Poverty in California

Technical Appendices

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Technical Appendix A: The California Poverty Measure

The California Poverty Measure (CPM), a joint research effort by PPIC and the Stanford Center on Poverty and Inequality, provides a robust measure of who lacks resources to meet basic needs in California, accounting for local differences in the cost of living and diverse safety net resources that families use to meet their needs.

The most recent previous CPM release reflects calendar year 2019, prior to the COVID-19 pandemic, which affected the social safety net and labor market in California in many ways that were important to low-income Californians. Some safety net programs increased benefits and expanded eligibility periods to help struggling families and workers, yet many of those pandemic-specific supports were only temporary.

The Fall 2021 CPM provides a more up-to-date picture of poverty by using a novel method to update the 2019 CPM data to project annual poverty rates into the labor market and policy conditions of the fourth quarter of 2021, after most pandemic emergency supports had ended and the labor market had significantly tightened. We use this method both to provide more timely poverty estimates, which are more relevant to the current policy context than 2020 estimates would be, and to respond to pandemic-related data quality issues affecting the American Community Survey (ACS), which compromised the usability of the 2020 ACS data for construction of the CPM.

This technical paper provides detailed information on our updated methodology and comparisons between the Fall 2021 CPM and 2019 CPM. We also compare changes in CPM poverty between 2019 and fall 2021 to changes in poverty in California under the Census Bureau's Supplemental Poverty Measure between 2019 and 2021.

Introduction

The goal of this technical paper is to provide detailed information on the methods, assumptions, and validation exercises undertaken by researchers at the Stanford Center on Poverty and Inequality and the Public Policy Institute of California in jointly creating the Fall 2021 California Poverty Measure (CPM). It builds upon three prior CPM technical appendices released since the launch of the CPM. The original CPM Technical Appendix document (published with the release of 2011 CPM data) can be found on the Public Policy Institute of California website, and the first and second revision Technical Appendices (published with the release of 2012 CPM and the 2014 CPM) can be found on the Stanford Center for Poverty and Inequality website.

The key motivation for developing the CPM is to provide a more accurate and comprehensive picture of poverty in California. During the COVID-19 pandemic, a variety of safety net policies were introduced or expanded to help people meet basic needs—yet many of these supports were one-time or short-term interventions that are no longer playing a role in helping Californians cover basic expenses. A primary goal in constructing the Fall 2021 CPM is to provide a picture of poverty within a time period that is relevant to current policy discussions, showing the impact of safety net expansions that continued into fall 2021.

Our hope is that the methods described here will prove useful for understanding the status of, and trends in, poverty in California in a more timely manner than has been typically available to researchers and policymakers. Using the Fall 2021 CPM, we identify policies that provided additional relief, above and beyond the traditional safety net, and seek to understand their varying impact on Californians. Moreover, we provide a clearer picture of who in California has continued to face poverty in the most recent year, since the fourth quarter of 2021, a period when the labor market had improved and some expanded safety net supports remained available, but many large-scale emergency policies had ended. This picture can help guide policymakers as they consider what policies may

be needed to address poverty looking forward, as the economy continues to recover from the effects of the pandemic.

Understanding poverty in California in a near-current timeframe is no simple task, because the resources, expenses, and standards of living of California families must all be individually measured or estimated using a variety of data sources and methods. Our usual method for developing the CPM has been to use the most recent available year of American Community Survey (ACS) data, which was data for 2020 at the time that we initiated the research described in this paper, in the first months of 2022. However, the Census Bureau encountered significant pandemic-related challenges in fielding the 2020 American Community Survey (ACS) that seriously compromised the quality of the 2020 ACS data, and we also recognized that the economic and policy conditions of 2020 were so unique that data for 2020 could have only limited usefulness for informing forward-looking policymaking.

Consequently, we elected to develop a new methodology inspired by the pandemic to measure poverty in closer to real time (Asiala, et al 2021; Rothbaum, et al 2021). This method adapts several of the strategies employed in the recent national poverty literature (Han, Meyer and Sullivan 2022; Han, Meyer and Sullivan 2020; Parolin, et al 2022; Wheaton, Giannarelli, and Dehry 2021). Essentially, this method uses the 2019 CPM as a foundation from which to project annual poverty rates to fall 2021, by updating income, expenses, and safety net supports to reflect those available to families as of the fourth quarter of 2021 and annualizing those net family resources, looking forward from Q4 2021, to calculate an annual poverty rate. This method allows us to provide more timely poverty estimates and avoid relying upon potentially problematic 2020 survey data. Alongside the novel approach we describe in this technical paper, we continue to employ a core technique used in the CPM: augmenting the ACS with a variety of administrative data sources to correct for survey underreporting and to incorporate categories of resources and necessary expenses that are not covered in the ACS.

The next section provides a brief overview of the standard CPM methodology. Full details are provided in the technical appendix reports referenced above. Subsequent sections provide details of adapting the standard CPM approach to the fall 2021 projection method for each category of poverty thresholds, resources, and expenses. The final section provides a number of checks and validations of our approach via comparisons of CPM 2019 and CPM fall 2021 poverty rates, poverty difference for safety net programs, and dollar amounts received by families and by demographics and region, as well as comparison to available poverty data for California for calendar year 2021 from the Census Bureau's Supplemental Poverty Measure (SPM).

Overview of the Standard CPM Methodology

The basic formula for the CPM follows that of the Census Supplemental Poverty Measure (SPM, Fox and Burns 2021). First, individuals are grouped into poverty units comprised of individuals living in the same household, who are assumed to share resources. For each poverty unit, an annual net resources amount is calculated, which represents the cash and near-cash resources available to meet basic needs. Resources include cash income (including income from work and investments plus cash benefits like Social Security, SSI, and TANF), plus near-cash, in-kind benefits (e.g., SNAP and housing subsidies).[1] Nondiscretionary expenses including commuting costs, child care, and medical out-of-pocket expenses are subtracted from resources. Income and payroll taxes are subtracted from resources, while tax credits (e.g., the Earned Income Tax Credit and Child Tax Credit) are added to resources. The resulting net resource amount for the poverty unit is then compared to a poverty threshold that is based on national contemporaneous expenditures on food, clothing, shelter, and utilities, adjusted for family size,

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[1] SSI is Supplemental Security Income, which in California includes a State Supplemental Payment (SSP) payment; TANF is Temporary Assistance for Needy Families, known in California as CalWORKs; SNAP is the Supplemental Nutrition Assistance Program, known in California as CalFresh.

and adjusted for the local cost of housing. All individuals in poverty units with net resources less than this adjusted poverty threshold are considered poor.

Key differences between the CPM and the SPM include:

1. The CPM uses the ACS instead of the Current Population Survey (CPS) as the base survey data source;
2. The CPM augments the information about resources and expenses available in the ACS with aggregated administrative data sources that also allow for corrections to underreporting;
3. The CPM imputes unauthorized immigration status at the individual-level to improve the accuracy of the resources and expenses imputations, given that unauthorized immigrants are excluded from eligibility for many safety net benefits;
4. The CPM adjusts poverty thresholds separately for homeowners without mortgages, to better account for California-specific property tax policy which tends to produce lower housing costs for long-term homeowners.
5. The CPM differs slightly from the SPM in the accounting for specific safety net programs. The CPM does not account for the Low Income Home Energy Assistance Program (LIHEAP), which is included in the SPM, but does account for school breakfast, which is not included in the SPM.

Detailed descriptions of the methods used to construct the different CPM components are available in the Technical Appendices for prior years. Table 1 provides a summary of the data sources for resources and expenses captured in the CPM.

TABLE 1
CPM resource and expense components and estimation approach, 2011-2019 CPM

CPM/SPM resource and expense components	In ACS?	Adjustments for CPM estimate	Administrative or survey data source used to augment information in the ACS
RESOURCES			
Wage and salary income	Yes	No	N/A
Self-employment income	Yes	No	N/A
Interest and dividend income	Yes	No	N/A
Pension income	Yes	No	N/A
Unemployment benefits, alimony, child support, veteran's benefits, workers' compensation benefits, other income	Yes (but lumped into "all other income" field, cannot be separated)	No	N/A
Social Security income	Yes	No	N/A
SSI income	Yes	No	N/A
"Welfare" income (TANF [CalWORKs] and GA)	Yes	Yes (underreporting adjustment for TANF)	California Department of Social Services
SNAP (CalFresh)	Yes (but only participation, not dollar amount)	Yes (underreporting adjustment and benefit amount imputation)	California Department of Social Services
Income tax credits (federal EITC, ACTC, state CalEITC, Young Child Tax Credit)	No	Yes (imputation)	Internal Revenue Service and Franchise Tax Board
School lunch and breakfast	No	Yes (imputation)	California Department of Education
WIC	No	Yes (imputation)	California Department of Public Health
Housing subsidies	No	Yes (imputation)	HUD Fair Market Rents; Current Population Survey
LIHEAP (energy subsidy)	No	No (not included in CPM)	N/A
EXPENSES			
Income tax and payroll tax liabilities	No	Yes (imputation)	NBER's TAXSIM tax calculator, Internal Revenue Service, Franchise Tax Board
Child care expenses	No	Yes (imputation)	Current Population Survey
Other work-related expenses	No	Yes (imputation)	Survey of Income and Program Participation
Medical out-of-pocket expenses	No	Yes (imputation)	Current Population Survey

Overview of Methodology Changes for the Fall 2021 CPM

For the Fall 2021 CPM, we use the 2019 CPM and directly calculate changes to employment, earnings, and safety net supports using September-December 2021 as the reference period to estimate updated annual family resources, expenses, and poverty thresholds. These calculations allow us to estimate family net annual resources for fall 2021 looking forward. We think of these resources on an annualized basis; that is, we estimate what poverty would look like if the employment and policy conditions of fall 2021 persisted throughout the 12-month

period beginning in October 2021. The purpose of this exercise is to develop a methodology that will allow us to project, in closer to real time, California poverty rates absent real time Census data on Californians' resources.

