	Vietnamese	18,540	1.3%	2,737	1.1%
Other		149,613	10.8%	26,071	10.5%
	Alaskan Native/American Indian	9,638	0.7%	1,698	0.7%
	Other	139,975	10.1%	24,373	9.8%
		1,391,415	100.0%	247,464	100.0%

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Table shows race/ethnicity based on most recent responses recorded in the SNAP LDB. See Appendix A for detail. "Asian/Pacific Islander" is used as an umbrella group here, but it also the name of a more detailed category used in MEDS data.

**TABLE B4**

Race/ethnic distribution of cohort, and impact of reconciling differences in responses over time

Most recent responses in SNAP LDB		Adjusted flags used in analysis
No response	5.7%	1.5%
White	29.2%	31.4%
Black	11.3%	12.4%
Hispanic	36.2%	34.4%
Asian/Pacific Islander	7.2%	8.1%
Other	10.5%	12.2%

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Table shows race/ethnic flags as used in analysis highlighted in grey after using previous responses and responses of case members to reduce the number of individuals with no response. See Appendix A for detail.

**TABLE B5**

Most participants receive CalFresh case materials in English

Broader language group	Detailed language group	New CalFresh adults not in analysis cohort	%	Adults in analysis	%
Missing		552	0.04%	126	0.05%
	Missing/No valid data reported	61		<30	
	Declined to state	491		>30	
English		1,168,737	84.0%	211,596	85.5%
Spanish		161,929	11.6%	28,897	11.7%
East Asian languages		9,628	0.7%	1,395	0.6%
	Cantonese	5,667		830	
	Mandarin	86		<30	
	Korean	1,254		142	
	Other Chinese	2,450		369	
	Japanese	177		>30, next smallest N	
Southeast Asian languages		18,548	1.3%	2,700	1.1%
	Vietnamese	2,312		451	
	Tagalog	904		134	
	Hmong	<30		<30	
	Cambodian	169		<30	
	Lao	1,636		196	
	Mien	559		64	
	Thai	>30, next smallest N		<30	
	Ilocano	12,814		1,810	
Middle Eastern languages		20,445	1.5%	1,647	0.7%
	Armenian	7,423		562	
	Arabic	>30, next smallest N		<30	
	Farsi	<30		<30	
	Turkish	7,464		543	
	Hebrew	5,474		531	

Broader language group	Detailed language group	New CalFresh adults not in analysis cohort	%	Adults in analysis	%
European & Russian		4,479	0.3%	458	0.2%
	Russian	251		44	
	French	<30		<30	
	Portuguese	4,105		396	
	Polish	88		<30	
	Italian	<30		<30	
Sign languages, Samoan, and other		7,097	0.5%	645	0.3%
	Other non-English	428		42	
	American Sign Language (ASL)	6,525		584	
	Samoan	56		<30	
	Other sign language	88		<30	
Total		1,391,415	100.0%	247,464	100.0%

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Table shows most recent language of case materials flags present in the SNAP LDB. See Appendix A for detail.

**TABLE B6**

Earnings before and after CalFresh, for those with low, medium, and high levels of earnings

	N	20th percentile	Median	80th percentile	Average
6 quarters before CF	131,299	\$3,700	\$8,700	\$17,300	\$11,400
5 quarters before CF	131,103	\$3,800	\$8,700	\$17,300	\$11,400
4 quarters before CF	129,101	\$3,600	\$8,500	\$17,100	\$11,200
3 quarters before CF	128,437	\$3,500	\$8,400	\$17,200	\$11,200
2 quarters before CF	124,950	\$3,200	\$8,100	\$16,800	\$10,900
1 quarters before CF	120,880	\$2,600	\$7,200	\$15,700	\$10,000
1st quarter of CalFresh	120,365	\$1,400	\$4,600	\$12,000	\$7,300
Last quarter of CalFresh	135,574	\$3,300	\$7,600	\$15,800	\$10,300
1 quarter after CalFresh	146,330	\$4,000	\$8,700	\$17,400	\$11,500
2 quarters after CalFresh	143,914	\$3,900	\$8,800	\$17,800	\$11,700
3 quarters after CalFresh	141,473	\$4,000	\$9,100	\$18,100	\$11,900
4 quarters after CalFresh	141,385	\$4,200	\$9,400	\$18,800	\$12,400
5 quarters after CalFresh	140,591	\$4,300	\$9,700	\$19,200	\$12,600
6 quarters after CalFresh	139,266	\$4,400	\$9,900	\$19,500	\$12,800

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Dollars adjusted to 2020 quarter 4 values, and for differences in case size. N shows number of individuals with earnings in each quarter relative to CalFresh start. CalFresh quarters are omitted in order to show distribution across all participants, regardless of the number of quarters spent in CalFresh. The small share who spend just 3 months enrolled have that quarter assigned as their first quarter during CalFresh.

**TABLE B7**

Monthly income sources for all CalFresh adults age 25 to 54 in 2019, from Quality Control sample data

	Weighted total N	Weighted percent of total N	N
Any income from...			
Wages and salaries	260,048	23.4	760
Self-employment	166,238	14.9	528
TANF	59,794	5.4	161
SSI/SSP	49,287	4.4	114
GA	43,198	3.9	94
UI	22,727	2.0	67
<hr/>			
Total in sample	1,112,781		3,269

SOURCES: Authors' analysis of FFY 2019 SNAP RADEP data.

NOTES: Table shows estimated number and share of adults age 25-54 with income from each source in the month before sampling.

**TABLE B8**

Incidence of unemployment, single-quarter jobs, and full-quarter jobs across demographic groups

	N with earnings	Quarters without earnings	Single-quarter jobs			Full-quarter jobs				
		Any	Any	Before CalFresh	During CalFresh	After CalFresh	Any	Before CalFresh	During CalFresh	After CalFresh
Gender										
Male	106,209	81.8%	61.7%	31.8%	25.6%	34.2%	81.9%	57.3%	45.4%	65.0%
Female	100,842	75.3%	53.4%	26.2%	20.0%	28.8%	87.6%	66.3%	54.6%	72.6%
Case composition										
1 adult 18+, no children	96,314	87.2%	65.0%	33.2%	27.8%	35.9%	79.5%	52.2%	40.7%	61.7%
1 adult 18+, children ages 0-5	21,510	69.5%	51.6%	25.4%	18.9%	27.7%	90.4%	73.2%	62.1%	76.8%
1 adult 18+, children ages 6-17 only	20,261	68.2%	52.9%	25.9%	19.3%	29.2%	90.6%	73.7%	58.4%	76.9%
1+ adult 18+, no children	13,728	79.8%	53.0%	27.5%	19.2%	28.2%	85.5%	61.1%	49.1%	69.1%
1+ adult 18+, children ages 0-5	32,513	70.9%	50.4%	25.2%	18.2%	27.1%	88.9%	69.4%	58.8%	74.0%
1+ adult 18+, children ages 6-17 only	22,725	71.2%	49.6%	24.3%	18.2%	27.6%	89.4%	69.4%	57.5%	75.3%
Race/ethnicity										
Asian/Pacific Islander	16,971	75.3%	50.9%	24.5%	18.6%	27.6%	88.1%	63.5%	54.7%	74.2%
Black	25,757	80.8%	65.4%	30.6%	30.0%	37.9%	83.5%	58.2%	49.9%	67.1%
Latino	74,115	73.8%	57.8%	30.8%	22.9%	32.4%	86.8%	67.0%	53.5%	72.2%
Multiracial and other	25,372	80.2%	58.8%	29.3%	22.9%	32.9%	84.1%	61.4%	48.7%	67.3%
No response	2,985	79.7%	55.5%	28.5%	21.6%	28.8%	84.0%	58.8%	46.4%	68.7%
White	61,851	83.8%	55.7%	27.6%	21.1%	28.7%	82.1%	56.5%	44.8%	64.2%

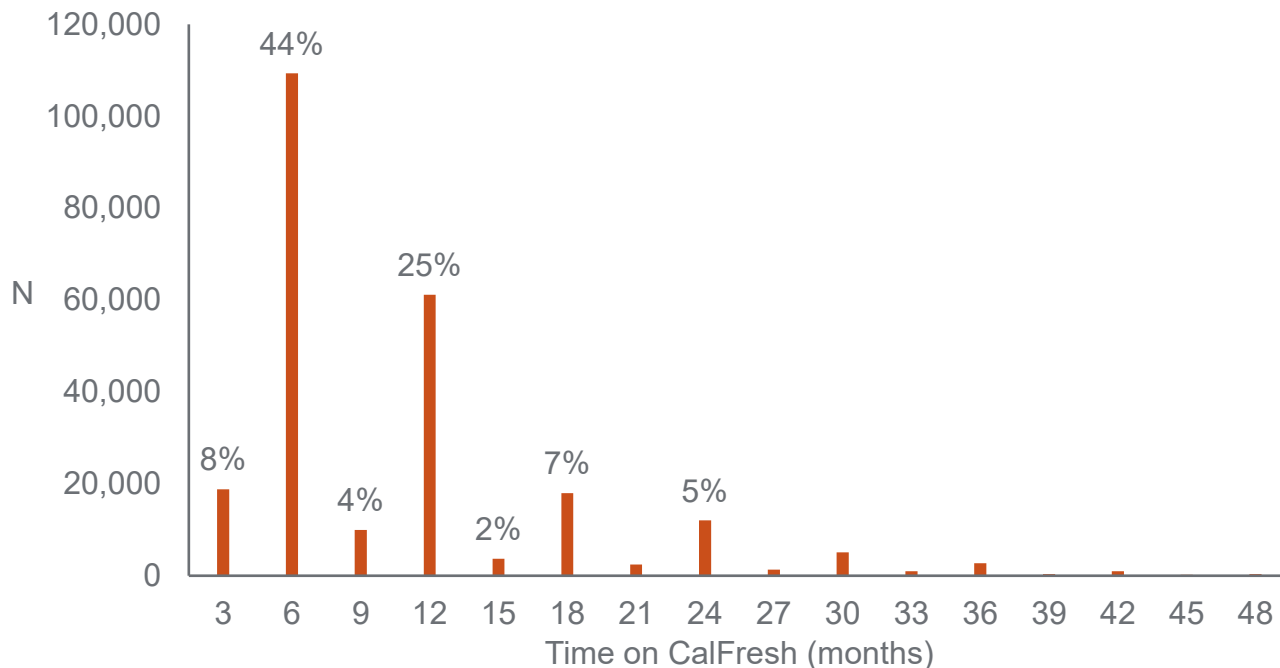
SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTES: Table shows average incidence of event among population who ever have earnings before, during, or after CalFresh.



**FIGURE B1**

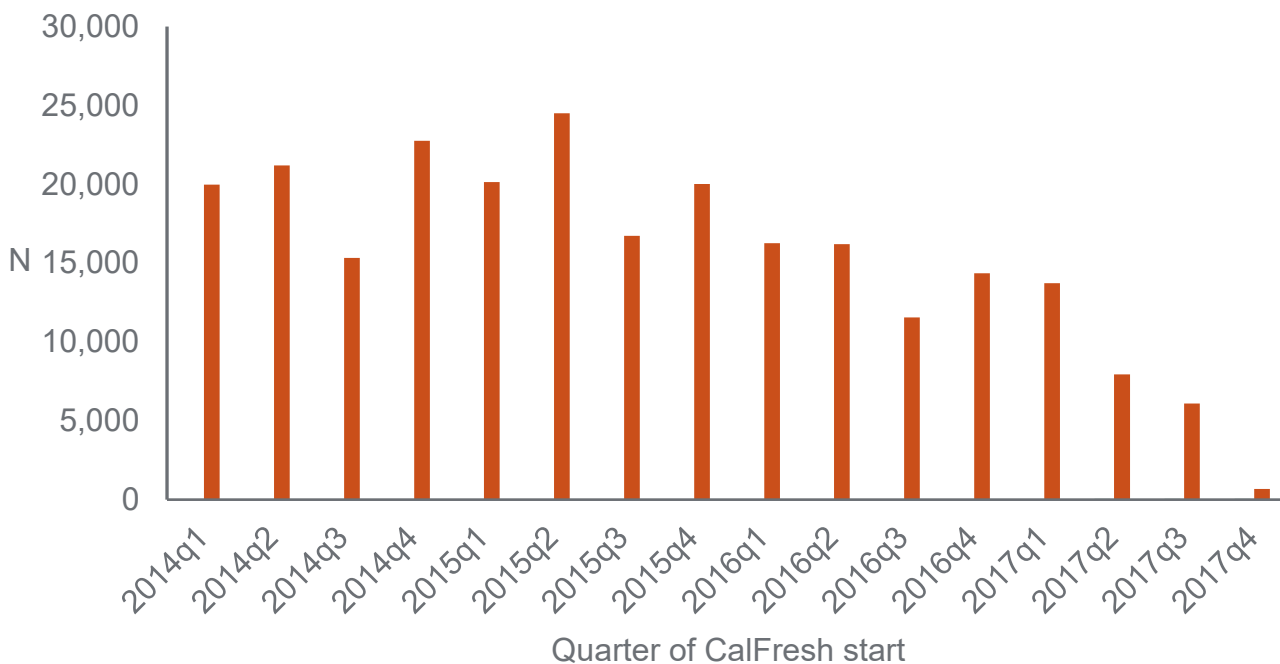
The majority of adults in the analysis cohort have new CalFresh spells that last for less than a year



SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

**FIGURE B2**

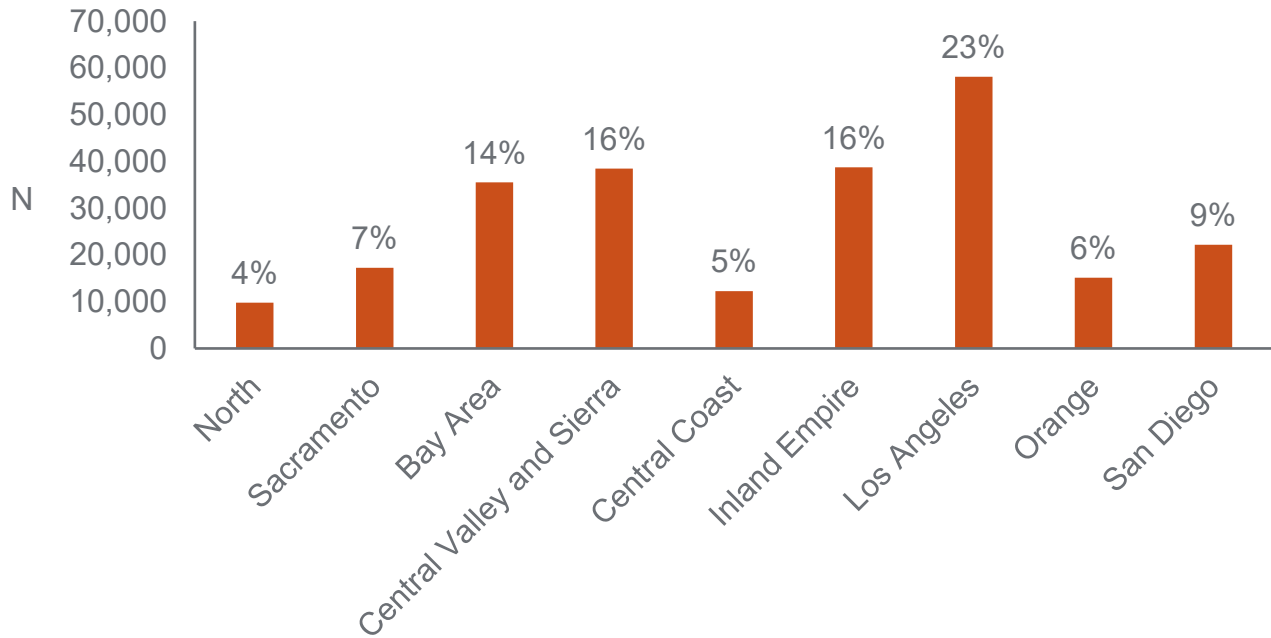
Restricting the cohort to those who leave CalFresh before 2018 results in a group that starts CalFresh early in the window



SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

**FIGURE B3**

The largest number of participants live in Los Angeles County

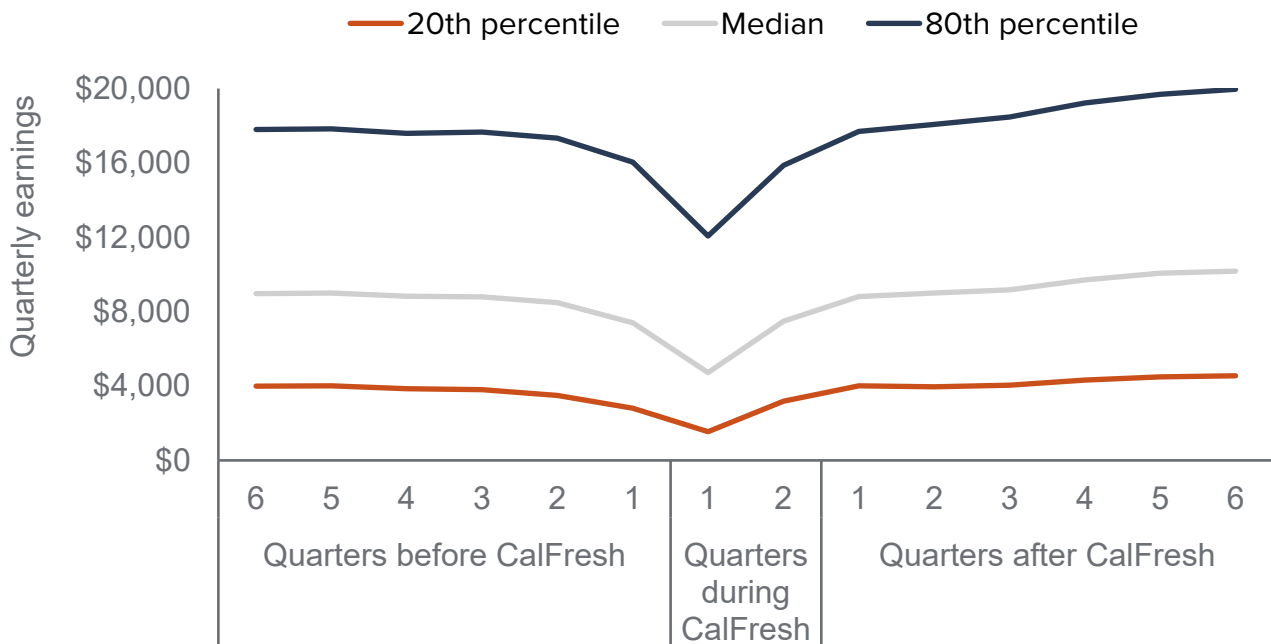


SOURCES: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTE: See Appendix A for complete list of counties in each region.

**FIGURE B4**

Quarterly earnings for participants with 2-quarter spells

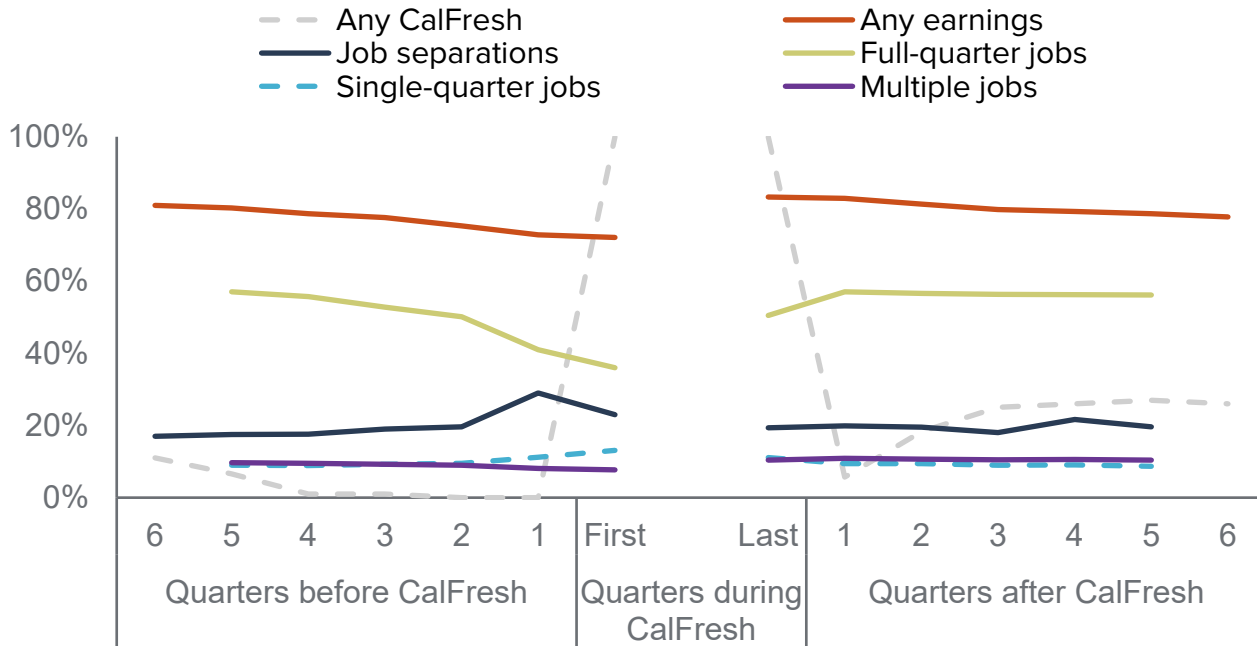


SOURCE: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTE: Chart shows value of quarterly earnings of those with any earnings in quarter, among cohort adults who spend 2 quarters on CalFresh (adjusted for inflation to pertain to 2020 quarter 4, and for differences in case size).

**FIGURE B5**

Quarterly likelihood of event, for participants with any recorded earnings



SOURCE: Authors' analysis of SNAP LDB, SSNSORT, and EDD base wage files, 2012-2019.

NOTE: Chart shows quarterly probability of each type of employment event, for participants who work at any point around CalFresh. Quarters during CalFresh other than the first and last are omitted because this varies for individuals in the analysis cohort. The small share who spend just 3 months enrolled have that quarter assigned as their first quarter during CalFresh, and are assigned a missing value for their last quarter during CalFresh. Estimates for the sixth quarters before and/or after CalFresh are omitted when metrics are not calculable in those quarters. Job separations describes incidence of leaving the employer from which a person earned the majority of their UI-covered earnings. Estimates drawn from results of linear probability models with individual fixed effects in Appendix Table C3; chart shows sum of coefficient and constant for each model.

## Appendix C. Regression tables

We use linear probability models to describe the correlations between employment dynamics (as dependent variables) and participant characteristics, over four types of time periods.

The key characteristics of interest in all regressions include race/ethnicity, gender, case composition, and language of case materials. We also control for age, length of CalFresh spell, number of CalFresh case numbers during that spell, participation in CalWORKs, General Assistance (GA), SSI/SSP, and IHSS (and whether someone had a work exemption during CalWORKs). In most models, we run a secondary set stratifying based on whether individuals return to CalFresh in the 18 months after their spell. Appendix A discusses the sources and creation of these metrics.

Throughout, we keep the largest group in the cohort as the core reference group: single Latino men in Los Angeles County whose CalFresh cases never include others, and who receive case materials in English. This group joins CalFresh in January 2014, has a 3 or 6 month spell of assistance, does not participate in CalWORKs, GA, SSI/SSP, or IHSS, does not return to CalFresh for at least 18 months, and has only one case number during their CalFresh spell.

Table C1 shows these associations between characteristics and experiencing each employment dynamic at some point during CalFresh, or in the 18 months before or after, for people who have earnings in the entire time frame. These models include controls for quarter of CalFresh start.

Table C2 shows associations between characteristics and experiencing each employment dynamic within each discrete period (before, during, or after CalFresh), for people who have earnings in that specific time period. In these models, we use individual and calendar quarter fixed effects, and drop time periods in which individuals have no earnings, so that each individual may up to three observations (for before, during, and after CalFresh). We step in interactions between time period and characteristics of interest in order to isolate group-specific differences in employment dynamics over time. Table C2 shows only output for our key metrics of interest, full-quarter and single-quarter jobs. In the text of the report, we interpret outcomes from columns 4 and 6.

Table C2a shows the same set of regressions as Table C2, run separately for those who return to CalFresh within 18 months of exiting the new spell that puts them in our analysis cohort, and those who do not.

Table C3 shows associations between the quarter of analysis window – relative to the first quarter of receiving CalFresh benefits – and experiencing each employment dynamic in that quarter, for those who ever have earnings. In order to include individuals with spells of all lengths, we include during CalFresh only the first and last quarters, and assign those with single-quarter spells a missing value for the last quarter of CalFresh. These models again use individual fixed effects.

Table C4 shows associations between characteristics and improvement in our key metrics (single- and full-quarter jobs) after CalFresh, for people who experienced some job instability before starting CalFresh.

These models vary by design both in the number of individuals included and the independent variables used. Although demographic and participation variables are consistent across models, we frame improvement in each metric in part as related to the amount of instability from the dependent variable before and during CalFresh, and in part as a function of instability based on other metrics. For example, columns 1 to 3 show associations with experiencing more quarters with full-quarter jobs after CalFresh. Here, the reference group are those who spent less than every quarter before CalFresh with full-quarter jobs.

