

Evaluating school-based food pantries using a health equity perspective

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
Abstract


In the United States, the charitable food system is one source of support for households experiencing food insecurity. Previous studies have focused on the role of community food pantries in providing nutritious food for households, but few studies have focused on school-based food pantries, located inside or close to kindergarten through twelfth grade (K-12) schools. In this study, we

conducted a landscape analysis of school pantries in Maryland and used a mixed-methods approach to evaluate the degree to which school pantries promote food access using a health equity perspective. We conducted a survey of 196 school pantries (87.9% response rate) and in-depth interviews and nutritional assessments with a subset of 22 pantries. We used the Getting to Equity framework to outline data collection methods and analysis. Like community pantries, our study sample's school pantries centered clients' needs, engaged clients, and promoted equity through providing foods that balance healthfulness and cultural relevance and adjusting offerings based on feedback from clients; provided nutrition education; used full choice models when possible; and connected clients with wraparound services and other resources. Additionally, pantry coordinators emphasized the strength of relationships and trust with students and parents, developed through frequent interactions. However, school pantries faced capacity

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Conflicts of Interest

The authors declare they have no conflicts of interest.

challenges because running the pantry was not the full-time job of coordinators. This study provides a model for food banks in other states to evaluate their school pantry programs with equity, community-engaged, and people-centered perspectives to ensure students and their families have a fair and just opportunity for food access.

Keywords

charitable food system, school-based food pantry, childhood food insecurity

Introduction

In the U.S., approximately one in eight households with children experiences food insecurity, defined as having limited or inconsistent access to enough food for an active, healthy life (Rabbitt et al., 2024). The charitable food system, also called the food banking system or emergency food system, is one source of support for households experiencing food insecurity. The charitable food system is a complex network of food banks, pantries, and congregate meal sites that provides food for over 50 million households experiencing food insecurity each year (Feeding America, 2024; Schwartz & Caspi, 2023). Although originally intended to provide support in emergency times, current evidence suggests that individuals rely on the charitable food system for chronic food support (UConn Rudd Center for Food Policy and Health, n.d.). Feeding America is the primary organizing entity for the charitable food system in the U.S. and has a network of around 200 food banks, 21 statewide associations, and 60,000 partner food pantries and meal programs across all 50 states, Washington, D.C., and Puerto Rico (Feeding America, 2022). In Maryland, the Feeding America food banks are the Maryland Food Bank (MFB) and Capital Area Food Bank (CAFB).

School-based food pantries, or simply, school pantries, are located inside or close to K-12 schools and provide free food to students and their families. The Feeding America network supports over 4,000 school pantries across the country through their School Food Pantry Program, which facilitates partnerships between schools and food banks (Feeding America, n.d.-a). In the 2023–2024 academic year, MFB provided food to 190 school

pantries located in 22 jurisdictions including Baltimore City in Maryland. CAFB provided food to 27 pantries located in Prince George's and Montgomery counties. All Maryland schools may apply to have a pantry supported by MFB or CAFB, depending on the county. However, food banks have limited capacity to support school partners, as the program relies almost entirely on food banks' private fundraising efforts. MFB only considers adding new pantries to the program if data show significant community need, if there are few or no community pantries in the area, and if the school is deemed by the food bank to be a strong and accessible community institution (MFB, personal communication, January 8, 2025).

Several previous studies have focused on the role of food banks and community food pantries in providing nutritious food for households (Cooksey-Stowers et al., 2019; Levi et al., 2022; Schwartz & Caspi, 2023). However, few studies have focused on school pantries. In 2012, Snelling et al. used surveys and in-depth interviews to evaluate Feeding America-affiliated elementary school pantries and explored operations of school pantries with a specific focus on client satisfaction (Snelling et al., 2014). Using similar methods, Christner and Cotugna (2014) evaluated the programmatic outcomes of the Food Bank of Delaware's school pantry program. Only three studies have been published in the following decade: one that focuses on an intervention to help clients prepare healthy foods at a school pantry in Idaho (Lee et al., 2021), one that explores clients' experiences at school pantries in Indiana (Jones & Adkins, 2021), and most recently, one that sought to understand how school pantries in the Midwest adjusted to changes during the pandemic (Doll et al., 2023). However, there remain many unknowns about the School Food Pantry Program, and it is unclear if earlier evaluations reflect current practices or if practices differ across states or regions. There is a paucity of information about the characteristics, operations, and utilization of school pantries, such as geographic distribution, pantry location, types of service delivery models, to what extent pantries are advertised and utilized, and who utilizes them.

There is also a gap in knowledge regarding the nutritional quality of foods distributed by school

pantries. In recent years, food banks and food pantries have begun providing more nutritious foods following the creation and adoption of formal nutrition policies (Levi et al., 2020). For example, Feeding America encourages its partner food banks to offer a variety of foods to school pantries, including fresh fruits and vegetables, grains (e.g., bread, pasta, rice), meat and non-meat protein options, canned food (e.g., beans, soup), and pantry staples (e.g., pasta sauce, jam) (Feeding America, n.d.-a). However, there are no published reports or grey literature that outline what foods school pantries typically order and distribute, and what factors influence decision making.

Additionally, no studies have utilized health equity frameworks in their evaluations of school pantries. Health equity means that everyone has a fair and just opportunity to be as healthy as possible (Braveman et al., 2017). Historic and ongoing racial discrimination has led to immense variation in the quality of economic, social, and educational resources people of different racial and ethnic groups have access to, which corresponds to fewer opportunities to advance physical, social-emotional, and mental health (Yearby et al., 2022). In the context of food pantries, there are many barriers related to desirability (i.e., if clients *want* to use the pantry), such as stigma, fear, mistrust, and usability (i.e., if clients *are able* to use the pantry), such as lack of awareness, limited hours of operation, and inconvenient locations (Ginsburg et al., 2019). Because schools are familiar, geographically distributed, and visited frequently by parents and students, pantries located in schools may play an important role in reducing some barriers to accessing community pantries.

The goal of this study was to conduct a landscape analysis of school-based food pantries in Maryland partnering with two Feeding America affiliated food banks. We used a mixed-methods approach to evaluate the degree to which school pantries promote food access through a health equity perspective.

Materials and Methods

We used explanatory sequential mixed-methods to explore school food pantries in Maryland. We began by collecting and analyzing quantitative

survey data, which helped us identify patterns and trends to explore in subsequent stages of the project. We used these findings to guide the collection of qualitative interview data to provide deeper insight and explanation of the quantitative results. We mixed the results of our quantitative and qualitative findings using the Getting to Equity framework. These methods are described in detail below.

Recruitment and Sample Population

This study includes information from school food pantries in Maryland. All school pantries were affiliated with either the MFB or CAFB during the 2023–2024 academic year. Prior to beginning the study, the first author met with staff from MFB and CAFB to discuss the study and determine mutual goals. The lead researcher and food bank staff co-created the recruitment emails, and food bank staff sent surveys to their respective school food pantry coordinators (for brevity: coordinators) in November 2023. Coordinators had three weeks to complete the survey, and each food bank sent two email reminders.

The last question of the survey asked if coordinators would be willing to conduct an in-depth interview and pantry visit with researchers, and 69% percent of coordinators responded that they would be willing to be contacted or would like more information before deciding. In January 2024, the research team used purposive sampling to select school pantries that would represent the distribution of pantries by food bank affiliation (MFB or CAFB), county, urbanicity (urban or non-urban, as defined by the USDA's Food Access and Research Atlas [USDA Economic Research Service [USDA ERS], n.d.]), and low-income, low-access (LILA) tract. LILA tracts are defined as U.S. census tracts having either a poverty rate of 20% or more or a median family income less than 80% of the statewide median family income, *and* where a significant number or share of residents is more than half a mile or 0.8 km (urban) or 10 miles or 16 kms (rural) from the nearest supermarket (USDA ERS, n.d.). We recruited coordinators on a rolling basis and stopped recruitment and data collection in May 2024, as many coordinators do not work during the summer break. For recruitment, we sent an initial email, then followed up with an additional

email and up to two phone calls. This study was ruled exempt through the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Data Collection

We first collected survey responses from a large sample of school food pantries in Maryland ($n = 196$), then conducted in-depth interviews and nutritional assessments in a smaller subset of pantries ($n = 22$). We described our detailed methodology below.

Survey

The goal of the survey was to explore a wide range of information related to the operation and utilization of school food pantries in Maryland. The survey included six sections. In the first section, we asked general questions about the pantry, including county location, grade levels served (elementary, middle, high school, or a combination of grade levels), and whether the school was a community school. Community schools in Maryland receive funding from the Maryland Concentration of Poverty Grant if they have 75% of students who qualify for free or reduced-price meals and typically hire a community school coordinator to run programs related to food security, housing, and literacy (Blueprint for Maryland's Future, n.d.).

The next section of the survey asked questions about which service delivery models the pantry uses. School pantries use up to four types of service models to distribute food to clients: (1) designated space, which is a permanent location (e.g., inside a building or trailer) that is open during set hours and days, in which clients come to shop; (2) distribution events, which are large pop-up events that typically serve many clients within a short timeframe (e.g., scheduled drive-through or walk-up from 3–5pm on Thursdays); (3) backpack programs, in which pantries hand out pre-packed bags or backpacks for students to take home on weekends; and (4) home delivery, in which pantry staff deliver food directly to the homes of students. School pantries may operate one, multiple, or all these types of programs. Although all four programs are supported by MFB, CAFB encourages their school partners to choose either the design-

nated space or distribution event as their primary service model.