We take 2019 population characteristics – age, race, residence, homeownership – as given. We do not adjust the data for migration into or out of California, and we do not age-adjust the data. Poverty unit composition remains the same. Therefore, the estimates should be interpreted as poverty conditions as applied to the 2019 California household demographic snapshot.

Safety net supports consistently play a vital role in reducing poverty, and this was particularly the case during the initial months of the pandemic, when many federal and state supports were introduced or expanded (e.g., Wheaton, Giannarelli, and Dehry 2021). Yet many of these pandemic-era new programs and program expansions were temporary and had ended by mid- to late-2021, for example federal and some state stimulus payments and federal unemployment benefits. Thus, our choice to focus on fall 2021 is not just to create more timely estimates, but to deliberately focus only on pandemic-era expansions of public supports that remained available to families as of the end of 2021. This allows us to provide a more useful picture of the resources available to California families in an updated forward-looking policy context, and to identify which households may face poverty under economic and policy conditions that are more relevant to current policymaking efforts.

Consequently, public supports that we do not consider, because they were no longer available to families as of Q4 2021 include: state-funded relief/stimulus payments including the Golden State Grant and Golden State Stimulus I, Pandemic-EBT (P-EBT) 1.0, federal pandemic unemployment benefits, federal stimulus payments, and advanced payments of the federal Child Tax Credit received in the third quarter of 2021.[2] Benefits from these programs were paid earlier in 2021 (or 2020). Instead, we focus attention on estimating accurate caseloads and benefit receipt – using state administrative totals – for major safety net programs as of fall 2021. Beyond the usual safety net programs included in CPM, along with any expansions to existing safety net programs still in place as of fall 2021, we also account for the Pandemic-EBT (P-EBT) 2.0 and the Golden State Stimulus II, which were paid out during Q4 2021. We also include temporarily expanded federal tax credits for tax year 2021 received by families in the fourth quarter of 2021 or when they filed taxes in early 2022, including the expanded federal Child Tax Credit, the expanded federal Child and Dependent Care Tax Credit, and the expanded federal EITC for filers without dependent children.

In this paper we do not consider the effect of safety net policy changes that took effect after fall 2021 or will take effect in coming months, but in future work we will explore simulating those changes as an approach to further update the data in ways that may be useful to inform forward-focused policymaking. Such post-fall-2021 policy changes include reversion of expanded federal tax credits to prior law and inclusion of families with no employment income in the state Young Child Tax Credit, effects of which will be felt when individuals file taxes for tax year 2022, and an increase to the state portion of SSI/SSP payments, for example.

Table 2 summarizes each element of our calculations. The following sections detail our approach for each piece of these calculations.

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[2] For further information about California's Golden State Grant and Golden State Stimulus, see https://www.cdss.ca.gov/inforesources/cdss-programs/golden-state-grant-program and https://www.ftb.ca.gov/about-ftb/newsroom/golden-state-stimulus/index.html.

TABLE 2
Summary of adjustments made to create the 2021 CPM

CPM resource and expense components	Adjusted methods for Fall 2021 estimate?	Source used to augment information in the 2019 CPM
THRESHOLDS	Yes	Updated using CPI-U components
RESOURCES		
Wage and salary income	Yes	CPS and BLS
Self-employment income	Yes	BLS
Interest and dividend income	No	Updated using CPI-U
Pension income	No	Updated using CPI-U
Unemployment benefits	Yes	Predicted for individuals assigned to unemployment based on 2019 wages
Alimony, child support, veteran's benefits, workers' compensation benefits, other income	No	Updated using CPI-U
Social Security income	No	Updated using Social Security Administration COLA
SSI income	No	Updated using Social Security Administration COLA
TANF (CalWORKs) income	Yes	California Department of Social Services, based on adjusted 2021 income
General assistance	No	Updated using CPI-U
SNAP (CalFresh)	Yes	California Department of Social Services, based on adjusted 2021 income
Income tax credits (federal EITC, CTC, state CalEITC, Young Child Tax Credit)	Yes	NBER's TAXSIM, Internal Revenue Service, Franchise Tax Board
Golden State Stimulus II	Yes	Newly imputed in 2021
School lunch and breakfast, including Pandemic-EBT 2.0	No	California Department of Education, based on adjusted 2021 income
WIC	No	California Department of Public Health, based on adjusted 2021 income
Housing subsidies	No	CPS, based on adjusted 2021 income
EXPENSES		
Income tax and payroll tax liabilities	Yes	NBER's TAXSIM, Franchise Tax Board
Child care expenses	No	CPS, based on adjusted 2021 income
Other work-related expenses	No	Updated using CPI-U; SIPP; based on adjusted 2021 income
Medical out-of-pocket expenses	No	CPS, based on adjusted 2021 income

Poverty Thresholds

CPM poverty thresholds are typically based each year on the Census' and Bureau of Labor Statistics' (BLS) Supplemental Poverty Measure (SPM) thresholds. These thresholds are based off of five-year moving averages of expenditures by families on a core set of goods, which include food, clothing, shelter, and utilities, plus a 20 percent additional dollar amount to account for other necessities. To derive CPM thresholds, we have historically taken base thresholds for a given year from the BLS as our starting point. Those give national-level thresholds for each of three housing status groups: renters, homeowners who hold mortgages, and homeowners who do not. From these, we use BLS data to determine the proportion of thresholds devoted to shelter and utilities. We take

this proportion of the threshold and adjust it for geographic differences in the costs of housing, differentially by: (a) renters/owners with mortgages; and (b) owners without a mortgage. A so-called "dual index" is used for these two populations, as described in the original CPM technical appendix. This allows us to better account for California's property tax structure, where comparatively low property taxes for long-term homeowners tend to produce lower housing costs for homeowners without mortgages. With these 2019 CPM thresholds in hand, we update to fall 2021 as follows: (1) We take 40 percent of the 2019 thresholds as available to update, given that 2020 and 2021 constitute 2 years and SPM thresholds are calculated using five-year moving averages (2 years/5 years = 40 percent). (2) We update this 40 percent portion using a weighted average of inflation from calendar year 2019 to quarter 4 of 2021 using inflation indices tied to components of the threshold, namely food, clothing, shelter, and utilities. The calculated weighted inflation increase is about 9 percent, differing somewhat by housing status. (3) We recombine this adjusted threshold proportion with the remaining 60 percent of the 2019 poverty thresholds, and this sum constitutes our 2021 CPM poverty thresholds.

Resources

Wage, Salary, and Self-Employment Income

Typically in constructing the CPM we use self-reported wages and salary income, along with self-reported income from self-employment. In the Fall 2021 CPM, we use Bureau of Labor Statistics (BLS), CPS, and ACS data to simulate employment conditions and wages in the fourth quarter of 2021, as detailed below. The resulting earned income and employment values are used as inputs to the other imputations that we typically make in the CPM.

Determining aggregate job gains and losses

Our general approach is to modify employment status and wages in the baseline CPM 2019 ACS dataset to match the changes in number of jobs by industry and metropolitan area between Q4 2019 and Q4 2021 reflected in BLS State and Area Employment estimates. These BLS data are reported monthly, enabling us to focus on labor market conditions within a targeted quarterly timeframe, and they provide detail specific to industries and local geographic areas, which is important in order to leverage the local geographic specificity that is a key strength of the baseline CPM ACS microdata. The BLS and ACS employment data are not directly comparable because the BLS data measure number of jobs, while the ACS data reflect workers, who may hold more than one job. Directly comparable data are not available from other sources at the same level of detail, however, so we consider the BLS data to be the best available source for our purposes despite this limitation.

We compare Q4 2019 to Q4 2021 in the BLS data to minimize the effect of seasonal employment factors. Statewide, the BLS data show an overall 2.6 percent net decrease in the number of jobs between these two time periods. First, we calculate the relative percent increase or decrease in number of jobs by industry-metro area for the months of Q4 2019 versus the months of Q4 2021 (e.g., we compare the average number of jobs in leisure and hospitality in the Bakersfield metro area in October, November, and December 2019 combined to the average number of jobs for the same industry and metro area in October, November, and December 2021). We code the same industry groupings and metro areas in the ACS data, and apply these percentages to calculate an increase or decrease in the number of workers employed in each industry-metro area to simulate in the ACS data. For industry-areas with net job losses, we assign employed individuals to unemployment to match these calculations, and for industry-areas with net job gains, we assign unemployed individuals to employment.