For each metric, we step in interactions between region and quarter of CalFresh start, and additional variables on previous employment and safety net program participation. In the text of the report, we interpret outcomes from columns 3 and 6 (including variables on previous employment), but use columns 1 and 4 to look at overall differences by region.

Table C4a shows the same set of regressions as Table C4, run separately for those who return to CalFresh within 18 months of exiting the new spell that puts them in our analysis cohort, and those who do not.

Table C5 shows associations between characteristics and growth in earnings after CalFresh, for people with earnings both before and after CalFresh. We define this in a slightly limited fashion in order to reduce the influence of outliers, as those with more than \$50 in earnings in their highest earning quarters before and after CalFresh, and we omit those above the 99<sup>th</sup> percentile for growth in earnings. Unlike other models, units of the dependent variable – percent change in earnings between the quarters with highest earnings before and after CalFresh– are such that 100 indicates 100 percent. Notably, the majority of people with earnings both before and after CalFresh have no quarters of unemployment in either period; they become the reference group for this regression.

We also include in these models the average county unemployment rate in the quarter after CalFresh exit, whether a person does *not* have a new employer after CalFresh, and the dollar value of their highest quarterly earnings before and during CalFresh. In the text of the report, we interpret outcomes from column 2, which accounts for impacts on earnings growth of changes in regional differences over time, but use column 1 to look at overall differences by region.

Columns 3 and 4 (and 6 and 8) show an alternate measure of earnings change – measured based on change in average earnings in quarters with nonzero earnings in each period. As with the highest-earning quarters measure, we include only those with average earnings over \$50, and with less than the 99<sup>th</sup> percentile for growth in earnings. Although these models are not discussed in the text of the report, they show that our estimates of differences in earnings changes across demographic groups are robust to the change in methodology.

Finally, columns 5 through 8 show our preferred models run separately for those who return to CalFresh within 18 months of exiting the new spell that puts them in our analysis cohort, and those who do not.

## Additional geographic analysis

The following text provides interpretation of regional coefficients in Tables C2 and C4, which is not discussed in the main body of the report.

**During and after CalFresh** (see Table C2). Large differences in employment dynamics occur across the state during and after CalFresh, although large differences do not occur with the overall likelihood of participants holding particular kinds of jobs. Participants based in Los Angeles, northern, Sacramento area, and Orange counties are substantially more likely than others to hold longer-term jobs while enrolled in CalFresh, on the order of 25 percent to 45 percent. After exit, the gap shrinks somewhat, so that participants in Central Valley, Sierra, Central Coast, and Inland Empire counties are just 15 percent to 25 percent less likely to hold longer-term jobs.

Workers based in Los Angeles and Central Coast counties are more likely than most others to hold short-term jobs, both during and after CalFresh enrollment, although differences between other regions are not statistically significant. We account for how regional economies changed differently over the time period of our analysis; therefore, these differences in jobholding likely reflect either underlying features of those economies—like the mix of industries—or county practices in administering CalFresh.

**Persistence of short- and longer-term jobs after CalFresh.** Residents of Central Valley and Sierra counties, are up to 5 percent less likely to hold fewer short-term jobs after CalFresh than before (see Table C4, column 4).

Working CalFresh adults are unlikely to increase the amount of time they spend in full-quarter employment after CalFresh, regardless of where they live. Still, participants in Central Valley, Sierra, Inland Empire, Los Angeles, and northern counties are less likely than others by 8 percent to 13 percent to spend more of the quarters they are employed after CalFresh in full-quarter employment than before enrolling (Table C4, column 1). For Central Valley, Sierra, and Inland Empire residents, this is consistent with the slightly lower likelihood of full-quarter employment after CalFresh, but the same is not true of Los Angeles County and northern residents.

**TABLE C1**

Likelihood of event occurring at any point before, during, or after a new CalFresh spell

	(1) Any quarters without earnings	(2) Any primary separations	(3) Any full- quarter employment	(4) Any single quarter employment	(5) Any multiple job-holding
Asian and Pacific Islander	0.012** (0.0036)	-0.020*** (0.0030)	0.0060* (0.0028)	-0.064*** (0.0043)	-0.00072 (0.0039)
Black	0.0064* (0.0030)	0.013*** (0.0022)	-0.00069 (0.0027)	0.032*** (0.0036)	0.077*** (0.0035)
Multiracial	0.035*** (0.0030)	0.0088*** (0.0023)	-0.017*** (0.0027)	-0.011** (0.0037)	-0.0041 (0.0034)
No response	0.018* (0.0074)	0.0041 (0.0055)	-0.0050 (0.0068)	-0.060*** (0.0092)	-0.0011 (0.0083)
White	0.064*** (0.0023)	0.0045* (0.0019)	-0.034*** (0.0021)	-0.044*** (0.0029)	-0.037*** (0.0026)
Non-English case material	0.013*** (0.0029)	-0.025*** (0.0025)	-0.030*** (0.0024)	0.018*** (0.0034)	0.0020 (0.0031)
Female	-0.068*** (0.0024)	-0.012*** (0.0018)	0.078*** (0.0026)	-0.051*** (0.0032)	0.097*** (0.0031)
1 Adult, children under age 6	-0.24*** (0.0074)	-0.074*** (0.0054)	0.14*** (0.0050)	-0.13*** (0.0081)	0.079*** (0.0077)
1 Adult, children ages 6-17	-0.17*** (0.0067)	-0.047*** (0.0050)	0.11*** (0.0053)	-0.096*** (0.0079)	0.033*** (0.0070)
Multiple adults, no children	-0.068*** (0.0049)	-0.035*** (0.0041)	0.076*** (0.0048)	-0.092*** (0.0065)	-0.0026 (0.0055)
Multiple adults, children under age 6	-0.24*** (0.0037)	-0.092*** (0.0028)	0.14*** (0.0028)	-0.16*** (0.0042)	0.032*** (0.0038)
Multiple adults, children ages 6-17	-0.19*** (0.0047)	-0.069*** (0.0037)	0.13*** (0.0035)	-0.14*** (0.0055)	0.020*** (0.0047)
Female * 1 Adult, children under age 6	0.087*** (0.0083)	-0.018** (0.0061)	-0.081*** (0.0058)	-0.035*** (0.0092)	-0.12*** (0.0087)
Female * 1 Adult, children ages 6-17	-0.0069 (0.0078)	-0.033*** (0.0058)	-0.049*** (0.0060)	-0.015 (0.0091)	-0.024** (0.0082)
Female * Multiple adults , no children	0.033*** (0.0071)	-0.022*** (0.0060)	-0.074*** (0.0065)	0.010 (0.0091)	-0.040*** (0.0079)
Female * Multiple adults , children under age 6	0.16*** (0.0054)	-0.017*** (0.0045)	-0.13*** (0.0044)	-0.017* (0.0065)	-0.12*** (0.0058)
Female * Multiple adults, children ages 6-17	0.058*** (0.0064)	-0.035*** (0.0052)	-0.099*** (0.0048)	0.0085 (0.0074)	-0.038*** (0.0066)
Ever have CW	0.16*** (0.0031)	0.071*** (0.0024)	-0.074*** (0.0030)	0.093*** (0.0041)	-0.051*** (0.0036)

	(1)	(2)	(3)	(4)	(5)
	Any quarters without earnings	Any primary separations	Any full-quarter employment	Any single quarter employment	Any multiple job-holding
Ever have SSI/SSP	0.076*** (0.0060)	0.015* (0.0061)	-0.21*** (0.012)	0.0053 (0.012)	-0.11*** (0.0087)
Ever have GA	0.086*** (0.0022)	0.014*** (0.0021)	-0.11*** (0.0039)	0.057*** (0.0041)	-0.076*** (0.0036)
Ever have IHSS	0.091*** (0.0097)	0.046*** (0.0088)	-0.050** (0.017)	-0.053** (0.019)	-0.044** (0.016)
Work exemption during CW	0.041*** (0.0048)	0.00085 (0.0041)	-0.028*** (0.0057)	0.0079 (0.0073)	-0.014* (0.0065)
Number of CF case numbers	0.039*** (0.0037)	0.026*** (0.0028)	-0.029*** (0.0052)	0.071*** (0.0059)	-0.018** (0.0056)
Age at CF spell start	0.0051*** (0.0010)	-0.0083*** (0.00082)	-0.0035*** (0.00096)	-0.013*** (0.0013)	-0.014*** (0.0012)
Age squared	-0.000059*** (0.000013)	0.000086*** (0.000011)	0.000042*** (0.000012)	0.00012*** (0.000017)	0.00014*** (0.000015)
Northern region	0.032*** (0.0047)	0.0084* (0.0040)	-0.033*** (0.0048)	-0.016* (0.0063)	-0.015** (0.0055)
Sacramento region	0.0020 (0.0038)	0.014*** (0.0030)	0.0028 (0.0034)	0.0038 (0.0048)	0.0098* (0.0044)
Bay Area region	0.019*** (0.0029)	0.024*** (0.0023)	0.0027 (0.0027)	0.028*** (0.0037)	0.021*** (0.0034)
Central Valley and Sierra region	0.025*** (0.0029)	0.019*** (0.0024)	-0.030*** (0.0026)	0.046*** (0.0036)	-0.024*** (0.0033)
Central Coast region	0.022*** (0.0043)	0.026*** (0.0034)	-0.0089* (0.0038)	0.045*** (0.0053)	0.0035 (0.0048)
Inland Empire region	0.025*** (0.0029)	0.016*** (0.0023)	-0.026*** (0.0026)	0.028*** (0.0036)	-0.030*** (0.0032)
Orange County	0.0048 (0.0040)	0.016*** (0.0032)	-0.0073* (0.0035)	0.032*** (0.0049)	-0.019*** (0.0044)
San Diego County	0.017*** (0.0035)	0.016*** (0.0028)	-0.0084** (0.0031)	0.00056 (0.0043)	-0.017*** (0.0039)
3 to 4 quarter spell length	0.068*** (0.0020)	0.039*** (0.0016)	-0.011*** (0.0019)	0.022*** (0.0026)	0.0013 (0.0023)
5 to 6 quarter spell length	0.086*** (0.0030)	0.053*** (0.0025)	0.012*** (0.0028)	0.037*** (0.0040)	0.028*** (0.0037)
7 or more quarters spell length	0.10*** (0.0028)	0.079*** (0.0023)	0.0086** (0.0028)	0.043*** (0.0038)	0.044*** (0.0035)
Constant	0.68*** (0.020)	1.03*** (0.016)	0.93*** (0.019)	0.84*** (0.025)	0.56*** (0.023)
Quarter of spell start	X	X	X	X	X



	(1)	(2)	(3)	(4)	(5)
	Any quarters without earnings	Any primary separations	Any full-quarter employment	Any single quarter employment	Any multiple job-holding
Observations	207,051	207,051	207,051	207,051	207,051
R-squared	0.091	0.045	0.047	0.040	0.024
Mean of dependent variable	0.79	0.89	0.85	0.58	0.27

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

**TABLE C2**

Likelihood of event occurring before, during, or after a new CalFresh spell

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any full-quarter jobs				Any single-quarter jobs			
	Basic	Add demographic interactions	Add race*gender interactions	Add region interactions	Basic	Add demographic interactions	Add race*gender interactions	Add region interactions
During CF	-0.16***	-0.20***	-0.20***	-0.18***	-0.066***	-0.079***	-0.078***	-0.070***
After CF	(0.0015)	(0.0036)	(0.0047)	(0.0052)	(0.0015)	(0.0037)	(0.0048)	(0.0054)
	0.032***	0.043***	0.048***	0.046***	0.0056***	-0.010**	-0.0089	-0.011*
During CF * Asian and Pacific Islander	(0.0013)	(0.0032)	(0.0042)	(0.0048)	(0.0016)	(0.0038)	(0.0048)	(0.0055)
		0.025***	0.024**	0.026**		0.0028	0.016	0.020*
During CF * Black		(0.0054)	(0.0082)	(0.0083)		(0.0055)	(0.0084)	(0.0085)
		0.025***	0.031***	0.030***		0.028***	0.030***	0.031***
During CF * Multiracial		(0.0050)	(0.0075)	(0.0076)		(0.0054)	(0.0078)	(0.0079)
		-0.0069	-0.012	-0.0066		0.0038	0.0060	0.013
During CF * No response		(0.0048)	(0.0074)	(0.0075)		(0.0050)	(0.0076)	(0.0077)
		0.0080	0.0099	0.0083		0.0019	0.010	0.0094
During CF * White		(0.013)	(0.019)	(0.019)		(0.013)	(0.018)	(0.018)
		0.0035	-0.0043	-0.0056		-0.0034	0.0032	0.0061
During CF * Non-English case material		(0.0039)	(0.0056)	(0.0057)		(0.0040)	(0.0057)	(0.0059)
		0.034***	0.029***	0.028***		-0.019***	-0.0086	-0.0095
During CF * Female		(0.0041)	(0.0061)	(0.0061)		(0.0043)	(0.0064)	(0.0064)
		0.022***	0.0096	0.0078		0.0089**	0.0059	0.0046
During CF * 1 Adult, children under age 6		(0.0031)	(0.0068)	(0.0068)		(0.0032)	(0.0071)	(0.0071)
		0.048***	0.048***	0.047***		0.0081	0.0011	0.0011
During CF * 1 Adult, children ages 6-17		(0.0048)	(0.0099)	(0.0098)		(0.0051)	(0.011)	(0.011)
		0.0069	0.0022	0.0025		0.013*	-0.0018	-0.0021
During CF * Multiple adults, no children		(0.0050)	(0.010)	(0.010)		(0.0053)	(0.011)	(0.011)
		0.021***	0.020*	0.018*		0.0015	-0.016	-0.020*
During CF * Multiple adults, children under age 6		(0.0063)	(0.0092)	(0.0092)		(0.0064)	(0.0092)	(0.0092)
		0.058***	0.063***	0.063***		0.013**	0.0044	0.0030

