SNAP and WIC Participation During Childhood and Food Security in Adulthood, 1984–2019

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See also Gundersen, p. 1370.

Objectives. To examine the effects of childhood participation in the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on adult food security in the United States.

Methods. We used data from the 1984 to 2019 waves of the Panel Study of Income Dynamics to follow a balanced panel of 1406 individuals from birth through ages 20 to 36 years. We measured food insecurity from 1999 to 2003 and 2015 to 2019 among those who resided in low-income households during childhood.

Results. Twenty-eight percent of individuals who resided in low-income households during childhood exhibited improved food security status from childhood to adulthood. Those who participated in SNAP and WIC during childhood had 4.16-fold higher odds (95% confidence interval [CI] = 1.91, 9.03) of being more food secure than those who were eligible for but did not receive SNAP or WIC, and those who participated in SNAP alone had 3.28-fold higher odds (95% CI = 1.56, 6.88).

Conclusions. Participation in social safety net programs such as SNAP and WIC during childhood helps to improve food security across the life course. Our findings add evidence regarding the long-term benefits of participation in SNAP and WIC during childhood. (*Am J Public Health*. 2022;112(10):1498–1506. https://doi.org/10.2105/AJPH.2022.306967)

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In 2019 in the United States, 13.7 million households (representing 10.5% of the population) experienced food insecurity, including 2.4 million households (6.5% of households) in which children experienced food insecurity.[1,2] In 2020, despite the overall level of food insecurity across US households remaining, similar to that of 2019, food insecurity among households with children increased to 14.8% (from 13.6% in 2019), and in 7.6% of households, children were food insecure.[3]

Childhood food insecurity is associated with numerous adverse outcomes including anxiety, depression, poorer diet quality, higher rates of diabetes and obesity, and lower academic performance.[4–8] The Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), 2 of the largest federal food assistance programs, aim to improve nutrition and food security among low-income people in the United States.[3,4] One in 9 US residents received SNAP benefits in 2019, and more than half of the children born each year receive WIC benefits.[9,10] Evidence suggests that SNAP and WIC participation improves food security at the time benefits are received.[5–12] However, the effect of program participation on longer-term food security status (FSS) is largely unknown.

Whether SNAP and WIC participation during childhood promotes food security later in life is a key area of inquiry given the programs' scale and the high prevalence of food insecurity among low-income US residents. This is especially salient now given that SNAP enrollment during the first year of the COVID-19 pandemic increased 23% relative to 2019.[11] Several federal and state policy changes to both SNAP and WIC, including temporary expansion of SNAP eligibility, raising of SNAP benefits, and increased flexibility to waive program requirements, likely mitigated

early indicators of worsening food insecurity related to the pandemic.[12] In a national survey of low-income households in March 2020, 44% reported experiencing food insecurity.[13–15] In the case of young children in particular, programs such as SNAP and WIC that ameliorate food insecurity could change their life course trajectories, although more longitudinal research on the effects of food insecurity during childhood is needed.

In this study, involving prospectively collected life course data from a large, nationally representative longitudinal survey in the United States, our primary aim was to quantify the impact of SNAP or WIC participation (or both) during childhood on adult food security outcomes among individuals who had ever resided in low-income households in childhood. We conducted our analysis at the individual level, assessing the relationship between participation in SNAP and WIC in childhood (ages 0–18 years) and FSS in adulthood once individuals had established their own households.

METHODS

We obtained data from the Panel Study of Income Dynamics (PSID), the world's longest-running nationally representative household panel survey.[16] The study began in 1968 and has followed the members of the original sample and their descendants since that time, first annually and then (since 1997) biennially. For our study, we used data from the PSID main interview as well as the Child Development Supplement, which, starting in 1997, collected additional information about a cohort of children 0 to 12 years old in 1997 with follow-up waves in 2002 and 2007. To construct the analytic sample, we created a balanced panel of individuals who had SNAP and family income information from their year of birth through the age of 18 years as well as WIC information from the PSID main interview or the Child Development Supplement.

We created a binary indicator for low income during childhood, coded as 1 if an individual was in a household whose income-to-needs ratio was less than or equal to 130% of the federal poverty level (the gross income threshold for SNAP) in any wave from ages 0 to 18 years. We limited the sample to individuals who were living independently as a reference person or spouse or partner in their own family unit in 2015, 2017, or 2019 (meaning that they had moved out of their parents' household and were economically independent) and who had resided in a low-income household during at least 1 time period during childhood (n = 1406).

