Reflections on 2016 Shared Measurement Pilot Food Access Survey – Year One

Lessons Learned and Recommendations for Next Steps

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Prepared jointly by the Michigan State University Center for Regional Food Systems and the

Gretchen Swanson Center for Nutrition

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Recommendations for Year Two

This section summarizes the recommendations for changes and adjustments in the second year of the healthy food access pilot.

These recommendations are based on the reflections of the staff from the Michigan State University Center for Regional Food Systems (CRFS) and the Gretchen Swanson Center for Nutrition (GSCN) involved in the pilot project and the input of the three grantees who participated in the pilot. The experiences of the grantees is documented in a report by CRFS evaluation partners from University of Michigan; key recommendations based on that report are included here.[1]

Recommendations for Pilot Process

1. Create a timeline of the project to help community partners understand where they are in the scheme of the project and what steps lie ahead. Ensure that organizations selected understand the level of involvement with this pilot and are prepared to fully engage in capacity building activities. This type of criteria can be described in the RFP and potential grantees can build this into their proposed data collection activities.
2. Spend more time with selected communities identifying what research questions they have and what they want to learn from the pilot in order to ensure that the right questions are included in their survey, and facilitate analysis.
3. Allow more time for data collection – six to nine months instead of three to six months.
4. Recognize the value of established relationships with data collection sites when selecting community partners to participate in the second year pilot by including this item in the RFP as a factor that will be considered during scoring and selection of grantees. Encourage selected partners to cultivate relationships with data collection sites in order to facilitate timely and effective data collection.
5. Utilize similar data collection sites to the 2016 pilot, which will allow for oversampling of low-income individuals while also including some distribution across income groups.
6. Offer to provide support and guidance on administering the survey, which may be helpful for groups who do not have prior survey experience. Check-in with community-partners midway through data collection process to see if they need assistance or need to alter their plan to incorporate a broader target population in order to meet recruitment targets.
7. Leverage peer-to-peer learning that occurs when pilot communities discuss their project plans and trouble-shooting any challenges that arise collectively by having regular check-in calls and meetings among the grantee organizations and project team. This process will encourage more shared learning between stakeholder groups and strengthen the cornerstones of shared measurement and collective impact.
8. Streamline the process of moving from data analysis to reporting.
    a. Develop core messages based on descriptive statistics and use these to drive data visualizations and inferential statistics.
    b. Provide more hands-on training with grantees so that they build capacity to conduct most of the analysis using research questions developed early in the project. This training will allow grantees to potentially run analyses, but all grantees will be able to read and interpret output from SAS/SPSS analysis. This will reduce the room for human error and maintain the integrity of the results and interpretations.

[1] Shapiro, Lilly Fink and Hoey, Lesli. "Shared Measurement Food Access Survey Pilot: Synthesis of Phone Interviews." Michigan Good Food Charter Phase II Project Evaluation. June 2017.

    c. Involve multiple organizations/stakeholders with conducting data analyses in order to provide opportunities for validity checkpoints throughout the analysis and reporting process.
    d. Develop one core dataset that can be analyzed by multiple partners across various statistical software packages (i.e., a cleaned excel file that is finalized and not modified from agreed upon variable definitions). Development of this core dataset will be conducted by a statistician from GSCN and documentation of variable cleaning and coding will be provided (e.g., analysis plan).
    e. Involve graphic designer during analysis and reporting to ensure variable definitions and outputs are meaningful for developing data visualizations.
9. Work with grantees to develop capacity for data collection, management, analysis and reporting in an iterative fashion. Meet with grantees regularly to develop research questions, review preliminary descriptive results, further define and develop analyses jointly.
10. Use infographics and lessons learned from year one to inform the types of reports that will be most beneficial for year two.