The subsequent sections of the survey collected information about each selected service delivery model. Respondents were asked to answer questions about the location of the pantry or distribution event; operation hours, frequency, and time; sources of food outside the food bank (e.g., non-profits, individual donations); types of food and non-food items served; eligibility and tracking systems; provision of informational resources (e.g., housing, financial literacy, and federal nutrition assistance); challenges related to funding, staffing, space, storage, and awareness; and client choice model. There are four client choice models: (1) no choice, in which every recipient receives the same, predetermined items; (2) limited choice, in which recipients can choose among a few types of pre-packed bags or can combine a prepacked bag with choice of certain food items from a table or basket; (3) modified choice, in which recipients may select from a menu or tell staff what food items they want, and volunteers or staff pack the bag; and (4) full choice, in which recipients may shop for food like at a grocery store. Each of these four models may be used with any of the types of service delivery models described above.

Interviews

We conducted semi-structured in-depth interviews in-person with coordinators at the site of the pantry. We created the interview guide using a combination of the survey responses and the Getting to Equity (GTE) framework, as described below. Broadly, we asked questions on general pantry information, accessibility, food quality, informational resources provided by the pantry, food procurement, and barriers to operation and utilization. (See the complete in-depth interview guide in Appendix A.) As recommended in qualitative research, the interview guide was adjusted during the interview process to ensure that questions were understood the way they were intended, and to adjust to any emerging themes (McGrath et al., 2019). All interview participants provided oral consent at the time of the interview. We conducted interviews in a private location, in the pantry during off hours or in the coordinator's

office. The interviews lasted between 30 and 60 minutes, and participants received a US\$30 gift card as compensation for their time.

Nutritional Assessment

Two members of the research team visited each pantry. While one researcher conducted the interview, the other researcher conducted a nutritional assessment of the pantry. For each unique item in the pantry, researchers filled out a Google Form with the following information: item name (Brand and food name; e.g., Campbell's Chicken Noodle Soup); saturated fat (g) listed on the nutritional label; sodium (mg); total sugar (g); added sugar (g); item weight (oz); number of items present in the pantry; and food category. Food categories were determined by the Healthy Eating Research Nutrition Guidelines for the Charitable Food System and include fruit and vegetables; grains; protein; dairy; non-dairy alternatives; beverages; mixed dishes; processed and packaged snacks; desserts; and condiments and baking and cooking staples (Levi et al., 2020). According to the guidelines, each food is characterized as green ("choose often"), yellow ("choose sometimes"), or red ("choose rarely") according to their nutrient profile, which differs for each food category. Item rankings are determined by the lowest tier of any nutrient. For example, a product that is ranked green for added sugar, yellow for sodium, and red for saturated fat would receive a final ranking of red. Because the nutritional content of the pantry can vary greatly depending on what items are available, we requested to visit only during times when the pantries were recently stocked (i.e., within one week of delivery).

Data Analysis

We conducted quantitative analysis of survey responses, followed by qualitative analysis of the in-depth interviews and quantitative analysis of the nutritional assessment data. Lastly, we mixed the results of our quantitative and qualitative analyses using the Getting to Equity framework. We describe our analysis methods in detail in the sections below.

Quantitative Analysis

We calculated univariate statistics for all survey variables and compared characteristics of survey participants with interview participants to ensure representativeness. Additionally, we compared survey variables across the two supporting food banks. We presented the final survey results to each food bank separately to receive feedback and make sure the responses aligned with their general understanding of food bank operations and utilization prior to conducting interviews.

We calculated Charitable Food Nutrition Index (CFNI) scores to assess the nutritional value of foods in each school pantry (Gombi-Vaca et al., 2022). CFNI was developed to calculate a continuous score from 0 (lowest) to 100 (highest) of overall nutritional quality that can be used to assess any assortment of foods, and it has a moderate-to-strong correlation with Healthy Eating Index scores (Gombi-Vaca et al., 2022). The score utilizes three numbers: the percentage of green, yellow, and red foods in an assortment of items, as defined by the Healthy Eating Research Nutrition Guidelines for the Charitable Food System described above (Levi et al., 2020). We calculated CFNI scores using R statistical program. First, we combined the weight of all green, yellow, and red items in each pantry and calculated the percent of total weight for each color category (e.g., 50% green, 40% yellow, 10% red). Next, we used the standardized equation for calculating CFNI scores by pantry: $CFNI = (((0.7773 * \%green) + (0.5923 * \%yellow) + (0.3753 * \%red)) - 37.53) / 40.2) * 100$ (Gombi-Vaca et al., 2022).

We calculated basic descriptive statistics for all CFNI scores. Additionally, we used the Wilcoxon Rank-Sum Test or Kruskal-Wallis test to compare CFNI scores to selected survey variables from each of the 21 schools that participated in the nutritional assessment. Nonparametric tests were chosen to account for small sample sizes. Variables included grade level (elementary, middle, high, elementary and middle, middle and high), pantry coordinator years of experience (0–1 year, 2–4 years, 5 or more years), challenges with storage (high vs. low barrier to pantry operations), challenges with space (high vs. low barrier to pantry operations), a binarized version of choice model (no/limited choice vs.

modified/full choice), and whether the pantry purchased food from sources other than the food bank. Additionally, we qualitatively coded all interviews to explore the question, “How do you decide what foods to order from the food bank?” and compared themes with CFNI scores above and below the mean CFNI score for all schools.

Qualitative Analysis and Mixing

We transcribed all audio recordings using a professional transcription service, de-identified them, and checked them for accuracy by simultaneously listening to the recording and reading through the transcription, correcting errors as needed. We used deductive and inductive methods to conduct a thematic analysis of data collected during interviews (Proudfoot, 2023). We developed an initial codebook based on the in-depth interview guides. Using the comments tool in Google docs, all three researchers initially coded two interview transcripts to test the initial codebook and inductively added codes. The researchers then double coded the remaining set of interview transcripts.

We used the Mural visual collaboration platform (<https://www.mural.co/>) to organize our results and collectively analyze the data. The Mural visual collaboration platform is a cloud-based application that allows teams to work simultaneously on projects. In this study, we used the platform as a virtual whiteboard to arrange codes, themes, and subthemes. First, we set up the board by creating sections for each code and moving each data point (i.e., a section of text assigned to a code) from the Google doc to the corresponding section on the board. Each data point was tagged with the research participant’s code name. Then, each member of the research team was assigned two to four codes to categorize into smaller themes and, subsequently, larger umbrella themes. We categorized all umbrella themes under one of the four categories of the GTE framework. At this point, we reviewed the survey data and nutritional assessment data and added notes about relevant quantitative patterns next to each qualitative theme. After all data points had been assigned and quantitative data had been integrated, we compared and contrasted umbrella themes in each of the GTE domains. One member of the research team wrote summaries of these

themes, and all researchers revised iteratively. Finally, we presented the qualitative results to staff at each food bank separately to ensure themes aligned with their general understanding of food bank operations and utilization and gathered additional insights for discussion.

Getting to Equity (GTE) Framework

This study utilized the Getting to Equity (GTE) in Obesity Prevention theoretical framework (Kumanyika, 2019). The GTE framework was originally designed to guide practitioners and researchers to develop and implement strategies that increase the equity impact of obesity prevention policy, system, and environment change interventions. However, the framework has been adapted for use in various food-related research settings, including evaluations of emergency school meal distribution programs during the COVID-19 pandemic (McLoughlin et al., 2020). The framework comprises four key domains: (1) *increase healthy options*, which describes interventions or approaches that address a specific problem; (2) *reduce deterrents*, which identifies circumstances or factors that might work against the effectiveness of the intervention; (3) *improve social and economic resources*, which focuses on extending individuals’ financial stability and resources and reducing social needs, and supports the goals of the intervention; and (4) *build on community capacity*, which focuses on identifying and leveraging community-level assets and resources to support the intervention. These four domains are distinct but interconnected, and an intervention is most likely to advance equity when all four domains build on and reinforce each other. Additionally, the framework utilizes three foundational principles that provide the basis for the domains: the intervention should be approached with an equity lens (i.e., equity-focused), use community-engaged approaches, and maintain a people-centered perspective. In this study, we detailed the alignment of school food pantry efforts to each of the four quadrants of the framework using qualitative, quantitative, and mixed data. To do this, we adapted the GTE Framework: User Worksheet (Kumanyika, 2024) to evaluate school pantries retrospectively (Appendix B).

Results

Of the 223 school food pantries in Maryland, 196 (87.9%) responded to the survey, including 176 (92.1%) and 20 (62.5%) pantries affiliated with MFB and CAFB, respectively. (See Appendix C for the survey results.) Twenty-two (38.6%) of the 57 invited pantries participated in the interviews. Generally, interview participants' pantries were representative of survey respondents' in almost all characteristics, except interview respondents represented slightly more schools in low-income and LILA districts (Table 1, next page).

