A Summer Nutrition Benefit Pilot Program and Low-income Children's Food Security

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abstract

BACKGROUND: Federal summer meals programs serve less than one-sixth of children that receive free or reduced-price meals during the school year. To address this gap in food assistance for school-aged children, the Summer Electronic Benefits Transfer for Children (SEBTC) Demonstrations provided summer food assistance in the form of electronic benefits transfer cards to households with school-aged children certified for free or reduced-price meals during the school year.

METHODS: Over 2011–2013, the SEBTC demonstrations were evaluated by using a random assignment design. Households were randomly assigned a monthly $60-per-child benefit, a monthly $30-per-child benefit, or no benefit, depending on the study year. Key outcomes included children's food security and consumption of foods and food groups related to a healthful diet (diet quality). At baseline (in the spring) and again in the summer, the evaluation surveyed ~52 000 households over the course of the 3 years of the impact study.

RESULTS: SEBTC reduced the prevalence of very low food security among children by one-third. It also had positive impacts on 6 of the 8 child nutrition outcomes measured (amounts of fruits and vegetables; whole grains; dairy foods; and added sugars).

CONCLUSIONS: SEBTC is a promising model to improve food security and the dietary quality of low-income school-aged children in the summer months.

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Ms Collins was the project director for most of the study period, helped design the study, was the principal author of all of the impact study reports, and drafted the initial manuscript; Mr Klerman helped design the study, directed the impact analyses, and helped revise the initial manuscript; Dr Briefel served as a co-principal investigator for the evaluation, directed the analysis on nutrition outcomes, reviewed and revised the manuscript; Ms Rowe directed the data collection and analysis of the implementation study and reviewed and revised the manuscript; Dr Gordon directed data collection and analysis of administrative costs, contributed to the implementation study, and reviewed and commented on early drafts; Mr Logan served as a leader of the benefit redemption analysis for the evaluation, reviewed and revised the manuscript; Dr Wolf led the analysis for the impact study and reviewed the manuscript; Dr Bell served as a co-principal investigator for the evaluation, reviewed and revised the manuscript; and all authors approved the final manuscript as submitted.

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WHAT'S KNOWN ON THIS SUBJECT: Low-income, school-aged children may lack access to adequate food during the summer, when they do not receive subsidized school meals. Only ~15% of children who receive free or reduced-price meals during the school year receive federally supported summer meal assistance.

WHAT THIS STUDY ADDS: In 16 US communities, the evaluation rigorously assessed the impacts of summer food assistance for low-income school-aged children. The benefit reduced children's very low food security by one-third and increased the consumption of fruits, vegetables, and whole grains.

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TABLE 1 Overview of the SEBTC Demonstrations by Year

Year and Monthly Benefit Amount Issued[a]	No. Grantees and Sites in the Evaluation	SEBTC Model	Approximate No. Children and Households Issued SEBTC Benefits	Approximate No. Households in the Impact Evaluation
2011: $60, $0	5 grantees (Connecticut, Michigan, Missouri, Oregon, and Texas) operating 5 sites	3, SNAP model 2, WIC model	12 500 children 7000 households	9700 households
2012: $60, $0	10 grantees (Cherokee Nation, Chickasaw Nation, Connecticut, Delaware, Michigan, Missouri, Nevada, Oregon, Texas, and Washington) operating 14 sites	8, SNAP model 6, WIC model	67 000 children 37 000 households	4200 households
2013: $30, $60	4 grantees (Chickasaw Nation, Delaware, Michigan, and Oregon) operating 6 sites	2, SNAP model 4, WIC model	100 000 children 51 000 households	23 000 households

Adapted from Collins AM, Briefel RR, Klerman JA, et al. Summer Electronic Benefits Transfer for Children (SEBTC) Demonstration: Summary Report. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service; 2016.

[a] The 2014 evaluation year included an implementation and process study but not an impact study.