Recommendations for Survey Tool

1. Consistently have both iPad and paper versions of the survey available.
2. Consider translating the survey into other languages and having translated versions available electronically as well as on paper.
3. Consider eliminating some of the four questions used to assess perceived food access.
    a. Since general availability of fruits and vegetables and high quality fruits and vegetables had similar responses, consider eliminating one of these constructs.
    b. Consider eliminating the question on access to Michigan-grown foods; this also had similar responses and some community partners were skeptical of interviewees' knowledge of food origins.
4. Consider adding an item on perceived health status.
5. Consider opportunities to explore the role of dollar stores in influencing perceived food access.
6. Broaden the language in two of the response options for the question on mode of transportation. Additional examples of public transportation and taxi-type service can be named as follows:
    a. I take public transit like a bus, train
    b. I take a taxi or app-based ride like Uber, Lyft
7. Include the two-item food security screener in the core set of questions for all surveys.
8. Eliminate the question asking about "distance" traveled since this variable was not significantly correlated with other variables in the survey, and since respondents may find it difficult to accurately report distance in miles.
9. Ensure the Qualtrics survey file is updated and reviewed by a GSCN research associate with extensive knowledge of data coding. Review of how the questions are organized and exported will be important in the proper cleaning of the data.

Background

This section explains the reasons for creating a food access survey and the process of developing the tool.

Background on the Shared Measurement Project

In 2014, the Michigan State University Center for Regional Food Systems contracted the Gretchen Swanson Center for Nutrition (GSCN) to help initiate a shared measurement project. A shared measurement system allows stakeholders to hold each other accountable, to learn collectively from successes and failures, and helps ensure that efforts remain aligned.[2] Developing a shared measurement system often begins with agreement on a short list of indicators that can be collected at the community level, across a variety of organizations.[3] The goals of the Michigan Good Food Charter Shared Measurement project are to identify metrics to better track progress towards the six goals of the Charter, leverage the power of food system-related data currently being collected by aligning metrics, and empower community-based organizations to collect and have ownership over data relevant to them.[4]

Background on the Food Access Survey

In the first phase of the shared measurement project, GSCN engaged Michigan Good Food Charter stakeholders through a series of interviews and surveys, followed by a consensus building process with the Advisory Committee. One of the three main areas of interest that emerged from these initial exploratory assessments was food access. The stakeholder engagement phase also revealed that a large number of organizations were already collecting surveys related to health, consumption or food access.

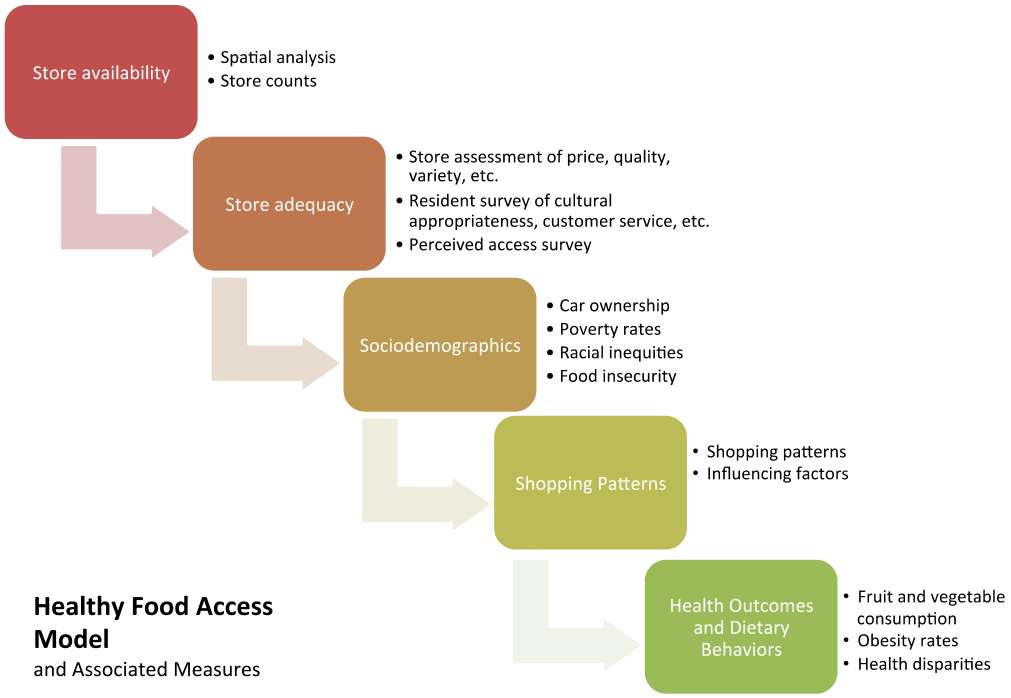
The construct of food access was explored with reference to the literature as well as how MI Good Food Charter stakeholders were conceptualizing food access in their work. The food environment influences an individuals' ability to achieve and maintain a healthy diet. A review of studies focusing on the food environment and diet revealed moderate evidence in support of the causal hypothesis that neighborhood food environments influence dietary health.[5] Many individuals experience poor access to healthy food, and those of lower socioeconomic or racial-ethnic minority status are more likely to live in neighborhoods that lack spatial access to food stores.[6] However, simply using geographic/spatial data to determine food access is limiting, as real world food purchasing has multidimensional influences.[7] Usher (2016), for example, discusses five dimensions of "food access" as availability, accessibility, affordability, accommodation, and acceptability.[8] In addition, perceived measures of the food environment may be more strongly related to dietary behaviors than objective ones, and may incorporate components of food access not captured in objective measures.[9] Based on this theory, as well as the finding from the

