



SNAP participation among low-income US households stays stagnant while food insecurity escalates in the months following the COVID-19 pandemic

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ABSTRACT

The COVID-19 pandemic led to increased food-insecurity rates, particularly among low-income households. Participation in the Supplemental Nutrition Assistance Program (SNAP) was expected to rise in response. We surveyed 931 US residents from households with annual incomes below \$50,000 to collect information on food security and food assistance program participation in the year prior to the pandemic and in the first four months of the pandemic, along with household and individual-level demographics. Food insecurity increased from 31% prior to the pandemic to 39% in the first four months of the pandemic, while self-reported SNAP participation stagnated. Even more alarmingly, among low-income households that were also food-insecure, 47% reported participating in SNAP prior to the pandemic but only 39% did so in the first four months following the pandemic's onset. In particular, Black households, households with children, and those in the lowest income category experienced the largest declines in SNAP participation. Food assistance programs designed to alleviate hunger should facilitate participation among the most vulnerable, especially when these groups are faced with multiple challenges, like during the COVID-19 pandemic.

1. Introduction

Since the COVID-19 pandemic began, food insecurity has increased at alarming rates in the United States. Data from the national pulse survey (US Census Bureau, 2021) implemented by the US Census Bureau has captured high levels of household food insufficiency, especially among Black and Hispanic households (Feng et al., 2020). Other surveys using validated USDA measures have also reported a higher prevalence of food insecurity since the beginning of the pandemic (Wolfson and Leung, 2020; Niles et al., 2020; Dubowitz et al., 2021). Simultaneously, unemployment rates reached record-high levels early in the pandemic, increasing from 3.5% in February 2020 to 14.8% in April 2020 (US Bureau of Labor Statistics, 2021). Participation rates in the Supplemental Nutrition Assistance Program (SNAP), the country's largest nutrition safety net program, have traditionally responded proportionately to economic downturns (Rosenbaum and Keith-Jennings, 2019). As the country faced the consequences of the pandemic, with high rates of unemployment and income losses accompanied by increases in food insecurity, the U.S. Department of Agriculture (USDA) allowed states to request a number of waivers to facilitate SNAP participation by expanding eligibility, increasing benefits, and granting flexibilities for

enrollment and implementation (US Department of Agriculture, 2021b). These waivers have continually been updated to address emerging issues and address unintended consequences of policy changes. Given the increase in food insecurity, economic instability, and USDA's SNAP waivers, SNAP participation was expected to rise. Indeed, USDA administrative data show that, on average, 2.9 million more households participated in SNAP each month between April and July 2020 than during April–July 2019 (US Department of Agriculture, 2021a). Nonetheless, existing safety net programs like SNAP may have failed to reach the most marginalized segments of the population, widening socioeconomic and health disparities (Dubowitz et al., 2021). Using a nationally representative sample, this paper compares SNAP participation rates in the year prior to the pandemic with participation rates during the first four months of the pandemic among low-income households. We further examine how SNAP participation rates varied across different demographic and socio-economic groups within the most vulnerable – low-income food insecure households.

2. Study data and methods

An online survey was conducted in July–August 2020 to collect

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information from US adults (n = 931) living in households with annual income below \$50,000 in 2019. The Qualtrics (Qualtrics, 2021) survey firm invited potential respondents, recruited from pre-existing panels, to participate in our online survey. The sample was representative of the US population for race and age based on 2018 American Community Survey data (5-year estimates). Equal numbers of participants were recruited with household incomes below \$25,000 and between \$25,000 and \$50,000. The response rate of 27% was calculated using the American Association of Public Opinion Research’s calculator (The American Association for Public Opinion Research, 2021b) for web based surveys, and was reported using the standard definition for Response Rate 4 (The American Association for Public Opinion Research, 2016). Respondents were eligible to participate if they had been living in the US at least since January 2020 and if their household income in 2019 was \$50,000 or less. The survey was conducted as part of the National Food Access during COVID Research Team (NFACT) study (Niles et al., 2021), a multi-site collaborative of researchers examining food security, food access, and food assistance program participation during COVID-19 nationally, and in multiple states across the US. Information from NFACT surveys was summarized into policy and research briefs and shared with key stakeholders across the country (NFACT, 2021).