To help meet the nutritional needs in the summer of low-income, school-aged children who are eligible to receive school-based free or reduced-price meals during the school year, the US Department of Agriculture (USDA) provides free meals and snacks through the Summer Food Service Program.[1] However, these summer meals programs serve less than one-sixth as many children as receive the free or reduced-price meals during the school year (estimate for 2013).[2]

In 2016, 9% of all American children were living in food-insecure households.[3] Food insecurity, defined as access to adequate food limited by a lack of money or other resources, is highly correlated with adverse health effects through the entire life cycle, from infancy through adulthood.[4–6] In a summary of research by the American Academy of Pediatrics, it was concluded that "children who live in households that are food insecure, even at the lowest levels, are likely to be sick more often, recover from illness more slowly, and be hospitalized more frequently."[6]

Research is limited on differences in food security among low-income households with school-aged children in months when school is not in session. The authors of 1 analysis of data from the 1995–2001 Current Population Survey suggest that food insecurity was higher in the summer in states that provided fewer Summer Food Service Program meals and summer school lunches.[7] The authors of another study, using data from the Survey of Income and Program Participation, concluded that households with free or reduced-price meal recipients were more likely to experience food insecurity in the summer months than during the school year.[8]

To address concern about school-aged children's food security and nutritional status when school is out of session, the 2010 Agriculture Appropriations Act (Public Law Number 111-80) authorized and provided funding for the USDA to implement and rigorously evaluate the Summer Electronic Benefits Transfer for Children (SEBTC) Demonstrations. The USDA in turn awarded grants to 10 states or tribal American Indian organizations. Across the summers of 2011–2013, these grantees delivered the benefits to a total of 16 sites, using electronic benefits transfer cards. Sites varied widely in terms of geographic size, urbanicity, and the participating population's racial and ethnic composition. The number of participating grantees and sites varied from year to year, as did other implementation details (see Table 1; for additional information, see Collins et al[9]).

Grantees chose to distribute benefits using the electronic benefit transfer system and the associated program rules for either the Supplemental Nutrition Assistance Program (SNAP) or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). For grantees choosing the SEBTC-SNAP model, benefits could be used for almost any food. For grantees choosing the SEBTC-WIC model, the benefits package was based on foods in existing WIC food packages, chosen by the USDA to meet the nutritional needs of school-aged children. Benefits were loaded onto electronic benefits transfer cards that functioned much like debit cards. The USDA allowed grantees to choose which model to use before issuing an evaluation contract.

METHODS

Evaluation Design

To provide the most credible and rigorous estimates of the impact of the demonstrations, we used a random assignment design for the evaluation's impact analysis (registered at ClinicalTrials.gov: NCT02877147). In the spring of each year, participating School Food Authorities at each site constructed lists of households with eligible children (ie, certified for free or reduced-price meals) and obtained household consent. Using those lists, the evaluation team randomly assigned eligible households (using the SAS SURVEYSELECT procedure [SAS Institute, Inc, Cary, NC]). In 2011 and 2013, almost all households randomly assigned were selected

TABLE 2 Sample Sizes and Sample Loss: Household Sample, Summers of 2011, 2012, and 2013 (for Analyses of Food Security and Program Participation)

	$60 Benefit Group	$30 Benefit Group	$0 Benefit Group
Allocation, *N* = 123 820	41 518	11 423	70 879
Pool for random selection, *N* = 120 555	41 012	11 423	68 120
Ineligibles excluded	506, school district with no phone	0	888, school district with no phone 1871, households in 2013
Random selection of evaluation sample, *N* = 65 140	32 885	11 423	20 832
Follow-up (completed summer interview), *N* = 46 783	23 976	9 822	12 985
Lost to follow-up	8909 did not complete summer interview (eg, poor contact information, moved, refusal)	1601 did not complete summer interview (eg, poor contact information, moved, refusal)	7847 did not complete summer interview (eg, poor contact information, moved, refusal)
Analysis, *N* = 44 377	22 757	8703	12 917
Excluded from analysis	1097, second year in evaluation 122 missing child panel analysis weight	1119, second year in evaluation 0 missing child panel analysis weight	0, second year in evaluation 68 missing child panel analysis weight

for the evaluation sample. In 2012, in most of the participating sites, more households were assigned SEBTC benefits than required for the evaluation. Consequently, a random sample was selected for the evaluation. Sites and households had no involvement in randomization procedures. Blinding was not possible.