[2] Kania J, Kramer M. Collective impact. Stanf Soc Innov Rev. 2011;1(9):36–41.
[3] Hanleybrown F, Kania J, Kramer M. Channeling change: Making collective impact work. 2012.
[4] For more information, see: http://foodsystems.msu.edu/our-work/michigan_good_food_charter_shared_measurement_project/
[5] Caspi CE, Sorensen G, Subramanian S, Kawachi I. The local food environment and diet: a systematic review. Health Place. 2012;18(5):1172–87.
[6] Sharkey JR, Horel S. Neighborhood socioeconomic deprivation and minority composition are associated with better potential spatial access to the ground-truthed food environment in a large rural area. J Nutr. 2008;138(3):620–7.
[7] Chen X, Kwan M-P. Contextual uncertainties, human mobility, and perceived food environment: The uncertain geographic context problem in food access research. Am J Public Health. 2015;105(9):1734–7.
[8] Usher KM. Valuing all knowledges through an expanded definition of access. J Agric Food Syst Community Dev. 2016;5(4):109–14.
[9] Caspi CE, Kawachi I, Subramanian S, Adamkiewicz G, Sorensen G. The relationship between diet and perceived and objective access to supermarkets among low-income housing residents. Soc Sci Med. 2012;75(7):1254–62.

stakeholder interviews that surveys were a common data collection strategy among Michigan Good Food Charter stakeholders, the Shared Measurement Advisory Committee made the decision to assess food access through a survey focused on individual perceptions of food access.

CRFS and GSCN drafted a model to illuminate the multiple dimensions of food access. This model is derived from an ecological model depicting the multiple influences of what people eat.[10] CRFS and GSCN then identified data sources and data collection tools associated with the components in the model and based the survey on the components that were not adequately captured in existing data sources.

Figure 1. Food Access Model



Survey Development

Existing validated surveys and scales were identified and modifications that were needed based on the purpose of the pilot were made. New scales were also created as needed. The main constructs assessed in the survey included: sociodemographics, food assistance and other benefits received, perceived neighborhood food availability, shopping patterns, motivating factors when selecting food stores, fruit and vegetable consumption, and transportation barriers. The survey was reviewed, both internally with the shared measurement project staff and advisory committee, as well as with external reviewers that are experts in the field of food access, public health, and survey methodology.

[10] Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. Annu Rev Public Health. 2008 Apr;29(1):253–72.