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any full-quarter jobs			Any single-quarter jobs				
During CF * Multiple adults, children ages 6-17		(0.0042)	(0.0053)	(0.0053)		(0.0043)	(0.0056)	(0.0056)
		0.034***	0.0069	0.0057		0.028***	0.014*	0.012
After CF * Asian and Pacific Islander		(0.0048)	(0.0071)	(0.0071)		(0.0050)	(0.0072)	(0.0072)
		0.019***	0.015*	0.013		0.0024	0.0042	0.010
After CF * Black		(0.0047)	(0.0072)	(0.0073)		(0.0058)	(0.0087)	(0.0088)
		-0.0030	-0.0047	-0.0047		0.037***	0.037***	0.043***
After CF * Multiracial		(0.0045)	(0.0069)	(0.0070)		(0.0055)	(0.0080)	(0.0080)
		-0.014**	-0.016*	-0.016*		0.018***	0.021**	0.030***
After CF * No response		(0.0043)	(0.0067)	(0.0068)		(0.0052)	(0.0078)	(0.0080)
		0.023*	0.025	0.020		-0.015	-0.020	-0.028
After CF * White		(0.011)	(0.016)	(0.016)		(0.013)	(0.018)	(0.018)
		0.0079*	0.0050	0.00036		-0.0067	-0.0032	-0.00097
After CF * Non-English case material		(0.0035)	(0.0051)	(0.0052)		(0.0041)	(0.0059)	(0.0060)
		0.0085*	0.00011	-0.0013		-0.0023	0.00077	0.00029
After CF * Female		(0.0037)	(0.0054)	(0.0054)		(0.0045)	(0.0066)	(0.0066)
		0.0016	-0.0079	-0.0095		0.0058	0.00084	0.00020
After CF * 1 Adult, children under age 6		(0.0028)	(0.0061)	(0.0061)		(0.0033)	(0.0073)	(0.0073)
		-0.033***	-0.030***	-0.030***		0.012*	0.0017	0.0022
After CF * 1 Adult, children ages 6-17		(0.0042)	(0.0085)	(0.0085)		(0.0053)	(0.011)	(0.011)
		-0.035***	-0.032***	-0.033***		0.027***	0.011	0.0073
After CF * Multiple adults, no children		(0.0043)	(0.0090)	(0.0090)		(0.0055)	(0.011)	(0.011)
		-0.0074	0.0079	0.0045		-0.0019	-0.013	-0.019*
After CF * Multiple adults, children under age 6		(0.0056)	(0.0083)	(0.0083)		(0.0066)	(0.0096)	(0.0096)
		-0.029***	-0.036***	-0.035***		0.011*	0.0083	0.011
After CF * Multiple adults, children ages 6-17		(0.0037)	(0.0047)	(0.0048)		(0.0045)	(0.0058)	(0.0058)
		-0.028***	-0.038***	-0.040***		0.022***	0.015*	0.011
During CF * Female * Asian and Pacific Islander		(0.0042)	(0.0061)	(0.0061)		(0.0052)	(0.0075)	(0.0075)
			0.0023	0.0029			-0.025*	-0.024*
During CF * Female * Black			(0.011)	(0.011)			(0.011)	(0.011)
			-0.013	-0.012			-0.0042	-0.0043

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any full-quarter jobs			Any single-quarter jobs				
During CF * Female * Multiracial			(0.010)	(0.010)			(0.011)	(0.011)
			0.010	0.011			-0.0049	-0.0042
During CF * Female * No response			(0.0097)	(0.0097)			(0.010)	(0.010)
			-0.0043	-0.0022			-0.017	-0.015
During CF * Female * White			(0.026)	(0.026)			(0.026)	(0.026)
			0.016*	0.018*			-0.013	-0.013
During CF * Female * Non-English case material			(0.0078)	(0.0078)			(0.0080)	(0.0080)
			0.011	0.011			-0.019*	-0.019*
During CF * Female * 1 Adult, children under age 6			(0.0083)	(0.0083)			(0.0087)	(0.0087)
			0.0046	0.0059			0.014	0.013
During CF *Female * 1 Adult, children ages 6-17			(0.011)	(0.011)			(0.012)	(0.012)
			0.0098	0.012			0.024	0.026*
During CF * Female * Multiple adults , no children			(0.012)	(0.012)			(0.012)	(0.012)
			0.0041	0.0038			0.037**	0.039**
During CF * Female * Multiple adults , children under age 6			(0.013)	(0.013)			(0.013)	(0.013)
			-0.013	-0.014			0.020*	0.019*
During CF * Female * Multiple adults, children ages 6-17			(0.0086)	(0.0086)			(0.0088)	(0.0088)
			0.053***	0.052***			0.028**	0.027**
After CF * Female * Asian and Pacific Islander			(0.0097)	(0.0097)			(0.0100)	(0.0100)
			0.0068	0.0059			-0.0034	-0.0044
After CF * Female * Black			(0.0096)	(0.0096)			(0.012)	(0.012)
			0.0041	0.0044			-0.00044	-0.0020
After CF * Female * Multiracial			(0.0090)	(0.0091)			(0.011)	(0.011)
			0.0037	0.0046			-0.0048	-0.0036
After CF * Female * No response			(0.0087)	(0.0087)			(0.010)	(0.010)
			-0.0049	-0.0013			0.012	0.019
After CF * Female * White			(0.022)	(0.022)			(0.026)	(0.026)
			0.0060	0.0079			-0.0066	-0.0053
After CF * Female * Non-English case material			(0.0069)	(0.0069)			(0.0082)	(0.0082)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any full-quarter jobs			Any single-quarter jobs				
			0.017*	0.017*			-0.0049	-0.0041
After CF * Female * 1 Adult, children under age 6			(0.0074)	(0.0074)			(0.0091)	(0.0091)
			-0.00011	0.0043			0.017	0.023
After CF *Female * 1 Adult, children ages 6-17			(0.0099)	(0.0099)			(0.013)	(0.013)
			-0.0021	0.000051			0.024	0.027*
After CF * Female * Multiple adults , no children			(0.010)	(0.010)			(0.013)	(0.013)
			-0.028*	-0.026*			0.023	0.026*
After CF * Female * Multiple adults , children under age 6			(0.011)	(0.011)			(0.013)	(0.013)
			0.019*	0.022**			0.0070	0.010
After CF * Female * Multiple adults, children ages 6-17			(0.0076)	(0.0077)			(0.0092)	(0.0092)
			0.020*	0.025**			0.015	0.024*
During CF * Northern region			(0.0085)	(0.0085)			(0.010)	(0.010)
				0.021				-0.30*
During CF * Sacramento region				(0.080)				(0.12)
				-0.059				-0.38***
During CF * Bay Area region				(0.086)				(0.11)
				-0.15**				-0.25***
During CF * Central Valley and Sierra region				(0.051)				(0.061)
				-0.24***				-0.14**
During CF * Central Coast region				(0.053)				(0.053)
				-0.27***				-0.029
During CF * Inland Empire region				(0.081)				(0.096)
				-0.19**				-0.17**
During CF * Orange County				(0.064)				(0.067)
				0.031				-0.15
During CF * San Diego County				(0.10)				(0.084)
				-0.16*				-0.22**
After CF * Northern region				(0.073)				(0.079)
				0.058				-0.21

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any full-quarter jobs			Any single-quarter jobs				
After CF * Sacramento region				(0.080)				(0.12)
				0.032				-0.31**
After CF * Bay Area region				(0.086)				(0.11)
				-0.058				-0.15*
After CF * Central Valley and Sierra region				(0.051)				(0.062)
				-0.17**				-0.054
After CF * Central Coast region				(0.052)				(0.053)
				-0.20*				0.063
After CF * Inland Empire region				(0.081)				(0.096)
				-0.13*				-0.074
After CF * Orange County				(0.064)				(0.067)
				0.078				-0.089
After CF * San Diego County				(0.10)				(0.084)
				-0.092				-0.16*
Constant				(0.072)				(0.079)
	0.77***	0.77***	0.77***	0.79***	0.36***	0.36***	0.36***	0.28***
	(0.00081)	(0.00082)	(0.00083)	(0.020)	(0.00091)	(0.00092)	(0.00092)	(0.021)
Individual fixed effects	X	X	X	X	X	X	X	X
Quarter of time period start fixed effects	X	X	X	X	X	X	X	X
Region*quarter of time period start				X				X
Observations	514,400	514,400	514,400	514,400	514,400	514,400	514,400	514,400
R-squared	0.070	0.074	0.074	0.079	0.009	0.010	0.010	0.018
Number of individuals	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051
Mean of dependent variable	0.73	0.73	0.73	0.73	0.34	0.34	0.34	0.34

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

**TABLE C2A**

Likelihood of event occurring before, during, or after a new CalFresh spell – for those who do and do not return to CalFresh after ending a new spell

	(1)	(2)	(3)	(4)
	Any full-quarter jobs	Any single-quarter jobs	Any full-quarter jobs	Any single-quarter jobs
	Those who return to CalFresh		Those who do not return to CalFresh	
During CF	-0.22*** (0.0086)	-0.047*** (0.0089)	-0.15*** (0.0066)	-0.086*** (0.0068)
After CF	-0.058*** (0.0083)	0.082*** (0.0090)	0.11*** (0.0057)	-0.071*** (0.0069)
During CF * Asian and Pacific Islander	0.037* (0.016)	-0.00068 (0.016)	0.018 (0.0097)	0.029** (0.010)
During CF * Black	0.033** (0.012)	0.029* (0.013)	0.030** (0.0096)	0.030** (0.010)
During CF * Multiracial	-0.0025 (0.012)	0.0098 (0.012)	-0.0019 (0.0097)	0.0100 (0.010)
During CF * No response	0.092 (0.049)	-0.010 (0.047)	-0.022 (0.020)	0.023 (0.019)
During CF * White	-0.0012 (0.0099)	-0.0090 (0.010)	-0.0088 (0.0070)	0.015* (0.0072)
During CF * Non-English case material	0.026* (0.011)	-0.021 (0.011)	0.028*** (0.0074)	-0.0027 (0.0078)
During CF * Female	0.026* (0.012)	-0.0090 (0.012)	-0.0071 (0.0085)	0.015 (0.0088)
During CF * 1 Adult, children under age 6	0.056** (0.017)	-0.022 (0.018)	0.037** (0.012)	0.016 (0.013)
During CF * 1 Adult, children ages 6-17	0.0063 (0.017)	0.0061 (0.018)	-0.0039 (0.012)	-0.0040 (0.013)
During CF * Multiple adults, no children	0.0096 (0.017)	0.00030 (0.018)	0.012 (0.011)	-0.022* (0.011)
During CF * Multiple adults, children under age 6	0.071*** (0.0093)	-0.011 (0.0096)	0.052*** (0.0066)	0.014* (0.0069)
During CF * Multiple adults, children ages 6-17	0.024 (0.013)	-0.010 (0.013)	-0.011 (0.0085)	0.025** (0.0087)
After CF * Asian and Pacific Islander	0.025 (0.015)	-0.0043 (0.017)	-0.0032 (0.0083)	0.025* (0.010)
After CF * Black	0.013 (0.012)	0.046*** (0.013)	-0.0048 (0.0085)	0.028** (0.010)
After CF * Multiracial	-0.010 (0.011)	0.032* (0.013)	-0.0019 (0.0083)	0.011 (0.010)
After CF * No response	0.036 (0.011)	-0.027 (0.013)	-0.024 (0.0083)	0.0098 (0.010)

