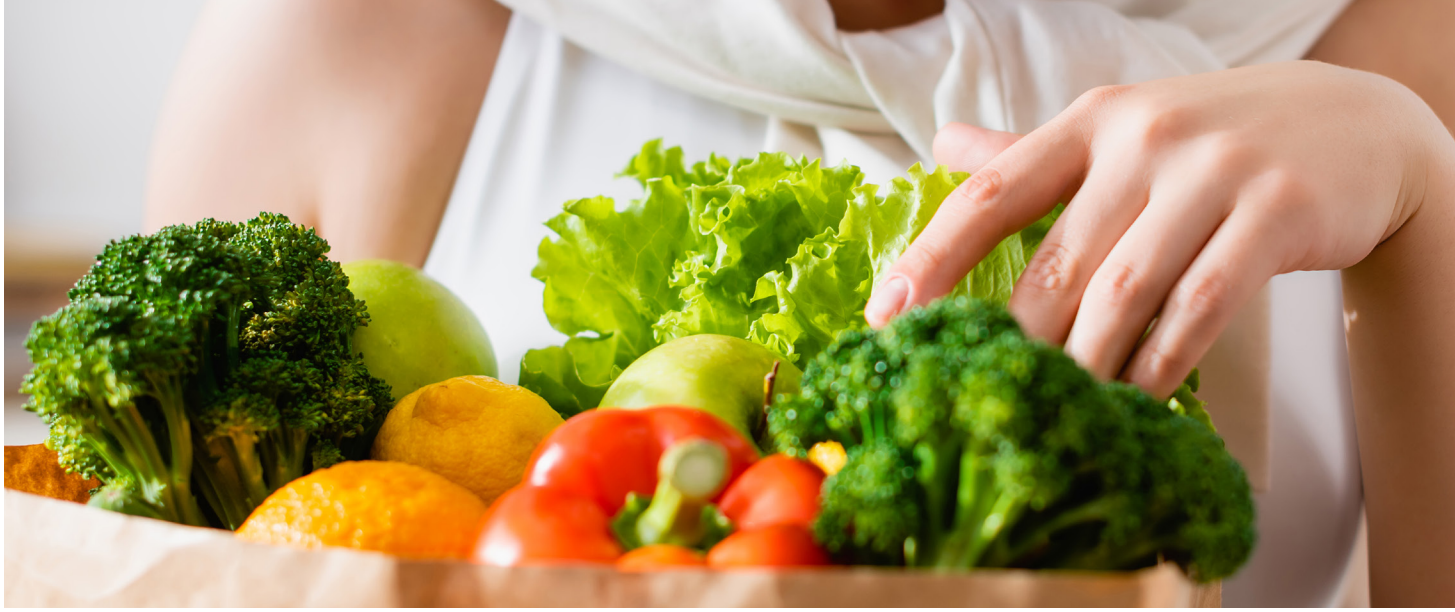

SAN ANTONIO FOOD INSECURITY ASSESSMENT

AND USER GUIDE FOR WEB-BASED TOOLS BUILT TO COLLECT AND VISUALIZE DATA RELATED TO FOOD INSECURITY IN BEXAR COUNTY

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This Food Insecurity Assessment and User Guide was created by the University of Texas Health Science Center at Houston for the Health Equity Network. The Network is a collective impact initiative with three focus areas: Food Insecurity, Housing Stability, and Access to Respectful Care. It is supported by its backbone organization, the Policy and Civic Engagement Office, at the San Antonio Metropolitan Health District.

This report is part of a qualitative and quantitative food insecurity assessment being conducted for the City of San Antonio to support data-driven decisions for collective action. This tool is one example of the backbone team's commitment to equipping community and systems leaders with knowledge that informs collective action.

BACKGROUND

FOOD INSECURITY DEFINITIONS

Food insecurity is defined as a lack of consistent access to *sufficient, safe, and nutritious food which meets dietary needs and food preferences* for an active, healthy life. It is also a household-level economic, social, and *environmental* condition of limited or uncertain access to adequate food *that meets cultural or personal needs*. Food insecurity may begin with worrying about where the next meal will come from and can lead to missed meals and poor health outcomes.

Food security and insecurity are described through the use of ranges at a household level. Food security is described using ranges as defined by the United States Department of Agriculture (USDA):

- High food security is achieved when there are no indications of issues accessing food or related to changing food intake.
- Marginal food security is determined through certain indications, either of anxiety regarding food sufficiency or a shortage of food available in the home; however, with marginal food security, there is little or no change in food intake.
- Low food security is characterized by reduced quality, variety, or desirability without much, if any, change in food intake.
- Very low food security includes disruption of eating patterns and a reduction in food intake.[1]

While food security is defined at the household level, it is sometimes aggregated to census tracts, ZIP Codes, or neighborhoods. The use of standardized definitions and related measurement tools improve assessment of food insecurity on a national scale.

MEASURES OF FOOD INSECURITY

Standardized measurement tools are used to assess rates of food insecurity at the household level. The USDA's *Guide to Measuring Household Food Security* serves as the primary resource on food security measurement.[2] The 18-item Household Food Security Survey produces reliable data while minimizing respondent burden, as most households are asked just three questions, or five if children are present in the household. The survey relates to food eaten in the household over the past 12 months and can be administered in three stages. Questions ask how often households worried whether food would run out before they got money to buy more and how often the food they bought just didn't last and they didn't have money to get more. A 10-item measure also exists, with most households being asked only three questions, though this measure does not provide specific details related to children's food security. In addition, a six-item short form of the Food Security Survey can be used as a reliable substitute for the longer versions.

FOOD INSECURITY AND THE SAN ANTONIO METROPOLITAN HEALTH DISTRICT

Multiple departments at the City of San Antonio provide meals and food- and nutrition-related resources, including the Department of Human Services and the San Antonio Metropolitan Health District (Metro Health). Metro Health has developed a multi-pronged approach to food and nutrition through various programs. The Community Health and Safety Division houses a number of programs that address diet-related preventative health and chronic disease management and food environment, food access, and food systems work.

The health department updated its strategic plan, SA Forward, in 2018 to be implemented throughout 2021-2026.[3] Nutrition was identified as one of the top four health issues, along with Access to Care, Trauma and Adverse Childhood Experiences, and Violence, through a community-informed decision-making process. As the COVID-19 pandemic occurred, along with "highly visible episodes of racism and police brutality",[4] the strategic plan was expanded to highlight six priority areas:

- Access to Care
- Data & Technology Infrastructure
- Food Insecurity & Nutrition
- Mental Health & Community Resilience
- Health Equity & Social Justice
- Violence Prevention[4]

Within the Food Insecurity and Nutrition priority area, the SA Forward plan calls to:

- create a food insecurity workgroup
- expand the ¡Por Vida! and ¡Viva Health! initiatives
- launch a community-based nutrition education campaign
- expand the peer-led Diabetes Prevention program
- expand the Healthy Neighborhoods program
- expand the Healthy Corner Store project[5]

A food insecurity planning team comprised of Metro Health program managers and leadership was formed to develop a request for proposals for a San Antonio Food Insecurity Assessment and lay the groundwork for the San Antonio Food Insecurity Workgroup. The Policy and Civic Engagement (PaCE) Office, which serves as the backbone organization for the collective impact Health Equity Network, opened in January 2022. One of the Health Equity Network's goals focuses on food insecurity. Metro Health's Community Nutrition program is comprised of two teams that focus on policy and programmatic work respectively. In July 2022, the Community Nutrition Policy team began conducting initial interviews with key informants. The PaCE Office and Community Nutrition Policy team supported the convening of the Food Insecurity Workgroup in March 2023. The Workgroup continues to build community trust and gather information as the assessment is conducted. Workgroup members will develop and decide on actions to take using evidence-based strategies to address food insecurity locally, with appropriate metrics to measure progress.

¡Por Vida! is a restaurant recognition program that identifies and partners with local restaurants and food service establishments with healthy environments as demonstrated through good nutrition, sanitation, sustainability, and community development.[6] ¡Viva Health! is a nutrition education resource hub based on a localized version of the United States Department of Agriculture's MyPlate that provides nutrition workshops, recipes, and meal planning tools.[7] Both ¡Por Vida! and ¡Viva Health! utilize a community health worker model.

A community health worker model is also being used to develop and launch a community-based nutrition education campaign on the south, west, and east sides of San Antonio. A community survey of nutrition education topics will inform the communications campaign to respond to community needs.

The Diabetes Prevention and Control program provides services to individuals living with or who are at risk for type 2 diabetes.[8] Individuals with prediabetes are referred to the program's workshops to develop skills to improve their overall health and prevent diabetes.[5]

The Healthy Neighborhoods program partners with individuals and organizations in targeted neighborhoods using an asset-based community development approach and a community health worker model to improve neighborhood environments, promote healthy living, and improve nutrition habits.[9] The Racial and Ethnic Approaches to Community Health (REACH) grant program is also part of Healthy Neighborhoods and improves food environments in early childhood education centers and promotes breast/chestfeeding. The REACH program opened a neighborhood resource center on the city's south side in September 2023.

The Healthy Corner Stores program, piloted in 2018, connects over 30 convenience stores with a local produce vendor to stock fresh fruit and vegetables to support healthy food choices in neighborhoods located one mile or more from a grocery store. By 2026, the program will expand to at least 50 stores.[5]

DATA ON THE NATURE AND SEVERITY OF FOOD INSECURITY IN SAN ANTONIO

Food insecurity in San Antonio, Texas remains a pressing and multifaceted issue. Despite the city's vibrant cultural scene and economic growth, some residents continue to struggle with consistent access to nutritious and affordable food. The problem of food insecurity is often intertwined with socio-economic factors such as poverty, unemployment, and inadequate access to education and healthcare. Geographical disparities also play a role in exacerbating food insecurity.

Every year, Feeding America conducts the Map the Meal Gap study to learn more about food insecurity at the local level. To accurately estimate the number of people who may be food insecure in every U.S. County and congressional district, Map the Meal Gap uses publicly available state and local data from the U.S. Census Bureau and Bureau of Labor Statistics on factors that contribute to food insecurity. These factors include unemployment and poverty, as well as other demographic and household characteristics.[10]

Bexar County, Texas	Estimated Food Insecurity Rate
Overall	14.0%
Children (<18 years)	18.4%
Older adults (50-59 years)	9.4%
Seniors (Age 60+)	7.1%

Feeding America Mapping the Meal Gap 2021

Bexar County, Texas	Estimated Food Insecurity Rate
Black (all ethnicities)	22%
Latino (Hispanic)	17%
White (Non-Hispanic)	9%
Asian	Not Available*
Native American or Alaska Native	Not Available*
Native Hawaiian and/or Pacific Islander	Not Available*
People identifying as other or multiple races	Not Available*

Feeding America Mapping the Meal Gap 2021

*Asian, Native American or Alaska Native, Native Hawaiian and/or Pacific Islander, and multiracial populations exist in Bexar County and throughout the United States, but their respective proportions of the total population are small enough such that sample sizes have historically been insufficient for Feeding America to calculate individual estimates. Further research on food insecurity should intentionally target these populations to obtain precise estimates.

To democratize additional data on the nature and severity of food insecurity in San Antonio, the University of Texas Health Science Center (UTHealth) at Houston School of Public Health partnered with Community Information NOW (CI:NOW), a San Antonio-based non-profit organization, whose mission is to provide timely and trustworthy local data. CI:NOW operates the Bexar Data Dive, a localized data platform. The UTHealth research team worked with CI:NOW to integrate tables, maps, and the ability to download data related to food insecurity in San Antonio to CI:NOW's Bexar Data Dive. This will ensure the longevity of this data because CI:NOW will still exist after this project is completed, like it has for the last decade, as a centralized location for localized data on Bexar County. In the future, the UTHealth School of Public Health, The City of San Antonio, or even the San Antonio Food Insecurity Workgroup can easily and seamlessly work with CI:NOW to update key layers on this platform.