In 2011 and 2012, households were randomly assigned to either a $60-per-eligible-child monthly benefit group or a no-benefit group. In 2013, households were randomly assigned to either a $60- or a $30-per-eligible-child monthly benefit group. Benefits were issued for the summer period when school was not in session and prorated for partial months.

The sample size needed for the evaluation subsample in 2012 (n = 27 000) was calculated before the study began, on the basis of the size needed to estimate an impact of 5 percentage points on the study's confirmatory outcome at a 95% level of confidence with 80% power. Given the 2012 results, the evaluation sample size in 2013 (n = 18 000) was calculated to detect a difference between the 2 benefit amounts, assuming a constant per-dollar impact.

Table 2 shows the overall allocation of participants and analysis sample sizes for the food security samples pooled across years. (The Supplemental Information depicts both the food security and nutrition samples for each year.) Exact analysis sample sizes vary by analytic outcome (see the results tables), but sample sizes are large; for most analyses, sizes are well over 30 000.

There were a few known crossovers in 2012 and 2013 (for example <50 households in 2013); which occurred when a grantee mistakenly issued summer benefits to families in the incorrect group. Grantees received no reports of benefit sharing.

The study design was reviewed and approved by the institutional review board of Abt Associates. The parts of the study taking place in Washington and Michigan were reviewed and approved by the Washington State Institutional Review Board and the Michigan Department of Community Health Institutional Review Board, respectively. The full study protocol is available on the USDA Food and Nutrition Service Web site.[9–12]

Data Collection

The evaluation's data collection team surveyed households in the spring (before the school year ended) and again in the summer. The spring and summer surveys were administered by computer-assisted telephone interview. Households not reached by telephone were assigned to field staff for locating; respondents who were located and agreed to answer the survey were connected to the phone center.

Outcome Measures

Given the importance of food security for children's health and development, the primary and confirmatory outcome selected by the USDA for the evaluation was the prevalence of very low food security among children (VLFS-C), the most severe form of food insecurity (see Table 3). VLFS-C occurs when the food intake of any child in the household is reduced and normal eating patterns are disrupted because the household lacks money and other resources for food.

To measure this outcome, the USDA's 18-item US Household Food Security Survey Module with a 30-day reference period was used in the evaluation. The measure reflects the food security status of adults and children in the household. It has been used widely since the 1990s to assess and monitor food security in large-scale population studies and is included as an annual supplement to the Current Population Survey.[13,14]

Among other exploratory items, we also measured the prevalence of food insecurity among children (FI-C). This occurs when any child in the

TABLE 3 Definitions Used in the SEBTC Evaluation

Term	Definition
Food security	Access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum the following: (1) the ready availability of nutritionally adequate and safe foods; and (2) assured ability to acquire acceptable foods in socially acceptable ways (ie, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies).
FI	Either very low food security (VLFS) or low food security
Low food security	Households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns were not substantially disrupted.
VLFS	At times during the year, eating patterns of 1 or more household members were disrupted, and food intake reduced because the household lacked money and other resources for food.

Adapted from US Department of Agriculture. Definitions of Food Security. Washington, DC: US Department of Agriculture Economic Research Service; 2017. FI, food insecurity; VLFS, very low food security.

household experiences either VLFS-C or the less severe low food security among children. We also measured food consumption for a focal child developed by the National Cancer Institute for the 2009–2010 NHANES Multifactor Diet Screener[15,16] to assess the intake of specific dietary factors associated with the 2010 *Dietary Guidelines for Americans*. One SEBTC-eligible child per household was randomly selected to be the focus of the food consumption questions, with the household's respondent reporting that child's consumption of specific items in the last 30 days. Scoring procedures developed by the National Cancer Institute were used to convert the reports into estimated amounts of specific foods and nutrients.[17]

Statistical Methods

Building on the random assignment design, impact estimates were computed from weighted linear regressions estimated on pooled 2011–2013 data, by using an intention-to-treat analysis. These estimates allow the determination of whether outcomes differed monthly by per-child benefit level ($0 versus $60 and $30 versus $60).