	(1) Any full-quarter jobs	(2) Any single-quarter jobs	(3) Any full-quarter jobs	(4) Any single-quarter jobs
	Those who return to CalFresh		Those who do not return to CalFresh	
	(0.046)	(0.045)	(0.017)	(0.020)
After CF * White	-0.0030 (0.0094)	-0.0042 (0.010)	-0.00039 (0.0061)	0.0033 (0.0073)
After CF * Non-English case material	0.021* (0.010)	-0.035** (0.012)	-0.014* (0.0063)	0.019* (0.0080)
After CF * Female	0.021 (0.011)	-0.017 (0.012)	-0.038*** (0.0071)	0.020* (0.0089)
After CF * 1 Adult, children under age 6	0.0085 (0.016)	-0.029 (0.019)	-0.060*** (0.0097)	0.027* (0.013)
After CF * 1 Adult, children ages 6-17	-0.00091 (0.016)	0.012 (0.019)	-0.062*** (0.010)	0.014 (0.014)
After CF * Multiple adults, no children	0.0016 (0.017)	-0.0037 (0.019)	-0.019 (0.0095)	-0.0037 (0.011)
After CF * Multiple adults, children under age 6	0.0070 (0.0086)	-0.014 (0.010)	-0.070*** (0.0057)	0.037*** (0.0071)
After CF * Multiple adults, children ages 6-17	-0.012 (0.012)	-0.020 (0.014)	-0.074*** (0.0071)	0.045*** (0.0089)
During CF * Female * Asian and Pacific Islander	-0.036 (0.021)	-0.0099 (0.021)	0.021 (0.013)	-0.032* (0.013)
During CF * Female * Black	-0.032 (0.016)	0.015 (0.017)	-0.00036 (0.013)	-0.016 (0.014)
During CF * Female * Multiracial	-0.024 (0.015)	-0.00085 (0.016)	0.033** (0.013)	-0.0032 (0.013)
During CF * Female * No response	-0.11 (0.070)	-0.017 (0.068)	0.026 (0.028)	-0.023 (0.028)
During CF * Female * White	-0.0041 (0.013)	-0.00065 (0.014)	0.030** (0.0095)	-0.020* (0.0098)
During CF * Female * Non-English case material	-0.00020 (0.015)	-0.0081 (0.015)	0.019 (0.010)	-0.026* (0.011)
During CF * Female * 1 Adult, children under age 6	0.014 (0.020)	0.026 (0.021)	0.0080 (0.014)	0.0026 (0.015)
During CF * Female * 1 Adult, children ages 6-17	0.015 (0.020)	0.013 (0.021)	0.015 (0.014)	0.030* (0.015)
During CF * Female * Multiple adults , no children	0.023 (0.024)	0.013 (0.024)	0.00057 (0.015)	0.045** (0.015)
During CF * Female * Multiple adults , children under age 6	-0.0051 (0.015)	0.026 (0.015)	-0.013 (0.011)	0.012 (0.011)



	(1) Any full-quarter jobs	(2) Any single-quarter jobs	(3) Any full-quarter jobs	(4) Any single-quarter jobs
	Those who return to CalFresh		Those who do not return to CalFresh	
During CF * Female * Multiple adults, children ages 6-17	0.047** (0.018)	0.032 (0.018)	0.059*** (0.012)	0.023 (0.012)
After CF * Female * Asian and Pacific Islander	-0.033 (0.020)	0.014 (0.022)	0.028* (0.011)	-0.015 (0.014)
After CF * Female * Black	-0.020 (0.016)	0.015 (0.018)	0.016 (0.011)	-0.0094 (0.014)
After CF * Female * Multiracial	-0.018 (0.015)	-0.0099 (0.017)	0.018 (0.011)	0.0021 (0.013)
After CF * Female * No response	-0.074 (0.064)	0.023 (0.067)	0.030 (0.024)	0.0060 (0.029)
After CF * Female * White	0.00088 (0.013)	-0.0039 (0.014)	0.015 (0.0081)	-0.0092 (0.010)
After CF * Female * Non-English case material	0.0084 (0.014)	0.0031 (0.016)	0.024** (0.0087)	-0.0086 (0.011)
After CF * Female * 1 Adult, children under age 6	0.00069 (0.018)	0.035 (0.021)	0.020 (0.011)	0.0021 (0.016)
After CF *Female * 1 Adult, children ages 6-17	-0.0020 (0.019)	0.022 (0.022)	0.015 (0.012)	0.016 (0.016)
After CF * Female * Multiple adults , no children	-0.035 (0.023)	0.024 (0.025)	-0.0100 (0.013)	0.016 (0.015)
After CF * Female * Multiple adults , children under age 6	-0.0029 (0.014)	0.013 (0.016)	0.049*** (0.0090)	-0.0038 (0.011)
After CF * Female * Multiple adults, children ages 6-17	0.015 (0.017)	0.048* (0.019)	0.044*** (0.0097)	-0.00029 (0.012)
During CF * Northern region	0.038 (0.033)	-0.081 (0.046)	0.0024 (0.10)	-0.35* (0.15)
During CF * Sacramento region	-0.041 (0.14)	-0.65*** (0.16)	-0.073 (0.11)	-0.24 (0.14)
During CF * Bay Area region	0.070 (0.10)	-0.32** (0.11)	-0.28*** (0.053)	-0.20** (0.074)
During CF * Central Valley and Sierra region	-0.38*** (0.084)	-0.22* (0.094)	-0.16* (0.063)	-0.10 (0.064)
During CF * Central Coast region	-0.16 (0.090)	-0.11 (0.096)	-0.34** (0.12)	0.020 (0.15)
During CF * Inland Empire region	-0.16 (0.12)	-0.063 (0.090)	-0.22** (0.070)	-0.24** (0.089)
During CF * Orange County	0.062	-0.043	0.011	-0.19

	(1) Any full-quarter jobs	(2) Any single-quarter jobs	(3) Any full-quarter jobs	(4) Any single-quarter jobs
	Those who return to CalFresh		Those who do not return to CalFresh	
	(0.17)	(0.093)	(0.13)	(0.11)
During CF * San Diego County	0.0100	-0.37**	-0.23**	-0.16
	(0.16)	(0.13)	(0.080)	(0.097)
After CF * Northern region	0.068*	0.0041	0.043	-0.25
	(0.030)	(0.043)	(0.10)	(0.15)
After CF * Sacramento region	0.043	-0.55***	0.020	-0.17
	(0.14)	(0.16)	(0.11)	(0.14)
After CF * Bay Area region	0.16	-0.21	-0.18***	-0.11
	(0.10)	(0.11)	(0.052)	(0.074)
After CF * Central Valley and Sierra region	-0.31***	-0.14	-0.088	-0.011
	(0.084)	(0.094)	(0.063)	(0.064)
After CF * Central Coast region	-0.074	-0.027	-0.28*	0.11
	(0.089)	(0.096)	(0.12)	(0.15)
After CF * Inland Empire region	-0.098	0.029	-0.15*	-0.14
	(0.12)	(0.089)	(0.070)	(0.089)
After CF * Orange County	0.11	0.040	0.056	-0.14
	(0.17)	(0.094)	(0.13)	(0.11)
After CF * San Diego County	0.065	-0.32*	-0.16*	-0.084
	(0.16)	(0.13)	(0.080)	(0.097)
Constant	0.73***	0.31***	0.83***	0.27***
	(0.035)	(0.031)	(0.023)	(0.027)
Individual fixed effects	X	X	X	X
Quarter of time period start fixed effect	X	X	X	X
Region*quarter of time period start	X	X	X	X
Observations	189,338	189,338	325,062	325,062
R-squared	0.066	0.036	0.098	0.016
Number of individuals	79,589	79,589	127,462	127,462

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

**TABLE C3**

Likelihood of event occurring in a given quarter relative to CalFresh spell start

	(1) Any CalFresh	(2) Add programs	(3) Any earnings (0.00049 )	(4) Add programs (0.00048)	(5) Job separation (0.00030)	(6) Add programs (0.00030)	(7) Full- quarter job (0.00048)	(8) Add programs (0.00047)	(9) Single- quarter job (0.00021)	(10) Add programs (0.00021)	(11) Multiple job- holding (0.00025)	(12) Add programs (0.00025)
Unemployment rate	-0.0013*** (0.00031)	-0.00080** (0.00030)	-0.020*** (0.00049 )	-0.020*** (0.00048)	-0.0054*** (0.00030)	-0.0054*** (0.00030)	-0.013*** (0.00048)	-0.013*** (0.00047)	-0.0052*** (0.00021)	-0.0051*** (0.00021)	-0.0034*** (0.00025)	-0.0035*** (0.00025)
Any CalFresh				-0.080*** (0.0014)		0.039*** (0.0010)		-0.17*** (0.0015)		0.030*** (0.00076)		-0.021*** (0.00074)
Any CalWORKs		0.29*** (0.0026)		-0.059*** (0.0031)		0.016*** (0.0022)		-0.10*** (0.0028)		0.013*** (0.0016)		-0.015*** (0.0013)
Any SSI/SSP		0.16*** (0.0064)		-0.099*** (0.0088)		-0.040*** (0.0058)		-0.022** (0.0070)		-0.019*** (0.0041)		-0.0042 (0.0032)
Any GA		0.18*** (0.0022)		-0.10*** (0.0030)		-0.014*** (0.0022)		-0.096*** (0.0023)		0.012*** (0.0017)		-0.017*** (0.0011)
Any IHSS		0.23*** (0.012)		-0.26*** (0.016)		-0.067*** (0.0087)		-0.16*** (0.014)		-0.021*** (0.0057)		-0.044*** (0.0077)
Quarters relative to new CalFresh spell												
5 quarters before	-0.044*** (0.00051)	-0.042*** (0.00051)	-0.0076** (0.00074 )	-0.011*** (0.00074)	0.0048*** (0.00100)	0.0066*** (0.00100)						
4 quarters before	-0.10*** (0.00069)	-0.10*** (0.00068)	-0.023*** (0.00096 )	-0.032*** (0.00097)	0.0061*** (0.0010)	0.010*** (0.0010)	-0.013*** (0.00077)	-0.024*** (0.00078)	-0.0013* (0.00062)	0.00059 (0.00062)	-0.0017*** (0.00044)	-0.0031*** (0.00044)
3 quarters before	-0.10*** (0.00072)	-0.10*** (0.00071)	-0.034*** (0.0011)	-0.043*** (0.0011)	0.020*** (0.0011)	0.025*** (0.0011)	-0.042*** (0.0010)	-0.053*** (0.0010)	0.0025*** (0.00065)	0.0044*** (0.00065)	-0.0046*** (0.00055)	-0.0059*** (0.00055)
2 quarters before	-0.11*** (0.00076)	-0.11*** (0.00075)	-0.057*** (0.0013)	-0.062*** (0.0013)	0.026*** (0.0011)	0.031*** (0.0011)	-0.069*** (0.0012)	-0.076*** (0.0012)	0.0053*** (0.00069)	0.0069*** (0.00069)	-0.0075*** (0.00062)	-0.0083*** (0.00062)