DASHBOARD

Users can click on the "Environment" tab of the Bexar Data Dive to visualize several food insecurity-related data points, including food insecurity rates by ZIP Code and census tract. To obtain this data, UTHealth Houston School of Public Health worked with the researchers who developed the Map the Meal Gap report to obtain sub-county estimates of food insecurity in Bexar County. Food insecurity data at this spatial resolution is rare, as many organizations do not attempt to estimate food insecurity rates at subcounty levels. UTHealth Houston School of Public Health requested this data directly from Feeding America in order to display on this dashboard. When users click on a ZIP Code or census tract, a report is generated that provides a plethora of information in relation to the food insecurity rate of the ZIP or tract that was clicked on. This information includes the following:

Food Insecurity Popup

Variable	Description	Data Source
Age	% <18 years old, % 19-59 years old, and % 65+ years old	Census ACS 2022; 5-Year estimates
Sex at birth	% Male, % female	Census ACS 2022 5-Year estimates
Race/ethnicity	% Hispanic, % White alone, non-Hispanic, % Black or African American alone, non-Hispanic, % American Indian and Alaska Native alone, non-Hispanic, % Asian alone, non-Hispanic, % Native Hawaiian and Other Pacific Islander alone, non-Hispanic, % Some Other Race alone, non-Hispanic, % Multiracial, non-Hispanic	Census ACS 2022 5-Year estimates
Income	Median household income, % below the federal poverty level	Census ACS 2022 5-Year estimates
Education	% With no HS diploma, % with some college	Census ACS 2022 5-Year estimates
Access to care	% Uninsured	Census ACS 2022 5-Year estimates
Health outcomes	% Diabetes, % obesity, % heart disease	CDC PLACES 2023
Neighborhood and built environment	% Housing cost burdened households, Transportation Disadvantaged Census Tracts	Census ACS 2022 5-Year estimates/US Department of Transportation

Users can also visualize data on the network of organizations and stakeholders addressing food insecurity within Bexar County. These data include the following:

Food Nutrition Assistance Programs

Variable	Description	Data Source
Estimated % eligible for WIC	Choropleth layer of % of kids <6, who are at or below 185% of FPL	Census ACS 2022; 5-Year estimates
Estimated % of families eligible but not enrolled in SNAP	Choropleth layer of number of families on SNAP/ number of families below 150% FPL	Census ACS 2022 5-Year estimates
Summer Meals Program	Proportional point layer of the total meals and snacks served in 2023. When a user clicks on a point it will display site name, address, days of operation, and meal types served.	Census ACS 2022 5-Year estimates
School Breakfast/ National School Lunch/ Afterschool Meals Programs	Point layer of schools that participate in the program. When a user clicks on a point it will display school enrollment, students eligible for free and reduced school lunch, free breakfast meals served in 2021-2022 school year, free lunch meals served in 2021-2022 school year, reduced price breakfast meals served in 2021-2022 school year, reduced price lunch meals served in 2021-2022 school year, and whether or not the school participates in the afterschool meals program.	Texas Department of Agriculture
Child and Adult Care Food Program – Adult and Child Care Centers	Point layer of locations. When a user clicks on a point it will display the site name, number of people eligible for free meals enrolled, number eligible for reduced price enrolled, number of eligible full price enrolled, and total participants enrolled.	Texas Department of Agriculture
Child and Adult Care Food Program – Day Care Homes	Point layer of locations. When a user clicks on a point it will display the site name, number of people eligible for free meals enrolled, number eligible for reduced price enrolled, number of eligible full price enrolled, and total participants enrolled.	Texas Department of Agriculture

In addition, users can visualize data on food retailers that accept SNAP and WIC in Bexar County.

Food Retailers

Variable	Description	Data Source
Food Retailers That Accept SNAP	The SNAP Retailer Locator, a web-based portal that displays retailers that accept SNAP throughout the US.	The USDA
Food Retailers That Accept WIC	A portal of WIC Vendors in Texas that is updated each month.	Texas of Health and Human Services Commission

Users can also visualize data on the physical locations of key food access points.

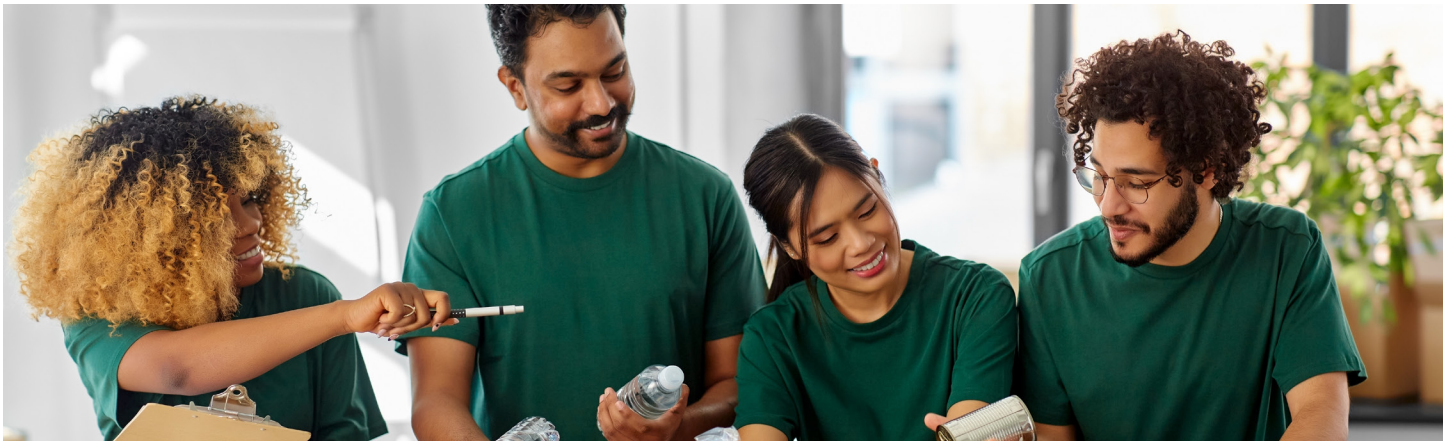
Physical Locations of Additional Food Access Points

Variable	Description	Data Source
Food Pantries	Point layer of the locations. When a user clicks on a point it will contain select descriptors of that location (e.g., Address, hours of operation, etc.)	San Antonio Resource Directory (SACRD)
FreshTrak, The Harlandale Sunshine Pantry	A portal of WIC Vendors in Texas that is updated each month.	Texas of Health and Human Services Commission
Free Meal Sites	Point layer of the locations. When a user clicks on a point it will contain select descriptors of that location (e.g., Address, hours of operation, etc.)	San Antonio Resource Directory (SACRD)
Farmers Markets	Point layer of the locations. When a user clicks on a point it will contain select descriptors of that location (e.g., Address, hours of operation, etc.)	San Antonio Resource Directory (SACRD)
Community Gardens	Point layer of the locations. When a user clicks on a point it will contain select descriptors of that location (e.g., Address, hours of operation, etc.)	San Antonio Resource Directory (SACRD)

Finally, users can visualize a proprietary metric that scores ZIPs and census tracts based on the healthiness of food retailers, called the Bexar County Retail Food Environment Index (BCRFEI).

The Bexar County Retail Food Environment Index (BCRFEI)

Variable	Description	Data Source
The Bexar County Retail Food Environment Index (BCRFEI)	Choropleth layer that scores the healthiness of food retailers in census tracts and ZIP Codes in Bexar County	NAICS Association dataset of all retailers that sell food in Bexar County



NETWORK OF ORGANIZATIONS ADDRESSING FOOD INSECURITY IN SAN ANTONIO

In 2023, San Antonio Metropolitan Health District's Community Nutrition Program and the Policy and Civic Engagement (PaCE) Office convened the Food Insecurity Workgroup to identify policies addressing food insecurity and access to healthy foods. This Workgroup has members from both grassroots and grass tops organizations and includes community members who have lived experience with food insecurity. The Workgroup represents a vast network of organizations addressing food insecurity in San Antonio, with representation from sectors like healthcare, government, business, academia, faith-based, and more. Many of the organizations and businesses who participate in San Antonio Food Insecurity Workgroup meetings work directly with food insecure populations, and in some cases even collect data.

South Texas Veterans Health Care System, for example, conducts a homelessness and food insecurity clinical reminder which collects data on individuals experiencing either food insecurity or homelessness. They also recently started a food insecurity program and hired a registered dietitian, who is currently putting together a grant application for the Gus Schumacher Nutrition Incentive Program.

Methodist Healthcare Ministries of South Texas is a private, faith-based, not-for-profit organization dedicated to creating access to health care for uninsured and low-income families and is also engaged in food insecurity efforts. In April 2021, they began deploying the Protocol for Responding to & Assessing Patients' Assets, Risks & Experiences (PRAPARE) screening tool to any client visiting their wellness clinics in Bexar County for recreation activity, medical, or dental services. PRAPARE is designed to equip healthcare providers and their community partners to better understand and act on individuals' social drivers of health (SDOH). University Health, CentroMed, and Health Confianza also collect data on food insecurity and other non-medical drivers of health.

In addition, organizations like Big Fresh Market Box, which connects households with affordable and diverse boxes of produce through home delivery, conducts paper surveys, interviews, and focus groups to understand the social needs of the clients they serve. The YWCA, Texas Tribal Buffalo Project, the San Antonio Food Bank, and other members of the San Antonio Food Insecurity Workgroup also assess the needs of their target populations through interviews, focus groups, and surveys.

While food insecurity-related data collection is currently siloed in a variety of organizations, the San Antonio Food Insecurity Workgroup is working towards synergizing these efforts in a manner that enhances the collective impact of these organizations on food insecurity in the region.

ELIGIBILITY VERSUS PARTICIPATION RATES OF FOOD AND NUTRITION ASSISTANCE PROGRAMS

SPECIAL SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS, AND CHILDREN

Commonly known as WIC, the Special Supplemental Nutrition Program for Women, Infants, and Children is a federally-funded program administered at the state and local level that serves 53% of all infants born in the U.S.[11] Participants include pregnant and postpartum women and their infants and children up to age 5.[12] Established as a permanent program in 1975 after a two-year pilot,[13] program benefits include supplemental foods, nutrition education, and breastfeeding support.[16] WIC participation may reduce child food insecurity prevalence by at least 20% and perhaps as much as 49% in infants under one year and 31% in children age one to four.[14]

A gap exists between those who are eligible for WIC and those who are actually enrolled in WIC. In 2020, approximately 12.51 million individuals were eligible for WIC, and slightly over half participated.[15] There are a few primary reasons for this, including misunderstandings about eligibility requirements, time required for appointments along with the inability to schedule appointments or submit documentation online, and challenges associated with finding WIC-authorized foods while shopping.[16] Attending required nutrition counseling and classes can be burdensome, requiring time and transportation to attend.

The "Environment" tab of the Bexar Data Dive includes a choropleth layer of the estimated percentage of children less than 6 years old, who are at or below 185% of the federal poverty level, by census tract. This is a rough way of estimating the percentage of a census tract that is eligible for WIC; the Census does not release estimates of households participating in WIC, so we are unable to produce census tract-level estimates of the WIC gap. More precise estimates can only be calculated with access to WIC administrative data from the Texas Health and Human Services Commission, but accessing WIC data from the Texas Health and Human Services Commission is challenging.

WIC data contains sensitive personal information about program participants, including income, family size, and health information. Stringent privacy and confidentiality regulations govern the release of such data to protect individuals' privacy. The Texas Health and Human Services Commission must take extensive precautions to safeguard WIC data from potential breaches, hacking, or misuse, adding complexity to data access procedures. Additional legal restrictions, including federal laws such as the Privacy Act, restrict the sharing and release of personal information collected by government agencies.

SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM

The Supplemental Nutrition Assistance Program (SNAP) is the largest federal food assistance program in the United States. The "SNAP gap" refers to those who are SNAP eligible but not enrolled.[17] In 2019, estimates show that 75% of all SNAP-eligible individuals in Texas participated in SNAP, meaning that 1 in 4 individuals who were eligible did not participate.[18] In comparison to other states the same year, Texas tied for 40th in percentage of SNAP-eligible participation rates.[18]

The "Environment" tab of the Bexar Data Dive includes a choropleth layer of number of families on SNAP and number of families below 150% of the federal poverty level by census tract. This is a rough way of estimating the "SNAP gap" at the neighborhood level. More precise estimates can only be calculated with access to SNAP administrative data from the Texas Health and Human Services Commission, but accessing SNAP administrative data from the Texas Health and Human Services Commission can be a challenging process for researchers, policymakers, and organizations.