Assigning unemployed and employed status to workers

For each industry-metro area with net job *losses*, we assign employed workers from that industry-metro area to unemployment in the ACS data until we match the desired change in number of workers calculated above, selecting individuals based on random order among employed individuals within each industry-metro area. For each industry-metro area with net job *gains*, we then assigned unemployed workers from the same metro area to employment. We select first from the pool of individuals who were assigned to unemployment in the previous step (implicitly assuming that workers within a metro area who lose jobs in an industry with net job losses shift to work in an industry in the same metro area with net job gains), again using random assignment within this pool of workers. If additional workers need to be assigned to employment, we randomly draw from the pool of individuals in the same metro area who are unemployed in the baseline 2019 ACS data.[3]

As a validation check for our assignment method, we compare the demographic characteristics of the unemployed population in the CPS 2021 Q4 data to the characteristics of the total unemployed population in the Fall 2021 ACS data (including individuals assigned to unemployment as well as those who were unemployed at baseline with no assigned change in employment status). We are reassured that the populations match reasonably well across a variety of characteristics, as shown below.

TABLE 3
Characteristics of unemployed individuals

	CPS 2019	ACS 2019	CPS 2021 Q4	ACS Fall 2021
Race (includes Hispanic)				
White	55%	56%	56%	56%
Black	13%	16%	14%	13%
Asian	24%	21%	24%	25%
Hispanic (of any race)	43%	43%	40%	42%
Noncitizen	18%	15%	14%	16%
Female	46%	47%	50%	46%
Parent living with child under age 18	26%	24%	21%	25%
Manager	6%	5%	7%	6%

Assigning duration of unemployment

Workers assigned to unemployment need to be assigned a specific duration of unemployment in order to later adjust annual earnings and estimate unemployment benefits. We use CPS data for Q4 2021 to calculate the statewide distribution of weeks unemployed for all unemployed workers. (Note that cell sizes are too small to calculate distributions by industry, local geography, or demographic characteristics.) We then randomly assign weeks unemployed to all unemployed workers in the CPM ACS data, both those assigned to unemployment above and those unemployed in the baseline data, to match the distribution of weeks in the CPS data.

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[3] We explored an alternative method for ranking individuals in the ACS data for order of assignment to unemployment and employment, based on coefficients from a logit model of available demographic predictors of unemployment in Q4 2021 in CPS data. However, this approach proved inadequate to produce an overall unemployed population that reasonably matched the demographic characteristics of unemployed individuals in Q4 2021 as reflected in CPS data. Random assignment of workers within industry-metro area produced a substantially better overall match to the characteristics of the Q4 2021 unemployed population in the CPS data.

Assigning part-time work

We follow a parallel procedure to modify the number of part-time workers to match Q4 2021 data. Here we rely on CPS Basic Monthly data to calculate the relative percent change in the share of workers who are working part-time in Q4 2021 versus Q4 2019. The CPS sample size is not large enough to calculate this change by industry, and CPS data do not allow for systematic sub-state geographic estimates, so we use statewide data for all workers, which show a relative 11 percent increase in the share of employed individuals working part-time. In the baseline CPM ACS data, we then apply this percentage increase to calculate the number of full-time workers to assign to part-time status.

To select which full-time workers to assign to part-time status, we use a model developed in CPS data. Using California Q4 Basic Monthly CPS microdata, we identify demographic predictors of part-time status among workers who usually work full-time but report working part-time for economic or non-economic reasons. We use demographic variables (including race/ethnicity, educational attainment, age, parent and cohabiting partner status, immigrant and citizenship status) to predict part-time employment status, as well as manager status and industry, because patterns of part-time status for economic or non-economic reasons vary significantly by industry in the CPS data, with an especially large share of workers in government having shifted to part-time work. Applying a logit model in the CPS data, we calculate coefficients for the predictor variables, which we then apply in the ACS data to rank full-time workers by likelihood of shifting to part-time status. We select full-time workers in the ACS data to assign to part-time employment based on these rankings until we match the desired number of part-time workers.

We also assign duration of part-time work to these workers. We assume the distribution of weeks of part-time work for economic or non-economic reasons is the same as the distribution of weeks of unemployment calculated above in CPS data. Similar to the procedure used for unemployed workers, we randomly assign weeks of part-time work to all workers assigned to part-time work to match the CPS distribution of weeks.

Adjusting baseline annual earnings

We next adjust the baseline annual earnings for workers assigned to a change in employment status. For individuals who were assigned to unemployment, we prorate baseline earnings by assuming that earnings are zero for the share of the year equal to the assigned weeks of unemployment. For full-time workers assigned to part-time work, we prorate baseline earnings by assuming that earnings are halved for the share of the year equal to assigned weeks of part-time work.

For individuals who were assigned to shift to employment in a new industry, who had reported earnings at baseline, we assume baseline earnings remain the same (implicitly assuming that earnings in a job in a new industry will be similar to earnings in a previous job in a different industry). For the relatively small number of individuals who were assigned to employment who were unemployed at baseline, and who have no reported earnings at baseline, we assign median non-zero earnings by industry-metro area (an admittedly rough approach to estimating earnings). For the relatively small number of individuals assigned to employment who were unemployed at baseline and had reported annual earnings at baseline, we assume no change in baseline earnings (which may tend to underestimate annual earnings for these workers).

Adjusting earnings for wage inflation

Next we adjust earnings for all workers to account for wage inflation, using multipliers based on BLS hourly wage data by industry for California. Using monthly statewide BLS wage data, we calculate the nominal increase in hourly wages by industry from Q4 2019 to Q4 2021, with results ranging from 6.5 percent (for construction) to 17.4 percent (for financial activities). In the CPM ACS data, we multiply annual earnings, from wages, salaries,

and self-employment combined, for all workers by the appropriate industry wage multiplier. For workers with missing industry data or in industries excluded from the BLS data, we use the multiplier for total private employment (11.6 percent).

Estimating unemployment benefits

Finally, we estimate annual unemployment insurance (UI) benefits for workers assigned to unemployment. We estimate weekly wages from reported baseline earnings (after adjustment for wage inflation), and use those with assigned weeks of unemployment to calculate state unemployment benefits. (Note that as of Q4 2021, federal COVID-19 unemployment benefits had ended.) We estimate the Q4 2021 take-up rate for California state unemployment benefits using administrative data, taking the average weekly continuing state unemployment insurance claims for that quarter, as reported by the U.S. Department of Labor, divided by the average number of unemployed individuals actively seeking work in Q4 2021 CPS data, arriving at an estimated 42 percent take-up rate. We then randomly assign unemployment benefits to this percentage of individuals among those assigned to unemployment, excluding those who are ineligible due to unauthorized immigrant status.

Validation checks

We conduct a number of checks to assess the validity of the results of our modifications of employment and earnings to match conditions in Q4 2021, comparing aggregate employment statistics for the modified ACS data to comparable statistics for CPS data for Q4 2021. We do not expect to match the CPS data perfectly, but hope to match closely enough to reasonably reflect income and benefits linked to employment, as they may affect poverty status.

Our modified ACS dataset shows 60.6 percent of individuals age 16+ are employed (the employment-to-population ratio), which is quite close to the CPS Q4 2021 ratio of 59.1 percent for California. Among individuals age 25 to 54, the share employed (the prime-age EPOP) in the modified ACS data is 78.1 percent, slightly higher than the CPS figure of 76.3 percent.

We also calculate the unemployment rate among all individuals in the labor force.[4] In the modified ACS data, 7.3 percent of workers are unemployed, somewhat higher than the CPS Q4 2021 unemployment rate of 5.2 percent. At the same time, in the ACS data, 34.6 percent of individuals age 16+ are not in the labor force, somewhat lower than the 37.7 percent in the CPS data. Together these results may suggest that our methods for adjusting employment status assign some workers to unemployment who should rather be assigned to exiting the labor force. In terms of potential effect on family incomes, and therefore poverty status – if unemployed, workers will lose earnings but may become eligible for unemployment benefits, while if exiting the labor force, they will lose earnings but may become eligible for retirement or disability benefits. Either way workers will no longer be eligible for benefits that are conditional on employment, like EITC, and will no longer have work-related expenses, like commuting costs or child care necessary for work.

Overall, we are reassured by the close match in the employed share of individuals age 16+ (EPOP), as this metric should most closely align with the earned income resources and associated benefits and expenses available at the level of poverty units.

Temporary Assistance for Needy Families (TANF)

TANF is cash assistance for low-income families with dependent children, known as CalWORKs in California. CPM typically takes self-reports of TANF receipt in the ACS as given, and corrects for underreporting by adding

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[4] This is the official unemployment or U3 rate.

additional income-eligible individuals to match unduplicated administrative data counts customized for the CPM from the California Department of Social Services (CDSS). These counts in a typical CPM year are disaggregated by case type, county, and race/ethnicity.

For fall 2021 estimates of TANF participation and benefit amounts, these custom CDSS tabulations were not yet available. Therefore, we rely on more aggregated counts of TANF participation and benefits as given in CDSS "Public Assistance Facts and Figures" reports. According to CDSS counts[5], the caseload in Q4 2021 was 20 percent lower in than in 2019 (based on the monthly average, see also LAO 2021). We apply this rate of decline to the caseload estimated in the 2019 ACS and then select TANF cases to "exit" the program.