Most pantries ($n = 142$, 72.4%) were located in community schools, and approximately two-thirds of pantries ($n = 131$, 66.8%) served elementary schools, while just over one-third ($n = 78$, 39.8%) served middle schools, with even fewer ($n = 33$, 16.8%) serving high schools. Most survey respondents reported utilizing a designated space ($n = 163$,

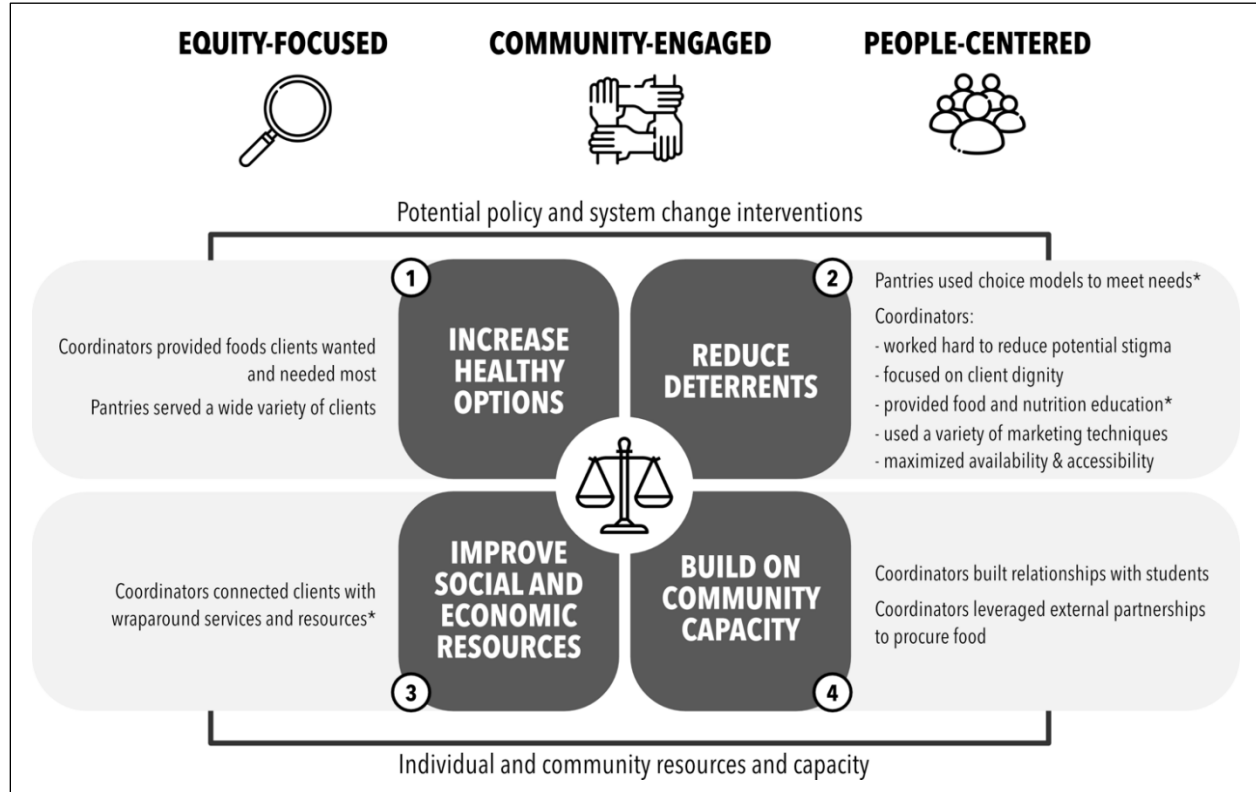
83.2%) or distribution event ($n = 120$, 61.2%) as their main program type. Additionally, just over half ($n = 103$, 52.6%) of pantries used a weekend backpack program and approximately one-third of pantries ($n = 68$, 34.7%) used home delivery.

Getting to Equity Framework

In the following sections, we use the GTE framework (Figure 1) to describe specific approaches pantries used to improve food and nutrition security for households (Quadrant 1); factors that hindered success of the pantries and ways coordinators adapted operations to meet clients' needs (Quadrant 2); social and economic resources pantries provided to clients (Quadrant 3); and ways coordinators leveraged community capacity to improve the pantry effectiveness (Quadrant 4). Notably, some themes could fit under multiple GTE domains. For example, using specific choice

Figure 1. Getting to Equity Framework adapted from Kumanyika, 2019, and McLoughlin et al., 2020, and Grounded in In-depth Interviews Conducted with School Pantry Coordinators in Maryland

Text in each box describes themes related to pantry practices.



* Indicates approaches that are secondarily mapped to Quadrant 1.

Table 1. Characteristics of Maryland School-Based Food Pantries (Surveyed and Interviewed)

Characteristics	Survey Respondents (n = 196)	Interview Participants (n = 22)
Food bank affiliation		
MFB	176 (90%)	19 (86%)
CAFB	20 (10%)	3 (14%)
County (School code abbreviation for in-depth interviews) ^a		
Anne Arundel (Aa)	7 (4%)	1 (5%)
Baltimore City (Bc)	78 (40%)	7 (32%)
Baltimore County (Ba)	31 (16%)	2 (9%)
Caroline	1 (1%)	--
Carroll (Ca)	8 (4%)	1 (5%)
Cecil	2 (1%)	--
Dorchester (Do)	1 (1%)	1 (5%)
Frederick	8 (4%)	--
Harford	3 (2%)	--
Montgomery (Mo)	10 (5%)	2 (9%)
Prince George's (Pg)	10 (5%)	1 (5%)
Queen Anne's	1 (1%)	--
Somerset (So)	5 (3%)	1 (5%)
Talbot	1 (1%)	--
Washington (Wa)	11 (6%)	3 (14%)
Wicomico (Wi)	13 (7%)	1 (5%)
Worcester (Wo)	6 (3%)	1 (5%)
Grade Level(s)		
Elementary School	96 (49%)	6 (27%)
Elementary and Middle School	29 (15%)	4 (18%)
Middle School	28 (14%)	4 (18%)
Middle and High School	7 (4%)	1 (5%)
High School	34 (17%)	7 (32%)
All Grades	2 (1%)	--
Urbanicity ^b		
Urban	173 (88%)	18 (82%)
Non-Urban	23 (12%)	4 (18%)
Located in a Low-Income Tract ^c		
Yes	149 (76%)	19 (86%)
No	46 (23%)	3 (14%)
Located in LILA Area ^d		
Yes	103 (53%)	13 (59%)
No	93 (47%)	9 (41%)
U.S. Census Poverty Rate		
Mean poverty rate	17.5%	21.8%
Tracts higher than Maryland mean poverty rate (9.3%)	143 (73.0%)	16 (72.7%)
Tracts higher than U.S. mean poverty rate (12.5%)	125 (63.8%)	13 (59.1%)
U.S. Census Median Family Income (US\$)		
Median family income	\$64,576.70	\$52,167.00
Tracts higher than Maryland median (\$94,991)	31 (15.8%)	3 (13.6%)
Tracts higher than U.S. median (\$74,580)	87 (44.4%)	8 (36.4%)

^a Abbreviations are only used for schools in which in-depth interviews were conducted and are used in-text to indicate which participants provided quotes.

^b Defined by the USDA's Food Access and Research Atlas (USDA Economic Research Service, n.d.).

^c A tract with either a poverty rate of 20% or more, or a median family income less than 80% of the statewide median family income; or a tract in a metropolitan area with a median family income less than 80% of the surrounding metropolitan area median family income.

^d Low-income census tracts where a significant number or share of residents is more than half a mile (0.8 km) (urban) or 10 miles (16 km) (rural) from the nearest supermarket.

models and providing food and nutrition education were mapped to Quadrant 2 because they addressed specific factors that could potentially hinder clients' utilization of pantries. However, these themes could also be mapped to Quadrant 1, as they describe specific approaches used by the pantries to improve food security. For clarity in this analysis, we categorized these themes based on which domain they addressed in the GTE Framework: User Worksheet.

Increase Healthy Options (Quadrant 1)

This section focuses on how coordinators worked to increase healthy options for pantry clients, aligning with Quadrant 1 of the GTE framework. Coordinators described a thoughtful and often challenging process of selecting foods that met their clients' preferences and nutritional needs, balancing healthy options with cultural relevance, student appeal, and ordering restrictions.

Coordinators Provided Foods Clients Wanted and Needed Most

Coordinators noted that the goal of school pantries was to provide immediate food support for households, particularly those with school-aged children. They aimed to improve nutritious food security by providing healthy, culturally appropriate, and desirable foods to households. There was a wide range of CFNI scores among the 21 schools who participated in the nutritional assessment (Table 2). The mean score was 70.2, with a range from 39.9 to 89.3 out of 100 points (standard deviation: 15.2). CFNI scores were not statistically significantly associated with grade level, years of coordinator experience, space constraints, storage constraints, or supplemental purchases, but pantries with higher CFNI scores were significantly more likely to have modified or full choice compared to those with limited or no choice ($p = 0.04$).

