

The Use of State Administrative Data to Improve Supplemental Nutrition Assistance Program (SNAP) Eligibility Estimates: Findings and Recommendations from an Expert Panel

First Expert Panel and Background

U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS) has historically estimated the percentage of eligible persons who actually participate in the Supplemental Nutrition Assistance Program (SNAP) (the participation rate) by: (1) using Current Population Survey Annual Social and Economic Supplement (CPS ASEC) data to estimate the number of individuals eligible for SNAP (the denominator); and (2) using SNAP administrative data to calculate the number of participants (the numerator). However, modeling eligibility using survey data has a number of challenges, such as respondents misreporting of eligibility-related information and the necessity of using other data sources to impute information not included in the survey. This use of different data sources sometimes results in implausible participation rates exceeding 100 percent for certain subgroups. FNS, the USDA, Economic Research Service (ERS), and the Census Bureau sought potential solutions to these issues by linking Census survey data with monthly administrative records at the person level.

In 2016, an expert panel was convened to identify and prioritize SNAP eligibility modeling issues that could be assessed using survey data that is matched with State SNAP administrative data. The panel of experts was drawn from Federal agencies FNS, ERS, and the Census Bureau; research institutions Mathematica, Decision Demographics, the Urban Institute, and National Opinion Research Center (NORC); and academia. The expert panel held two sessions. In the first session in May 2017, the panel developed four research priorities which are summarized below:

(1) Administrative Data Quality: Little is known about the quality of State SNAP administrative data at the micro- or unit-level, their comparability to other sources; and any potential errors in them. There is no single national database of SNAP records. Each State maintains its own SNAP data file and the documentation in many cases lacks the detail necessary for analysts.

(2) SNAP Unit Simulation: An important part of modeling SNAP eligibility in household survey data is simulating the SNAP unit, (i.e. the individuals that share food resources). In many cases, the household and family identifiers in survey data do not fully align with SNAP units identified in administrative records. Without accurate SNAP unit simulations from survey data, there will be mismeasurement in the unit's size, income, allowable deductions, eligibility, and benefits. Especially difficult to model accurately using survey data have been one-person SNAP units, child-only units, and households with both SNAP participants and non-participants.

Data Used in These Reports

State Administrative Data: Collected by State SNAP agencies for administering SNAP caseloads; contains eligibility-related variables, including income, disability status, deductions, etc.

SNAP National Data Bank (NDB): Sent by State SNAP agencies to FNS for monthly estimates; contains aggregate State participation, issuance, and budget totals.

SNAP Quality Control (QC): A monthly random sample of administrative data in each State that is collected for payment accuracy.

Current Population Survey Annual Social and Economic Supplement (CPS ASEC): An annual survey of social and economic characteristics of more than 75,000 households collected by the Census Bureau.

(3) Survey Data Quality: Administrative data can help assess the quality of survey data. The Current Population Survey (CPS) has a prominent role in modeling SNAP eligibility, and the Survey of Income and Program Participation (SIPP) and the American Community Survey (ACS) are each used in SNAP eligibility modeling and SNAP research. Two foundational research issues are: (1) how well does the CPS represent the SNAP population and what is the impact of survey errors including coverage, weighting, survey nonresponse, item misreporting and imputations on representation; and (2) does misrepresentation impact certain demographic groups differently, such as households with individuals or income sources missing from the survey data?

(4) Subgroup Variance: Microsimulation models may be relatively better at capturing eligibility of some demographic subgroups than others. The possibility of linking administrative data and survey data provides new opportunities for assessing these models and identifying subgroups with variable estimates, in which the microsimulation estimates of eligible units are lower than the number receiving SNAP according to administrative records. Specific subgroups of interest that could be investigated include: single parents; nonelderly, nondisabled adults without dependents; elderly individuals; working families; single-person households; households with zero or near-zero income; child-only TANF cases; and individuals with disabilities. The last two groups may be difficult to identify in either the survey or administrative data but are likely to be important for policy reasons.