We do not aim match caseload totals exactly because the ACS concept of participation, and hence the concept applied in the CPM concept, reflects families who received TANF *at some point* during the year rather than during a given month. Some families participate only part of the year, so CPM TANF participation is higher than TANF monthly caseloads. For the standard CPM, we rely on the more detailed administrative counts mentioned above that mimic the CPM concept of participation over the course of a year; however, this detailed data for 2021 will not be available until early 2023.

To reduce the caseload by a fifth, we randomly select "exits" from among cases who are no longer income-eligible given their changes in employment and earnings. The random selection uses the *reverse* of the probability of participation (based on household demographics) that is used in the standard CPM TANF imputation. Because the number of TANF "exits" in 2021 is low, we only select exits from among the portion of the caseload that was imputed participation in 2019 – that is, self-reported TANF participation is preserved.

For cases that are selected to exit TANF, we assume they preserve their SNAP participation (see section below; SNAP caseloads went up in 2021, which is convenient for the estimation). We zero out their TANF income.

For all other TANF cases, cash benefits are adjusted for benefit levels as of fall 2021. TANF benefit levels increased in October 2019 following Senate Bill 80, varying by size of benefit unit. Then benefits in 2021 increased 5.3 percent across the board in the 2021-2022 budget agreement.[6] We use an estimate of the combined percentage increase by unit size to inflate 2019 TANF grant levels to fall 2021.

Other Sources of Cash Income

Other cash income sources included in the CPM ACS data include old age and disability benefits, retirement and investment income, and "other income," which includes alimony, child support, veteran's benefits, unemployment benefits (as reported at baseline), workers' compensation benefits, and any "other." We adjust each of these items to account for increases in benefits due to policy and/or to inflate to 2021 dollars.

We typically take self-reported Supplemental Security Income/State Supplemental Payment (SSI/SSP) as given. For the Fall 2021 CPM we increase SSI/SSP income to match the nominal change in benefit amounts from 2019 to 2021 according to the Social Security Administration cost-of-living adjustment. Similarly, we update self-reported Social Security income in the 2019 baseline CPM dataset by the federal cost-of-living adjustments applied in January 2020 and January 2021.

For all other sources of cash income – non-Social Security retirement income, investment income, and "other income" – we update the baseline 2019 self-reported amounts by applying a simple inflation adjustment, based on annual average all-items CPI-U for 2019 versus average all-items CPI-U for Q4 2021. Note also that our methods

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[5] CDSS CA 237 CW reports, available here: https://www.cdss.ca.gov/inforesources/research-and-data/calworks-data-tables/ca-237-cw
[6] For SB 80 see https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB80 and for the 2020-21 budget agreement see: https://www.ebudget.ca.gov/2021-22/pdf/Enacted/BudgetSummary/HealthandHumanServices.pdf

for estimating unemployment insurance benefits for individuals we assign to unemployment are described above in the discussion of methods for adjusting employment status.

Tax Liabilities and Tax Credits

We typically use family composition and self-reported annual earnings and other cash income to construct tax units in the CPM ACS data, and then use the NBER TAXSIM tax calculator to calculate federal and state income taxes, calculating a few components manually, including the state refundable tax credits CalEITC and Young Child Tax Credit.[7] For the Fall 2021 CPM we use the same approach to constructing tax units, but use updated annual earnings and other cash income as modified above, and calculate federal and state income taxes using TAXSIM based on tax year 2021 tax policy parameters (available through TAXSIM v35). These results include the expanded federal EITC for filers without dependent children adopted for tax year 2021 through the American Rescue Plan (with increased income thresholds, credit amounts, and an expanded age range).

We manually calculate some federal income tax components in order to match policy parameters more precisely than possible through TAXSIM. Specifically, we manually calculate the federal "other dependent credit" and the expanded and fully refundable federal Child and Dependent Care Tax Credit (CDCTC) available for tax year 2021 through the American Rescue Plan.

We also manually calculate the expanded and fully refundable federal Child Tax Credit (CTC) available for tax year 2021 through the American Rescue Plan. Most filers eligible for the expanded federal CTC received half of their CTC in advanced monthly payments from July to December 2021, and received the other half of the credit when they filed their federal income tax returns in early 2022. Because we seek to reflect resources available to families looking forward from Q4 2021, we exclude from CPM family resources the one-quarter of the federal CTC received in advanced payments from July to September 2021.

Following our usual CPM practice, we assume that all tax filers who appear to owe tax liabilities pay those taxes and all filers who appear eligible for refundable tax credits claim those credits. This strategy prioritizes alignment with administrative data indicating the total resources available to California families through tax credits, as under these assumptions, the calculated aggregate number of federal EITC and CTC filers and aggregate amount of federal EITC and CTC in prior years match IRS aggregate totals for California quite closely (representing about 80 to 90 percent of EITC filers and dollars in the administrative data and about 100 percent of CTC filers and dollars). For the Fall 2021 CPM, we make one exception to this assumption, specifically for take-up of federal CTC among families with no earnings, who became eligible for the federal CTC for tax year 2021 only but would not normally be expected to file taxes, since they have no filing requirement and are not eligible for other refundable credits. These filers may have been especially likely not to claim the CTC due to informational and tax filing access barriers (Maag and Karpman, 2022; Augustine, et al., 2021). Available national IRS data suggest that the number of filers who used nonfiler tax filing portals to claim the advance CTC was equal to roughly 20 percent of the total filers potentially eligible for the 2021 CTC who had not filed taxes in recent years.[8] These data, while imperfect, suggest that families who do not usually file taxes may have been about one-quarter as likely to claim the CTC as families who usually file and claim refundable tax credits, given IRS estimates that about 80 percent of eligible filers nationally claim the federal EITC.[9] In our main specification, we therefore assume that 25 percent of families with no earnings who appear eligible for the federal CTC receive the credit,

[7] For more information on these state credits, see https://www.ftb.ca.gov/file/personal/credits/california-earned-income-tax-credit.html.

[8] For the number of filers using the CTC nonfiler portal, see Treasury Inspector General for Tax Administration, 2022. For the estimated number of adults potentially eligible to claim the CTC who did not file taxes in the prior two tax years (based on children appearing on federal health coverage information returns but not on federal income tax returns), see Department of the Treasury, 2021.

[9] See https://www.eitc.irs.gov/eitc-central/participation-rate/eitc-participation-rate-by-states.

assigning receipt randomly among tax filers in this group. As a sensitivity check, we also present poverty results under an alternative approach assuming full take-up of the federal CTC among eligible families with no earnings (Table 4).

The question of how to address the timing of tax liabilities and credits in the CPM and SPM framework is a broader issue. Under the usual CPM/SPM framework, tax liabilities and credits are calculated and incorporated into net family resources for a calendar year based on incomes for that calendar year. However, for many families much of tax liabilities are paid and resources from refundable credits are received *after* the calendar year, when families file taxes early in the following year. Withholding complicates the timing of these expenses and resources. For tax year 2021 specifically, policy changes to expand the federal EITC and CTC, as well as advance payments of the federal CTC, add further complications to timing. Given these complexities, we also explore an alternative approach to accounting for the federal CTC in the Fall 2021 CPM, incorporating the full tax year 2021 CTC amount (i.e, not excluding pre-Q4 2021 advance payments). See Table 4 for differences in poverty rates and related statistics using this alternative federal CTC specification.

We note that in our preferred specification we exclude the amount of CTC that was received in advance payments before Q4 2021 (or one-quarter of the total CTC amount). Table 4 (middle three columns) shows the larger poverty impacts of an alternative specification for the CTC, including the full 2021 CTC amount (without excluding pre-Q4 advance payments). The CPM poverty rate is 0.8 points lower overall and 1.7 points lower for children. Median amounts are $850 higher overall and $1,550 higher for children.

In terms of state income taxes, we rely on TAXSIM for our main results but also manually calculate the state CalEITC and Young Child Tax Credit as we usually do. For the Fall 2021 CPM, we add eligibility for these credits for unauthorized immigrants filing taxes with Individual Taxpayer Identification Numbers (ITINs), a policy change implemented in tax year 2020. We also calculate the state Golden State Stimulus II payment, which was distributed by the Franchise Tax Board and received by most eligible tax filers during Q4 2021. Because we focus on resources available from Q4 2021 looking forward, we do not include the state Golden State Stimulus I payments, which were distributed earlier in calendar year 2021. Similarly, we do not include the federal Economic Impact Payments (EIP) that were distributed to eligible individuals in early 2021.

Finally, we calculate the California "Shared Responsibility Penalty" applied as a tax penalty for individuals who do not maintain minimum adequate health insurance coverage during the year. This state policy was implemented in tax year 2020, after the elimination of the similar federal penalty established through the Affordable Care Act.

We also calculate the employee share of federal FICA payroll taxes (Social Security and Medicare taxes) as we usually do, using TAXSIM, but based on the CPM fall 2021 modified earnings.