Like WIC administrative data, SNAP administrative data contains sensitive personal information about program participants, including income, household size, and other personal identifiers. To protect the privacy and confidentiality of recipients, the Texas Health and Human Services Commission imposes strict data access regulations and safeguards. These restrictions are designed to comply with federal laws, such as the Privacy Act, which limits the disclosure of personal information collected by government agencies. Accessing SNAP administrative

data often involves complex data sharing agreements and protocols. Researchers and organizations seeking access must navigate bureaucratic processes and adhere to specific procedures established by the Texas Health and Human Services Commission.

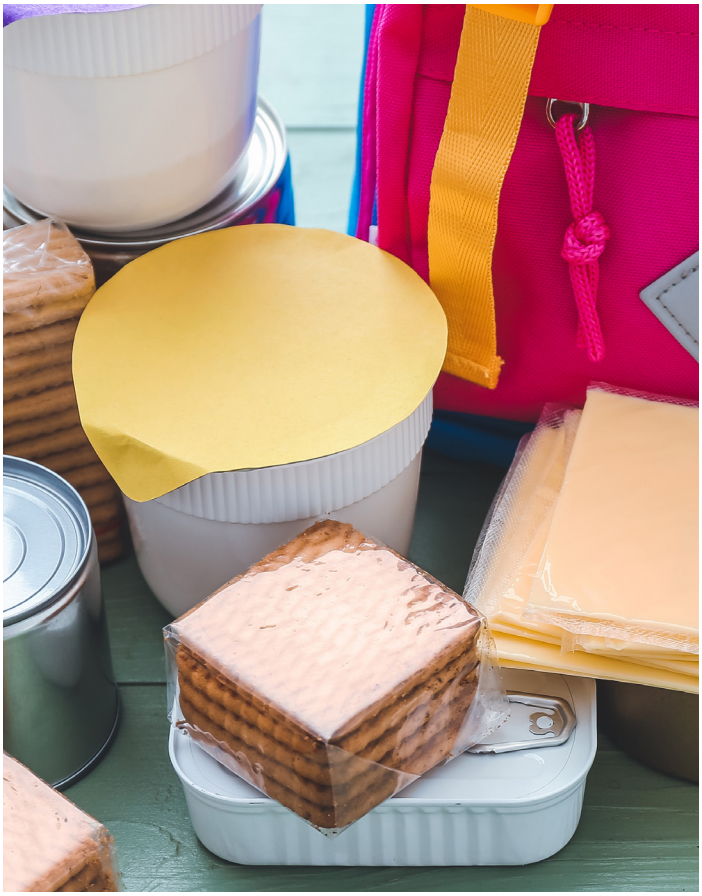
MEALS ON WHEELS

Meals on Wheels of San Antonio, Texas, is a dedicated nonprofit organization that has been serving the community for decades. Their mission is to nourish and enrich the lives of older adults and individuals with disabilities by providing nutritious meals, companionship, and supportive services that allow them to maintain their independence and quality of life. This vital organization goes beyond delivering meals; it also conducts wellness checks, provides pet food for clients' animal companions, and offers a friendly visit from volunteers. Meals on Wheels of San Antonio embodies the spirit of community care, ensuring that vulnerable members of the city have access to nourishing meals and the warm companionship of dedicated volunteers, fostering a sense of belonging and well-being among those they serve.

Eligibility versus utilization of Meals on Wheels in San Antonio often reflects the intricate interplay of demographic factors, awareness, and accessibility. While eligibility primarily hinges on factors like age, disability, and homebound status, actual utilization can be influenced by awareness of the program's existence, the ease of accessing services, and cultural considerations. Despite a significant older adult population in San Antonio, many eligible individuals might not be aware of the program or may face barriers in accessing it due to communication challenges or cultural misconceptions. Bridging the gap between eligibility and utilization involves robust community outreach efforts, partnerships with healthcare providers for referrals, and cultural humility in service delivery, ensuring that those in need receive the nourishing meals and social support provided by Meals on Wheels. Despite these nuances, Meals on Wheels of San Antonio was able to provide the community with 1,200,000 fresh and nutritious meals and 31,484 pounds of pet food through their "AniMeals" program in 2020.[19]

SUMMER FOOD SERVICE PROGRAM

The Summer Food Service Program (SFSP) is administered by states, who are reimbursed with federal funds for meals and snacks served at no cost to children 18 years old and younger at participating sites in low-income areas. The program began as a pilot in 1968 and was eventually established as a standalone program. It grew throughout



the 1970s and has since been adapted through various legislation.[20] Food insecurity-related data points on the "Environment" tab of the Bexar Data Dive include a proportional point layer of the total meals and snacks served at participating sites in the summer of 2023. Sites with a larger dot served more meals and sites with a smaller dot served fewer meals. When a user clicks on a point it will display the site name, address, days of operation, and meal types served. Estimating eligibility versus utilization of this program is difficult because sites that administer this program do not track individuals who use the program but instead report on aggregate meals served.

NATIONAL SCHOOL LUNCH PROGRAM, SCHOOL BREAKFAST PROGRAM, AND AFTER SCHOOL MEALS PROGRAM

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) are national programs established and enhanced through federal policies to provide meals to children, primarily those from low-income households. In 2010, the Healthy, Hunger-Free Kids Act provided updates to the nutrition requirements for both the NSLP and SBP.[21] The Act also increased the availability of universal free meals. During the COVID-19 pandemic, federal waivers were provided so all students

could receive meals at no cost until June 2022; since then, seven states have opted to offer universal school meals permanently, meaning all students can receive school meals at no cost regardless of household income.[22] Texas is not one of those states.

In nationally representative studies, NSLP participation or availability was associated with significantly lower food insecurity rates in households with children, while the SBP has a significant impact on marginal food security but not food insecurity.[23,24] Some estimates for the NSLP show a 2.3 to 9.0 percentage point reduction in food insecurity prevalence, though after taking into account possible reporting errors, estimates range from 3.2 to 15.8 percentage point decreases.[25]

While San Antonio Independent School District offers free meals to all students district wide,[26] other school districts within Bexar County may use an income-based model stemming from the 76-year-old National School Lunch Act, where children from families whose income is 130% of the federal poverty level receive a free lunch, and others above that income threshold may receive reduced cost lunch.

Food insecurity-related data points on the "Environment" tab of the Bexar Data Dive include a point layer of schools that participate in these programs. When a user clicks on a point it will display school enrollment, students eligible for free and reduced school lunch, free breakfast meals served in the 2021-2022 school year, free lunch meals served in the 2021-2022 school year, reduced price breakfast meals served in the 2021-2022 school year, reduced price lunch meals served in the 2021-2022 school year, and whether or not the school participates in the afterschool meals program.

CHILD AND ADULT CARE FOOD PROGRAM

The Child and Adult Care Food Program (CACFP) provides meal and snack reimbursements for children and adults at participating day care centers, child care centers, and day care homes, as well as afterschool care programs and emergency shelters. Beginning as a three-year pilot program in 1968, the CACFP was extended and made permanent through legislative updates in 1975, after which it has undergone several policy changes.[27] While a significantly smaller program than those previously mentioned, over 4.2 million children and almost 140,000 adults receive CACFP meals each day.[28] The CACFP is associated with food security,[29] but program utilization is decreasing due to administrative burdens and paperwork required on behalf of the care provider, training and staffing required, strict nutrition requirements, and insufficient reimbursement rates, among other challenges.[28]

For adult and child care centers, the Bexar Data Dive includes a point layer of locations. When a user clicks on a point it will display the site name, number of people eligible for free meals enrolled, number eligible for reduced price enrolled, number of eligible full price enrolled and total participants enrolled. For day care homes, the Bexar Data Dive (Environment tab) includes a point layer of the locations. When a user clicks on a point it will display the site name, number of children enrolled, total free breakfasts serve, total lunch served, total supper served, total snack served, and total meals/snacks served.

BEXAR COUNTY RETAIL FOOD ENVIRONMENT INDEX

As part of this Food Insecurity Assessment, the Bexar County Retail Food Environment Index (BCRFEI) was developed to measure the food environment of geographic areas in and around Bexar County. It is based heavily on the Centers for Disease Control and Prevention's (CDC) modified Retail Food Environment Index (mRFEI)[30] and is calculated using primary data from instruments called the BCNEMS, all of which are explained in the following sections.

BEXAR COUNTY NUTRITION ENVIRONMENT MEASURES SURVEY

Although many tools have been developed by researchers over the past few decades to evaluate food environments, few have been scientifically validated.[31] One family of instruments that has been validated is the University of Pennsylvania's Nutrition Environment Measures Survey (NEMS),[31-33] which are considered the "gold standard" field instruments for evaluating the food environment of retailers.[31] Two of these, the NEMS-Stores (NEMS-S)[32] and the NEMS-Restaurants (NEMS-R),[33] are the ultimate basis for the Bexar County Nutrition Environment Measures Survey for Stores (BCNEMS-S) and Restaurants (BCNEMS-R) that are used in this Food Insecurity Assessment to evaluate stores and restaurants, respectively.

Though effective, the NEMS-S and NEMS-R are time-intensive to administer for large numbers of retailers, taking between 14-42 minutes per outlet in their original research studies.[32-34] To improve timeliness, researchers Partington et al.[34] used machine learning processes to develop reduced-item (short form) versions of these tools that included only those questions that were most predictive of the final score for each instrument.

The BCNEMS-S and BCNEMS-R were developed to serve as localized, updated versions of the short form NEMS-S and NEMS-R. The BCNEMS instruments and their standard operating procedures are available in full in Appendices A and B, respectively. In summary, their deviations from the short form NEMS instruments are as follows:

- To account for certain staple foods that are more commonly available in Bexar County than in the predominantly non-Hispanic counties where the short form NEMS instruments were developed and validated,[34] several items were added during development of the BCNEMS-S.
- Since the short form NEMS-R was published in 2015,[34] its development well preceded the COVID-19 pandemic and accompanying surge in delivery services for restaurant food. An increasing number of restaurants use technology and media platforms to make their menus available to the public. As such, the BCNEMS-R focuses on a location's offerings as presented through its website, online restaurant review pages, and delivery service apps. This also allows data collection to be performed remotely.

To account for additional questions in the BCNEMS-S and removed sections in the BCNEMS-R, the scoring conventions are different for the BCNEMS instruments than for the short form NEMS, though the former are based on the latter. These scoring conventions are displayed in full in Appendix C of this report. Briefly, sections of the BCNEMS-S carry the same weight relative to each other as in the short form NEMS-S. Within sections (e.g. bread products, fruit, etc.) that had items added to the BCNEMS-S, the new items are weighted based on analogous existing items, while the pre-existing items are adjusted accordingly to keep the section's weight consistent with that of the short form NEMS-S. The BCNEMS-R, meanwhile, has two fewer sections than the short form NEMS-R. One of these has its former weight assigned to an analogous section in the BCNEMS-R. Otherwise, the relative weights of the remaining sections are preserved from the short form NEMS-R, and scored items in the BCNEMS-R are adjusted such that relative weights within their respective sections are likewise preserved.

RETAIL FOOD ENVIRONMENT INDICES

Modified Food Retail Environment Index

The Bexar County Retail Food Environment Index (BCRFEI) was developed as part of the Food Insecurity Assessment and is based heavily on the CDC's mRFEI.[30] Both are measures of the relative numbers of healthy and less healthy food retailers in a spatial area, but the two metrics are not directly comparable because they are

calculated using different methodologies. The mRFEI is calculated for a given area using the following formula:[30]

$$mRFEI = 100 * \frac{\text{\# Healthy Food Retailers}}{\text{\#Healthy Food Retailers + \# Less Healthy Food Retailers}}$$

Where retailers are categorized as "healthy" or "less healthy" at the level of their North American Industry Classification System (NAICS) code (as opposed to the level of the individual retailer). Based on previous literature,[30,35-37] the CDC uses NAICS codes for supermarkets and larger grocery stores, fruit and vegetable markets, and warehouse clubs to determine the number of healthy food retailers. Similarly, it uses those for fast food restaurants, small grocery stores, and convenience stores to determine the number of less healthy food retailers. Supermarkets and grocery stores of all sizes share a NAICS code, so the CDC differentiates them based on the number of employees.