Analysis weights, developed for each site and each year, were adjusted for the sample design and differential survey nonresponse. Across years and sites, the weights were rescaled such that the sum of the weights equaled the number of completed interviews in the specific year in a specific site.

Simple comparisons of treatment and control group means would be unbiased and consistent; regression-based estimates in general are more precise. For both continuous outcomes and binary outcomes, estimates were computed by using weighted least squares. SEs were robust, accounting both for non-normal residuals induced by the analysis of binary outcomes and the complex nested sample structure (children within households within school food authorities within sites). The number of households in each treatment group used in each analysis is shown in the relevant figures and tables. All results reported in the article were considered statistically significant if they met the $P < .05$ threshold.

Sample Characteristics

Table 4 provides information on household characteristics at baseline (when participants entered the study), pooled across the 3 years. (Supplemental Tables 6 through 11 report equivalent information for individual years.) Generally, participating households reported lower incomes than households nationally with children receiving free or reduced-price meals in 2013.[9]

RESULTS

SEBTC Benefit Use

Across 2011, 2012, and 2013, 90% of the households that were issued a $60 monthly per-child SEBTC benefit amount participated (ie, used those benefits at least once) (Supplemental Tables 12 and 13). For all households assigned benefits, the mean percentage of benefits redeemed was 77%; among households that used any benefits, the redemption rate was 86%. Usage rates were slightly lower for the $30 group, compared with the $60 group; participation rates were 1.3% points lower and redemption was 2.0% points lower ($P < .001$).

In both the $30 and $60 groups, households issued the WIC-model benefit redeemed less than those issued the SNAP-model benefit. For instance, including those who redeemed no benefit, among the $60 group, households in the WIC-model sites redeemed 61% of the summer benefit compared with the 93% redemption rate among households in in SNAP-model sites. This pattern is consistent with the general pattern of lower redemptions of regular WIC benefits compared with SNAP benefits, which may be due to limitation of the foods that can be redeemed under WIC compared with the allowable SNAP foods.[18–21]

Impacts on Children's Food Security

Impacts of a $60 SEBTC Monthly Benefit Compared With No Benefit

Relative to no benefit, a $60 SEBTC monthly per-child benefit decreased the prevalence of VLFS-C during the summer by one-third ($P < .01$). Without SEBTC, 9.1% of households in the evaluation experienced VLFS-C; in contrast, with a $60 SEBTC benefit, 6.1% of households experienced VLFS-C (Fig 1).

SEBTC also reduced the prevalence of FI-C by nearly one-fifth ($P < .01$; Fig 1). Without SEBTC, 43.0% of households reported children with food insecurity; with a $60-per-child