	(1) Any CalFresh	(2)	(3) Any earnings	(4)	(5) Job separation	(6)	(7) Full- quarter job	(8)	(9) Single- quarter job	(10)	(11) Multiple job- holding	(12)
1 quarter before	-0.11*** (0.00081)	-0.11*** (0.00079)	-0.082*** (0.0014)	-0.088*** (0.0014)	0.12*** (0.0013)	0.12*** (0.0013)	-0.16*** (0.0013)	-0.17*** (0.0013)	0.022*** (0.00075)	0.024*** (0.00075)	-0.016*** (0.00066)	-0.017*** (0.00067)
1st quarter of spell	0.89*** (0.00085)	0.87*** (0.00086)	-0.089*** (0.0016)	-0.0099*** (0.0020)	0.060*** (0.0012)	0.025*** (0.0015)	-0.21*** (0.0014)	-0.038*** (0.0019)	0.041*** (0.00084)	0.012*** (0.0011)	-0.020*** (0.00072)	0.0015 (0.0010)
2nd quarter of spell	0.89*** (0.0010)	0.88*** (0.00100)	0.023*** (0.0018)	0.099*** (0.0022)	0.024*** (0.0013)	-0.011*** (0.0016)	-0.065*** (0.0017)	0.10*** (0.0022)	0.021*** (0.00088)	-0.0072*** (0.0011)	0.0069*** (0.00089)	0.028*** (0.0011)
1 quarter after	-0.053*** (0.0011)	-0.055*** (0.0011)	0.019*** (0.0018)	0.016*** (0.0018)	0.029*** (0.0013)	0.032*** (0.0013)	0.00033 (0.0017)	0.00045 (0.0017)	0.0046*** (0.00086)	0.0048*** (0.00086)	0.012*** (0.00092)	0.012*** (0.00092)
2 quarters after	0.073*** (0.0013)	0.070*** (0.0013)	0.0033 (0.0019)	0.011*** (0.0019)	0.025*** (0.0014)	0.022*** (0.0014)	-0.0044* (0.0018)	0.018*** (0.0018)	0.0043*** (0.00088)	0.00056 (0.00088)	0.0096*** (0.00096)	0.012*** (0.00097)
3 quarters after	0.14*** (0.0014)	0.13*** (0.0014)	-0.012*** (0.0020)	0.00083 (0.0020)	0.010*** (0.0014)	0.0052*** (0.0014)	-0.0069*** (0.0019)	0.027*** (0.0019)	-0.00019 (0.00090)	-0.0059*** (0.00090)	0.0081*** (0.00099)	0.012*** (0.0010)
4 quarters after	0.15*** (0.0015)	0.15*** (0.0014)	-0.017*** (0.0020)	-0.0021 (0.0020)	0.047*** (0.0015)	0.041*** (0.0015)	-0.0080*** (0.0019)	0.028*** (0.0019)	0.00041 (0.00092)	-0.0058*** (0.00093)	0.0086*** (0.0010)	0.013*** (0.0011)
5 quarters after	0.16*** (0.0015)	0.15*** (0.0015)	-0.023*** (0.0021)	-0.0085*** (0.0021)	0.026*** (0.0015)	0.020*** (0.0015)	-0.0081*** (0.0020)	0.029*** (0.0020)	-0.0031*** (0.00094)	-0.0093*** (0.00094)	0.0072*** (0.0011)	0.012*** (0.0011)
6 quarters after	0.15*** (0.0015)	0.15*** (0.0015)	-0.032*** (0.0022)	-0.018*** (0.0021)								
Constant	0.11*** (0.0027)	0.11*** (0.0027)	0.81*** (0.0043)	0.82*** (0.0043)	0.17*** (0.0027)	0.17*** (0.0027)	0.57*** (0.0041)	0.59*** (0.0041)	0.090*** (0.0018)	0.088*** (0.0018)	0.097*** (0.0022)	0.099*** (0.0022)
Observations	2,884,013	2,884,013	2,884,013	2,884,013	2,676,962	2,676,962	2,469,911	2,469,911	2,469,911	2,469,911	2,469,911	2,469,911
R-squared	0.630	0.639	0.015	0.020	0.008	0.009	0.036	0.051	0.004	0.005	0.004	0.005
Number of individuals	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051	207,051

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Quarters during CalFresh other than the first and last are omitted because this varies for individuals in the analysis cohort. The small share who spend just 3 months enrolled have that quarter assigned as their first quarter during CalFresh, and are assigned a missing value for their last quarter during CalFresh. Estimates for the sixth quarters before and/or after CalFresh are omitted when metrics are not calculable in those quarters. Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

**TABLE C4**

Change in single- and full- quarter jobholding from before to after CalFresh

	(1)	(2)	(3)	(4)	(5)	(6)
	More full-quarter jobs			Fewer single-quarter jobs		
	Basic	Add region interactions	Add program and prev. employment vars	Basic	Add region interactions	Add program and prev. employment vars
Female	0.060*** (0.0050)	0.060*** (0.0050)	0.056*** (0.0043)	0.040*** (0.0084)	0.039*** (0.0084)	0.043*** (0.0073)
Asian and Pacific Islander	0.022*** (0.0063)	0.021*** (0.0063)	0.035*** (0.0054)	0.058*** (0.011)	0.059*** (0.011)	0.049*** (0.0093)
Black	-0.024*** (0.0049)	-0.024*** (0.0049)	-0.0036 (0.0041)	-0.028** (0.0087)	-0.029*** (0.0087)	-0.014 (0.0073)
Multiracial	-0.039*** (0.0051)	-0.039*** (0.0051)	-0.0083 (0.0044)	0.0075 (0.0088)	0.0073 (0.0088)	-0.00022 (0.0075)
No response	0.022 (0.011)	0.022 (0.011)	0.018 (0.0098)	0.040 (0.021)	0.040 (0.021)	0.033 (0.018)
White	-0.043*** (0.0038)	-0.043*** (0.0038)	-0.0076* (0.0033)	0.051*** (0.0067)	0.050*** (0.0067)	0.021*** (0.0057)
Non-English case material	0.0016 (0.0051)	0.0014 (0.0051)	-0.014** (0.0044)	-0.029*** (0.0085)	-0.030*** (0.0085)	-0.036*** (0.0073)
Female * Asian and Pacific Islander	0.0074 (0.0087)	0.0076 (0.0087)	-0.017* (0.0074)	-0.058*** (0.015)	-0.059*** (0.015)	-0.048*** (0.013)
Female * Black	0.012 (0.0075)	0.012 (0.0075)	-0.021** (0.0064)	-0.034** (0.013)	-0.033* (0.013)	-0.026* (0.011)
Female * Multiracial	0.0083 (0.0073)	0.0081 (0.0073)	-0.0090 (0.0062)	-0.022 (0.013)	-0.022 (0.013)	-0.022* (0.011)
Female * No response	-0.019 (0.018)	-0.019 (0.018)	-0.021 (0.015)	-0.017 (0.032)	-0.019 (0.032)	-0.044 (0.027)
Female * White	-0.0056 (0.0057)	-0.0057 (0.0057)	-0.017*** (0.0048)	-0.030** (0.0099)	-0.029** (0.0099)	-0.023** (0.0085)
Female * Non-English case material	-0.051*** (0.0069)	-0.050*** (0.0069)	-0.020*** (0.0059)	-0.042*** (0.012)	-0.042*** (0.012)	-0.037*** (0.010)

	(1)	(2)	(3)	(4)	(5)	(6)
	More full-quarter jobs			Fewer single-quarter jobs		
1 Adult, children under age 6	0.078*** (0.0090)	0.078*** (0.0091)	0.013 (0.0081)	0.0022 (0.014)	0.0011 (0.014)	0.0062 (0.012)
1 Adult, children ages 6-17	0.063*** (0.0082)	0.063*** (0.0082)	0.010 (0.0072)	0.015 (0.013)	0.015 (0.013)	0.011 (0.012)
Multiple adults, no children	0.073*** (0.0063)	0.073*** (0.0063)	0.031*** (0.0054)	0.021 (0.011)	0.022 (0.011)	0.019* (0.0096)
Multiple adults, children under age 6	0.091*** (0.0045)	0.091*** (0.0045)	-0.0056 (0.0041)	0.038*** (0.0072)	0.038*** (0.0072)	0.020** (0.0065)
Multiple adults, children ages 6-17	0.091*** (0.0057)	0.091*** (0.0057)	0.014** (0.0051)	0.027** (0.0097)	0.028** (0.0097)	0.023** (0.0085)
Female * 1 Adult, children under age 6	-0.054*** (0.010)	-0.054*** (0.010)	0.0024 (0.0090)	0.046** (0.016)	0.047** (0.016)	0.019 (0.014)
Female * 1 Adult, children ages 6-17	-0.0097 (0.0097)	-0.010 (0.0097)	0.015 (0.0084)	-0.0089 (0.016)	-0.0086 (0.016)	-0.0037 (0.014)
Female * Multiple adults , no children	-0.076*** (0.0088)	-0.076*** (0.0088)	-0.029*** (0.0075)	0.012 (0.016)	0.011 (0.016)	-0.0079 (0.014)
Female * Multiple adults , children under age 6	-0.12*** (0.0067)	-0.12*** (0.0067)	0.0085 (0.0058)	0.024* (0.012)	0.024* (0.012)	0.0016 (0.010)
Female * Multiple adults, children ages 6-17	-0.054*** (0.0079)	-0.054*** (0.0079)	0.017* (0.0068)	-0.00094 (0.014)	-0.0014 (0.014)	-0.00038 (0.012)
Age at CF spell start	-0.0013 (0.0013)	-0.0013 (0.0013)	-0.0016 (0.0011)	0.0071** (0.0023)	0.0072** (0.0023)	0.0027 (0.0019)
Age squared	-0.000021 (0.000016)	-0.000021 (0.000016)	0.000014 (0.000014)	-0.000065* (0.000029)	-0.000066* (0.000029)	-0.000034 (0.000025)
Northern region	-0.013* (0.0058)	-0.021 (0.020)	-0.032 (0.017)	0.010 (0.011)	0.034 (0.043)	0.020 (0.038)
Sacramento region	0.024*** (0.0047)	0.013 (0.016)	0.0021 (0.014)	-0.015 (0.0085)	-0.033 (0.034)	-0.018 (0.030)
Bay Area region	0.037*** (0.0037)	0.039** (0.013)	-0.0035 (0.011)	-0.013* (0.0065)	-0.018 (0.027)	-0.0038 (0.023)

	(1)	(2)	(3)	(4)	(5)	(6)
	More full-quarter jobs			Fewer single-quarter jobs		
Central Valley and Sierra region	-0.0035 (0.0036)	-0.013 (0.012)	-0.037*** (0.011)	-0.038*** (0.0062)	-0.093*** (0.025)	-0.086*** (0.022)
Central Coast region	0.028*** (0.0054)	0.013 (0.018)	-0.036* (0.016)	-0.0063 (0.0090)	0.0087 (0.035)	0.0022 (0.031)
Inland Empire region	0.00067 (0.0035)	-0.0029 (0.013)	-0.015 (0.011)	-0.017** (0.0062)	-0.0060 (0.026)	0.0013 (0.022)
Orange County	0.023*** (0.0050)	0.032 (0.018)	0.0055 (0.016)	-0.0076 (0.0086)	-0.028 (0.036)	-0.027 (0.032)
San Diego County	0.025*** (0.0043)	0.0028 (0.016)	-0.019 (0.014)	0.0068 (0.0076)	-0.089* (0.036)	-0.074* (0.029)
3 to 4 quarter spell length	0.0054* (0.0025)	0.0045 (0.0025)	-0.027*** (0.0022)	0.034*** (0.0045)	0.034*** (0.0045)	0.026*** (0.0039)
5 to 6 quarter spell length	0.042*** (0.0040)	0.042*** (0.0040)	-0.012*** (0.0035)	0.043*** (0.0070)	0.044*** (0.0071)	0.038*** (0.0062)
7 or more quarters spell length	0.027*** (0.0037)	0.027*** (0.0037)	-0.024*** (0.0034)	0.074*** (0.0068)	0.074*** (0.0068)	0.053*** (0.0063)
Average quarterly earnings before CF			-2.8e-06*** (3.4e-07)			8.9e-07 (5.1e-07)
Average quarterly earnings during CF			0.000044*** (4.2e-07)			4.2e-06*** (5.6e-07)
Any new employers after CF			0.12*** (0.0020)			-0.40*** (0.0037)
Any primary job separations before CF			0.097*** (0.0032)			-0.014* (0.0067)
Any single-quarter jobs before CF			-0.035*** (0.0029)			
Any multiple job-holdings before CF			-0.037*** (0.0044)			-0.027*** (0.0045)
Unemployment rate in quarter after exit			0.000098 (0.00051)			-0.0026** (0.00081)

	(1)	(2)	(3)	(4)	(5)	(6)
	More full-quarter jobs			Fewer single-quarter jobs		
Ever have SSI/SSP			-0.11***			-0.054***
			(0.0042)			(0.013)
Ever have CW			-0.067***			-0.016*
			(0.0035)			(0.0062)
Ever have GA			-0.053***			-0.030***
			(0.0030)			(0.0060)
Ever have IHSS			-0.095***			0.0042
			(0.0067)			(0.021)
Work exemption during CW			0.0083			-0.0094
			(0.0058)			(0.011)
Number of CF case numbers			-0.028***			-0.014
			(0.0051)			(0.0092)
1 full-quarter job before CalFresh			-0.044***			
			(0.0038)			
2 full-quarter jobs before CalFresh			-0.11***			
			(0.0040)			
3 full-quarter jobs before CalFresh			-0.19***			
			(0.0043)			
4 full-quarter jobs before CalFresh			-0.30***			
			(0.0041)			
5 full-quarter jobs before CalFresh			0.29***			
			(0.0028)			
No earnings after CF						0.12***
						(0.0039)
Number of quarters without earnings before CF						-0.0012
						(0.0011)
2 single-quarter job quarters before CF						0.21***
						(0.0041)
3 single-quarter job quarters before CF						0.32***
						(0.0066)



	(1)	(2)	(3)	(4)	(5)	(6)
	More full-quarter jobs			Fewer single-quarter jobs		
4 single-quarter job quarters before CF						0.40*** (0.012)
5 single-quarter job quarters before CF						0.48*** (0.018)
6 single-quarter job quarters before CF						0.53*** (0.031)
Any single-quarter job during CF						-0.095*** (0.0038)
Constant	0.50*** (0.025)	0.50*** (0.026)	0.29*** (0.023)	0.42*** (0.043)	0.44*** (0.045)	0.83*** (0.041)
Quarter of spell start	X	X	X	X	X	X
Quarter of spell start * region		X	X		X	X
Observations	203,867	203,867	203,867	60,233	60,233	60,233
R-squared	0.024	0.025	0.299	0.014	0.016	0.288
Mean of dependent variable	0.39	0.39	0.39	0.69	0.69	0.69