There are several reasons that the mRFEI was not used directly for the Food Insecurity Assessment. The first is that the mRFEI was last used by the CDC in 2011, and NAICS codes themselves are updated every 5 years.[38] Since their most recent update in 2022, the NAICS includes many codes for food retailers that did not exist when the CDC last used the mRFEI. Another reason is that the studies used by the CDC to dichotomize retailers nationwide into "healthy" and "less healthy" in 2011 may not be representative of Bexar County retailers in 2023. Finally, the Food Insecurity Workgroup has the resources and capabilities to perform a more detailed physical survey of Bexar County's retail food environment, which the CDC recommends that localities do in their mRFEI methodology.[30]

Bexar County Food Retail Environment Index

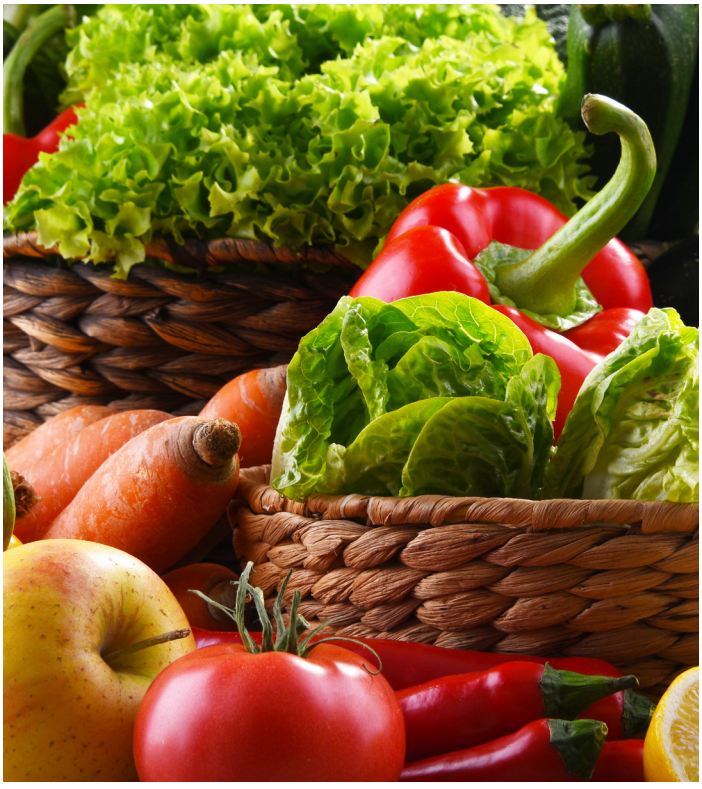
The BCRFEI was developed to update, improve, and localize the mRFEI to Bexar County in the areas described above. It represents a weighted average of estimated BCNEMS scores for the food retailers in an area, such as a ZIP Code or census tract. The BCRFEI is calculated for a given spatial area *(A)* using the following model:

$$BCRFEI_A = \frac{\sum_{i=1}^{n_A} w_i X_i}{\sum_{i=1}^{n_A} w_i}$$

where n_A is the number of retailers in area A that are being evaluated, X_i is the estimated BCNEMS score of the particular retailer i, and w_i is the estimated frequency with which retailers in X_i's modified NAICS (mNAICS) category are valid. A retailer is considered valid if it sells food (other than items only in a checkout aisle), is public-facing, and is not permanently closed at the time of evaluation. The mNAICS categories of retailers that make up n are determined by selecting those categories that are valid at a reasonable frequency of $w_{mNAICS} \geq 0.5$. For this assessment, the number of retailers from each mNAICS category in area A is calculated using a commercial dataset purchased from the NAICS Association.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM CODES AND MODIFIED CATEGORIES

The CDC uses 5 NAICS codes to calculate the mRFEI, with the code for supermarkets and grocery stores split into two categories.[30] For the BCRFEI, 21 NAICS codes were initially assessed, 18 underwent data collection, and six are ultimately included in calculating the BCRFEI. Due to small numbers of certain NAICS codes (e.g. only eight retailers with NAICS code 455211 in Bexar County), these codes are aggregated into mNAICS categories. Additionally, similar to mRFEI methodology, NAICS code 445110 is split into two categories based on the retailer's number of employees. Each mNAICS category is represented by either an unaltered NAICS code, the average of its component NAICS code values if it is an aggregate category, or code 445110 followed by either "S" or "L" to distinguish small grocery stores from supermarkets and large grocery stores. The mNAICS categories that were analyzed with the BCNEMS instruments are listed in the table below, with those that are used to calculate the BCRFEI in bold.



Evaluation Instrument	mNAICS Category	Component NAICS Codes	Description[38]
BCNEMS-R	722513	722513	Limited-Service Restaurants
BCNEMS-R	722512.5	722511; 722514	Full-Service Restaurants; Cafeterias, Grill Buffets, and Buffets
BCNEMS-S	**445110L**	**445110**	**Supermarkets and Large Grocery Retailers (≥ 10 Employees)**
BCNEMS-S	**445110S**	**445110**	**Small Grocery Retailers (< 10 Employees)**
BCNEMS-S	**445245**	**445240; 445250**	**Meat Retailers; Fish and Seafood Retailers**
BCNEMS-S	**451120.5**	**445131; 457110**	**Convenience Retailers; Gasoline Stations with Convenience Stores**
BCNEMS-S	**455219**	**455219**	**All Other General Merchandise Retailers**
BCNEMS-S	445230	445230	Fruit and Vegetable Retailers
BCNEMS-S	455160.5	455211; 455110	Warehouse Clubs and Supercenters; Department Stores
BCNEMS-S	445291.5	445291; 445292	Baked Goods Retailers; Confectionery and Nut Retailers
BCNEMS-S	445298	445298	All Other Specialty Food Retailers
BCNEMS-S	456191	456191	Food (Health) Supplement Retailers
BCNEMS-S	456110	456110	Pharmacies and Drug Retailers
BCNEMS-S	445320	445320	Beer, Wine, and Liquor Retailers

Note: **Bolded** rows indicate mNAICS categories that are used to calculate the BCRFEI

BEXAR COUNTY RETAIL FOOD ENVIRONMENT INDEX ANALYSIS

Although the CDC used a single mRFEI that incorporated NAICS codes for both restaurants and stores,[30] the same is not an option for the BCRFEI. The mRFEI was able to accommodate both types of retailers because it dichotomized them into healthy or less healthy, and it included restaurants to the extent that they counted those with the 2007 NAICS code 722211 (fast food restaurants) among the less healthy retailers.[30] The BCNEMS instruments were developed to score, not dichotomize, food retailers, and the BCNEMS-S and BCNEMS-R are entirely different instruments with distinct questions and scoring conventions that are not directly comparable. Therefore, a single BCRFEI value may describe either the restaurant or food store environment of an area, but not both.

Following the initial assessment, two mNAICS categories for restaurants underwent data collection: 722513 and 722512.5. While locations in the 722513 sample were valid at sufficient frequencies for inclusion in the calculation of a BCRFEI for restaurants, those in the 722512.5 sample were not, with $w_{722512.5} \approx 0.31$. For this reason, lacking a viable category with which 722513 could be compared, a BCRFEI for restaurants is not presented on the Bexar Data Dive.

BEXAR COUNTY RETAIL FOOD ENVIRONMENT INDEX LIMITATIONS

Ideally, this index could be calculated by holistically evaluating every food retailer in Bexar County and surrounding areas. In reality, such an approach is logistically prohibitive, especially when considering that both the distribution of retailers and their food selection change constantly. Consequently, estimates are used to represent broad categories of food retailers, which may introduce error.

The BCRFEI has many similar limitations to the mRFEI that it is based on. It assumes the distribution of healthy foods available within each mNAICS category is homogeneous between spatial areas. Their true distribution may not reflect this; for example, large grocery stores in ZIP Code A may, on average, have a significantly wider availability of healthy foods than large grocery stores in Zip Code B. This same limitation applies to estimates of valid retailer frequencies for each mNAICS category.

Additionally, logistical considerations regarding the large number of mNAICS categories that need to be sampled necessitate that an alpha level of 0.2 is used in calculating sample size for each category rather than the standard 0.05. Finally, although the original short-form NEMS instruments have been validated,[34] the BCNEMS instruments specifically have not undergone validity testing.

BEXAR COUNTY RETAIL FOOD ENVIRONMENT INDEX USAGE

Like the mRFEI before it, the BCRFEI may be used to compare the food retail environment of spatial areas, with lower scores indicating relative food swamps. The term "food swamps" refers to areas in which healthy food options are inundated with more energy-dense foods.[39] Previous research has found that food swamps predict higher rates of obesity[40] and adult hospitalizations due to diabetic complications,[41] but public health solutions are not straightforward. For example, past interventions that have involved building new grocery stores in areas that lack healthy food retailers have not demonstrated efficacy in improving dietary intake.[42-44] The BCRFEI may be used as one tool among others to help target more evidence-based interventions and as a relative measure of food swamps for further research.

MONITORING TOOL TO IDENTIFY RESOURCE GAPS RELATED TO FOOD INSECURITY

While the food insecurity-related factors on the Bexar Data Dive are intended to serve as a central repository of data that allows users to visualize and download a wide range of data points, we recognize that not all users are proficient in working with data dashboards and large amounts of data variables. As such, we created an ArcGIS Story Map to tell the story of food insecurity in San Antonio that is designed to be user friendly and accessible to a wider audience. ArcGIS Story Maps are an effective and immersive way to visually convey the complex narrative of food insecurity in San Antonio through informative maps and data visualizations.

STORY MAP

FOOD ACCESS

The Story Map starts by providing a comprehensive overview of food insecurity rates in San Antonio. We used color-coded choropleth maps to visualize these rates by census tract, with darker shades indicating higher levels of food insecurity. This allows viewers to see the geographic distribution of food insecurity and identify areas of particular concern. To offer deeper insights, we incorporated another map layer displaying median household income by census tract. By viewing this data in relation to food insecurity rates, viewers can discern relationships between income levels and food insecurity, highlighting areas where economic disparities may contribute to higher food insecurity rates.

The Story Map also incorporates data on the percentage of households burdened by housing costs, offering insights into the financial challenges faced by residents in different tracts. Access to transportation, furthermore, can influence food access. The Story Map features United States Department of Transportation-designated "transportation disadvantaged" tracts, helping to identify areas where limited transportation options may exacerbate food insecurity issues. Finally, understanding the impact of disabilities on food insecurity is crucial. The Story Map includes a third layer displaying the percentage of individuals with disabilities by census tract. This visual representation allows users to explore the intersection of disability rates and food insecurity, identifying communities where these challenges are most pronounced.

FOOD AVAILABILITY AND QUALITY

In many urban areas, including San Antonio, the issue of food availability has evolved over time. While there may still be underserved pockets, the majority of urban neighborhoods now have a reasonable number of food retail options, including grocery stores, supermarkets, and convenience stores. The problem often lies in the type and quality of food available within these retail establishments rather than their mere presence.

This gives rise to the issue of "food swamps", where although food is available, it is disproportionately dominated by unhealthy, highly processed, and calorie-dense options. This can lead to poor dietary choices even when stores are nearby. Additionally, the cost of healthy, fresh foods compared to cheaper, processed alternatives can be a significant factor in food choices, especially for low-income residents.

The Story Map includes a choropleth layer of the Bexar County Retail Food Environment Index, allowing users to visualize a proprietary metric that scores ZIP Codes and census tracts based on the healthiness of food retailers. Creating this index was a time-intensive and significant undertaking that involved completing a survey on the types of food sold by 198 retailers in Bexar County, including through physically visiting 171 stores.

NUTRITION AND CONSUMPTION

While datasets on nutrition, consumption, and cultural preferences of food do not exist at the neighborhood level, the Research Team included layers of diet related health outcomes like diabetes and obesity to view in relation to neighborhood-level estimates of food insecurity. Additionally, the Research Team included a choropleth layer of the primary country of origin for foreign-born populations in each census tract in Bexar County. This may help users understand the ethnic composition of various neighborhoods, which can also have implications for food preferences. The Houston Food Bank, for example, uses this kind of data in their Cultural Awareness Initiative, which aims to align their services and programs with cultural preferences, thereby amplifying their ability to provide service with dignity, reduce barriers, and build trust. If they operate a food pantry in an area where the primary foreign-born population may be from India, for example, they might expand the offerings in that pantry to include common staples of the Indian diet, like dahl and lentils.

IMPLEMENTATION PLAN TO IDENTIFY RESOURCE GAPS FURTHER

To better understand the lived experience of food insecurity in San Antonio, the UTHealth Research Team will embark on a yearlong effort, working with the San Antonio Food Insecurity Workgroup on a city-wide, qualitative data collection effort involving focus groups, community conversations, and surveys.