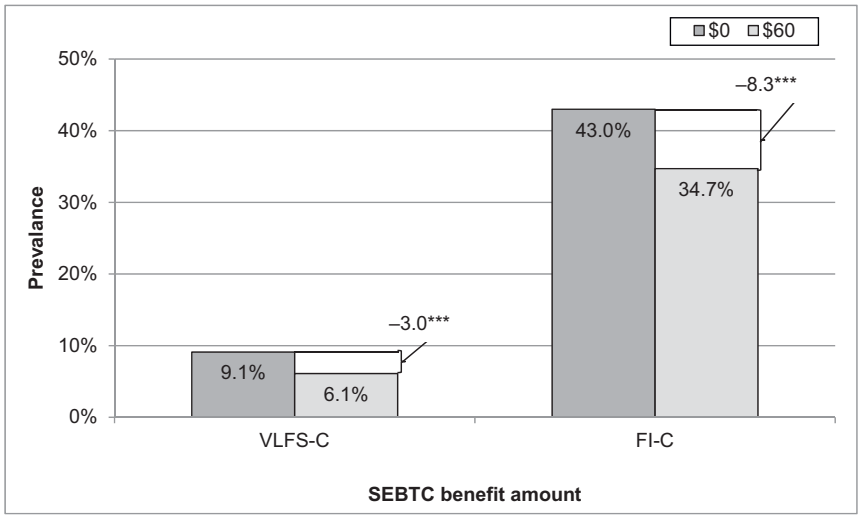

FIGURE 1
Children's Food Security Level. Estimated impact on VLFS-C and FI-C: SEBTC benefit, $0 vs $60. Data were pulled from the regression model estimated on the basis of pooled SEBTC Summer Survey data from 2011, 2012, and 2013. Households were randomly assigned to either the $60-per-child monthly benefit group (n = 24 876) or the no-benefit group (n = 14 855) in 2011 and 2012. * .05 < P < .10; ** .01 < P < .05; *** P < .01.

monthly benefit, the rate dropped to 34.7% of households.[11]

These estimated impacts are roughly consistent with Mabli and Worthington's[22] nonexperimental estimates for a much larger change in food assistance. When comparing the differences between households that received no SNAP benefits and those that received full SNAP benefits, the authors estimated that SNAP decreased FI-C by 38%; however, the corresponding estimate for VLFS-C was not statistically different from 0. Corresponding analysis of household food security failed to detect an impact.[22,23]

These results are also qualitatively similar to analyses of the American Recovery and Reinvestment–induced changes in SNAP benefits, in which it was concluded that

TABLE 4 Characteristics of Participating SEBTC Households at Baseline

Characteristic	$0 Benefit		$30 Benefit		$60 Benefit		All	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Household size[a]								
Mean No. people in household	4.41	0.03	4.27	0.02	4.38	0.03	4.40	0.02
Household composition,[a] %								
Household with 1 adult, female	48.21	1.15	51.50	0.54	50.27	1.05	49.24	0.78
Household with 1 adult, male	3.38	0.43	4.02	0.22	3.04	0.36	3.21	0.28
Household with >1 adult	48.41	1.15	44.49	0.54	46.69	1.04	47.55	0.78
No. children,[a] %								
1 child	23.58	1.00	26.33	0.48	23.08	0.91	23.33	0.68
2 children	33.56	1.10	33.92	0.51	33.57	1.00	33.57	0.75
≥3 children	42.86	1.15	39.75	0.53	43.34	1.05	43.10	0.78
Mean No. children in household	2.41	0.03	2.40	0.01	2.42	0.03	2.42	0.02
Last month's household income[a,b]								
Mean	1577.24	32.92	1560.59	12.51	1555.93	27.06	1566.60	21.31
0 income, %	3.67	0.56	3.21	0.20	2.34	0.39	3.01	0.34
Less than federal poverty level,[c] %	71.14	1.31	72.21	0.50	71.60	1.16	71.37	0.87
101%–130% of federal poverty level,[c] %	13.84	0.98	14.26	0.40	15.14	0.92	14.49	0.68
131%–185% of federal poverty level,[c] %	10.95	0.90	10.20	0.34	9.81	0.79	10.38	0.60
>185% of federal poverty level,[c] %	4.07	0.57	3.33	0.20	3.45	0.42	3.76	0.36
Household nutrition benefits before any receipt of SEBTC,[a] %								
Reported receiving SNAP[c]	64.94	1.33	67.27	0.52	62.67	1.18	63.80	0.89
Reported receiving WIC[b]	25.17	1.2	20.9	0.46	23.53	1.06	24.35	0.80
Reported receiving food from food pantry, food bank, or emergency kitchen	16.28	1.01	16.65	0.42	14.75	0.86	15.52	0.66
Reported receiving none of the above	25.03	1.2	24.09	0.47	27.1	1.07	26.07	0.80
Household food security before any receipt of SEBTC,[a] %								
VLFS-C	7.40	0.71	7.23	0.29	7.04	0.63	7.22	0.47
FI-C	42.92	1.38	42.85	0.56	42.86	1.22	42.89	0.92