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

**TABLE C4A**

Change in single- and full-quarter jobholding from before to after CalFresh – for those who do and do not return to CalFresh in the 18 months after exit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
Female	0.047*** (0.0070)	0.055*** (0.0061)	0.046*** (0.014)	0.047*** (0.011)	0.054*** (0.0067)	0.049*** (0.0058)	0.029** (0.011)	0.035*** (0.0094)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
Asian and Pacific Islander	0.012 (0.0099)	0.028** (0.0086)	0.052** (0.020)	0.051** (0.016)	0.00091 (0.0078)	0.023*** (0.0067)	0.052*** (0.013)	0.043*** (0.011)
Black	0.020** (0.0066)	0.020*** (0.0057)	-0.038** (0.013)	-0.015 (0.011)	-0.043*** (0.0067)	-0.022*** (0.0057)	-0.013 (0.011)	-0.0089 (0.0098)
Multiracial	-0.011 (0.0067)	0.0067 (0.0059)	0.024 (0.013)	0.0088 (0.011)	-0.029*** (0.0072)	-0.0018 (0.0062)	0.0061 (0.012)	0.0026 (0.010)
No response	-0.00069 (0.022)	0.0038 (0.019)	0.015 (0.050)	0.0085 (0.042)	-0.050*** (0.013)	-0.025* (0.011)	0.015 (0.023)	0.013 (0.020)
White	-0.029*** (0.0053)	0.0022 (0.0046)	0.068*** (0.011)	0.031*** (0.0089)	-0.051*** (0.0052)	-0.014** (0.0045)	0.037*** (0.0084)	0.014* (0.0074)
Non-English case material	0.043*** (0.0079)	0.011 (0.0071)	-0.020 (0.014)	-0.026* (0.012)	-0.035*** (0.0065)	-0.029*** (0.0056)	-0.038*** (0.010)	-0.040*** (0.0092)
Female * Asian and Pacific Islander	0.0027 (0.014)	-0.017 (0.012)	-0.064* (0.028)	-0.054* (0.023)	0.013 (0.011)	-0.012 (0.0092)	-0.054** (0.018)	-0.046** (0.016)
Female * Black	-0.015 (0.011)	-0.033*** (0.0091)	-0.052* (0.021)	-0.042* (0.017)	0.025* (0.010)	-0.0072 (0.0086)	-0.029 (0.017)	-0.018 (0.014)
Female * Multiracial	-0.00065 (0.0098)	-0.011 (0.0085)	-0.039* (0.019)	-0.029 (0.016)	0.015 (0.010)	-0.0045 (0.0087)	-0.0095 (0.017)	-0.016 (0.014)
Female * No response	0.018 (0.038)	0.019 (0.033)	-0.010 (0.081)	-0.025 (0.061)	-0.020 (0.020)	-0.024 (0.017)	-0.013 (0.035)	-0.040 (0.031)
Female * White	-0.0025 (0.0080)	-0.017* (0.0069)	-0.040* (0.016)	-0.026 (0.013)	-0.0047 (0.0075)	-0.015* (0.0064)	-0.020 (0.012)	-0.019 (0.011)
Female * Non-English case material	-0.053*** (0.011)	-0.033*** (0.0092)	-0.036 (0.020)	-0.045** (0.016)	-0.041*** (0.0089)	-0.013 (0.0076)	-0.044** (0.015)	-0.033** (0.013)
1 Adult, children under age 6	0.085*** (0.013)	0.046*** (0.012)	-0.014 (0.022)	0.0025 (0.019)	0.057*** (0.012)	-0.0085 (0.011)	0.015 (0.018)	0.011 (0.016)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
1 Adult, children ages 6-17	0.066*** (0.012)	0.043*** (0.011)	-0.0089 (0.022)	0.0044 (0.018)	0.035** (0.011)	-0.023* (0.0096)	0.021 (0.016)	0.0069 (0.015)
Multiple adults, no children	0.045*** (0.0097)	0.024** (0.0084)	0.0066 (0.020)	0.019 (0.018)	0.043*** (0.0079)	0.014* (0.0068)	0.012 (0.013)	0.0099 (0.011)
Multiple adults, children under age 6	0.10*** (0.0069)	0.039*** (0.0063)	0.045*** (0.012)	0.045*** (0.011)	0.049*** (0.0058)	-0.041*** (0.0053)	0.023** (0.0090)	0.00095 (0.0083)
Multiple adults, children ages 6-17	0.069*** (0.0088)	0.030*** (0.0079)	0.027 (0.017)	0.047** (0.015)	0.055*** (0.0072)	-0.013* (0.0064)	0.014 (0.012)	0.0022 (0.010)
Female * 1 Adult, children under age 6	-0.020 (0.015)	0.0096 (0.013)	0.078** (0.026)	0.047* (0.021)	-0.055*** (0.014)	0.0018 (0.012)	0.028 (0.021)	0.0023 (0.019)
Female * 1 Adult, children ages 6-17	0.013 (0.014)	0.014 (0.012)	0.0032 (0.026)	0.011 (0.021)	-0.0056 (0.013)	0.026* (0.011)	-0.0028 (0.019)	-0.0012 (0.017)
Female * Multiple adults , no children	-0.051*** (0.013)	-0.026* (0.011)	0.037 (0.029)	-0.013 (0.024)	-0.072*** (0.011)	-0.024* (0.0095)	0.0084 (0.019)	-0.0015 (0.017)
Female * Multiple adults , children under age 6	-0.092*** (0.0100)	-0.0092 (0.0087)	0.035 (0.019)	-0.0092 (0.016)	-0.11*** (0.0088)	0.024** (0.0076)	0.027 (0.015)	0.012 (0.013)
Female * Multiple adults, children ages 6-17	-0.0081 (0.012)	0.021* (0.010)	0.00091 (0.024)	-0.016 (0.020)	-0.057*** (0.010)	0.019* (0.0086)	0.0059 (0.017)	0.011 (0.015)
Age at CF spell start	-0.0068*** (0.0018)	-0.0014 (0.0016)	0.0040 (0.0036)	0.00077 (0.0030)	0.0053** (0.0017)	-0.00012 (0.0015)	0.0097*** (0.0028)	0.0050* (0.0025)
Age squared	0.000044 (0.000023)	0.000012 (0.000020)	-0.000013 (0.000047)	-4.1e-06 (0.000038)	-0.000097*** (0.000022)	-2.5e-06 (0.000018)	-0.00011** (0.000037)	-0.000067* (0.000032)
Northern region	0.0049 (0.0079)	-0.018 (0.022)	-0.013 (0.018)	-0.045 (0.056)	-0.017* (0.0078)	-0.019 (0.025)	0.029* (0.014)	0.097 (0.051)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
Sacramento region	0.019** (0.0066)	0.0085 (0.019)	-0.047*** (0.014)	-0.079 (0.047)	0.023*** (0.0062)	-0.0052 (0.019)	0.0045 (0.011)	0.025 (0.039)
Bay Area region	0.017** (0.0052)	0.00020 (0.015)	-0.027* (0.011)	-0.064 (0.037)	0.038*** (0.0048)	-0.00076 (0.015)	-0.0070 (0.0081)	0.045 (0.029)
Central Valley and Sierra region	0.0062 (0.0049)	-0.0099 (0.015)	-0.055*** (0.0099)	-0.13*** (0.032)	0.0027 (0.0048)	-0.037* (0.015)	-0.021** (0.0079)	-0.037 (0.029)
Central Coast region	0.030*** (0.0076)	-0.00023 (0.022)	-0.017 (0.014)	-0.043 (0.047)	0.029*** (0.0072)	-0.036 (0.022)	0.0027 (0.011)	0.056 (0.041)
Inland Empire region	0.0078 (0.0049)	-0.011 (0.014)	-0.036*** (0.010)	-0.039 (0.034)	0.0060 (0.0047)	0.0093 (0.015)	0.00049 (0.0079)	0.050 (0.030)
Orange County	0.022** (0.0071)	0.013 (0.022)	-0.015 (0.014)	-0.099* (0.051)	0.018** (0.0065)	0.0098 (0.021)	-0.0025 (0.011)	0.026 (0.040)
San Diego County	0.023*** (0.0062)	-0.0073 (0.018)	0.0064 (0.013)	-0.15*** (0.043)	0.013* (0.0056)	-0.0084 (0.019)	0.0020 (0.0095)	-0.0038 (0.039)
3 to 4 quarter spell length	-0.0063 (0.0035)	-0.030*** (0.0031)	0.032*** (0.0072)	0.024*** (0.0061)	0.020*** (0.0034)	-0.021*** (0.0030)	0.037*** (0.0056)	0.027*** (0.0050)
5 to 6 quarter spell length	0.033*** (0.0057)	-0.023*** (0.0051)	0.022 (0.011)	0.023* (0.0096)	0.055*** (0.0053)	0.00013 (0.0047)	0.064*** (0.0088)	0.052*** (0.0080)
7 or more quarters spell length	0.022*** (0.0052)	-0.035*** (0.0049)	0.069*** (0.011)	0.044*** (0.0097)	0.039*** (0.0050)	-0.012* (0.0046)	0.082*** (0.0085)	0.058*** (0.0081)
Average quarterly earnings before CF		-4.3e-06*** (5.1e-07)		3.6e-07 (8.3e-07)		-3.4e-06*** (4.2e-07)		9.3e-07 (6.4e-07)
Average quarterly earnings during CF		0.000036*** (7.8e-07)		3.5e-06*** (9.7e-07)		0.000042*** (4.9e-07)		2.9e-06*** (6.9e-07)
Any new employers after CF		0.15***		-0.43***		0.10***		-0.37***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
		(0.0031)		(0.0065)		(0.0027)		(0.0046)
Any primary job separations before CF		0.082***		-0.018		0.11***		-0.016
		(0.0048)		(0.012)		(0.0042)		(0.0082)
Any single-quarter jobs before CF		-0.028***				-0.034***		
		(0.0043)				(0.0037)		
Any multiple job-holdings before CF		-0.015*		-0.012		-0.044***		-0.035***
		(0.0065)		(0.0074)		(0.0057)		(0.0057)
Unemployment rate in quarter after exit		0.00024		-0.0031**		0.0011		-0.0017
		(0.00071)		(0.0012)		(0.00071)		(0.0011)
Ever have SSI/SSP		-0.055***		-0.052**		-0.17***		-0.064***
		(0.0064)		(0.019)		(0.0056)		(0.018)
Ever have CW		-0.050***		0.0011		-0.029***		0.0054
		(0.0045)		(0.0083)		(0.0054)		(0.0096)
Ever have GA		-0.041***		-0.017*		0.0021		-0.00013
		(0.0038)		(0.0079)		(0.0049)		(0.0096)
Ever have IHSS		-0.044***		0.0096		-0.11***		0.020
		(0.0095)		(0.027)		(0.0092)		(0.031)
Work exemption during CW		0.010		-0.019		-0.018*		-0.013
		(0.0077)		(0.015)		(0.0086)		(0.016)
Number of CF case numbers		-0.013		-0.00015		-0.028***		-0.020
		(0.0066)		(0.013)		(0.0077)		(0.013)
No earnings after CF				0.15***				0.10***
				(0.0068)				(0.0050)
Number of quarters without earnings before CF				0.00063				-0.0019
				(0.0017)				(0.0014)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Those who return to CalFresh				Those who do not return to CalFresh			
	More full-quarter jobs		Fewer single-quarter jobs		More full-quarter jobs		Fewer single-quarter jobs	
	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions	Basic	Add program, employment, and region interactions
Any single-quarter job during CF				-0.099*** (0.0060)				-0.089*** (0.0049)
Constant	0.42*** (0.034)	0.16*** (0.033)	0.42*** (0.069)	0.84*** (0.064)	0.53*** (0.033)	0.35*** (0.031)	0.42*** (0.054)	0.78*** (0.054)
Quarter of spell start	X	X	X	X	X	X	X	X
Quarter of spell start * region		X		X		X		X
N quarters with single- or full-quarter jobs before CalFresh		X		X		X		X
Observations	85,399	85,399	24,746	24,746	118,468	118,468	35,487	35,487
R-squared	0.019	0.270	0.018	0.344	0.045	0.304	0.014	0.252
Mean of dependent variable	0.27	0.27	0.64	0.64	0.48	0.48	0.73	0.73