Census and USDA funded a small number of research projects to address the priorities identified in the first expert panel session, with the goal of presenting the findings at a second expert panel to discuss their implications for further research on improving Federal estimation of program participation.

Second Expert Panel: Research Presented

The second expert panel was held in March 2021 during which the findings from the research projects were presented and topics of future research were identified by the panelists and presenters. Each research project utilized SNAP administrative data collected by the Census Bureau from State SNAP agencies. They each address a particular aspect of comparison between administrative data with other data sources and the implications for estimating SNAP participation rates and unit characteristics.

(1) Census Bureau estimates of SNAP eligibility and participation at the sub-State level

To produce estimates for a given State, Renuka Bhaskar and Brad Foster of Census Bureau's Center for Economic Studies linked 1 year of ACS data to 2 years of State SNAP administrative records using the methodology of Newman and Scherpf (2013). For estimates below the State level, they used 3 years of ACS data linked with 4 years of State SNAP administrative records. Then, Census computed the reported income of the SNAP unit and used ACS data to estimate additional criteria to determine eligibility. Finally, they used the administrative records themselves to assign participation to individuals in the ACS, inferring that everyone in their SNAP unit was eligible. Census then estimated who among the eligible population accessed SNAP at any time in the 12 months prior to their ACS survey. The Census estimates provide a descriptive view of who accesses SNAP among the eligible population (see these estimates visualized on the [Census website](#)), but a more systematic analysis could provide useful information into how well SNAP reaches populations in need.

(2) Administrative data quality assessment

Karen Cunyningham of Mathematica presented findings from a study by her, John Czajka, and Jacqueline Agufa to standardize and assess the quality of SNAP administrative data from Illinois, Mississippi, and Tennessee. They compared monthly totals from the SNAP administrative files with corresponding data from the National Data Bank (NDB) and found that the totals generally corresponded. The largest differences across the three States were lower benefit, participant, and household totals for Illinois reported in the administrative files, along with slightly lower participant totals for Tennessee in the administrative data.

The team also compared subpopulation distributions from the standardized files with corresponding estimates from the SNAP QC data. Generally, the estimates were similar to those from the SNAP QC data, but there were some exceptions. This assessment validates the quality of the State administrative data held by the Census Bureau and demonstrates the usefulness of standardized data files for SNAP-related research.

(3) Assessment of SNAP unit simulation using linked survey and administrative data

John Czajka of Mathematica with Jacqueline Agufa conducted analyses using administrative data from Illinois, Mississippi, and Tennessee to improve the simulation of SNAP-eligible units for participation rate estimates. They found that children excluded from CPS ASEC household rosters (which are defined more broadly than SNAP households, or units) may fully account for the underestimation of this subgroup of SNAP units, also causing SNAP units with children to be underestimated. Further, adults with disabilities may be overestimated in eligibility simulations using CPS ASEC because of its broader definition of disability than that used by SNAP. Alternatively, nondisabled adults age 18-49 in childless units may be underestimated by a combination of the aforementioned disability definition and their high likelihood of being in a households with multiple SNAP units. Units with no earnings may be underestimated because CPS ASEC captures earnings that the SNAP administrative data do not capture. They also found low incidence of multiple SNAP units in a CPS-defined household, suggesting that there should rarely be simulated more than one eligible unit within a CPS household.

(4) SNAP Eligibility and Participation Rate Analysis: National Context and Preliminary Insights from Linked Data Analysis

Laura Wheaton of the Urban Institute along with Nancy Wemmerus and Tom Godfrey of Decision Demographics also conducted research on subgroups. Using data sources for 2011 and 2016, they compared the SNAP participation rate estimates of Mathematica's MATH CPS (used to produce the SNAP participation rates published by FNS¹) and Urban's TRIM3 model (used to produce U.S. Department of Health and Human Services participation rates²), both of which rely on CPS ASEC data. Some SNAP subgroups had participation rates over 100 percent in both models, including children and people in SNAP units with very low income. Other subgroups had participation rates near or over 100 percent only in the MATH CPS, including SNAP units that were child-only, contained someone receiving SSI, were one-person, and adults age 18-49 without disabilities in households without children.