Individuals who had not split off from their natal homes by 2019 were not included in the analytic sample because their FSS was that reported by their parents or guardians and they did not have the same detailed employment, race/ethnicity, or income information as their economically independent counterparts. Individuals still living in their natal homes were more likely to be in the youngest age category (20–26 years), to be male, and to have a high school education or less. The PSID is nationally representative of the US population when sample weights are applied.

The PSID and the Child Development Supplement collect in-depth information on demographic characteristics, income, and health status, following multiple generations of the same families over time. This enables analysis of firsthand, prospective reporting of income, SNAP and WIC participation, family composition, and social environment during childhood through adulthood.

We measured FSS using the US Department of Agriculture's 18-question Household Food Security Survey Module, which is scored to create a 4-category food security measure: high food security (score = 1), marginal food security (score = 2), low food security (score = 3), or very low food security (score = 4).[17] FSS was measured in 1999, 2001, 2003, 2015, 2017, and 2019.

Outcomes for our analyses were 2 binary measures capturing changes in FSS from childhood (1999–2003) to adulthood (2015–2019), the first indicating that FSS had improved (more secure) and the second indicating that FSS had worsened (less secure). Changes in food security were based on average food security scores for up to 3 childhood waves (1999–2003) and average scores for up to 3 adulthood waves (2015–2019). Average scores were then categorized back into a 4-category average FSS variable: high (average score of 1.0; high food security in all waves), marginal (average score of 1.33–2.33; marginal food security in at least 1 wave), low (average score of 2.5–3.33; multiple waves of marginal, low, or very low food security with at least 1 wave of low food security), or very low (average score of 3.5–4.0; multiple waves of low or very low food security with at least 1 wave of very low food security).

Individuals were defined as having become more secure if their average FSS improved from childhood to adulthood. Individuals were coded 1 if they were more secure and 0 if their FSS worsened or stayed the same. Conversely, individuals were defined as being less secure if their average FSS worsened from childhood to adulthood. In this case, individuals were coded 1 if they became less food secure and 0 if their FSS improved or stayed the same. As a robustness

check, we also created binary measures of improved and worsened FSS by selecting the minimum, maximum, and single wave values from childhood and adulthood; the resulting trends were the same (Appendix A, available as a supplement to the online version of this article at http://www.ajph.org).

Family SNAP participation during childhood was measured in all available waves from an individual's birth through the age of 18 years. Multiple questions were aggregated to define whether the child's family received SNAP benefits in the previous year, how many months they used SNAP in the previous year, and receipt in the preceding month.

In the Child Development Supplement, primary caregivers were asked whether the target child received WIC benefits in the primary caregiver–child portion of the 1997 interview. Primary caregivers were asked whether they received benefits when pregnant with that child, as well as after the child was born. Because WIC benefits are available to eligible children 0 to 5 years old, we used information from the PSID main interview for 1999 to 2003 (at which point all children in the analytic sample were at least 5 years old) to capture additional WIC receipt for children who were younger than 5 years after 1997. We then created a binary indicator of whether these children received WIC benefits at any point when they were 0 to 5 years old. The key independent variable for the analyses was a 4-category variable that captured whether individuals received the following during childhood: (1) no SNAP or WIC benefits, (2) SNAP alone, (3) WIC alone, or (4) both SNAP and WIC.

Covariates included individual- and family-level measures taken from 2015 to 2019. Individual-level measures included age (20–26, 27–31, 32–36 years), sex (male, female), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, other), marital status (married, never married, divorced/separated/widowed), educational attainment (less than high school, high school or equivalent, some college, college degree or greater), employment (employed, unemployed, out of the labor force, nonworking student), and time since "launch" (the number of waves since individuals had split off from their parental family units). Family-level covariates included log of total family income, region of residence (Northeast, South, Midwest, West), metropolitan or nonmetropolitan status, and family unit size.

We used PSID-provided individual longitudinal survey weights in all of our analyses, which allowed us to generate nationally representative estimates and account for sample attrition, clustering, and strata. Initially, we generated weighted cross tabulations to examine participation in SNAP and WIC during childhood and transitions between food insecurity status in childhood and adulthood. Because of the potential for bidirectional associations, we tested whether receipt of SNAP or WIC was associated with higher odds of improved or worsened food security in adulthood. To do so, we estimated 2 logit models in which the outcome was the change in FSS (improved or worsened) from childhood to adulthood after adjustment for each of our individual- and family-level covariates.