Coordinators described an intentional and nuanced process for deciding what items to order from the food bank. Coordinators from pantries with CFNI scores above the mean described ordering popular items that moved off the shelves quickly; staple items such as pasta and rice; mostly "green" items (referring to the stoplight metrics used on the food bank websites (Martin, Wolff et

al., 2019)); and foods that matched clients' cultural preferences, such as dried beans and *masa* (corn flour). Conversely, four of the nine pantries with scores below the mean noted that one of their main criteria for choosing items was based on student feedback and/or what they thought students would want to eat, and they did not mention paying attention to what items were healthier on the website. For example, one pantry with a CFNI score of 45.1 noted:

Most [adults] are looking for the vegetables and stuff. Our kids, they're high schoolers, so they aren't necessarily cooking a meal. They would rather have the Goldfish packs and ramen noodles, those kind of things. [Wo1]

Across the CFNI spectrum, nutritional quality of food was not the only priority for pantry coordinators when choosing what foods to order. Coordinators described building strong relationships with clients and school staff, which helped them decide what types of foods to order. More experienced coordinators gained knowledge through client observations, eliciting recommendations from teachers and other school staff, directly asking clients what they would like to see in the pantry, and through trial and error, such as noting what foods stayed on shelves for longer periods of time. They described using both informal conversations and formal mechanisms, such as surveys and feedback forms, to collect feedback. One pantry coordinator noted:

Honestly, when it comes to things like pasta sauce, people won't take the less sodium [options]. They'll take the traditional, but as soon as it says less sodium across the top, I got a stack of them sitting on the table. Everybody is like, "Oh, you have any more pasta sauce?" I'm like, "There's some right there." "Oh, I don't want that." Same thing with brown rice, whole grain pasta noodles, ... At a certain point, it's like, "I want to get what my families are going to eat." [Bc6]

Coordinators also described other factors they used in deciding what items to procure for the

Table 2. Charitable Food Nutritional Index Scores (CFNI) and Related Characteristics for Maryland School Food Pantries that Participated in the Nutritional Assessment (n = 21)

School Code	CFNI Score	% Green	% Yellow	% Red	Grade levels *	Years operating pantry	Space as an operational barrier	Storage as an operational barrier	Choice model	Pantry purchases food	If yes, amount used to purchase per month (US\$)	How do you decide what to order? (Qualitative themes); FB=Food bank
Aa1	39.9	14	48	38	ES	2-4 years	Low barrier	High barrier	Full choice	Yes	\$1,200	- Feedback from families - No canned items - Staple items
Wo1	45.8	28	33	39	HS	2-4 years	Low barrier	Medium barrier	Limited choice	No	N/A	- What coordinators think kids want
Bc2	47.8	37	20	43	ES/MS	0-1 year	Low barrier	Medium barrier	No choice	No	N/A	- What coordinators think kids want - High-priced items - What coordinators think people want
Do1	49.1	34	28	38	ES/MS	5+ years	Medium barrier	Low barrier	Limited choice	Yes	Not stated	- What coordinators think kids want - Best bang for buck on FB website
Bc3	59	45	26	29	MS/HS	0-1 year	Not an issue	Not an issue	Full choice	No	N/A	- What they think sounds good - What they think is healthy
Bc8	60.5	54	12	34	ES/MS	5+ years	Low barrier	Not an issue	Full choice	No	N/A	- Feedback from families
Wa2	61.9	50	22	28	MS	2-4 years	Not an issue	Not an issue	Full choice	No	N/A	- Balance of red, yellow, green - What coordinators think kids want
Bo2	67.5	59	14	28	MS	2-4 years	Medium barrier	Medium barrier	Full choice	Yes	\$100	- What they think parents wants - Feedback from families
Wa3	68.6	55	27	17	HS	2-4 years	Medium barrier	High barrier	Full choice	No	N/A	- Getting staple items - What is healthy - What is filling
Wa4	71.8	68	7	25	MS	0-1 year	Not an issue	Not an issue	Full choice	No	N/A	- What sounds good - Cultural consciousness
So1	72.9	66	11	24	MS/HS	0-1 year	Low barrier	Not an issue	Limited choice	No	N/A	- Whatever is on the FB website
Wa1	75	70	11	18	MS	2-4 years	Low barrier	Medium barrier	Modified choice	No	N/A	- Getting staple items - What goes quickly
Bc7	77.2	74	6	20	ES/MS	0-1 year	High barrier	Not an issue	Modified choice	Yes	\$1,300	- Feedback from families
Pg1	77.3	66	21	13	ES	0-1 year	Not an issue	Not an issue	Full	No	N/A	- Cultural consciousness
Mo1	82.2	71	19	11	ES	2-4 years	Not an issue	Medium barrier	Full	No	N/A	- What goes quickly - Staple items
Bc5	83.3	70	23	8	ES	2-4 years	Low barrier	Not an issue	Full choice	No	N/A	- Whatever sounds good
Ca3	84.4	79	10	11	HS	5+ years	Not an issue	Not an issue	Full choice	Yes	Varies	- What goes quickly - More substantial/filling things
Bc4	84.9	79	11	10	MS/HS	0-1 year	High barrier	High barrier	Modified choice	Yes	Not stated	- What goes quickly - What do kids want?
Bc6	87.7	87	3	9	ES/MS	2-4 years	Medium barrier	Low barrier	Full choice	Yes	Not stated	- Feedback from families - Staple items
Mo2	88.4	83	10	7	ES	2-4 years	Medium barrier	High barrier	Full	No	N/A	- What goes quickly
Wi1	89.3	87	6	6	HS	5+ years	Low barrier	Low barrier	Full choice	Yes	Not stated	- Choosing mostly green

* Grade levels: ES = Elementary school (generally grades K-5); MS = Middle school (generally grades 6-8); HS = High school (generally grades 9-12)

pantry. Five coordinators described trying to stay stocked up on meat, eggs, and/or baby formula, because those items are sometimes too expensive for families to purchase at the grocery store. Other coordinators described wanting to provide the best quality food for families, ordering a variety of items so families would not receive the same foods over and over, and ordering a selection of filling foods to ensure the food would last.

However, coordinators commonly noted that it is sometimes difficult to order the items their clients wanted because the food bank ran out of popular items quickly. Many described competing with other schools to select foods the quickest, and that even when they would put items in their online basket, by the time they reached checkout the items would be unavailable. Additionally, coordinators noted that clients wanted to see more fresh fruits and vegetables and meats in the pantry, but that these items were either not offered or typically unavailable at the food banks. Only 21 pantries (10.7%) indicated on the survey that they purchased supplemental food in addition to their food bank orders. However, other pantries indicated that they received supplemental food from non-profits ($n = 35$, 21.5%), churches ($n = 20$, 12.3%), businesses ($n = 2$, 1.2%), or local sororities ($n = 4$, 2.5%) (Appendix C).

Pantries Served a Wide Variety of Clients

Most pantries (90.8%) served both students and families, as well as community members (69.3%) and teachers and other school staff (63.2%). Some prioritized serving students and families over non-school community members, while others made it an explicit priority to serve community members. Even pantries that were not always open to the community typically allowed community members to come in at least occasionally. For example, of the pantries with a designated space, only 11 (6.6%) noted that they exclusively serve students. One coordinator summarized their philosophy around eligibility by saying:

There are no rules of who can go in there and pull food. As long as the food is consumed, that is our only concern. I don't care who eats it. ... If you're hungry, you qualify. [Wa3]

In elementary and middle schools, pantries rarely allowed students to attend by themselves without parents. Conversely, in high schools or combined middle and high schools, pantries were often available to students during the day or after school. Most often, coordinators reported that high school students stopped by to get snacks that they could eat in the middle of the day; however, some students also took bags of food home for their families after school.

Overwhelmingly, coordinators felt that their pantries served families that matched the racial and ethnic demographic of the school community and/or the surrounding community. In some cases, this meant serving a wide range of demographic groups, and other times this meant serving individuals from mainly the same demographic group (e.g., French-speaking, Spanish-speaking).

Reduce Deterrents (Quadrant 2)

In this section, we highlight how coordinators reduced deterrents to pantry use, aligned with Quadrant 2 of the GTE framework. Coordinators worked intentionally to reduce stigma, preserve client dignity, offer food and nutrition education, and improve accessibility through flexible scheduling and varied choice models.

Coordinators Worked Hard to Reduce Potential Stigma

Coordinators noted that stigma was a large barrier to clients utilizing the pantry and described numerous ways they aimed to reduce stigma for both adult and student clients. Coordinators paid special attention to details that would enhance clients' experiences. For example, coordinators used a variety of methods for tracking who visited the pantry. Two-thirds ($n = 108$, 66.3%) of pantries with a designated space and over half ($n = 76$, 63%) of those with distribution events reported using a sign-in sheet upon arrival. However, coordinators in the interviews described using tallies instead of writing down names and not requiring personal information or identification. Coordinators who did collect personal information noted that they either reported the information to the food bank or used it to contact clients in the future about distribution events or informational resources. Some coordina-

tors still believed that providing personal information to the food bank was required, although this requirement was rescinded in the past five years. During sign up, coordinators told clients what they were collecting and why, balancing logistics with discretion and understanding of clients' feelings and fears.

Additionally, coordinators whose clients shopped in the pantry were intentional about creating a physical space that felt warm and welcoming. Many emphasized that they wanted the pantry to be a place where clients felt comfortable, and that they would let clients shop on their own rather than "hovering around them" or micromanaging their experience.

Coordinators were particularly sensitive to the potential stigma experienced by students who visit the pantry. They often offered students options for how they would receive food—in a bag or directly into their backpacks—and would adjust the amount of food based on the response. Additionally, multiple coordinators worked to normalize use of the pantry by handing out bags of food to anyone who wanted them. Those coordinators noted that when students saw others taking them, they were more likely to stop by the pantry on a different day to get food.

At lunchtime, after they finish their lunch, anybody that wants a bag gets it. ... As the kids leave out [we ask], you want a bag? You want a bag? ... Whoever wants a bag then takes a bag. [Do1]

Coordinators also noted that, after the COVID-19 pandemic, more students and families were familiar with using pantries than previously, because it was so common in their communities. They noted that there was less stigma and more positivity around the pantries in recent years.

Coordinators Focused on Client Dignity

Pantry coordinators noted that some clients did not want to take food from the pantries if they were dated past the date label (e.g., best by, sell by). Some clients, they explained, pointed out when foods were past their date label, noting that those items should be removed from the shelves. Cur-

rently, date labels are not federally standardized and do not provide information about food safety, but consumers often mistake foods past their date labels as inedible (Neff et al., 2025). Coordinators had varying levels of knowledge around what foods remained high quality and safe past their date labels. Some did not distinguish between types of date labels and noted that any foods past their date label should immediately be thrown away, while others acknowledged that those foods were still okay to eat. Approximately a quarter of the coordinators we interviewed were accurately informed about the differences in date labels and were aware that most foods in the pantry were able to be safely consumed even past the date.