(5) Do Surveys Miss the Poor? Evidence from Administrative SNAP Records

Bruce D. Meyer of University of Chicago, National Bureau of Economic Research, the American Enterprise Institute, and Census and Derek Wu of University of Chicago linked 2006-2016 ACS and CPS ASEC data to administrative data from 21 States to examine the under coverage of SNAP recipients (Meyer et al., 2015). Overall, ACS and CPS provide fairly precise estimates of the SNAP population. However, there are some subgroups with over-coverage, such as case with multiple people, and some that tend to be under-covered. Potential explanations for under-coverage include differential non-response, SNAP non-compliance, errors in the administrative data, and survey frames that may miss certain individuals, such as those staying homeless shelters.

(6) Fixing Errors in a SNAP: Addressing SNAP Underreporting To Evaluate Poverty

Liana Fox of Census attempted to correct for underreporting of SNAP receipt in surveys using administrative data from 8 States to impute household SNAP receipt, months of receipt, and the annual total in the other 42 States and the District of Columbia. Fox used 2014 CPS ASEC data linked to U.S. Internal Revenue Service (IRS) and Social Security Administration (SSA) income data, providing information on administrative earnings, interest income, dividends, rental income, retirement income, survivor and disability benefits, and taxable adjusted gross income. Generally, their

¹ The most recent official SNAP participation rate estimates can be found in "Reaching Those in Need: Estimates of State SNAP Participation Rates in 2018," <https://www.fns.usda.gov/snap/reaching-those-need-estimates-state-2018> (Accessed September 24th, 2021)

² Gilbert Crouse and Suzanne Macartney, "Welfare Indicators and Risk Factors: Eighteenth Report to Congress Spring 2019," U.S. Department of Health and Human Services https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//198451/welfare-indicators-risk-factors-18th-report.pdf (accessed October 10, 2021)

approach offers a possible solution to addressing survey misreporting with limited administrative data, and it yields microdata for use in other research.

Research Topics Recommended for Future Consideration

The discussion of the panel findings generated recommendations for topics for the broader research community, both within or external to Federal agencies, to explore in the future:

(1) Administrative Data Quality

- **Extend to other States the work of Cunyningham (2021) comparing SNAP administrative to Quality Control (QC) estimates**, specifically identifying those States and years where the estimates of the two datasets are particularly comparable and consistent.
- **Conduct intentional qualitative work with State data administrators to better understand cross-State differences in SNAP administrative data variables.** Qualitative work with State data administrators could shed light on how they process their administrative data, how variables are defined, and whether these vary between States in a manner which could explain the variations in administrative data-survey divergences.
- **Examine the rapid changes in the SNAP caseloads due to disasters in the administrative data.** Disaster SNAP provides food assistance to low-income households experiencing damages from natural disasters. QC data do not include these participants, so administrative data offer an opportunity to examine the caseload dynamics in response to disasters.