As a robustness check, we also estimated multinomial logistic models adjusted for our covariates with a 4-category outcome variable in which 1 represented more secure, 2 represented less secure, 3 represented always high food security, and 4 represented always food insecurity (marginal, low, very low; see Appendix B, available as a supplement to the online version of this article at http://www.ajph.org).

Analyses were conducted in 2020–2021 with Stata version 15 (StataCorp LLC, College Station, TX); all tests were 2 sided, and significance was set at $P < .05$. Survey weights and original sampling strata and clusters were applied to all analyses with *svyset* commands, and postestimation *margins* commands were used to generate predicted probabilities of improved or worsened FSS.

RESULTS

Characteristics of the study sample are described in Table 1, overall and by adult FSS; in the context of this table, food insecure is defined as having low or very low food security from 2015 to 2019. Nearly 47% of the sample received SNAP and WIC during childhood, with an additional 32% receiving SNAP alone and 5% receiving WIC alone. Individuals who experienced food insecurity in adulthood were significantly more likely to have received SNAP at some point during childhood. Individuals who experienced food insecurity in adulthood were also significantly more likely to have lower incomes and to be less educated, unmarried, and unemployed ($P < .01$).

According to weighted transitions between average FSS from childhood (1999–2003) to adulthood (2015–2019), 24.4% of the sample reported high food security at every time point. Of the total sample, 28% saw improved FSS from childhood to adulthood, whereas 32.6% had worsened FSS (Appendix C, Table C1, available as a supplement to the online version of this article at http://www.ajph.org).

Figure 1 shows the weighted distributions of SNAP receipt during different

TABLE 1— Characteristics of the Study Sample, Overall and by Adult Food Security Status: Panel Study of Income Dynamics, United States, 1984–2019