TABLE 4
Federal Child Tax Credit sensitivity analysis

	Fall 2021 Federal CTC excluding advance payments received before fall 2021, with 25% CTC take-up among families with no earnings			Fall 2021 (alternate 1) Federal CTC without excluding advance payments received before fall 2021			Fall 2021 (alternate 2) Federal CTC excluding advance payments received before fall 2021, with 100% take-up among families with no earnings		
	Poverty (<100%)	% with any	Median ($)	Poverty (<100%)	% with any	Median ($)	Poverty (<100%)	% with any	Median ($)
All	11.7	59.1	3,250	11.1	59.1	4,100	11.4	58.4	3,250
Age									
Young children (0-5)	8.4	96.2	5,400	7.0	96.2	7,130	8.3	96.2	5,400
All Children	9.0	95.8	4,950	7.6	95.8	6,500	9.0	95.8	4,950
Adults 18-64	11.6	54.6	2,750	11.2	54.6	3,600	11.6	54.7	2,750
Adults 65+	16.3	21.4	1,500	16.3	21.4	1,500	16.3	21.4	1,500
Employment status									
Employed	6.3	52.0	2,750	6.0	52.0	3,600	6.3	52.1	2,750
Unemployed	22.6	52.7	2,700	22.0	52.7	3,600	22.6	53.7	2,700
Not in labor force	22.9	55.1	2,750	22.3	55.1	3,600	22.9	55.2	2,750

SOURCES: Author calculations from the Fall 2021 California Poverty Measure.

NOTES: Employment status is calculated among individuals ages 25-64. Includes non-refundable portion of the CTC.

Supplemental Nutrition Assistance Program (SNAP)

SNAP, known as CalFresh in California, is a nutrition assistance program that provides a monthly amount on an Electronic Benefits Transfer (EBT) card for families to purchase groceries, and in limited circumstances, restaurant meals. We typically take self-reports of SNAP as given and correct for underreporting by adding additional income-eligible individuals to match unduplicated administrative data counts from the California Department of Social Services (CDSS). These counts are disaggregated by case type, county, and race/ethnicity and adjusted to count all units who participated in SNAP at any point during the calendar year. We then use CDSS survey data to estimate SNAP amounts received (since the ACS does not include amounts, only participation). This is based on a monthly allotment model in administrative survey data (RADEP) and an estimate of how many months each family participated (again matching CDSS administrative counts by case type, county, and race/ethnicity).

For the Fall 2021 CPM, we do not have such detailed CDSS administrative data available. However, administrative aggregates on caseload totals by county are available for fall 2021. These data show a 14 percent increase in the SNAP caseload compared to 2019 (average monthly).[10] However, the increase varies across counties: from small declines in 3 counties to up to 40 percent increase in others.[11] We apply these county-level rates to adjust the 2019 CPM caseload to fall 2021 participation patterns As with TANF, SNAP participation in the CPM is always higher than monthly caseload estimates from CDSS because the CPM (and ACS) concept is to measure families who participated *at some point* during the year.

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[10] These estimates rely on the CDSS CF 296 reports available here: https://www.cdss.ca.gov/inforesources/research-and-data/calfresh-data-tables/cf296

[11] The 3 counties with caseload declines include San Bernardino, Stanislaus, and Tulare.

We start by assuming that all SNAP participants in the 2019 CPM also participated in fall 2021. To select additional recipients, we calculate income eligibility based on the updated employment and income information at the SNAP case level. We select new participants among those who are income eligible in order of their estimated probability of participation (from the CPM 2019 imputation), to match the inflated caseload at the county level and to match the statewide total. In the three counties where SNAP participation declines, we make no changes to the caseload.

In fall 2021, SNAP recipients all received the maximum monthly payment according to case size, a COVID-19 policy response that persists as of this writing. We therefore apply these maximum payments to all SNAP cases, both existing and newly assigned. We calculate these payments using the Thrifty Food Plan update that went into effect in October 2021 (FNS 2021). As in the 2019 CPM, we estimate the number of months that each case participated in SNAP, and multiply that number times the monthly payment to arrive at an annual SNAP estimate.

There were additional emergency allotments granted to SNAP units who were not currently receiving the maximum benefit. We estimate the emergency allotment (EA) by calculating the difference between the maximum amount and the SNAP amount predicted by our benefit model – and taking whichever is smaller, that or $95. No inflation adjustments are necessary because the EA and maximum SNAP benefits we assign are in 2021 dollars.

This increase results in the median SNAP amount to poverty units increasing from $1,800 in 2019 (among participants) to about $3,100 in fall 2021. These unit-level increases along with the increasing caseload produce a large increase in the total SNAP benefits paid in California. Administrative data show that total benefits paid more than doubled from fall 2019 to fall 2021 – from $1.5 billion to $3.3 billion.[12]

Housing Subsidies

In the CPM framework, the monetary value of housing subsidies is typically derived as the difference between (a) estimated rent paid, and (b) the lower of the market value of the respondent's housing unit or the shelter and utilities portion of the CPM threshold. This generally follows the SPM framework, with the exception that we use HUD Fair Market Rents to establish market values of housing units of various sizes as opposed to linked administrative data used to calculate market values of housing units.

To derive fall 2021 housing subsidy values, we take three steps: (1) We take 2019 poverty threshold geographically-adjusted shelter and utility values as our starting point; (2) We bring this to 2021 using the same methodology described above with regards to poverty thresholds, but here restricting to a weighted average of housing and utility inflation; and (3) we take the lesser of this or the 2021 Fair Market Rents as the new cap and calculate 2021 housing subsidy values. Throughout this updating procedure we utilize re-calculated household incomes for 2021 in both the housing subsidy prediction model as well as calculation of likely rent payments needed to calculate monetary subsidy values.

Special Supplemental Nutrition Program for Women, Infants and Children (WIC)

WIC is a nutrition assistance program for low-income pregnant and new mothers, infants up to age 1, and children up to age 5. The ACS does not include questions on WIC receipt, and our typical procedure is to randomly assign receipt to those we flag in the ACS as income- and/or categorically eligible to match administrative totals. We make several simplifying assumptions to arrive at income and categorically eligible individuals, described in the original CPM Technical Appendix (Bohn, et al. 2013).

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[12] Based on the CDSS DFA 256 report available here: https://www.cdss.ca.gov/inforesources/research-and-data/calfresh-data-tables/dfa256

For the Fall 2021 CPM we use auxiliary data on Electronic Benefits Transfer (EBT) claiming from the California Department of Public Health (CDPH).[13] We note that these data are reported with less detail in 2021 as compared with earlier years because California had fully rolled out EBT for WIC by mid-2020. With families no longer receiving vouchers brought to stores, we lack detail about the family composition and race/ethnicity that used to be available. For the 2021 CPM, we use the EBT redemption data for 2021 to obtain a monthly per-family amount of benefits redeemed. To obtain disaggregated, person-level counts of WIC receipt, we use average monthly counts of individuals issued WIC benefits for 2021. Most, but not all, of these benefits are redeemed. We obtain these separately by county for women, infants, and children. And we obtain the counts separately for broad categories of race/ethnicity: Hispanic of any race, non-Hispanic white, non-Hispanic Black, non-Hispanic Asian, and non-Hispanic other.

Using the updated simulated cash income variables described above, we flag individuals as eligible for WIC and use random assignment to select participants from the eligible pool, a procedure identical to the one followed in earlier years of the CPM. While there were pandemic-related waivers in the WIC program that have been extended until 30 days after end of the national health emergency, these waivers are not directly related to benefit amounts and duration, and so we did not alter the imputations for the 2021 CPM based on these temporary changes.

School Breakfast and Lunch

School nutrition programs provide breakfast and lunch during the school year, and to a smaller extent in summer months. School meal provision was severely disrupted by the pandemic due to school closures in 2020 through spring 2021. By fall 2021, most schools had reopened. However, certain pandemic policies remained in place. First, federally funded universal free meals extended through the 2021-22 school year.[14] Second, reimbursement rates for the Summer Food Service Program (SFSP) were used in place of National School Lunch Program (NSLP) rates. SFSP rates were about 5 percent higher than NSLP rates (including commodity foods, CDE 2022). Pandemic-EBT (P-EBT 2.0) benefits were also distributed in California in November and December 2021 to parents of students who had an approved application for free and reduced price meals, who lived in a district or school that was a Community Eligibility Provision participant, or who were participating in SNAP in winter/spring 2021. We include an amount of $375 for P-EBT for all free and reduced price-eligible students and for those flagged as receiving SNAP in the Fall 2021 CPM. The total amount we assign for P-EBT 2.0 is $1.11 billion.

For the Fall 2021 CPM we use auxiliary data on school meal claiming by school district from the California Department of Education (CDE) for the months of September, October, and November 2021, the latest available. Using the simulated cash income variables described above, we flag public school students as eligible for free or reduced price meals. As per the usual imputation procedure, we randomly assign students to match separate school breakfast and lunch counts in the CDE administrative data—after summing the district-level counts to Public-Use Micro Area (PUMA) counts—and taking into account district-specific attendance rates. Categorically eligible students are assigned a probability of 1, as is our usual procedure in earlier years. Given universal free meals, instead of excluding higher income students as ineligible for free meals, we assign them a random number, but then halve it to halve the probability of their being assigned a meal. We do this to provide a rough adjustment to the number of higher-income students served. We also adjust the probability of being assigned a meal for reduced-price students to 85 percent that of free students. On average the Food and Nutrition Service (2022)

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[13] The WIC EBT system is separate from the SNAP EBT system in California.