(2) SNAP Unit Simulation

- **Utilize linked data to examine instances where an individual is in a SNAP unit in the administrative data but is not in the same CPS ASEC household.** Researchers could look forward and backward in the administrative data to identify if residences had changed or if there were other changes. Additionally, using CPS data to find the other household(s) that contain individuals in the same SNAP-unit is improbable because the other household is very unlikely to be in the survey, so utilizing 2010 Census data to examine this could be fruitful as well.
- **Merge the new TRIM3 model's eligibility flags (which identify households estimated to be eligible) with other simulation models to assess the accuracy of different assumptions of unit formation strategy by SNAP households.** The new TRIM3 methodology assumes that households take the unit formation approach that maximizes their eligible benefits, in particular the assumption that adults form the smallest units possible, which increases the estimates of eligible child units. The TRIM3 eligibility flags and unit flags could be potentially obtained and merged onto linked data sets and other estimation models.
- **Examine the extent to which the linked-data approach (and imputations based on them) are assigning SNAP benefit receipt to households above the income eligibility range and the extent to which imputed income variables in the survey data impact these estimates.** The examination could consider whether imputed income households should be dropped and remaining households reweighed for SNAP eligibility estimation, and using the Newman and Scherpf methodology could also be examined.
- **Add MATH CPS eligibility flags (which identify households estimated to be eligible) to the linked data with the TRIM3 flags to examine the differences in estimated SNAP participation.** FNS uses the MATH models for policy simulation. Certain population subgroups have unexpectedly high participation rates in the MATH CPS estimates but not in TRIM3 and MATH SIPP+, even though all three models use the same number of participants in the numerator of their estimates. Analyzing differences in modeling approaches could help FNS more accurately estimate participation, for instance examining: (i) Methods to divide survey households into potential SNAP units; (ii) Methods to define disability; (iii) Methods used to simulate work-based time limits; (iv) Modeling approaches affecting child-only, immigrant, and mixed-status household imputations; (v) Modelling approaches to broad-based categorical eligibility; and (vi) methods for correcting for underreporting of SSI.

(3) Survey Data Quality

- **Examine which groups are not represented in the CPS ASEC (weighted numbers) and which have under-coverage issues in the survey and quantify how many SNAP recipients are not represented in the ASEC due to this.** Key groups are Armed Forces, homeless populations (sheltered and unsheltered), and those in temporary or transient living situations.
- **Utilize administrative data linked to Census survey data to examine the versions of the interviews to better understand nonresponse**, including potential perceived stigma in reporting SNAP receipt. With linked data, one would know which units received SNAP but did not report receipt in the survey. Interview mode could provide a useful method for examining this. For instance, the ACS has an Internet mode, mail mode, phone mode, and in-person mode (although response mode is not random).
- **Test alternative weights for dealing with nonresponse bias in the CPS ASEC.** CPS ASEC is a 1-month-per-year supplemental survey for the monthly CPS, so applying different weighting techniques could shed light on how those techniques interact with nonresponse bias.

(4) Subgroup Variance

- **Investigate the unexpectedly high estimated participation rates and underestimation of eligible SNAP units for people in households with no or very low income and those eligible for higher benefits (likely the same households)**, which appears across simulation models. The investigation could examine whether this is due to an underestimate of eligible single adult households with children, an underestimate of these families in the pool of eligible units, or whether misreporting of certain types of income could be driving underestimates.
- **Examine and compare the definitions used to identify the homeless population because across the different datasets and understand how they change estimates of this population.** There are fairly substantial differences and rates of homelessness between estimates using different datasets. For instance, in SNAP QC data, the homeless deduction will capture only some homeless families, and, in SNAP administrative data, addresses are sometimes coded as undomiciled or homeless. Another difficulty comes from recorded address, whether of the homeless shelter or a friend/family member.
- **Develop methods for linking SNAP unit members in the administrative data with household survey data when the absence of information may have prevented Census linkages**, which makes it possible to refine previous findings about nonparticipating members and SNAP unit members not listed on survey household rosters.
- **Examine the differences in survey and administrative measures of characteristics used to define subgroups of SNAP-eligible persons and make direct comparisons.** For example, researchers could examine the disability definitions used in SNAP modeling and compare to disability flags on administrative data (where they exist).
- **Link SNAP administrative data to SIPP to examine the longitudinal dynamics of the single adult and children households.** It may be possible to combine enough States to build sufficient sample size when linked with the administrative data, making direct measurements of changes over time.

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For More Information:

Karen Cunnyngnam, (2022). Final assessment of the quality of State SNAP administrative data. John Czajka, (2021). Final memorandum assessing SNAP unit simulation. Prepared by Mathematica, Contract No. AG-3198-B-16-0001/12-3198-18-F-0053 Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, Project Officer: Kameron Burt. Available online at: www.fns.usda.gov/research-and-analysis.