	Overall (n = 1406), % (95% CI) or Mean ±SE	Food Secure[a] (n = 866), % (95% CI) or Mean ±SE	Food Insecure[a] (n = 540), % (95% CI) or Mean ±SE	*P*[b]
Total	100	65	35	
SNAP and WIC benefits in childhood				< .01
None	16.5 (13.3, 20.4)	21.3 (16.8, 26.6)	7.7 (4.6, 12.5)	
SNAP alone	31.8 (27.4, 36.7)	31.1 (25.9, 36.8)	33.2 (27.0, 40.1)	
WIC alone	4.9 (3.1, 7.7)	5.54 (2.94, 10.2)	3.65 (1.9, 6.83)	
SNAP and WIC	46.8 (41.0, 52.7)	42.1 (35.3, 49.2)	55.5 (47.7, 62.9)	
SNAP benefits in childhood	78.6 (74.7, 82.0)	73.2 (67.4, 78.2)	88.7 (84.1, 92.1)	< .01
WIC benefits in childhood	51.6 (46.1, 57.2)	47.6 (41.1,54.3)	59.1 (51.3, 66.5)	.01
Income, $	57 310 ±2029	67 725 ±2942	37 965 ±1858	< .01
Sex				.09
Male	48.5 (43.8, 53.2)	51.3 (45.6, 57)	43.2 (35.7, 51)	
Female	51.5 (46.8, 56.2)	48.7 (49, 64.3)	56.8 (43, 54.4)	
Age, y				< .01
20–26	27.9 (24.3, 31.9)	22.0 (18.0, 26.5)	39.0 (31.3, 47.3)	
27–31	36.3 (32.5, 40.3)	38.7 (33.2, 44.5)	31.9 (26.6, 37.7)	
32–36	35.8 (32.3, 39.4)	39.3 (34.5, 44.4)	29.1 (23.1, 36.0)	
Waves since launch[c]	3.0 ±0.08	3.0 ±0.10	3.0 ±0.15	.85
Race/ethnicity				.24
Non-Hispanic White	50.8 (43.5, 58.1)	51.9 (43.7, 60.0)	48.7 (38.7, 58.8)	
Non-Hispanic Black	25.1 (19.0, 32.4)	22.5 (16.2, 30.4)	29.9 (20.8, 40.9)	
Hispanic	20.0 (15.0, 26.2)	22.0 (17.1, 27.9)	16.2 (9.4, 26.6)	
Other	4.1 (2.4, 6.9)	3.6 (1.8, 7.1)	5.1 (2.6, 9.8)	
Family size	2.46 ±0.06	2.50 ±0.07	2.37 ±0.08	.23
No. of children	0.88 ±0.05	0.88 ±0.07	0.89 ±0.07	.11
No. of adults	1.58 ±0.02	1.63 ±0.02	1.48 ±0.04	< .01
Education				< .01
< high school	10.5 (8.4, 13.2)	7.2 (5.1, 10.1)	16.7 (12.7, 21.6)	
High school or equivalent	38.0 (33.6, 42.6)	34.5 (29.4, 40.1)	44.5 (37.8, 51.4)	
Some college	31.7 (27.2, 36.6)	31.9 (26.3, 38.0)	31.4 (25.4, 38.1)	
≥ college	19.7 (16, 24.2)	26.4 (20.8, 32.8)	7.4 (4.5, 11.8)	
Employment status				< .01
Employed	76.2 (72.4, 79.5)	79.8 (75.9, 83.3)	69.3 (62.9, 75.1)	
Unemployed	12.9 (10.1, 16.3)	10.0 (7.16, 13.9)	18.2 (12.5, 25.6)	
Out of labor force	8.7 (6.9, 10.9)	7.1 (5.0, 10.0)	11.6 (8.6, 15.5)	
Student	2.3 (1.5, 3.7)	3.07 (1.9, 5.0)	0.9 (0.3, 3.1)	
Urbanicity				.46
Metropolitan	79.4 (75.1, 83.1)	78.3 (72.5, 83.1)	81.4 (74.3, 86.9)	
Nonmetropolitan	20.6 (16.9, 24.9)	21.7 (16.9, 27.5)	18.6 (13.1, 25.7)	
Region				.88
Northeast	11.2 (6.54, 18.6)	11.5 (6.4, 19.9)	10.6 (5.82, 18.7)	
Central	25.5 (20.4, 31.4)	24.8 (18.9, 31.7)	26.9 (18.6, 37.2)	
South	40.5 (34.2, 47.1)	41.5 (34.7, 48.7)	38.6 (30.7, 47.1)	
West	22.8 (16.9, 30)	22.2 (15.9, 30.1)	23.9 (15, 35.7)	

Continued

TABLE 1— Continued

	Overall (n = 1406), % (95% CI) or Mean ±SE	Food Secure[a] (n = 866), % (95% CI) or Mean ±SE	Food Insecure[a] (n = 540), % (95% CI) or Mean ±SE	*P*[b]
Marital status				< .01
Married	47.2 (43.3, 51.1)	53.4 (48. 8,58.0)	35.7 (28.8, 43.3)	
Never married	46 (42.2, 50.0)	40.8 (36.2, 45.6)	55.8 (48.9, 62.5)	
Divorced or widowed	6.75 (5.0, 9.2)	5.81 (3.7, 8.9)	8.5 (5.0, 14.0)	

Note. CI = confidence interval; SNAP = Supplemental Nutrition Assistance Program; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Data are weighted.

[a]Food secure refers to high or marginal food security status in adulthood; food insecure refers to low or very low food security status in adulthood.
[b]Based on χ^2 test.
[c]Number of waves since individuals split off from their parental family units.

stages of childhood and WIC receipt from ages 0 to 5 years among individuals who received SNAP during childhood (n = 1180). The combination of SNAP and WIC in early childhood (ages 0–5 years) was common, showing the potential for a synergistic relationship between the 2 programs. Among those who received SNAP in childhood, 45.6% did so at ages 0–5 years, 6–11 years, and 12–18 years, and 30.6% of them also received WIC benefits. To be included in this category, these individuals were required to have lived in households that received SNAP benefits during at least 3 years in childhood, at least 2 of which had to be nonconsecutive. This indicates that SNAP receipt is less often a 1-time experience for low-income families and more often a safety net for those in need over time.