[14] State funding has also been allocated to continue universal free school meals beyond the 2021-22 school year. See https://www.cde.ca.gov/ls/nu/univmealsqandapart2.asp.

calculated that 26 percent of students participating in the National School Lunch Program ate full price meals, and the remaining had free (68 percent) or reduced price (6 percent) meals (2017-2019 national average). Before adding an amount for P-EBT for low-income students, we assign 20.6 percent of income-ineligible students any school meals, but 84.4 percent of those who are categorically eligible, 54.6 of students who are solely income-eligible for free meals, and 46.9 percent of those who are income-eligible for reduced-price meals. The result is 76.1 percent of participation in school meals among low-income or categorically eligible students, which roughly approximates the pre-pandemic national average.[15]

Despite the universal meals policy, we note that CDE meal claiming counts indicate that the number of school lunches served were still 3 percent lower, and the number of breakfasts 10 percent lower, in fall 2021 as compared with fall 2019 (Danielson and Gao 2022). Table 7 shows a higher share of poverty units containing children with any resources from school meals in fall 2021 as compared with 2019 (45.2 percent as compared with 28.8 percent of units). Median amounts were larger because low-income and categorically eligible students all received P-EBT 2.0 ($1,134 in 2021 vs. $1,095 in 2019).

Out-of-Pocket Expenses

Medical Out-of-Pocket (MOOP)

Questions about medical expenses are not asked in the ACS, although questions about health insurance coverage are. As described in prior CPM technical appendices, we typically assign medical out-of-pocket expenses using a predictive model from three years of the California sample of the CPS-ASEC. For the Fall 2021 CPM, we use the 2019-2021 CPS-ASEC samples. The COVID-19 pandemic affected health care use, lowering routine visits and elective surgery.

As described in prior CPM technical appendices, we begin by estimating two sets of regression models to predict medical expenses for the California sample and we do this at the SPM unit level by selecting one individual from each SPM unit and applying household weights in our analyses. Since the regression models include income as a predictor we use the 2021 Q4 simulated income data.

Child Care and Other Work Expenses

Questions about child care expenses are not asked in the ACS. The typical CPM methodology for assigning work-related expenses is parallel to the methodology for assigning MOOP. For the Fall 2021 CPM, we use the 2019-2021 CPS-ASEC samples. In addition, we adjust commuting expenses for inflation to 2021Q4 using the CPI transportation values. The transportation CPI adjustment is 117 percent. This has the drawback of not reflecting changes in working from home.

Due to the capping of combined child care and other work-related costs, combined expenses do reflect the changes in employment described above.

Validating Results: Fall 2021 Poverty Rates

As a final check on the methods used to construct the Fall 2021 CPM, we examine the resulting rates of poverty and deep poverty in comparison to previous CPM poverty data and in comparison to available poverty data for California for calendar year 2021 from the Census Bureau's Supplemental Poverty Measure. We check to ensure that observed patterns in poverty rates over time and across populations reasonably align with or differ from these

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[15] We impute 52.2% of public school students to be ineligible for free or reduced-price meals, 30.3% to be categorically eligible, 7.1% to be income-eligible for free meals, and 10.3% to be income-eligible for reduced price meals.

previous data and external data given changes in the economic and policy context, time period, and data sources. The tables below provide estimates for poverty and deep poverty by demographic characteristics and nine geographic regions of the state. [16] We present estimates for the Fall 2021 CPM, along with the 2019 CPM for comparison purposes. We also provide percentage point differences in poverty rates after subtracting resources from three of the largest-scale safety net programs.

Figure 1 shows a substantial drop from 2019 to 2021 counting safety net programs, but no difference in poverty without those programs.
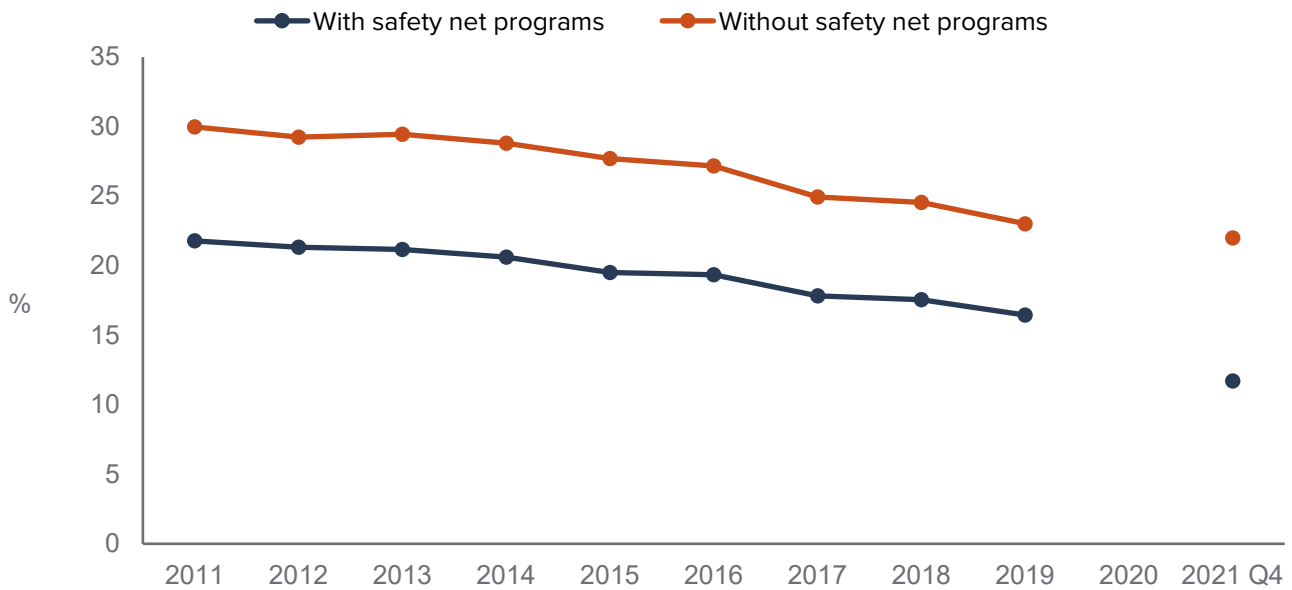
SOURCES: Author calculations from the 2011-2019 and fall 2021 California Poverty Measure.
NOTES: Safety net programs exclude Social Security. In 2021, safety net programs includes GSS II and the expanded federal Child Tax Credit (excluding advanced payments received before fourth quarter 2021).

Table 5 provides substantially more detail for Fall 2021 as compared with 2019. The overall decline was 4.1 percentage points, a 25 percent decrease. Those ages 65 and older had the smallest changes in poverty, deep poverty, and near poverty (8 percent to 9 percent lower). Seniors are less likely to have children in their families, so were less likely to benefit from the 2021 advance CTC. Across demographic groups, the percentage point and percent declines poverty rate drops were largest for children (-7.4 points or 42 percent lower), Hispanic individuals (-6.8 points or 32 percent), and those with less than a high school degree (-7.3 points or 34 percent lower). In terms of depth of poverty, we estimate deep poverty changes to have been larger on a percentage basis for these same groups. Near poverty changes are generally smaller and less varied.

Over half of the drop for most groups is coming from an increase in safety net benefits (Table 6). The percentage point difference in poverty excluding the combined safety net – all cash, nutrition, tax credit, and housing programs tracked in the CPM – yields an overall poverty rate that was 8.9 percentage points higher in fall 2021, but 6.6 points higher in 2019. The difference (2.3 points) is over half of the 4.1 point poverty rate drop overall.

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[16] Technical Appendix A lists the counties within each region.

These observed changes compared to calendar year 2019 appear reasonable given the significant expansions of some wide-reaching safety net supports that remained in effect as of fall 2021, in particular expansions of the federal Child Tax Credit and increases in the benefits available through SNAP, as discussed above. The 2021 expanded CTC and SNAP are the main drivers of the increased role of safety net programs, with the CTC's role growing by 0.5 points and the role of SNAP growing by 1 point.

Work-related and medical expenses were also notably lower in fall 2021, by 0.6 and 1.0 points, respectively (Table 6). These differences are echoed across children, adults, and older adults, although the scale of the changes is largest for children and smallest for older adults. These reductions are plausible given reductions in health care spending and the increase in remote work over the course of the pandemic, although it is open to question whether health care and child care utilization were more similar in fall 2021 to 2020 (e.g., as reported in the 2021 CPS-ASEC) or to pre-pandemic years. We note that to some extent the reduction in childcare expenses follows mechanically from capping combined work-related expenses at the earnings of the lowest-earning adult in the family.

A few programs were notably smaller in their effects on poverty rates in fall 2021 versus 2019: TANF lowered poverty by 0.4 points in 2021 as compared with 0.8 points in 2019. This smaller poverty impact is expected because our method matches TANF participation to administrative caseload data, and in California, TANF caseloads were down by about 20 percent in fall 2021 as compared with 2019, while no pandemic-era waivers or state policy changes affected the amount of TANF benefits. The federal EITC made a 1.2-point difference to rates in 2021 as compared with 1.6 points in 2019, some of which may reflect the statewide aggregate decrease in jobs between 2019 and fall 2021. It is possible that some of these effects are smaller because the larger effects of the CTC and SNAP in 2021 were enough to move individuals above poverty before accounting for these other programs. The CTC in particular was available to many of the same families as the federal EITC.