Survey participants were asked to reflect on the period from March 2019 to March 10, 2020 as the time prior to the pandemic, and the period between March 11, 2020 and the date of the survey as the time since the pandemic began. Food security status was measured using the USDA’s validated six-item household food security survey module (Blumberg et al., 1999). The six-item module has the advantage of minimizing respondent burden for food insecure households, and its estimates of food insecurity prevalence differ only minimally from those derived from the 18- or the 10-item modules (Blumberg et al., 1999; U.S. Department of Agriculture, 2012). Respondents answering affirmatively to two or more food insecurity questions were considered food insecure. The survey also included questions related to SNAP and other food assistance program participation. Respondents were asked, “Which of the following food assistance programs did your household use in the year before the COVID-19 outbreak, if any, and since the COVID-19 outbreak (March 11, 2020)? Response options included a list of food assistance programs with an option to check boxes for each time period. Respondents also provided information on age, sex, race/ethnicity, annual household income in 2019, household size and composition. A full description of the NFACT survey is available elsewhere (Niles et al., 2020). This research was approved by the authors’ Institutional Review Board. Participants consented to participation before answering survey questions.

2.1. Statistical analysis

Bivariate analyses were conducted to examine the prevalence of food insecurity and SNAP participation among the full sample of low-income households, both prior to and in the first four months of the pandemic. Multivariate logistic regression models predicted SNAP participation among low-income food insecure households, adjusting for age, sex, and race/ethnicity of the respondent, along with household income, household size, an indicator for households with children (any households with at least one member < 18 years old), food pantry use—a commonly used source for acquiring food among households in need, and the score on the USDA food insecurity module, indicating the number of affirmative answers to the USDA six-item food security questions. Predicted prevalence of SNAP participation by various household demographics is presented.

3. Study results

The 931 respondents in the sample resided in 47 states within the US (all except North Dakota, Vermont, and Wyoming), plus the District of

Columbia, with residents of New York, California, Florida, and Texas, together accounting for almost 36% of the sample. Table 1 presents a description of the sample. Respondents were 18–92 years old, with an average age of 49. The majority of respondents were female (70%), more than half (56.3%) were non-Hispanic White, 14.5% were Hispanic, 19.4% were non-Hispanic Black, 6.2% were Asian, and 3.6% were other/multiple races. While the survey included an option for Native American or Alaskan Native, only 4 individuals selected this option; thus, they were combined with the other/multiple category. About a third of the respondents had a high school education or less and 41% had some college education. A little less than a quarter of the households in the sample included at least one child under the age of 18. In the year prior to the pandemic, 14.4% of respondents reported using food pantries, compared to 16.2% during the first 4 months of the pandemic. The average food insecurity score was 1.25 and 1.54 during the same periods, respectively.

As shown in Fig. 1, among this sample of low-income households, food insecurity rates increased by 26%; in the 12 months prior to the pandemic 31% of the households were classified as being food insecure, and this proportion increased to 39% in the first four months of the pandemic (p < 0.001). The observed increase in food insecurity was not accompanied by a commensurate increase in self-reported SNAP participation, which was unchanged (from 29% to 28%; p = 0.439) among low-income households. Remarkably, when considering only the food insecure households in our sample, the SNAP participation rate declined from 47% in the year prior to the pandemic, to 39% in the first four months following the onset of the pandemic.

Fig. 2 presents the adjusted prevalence of SNAP participation among low-income food insecure households in the 12 months prior to (n = 228) and four months immediately following the onset of the pandemic (n = 307) by household characteristics. The first panel (panel A) shows that prior to the pandemic households from different racial groups participated in SNAP at similar rates, but in the months following the onset of the pandemic, non-Hispanic Black households were significantly less likely to participate in SNAP compared to non-Hispanic White households (p < 0.05). Similarly, prior to the pandemic, households with children participated at significantly higher rates than did households without children (p < 0.01); no such difference was observed in the 4 months following the pandemic’s onset (panel B). And

Table 1
Demographic characteristics of the nationally representative sample of adults from low-income households in the US.