Estimates are from SEBTC Spring and Summer Surveys, pooled from 2011, 2012, and 2013 (full sample: Spring Survey n = 41 793; Summer Survey n = 48 449).
[a] The respondent reported the household's characteristics and circumstances in the last 30 days (and last month for income). Means and medians include households with 0 income.
[b] Estimates for household income, household nutrition benefits, and household food security are reported on the basis of Spring Survey responses.
[c] Poverty level was calculated on the basis of reported household income last month before taxes, household size, and the poverty guidelines for the given year (http://aspe.hhs.gov/poverty/13poverty.cfm for 2013). A small percentage of households provided annual income, which was used to calculate monthly income for the poverty distribution.

moderate changes in SNAP benefits have impacts on household food security.[24–26] For example, Nord[25] estimated that the American Recovery and Reinvestment–induced 7% decline in SNAP benefits increased very low food security among households by 16.5%. Katare and Kim[26] estimated an increase in very low food security among households of 14% and an increase in food insecurity of 7%.

Although there were differences in benefit-redemption rates between households in WIC- and SNAP-model sites, the study did not find statistically significant differences in children's food security outcomes by program model ($P > .05$).

Impacts of a $60 SEBTC Monthly Benefit Compared With a $30 Benefit

Results were mixed as to whether a $60 monthly benefit had larger impacts than a $30 benefit. The $60 benefit reduced VLFS-C by 0.6 percentage points compared with the $30 benefit ($P = .076$), but the difference did not meet the study's threshold for statistical significance ($P < .05$). (See Fig 2.)

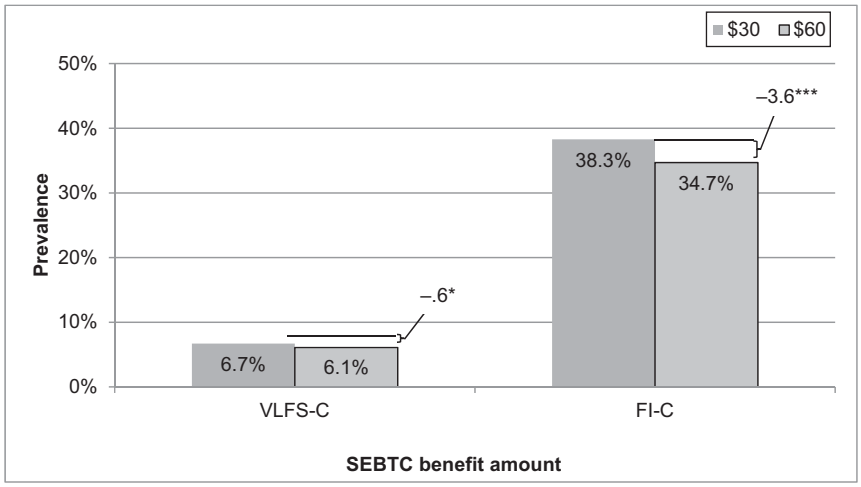

FIGURE 2

Estimated impact on VLFS-C and FI-C: SEBTC benefit, $30 vs $60. Data were pulled from the regression model estimated on the basis of pooled SEBTC Summer Survey data from 2011, 2012, and 2013. Households were randomly assigned to either the $60-per-child monthly benefit group in 2012 and 2013 ($n = 24\,876$) or the $30-per-child monthly benefit group in 2013 ($n = 8700$). The difference in VLFS-C is −0.6 percentage points (SE = 0.3, $P = .076$). The difference in FI-C is −3.6 percentage points (SE = 0.64, $P < .001$). * $.05 < P < .10$; ** $.01 < P < .05$; *** $P < .01$.

Impacts on Children's Nutrition

On the basis of guardians' reports of a randomly selected child's average daily consumption of foods associated with health (fruits and vegetables, whole grains, dairy foods, and foods and beverages with added sugars[27]), SEBTC improved children's nutrition.