Other programs' poverty effects changed less between 2019 and 2021, including housing subsidies and school meals. As discussed above, we might have expected the role of school meals to grow with universal access, but California's schools had not returned to serving the same aggregate number of meals in fall 2021 as they had in fall 2019.[17]

To probe these differences further, in Table 7 we compare shares of poverty units with any benefit from these safety net programs, along with median dollar amounts adjusted for family size. Comparing fall 2021 shares with any benefit from programs to 2019 shares, we see similar shares with wages and self-employment (79.4 percent in fall 2021 and 80.1 percent in 2019), but sharply higher shares with any resources from the federal CTC and a moderately higher share with any resources from SNAP. Combining all state and federal tax credits, we obtain a participation rate of over half (50.6 percent), but a small change in benefit amount. The share participating in SNAP grew by just 2.5 percentage points, but the median dollar amount of benefits is about $1,700 higher (70 percent increase). These results are consistent with what we know about pandemic-era policy and caseload changes.

We also compare estimated with administrative aggregates for selected programs. In the case of SNAP, the CPM indicates an estimated total of $10.97 billion in benefits for fall 2021 (converted to an annualized basis), as compared with an estimated administrative total of $13.07 billion for fall 2021 (converted to an annualized basis).[18] The caseload increase we apply in the CPM between 2019 and fall 2021 is 14 percent statewide, matching the increased estimated from administrative data (Fall 2019 to Fall 2021; CDSS 2022). In other words,

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[17] Recall that SSI/SSP and Social Security benefits are only adjusted for inflation in the fall 2021 CPM as compared with the 2019 CPM.

[18] The quarter total was $3.27 billion in fall 2021.

and as intended, the procedures we use for this large-scale program in the 2021 CPM approximately match aggregate administrative data.

Tables 8 and 9 repeat poverty and safety net calculations by regions in the state. As we have found in previous work, regional CPM poverty rates tend to be higher in coastal areas (the Bay Area, Central Coast, Los Angeles, Orange and San Diego) than inland areas (Northern, Sacramento Area, Central Valley, and Inland Empire), and the role of safety net programs is larger in the lower-poverty regions of the state (Danielson, Malagon, and Bohn 2021). This translates also into a somewhat steeper drop in poverty rates between 2019 and fall 2021 in the inland parts of the state. Differences in regional poverty rates and safety net impact are primarily driven by substantial regional differences in cost of housing (as reflected in poverty thresholds) and incomes (as reflected in earnings). We expect this general pattern to remain constant, though we note that we do not directly model changes in housing costs at the sub-state level from 2019 to fall 2021, due to lack of appropriate public data.

As a final check, Table 10 provides summary statistics for poverty units whose status changed between the 2019 and Fall 2021 CPM. Our procedures resulted in 4,611 units (541,367 weighted) moved out of poverty and 681 units (77,122 weighted) moved into poverty. Both groups were on average close to the poverty line in both 2019 and fall 2021: those moved into poverty had a mean income-to-poverty ratio (CPM basis) of 122 percent in 2019, dropping to 78.9 percent after the procedures applied to produce the Fall 2021 CPM. Those moved out of poverty had a mean ratio of 89.5 percent in 2019, which increased to 112.6 percent in the Fall 2021 data.

Of those moved out of poverty, median wages and self-employment were about $3,400 higher (reflecting procedures to inflate wages for all workers), although the share with any wages or self-employment income remained essentially the same. Family resources were boosted by the higher CTC and SNAP receipt and amounts assigned through Fall 2021 CPM procedures. Among the smaller group moved into poverty, the share with any wages or self-employment income dropped by over 40 points, reflecting procedures to assign some working individuals to unemployment to match observed net job losses between 2019 and fall 2021. For those with positive median wages and self-employment, the median amount dropped by a substantial $10,600, reflecting procedures to assign some workers to unemployment and to assign some full-time workers to part-time work, to match the observed increase in part-time work for fall 2021. This decline in earned income for these poverty units was offset by higher SNAP receipt and benefits, as well as higher CTC benefits (although similar level of receipt). Overall these patterns align with expectations, providing reassurance that our methods are sound.

Comparison to Census Supplemental Poverty Measure 2021

Some comparison between our results and the 2021 Supplemental Poverty Measure (SPM), released in September 2022, is useful (Creamer, Shrider, Burns and Chen 2022). Nonetheless, the estimates are not directly comparable, as the SPM refers to calendar year 2021 while the CPM is pegged to conditions in quarter 4 of 2021. In addition, the underlying datasets are different—the CPS-ASEC in the case of the SPM and the ACS in the case of the CPM. Finally, as we note in the introduction to this paper, while there is considerable parallelism in the approach to calculating poverty across the two measures, there are also some key differences. That said, both the CPM and the SPM show drops in poverty that were largest for children. In particular, overall poverty in California according to the SPM was 16.6 percent in 2019, but 11.0 percent in 2021, a 34 percent decline (author calculations from the CPS-ASEC). For children, poverty dropped by over half, from 18.7 percent to 7.5 percent. Among adults, the decline was 4.3 points (from 15.5 percent to 11.1 percent) while for seniors it was 2.4 points (from 17.6 percent to 15.2 percent). These results again reassure us that our methods are performing adequately.

TABLE 5

CPM poverty rates by demographics

	Fall 2021			2019			Percentage point change, 2019-Fall 2021		
	Poverty (<100%)	Deep poverty (<50%)	Near poverty (<150%)	Poverty (<100%)	Deep poverty (<50%)	Near poverty (<150%)	Poverty	Deep poverty	Near Poverty
All	11.7	3.3	28.7	16.4	4.6	34.0	-4.7	-1.3	-5.3
Gender									
Male	11.2	3.1	27.7	15.7	4.3	33.0	-4.6	-1.2	-5.3
Female	12.2	3.4	29.7	17.2	4.8	35.1	-4.9	-1.4	-5.3
Age									
Young children (0-5)	8.4	1.5	30.4	17.4	3.6	39.8	-9.0	-2.1	-9.4
All Children	9.0	1.7	31.3	17.6	3.7	40.5	-8.6	-2.0	-9.1
Adults 18-64	11.6	3.5	27.4	15.6	4.7	32.2	-4.0	-1.2	-4.7
Adults 65+	16.3	4.7	30.1	18.0	5.4	31.9	-1.7	-0.7	-1.8
Citizenship									
Non-Immigrant	10.0	2.9	25.7	14.4	4.1	31.0	-4.5	-1.2	-5.3
Immigrant	16.1	4.2	36.3	21.6	5.7	41.7	-5.4	-1.5	-5.3
Race/ethnicity									
White	9.9	3.7	19.6	12.1	4.6	22.3	-2.2	-1.0	-2.7
Black	12.6	2.8	34.0	17.4	4.0	40.1	-4.7	-1.2	-6.1
Hispanic	13.5	2.9	38.8	21.4	4.6	47.3	-7.9	-1.8	-8.4
Asian	11.8	3.7	23.8	14.5	4.6	27.2	-2.7	-0.9	-3.3
Other	9.2	2.4	21.9	12.9	3.6	26.4	-3.7	-1.1	-4.4
Education									
Less than high school	13.2	2.7	37.6	21.6	4.7	46.3	-8.5	-2.0	-8.6
High school	14.1	3.8	34.7	19.2	5.2	40.5	-5.1	-1.4	-5.8
Some College	12.1	3.9	27.2	15.3	5.0	31.3	-3.1	-1.1	-4.1
College or more	7.7	3.2	14.1	8.7	3.6	15.7	-1.0	-0.4	-1.6

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

NOTES: Employment status is calculated among individuals ages 25-64 and refers to reported (or imputed) status in the week prior to the survey response.

TABLE 6
Percentage point difference in CPM poverty without resources and expenses

	Fall 2021				2019			
	All	Children	Adults 18-64	Adults 65+	All	Children	Adults 18-64	Adults 65+
Poverty rate	11.7	9.0	11.6	16.3	16.4	17.6	15.6	18.0
All safety net programs, excluding Social Security	10.3	19.7	8.1	5.2	6.6	12.1	5.1	4.0
TANF (CalWORKs) and GA	0.5	1.1	0.4	0.2	0.8	1.6	0.5	0.2
SSI	0.9	0.5	0.8	1.9	0.9	0.5	0.8	1.9
Federal EITC	1.1	1.9	1.1	0.3	1.6	3.1	1.3	0.2
Federal CTC	2.0	4.5	1.5	0.3	2.0	4.4	1.5	0.3
Federal CTC/EITC/CalEITC/YCTC	3.7	7.6	2.9	0.7	3.7	7.9	2.9	0.6
SNAP (CalFresh)	2.6	4.6	2.1	1.7	1.3	2.4	1.0	0.8
Housing subsidies	1.1	1.5	0.8	1.6	1.0	1.3	0.7	1.5
School meals	0.6	1.4	0.5	0.1	0.5	1.3	0.4	0.1
Child care and other work-related expenses	-1.8	-1.9	-2.0	-0.8	-2.4	-3.1	-2.5	-0.7
Medical out-of-pocket expenses	-2.7	-2.3	-2.4	-4.6	-3.7	-3.9	-3.3	-5.1

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

NOTES: All safety net, Federal CTC, and Combined federal CTC/EITC/CalEITC/YCTC rows include non-refundable portion of CTC. For Fall 2021, all safety net row includes Pandemic EBT 2.0, GSS II, and the expanded federal Child Tax Credit (excluding advanced payments received before fourth quarter 2021). For Fall 2021, School meals includes Pandemic EBT 2.0.