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

**TABLE C5**

Percent change in earnings, from before to after CalFresh

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall				Those who return to CalFresh		Those who do not return to CalFresh	
	% change between highest earning quarters		% change between average quarterly earnings		Highest	Average	Highest	Average
	Add region interactions		Add region interactions		With region*qtr of start interactions			
Highest quarterly earnings before CF	-0.017***	-0.017***			-0.017***		-0.017***	
	(0.00017)	(0.00017)			(0.00030)		(0.00021)	
Any quarters without earnings during CF	8.75***	8.78***	3.04*	3.02*	2.25	-0.49	14.0***	7.04***
	(1.37)	(1.37)	(1.18)	(1.18)	(2.19)	(1.80)	(1.75)	(1.54)
No new employers after CF	-18.3***	-18.4***	0.32	0.29	-24.9***	-6.17***	-21.1***	-3.70**
	(1.22)	(1.22)	(1.07)	(1.07)	(2.05)	(1.72)	(1.51)	(1.35)
Unemployment rate in quarter after exit	-0.22	-0.26	-0.65**	-0.72**	-0.80	-1.15***	0.25	-0.23
	(0.29)	(0.30)	(0.24)	(0.25)	(0.43)	(0.34)	(0.40)	(0.33)
Female	-12.1***	-12.0***	-7.00**	-7.01**	-6.44	-6.79	-17.2***	-9.51**
	(2.84)	(2.84)	(2.46)	(2.46)	(4.93)	(4.06)	(3.47)	(3.07)
Asian and Pacific Islander	-0.62	-0.52	1.62	1.69	-1.68	2.09	-2.26	-1.17
	(3.35)	(3.35)	(2.96)	(2.96)	(6.45)	(5.64)	(3.93)	(3.48)
Black	4.45	4.58	2.11	2.14	5.47	0.22	5.30	5.57
	(3.39)	(3.39)	(2.95)	(2.95)	(5.50)	(4.54)	(4.28)	(3.86)
Multiracial	-2.09	-1.99	-5.17*	-5.16*	-6.49	-5.78	5.73	0.86
	(3.03)	(3.02)	(2.57)	(2.57)	(4.53)	(3.94)	(4.05)	(3.37)
No response	21.8**	21.8**	18.0**	18.0**	38.2	18.7	9.88	7.26
	(7.02)	(7.02)	(5.91)	(5.92)	(22.7)	(16.0)	(7.26)	(6.38)
White	11.6***	11.7***	7.76***	7.84***	3.41	1.32	16.0***	11.1***
	(2.40)	(2.40)	(2.07)	(2.07)	(3.95)	(3.37)	(3.00)	(2.60)
Non-English case material	-19.6***	-19.4***	-23.5***	-23.4***	-15.7***	-15.9***	-19.9***	-25.6***
	(2.30)	(2.30)	(1.95)	(1.95)	(3.50)	(3.08)	(2.96)	(2.47)
Female * Asian and Pacific Islander	15.0***	15.1***	9.29*	9.44*	-0.13	-5.05	22.4***	16.3***
	(4.47)	(4.47)	(3.86)	(3.86)	(8.27)	(6.94)	(5.31)	(4.62)
Female * Black	19.0***	19.0***	14.2***	14.2***	12.9	9.86	22.9***	16.5***
	(4.39)	(4.40)	(3.82)	(3.82)	(7.16)	(5.93)	(5.55)	(4.97)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall				Those who return to CalFresh		Those who do not return to CalFresh	
	% change between highest earning quarters		% change between average quarterly earnings		Highest	Average	Highest	Average
Female * Multiracial	6.08 (3.88)	6.10 (3.88)	7.59* (3.37)	7.53* (3.38)	-1.12 (5.81)	-1.16 (5.02)	11.1* (5.22)	13.9** (4.52)
Female * No response	1.00 (9.98)	1.44 (9.98)	8.41 (9.24)	8.54 (9.26)	-52.3* (26.4)	-18.2 (24.5)	14.5 (10.7)	15.6 (9.98)
Female * White	0.64 (3.24)	0.61 (3.24)	0.34 (2.80)	0.28 (2.80)	-1.08 (5.54)	-1.05 (4.63)	1.81 (3.97)	1.28 (3.48)
Female * Non- English case material	-11.8*** (3.20)	-11.8*** (3.20)	-9.93*** (2.67)	-9.92*** (2.67)	-8.86 (5.11)	-8.51* (4.22)	-14.3*** (4.05)	-11.9*** (3.38)
1 Adult, children under age 6	16.9*** (3.75)	17.1*** (3.75)	17.1*** (3.38)	17.3*** (3.38)	24.5*** (6.44)	19.5*** (5.40)	12.4** (4.59)	15.5*** (4.30)
1 Adult, children ages 6-17	10.1** (3.68)	9.91** (3.68)	11.6*** (3.25)	11.5*** (3.25)	9.65 (6.11)	6.10 (4.72)	7.71 (4.58)	11.9** (4.26)
Multiple adults, no children	5.18 (3.73)	5.07 (3.72)	5.79 (3.10)	5.68 (3.10)	13.7* (6.84)	8.38 (5.38)	-2.77 (4.44)	-0.20 (3.76)
Multiple adults, children under age 6	21.9*** (2.17)	21.9*** (2.17)	22.2*** (1.95)	22.2*** (1.95)	22.9*** (3.57)	24.3*** (3.18)	19.8*** (2.72)	19.6*** (2.45)
Multiple adults, children ages 6-17	26.1*** (2.63)	26.1*** (2.63)	26.3*** (2.35)	26.4*** (2.35)	29.0*** (4.35)	25.6*** (3.73)	20.9*** (3.27)	23.0*** (2.96)
Female * 1 Adult, children under age 6	-17.5*** (4.40)	-17.7*** (4.40)	-19.6*** (3.91)	-19.7*** (3.92)	-16.2* (7.53)	-10.00 (6.32)	-15.5** (5.40)	-21.1*** (4.96)
Female * 1 Adult, children ages 6-17	-11.2* (4.34)	-11.1* (4.34)	-13.5*** (3.81)	-13.5*** (3.81)	-7.26 (7.22)	-0.89 (5.66)	-9.30 (5.41)	-15.8** (4.97)
Female * Multiple adults , no children	-14.3** (5.18)	-14.5** (5.18)	-14.0** (4.37)	-14.0** (4.38)	-23.6* (9.25)	-12.8 (7.52)	-8.24 (6.23)	-12.3* (5.33)
Female * Multiple adults , children under age 6	-19.5*** (3.51)	-19.6*** (3.51)	-20.4*** (3.13)	-20.4*** (3.13)	-13.1* (5.87)	-11.7* (5.08)	-20.3*** (4.36)	-22.2*** (3.95)



	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall				Those who return to CalFresh		Those who do not return to CalFresh	
	% change between highest earning quarters		% change between average quarterly earnings		Highest	Average	Highest	Average
Female * Multiple adults, children ages 6-17	-28.2***	-28.4***	-30.0***	-30.1***	-28.6***	-20.7***	-25.2***	-31.7***
	(3.86)	(3.86)	(3.37)	(3.37)	(6.62)	(5.50)	(4.73)	(4.21)
Age at CF spell start	8.69***	8.71***	7.47***	7.47***	7.38***	5.94***	9.59***	8.48***
	(0.75)	(0.75)	(0.65)	(0.65)	(1.23)	(1.02)	(0.95)	(0.83)
Age squared	-0.10***	-0.10***	-0.092***	-0.092***	-0.088***	-0.071***	-0.12***	-0.11***
	(0.0096)	(0.0096)	(0.0083)	(0.0083)	(0.016)	(0.013)	(0.012)	(0.011)
Ever have SSI/SSP	-28.7*	-28.2*	-33.1**	-32.7**	-11.9	-13.8	-38.4*	-44.7**
	(13.3)	(13.3)	(11.1)	(11.1)	(18.0)	(15.5)	(19.2)	(15.7)
Ever have CW	-3.04	-3.04	-7.29***	-7.21***	2.46	0.47	9.72**	8.08**
	(2.33)	(2.33)	(1.97)	(1.97)	(3.12)	(2.58)	(3.63)	(3.13)
Ever have GA	-8.70*	-8.85*	-11.8***	-11.8***	-5.96	-5.58	13.4*	10.9*
	(3.54)	(3.55)	(3.04)	(3.05)	(4.57)	(3.89)	(5.85)	(4.97)
Ever have IHSS	-58.6***	-57.8***	-55.6***	-55.0***	-32.4*	-25.9	-71.2***	-68.9***
	(11.3)	(11.3)	(10.0)	(10.1)	(14.5)	(13.2)	(16.8)	(13.6)
Work exemption during CW	4.83	4.65	7.61	7.33	0.36	5.04	2.11	1.51
	(4.59)	(4.60)	(3.97)	(3.98)	(6.45)	(5.59)	(6.56)	(5.63)
Number of CF case numbers	1.70	1.71	1.56	1.42	3.80	5.59	4.29	3.38
	(4.79)	(4.80)	(4.35)	(4.35)	(6.97)	(6.43)	(6.57)	(5.81)
Northern region	-10.2**	-7.17	-12.7***	-17.1	26.9	25.8	-23.6	-38.8***
	(3.94)	(13.7)	(3.37)	(11.5)	(24.6)	(23.5)	(15.8)	(11.3)
Sacramento region	-0.66	-7.83	-0.24	-10.8	4.16	-9.72	-14.9	-13.0
	(2.72)	(8.26)	(2.41)	(7.69)	(16.2)	(12.8)	(9.40)	(9.54)
Bay Area region	19.7***	12.1	16.9***	6.64	7.24	-2.50	14.8	11.0
	(2.28)	(7.25)	(2.01)	(6.79)	(12.3)	(10.4)	(8.95)	(8.71)
Central Valley and Sierra region	-11.0***	-10.4	-14.1***	-17.7**	-5.69	-12.4	-7.69	-14.5
	(2.20)	(6.63)	(1.86)	(6.04)	(10.5)	(9.20)	(8.51)	(7.91)
Central Coast region	-8.22**	6.44	-10.8***	-13.4	-2.69	-17.3	19.6	-3.14
	(2.78)	(10.3)	(2.40)	(7.97)	(15.7)	(11.8)	(13.6)	(10.6)
Inland Empire region	-6.82***	-1.20	-7.63***	-4.56	-8.47	-11.9	7.96	5.72
	(2.00)	(6.92)	(1.75)	(6.34)	(10.7)	(9.28)	(8.95)	(8.39)
Orange County	2.93	0.77	0.45	-5.83	9.13	8.09	-1.06	-10.6

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall				Those who return to CalFresh		Those who do not return to CalFresh	
	% change between highest earning quarters		% change between average quarterly earnings		Highest	Average	Highest	Average
	(2.83)	(9.74)	(2.45)	(8.76)	(17.9)	(15.4)	(11.5)	(10.6)
San Diego County	-4.67	-9.07	-4.42*	-10.1	-15.0	-8.92	-1.11	-5.47
	(2.54)	(8.37)	(2.23)	(8.26)	(12.8)	(13.1)	(10.9)	(10.5)
3 to 4 quarter spell length	1.77	2.04	4.65***	4.83***	-1.42	-1.38	2.21	6.22***
	(1.47)	(1.49)	(1.28)	(1.30)	(2.51)	(2.05)	(1.85)	(1.65)
5 to 6 quarter spell length	4.48	4.81*	9.92***	10.1***	2.25	5.75	4.74	10.7***
	(2.36)	(2.36)	(2.11)	(2.12)	(3.75)	(3.31)	(3.03)	(2.72)
7 or more quarters spell length	13.4***	13.3***	16.6***	16.5***	9.08*	10.7**	12.7***	16.3***
	(2.70)	(2.71)	(2.29)	(2.29)	(4.34)	(3.65)	(3.45)	(2.92)
Average quarterly earnings before CF			-0.018***	-0.018***		-0.018***		-0.019***
			(0.00018)	(0.00018)		(0.00030)		(0.00022)
Constant	47.8**	47.8**	45.4***	49.7***	61.3*	49.9*	33.9	42.1*
	(15.3)	(15.8)	(13.3)	(13.9)	(26.0)	(21.7)	(19.9)	(17.7)
Quarter of spell start	X	X	X	X	X	X	X	X
Quarter of spell start * region		X		X	X	X	X	X
Observations	143,331	143,331	143,334	143,334	51,350	51,403	91,981	91,931
R-squared	0.142	0.143	0.143	0.144	0.140	0.139	0.153	0.158
Mean of dependent variable	68.4	68.4	64.9	64.9	56.8	45.7	74.9	75.6

SOURCES: Authors' analysis of SNAP LDB, SSNSORT, WDTIP, and EDD base wage files, 2012-2019.

NOTES: Robust standard errors in parentheses. \*\*\* p<0.001, \*\* p<0.01, \* p<0.05



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