Sample Characteristics	Mean (SD) or % (n = 931)
Age (Years)	49 (18)
Sex (% female)	70.4
Race (%)	
Non-Hispanic White	56.3
Hispanic	14.5
Non-Hispanic Black	19.4
Asian	6.2
Other/Multiple	3.6
Education (%)	
High school or less	31.4
Some college or Associate degree	41.0
College or more advanced degree	27.6
Households with any child < 18 years old (%)	22.9
Income group based on 2019 annual household income (%)	
Less than \$14,999	28.4
\$15,000 to \$34,999	44.2
\$35,000 to \$49,999	27.4
Household size	2.3 (1.6)
Food pantry use – Prior to the pandemic (%)	14.4
Food pantry use – In the first 4 months of the pandemic (%)	16.2
Food insecurity (range: 0–6) – Prior to the pandemic	1.25 (1.9)
Food insecurity (range: 0–6) – In the first 4 months of the pandemic	1.54 (2.0)

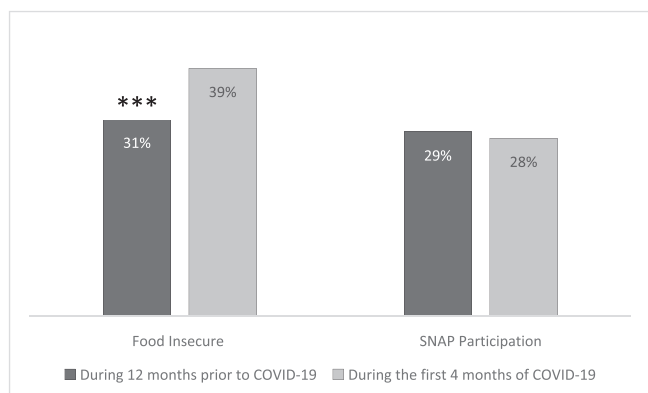


Fig. 1. Food Insecurity and Supplemental Nutrition Assistance Program Participation (SNAP) Before and After COVID-19 Pandemic Onset among Low-Income Households.

Note: Food security status was measured using the USDA’s validated six-item household food security survey module. Self-reports of SNAP participation in the 12 months prior to and during the 4 months after onset of the COVID-19 pandemic were used to calculate SNAP participation rates. Analyses presented are based on unadjusted estimates. *** indicates the difference between food insecurity rates at the two time points was statistically significant ($p < 0.001$).

while households in the lowest income category (less than \$15,000) participated at significantly higher rates than did higher income households both prior to and after the pandemic onset, the actual rates of participation fell for the lowest income group in the months following the onset of the pandemic (from 69% to 54%) (panel C). The results of the multivariate logistic regression models from which the adjusted prevalence of SNAP participation in Fig. 2 were calculated are reported in Appendix 1.

4. Discussion

Consistent with emerging evidence (Wolfson and Leung, 2020; Niles et al., 2020; Dubowitz et al., 2021) of escalation in rates of food insecurity and food insufficiency, we found that food insecurity rates increased among low-income US households by 26% in the months immediately following the onset of the coronavirus pandemic. Contrary to expectations, a parallel increase in SNAP participation was not observed; low-income households participated in SNAP during the first four months of the pandemic at the same rate as they did in the year prior to the pandemic. Different from our findings that are based on self-reports, USDA administrative data show that compared to a similar time period in 2019, SNAP participation increased overall during the first few months of the pandemic. It is important to note that USDA data includes all eligible households and not a subset from the lowest income groups; our sample was restricted to households making less than \$50,000 per year in 2019. Further, the stall in participation reported during the pandemic in our sample could be partially attributable to the shorter duration of 4 months considered since the start of the pandemic, compared to the full 12 months prior to the pandemic. Several other studies using NFACT survey data have found results similar to ours showing decline or stagnation in SNAP participation in the months following the onset of the pandemic (Drewnowski et al., 2020; Bertmann et al., 2021; Pemberton et al., 2021; Clay, 2021; Rogus et al., 2020; Martinelli et al., 2020) with a few exceptions where an increase in participation was observed (Zack et al., 2021; Pignotti et al., 2021). The absence of an increase in SNAP participation in the low-income sample prompts questions about what might be driving these unexpected findings. Among vulnerable households, what characteristics are associated with lower SNAP participation, despite the challenges the pandemic has presented?