Compared with no benefit, the $60 monthly per-child SEBTC benefit improved 6 of the 8 nutrition outcomes measured by the study authors (Table 5). For instance, the $60 benefit increased children's mean daily consumption of fruits and vegetables by one-third of a cup (0.36 cup Eq; a 13% difference). This is equivalent to the impact of the school-based Fresh Fruits and Vegetable program.[28] It also increased their mean consumption of whole grains by a 2.2 oz Eq per day (a 30% difference), which is roughly equivalent to half of a slice of whole wheat bread or one-fourth of a cup of cooked brown rice (see Briefel et al[29] for further information of SEBTC and children's nutrition). Although these changes are moving in the right direction, toward a higher consumption of nutritious foods, children need to make significantly greater changes or improvements to meet the dietary guidelines.[30]

Although there were no differences in children's food security impacts according to the type of model employed by the site (WIC or SNAP), we found differences in child nutrition outcomes by model. For instance, the impacts on children's average daily fruit and vegetable consumption (excluding fried potatoes) was approximately twice as large in WIC model sites, and daily whole grain consumption was almost 4 times as large. For daily consumption of total added sugars from all foods and beverages, we found no impact in SNAP-model sites.[29,31,32] Although there was no reduction in these added sugars among children in households in SNAP-model sites, the benefit did not increase purchases of sugar-sweetened beverages, even though these types of beverages can be purchased with SNAP.

DISCUSSION

Policy Implications

Low participation in standard federal summer meals programs raises concern about the food security and food consumption of low-income children during the summer, when many lack access to free or reduced-price school meals. There are few other large random assignment studies of the impact of food assistance policy on children, and there are even fewer on the impact of such policies in the summer. In this rigorous evaluation, we found that SEBTC improved school-aged children's food security and the nutrition of children. A 33% reduction in summer rates of VLFS-C is substantial and significant.

Given that the sites were not randomly selected to be representative, extrapolating from the results in the demonstration sites

TABLE 5 Estimated Impact on Nutrition Outcomes: SEBTC Benefit, $60 Versus $0

Outcome	$60 Benefit Group Sample Size	$0 Benefit Group Sample Size	$60 Benefit Group Consumption	$0 Benefit Group Consumption	Impact ($60/$0 Difference)		SE	*P*
Fruits and vegetables								
Fruits and vegetables (cup Eqs per d)[a]	22 041	12 521	3.3	2.9	0.4	***	0.03	<.001
Fruits and vegetables, excluding fried potatoes (cup Eqs per d)[a]	22 058	12 534	3.2	2.8	0.4	***	0.03	<.001
Whole grains								
Whole grains (oz Eqs per d)[b]	22 279	12 634	2.2	1.7	0.5	***	0.05	<.001
Dairy								
Dairy (cup Eqs per d)[c]	22 345	12 679	2.5	2.3	0.2	***	0.03	<.001
Usually drank nonfat or low-fat milk (%)[d]	21 978	12 348	13.2	13.7	−0.5	—	0.71	.442
Added sugars								
Added sugars (teaspoons per d)[e]	21 949	12 431	18.0	18.2	−0.2	—	0.17	.313
Added sugars, excluding cereals (teaspoons per d)[e]	22 089	12 536	16.6	17.1	−0.5	***	0.15	.002
Added sugars, sweetened beverages only (teaspoons per d)[e]	22 375	12 695	7.6	8.2	−0.6	***	0.16	<.001

Data presented are from the regression model estimated on the basis of pooled SEBTC Summer Survey data from 2012 and 2013. Households were randomly assigned to either the $60-per-child monthly benefit group or the no-benefit group in 2012. In 2013, households were randomly assigned to the $30- or $60-per child monthly benefit groups. Numbers may not add up because of rounding. The daily amounts of fruits and vegetables and dairy are measured in cup Eqs, and whole grains are measured in in oz Eqs, as defined by the 2010 *Dietary Guidelines for Americans*. —, not applicable.

[a] For fruits and vegetables, 1 cup Eq is defined as 1 cup of raw or cooked fruit or vegetables, vegetable juice, or fruit juice; 2 cups of leafy green vegetables; or 1/2 cup dried fruit.