Some coordinators tried not to serve foods that were past their date labels (e.g., best if used by, sell by, use by). This was a challenge for some pantries, because items that were less popular stayed on the shelves longer. Food going past date also occurred when coordinators accidentally ordered too much of a certain item or when they intentionally ordered too much food to meet the minimum amount required by the food bank for the month. Other coordinators—those who were more informed about date labeling practices—provided education to clients about date labels by handing out flyers or having in-person conversations. One client created stickers with a QR code that referred clients to educational websites about how to maximize the freshness and quality of items (e.g., USDA FoodKeeper app [FoodSafety.gov, 2019]) and handed out these stickers when shoppers visited the pantry.

Regardless of their knowledge on date labels, nearly all coordinators commented on being committed to providing high quality foods to their clients. As one coordinator noted:

I don't want to give anyone something that I wouldn't eat myself. If I wouldn't serve it to my daughter, I wouldn't serve it to your sons or daughters. [So1]

Almost all coordinators described using a variety of methods to provide what they perceived as high quality food, including diligently rotating the items in the pantry, sorting through fresh produce

and throwing out items that were not fresh, giving past-date foods to farms for composting, donating close-to-past date foods to other schools, organizations, or churches for same-day distribution or putting those foods in the school lobby at pick-up time so parents could grab them without having to go to the pantry. Schools would also reach out to each other if they had extra food. A few coordinators mentioned that they would cook up hotdogs and burgers that were left over from the pantry and serve them to kids after school. Only two coordinators noted that they would add items into to-go bags and send them home with the families just to get rid of them, regardless of whether they thought clients would want them. They noted this was common with unpopular items such as cranberry sauce, canned vegetables, and low-sodium and low-fat items:

Pg1: I'll give you an example. The cranberry sauce. That was the last thing on our list, and they've sent us 16 cases. ... We throw it in a weekend bag because that's the only way we can get rid of it.

Interviewer: Do you know if families are then just throwing it out?

Pg1: I don't even ask after that point. What you do with it is your business. It takes up space here.

Coordinators Provided Food and Nutrition Education

Coordinators described lack of food, nutrition, and cooking education to be a barrier for some clients to use the pantry (i.e., they would not take items they were unfamiliar with) or for using the foods they received (i.e., they threw them out after receiving them). Three coordinators independently described finding items from the pantry scattered across the school parking lot or hearing that students left certain items on the buses instead of taking them home. To combat or avoid this situation, coordinators provided educational materials to clients, and in multiple languages. Some pantries sent out digital newsletters to all parents of students in the school, sharing nutrition facts and recipes that could be made with items from the pantry. Other

pantries handed out flyers and recipe cards, and others provided in-person education to clients visiting the pantry. Approximately one quarter of coordinators noted that they prepared taste tests of certain items in the pantry. They found this particularly useful in helping students choose items with which they were unfamiliar. In addition to nutrition education, a few coordinators provided information about date labels, noting that this information helped parents feel more comfortable taking items that were close to the dates.

Coordinators Maximized Availability and Accessibility

At many schools, pantries are only open on designated days and times, which restricts some clients from using the pantry because of work schedules or other obligations. Coordinators described working hard to ensure that the pantries are available and accessible to clients. For example, both adult and student clients can request a pantry visit during a time when the pantry is not open, including evenings or on weekends. Coordinators noted that they sometimes change their schedules, work extra hours, and make multiple trips to the school on some days to accommodate these visits.

Although some pantries do have direct entry points from outside the school, schools with pantries accessible only from inside the building (i.e., through hallways inside the school) described this as a barrier for some clients to use the pantry. Schools have specific safety precautions for visitors and require all visitors to check in. This was a particular barrier for non-school affiliated community members, and especially undocumented individuals due to a misunderstanding of the sign-in process and/or fear of legal retribution for receiving services. Some pantry coordinators also asked clients to call ahead of time to make an appointment, so both the school and the pantry would be prepared. Although this was effective for some families, coordinators believed that these extra steps decreased participation and wished they had a way to provide service that did not require involvement from the school at large.

Even after maximizing availability and accessibility, coordinators described some existing barriers to pantry utilization. For example, they believed

that many potential clients lacked transportation to get to the pantry. Some clients do not have cars, which coordinators noted was especially problematic in rural areas where schools are not within walking distance from their homes and public transportation is not as widespread, reducing the number of clients who visit the pantries. In urban areas, many schools are located within walking distance of public transportation; however, coordinators noted that clients using public transportation tend to pick up fewer items from the pantry to make their travel easier. Coordinators felt that this barrier was out of their control but still expressed disappointment in not having the ability to reach potential clients.

Coordinators Use a Variety of Marketing Techniques

Approximately one-fifth ($n = 41$) of pantries surveyed described awareness of the pantry as a medium or high barrier to utilization. Coordinators spread awareness of the pantry through online marketing through social media, virtual classroom platforms (e.g., Google Classroom), and district websites and emails. Some schools also sent notifications to parents through text message or paper flyers. Around a quarter of coordinators interviewed noted that their schools had in-person events to help connect pantry clients with outside organizations or resources (e.g., housing, financial literacy). Coordinators often hosted a table at these events, handing out food and increasing awareness about the pantry. However, in the interviews, coordinators frequently stated that their current marketing tactics were not reaching as many people as they wanted to reach. Many coordinators said that they had capacity to increase the number of clients served, but did not know how best to inform families and community members. As one coordinator noted:

How do we market? I've sent flyers. I've sent video messages. Again, it gets buried in yet another ding. ... That's one of my biggest challenges. [Mo1]

Pantries use a Variety of Choice Models to Meet Clients' Needs

There is ample evidence that using full choice

models decreases stigma and increases clients' willingness to visit a pantry (Martin et al., 2024). However, pantries in this study used varying levels of client choice, often to address barriers related to feasibility of running the pantry. Of those with a designated space, just over half ($n = 91$, 55.8%) utilized a full choice model, followed by no choice ($n = 31$, 19%), limited choice ($n = 34$, 20.9%), and modified choice ($n = 16$, 9.8%) models. For pantries with distribution events, an equal number used full choice ($n = 44$, 36.7%) and no choice ($n = 46$, 38.3%). Many coordinators, even those using no, limited, or modified choice, saw the importance of having students and families shop for their own food in the pantries. Those who strictly used a no choice model described mainly logistical barriers to offering choice, including serving many clients at once, wanting to make sure each family got similar types of foods, and/or wanting to provide a balanced distribution of items that would last multiple days. For example, one coordinator noted:

That's a tough one. I have heard from families, like, "But it's 10 of us. Why can't I take three boxes of cereals?" [But] we have a hundred families in line. I'd rather have these one hundred families be able to go home with one box of cereal than just have 20 families take cereal. That one is always a tough one. [Bo1]

Numerous pantries used a combination of models. In these cases, coordinators would give families a set bag of food for the first time and then ask for feedback. In subsequent visits, coordinators used the feedback and knowledge gained from relationship-building to personalize bags. However, some coordinators noted that space was a constraint to allowing families to shop for themselves. Of all survey respondents, 17% ($n = 32$) reported that they had challenges with space. A few coordinators noted that they addressed space constraints by setting up tables and allowing clients to shop in a different space, such as the gym or cafeteria. This had drawbacks, however, as they were only available for shopping at very specific times and required effort to set up, run, and take down the event.

Improve Social and Economic Resources (Quadrant 3)

In this section, we describe how coordinators worked to improve social and economic resources, aligned with Quadrant 3 of the GTE framework. Coordinators connected families with wraparound services, referrals, and multilingual resources to provide support beyond food access.

Coordinators Connect Clients with Wraparound Services and Resources

Coordinators noted that, although they wanted to serve as many students and families as possible, the ultimate goal was for households to not need to use the pantries anymore. Coordinators also recognized that most families needed more than just food support, and almost all pantry coordinators connected clients with partners and resources outside of the school, such as organizations that offered housing services, banking services, and employment assistance. Many coordinators noted that these wraparound services were as important—if not more important—as providing food to clients. As one coordinator said:

We're a school. I'm not a supermarket and I don't want to be a supermarket. How can I help to make those connections with partners so that families are getting what they need to be successful? [Aa1]

Coordinators connected clients through direct connections or referrals to other organizations, or by providing information to families through collated lists of resources. Additionally, some pantries had a designated area (e.g., table, wall) that highlighted additional resources. These were openly available to clients when they came to the pantry, but coordinators would also pass them out when they saw or heard about a specific need. Community school coordinators were most likely to know of and hand out resources, since this was part of their job separately from the food pantry. Around half of the coordinators noted that they provided multilingual resources.

Around a quarter of coordinators also described having in-person events to help connect pantry clients with outside organizations. These

events were centered around non-food activities (e.g., literacy fair, family night), but there was almost always a food distribution component. Many coordinators described the relationships with outside partners as mutual and reciprocal; they helped connect pantry clients with other organizations and those organizations connected their clients with the school pantry.

Many, but not all, pantries provided information about how families could sign up for federal programs, such as the Supplemental Nutrition Assistance Program (SNAP) or the Special Supplemental Program for Women, Infants, and Children (WIC). None of the pantries we talked to directly assisted clients with signing up for these programs, although a few pantries were able to direct clients to partners who could assist them.

Build on Community Capacity (Quadrant 4)

In this section, we describe the strategies coordinators used to build on community capacity, aligned with Quadrant 4 of the GTE framework. Coordinators emphasized building trusting relationships with students and leveraging partnerships with local organizations, other schools, and individuals to aid pantry operations.