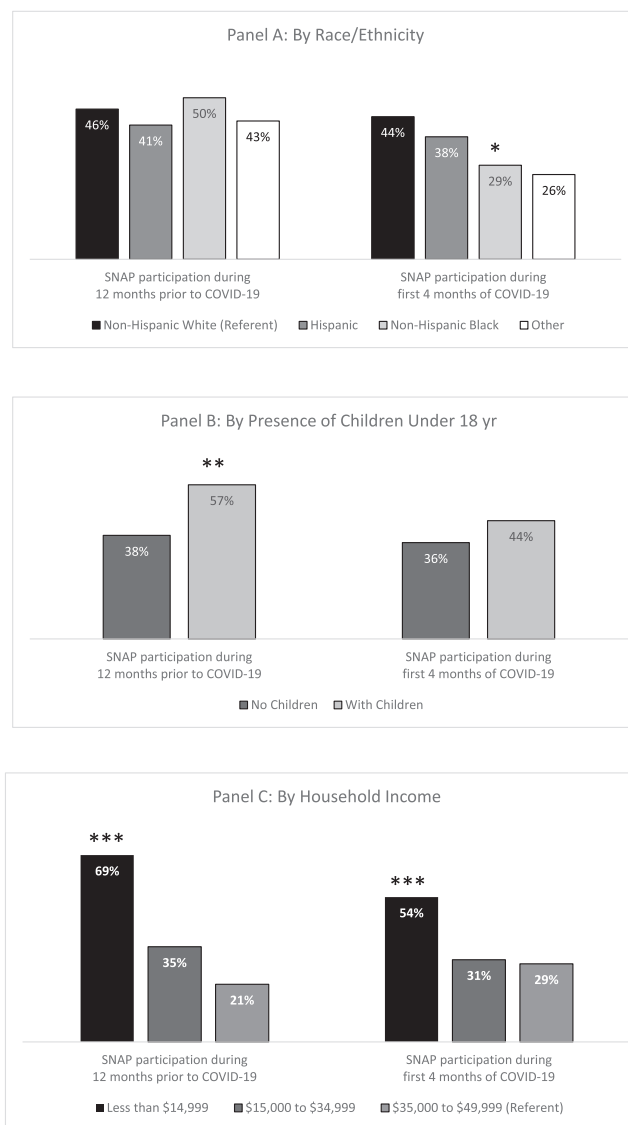


Fig. 2. Adjusted Supplemental Nutrition Assistance Program (SNAP) Participation Before and After COVID-19 Pandemic Onset among Low-Income (< \$50,000) Food Insecure Households.

Note: Self-reports of SNAP participation in the 12 months prior to and during the 4 months after onset of the COVID-19 pandemic were used to calculate SNAP participation rates. Estimates presented are based on multivariate regression models (see Appendix 1) predicting SNAP participation among different income groups, adjusting for age, sex, and race/ethnicity of the respondent, household income, household size, an indicator for households with children, food pantry use, and score on the USDA food insecurity module indicating the number of affirmative answers to the USDA six-item food security questions. * Post-pandemic onset, non-Hispanic Black households participated in SNAP at significantly lower rates than did non-Hispanic White households ($p < 0.05$) (Panel A). ** In the year prior to the pandemic, households with children participated in SNAP at significantly higher rates than did households without children ($p < 0.01$) (Panel B). *** Households in the lowest income group participated in SNAP at significantly higher rates than did households in the highest income group both prior to and since the onset of the pandemic ($p < 0.001$) (Panel C).