[b] For whole grains, 1 oz Eq is defined as 1 1-oz slice of bread; 1 oz of uncooked pasta or rice; 1/2 cup of cooked rice, pasta, or cereal; 1 6-in-diameter tortilla; 1 5-in-diameter pancake; or 1 oz of ready-to-eat cereal.

[c] For dairy, 1 cup Eq is defined as 1 cup of milk, fortified soy beverage, or yogurt; 11/2 oz natural cheese; or 2 oz of processed cheese. The dairy items included in the survey also included cheese in mixed dishes and pizza and ice cream.

[d] Respondents who reported that their child consumed more than 1 type of milk were included if any of the milk types reported were nonfat or low-fat. Those reporting only whole milk and/or 2% milk were not considered to usually consume nonfat or low-fat milk.

[e] Teaspoons of added sugars are derived from reported frequencies of consuming sugar-sweetened beverages (soda, fruit-flavored drinks, and sugar or honey added to coffee or tea); cookies, cakes, or pies; doughnuts; ice cream; candy; and cereals.

*** $P < .01$.

during the summer to the nation as a whole during the school year involves a set of methodological challenges and assumptions. However, partially in response to the evaluation's consistent and promising results, the Obama Administration's budget proposal for 2017 included a $12 billion nationwide expansion of SEBTC over 10 years.[33] In addition, the Food and Nutrition Service has continued and expanded the SEBTC Demonstration during the summers of 2014–2017 and plans to extend the pilot program to the summer of 2018.[34]

As noted, consistent with levels of the main SNAP and WIC programs, the redemption levels and therefore benefit costs for the new benefit were lower in sites using the WIC model than in the SNAP model. Although there were no statistically significant differences in food security impacts, nutrition impacts were several times larger in WIC-model sites than in SNAP-model sites. Difference in impacts between these types of sites should be interpreted with care because the number of sites is relatively small and the type of model implemented was not randomly assigned. See Gordon et al,[31] Klerman et al,[32] and Briefel et al[29] for a more complete discussion.

More broadly, these are the first experimental results to reveal that additional food assistance improves children's food security and nutrition. The authors of other studies have addressed the issue, but they used quasi-experimental approaches.[22,24,25,35–40] SEBTC's sample sizes are large and the evaluation's estimates are precise. Our findings provide strong evidence for the premise that food assistance can improve food security and nutrition among low-income households with children.

Limitations

The results reported in this article have excellent internal validity. They are based on a well-executed random assignment design, a large sample, and a household survey with a high response rate. Food security was estimated by using the standard USDA question battery and coding scheme with demonstrated measurement validity and reliability. Similarly, children's nutrition estimates relied on the standardized National Cancer Institute dietary questionnaire and coding scheme used in NHANES and other large-scale studies to estimate daily consumption of foods and food groups.

However, as is common with this type of research design, the evaluation was conducted in purposively selected sites, during a specific time period (summers of 2011, 2012, and 2013). Grantees

proposed demonstration sites on the basis of perceived need and the capacity of local school food authorities to help with evaluation tasks. Indeed, households in the sample were more disadvantaged than average households with children who received free or reduced-price meals nationally. Extrapolation of the SEBTC findings to other locations and times of the year should be done with caution.

CONCLUSIONS

Despite the limitations necessitated by the design, the findings are striking. The SEBTC Demonstrations add important new information about the impact of additional food assistance on children's food security in the summer. With rigorous random assignment-based evidence across 3 summers from nearly 50 000 households in 16 localities, the SEBTC evaluation reveals that additional food assistance ($60 or even $30 per school-aged child per month) would lead to substantial progress in addressing the problem of summer food insecurity among school-aged children and their households.

In future rigorous evaluations, researchers should explore ways to extrapolate these findings to other populations, other times of the year, and other localities. Research focused on providing additional food assistance for longer periods of time would provide additional guidance on national food assistance policy that aims to end childhood hunger.

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ABBREVIATIONS

FI-C: food insecurity among children
SEBTC: Summer Electronic Benefits Transfer for Children
SNAP: Supplemental Nutrition Assistance Program
USDA: US Department of Agriculture
VLFS-C: very low food security among children
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

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