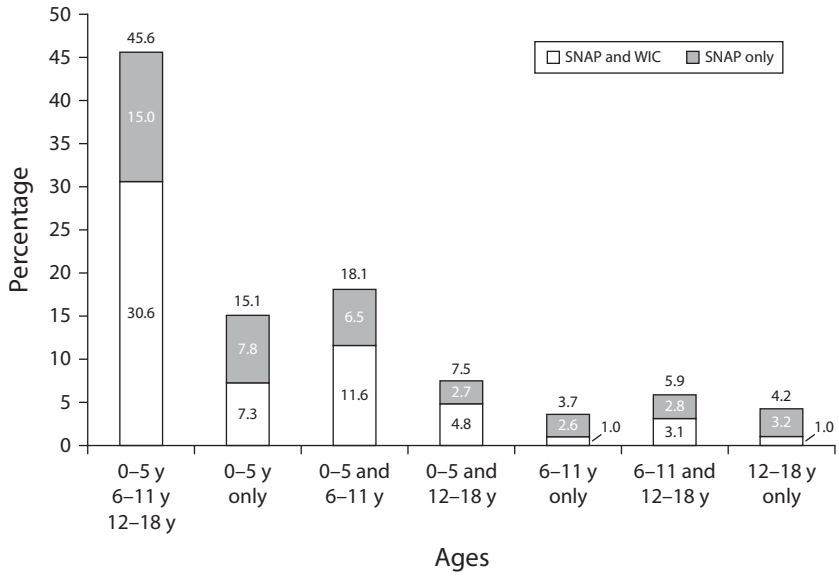

FIGURE 1— SNAP and WIC Participation Among Individuals Who Received SNAP in Childhood: Panel Study of Income Dynamics, United States, 1984–2019

Note. Supplemental Nutrition Assistance Program (SNAP) participation during different stages of childhood among children who received SNAP at any point during childhood. Participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) occurs only during ages 0 to 5 years. Interpretation of the percentages in the figure is as follows: 15.1% of all children who ever received SNAP benefits received them only when they were 0 to 5 years old, and 7.3% of all children who received SNAP benefits during childhood received SNAP benefits when they were 0 to 5 years old and also received WIC benefits. The weighted sample size was 1180.

A total of 15.1% of children received SNAP benefits only when they were 0 to 5 years old, and 7.3% received both SNAP and WIC benefits from ages 0 to 5 years. Some children received WIC alone between ages 0 and 5 years and subsequently participated in SNAP in middle and late childhood; however, the proportion of children who received SNAP benefits in later stages of childhood was much lower if they did not also receive benefits at ages 0 to 5 years.

Table 2 presents associations of SNAP or WIC participation during childhood with becoming more food secure (model 1) or less food secure (model 2) 16 to 20 years later. Children who received both SNAP and WIC benefits had 4.16-fold higher odds (95% confidence interval [CI] = 1.91, 9.03) of improved FSS in adulthood than those who did not receive either. Receipt of SNAP alone in childhood was associated with 3.28-fold higher odds (95% CI = 1.56, 6.88) of improved FSS in adulthood. None of the combinations

of SNAP and WIC receipt were associated with higher odds of worsened food security. Full model results are available in Appendix A, Table A3 (available as a supplement to the online version of this article at http://www.ajph.org).

Table 3 shows the predicted probabilities of becoming more or less food secure in adulthood on the basis of SNAP or WIC participation during childhood (as compared with not participating in either program). The predicted probability of being more food secure in adulthood was 33.9% for childhood SNAP and WIC recipients, as compared with 12.0% for those who did not receive either SNAP or WIC benefits (21.9% difference; $P < .001$). Receipt of SNAP alone was associated with a 29.2% predicted probability of being more food secure relative to nonreceipt of SNAP or WIC (17.2% difference; $P = .001$). These results were generally consistent with (and predicted probabilities were nearly identical to) those from the multinomial logistic modeling approach used as a robustness check (Appendix B, Tables B2 and B3, available as a supplement to the online version of this article at http://www.ajph.org).

DISCUSSION

In this nationally representative, longitudinal study of the long-term effects of SNAP and WIC participation during childhood on adult FSS, we found that among individuals who resided in low-income households during childhood, receipt of SNAP alone and receipt of both SNAP and WIC were associated with significantly higher odds of improved FSS in adulthood. Furthermore, the predicted probabilities of becoming more food secure as an adult were 4 times higher in magnitude among those who received both SNAP and WIC and 3 times higher among those who received SNAP alone than among those who did not receive either during childhood. Participation in WIC alone did not result in improved food security, but participation in both SNAP and WIC had an overall positive effect on FSS that was greater than that of participation in either program in isolation.