This study showed a decline in participation among low-income food insecure households, and within this group, differential SNAP participation by sociodemographic characteristics. Prior to the pandemic, households from all racial groups participated at more or less similar rates. However, in the early months of the pandemic, non-Hispanic Black families participated at significantly lower rates compared to

their non-Hispanic White counterparts. Comparable results were reported by Dubowitz et al. who found no changes in SNAP participation post-COVID-onset in a sample of low-income, predominantly African American residents of Philadelphia, despite a significant increase in food insecurity (Dubowitz et al., 2021).

Food insecurity rates are consistently and significantly higher among households with children (Bauer, 2020), and based on USDA data, these families also participate in SNAP at higher rates than do households with no children (U.S. Department of Agriculture, 2021b). In our multivariable analysis, prior to the pandemic, households with children participated in SNAP at significantly higher rates than did similar households without children. However, during the first few months of the pandemic, SNAP participation among low-income households with children declined, resulting in similar participation rates in households with and without children.

The need for food assistance is highest among households with the lowest income, as evidenced by the fact that over 80% of SNAP beneficiaries live in households that are at or below the federal poverty line (Center on Budget and Policy Priorities, 2019). Among low-income food insecure households in our sample, the highest SNAP participation rate was observed in households with annual income less than \$15,000, where almost 70% participated in SNAP before the pandemic. However, SNAP participation decreased in this group of households to 54% during the first four months of the pandemic.

Lower rates of participation in the country's largest safety-net program among low-income food insecure households, specifically those composed of racial/ethnic minorities, households with children, and those in the lowest income categories, during the period following the pandemic's onset is of major concern. The COVID-19 pandemic created multiple emergencies simultaneously, most of which disproportionately affected the most vulnerable households. Many of these households began juggling loss of income due to job disruptions (Acciai et al., 2020); increased childcare responsibilities, including providing more meals to their children due to school closures; supporting remote education of their children; and navigating the public support system that relied more and more on electronic formats, which may have been inaccessible for some. The most vulnerable households were also more likely to have directly experienced a COVID-related illness or death (Abedi et al., 2021). COVID not only created multiple emergencies but likely also created an environment that added challenges to food assistance program participation. A decline in rates of participation among these vulnerable groups calls for reviewing policies related to SNAP enrollment and implementation so that in future emergencies, the program is better prepared to meet its goal of providing a critical safety net for those in greatest need.

The USDA was prompt in its response to COVID-19 by issuing waivers for food assistance programs, which were intended to facilitate participation (U.S. Department of Agriculture, 2021a). Nonetheless, some of the benefits provided during the pandemic may have had unintended consequences. For example, until December of 2020, COVID related unemployment insurance was counted toward household income for establishing SNAP eligibility. This bump in income may have disqualified some families from the program (Bertmann et al., 2021; Center on Budget and Policy Priorities, 2021) creating an unwarranted churn in participation. The timely SNAP waivers (US Department of Agriculture, 2021b) allowing implementation flexibilities to address food insecurity did not always benefit the most vulnerable. One provision that increased emergency assistance benefits during COVID applied only to households not receiving the maximum benefit amount for their household type. Households in greatest need, those already receiving maximum allocation, received no increase in SNAP benefits. Subsequent enhancements to SNAP benefits have addressed these discrepancies in how additional benefits are allocated (U.S. Department of Agriculture food and Nutrition Service, 2021). Given the design of the study, we were not able to examine specific reasons for the lack of increase in self-reported SNAP participation in the months following the onset of the

pandemic.

Lastly, similar to what has been observed extensively in the national media, our data confirm that the use of food pantries increased in the post-COVID months. A higher proportion of low-income households used food pantries in the period following the onset of the pandemic (16.2%) compared to before (14.4%). If households in need experienced barriers to participating in SNAP during the pandemic, they may have resorted to using food pantries as a temporary solution. In emergency situations like those experienced during the COVID-19 pandemic, our findings highlight the importance of encouraging and facilitating participation in food assistance programs among the most vulnerable households, for whom the challenges associated with enrollment and participation may become insurmountable.