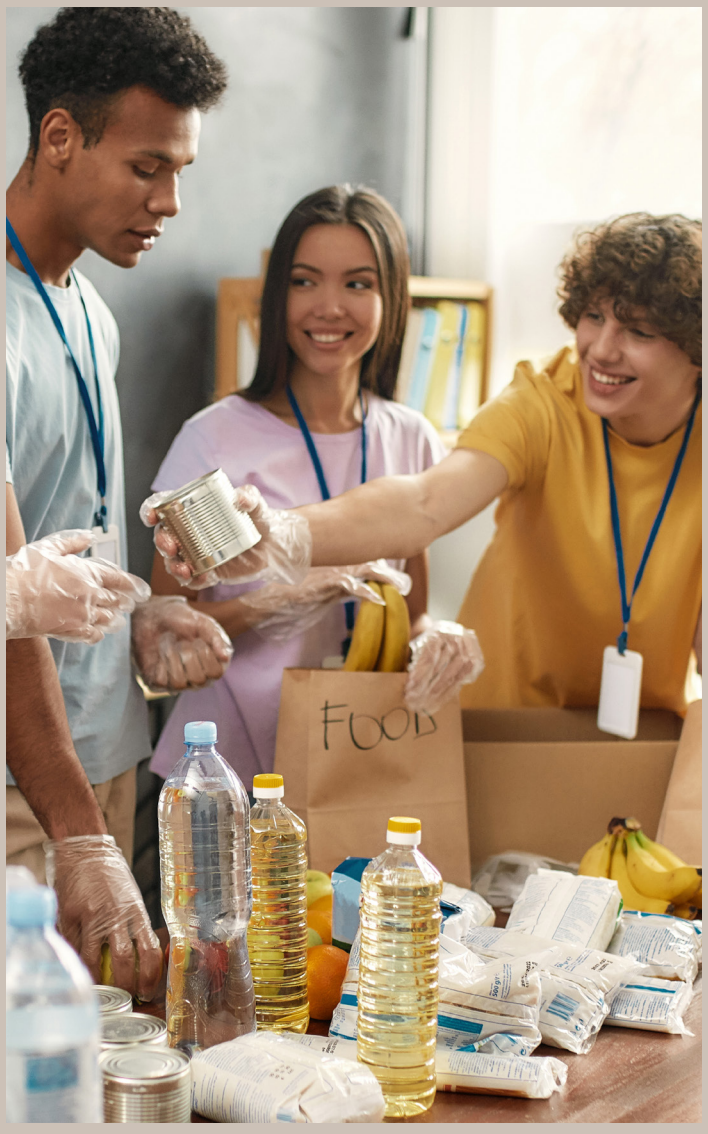
FOCUS GROUPS

Food insecurity is a pressing issue that affects communities across the United States, but it is particularly acute among three vulnerable groups: formerly incarcerated people, individuals with disabilities,[45,46] and single adults aged 18-59. These groups face unique challenges and systemic barriers that often result in higher rates of food insecurity. In the upcoming year we aim to conduct focus groups with each of these populations. Conducting focus groups is an effective method to gain a wider understanding of food insecurity and the factors that may contribute to it in San Antonio, as they provide a valuable opportunity to explore diverse perspectives and shared experiences. Participants can engage in open conversations, share personal stories, and exchange insights on the challenges they face in accessing food. Focus groups allow for the exploration of a range of factors contributing to food insecurity including poverty, unemployment, and systemic inequities.

By facilitating an interactive and supportive environment, focus groups enable researchers to uncover nuanced information, identify common themes and patterns, and gain a holistic understanding of food insecurity in San Antonio. The findings from these focus groups can inform targeted interventions, policies, and community-driven initiatives aimed at addressing the root causes of food insecurity and promoting equitable access to nutritious food for all residents of San Antonio, keeping in mind the potential for a targeted universalism approach to improve outcomes for the whole population as well as specific groups. Collaborating with the San Antonio Food Insecurity Workgroup presents a valuable opportunity to identify individuals within these subpopulations who can actively participate in focus groups.

COMMUNITY CONVERSATIONS

The UTHealth Research Team also aims to publicize and host five community conversations in San Antonio to elicit community feedback on food insecurity and strengthen relationships between the San Antonio Metropolitan Health District and disinvested communities. By leveraging the expertise, networks, and resources of the San Antonio Food Insecurity Workgroup, the San Antonio Metropolitan Health District can effectively promote these conversations and ensure their accessibility to disinvested communities. The Workgroup's involvement can promote these conversations through various channels, including community organizations, local leaders, and social service agencies. By selecting venues in diverse areas of the city, the conversations can reach a wide range of community members and foster a sense of inclusivity.



The goal of these community conversations is to elicit valuable feedback from residents on food insecurity. By actively engaging with community members, the San Antonio Metropolitan Health District can strengthen relationships, build trust with community members, and collaboratively develop strategies to address food insecurity and promote equitable access to nutritious food for all residents of San Antonio.

SURVEY

The UTHealth Research Team aims to craft and deploy a survey to food insecure populations that seeks to understand issues of access, availability, and consumption. We will work with the San Antonio Food Insecurity Workgroup to identify organizations that work with food insecure populations, and advertise the survey to them so they can promote it to their clients. Interested participants will be able to contact the research team, who will assess their eligibility, consent them to be in the study, and administer the survey either over the phone or through a web-based interface. Surveying people is a valuable method for gaining insights into food insecurity and contributing factors in San Antonio. By reaching out to a diverse sample of individuals, including those who have experienced or are currently experiencing food insecurity, surveys can provide a broader understanding of the issue.

Through carefully designed questionnaires, researchers can collect quantitative data on the prevalence of food insecurity, patterns of access to nutritious food, and the socioeconomic factors associated with it. Surveys can also explore the impact of systemic factors such as poverty, unemployment, housing instability, and inadequate social support systems. By analyzing survey responses, researchers can identify trends, correlations, and disparities related to food insecurity in San Antonio. This information is crucial for developing targeted interventions, policy recommendations, and resource allocation strategies to address food insecurity and improve food access for vulnerable populations. Additionally, surveys can provide a platform for individuals to share their lived experiences, amplifying their voices and contributing to a more comprehensive understanding of the challenges faced by the community.

APPENDIX A: BCNEMS INSTRUMENTS

The BCNEMS-S and BCNEMS-R are derived from Partington et al.'s short form NEMS instruments,[34] which in turn are reduced-item versions of the University of Pennsylvania's Nutritional Environment Measures Survey for Stores (NEMS-S)[32] and Restaurants (NEMS-R).[33] Both the BCNEMS-S and BCNEMS-R were built as REDCap electronic data capture tools hosted at UTHealth [47,48] so they may be completed via mobile device. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources. The instruments rely on logic branching to present messages and questions that are relevant based on previous answers when they are used in REDCap. In this appendix, all questions are presented, but a few optional messages such as definitions and examples related to particular survey items are omitted.

Page 1

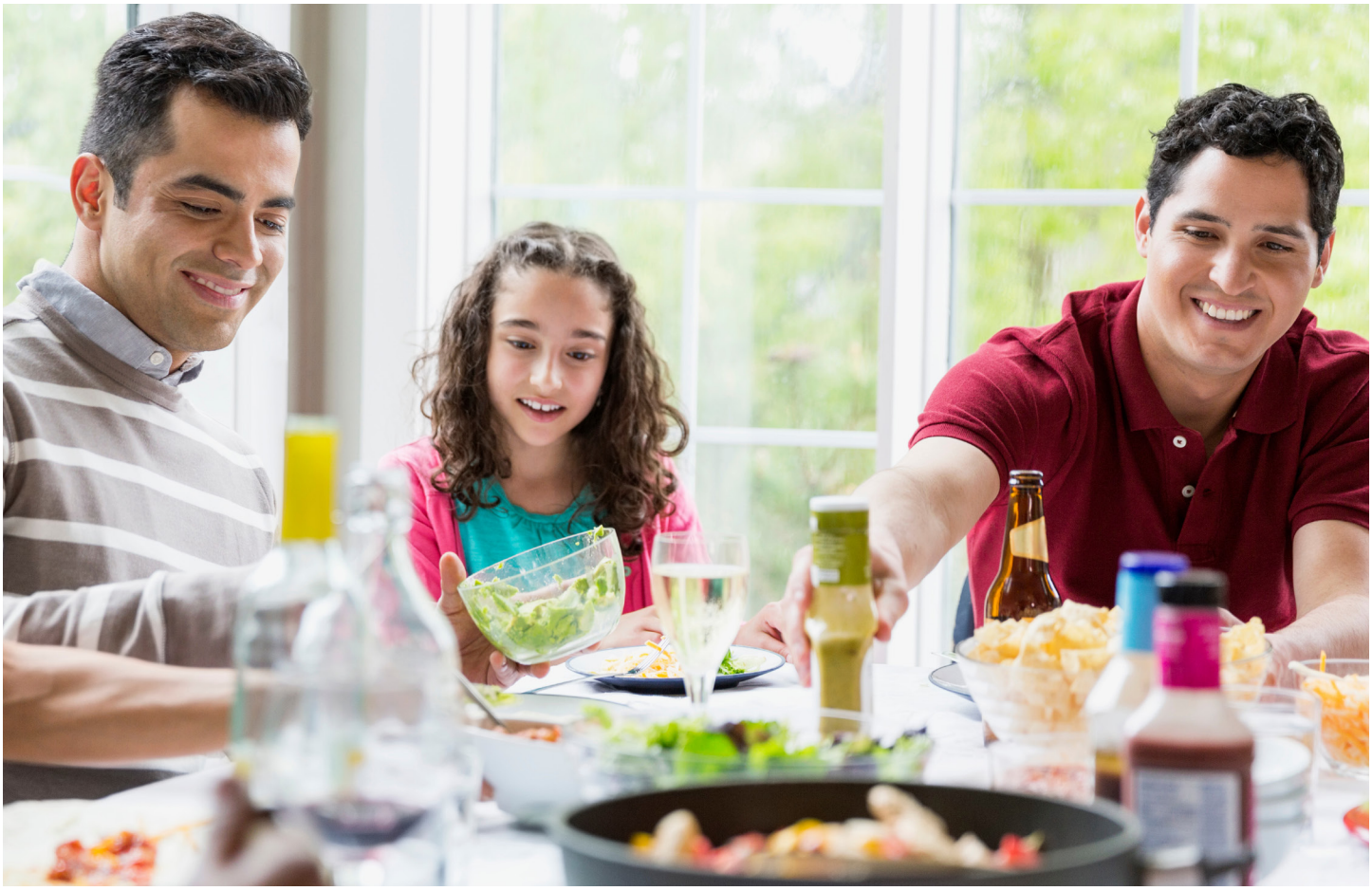
BCNEMS-S

Record ID	_____
It is extremely important that this field is correct-- double-check the location and be 100% sure before you continue Location ID:	_____
Can you complete the BCNEMS-S at this location now?	◯ No; location is not in Bexar County ◯ No; location is temporarily closed ◯ No; location is permanently closed ◯ No; location does not exist or is not public-facing (e.g. just a home/office/headquarters) ◯ No; location does not have a food section ◯ No; owner/staff refusal ◯ No; I feel unsafe ◯ Yes
Return to your vehicle immediately and drive somewhere safe. Do not continue this form until you are safely parked.	
What was the nature of the safety concern at this location? If unsure, select "Lasting concern"	◯ Temporary concern that will not be there for more than today (e.g. temporary hazard or threatening passerby) ◯ Lasting concern that may persist for more than today (e.g. long-term hazard or threatening store personnel)
Go to the next location on your list. Do not replace this sample location with one of the backups-- we may try to come back to this one later. _____	
Go to the next location on your list. This sample location will be replaced with one of the backups. _____	

	BCNEMS-S	
	Does this store have any fresh produce available? (i.e. fruits or vegetables)	◯ Yes ◯ No
	FRESH FRUIT AVAILABILITY - INDICATE AVAILABILITY BY SELECTING YES OR NO.	
1	Bananas	◯ Yes ◯ No
2	Pears	◯ Yes ◯ No
3	Apples	◯ Yes ◯ No
4	Oranges	◯ Yes ◯ No
5	Mangos	◯ Yes ◯ No
6	Grapes	◯ Yes ◯ No
7	Pineapple	◯ Yes ◯ No
8	Cantaloupe	◯ Yes ◯ No
9	Peaches	◯ Yes ◯ No
10	Honeydew melon	◯ Yes ◯ No
11	Watermelon	◯ Yes ◯ No
12	Strawberries	◯ Yes ◯ No
	FRUIT QUALITY	
13	Apple quality Acceptable = peak condition, top quality, good color, fresh, firm and clean. Unacceptable = bruised, old looking, mushy, dry, overripe, dark sunken spots in irregular patches or cracked or broken surfaces, signs of shriveling, mold or excessive softening.	◯ Acceptable ◯ Unacceptable
	FRESH VEGETABLE AVAILABILITY - INDICATE AVAILABILITY BY SELECTING YES OR NO.	