Coordinators Build Relationships with Students

In all interviews, we found that relationships are at the heart of school food pantry coordinators' work. In the older grades, coordinators worked hard to build rapport with students so they would feel comfortable utilizing the pantries. For example, coordinators mentioned keeping snacks in the pantry that students would want to eat during the day, having students volunteer in the pantry so they could promote it to their peers, and promoting the pantry to everyone (i.e., no income restrictions). They said this helped build relationships with students, brought in new students who might not have otherwise visited the pantry, and built general rapport in the school. One coordinator illustrated this by saying:

The first couple times, students can be really intimidated. They're like, "Oh, my gosh, I can't believe I have to go here and get food for my family." But then they walk in [and] there's like

20-30 people hanging out, having a good time. I [tell my volunteers], “We don’t say, ‘Do you need this?’ or things like that. It’s just, ‘Hey, we have this, would you like it?’” [Wi1]

Coordinators Leverage External Partnerships to Procure Food

Pantry coordinators built external relationships with local community organizations, libraries, churches, and nearby schools to supplement foods received from the food bank and acquire other nonfood items. Although they often had enough food to meet clients’ needs, they worked to expand the variety of foods they offered, specifically high-demand items such as fresh produce, meat, and eggs. Most often, coordinators described receiving free items from local nonprofit organizations and churches. A few coordinators described receiving items from individuals, such as families that attend the school, community members that live near the school, and even school staff. Two coordinators noted that they sometimes received leftover produce or canned items from the cafeteria. Other coordinators purchased or received free items from farms or for-profit businesses. One coordinator noted that they specifically fundraise to purchase additional food from wholesalers, because they have more freedom to choose items they know students and families will want, or to provide special items for families such as birthday cake mixes. However, many pantries had limited funds to purchase food from outside businesses or organizations, and coordinators described continuously looking for funding and writing grants so they could consistently offer a wide selection of foods.

Coordinators often built informal relationships with partners outside of work, on weekends or in the evenings. None of the coordinators directly acknowledged that this was an important part of their work, but they did tell stories about how the personal connections made outside of work helped sustain the pantry financially (e.g., through monetary or food donations) and/or provided additional supports for clients.

Coordinators Faced Barriers to Building Capacity

However, connecting with external partners also posed challenges, as running the pantry was only

one of many hats worn by coordinators. Fifty-six percent ($n = 111$) of survey respondents reported their main role as community school coordinators; 32% ($n = 62$) were counselors, 29% ($n = 57$) were volunteers at the school, 13% ($n = 25$) were teachers, and 6% ($n = 12$) were administrators. Many coordinators we spoke with had limited time during the day for capacity building with outside partners, and a quarter of survey respondents ($n = 52$, 27.5%) described lack of staffing as a high or medium barrier to their operations. Coordinators noted that these relationships were typically not documented, which would make it difficult to pass the information to succeeding coordinators. Indeed, multiple coordinators we spoke with worried that if they left their job, the pantry would shut down or, at the very least, run less efficiently and effectively.

Discussion

In this mixed-methods evaluation, we used the GTE framework to map the ways in which school-based food pantries in Maryland promoted equity through operations and utilization. School pantries sought to improve food security of households through providing desirable, culturally appropriate, and often healthy foods to a wide variety of adult and student clients (Quadrant 1). Coordinators recognized numerous factors that hindered pantry utilization and adjusted their approaches to increase desirability and usability for clients and feasibility for the coordinators themselves (Quadrant 2). Coordinators recognized the need to provide social and economic resources, such as information about other nutrition assistance programs as well as non-food resources (Quadrant 3). Finally, coordinators built on community capacity by leveraging partnerships with external donors to expand their food options and forming relationships with students to reach a wider population (Quadrant 4).

Additionally, all pantries exemplified the three GTE foundational principles—promoting equity, engaging communities, and centering people. For example, coordinators emphasized the importance of listening to student and family preferences and responding to their needs. Through the act of listening to clients (community engagement), coordinators came to understand clients’ goals at the pan-

try (centering people) and provided foods they would not have been able to access otherwise (providing equitable options). In general, pantry coordinators were essential to ensuring equitable implementation and, although not explicitly stated, they consistently looked for ways to advance equity in both operations and utilization. We often think of equity as creating opportunities that level the playing field between those with more wealth, resources, and opportunities and those who have less. Thus, food pantries themselves are an equitable intervention as they aim to alleviate financial strain on households and allow them to allocate their resources toward other essential needs. However, even within equity-targeted interventions, we must consider the extent to which equity is operationalized and implemented. Equitable implementation means that an intervention maximizes reach to the population of interest (i.e., inclusiveness, participation, utilization, destigmatization, operational flexibility, etc.); is sensitive to the needs and preferences of the population of interest; preserves dignity and affords an appropriate level of privacy; provides high quality resources and support (in this case, high quality, safe, and nutritious food); maximizes use of available resources and avoids waste that would work against overall program effectiveness; and works toward self-sufficiency (S.

Kumanyika, personal communication, April 23, 2025).

In many ways, school pantries simply acted as community pantries located in schools. This was particularly true for elementary school pantries, which were primarily open to guardians and community members, and rarely allowed students to utilize the pantry on their own. School pantries also promote equity in some similar ways to community pantries. For example, pantry coordinators noted that they ordered foods with intention, balancing nutrition, cultural relevance, and convenience to provide items clients wanted to eat (Kinderknecht et al., 2023; Martin et al., 2021). Additionally, some school pantries in this study provided food and nutrition education (An et al., 2019; Hardison-Moody et al., 2015), used full choice models (Martin et al., 2024; Sanderson et al., 2020), leveraged external partnerships to procure food (Gibson et al., 2022; Lowrey et al., 2024), and connected cli-

ents with wraparound services and resources (Martin, Redelfs et al., 2019; Sanderson et al., 2020). Traditionally, it has been beyond the scope of the charitable food system to address root causes of food insecurity; however, within the past decade, many food banks began to engage in root cause work. For example, addressing the root causes of hunger is highlighted on both MFB's and CAFB's websites, and since 2018, has been part of MFB's strategic plan (Maryland Food Bank, n.d.) and research efforts (Sturm, 2024). In recent years, Feeding America has added goals to create partnerships with organizations to address underlying causes of hunger (e.g., poverty) and advocate for anti-hunger policies in addition to their primary goal of providing food with respect and dignity (Feeding America, n.d.-b).

However, in other ways, school pantries operated in unique and novel ways compared to community pantries. For example, school pantries can build stronger relationships with clients because they have more touchpoints with each client. As opposed to community pantries, where clients may visit weekly or monthly (Coleman-Jensen & Rabbitt, 2021), pantry coordinators at elementary schools may connect with students' guardians during pickup and drop-off times. In schools of all grade levels, teachers and other school staff connect with guardians regularly about students' academic progress. Additionally, teachers, counselors, and other school staff interact with individual students every day and often know what students are experiencing outside of school and what additional resources they may need for support (Thomas et al., 2019). School pantries also have the advantage of being able to advertise through existing school channels. In this study, coordinators noted that they used email, newsletters, and in-person events at the school to engage potential clients. Schools tend to have up-to-date contact information for parents and can also hand out paper fliers, which is important for low-income populations who may have inconsistent access to technologies such as phone and email (Vogels, 2021). Some coordinators in this study also noted that they accommodated clients if they were not able to come during regular hours. Limited hours of operation has been identified as a major barrier to access of commu-

nity pantries (Ginsburg et al., 2019). Because coordinators typically work at the school all day, even when the pantry is not open, they may have more flexibility compared to coordinators at community pantries, who may have to drive to the pantry on days it is not open.

School pantries are also uniquely positioned to support adolescents experiencing food insecurity. Studies have also shown that adolescents in households experiencing food insecurity often take responsibility for household food acquisition (Mmari et al., 2019; Popkin et al., 2016) and that adolescents wished there were more places near to school where they could acquire free food (Harper et al., 2022). In this study, we found that pantries located in high schools were often open to both adults and students and that coordinators used strategies to reduce stigma and increase student awareness. Still, it is unknown if school pantries reach the number of students who are in need. In 2018, the Risk Youth Behavior Survey found that 28% of high school students in Maryland experienced food insecurity, and that Black, Latino, and Indigenous students were at a disproportionately higher risk (Kelley, 2020). Involving students in the design, marketing, and outreach of the pantry may help increase engagement and awareness (Feeding America & Urban Institute, 2015). Involving students in the ordering process may also ensure foods in the pantry meet the specific needs of students and their households. However, it is important that pantries in high schools also continue outreach to students' parents and guardians to avoid "adultizing" students by giving them the primary responsibility of food acquisition (Harper et al., 2022). Additionally, a challenge for high school pantries is balancing the provision of healthy foods and foods students want to eat. Adolescents have the lowest diet quality of all age groups in the U.S. (Dietary Guidelines for Americans, 2022), and studies have found that adolescents often choose foods with high sodium, sugar, and saturated fat (Neumark-Sztainer et al., 1999). High school pantry coordinators in this study noted that they wanted to provide nutritious options, but that their top priority was ensuring students want to visit and feel comfortable visiting the pantry. Strategies such as taste tests and cooking demonstrations may help

with students' willingness to try new foods (Nekitsing et al., 2019), but more research is needed in the context of school pantries.