The results of the current study should be interpreted with some methodological limitations in mind. First, our participants were enrolled in a Qualtrics panel; therefore, we cannot exclude the possibility that our sample was self-selected to some extent. For instance, the sample may over represent individuals who are tech-savvy and more highly educated. On the other hand, individuals without a reliable internet connection may be underrepresented. However, online panels have been shown to be credible sources for collecting data (Walter et al., 2019); especially when the sample is designed to be representative of the population (The American Association for Public Opinion Research, 2021a), as was the case in our study. In addition, using this approach allowed us to collect data from a nationally representative sample in a timely manner, despite the numerous closures and restrictions in place during the first months of the COVID-19 pandemic. Second, SNAP participation was self-reported and not from administrative data. While both recall and social desirability biases could occur and thus influence reported prevalence of SNAP participation, these biases would likely apply to both time points, and therefore, not affect the change in participation over time. Third, it is important to note that while SNAP participation prior to the pandemic referred to a 12-month period, SNAP participation after the onset of the pandemic only covered a 4-month period. This may have contributed to overall lower rates of participation. Fourth, the USDA six-item food insecurity module does not specifically ask food security questions about children in the household, but was chosen to lower respondent burden. Lastly, the survey instrument used to collect the data utilized in the current study (Niles et al., 2020) was not specifically designed to analyze reasons for changes in SNAP participation over time. Future research should specifically explore the reasons why SNAP participation decreased among vulnerable populations, despite a significant increase in food insecurity.

5. Conclusion

Despite the increase in food insecurity rates among low-income households during the COVID-19 pandemic, commensurate increases in SNAP participation were not observed. The most vulnerable families in this sample of low-income households—specifically those with children, of non-Hispanic Black race, and with the lowest income—participated in SNAP at lower rates during the first four months of the pandemic than they did prior to the pandemic. The pandemic exposed weaknesses in SNAP, but also demonstrated the ability of policy makers to move quickly in emergency situations. Improvements made to the program over the past year and a half should be closely examined for their application to non-emergency situations and improved upon even more, so that the most vulnerable households can easily access the program in times of need.

CRedit authorship contribution statement

Punam Ohri-Vachaspati: Conceptualization, Data curation, Funding acquisition, Data analysis, Data interpretation, Manuscript writing. **Francesco Acciai:** Data curation, Funding acquisition, Data analysis, Data interpretation, Manuscript writing. **Robin S. DeWeese:** Data interpretation, Manuscript writing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix 1. – Multivariable logistic regression models predicting SNAP participation prior to and since the onset of the pandemic

Variables included in the model	Model 1 – Prior to the pandemic (n = 228)				Model 2 – Since the onset of the pandemic (n = 307)			
	Odds Ratio	p-value	CI – Low	CI – High	Odds Ratio	p-value	CI – Low	CI – High
Race (Ref: Non-Hispanic White)								
Hispanic	0.773	0.571	0.317	1.884	0.756	0.451	0.365	1.566
Non-Hispanic Black	1.198	0.651	0.547	2.625	0.493	0.038	0.252	0.963
Other/Multiple	0.827	0.751	0.255	2.679	0.423	0.116	0.144	1.236
Children in the household (Ref: No)								
Yes	2.637	0.012	1.233	5.641	1.456	0.225	0.794	2.672
Food pantry use (Ref: No)								
Yes	1.429	0.299	0.728	2.806	1.702	0.052	0.996	2.909
Income (Ref: \$35,000 – \$49,999)								
Less than \$14,999	10.919	0.000	4.219	28.260	3.020	0.002	1.489	6.125
\$15,000 to \$34,999	2.194	0.083	0.902	5.338	1.080	0.828	0.539	2.162
Food security (0–6)	1.222	0.047	1.003	1.488	1.056	0.531	0.891	1.250
Household size	1.183	0.110	0.963	1.452	1.051	0.545	0.896	1.232

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