14	Avocados	◯ Yes ◯ No
15	Tomatoes	◯ Yes ◯ No
16	Onions	◯ Yes ◯ No
17	Bell Peppers	◯ Yes ◯ No
18	Carrots	◯ Yes ◯ No
19	Lettuce	◯ Yes ◯ No
20	Cauliflower	◯ Yes ◯ No
	HOTDOGS	
21	Fat-free hotdogs (≤ 1 gram of fat per serving) available?	◯ Yes ◯ No
22	Low-fat or reduced fat hotdogs (≤ 7 grams of fat per serving) available?	◯ Yes ◯ No
	PROTEIN	
23	Beans, peas, or legumes available? (e.g. dry, frozen, or low-sodium [≤ 140 mg] canned)	◯ Yes ◯ No
24	Chicken available without added salt, sauce, or breading? (e.g. canned, frozen, or refrigerated)	◯ Yes ◯ No
25	Lean ground beef (≤ 10% fat) available?	◯ Yes ◯ No
26	How many different types of lean ground meat products are available? (e.g. different brands, % fat content, organic)	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 or more
	BREAD PRODUCTS	
27	Is 100% wheat or whole grain bread available?	◯ Yes ◯ No
28	Are corn, wheat, or whole grain tortillas available?	◯ Yes ◯ No

29	Are bagels available (package or single)?	◯ Yes ◯ No
	CHIPS	
30	Are low-fat chips available? (≤ 3 grams of fat per 1 ounce serving)	◯ Yes ◯ No
31	How many different types and/or brands of low-fat chips are available?	◯ Only one type or brand ◯ Two types or brands ◯ Three or more types or brands
	CEREAL	
32	Healthy cereals (less than 7 grams sugar per serving) available?	◯ Yes ◯ No
	MILK	
33	Is 1% low-fat, skim, or non-fat milk available? Check box for definitions _____	◯ Yes ◯ No
	FRUIT JUICE	
34	Is 100% fruit juice available? (100% fruit juice on label, no added sugar)	◯ Yes ◯ No
	Additional notes that may be useful for data processing or regarding unexpected issues (Use only if needed-- this will usually be blank)	_____



BCNEMS-R

Record ID	_____
It is extremely important that this field is correct--double-check the location and be 100% sure before you continue Location ID:	_____
Can you complete the BCNEMS-R for this location? Check box for definitions _____	◯ No; location is not in Bexar County ◯ No; location is not associated with listed restaurant ◯ No; location is permanently closed ◯ No; location does not exist or is not public-facing (e.g. just a home/office/headquarters) ◯ No; there is not a food menu available for this restaurant online ◯ Yes

Go to the next location on your list. This sample location will be replaced with one of the backups.

_____

BCNEMS-R

MENU REVIEW

Check box for definitions

_____

1	Is 1% low-fat, skim, or non-fat milk available? Check box for definitions _____	◯ Yes ◯ No
2	Is 100% fruit juice available?	◯ Yes ◯ No
3a	Is 100% wheat or whole grain bread available?	◯ Yes ◯ No
3b	Are corn, wheat, or whole grain tortillas available?	◯ Yes ◯ No
4	Are baked chips available (≤ 3 grams fat/serving)? _____	◯ Yes ◯ No
5	Is a fruit side dish without added sugar available? _____	◯ Yes ◯ No
6	Are any non-fried healthy vegetables (without added sauce or breading) listed as sides or "extras"? Check box for definitions _____	◯ Yes ◯ No
7	Are healthy main dish salads available? Check box for definitions _____	◯ Yes ◯ No
8	Are healthy options (other than salad) available for main dishes and entrees? Check box for definitions _____	◯ Yes ◯ No
9	Are healthy entrees identified on menu? Check box for definitions _____	◯ Yes ◯ No

NUTRITION INFORMATION: WEBSITE & APP

10	Does outlet have a website or app?	◯ Yes ◯ No
11	Is nutrition information available on the website or app?	◯ Yes ◯ No
12	Does the website or app identify healthier menu items?	◯ Yes ◯ No

	BARRIERS	
13	All-you-can-eat or "unlimited trips"? _____	◯ Yes ◯ No
14	Menu notations that encourage large portion sizes. _____	◯ Yes ◯ No
15	Menu notations that discourage special requests. _____	◯ Yes ◯ No

APPENDIX B: BCNEMS STANDARD OPERATING PROCEDURE

STANDARD OPERATING PROCEDURE: DATA COLLECTION USING THE BEXAR COUNTY NUTRITIONAL ENVIRONMENT MEASURES SURVEY FOR STORES (BCNEMS-S) AND RESTAURANTS (BCNEMS-R)

UTHealth School of Public Health's Food Insecurity Assessment Commissioned by the City of San Antonio Metropolitan Health District

Developed: 7.11.2023
Last updated: 8.20.2023

PURPOSE

To evaluate the nutritional environment of a sample of stores and restaurants from each mNAICS category included in the Food Insecurity Assessment.

ACRONYMS AND ABBREVIATIONS

FIA: Food Insecurity Assessment; refers specifically to the UTHealth School of Public Health Research Team's 2023 Food Insecurity Assessment of Bexar County, commissioned by the City of San Antonio.

CDC: The Centers for Disease Control and Prevention.

mRFEI: Modified Retail Food Environment Index; a measure of the number of healthy and less healthy food retailers within a spatial area developed by the CDC.[30]

NAICS code: North American Industry Classification System code; a classification system for commercial establishments.[38] NAICS codes are updated every 5 years.[38] For the purposes of the FIA, this will always refer to 2022 NAICS codes unless otherwise specified.

mNAICS category: Modified North American Classification System category; a classification system developed for the FIA based heavily on NAICS codes. Specifically, NAICS code 445110 is split into two mNAICS categories, and several mNAICS categories are composites of multiple NAICS codes, resulting in a total of 14 NAICS categories.

BCRFEI: Bexar County Retail Food Environment Index; a measurement of healthy food availability from retailers in Bexar County developed as part of the FIA. This metric is based on the CDC's mRFEI.[30]

NEMS: Nutritional Environment Measures Survey; a set of tools developed by the University of Pennsylvania that use observational measures to assess the nutrition environment of various food outlets. The NEMS for Stores (NEMS-S) and Restaurants (NEMS-R) are of particular relevance to the FIA.

Short form NEMS: Refers to the reduced-item versions of the Nutritional Environment Measures Surveys developed by Partington et al.[34] by using machine learning to isolate those questions from the NEMS-S and NEMS-R that were most predictive of the final score of each instrument.

BCNEMS: Bexar County Nutritional Environment Measures Survey; refers to a pair of instruments developed for evaluating Stores (BCNEMS-S) and Restaurants (BCNEMS-R) as part of the FIA. These are localized versions of the short forms[34] of the NEMS-S[32] and NEMS-R,[33] respectively, that have been tailored to the specific needs of the FIA.

CONTEXT

The BCRFEI was developed as an updated version of the CDC's mRFEI to specifically evaluate the food environment of areas in and around Bexar County. Rather than the 5 now-outdated NAICS codes that the CDC used to calculate the mRFEI in 2011[30], the BCNEMS instruments were developed to evaluate 14 mNAICS categories, including 18 component NAICS codes, that will be considered for inclusion in the BCRFEI. The BCRFEI is calculated for a spatial area (A) using the following equation:

$$BCRFEI_A = \frac{\sum_{i=1}^{n_A} w_i X_i}{\sum_{i=1}^{n_A} w_i}$$

where n_A is the number of retailers in area A that are being evaluated, X_i is the estimated BCNEMS score of the particular retailer i, and w_i is the estimated frequency with which retailers in X_i's mNAICS category are valid. A retailer is considered valid if it sells food (other than items only in a checkout aisle), is public-facing, and is not permanently closed. The mNAICS categories that make up n are determined by selecting those that are valid at a reasonable frequency of $w_{mNAICS} \geq 0.5$.

The purpose of the data collection described in this standard operating proceedure (SOP) is to acquire the data necessary to calculate the BCRFEI for areas in and around Bexar County. Specifically, sample data on the valid retailer frequencies and BCNEMS scores for each mNAICS category are averaged to calculate w_{mNAICS} and X_{mNAICS}, which are used as the estimates w_i and X_i for all retailers (i) that are in each respective mNAICS category. The BCRFEI is calculated separately for the restaurant and food store environment (using data synthesized from the BCNEMS-R and BCNEMS-S instruments, respectively), and the two indices are not directly comparable.

PROCEDURE

Overview

In short, the BCNEMS-S and BCNEMS-R are needed to evaluate a list of sample locations for each mNAICS category that will be used in the calculation of the BCFREI. The BCNEMS-R is used to evaluate Bexar County restaurants based on data available online and through mobile apps, while the BCNEMS-S requires physically visiting Bexar County stores. For this reason, evaluation sessions with the BCNEMS-S and BCNEMS-R should be planned for their own separate times. Each investigator involved in data collection is assigned a portion of the sample stores and restaurants to evaluate. All investigators involved in data collection will familiarize themselves with the BCNEMS instruments and this SOP prior to beginning any evaluations.

STORES: BCNEMS-S

Safety

The field work required for evaluating the nutritional environment of stores in Bexar County carries some minimal inherent safety concerns for which investigators must be prepared.

The first is regarding driving: data collection involves driving to the many store locations in Bexar County and filling out the BCNEMS-S on a mobile device, but these should never be done at the same time. Under no circumstances should researchers complete store evaluations or use their phones for any other reason while driving. Plan your route to the next location before leaving, obey all traffic laws, and always prioritize the safety of yourself and those around you while on the road.

The second is regarding the store locations involved in the study: These locations are a sample of stores in Bexar County, and it is unknown if any safety hazards exist in or near them. Always assess each location for safety hazards upon arrival before beginning the evaluation. If you feel unsafe, drive to a safe location and do not attempt to evaluate the nutritional environment of the store. Once this is done and you are no longer on the road, access the BCNEMS-S, enter the location ID for the store in question, and select the option that you felt unsafe and could not complete the survey. The BCNEMS-S will prompt you with a follow-up question about the safety concern. Based on the nature of the safety concern, we may decide to return to the store to attempt an evaluation at a later date, or we may drop the location from the sample and use one of the backups.

Starting Equipment

A list and map of sample locations and backup locations are provided. Additionally, a QR code is provided that serves as a link to the BCNEMS-S in REDCap, which will need to be accessed via your mobile device. Print out this QR code so that it may be used repeatedly in the field. Print the list and map of sample locations as well, and bring a pen or pencil to write with.

Planning

Take the number of store locations in your sample list and divide by the number of days that you have allocated to data collection. This will be the target number of stores that you should evaluate each day. Be sure to budget enough days for data collection that this target is feasible. Time permitting, it is advisable to try to exceed this target during your early days of data collection so that spare time is available should complications arise later on.

Using the map of sample locations, plan a route from your starting point (home) through each of the locations from which you will need to collect data. Exclude any locations that are not within the Bexar County border on the provided map—these will be replaced with backup sample locations later. This is your travel route and the order in which you will visit our sample stores. When you have finished visiting locations for the day, you will return home and begin with the next unvisited location along your planned route on the next day of data collection.

Data Collection

Data collection should generally take place on business days to increase the likelihood that sample locations will be open when you arrive for their evaluation, but data collection on weekends is acceptable if investigators involved in data collections verify beforehand that the locations you plan to visit that day will be open. Begin data collection in the morning to maximize the time you can spend collecting data during business hours, and verify online that the first location you are visiting will be open by the time you get there. Gather your starting equipment and mobile device, familiarize yourself with the route to the first store location on your plan, and drive there.

Upon arrival, and once you have assessed the location to be safe (see: safety subsection of this SOP), open the BCNEMS-S instrument using the QR code. Enter the location ID of the store you are evaluating from your list or map of sample locations. This is the most important field in the entire instrument; a typo here may result in misclassification of the location's evaluation. Therefore, you need to be absolutely certain that the location ID is entered correctly.