Although WIC is a widely used public safety net program, participation is limited to pregnant women and children younger than 5 years. WIC benefits are not intended to provide food for entire families, but when participants are also enrolled in SNAP the effects of the 2 programs may be synergistic.

Our findings uniquely add to the literature regarding the ways in which SNAP and WIC help participating families not only at the time of receipt but over the life course and across generations. Through the use of nationally representative, prospectively collected longitudinal data on income and federal food assistance program participation over 35 years, our study contributes new evidence regarding the long-term impact of SNAP and WIC participation on mitigating current and future food insecurity.

The mechanism by which SNAP and WIC receipt would have a positive impact on FSS over the long term was not explored in this study and is an important subject for future research. SNAP and WIC benefits offset food costs for participating families and may allow them to allocate those resources to other household needs that would contribute to positive trajectories for children, thereby affecting their long-term outcomes including future FSS. Possible mechanisms include being able to afford rent and having more stable housing, investing in educational activities, and having the ability to afford

TABLE 2— SNAP and WIC Participation in Childhood and Food Security Outcomes: Panel Study of Income Dynamics, United States, 1984–2019

	OR (95% CI)
Fully adjusted model: more secure (vs less secure or no change)	
SNAP alone	3.28 (1.56, 6.88)
WIC alone	1.87 (0.44, 7.92)
Both SNAP and WIC	4.16 (1.91, 9.03)
Fully adjusted model: less secure (vs more secure or no change)	
SNAP alone	1.38 (0.78, 2.46)
WIC alone	1.43 (0.73, 2.81)
Both SNAP and WIC	1.10 (0.60, 2.04)

Note. CI = confidence interval; OR = odds ratio; SNAP = Supplemental Nutrition Assistance Program; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Logistic models adjusted for age, sex, race, marital status, educational attainment, employment status, time since launch, log of total family income, family unit size, region of residence, and metropolitan/nonmetropolitan status. The more secure outcome was coded as 1 if individuals became more secure (e.g., low food security in childhood and moderate food security in adulthood) and 0 if they became less secure or their food security status stayed the same. The less secure outcome was coded as 1 if individuals became less secure (e.g., high food security in childhood and moderate food security in adulthood) and 0 if they became more secure or their food security status stayed the same. The weighted sample size was 1406.

TABLE 3— SNAP and WIC Participation During Childhood and Food Insecurity Changes: United States, Panel Study of Income Dynamics, 1999–2019

	Predicted Probability, % (Difference)	*P*
Model 1: more secure (vs less secure or no change)		
Neither SNAP nor WIC	12.0 (Ref)	
SNAP alone	29.2 (17.2)	.001
WIC alone	19.7 (7.7)	.43
Both SNAP and WIC	33.9 (21.9)	< .001
Model 2: less secure (vs more secure or no change)		
Neither SNAP nor WIC	29.3 (Ref)	
SNAP alone	35.7 (6.4)	.25
WIC alone	36.4 (7.1)	.3
Both SNAP and WIC	31.3 (2.0)	.73

Note. SNAP = Supplemental Nutrition Assistance Program; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children. Postestimation margins from logistic models were adjusted for age, sex, race, marital status, educational attainment, employment status, time since launch, log of total family income, family unit size, region of residence, and metropolitan/nonmetropolitan status. The more secure outcome was coded as 1 if individuals became more secure (e.g., low food security in childhood and moderate food security in adulthood) and 0 if they became less secure or their food security status stayed the same. The less secure outcome was coded as 1 if individuals became less secure (e.g., high food security in childhood and moderate food security in adulthood) and 0 if they became more secure or their food security status stayed the same. The weighted sample size was 1406.

medical care or medications.[18–20] SNAP participants differed from their nonparticipating but eligible counterparts (e.g., participants tended to be younger and less educated), so the positive effects of SNAP and of SNAP and WIC in combination in this study may indicate that benefits are especially helpful in terms of not only purchasing food but providing financial stability, which has a positive influence on longer-term food security trajectories.[21–23]

The protective effects of SNAP and the combination of SNAP and WIC are especially important now given the role of social safety net programs in mitigating food insecurity during the COVID-19 pandemic.[24] Despite early signs of record high levels of food insecurity, year-end estimates showed that food insecurity levels in 2020 were on par with levels in 2019.[3,13] However, disparities in food insecurity rates persist, particularly among households with children.[3] Lack of access to in-person school and the economic fallout of the pandemic have been especially difficult for families with children, and although SNAP benefits and participation have increased, many families have not been able to access benefits.[11]