TABLE 7

Resources and expenses: percent with any, median dollar values, adjusted for family of four that rents

| | Fall 2021 | | | | | | | | 2019 | | | | | | | |
| | All | | Units with any child | | Units with no child | | Units with no one <65 | | All | | Units with any child | | Units with no child | | Units with no one <65 | |
	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)	% w/ any	Median ($)
Net resources	98.5	82,452	99.8	72,515	97.9	88,323	98.2	83,469	98.0	75,441	99.6	64,656	97.3	81,599	98.0	77,670
Wages and self-employment	79.8	102,834	96.0	86,268	72.9	114,734	24.8	77,008	80.1	94,152	96.3	79,294	73.2	105,686	24.9	69,746
All safety net programs, excluding Social Security	71.5	3,000	96.8	5,595	60.7	1,309	52.2	1,665	38.1	3,355	53.8	5,946	31.4	1,629	23.1	6,631
TANF (CalWORKs) and GA	3.7	5,118	8.7	5,879	1.6	2,927	1.0	2,928	4.2	4,452	10.3	4,771	1.7	2,928	1.0	3,039
SSI	5.5	11,984	4.2	7,601	6.0	14,499	8.2	16,716	5.5	11,734	4.2	7,433	6.0	14,189	8.2	16,347
Federal EITC	17.9	1,944	29.8	2,828	12.8	1,468	4.4	1,627	14.5	1,907	29.8	3,058	8.0	561	0.0	7,608
Federal CTC	35.6	3,000	92.6	3,433	11.2	689	1.1	763	34.9	2,272	90.1	2,827	11.4	672	1.1	763
Federal CTC/EITC/CalEITC/YCTC	48.1	2,609	93.5	4,405	28.7	763	6.6	1,095	46.9	2,240	91.5	3,942	27.9	493	6.6	255
SNAP (CalFresh)	18.6	4,542	29.7	5,907	13.9	3,812	13.0	3,994	16.2	2,409	25.3	3,110	12.4	2,099	11.5	1,954
Housing subsidies	4.1	14,068	3.6	13,731	4.3	14,232	6.6	14,518	3.8	13,330	3.6	12,594	3.9	13,461	6.6	14,101
School meals	14.0	1,125	45.2	1,134	0.7	738	0.0	0	8.9	1,095	28.8	1,105	0.3	873	0.0	0
Child care and other work-related expenses	79.8	5,244	96.0	3,995	72.9	5,941	24.9	4,263	80.1	4,611	96.3	3,408	73.2	5,069	25.0	3,636
Medical out-of-pocket expenses	91.5	6,850	98.2	5,662	88.6	7,750	91.7	11,464	92.1	6,962	98.7	5,704	89.2	7,890	93.0	11,088

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

NOTES: Median amounts are calculated for CPM units with positive amounts. Work expenses includes childcare and other work-related expenses that are capped at the earnings of the lowest wage-earner in the CPM unit. All safety net, Federal CTC, and Combined Federal CTC/EITC/CalEITC/YCTC rows include non-refundable portion of CTC. For Fall 2021, all safety net row includes Pandemic EBT 2.0, GSS II, and the expanded federal Child Tax Credit (excluding advanced payments received before fourth quarter 2021). For Fall 2021, School meals includes Pandemic EBT 2.0.

TABLE 8
Regional CPM poverty

	Fall 2021			2019			Percentage point changes, 2019-Fall 2021		
	Poverty (<100%)	Deep poverty (<50%)	Near poverty (<150%)	Poverty (<100%)	Deep poverty (<50%)	Near poverty (<150%)	Poverty	Deep poverty	Near poverty
Northern	11.1	3.7	25.7	15.3	5.4	32.2	-4.2	-1.6	-6.5
Sacramento	9.5	2.9	23.2	13.5	4.1	29.0	-4.1	-1.2	-5.9
Bay Area	11.4	3.3	24.6	14.4	4.2	27.2	-3.0	-0.9	-2.6
Central Valley and Sierra	9.3	2.6	25.1	14.8	4.1	34.8	-5.6	-1.5	-9.7
Central Coast	11.7	3.3	29.0	17.2	4.4	33.9	-5.5	-1.1	-5.0
Inland Empire	10.4	3.1	27.8	14.9	4.6	34.9	-4.4	-1.5	-7.0
Los Angeles	13.7	3.5	35.0	19.8	5.0	40.5	-6.1	-1.5	-5.6
Orange	13.1	3.5	30.4	17.7	4.7	33.5	-4.6	-1.1	-3.1
San Diego	12.2	3.7	29.5	16.8	4.9	33.7	-4.6	-1.2	-4.3

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

NOTES: Technical Appendix B lists the counties within each region.

TABLE 9

Regions: percentage point difference in poverty without safety net programs and expenses, by region

	Fall 2021							2019						
	All safety net, excl. Social Security	Federal EITC	Federal CTC	Federal CTC/ EITC/ CalEITC/ YCTC	Cal-Fresh	Child care and other work-related expenses	Medical out-of-pocket expenses	All safety net, excl. Social Security	Federal EITC	Federal CTC	Federal CTC/ EITC/ CalEITC/ YCTC	Cal-Fresh	Child care and other work-related expenses	Medical out-of-pocket expenses
Northern	10.7	0.7	0.6	2.7	3.0	-1.1	-3.2	7.2	1.5	1.1	3.1	1.8	-2.1	-4.7
Sacramento	9.8	0.9	1.1	2.4	2.4	-1.3	-2.1	6.8	1.6	1.7	3.6	1.6	-1.6	-3.3
Bay Area	5.7	0.6	1.3	1.9	1.5	-1.5	-2.4	3.1	0.6	1.2	2.0	0.5	-1.9	-3.2
Central Valley / Sierra	15.2	1.1	1.8	4.1	3.0	-1.1	-1.9	12.1	2.3	2.1	5.4	2.0	-1.8	-3.2
Central Coast	8.8	0.9	2.4	4.0	2.2	-2.3	-2.9	4.8	1.2	2.0	3.3	1.0	-2.9	-3.5
Inland Empire	11.5	1.4	2.0	4.1	2.6	-1.5	-2.3	8.5	2.1	2.4	4.7	1.7	-2.2	-3.6
Los Angeles	13.1	1.6	2.6	4.9	3.7	-2.3	-3.1	7.7	2.0	2.4	4.4	1.7	-3.1	-4.3
Orange	7.5	1.3	2.7	3.9	2.1	-2.5	-3.5	3.3	0.9	1.9	2.9	0.5	-2.8	-4.2
San Diego	9.0	1.2	2.2	3.7	2.2	-1.9	-2.9	5.3	1.3	2.2	3.7	1.0	-2.5	-3.8

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

NOTES: Includes non-refundable portion of CTC. All safety net, Federal CTC, and Combined CalEITC/YCTC/CTC/EITC rows include non-refundable portion of CTC. For Fall 2021, all safety net row includes Pandemic EBT 2.0, GSS II, and the expanded federal Child Tax Credit (excluding advanced payments received before fourth quarter 2021). Technical Appendix B lists the counties within each region.

TABLE 10
Summary statistics for CPM units assigned a different poverty status in Fall 2021 vs. 2019 CPM data

	Not in poverty→in poverty		In poverty→not in poverty	
	2019	**Fall 2021**	**2019**	**Fall 2021**
N		659		4,940
Weighted N		71,000		587,286
% of threshold	185.8	68.1	88.9	112.5
Net resources				
% with any	100.0	97.0	100.0	100.0
Median $	33,377	14,324	25,209	34,921
Wages and Self employment				
% with any	73.8	41.8	85.6	85.6
Median $	51,517	20,268	26,264	29,519
Federal CTC				
% with any	31.8	20.3	52.7	61.8
Median $	2,000	2,700	2,352	4,500
SNAP (CalFresh)				
% with any	21.9	69.6	52.6	65.8
Median $	1,243	2,738	2,382	5,508
TANF (CalWORKs)				
% with any	4.5	3.1	14.9	14.5
Median $	5,034	6,919	5,050	6,868
Employment				
% with any worker assigned to unemployment		57.8		2.4
% with any worker assigned to PT employment		4.9		0.3
% with any worker assigned to employment		0.3		1.3
Composition				
% with any children		24.0		57.7

SOURCES: Author calculations from the 2019 and Fall 2021 California Poverty Measure.

Conclusion

The research team has produced the CPM for a decade using the ACS augmented with a wide range of mainly administrative data sources in order to present more accurate—to California's demographics and policy context—and detailed estimates than those possible with the SPM. This technical paper describes an approach to measuring poverty using the CPM in a timelier manner that adapts and extends these techniques. In context of a rapidly changing economic and policy environment—and as other recent research using broadly similar projection methods has noted—this approach, if updated regularly, can be useful to policymakers and other stakeholders focused on understanding the current poverty context to inform forward-looking policymaking.

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Appendix B. Regional Grouping of Counties

Region	List of counties
Northern	Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Tehama, and Trinity
Sacramento area	El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma
Central Valley and Sierra	Alpine, Amador, Calaveras, Fresno, Inyo, Kern, Kings, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tulare, and Tuolumne
Central Coast	Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura
Inland Empire	Imperial, Riverside, and San Bernardino

NOTE: The three most populous counties—Los Angeles, Orange, and San Diego—are presented on their own.

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