Assess whether the rest of the BCNEMS-S can be completed at this time. Use your discretion here (e.g. if the store doesn't open for 5 more minutes and the next location on your route is 10 minutes away, it is probably best to just wait for them to open). Enter the conclusion of your preliminary assessment in the field on this first page that asks whether the BCNEMS-S can be completed at this location. If no, you will be prompted to move on to the next location. Select "Confirm", verify that the survey has ended, and then do so. **Always verify that your survey has ended before closing the window or moving on to the next location. Failing to do so may result in a loss of the instrument data from that location**.

In most cases, you should be able to complete the BCNEMS-S for your sample location. Selecting "yes" on the first page will allow you to proceed to the next page, which contains the questions that are used to evaluate the location. These questions concern food availability. Answer them to the best of your ability based on the products available at the time of your assessment (i.e. physically available for purchase during your assessment, not merely advertised as "coming soon" or out of stock). All questions must be answered. Some questions use logic branching, meaning they will only appear if certain responses to previous questions were selected. Some questions also include a box that may be checked in order to display relevant definitions or examples while in the field. There is space for additional notes for data processing at the end

of the BCNEMS-S. Use this sparingly; subjective notes such as "they had apples, but only a few" will not be meaningful in order to maintain consistency of the instrument during scoring. Instead, this space can be used to report any unforeseen issues related to the data, but it should generally be left blank.

When the survey is completed, select "submit". **Verify that the survey has ended before closing the window or moving to the next location**. Return to your vehicle, familiarize yourself with the route to the next location on your plan, and repeat the process for data collection on that location. As you approach the end of business hours, start checking the store hours of the next locations you plan to visit to ensure that they will still be open with long enough (about 15 minutes) for you to complete the BCNEMS-S by the time you arrive. Do not force store personnel to remain open longer than they want to by arriving just before closing time, especially since you will not be purchasing anything.

Store Owner/Personnel Refusals

Since this evaluation is observational in nature, collects data on public-facing food availability without identifying specific stores, and does not involve human subjects, consent of store owners or personnel is not required. However, during your evaluation, it is possible that store owners or personnel may inquire as to what you are doing. If this happens, introduce yourself, explain that you are evaluating the nutritional retail environment of Bexar County, and let them know that the results of your evaluation will not be connected with their store or any stores in particular. Answer any follow-up questions they may have about the evaluation.

Store personnel or owners may still request that their store not be included in the evaluation. If this happens, let them know that this is okay and that you will not include their store. Return to the first page of the BCNEMS-S (using the "<< Previous Page" button at the bottom of the second page) and change your response to the question there to "No; owner/staff refusal". Select "Confirm" once it pops up and end the survey. Verify that the survey has ended before closing the window, and move on to the next location.

RESTAURANTS: BCNEMS-R

Preparation

Unlike stores with the BCNEMS-S, no field work is required to evaluate restaurants with the BCNEMS-R. Instead, this is done entirely online with a computer and mobile device. A list of sample restaurants and backups will be provided, along with a QR code and browser link to the BCNEMS-R in REDCap which may be accessed via mobile device or computer. In preparation for data collection with the BCNEMS-R, download the following apps on your mobile device:

- Yelp
- UberEats
- DoorDash
- GrubHub
- Favor
- Postmates

Menu Priorities

Before starting restaurant evaluations, it is important to know what to look for in online menus. There are likely to be many different sources of the restaurant's menu available between their own website or app, online review pages, and third-party food delivery apps. Prioritize one that is 1) complete and 2) contains nutritional information. Some restaurants' websites have pages separate from their menu that list nutrition information. If this is the case, use that page in combination with their menu to perform the evaluation. If the restaurant is a chain, verify whether the menu is different between locations, and if so, be sure to evaluate the specific location that is listed in the sample.

If the same menu that maximizes the two priority areas for a particular sample restaurant is available from multiple sources, prioritize the one that is from 1) the restaurant's own website or app, 2) Google reviews or Yelp, or 3) a third-party delivery app, in that order. If the two priority areas are split between menus (e.g. one menu is complete and another is incomplete but contains nutritional information), combine the information from the menus to complete the evaluation.

Data Collection

First, enter the Location ID of the first restaurant that you are evaluating, again double-checking that this is field is correct before continuing. Unlike stores, sampled restaurants may be evaluated in any order. Search online for the first restaurant

and check whether it is operational (i.e. not permanently closed) and sells food to the public from the listed location. Indicate your conclusion on the first page of the BCNEMS-R. You will only be prompted to proceed with the evaluation if the answer is "Yes". If "No", you will be prompted to close the survey and continue to the next location. Ensure that the survey has ended before you proceed.

If the restaurant location is valid, you will be taken to the main page of the BCNEMS-R. Check all of the following locations for the restaurant's menu even if you find one in the first place you check, since other sources may have a more complete menu or one that includes more nutritional information:

- Restaurant website
- Restaurant mobile app (only if available for free from a reputable app store)
- Google Reviews
- Yelp
- UberEats
- DoorDash
- GrubHub
- Favor
- Postmates

Complete the BCNEMS-R evaluation using the menu(s) that you identified as well as the restaurant's website and app, if they exist. The last section of the BCNEMS-R asks specifically about the restaurant's website or app and is irrespective of the source of the menu used for the rest of the evaluation. Much more so than the BCNEMS-S, the BCNEMS-R contains many fields that have boxes that may be checked to bring up definitions or examples related to particular questions. Use these if you are having trouble determining how to answer said questions. Once the evaluation is complete, hit "Submit" at the bottom of the page, and ensure that the survey has ended before proceeding to the next restaurant.

APPENDIX C: BCNEMS SCORING

The scoring conventions for the BCNEMS instruments are based on those of the short form NEMS instruments developed by Partington et al.[34] Scores for both the BCNEMS-S and BCNEMS-R are calculated using the following formula:

$$Score = c + \sum_{i=1}^{n} \beta_i x_i$$

In which β_i and X_i represent the coefficient and value, respectively, of each item i from the scoring table that corresponds to the category of the retailer being evaluated. n and c respectively represent that retailer category's number of survey items and specific constant. Retailer category is determined based on its mNAICS category as indicated in the table below. Scores for the BCNEMS-S and BCNEMS-R are not directly comparable with each other.

mNAICS Category	Retailer Category	Description[38]
445110L	Grocery Store	Supermarkets and Large Grocery Retailers (≥ 10 Employees)
445110S	Grocery Store	Small Grocery Retailers (< 10 Employees)
456110	Convenience Store	Pharmacies and Drug Retailers
451120.5	Convenience Store	Convenience Retailers; Gasoline Stations with Convenience Stores
455160.5	Variety Store	Warehouse Clubs and Supercenters; Department Stores
455219	Variety Store	All Other General Merchandise Retailers
445230	Other Store	Fruit and Vegetable Retailers
445245	Other Store	Meat Retailers; Fish and Seafood Retailers
445291.5	Other Store	Baked Goods Retailers; Confectionery and Nut Retailers
445298	Other Store	All Other Specialty Food Retailers
456191	Other Store	Food (Health) Supplement Retailers
445320	Other Store	Beer, Wine, and Liquor Retailers
722513	Limited-Service Restaurant	Limited-Service Restaurants
722512.5	Full-Service Restaurants; Cafeterias, Grill Buffets, and Buffets	Full-Service Restaurants; Cafeterias, Grill Buffets, and Buffets

BCNEMS-S

Note that questions 1-12 are collectively scored as a single item for grocery stores and variety stores with a value of 0-12 indicating the number of these questions that were answered "yes". Additionally, for variety stores, the item that corresponds to questions 21 and 22 is "yes" if *either* of these questions was answered "yes".

Grocery Stores:

Question #	BCNEMS Question(s)	Value	Coefficient
33	1% low-fat, skim, or non-fat milk available	0=no, 2=yes	2.2600
27	100% wheat or whole grain bread available	0=no, 2=yes	1.2667
28	Corn, wheat, or whole grain tortillas available	0=no, 2=yes	1.1140
29	Bagels available (package or single)	0=no, 2=yes	0.9613
31	Number of types and/or brands of low-fat chips are available	0=none 1=1 type/brand 2=2 types/brands 3=3 or more types/ brands	2.3490
1-12	Total number of fruits available	0-12	0.6825
13	Apple quality	-1=unacceptable 0=no apples 1=acceptable	5.0590
20	Cauliflower available	0=no, 1=yes	1.0280
14	Avocados available	0=no, 1=yes	0.2570
15	Tomatoes available	0=no, 1=yes	0.2570
16	Onions available	0=no, 1=yes	0.2570
17	Bell peppers available	0=no, 1=yes	0.2570
26	Number of low-fat ground meat products available	0-6	0.5468
23	Beans, peas, or legumes available	0=no, 1=yes	0.5468
24	Plain chicken available	0=no, 1=yes	0.5468
NA	Constant	NA	1.3710

Convenience Stores:

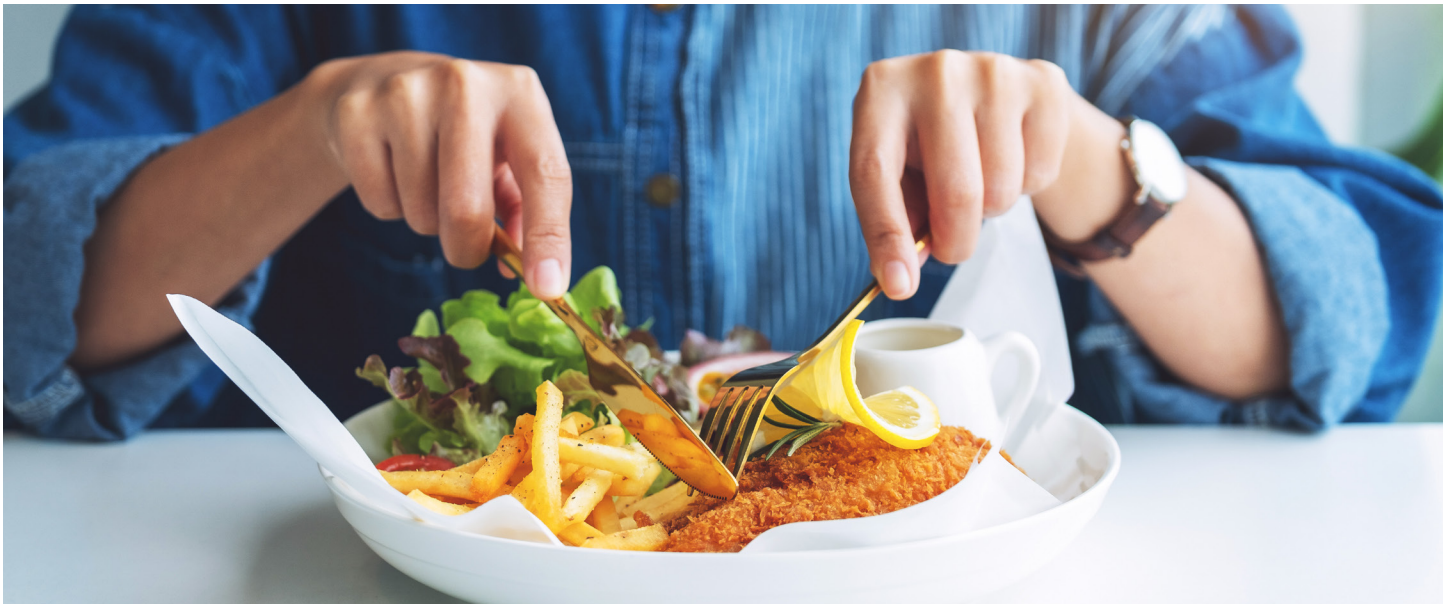
Question #	BCNEMS Question(s)	Value	Coefficient
33	1% low-fat, skim, or non-fat milk available	0=no, 2=yes	1.6200
27	100% wheat or whole grain bread available	0=no, 2=yes	0.5973
28	Corn, wheat, or whole grain tortillas available	0=no, 2=yes	0.7500
29	Bagels available (package or single)	0=no, 2=yes	0.9027
30	Low-fat chips available	0=no, 2=yes	1.4710
34	100% fruit juice available	0=no, 2=yes	0.5400
1	Bananas available	0=no, 1=yes	2.0730
13	Apple quality	-1=unacceptable 0=no apples 1=acceptable	2.9930
18	Carrots available	0=no, 1=yes	2.1950
14	Avocados available	0=no, 1=yes	0.5488
15	Tomatoes available	0=no, 1=yes	0.5488
16	Onions available	0=no, 1=yes	0.5488
17	Bell peppers available	0=no, 1=yes	0.5488
21	Fat-free hotdogs available	0=no, 2=yes	3.9800
32	Healthy cereals available	0=no, 2=yes	1.1390
NA	Constant	NA	1.7700