School pantries of all grades in this study provided numerous healthy options for clients, reflected by the mean CFNI score of 70.1. However, there was large variability in CFNI scores for school pantries, with nearly half of the pantries scoring lower than 70 points. Although the CFNI was recently developed and there is limited information on typical or ideal pantry scores, an analysis of three USDA household nutrition programs found that scores ranging between 74.4 and 81.1 out of 100 points reflect "availability of healthy foods" (Gombi-Vaca et al., 2023). We did not explicitly ask about coordinators' perceptions of the nutritional quality of the foods offered in the pantries, though they discussed numerous reasons, and some challenges, for ordering specific items. Although the food banks list the nutritional ranking of each item on the website according to the Supporting Wellness at Pantries (SWAP) stoplight system (Martin, Wolff et al., 2019), there is no guidance for pantry coordinators about what ratio of green, yellow, and red items they should order. Feeding America may consider providing standardized guidance for food banks and pantries about recommended ranges for CFNI scores. Additionally, food banks may consider calculating CFNI scores for all pantry orders to increase awareness and encourage pantry coordinators to choose items that add up to overall higher scores. Ensuring nutritious foods are consistently available in school pantries will increase equitability of food access for students and families.

In this study, we identified challenges that may make operations more difficult for school pantries compared to community pantries. For example, running the pantry was often not coordinators' full-time jobs, and they had a distinct disadvantage when ordering foods. According to MFB staff, community pantries with full-time staff can monitor the food bank websites more often, so they often get first choice in what they are able to order. One way MFB is working to correct this is by introducing "cart protection" for online ordering, which will allow coordinators to place items in their carts without the risk of losing them if they

have to pause and come back later (MFB, personal communication, December 17, 2024). Overall, food banks can support school pantries by providing efficient, easy-to-use ordering platforms, using coordinator feedback to ensure the items available for order align with communities' needs, and helping coordinators brainstorm solutions to problems. Other challenges we identified in this study (which are not necessarily unique to school pantries) include lack of client transportation to reach the pantry; lack of pantry awareness; what to do with surplus food if they did not have connections to outside organizations or other schools who wanted to take it; logistical barriers to using full choice models; and barriers to building capacity, including wearing too many hats, lacking staff support, and sustainability of the pantry when coordinators left the position. To address these challenges, it may be beneficial to create communities of practice (Mercieca, 2017) or other collaborative spaces for school pantry coordinators across the state to share best practices, successes, challenges, and strategies for problem solving.


Strengths and Limitations

This study had many strengths, including the high response rate of survey respondents and using qualitative methods to explain survey results. Additionally, the researchers worked closely with MFB and CAFB throughout the research process, including question formation, study design, and tool creation. We presented results to the food banks and used feedback to help shape analysis and discussion. Additionally, this study utilized the GTE framework, which focuses heavily on implementation of interventions (in this case, school food pantries). Interventions are often complex and setting-specific, and effectiveness depends on implementers' ability to respond to challenges and adapt approaches to unique populations.

This study also had some limitations. This landscape analysis included only one state and two Feeding America food banks, and the results may not be generalizable elsewhere. Some counties were also over- and underrepresented in our analyses, and results may better reflect pantries with certain characteristics over others. Additionally, we were only able to conduct the nutritional assessment in

21 pantries, which was sufficient for providing a general overview of the pantries but not enough to conduct robust statistical analyses. We also recognize that the GTE is a two-dimensional logic model, and that some themes fit into two or more domains. However, as the scales of justice in the figure represent, efforts are most likely to advance equity when all four quadrants build on each other and reinforce each other in complementary ways. Future studies may consider pairing the GTE with systems mapping techniques, following the methods of Headen and colleagues (2025) to assess complex interventions and approaches to food access, nutrition, and obesity prevention (Headen et al., 2025).

Conclusions

This study described myriad ways school-based food pantries use equity to provide nutritious, dignified food access to low-income households with children. We found that there are many benefits to operating pantries within schools and, at the same time, school pantries face unique challenges that hinder their efficiency and effectiveness. The results of this study identified numerous equitable practices other school pantries may be interested to explore. However, we are left with numerous questions for further research: Do school pantry programs in other states promote equity in similar ways? What resources do schools need to support and promote the effectiveness of their pantries? What is the long-term impact of school pantries on food insecurity and student learning outcomes? A better understanding of school pantries, including how to leverage existing assets and address key barriers, will lead to more equitable food access for children, families, and communities. 

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Appendix A. In-Depth Interview (IDI) Guide for School Pantry Coordinators

Background information

- Tell me a little bit about yourself. [Possible probes:
 - How long have you worked at the school / in this district?
 - How long have you been in charge of the pantry?
 - What first attracted you to work at the pantry?]

Pantry information

- You noted on the survey that you run [name all food distribution programs]. Are there any other programs you run or that the school runs that weren't listed on the survey?
 - [If yes] Tell me about them (e.g., location, reach, hours of operation, frequency, eligibility, choice model, utilization)
- Tell us a bit about the people who normally access the pantry.
 - e.g., English as first/second language, typical age, number of people in family, etc.
- Is the pantry open year round? (i.e., during summer and winter breaks as well as during the school year?)
- On the survey, you indicated that your pantry is open [time, frequency]. Does that seem to be sufficient for everyone who wants to use the pantry?

Accessibility [Getting to Equity Framework (GTE) sector: Reduce Deterrents]

- How do people normally get to the pantry? (e.g., bus, own car, carpool)
 - Is there a bus line close by?
 - For people who drive, is there a designated place for them to park?
 - Do you have any transportation challenges with clients accessing the pantry?
- How do you typically advertise or recruit people for the pantry?
- Do clients need documentation or ID in order to access the food pantry?
- Do you have a disaster-related plan for your food pantry (e.g., for inclement weather, other school closures)
 - If so, please describe it.
- For community members who use the pantry, how do they interact with the school? (e.g., do they have to go through security, where do they come in?)
 - Is this ever a barrier for people to use the pantry?
- Tell me a bit about who your pantry might be missing. In other words, are there people in the community you serve who are not currently accessing the pantry?
 - Are there specific reasons why these groups don't access the pantry?

Food quality [GTE sector: Increase Healthy Options]

- On the survey, you indicated that your pantry offers [name examples of foods]. Who makes the decisions about what foods are in the pantry?
- What are some challenges you face in stocking the pantry?
- [If not addressed above] Are you satisfied with the types of foods available in the pantry?
- On the survey you indicated you used [name choice model]. Tell me a little bit about your choice model.
 - Is there a specific reason why you use this type of model instead of another?
- What type of guidance, if any, do you provide to clients about the nutritional quality of the foods in the pantry?

Barriers to operation and utilization [*GTE sector: Reduce Deterrents*]

- On the survey, you noted that [name challenges] were challenges your pantry faces. Tell me more about these challenges.
 - e.g., storage, staffing, space, awareness, funding (*for Capital Area Food Bank [CAFB] partners, specifically probe about funding*)
- How are these barriers the same or different for different groups, such as parents, students, and non-school community members?
- You noted that [name any challenges that have already come up in the interview]. What are some other challenges you face when running the food pantry?
- What are some ways you've overcome those challenges?

Other types of assistance [*GTE sector: Improve Social and Economic Resources*]

- On the survey, you indicated that you provide [name other types of resources available]. Tell me a little more about those resources.
- [If applicable] Tell me more about the guidance you provide on accessing federal nutrition assistance programs.

Community partnerships [*GTE sector: Build on Community Capacity*]

- Tell me about how the surrounding community (outside the school) supports the school pantry.
 - Specific partnerships?
 - Outside resources?

Closing

- Is there anything else you'd like to share about the pantry?

Appendix B. Guide for Evaluating School Food Pantries Using the Getting to Equity (GTE) Framework

Problem Statement

1. What was the problem addressed by creating/utilizing school food pantries?

Quadrant 1: Increase Healthy Options

1. Describe school food pantries in depth. What approach or combination of approaches did pantries use to address the problem described above?
2. What assumptions did coordinators make about how different populations could access the pantries, with respect to reach, participation, feasibility, or sustainability?

Quadrant 2: Reduce Deterrents

1. What community, policy, organizational, and sociocultural factors hindered success of the pantries with regards to...
 - a. Whether the target population *wanted* to use the pantries (Desirability)?
 - b. Whether the target population *could* use the pantries (Usability)?
 - c. Whether the pantries were *able to be implemented* (Feasibility)?
2. How did the pantries address each of the factors above?

Quadrant 3: Social and Economic Resources

1. What type(s) of assistance or resources outside of the scope of the pantries could help address the problem outlined above?
2. In what ways did the pantries help connect the target population with those resources and other types of assistance?

Quadrant 4: Building On Community capacity

1. How did partnerships or advocacy help improve the likelihood that the pantries would be effective in addressing the problem at hand? What did the pantries gain from these partnerships or perspectives?
2. What community assets enhanced the work of the pantries? What existing networks and infrastructures were beneficial?

Systems Perspective

1. What were some of the potential positive side effects (“co-benefits”) of the pantries? In other words, what were some unintended benefits that fostered health or social equity in other ways?
2. What were some of the potential negative side effects of the pantries? How did coordinators manage these?