Although temporary increases in SNAP benefits and administrative waivers that make it easier to enroll and maintain benefits have been critical during the pandemic, many of these changes are temporary.[25] Many families experienced food insecurity for the first time as a result of the adverse economic shocks brought on by the COVID-19 pandemic, and these families may be less likely to access benefits because they do not know that public benefits are available, know that they are eligible, or know how to apply.[26–28]

In addition, although SNAP benefits are helpful, they have often been insufficient to ensure a household's ability to purchase enough nutritious food to last throughout the month.[29] This may change in response to the recent revisions of the Thrifty Food Plan, which increased benefits by an average of 27% above prepandemic levels.[30,31] Future research is needed to examine the effects of this benefit increase on food insecurity. WIC has also increased benefit allocations for fruits and vegetables during the pandemic in accordance with the American Rescue Plan Act of 2021, which could have a positive impact as well on both food security and diet quality among participating children.[31,32]

Our findings indicate that there could be long-term consequences for today's children if current levels of food insecurity are not addressed. Participation in public safety net programs such as SNAP and WIC during childhood is key in helping families experiencing food insecurity put food on the table. SNAP has expanded rapidly during the pandemic, but more needs to be done to ensure that people who need SNAP benefits receive them and that benefits are sufficient to allow participants to purchase food consistent with a healthy diet.[33]

Strengths and Limitations

Strengths of this study include the use of a nationally representative longitudinal panel survey with detailed income and SNAP participation data. These data are prospectively collected throughout all sample individuals' lives and provide consistent information on their environment from birth to present day. The genealogical design of the PSID provides

unparalleled information for life course research because children of sample members are followed once they leave their natal homes. This allows researchers to assume appropriate temporal order, minimize recall bias with prospective survey methods, and collect in-depth, self-reported information once individuals become householders themselves.

Several limitations of our study should also be considered. First, the initial measurement of food insecurity in the PSID occurred in 1999, and although we used all waves in which information was collected, FSS data were not collected from 2005 to 2013. Second, because of the biennial nature of PSID data collection after 1997, creating a continuous measure of SNAP participation at each age during childhood was not possible. Instead, a binary indicator of childhood SNAP receipt was included.

Third, because WIC benefits were measured at the child level and not at the household level, it is possible that household receipt of WIC was undercounted if siblings or other household members received WIC benefits. If so, this may have muted the potential effect of WIC benefit receipt during childhood on future FSS. Fourth, as a result of small cell sizes, binary measures of improved or worsened FSS did not differentiate the magnitude of FSS changes, which is an important area for future research. However, the majority of transitions in our study were within a single FSS level (e.g., marginal to high or marginal to low); dramatic transitions (e.g., from very low to high) were rare, mitigating some of this concern.

Finally, the present results may not be generalizable to children experiencing food insecurity today, as our sample comprised children at a period during which the economic environment, as well as SNAP and WIC benefits, differed in key respects to the present day. The COVID-19 pandemic has created a particularly perilous economic situation for many low-income families, and SNAP and WIC benefits have undergone several key policy changes since 1984, when the oldest member of the analytic sample was born. These changes include program restrictions as a result of budget cuts in the early 1980s, increased access and decreased stigma from development of the Electronic Benefits Transfer between 1988 and 2004, increased benefits during the Great Recession via the 2009 American Recovery and Investment Act, and the recent revisions of the Thrifty Food Plan.[34,35] More longitudinal research with contemporary cohorts is needed to examine the short- and long-term effects of SNAP and WIC participation on food security.

Public Health Implications

Our findings indicate that SNAP and WIC participation during childhood led to improved FSS in adulthood among individuals from low-income households eligible to participate in those programs. Although SNAP and WIC benefits may be increasing, they affect only families that are enrolled. Policies are needed to improve program access, minimize barriers to enrollment, and ensure adequacy of benefits so that today's children at risk for food insecurity can benefit from these important programs now and in the future. AJPH

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CONFLICTS OF INTEREST

The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in this article.

HUMAN PARTICIPANT PROTECTION

No protocol approval was needed for this study because secondary data were used.

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