Variety Stores:

Question #	BCNEMS Question(s)	Value	Coefficient
33	1% low-fat, skim, or non-fat milk available	0=no, 2=yes	1.8930
27	100% wheat or whole grain bread available	0=no, 2=yes	0.9653
28	Corn, wheat, or whole grain tortillas available	0=no, 2=yes	0.9853
29	Bagels available (package or single)	0=no, 2=yes	1.0053
30	Low-fat chips available	0=no, 2=yes	1.6130
34	100% fruit juice available	0=no, 2=yes	1.7787
1-12	Total number of fruits available	0-12	3.5333
21, 22	Fat-free or low-fat hotdogs available	0=no, 2=yes	2.5950
NA	Constant	NA	1.5540

Other Stores:

Question #	BCNEMS Question(s)	Value	Coefficient
33	1% low-fat, skim, or non-fat milk available	0=no, 2=yes	2.5420
27	100% wheat or whole grain bread available	0=no, 2=yes	1.8727
28	Corn, wheat, or whole grain tortillas available	0=no, 2=yes	1.8610
29	Bagels available (package or single)	0=no, 2=yes	1.8493
1	Bananas available	0=no, 1=yes	4.1290
19	Lettuce available	0=no, 1=yes	1.7565
14	Avocados available	0=no, 1=yes	0.4391
15	Tomatoes available	0=no, 1=yes	0.4391
16	Onions available	0=no, 1=yes	0.4391
17	Bell peppers available	0=no, 1=yes	0.4391
NA	Constant	NA	2.442



BCNEMS-R

Note that the item corresponding to questions 3a and 3b is "yes" if *either* of these questions was answered "yes".

Full-Service Restaurants; Cafeterias, Grill Buffets, and Buffets

Question #	Section	Value	Coefficient
1	Menu Review	0=no, 1=yes	3.4808
2	Menu Review	0=no, 1=yes	4.5665
3a *or* 3b	Menu Review	0=no, 1=yes	5.3240
5	Menu Review	0=no, 1=yes	3.1784
6	Menu Review	0=no, 1=yes	3.8233
7	Menu Review	0=no, 1=yes	2.7815
8	Menu Review	0=no, 1=yes	3.3942
9	Menu Review	0=no, 1=yes	4.8974
12	Nutrition Information: Website & App	0=no, 1=yes	14.6096
13	Barriers	0=no, 1=yes	-5.5308
15	Barriers	0=no, 1=yes	-4.0017
NA	Constant	NA	2.8992

Limited-Service Restaurants

Question #	Section	Value	Coefficient
1	Menu Review	0=no, 1=yes	2.9661
2	Menu Review	0=no, 1=yes	3.4072
3a *or* 3b	Menu Review	0=no, 1=yes	3.9742
4	Menu Review	0=no, 1=yes	2.1900
5	Menu Review	0=no, 1=yes	4.6419
6	Menu Review	0=no, 1=yes	3.4792
7	Menu Review	0=no, 1=yes	2.9672
8	Menu Review	0=no, 1=yes	1.6973
9	Menu Review	0=no, 1=yes	3.4011
11	Nutrition Information: Website & App	0=no, 1=yes	3.2039
12	Nutrition Information: Website & App	0=no, 1=yes	13.7153
13	Barriers	0=no, 1=yes	-3.3428
14	Barriers	0=no, 1=yes	-2.3853
15	Barriers	0=no, 1=yes	-1.6230
NA	Constant	NA	1.9673

FOR QUESTIONS OR COMMENTS ABOUT THE SAN ANTONIO FOOD INSECURITY NEEDS ASSESSMENT LAW AND POLICY REVIEW, PLEASE CONTACT THE FOLLOWING:

healthequitynetwork@sanantonio.gov

UTHealth® Houston
School of Public Health

1. Definitions of Food Security. 2021; https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/definitions-of-food-security/. Accessed August 8, 2023.

2. Survey Tools. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/survey-tools/#household. Accessed September 17, 2023.

3. SA Forward. In: District MH, ed: City of San Antonio:36.

4. 'SA Forward' Strategic Plan & Priority Areas. https://dashboards.mysidewalk.com/city-of-san-antonio-strategic-health-plan-dashboard-5bbc32e941c7/-sa-forward-priority-areas. Accessed September 15, 2023.

5. Food Insecurity & Nutrition. https://dashboards.mysidewalk.com/city-of-san-antonio-strategic-health-plan-dashboard-5bbc32e941c7/food-systems-nutrition. Accessed September 15, 2023.

6. Por Vida. https://www.porvidasa.com/. Accessed September 16, 2023.

7. ¡Viva Health! https://www.sanantonio.gov/Health/HealthyEating/VivaHealth#275423635-about. Accessed September 15, 2023.

8. Change today for a healthier future. 2021; https://diabeteshelpsa.com/. Accessed September 17, 2023.

9. Healthy Neighborhoods. https://www.sanantonio.gov/Health/HealthyEating/HealthyNeighborhoods#262593259-how-it-works. Accessed September 15, 2023.

10. Map the Meal Gap. https://map.feedingamerica.org/. Accessed September 17, 2023.

11. About WIC - WIC at a Glance. 2013; https://www.fns.usda.gov/wic/about-wic-glance. Accessed August 24, 2023.

12. Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). https://www.fns.usda.gov/wic. Accessed August 13, 2023.

13. Victor Oliveira ER, Jennifer Olmsted, and Linda M. Ghelfi. The WIC Program: Background, Trends, and Issues. In: Service ER, ed: United States Department of Agriculture; 2002:7-12.

14. Kreider B, Pepper JV, Roy M. Identifying the Effects of WIC on Food Insecurity Among Infants and Children. Southern economic journal. 2016;82(4):1106-1122.

15. National-and State-Level Estimates of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Eligibility and WIC Program Reach in 2020 (Summary). 2023; https://fns-prod.azureedge.us/sites/default/files/resource-files/2020-wic-eligibility-report-summary.pdf. Accessed August 30, 2023.

16. Neuberger Z. Streamlining and Modernizing WIC Enrollment. 2020; https://www.cbpp.org/research/food-assistance/streamlining-and-modernizing-wic-enrollment. Accessed August 24, 2023.

17. Closing the SNAP Gap: Recommendations to Prevent Hunger and Strengthen SNAP in Houston. Food Research & Action Center.

18. SNAP Participation Rates by State, All Eligible People (FY 2019). https://www.fns.usda.gov/usamap/2019. Accessed August 27, 2023.

19. Meals on Wheels San Antonio. https://www.mowsatx.org/. Accessed September 17, 2023.

20. Summer Food Service Program History. 2019; https://www.fns.usda.gov/sfsp/program-history. Accessed August 27, 2023.

21. Healthy, Hunger-Free Kids Act of 2010. In: Congress t, ed. S.3307. Vol Public Law No. 111-296: Library of Congress; 2010.

22. Healthy School Meals for All. https://frac.org/healthy-school-meals-for-all. Accessed August 24, 2023.

23. Katherine Ralston KT, Alisha Coleman-Jensen, and Joanne Guthrie. Children's Food Security and USDA Child Nutrition Programs. 2017.

24. Bartfeld JS, Ahn H-M. The School Breakfast Program Strengthens Household Food Security among Low-Income Households with Elementary School Children. The Journal of nutrition. 2011;141(3):470-475.

25. Gundersen C, Kreider B, Pepper J. The Economics of Food Insecurity in the United States. Applied economic perspectives and policy. 2011;33(3):281-303.

26. Child Nutrition Services. https://www.saisd.net/page/nutrition-menus#:~:text=The%20SAISD%20Child%20Nutrition%20Services,fat%2C%20low%20sugar%2C%20etc. Accessed September 17, 2023.

27. Legislative History. https://www.fns.usda.gov/cacfp/legislative-history. Accessed August 24, 2023.

28. Lee DL, Homel Vitale E, Marshall SK-D, Hecht C, Beck LT, Ritchie LD. Child and Adult Care Food Program Participation Benefits, Barriers and Facilitators for Independent Child Care Centers in California. Nutrients. 2022;14(21):4449.

29. Ettinger de Cuba S, Bovell-Ammon A, Ahmad N, et al. Child Care Feeding Programs Associated With Food Security and Health for Young Children From Families With Low Incomes. Journal of the Academy of Nutrition and Dietetics. 2023.

30. National Center for Chronic Disease Prevention and Health Promotion DoN, Physical Activity, and Obesity. Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI). 2011; https://www.cdc.gov/obesity/downloads/census-tract-level-state-maps-mrfei_TAG508.pdf. Accessed Sept 15, 2023.

31. Ohri-Vachaspati P, Leviton LC. Measuring food environments: a guide to available instruments. American Journal of Health Promotion. 2010;24(6):410-426.

32. Glanz K, Sallis JF, Saelens BE, Frank LD. Nutrition Environment Measures Survey in stores (NEMS-S): development and evaluation. American journal of preventive medicine. 2007;32(4):282-289.

33. Saelens BE, Glanz K, Sallis JF, Frank LD. Nutrition Environment Measures Study in restaurants (NEMS-R): development and evaluation. American journal of preventive medicine. 2007;32(4):273-281.

34. Partington SN, Menzies TJ, Colburn TA, Saelens BE, Glanz K. Reduced-item food audits based on the nutrition environment measures surveys. American Journal of Preventive Medicine. 2015;49(4):e23-e33.

35. Gebauer H, Laska MN. Convenience stores surrounding urban schools: an assessment of healthy food availability, advertising, and product placement. Journal of Urban Health. 2011;88:616-622.

36. Bustillos B, Sharkey JR, Anding J, McIntosh A. Availability of more healthful food alternatives in traditional, convenience, and nontraditional types of food stores in two rural Texas counties. Journal of the American Dietetic Association. 2009;109(5):883-889.

37. Connell CL, Yadrick MK, Simpson P, Gossett J, McGee BB, Bogle ML. Food supply adequacy in the Lower Mississippi Delta. Journal of nutrition education and behavior. 2007;39(2):77-83.

38. U.S. Economic Classification Policy Committee SC, and Instituto Nacional de Estadistica y Geografia. 2022 NAICS Code List. In. https://www.naics.com/search/: NAICS Association; 2022.

39. Rose D, Bodor JN, Swalm CM, Rice JC, Farley TA, Hutchinson PL. Deserts in New Orleans? Illustrations of urban food access and implications for policy. Ann Arbor, MI: University of Michigan National Poverty Center/USDA Economic Research Service Research. 2009.

40. Cooksey-Stowers K, Schwartz MB, Brownell KD. Food swamps predict obesity rates better than food deserts in the United States. International journal of environmental research and public health. 2017;14(11):1366.

41. Phillips AZ, Rodriguez HP. US county "food swamp" severity and hospitalization rates among adults with diabetes: A nonlinear relationship. Social Science & Medicine. 2020;249:112858.

42. Wright JD, Donley AM, Gualtieri MC, Strickhouser SM. Food Deserts: What is the Problem? What is the Solution? Society (New Brunswick). 2016;53(2):171-181.

43. Elbel B, Moran A, Dixon LB, et al. Assessment of a government-subsidized supermarket in a high-need area on household food availability and children's dietary intakes. Public health nutrition. 2015;18(15):2881-2890.

44. Dubowitz T, Ghosh-Dastidar M, Cohen DA, et al. Diet and perceptions change with supermarket introduction in a food desert, but not because of supermarket use. Health Affairs. 2015;34(11):1858-1868.

45. Hadfield-Spoor M, Avendano M, Loopstra R. Food insecurity among disabled adults. European journal of public health. 2022;32(4):593-599.

46. Coleman-Jensen A. U.S food insecurity and population trends with a focus on adults with disabilities. Physiology & behavior. 2020;220:112865-112865.

47. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. Journal of biomedical informatics. 2019;95:103208.

48. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. Journal of biomedical informatics. 2009;42(2):377-381.