Appendix C. General Characteristics of Survey Respondents ($n = 196$) and Characteristics Based on School Food Pantry Type

	All pantries ($n = 196$) n (%)	Maryland Food Bank ($n = 176$) n (%)	Capital Area Food Bank ($n = 20$) n (%)
GENERAL CHARACTERISTICS			
Total respondents (response rate)	196 (87.9)	176 (92.1)	20 (62.5)
Community school			
Yes	142 (72.4)	124 (70.5)	18 (90)
No	43 (21.9)	41 (23.3)	2 (10)
Not sure	11 (5.6)	11 (6.3)	0 (0)
Grade levels served ^a			
Elementary	131 (66.8)	114 (64.8)	17 (85)
Middle	78 (39.8)	74 (42)	4 (20)
High	33 (16.8)	33 (18.8)	0 (0)
Pantry coordinator job title			
School administrator	10 (5.1)	9 (5.1)	1 (5.0)
Teacher	14 (7.2)	14 (8.0)	0 (0)
Volunteer	4 (2.1)	4 (2.3)	0 (0)
Counselor or social worker	42 (21.5)	42 (24.0)	0 (0)
Community school coordinator	89 (45.6)	72 (41.1)	17 (85.0)
Other	36 (18.5)	34 (19.5)	2 (10.0)
0–1 year	64 (32.8)	59 (33.7)	5 (25.0)
2–4 years	92 (47.2)	77 (44.0)	15 (75.0)
5 or more years	39 (20.0)	39 (22.3)	0
PANTRY MODEL: DESIGNATED SPACE			
N (% of total respondents)	163 (83.2)	143 (81.3)	20 (100)
Access ^a			
Appointment	20 (12.3)	13 (9.1)	7 (35)
Invitation	19 (11.7)	16 (11.2)	3 (15)
Referral	2 (1.2)	2 (1.4)	0 (0)
Open access	88 (54.0)	74 (51.7)	14 (70)
Other	38 (23.3)	38 (26.6)	0 (0)
Frequency			
Less than once a month	3 (1.8)	3 (2.1)	0 (0)
Once a month	39 (23.9)	39 (27.3)	0 (0)
A few times a month	32 (19.6)	29 (20.3)	3 (15)
Once a week	26 (16.0)	25 (17.5)	1 (5)
A few times a week	33 (20.2)	22 (15.4)	11 (55)
Every day	13 (8.0)	12 (8.4)	1 (5)
Other	17 (10.4)	13 (9.1)	4 (20)

continued

	All pantries (n = 196) n (%)	Maryland Food Bank (n = 176) n (%)	Capital Area Food Bank (n = 20) n (%)
Time			
Morning only	8 (4.9)	8 (5.6)	0 (0)
Morning and afternoon	75 (46.0)	62 (43.4)	13 (65)
Afternoon only	39 (23.9)	38 (26.6)	1 (5)
Afternoon and evening	17 (10.4)	13 (9.1)	4 (20)
Other (e.g., during school day)	21 (12.9)	19 (13.3)	2 (10)
Average number of households served on a typical day			
0-10	45 (27.6)	40 (28)	5 (25)
11-30	49 (30.1)	38 (26.6)	11 (55)
31-50	29 (17.8)	28 (19.6)	1 (5)
51-100	34 (20.9)	31 (21.7)	3 (15)
>100	6 (3.7)	6 (4.2)	0 (0)
Choice model			
Full	91 (55.8)	75 (52.4)	16 (80)
Modified	16 (9.80)	15 (10.5)	1 (5)
Limited	25 (15.3)	23 (16.1)	2 (10)
No choice	31 (19.0)	30 (21)	1 (5)
Tracking use of the pantry ^a			
No tracking	22 (13.5)	21 (14)	1 (5)
Sign-in sheet	108 (66.3)	95 (49.7)	13 (65)
Sign-up ahead of time	24 (14.7)	18 (9.1)	6 (30)
Other	28 (17.2)	23 (11.9)	5 (25)
Eligibility ^a			
Students only	11 (6.7)	10 (7)	1 (5)
Students and families	148 (90.8)	134 (93.7)	14 (70)
Families	14 (8.6)	7 (4.9)	7 (35)
Community members	113 (69.3)	101 (70.6)	12 (60)
Teachers/school staff	103 (63.2)	91 (63.6)	12 (60)
Food source ^a			
Food bank	163 (100.0)	142 (99.3)	20 (100)
Nonprofit	35 (21.5)	34 (23.8)	1 (5)
Business	2 (1.2)	2 (1.4)	0 (0)
Church	20 (12.3)	17 (11.9)	3 (15)
Sorority	4 (2.5)	4 (2.8)	0 (0)
Purchased	21 (12.9)	20 (14)	1 (5)
PANTRY MODEL: DISTRIBUTION EVENT			
N (% of total respondents)	120 (61.2)	111 (63.1)	9 (45)
Frequency			
1 per month	91 (75.8)	88 (79.3)	3 (33.3)
2 per month	14 (11.7)	13 (11.7)	1 (11.1)
3+ per month	15 (12.5)	10 (9)	5 (55.6)

continued

	All pantries (n = 196) n (%)	Maryland Food Bank (n = 176) n (%)	Capital Area Food Bank (n = 20) n (%)
Time ^a			
Weekday mornings	30 (25.0)	24 (21.6)	6 (66.7)
Weekday afternoons	84 (70.0)	78 (70.3)	6 (66.7)
Evenings	26 (21.7)	23 (20.7)	3 (33.3)
Weekends	5 (4.2)	5 (4.5)	0 (0)
Average number of households served per event			
0-10	8 (6.7)	8 (7.2)	0 (0)
11-30	29 (24.2)	24 (21.6)	5 (55.6)
31-50	34 (28.3)	33 (29.7)	1 (11.1)
51-100	38 (31.7)	38 (34.2)	0 (0)
>100	11 (9.2)	8 (7.2)	3 (33.3)
Model			
Full	44 (36.7)	37 (33.3)	7 (77.8)
Modified	12 (10.0)	12 (10.8)	0 (0)
Limited	18 (15.0)	17 (15.3)	1 (11.1)
No choice	46 (38.3)	45 (40.5)	1 (11.1)
Tracking use of the event ^a			
No tracking	21 (17.5)	20 (18)	1 (11.1)
Sign-in sheet	76 (63.3)	71 (64)	5 (55.6)
Sign-up ahead of time	17 (14.2)	13 (11.7)	4 (44.4)
Other	19 (15.8)	17 (15.3)	2 (22.2)
Eligibility ^a			
Students only	7 (5.8)	7 (6.3)	0 (0)
Students and families	111 (92.5)	102 (91.9)	9 (100)
Families	9 (7.5)	9 (8.1)	0 (0)
Community members	82 (68.3)	75 (67.6)	7 (77.8)
Teachers/school staff	68 (56.7)	62 (55.9)	6 (66.7)
Food source ^a			
Food bank	120 (100.0)	110 (99.1)	9 (100)
Nonprofit	31 (25.8)	29 (26.1)	2 (22.2)
Business	1 (0.8)	1 (0.9)	0 (0)
Church	16 (13.3)	14 (12.6)	2 (22.2)
Sorority	3 (2.5)	3 (2.7)	0 (0)
Purchased	21 (17.5)	20 (18)	1 (11.1)
PANTRY MODEL: BACKPACK PROGRAM			
N (% of total respondents)	103 (52.6)	97 (55.1)	6 (30)
Frequency			
1 per month	2 (1.9)	1 (1)	1 (16.7)
2 per month	11 (10.7)	10 (10.3)	1 (16.7)
4 per month	78 (75.7)	75 (77.3)	3 (50)
Other	12 (11.7)	11 (11.3)	1 (16.7)

continued

	All pantries (n = 196) n (%)	Maryland Food Bank (n = 176) n (%)	Capital Area Food Bank (n = 20) n (%)
Average number of bags distributed per month			
0-50	47 (45.6)	43 (44.3)	4 (66.7)
51-100	20 (19.4)	19 (19.6)	1 (16.7)
101-500	30 (29.1)	29 (29.9)	1 (16.7)
>500	6 (5.8)	6 (6.2)	0 (0)
Tracking use of the program			
No tracking	9 (8.7)	9 (9.3)	0 (0)
Sign-in sheet	25 (24.3)	21 (21.6)	4 (66.7)
Sign-up ahead of time	50 (48.5)	48 (49.5)	2 (33.3)
Other	28 (27.2)	27 (27.8)	1 (16.7)
Eligibility ^a			
Students only	60 (58.3)	56 (57.7)	4 (66.7)
Students and families	43 (41.7)	41 (42.3)	2 (33.3)
Families	1 (1.0)	1 (1)	0 (0)
Community members	7 (6.8)	5 (5.2)	2 (33.3)
Teachers/school staff	12 (11.7)	11 (11.3)	1 (16.7)
Food source ^a			
Pack our own	53 (51.5)	50 (51.5)	3 (50)
Receive from another source	50 (48.5)	47 (48.5)	3 (50)
PANTRY MODEL: HOME DELIVERY			
N (% of total respondents)	68 (34.7)	66 (37.5)	2 (10)
Average number of deliveries per month			
0-10	60 (88.2)	58 (87.9)	2 (100)
11-30	3 (4.4)	3 (4.5)	0 (0)
31-50	3 (4.4)	3 (4.5)	0 (0)
51-100	2 (2.9)	2 (3)	0 (0)
Tracking use of home delivery ^a			
No tracking	12 (17.6)	11 (16.7)	1 (50)
Sign-in sheet	27 (39.7)	26 (39.4)	1 (50)
Sign-up ahead of time	18 (26.5)	18 (27.3)	0 (0)
Other	14 (20.6)	14 (21.2)	0 (0)
Eligibility ^a			
Students only	4 (5.9)	4 (6.1)	0 (0)
Students and families	56 (82.4)	54 (81.8)	2 (100)
Families	8 (11.8)	8 (12.1)	0 (0)
Community members	14 (20.6)	14 (21.2)	0 (0)
Teachers/school staff	6 (8.8)	6 (9.1)	0 (0)

^aSurvey option to "Select all that apply"