Next the survey tool was assessed through a series of cognitive interviews. The cognitive interview method aims to enhance the quality and accuracy of survey instruments and is used to identify and analyze sources of response error in survey questionnaires.[11,12] Cognitive interviews (N=14) were conducted with the target population of low-income adults in and around the East Lansing area in an iterative fashion. After a few interviews were conducted, the research team discussed changes to the survey based on the participants' responses and points of confusion. Changes made to the survey were to enhance the readability and understandability of the items among the target population, so the intended constructs are measured as accurately as possible.

The cognitive interview procedure asks participants to "read aloud" their responses and thinking process while answering the survey items. The interviews were led by a graduate student at MSU, and utilized a semi-structured interview guide that included probes for specific items on the survey. During cognitive interviews, there is no right or wrong answer from the participant, and responses to survey items are not the focus, but changes to the wording and structure of the survey are emphasized. See Appendix A for a metafile summarizing the origins of each item included in the survey, as well changes made as a result of the cognitive interviews. A manuscript discussing perceptions of transportation in relation to food access from the cognitive interviews was submitted to a Built Environment special issue, and is currently under review.

Reflections on the Pilot Process

This section overviews and reflects on the pilot process.

Timeline

Three pilot communities were selected through an RFA process. Applicants were solicited from large- or medium-sized cities in Michigan with an urban core population of at least 10,000. A review team[13] selected applicants based on their interest and capacity to participate in the data collection and analysis as well as indications that survey findings would be used by a local council or similar group to address needs among low-income and underserved populations. Each community was awarded up to $5800 to cover time for trainings, administering the survey, mileage for data collection, and survey incentives. A timeline for the pilot process from the RFA through data reporting is outlined in Figure 2.

Figure 2. Pilot Timeline

[11] Willis DGB. Cognitive Interviewing: A Tool for Improving Questionnaire Design. 1st ed. Sage Publications, Inc; 2004.

[12] Collins D. Pretesting survey instruments: An overview of cognitive methods. Qual Life Res. 2003;12(3):229–38.

[13] Courtney Pinard (GSCN), Kathryn Colasanti (CRFS) and Alex Bryan (Greater Lansing Food Bank) served on the review team.

The community partners worked with the Shared Measurement team to establish a sampling plan and customize the survey tool. Throughout data collection, analyses, and reporting, pilot communities received technical assistance to help build their capacity for data collection.

Collecting the targeted amount of surveys in each community took longer than anticipated. Therefore, we recommend allowing more time for data collection in the second round of the food access survey pilot. We also recommend offering more trainings, specifically working with the grantees to develop research questions, developing grantees' capacity for conducting their own analysis, and assisting grantees' interpret results relevant to their organizations and reporting needs. A potential timeline for the next phase of the food access survey pilot is proposed below.

	2017						2018									
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct
Interview/focus groups with rural consumers																
Finalize Survey																
Modify RFA																
Release RFA																
Submissions and application review																
Site selection and initial training/meetings																
Data collection																
Training and capacity building for data cleaning and analysis																
Analyses																
Develop reports																

Because the first year of the pilot focused on urban communities, in this second year of the pilot it is important to test the food access survey in rural communities in order to ensure the survey provides

meaningful data for all communities in Michigan. In addition, testing the survey in rural communities will provide data on food access for this understudied population, yielding potentially significant findings to inform programming and initiatives statewide. Sampling and participant recruitment in rural communities may present new challenges. It will be beneficial to allow for longer recruitment time as suggested above. We also suggest emphasizing in the RFP and throughout the selection and training process that community partners will need to utilize a wider catchment area than was utilized in the first round pilot. A wider geographic area may be necessary for data collection in a rural area given a sparser population. Sampling from a larger area will also expand the generalizability of the survey tool and provide results that can inform strategies for many communities across Michigan. Another potential challenge with a more rural focus may be having sufficient applicants from communities that meet the criteria specified in the RFP. It may be advantageous to provide broad guidance as to what type of communities are eligible to apply and potentially selecting three communities that range in size, in order to provide opportunity to compare results across communities of differing sizes.

Analysis

Data cleaning occurred in conjunction with pilot sites in order to help build capacity in handling data once it is collected. A workshop was conducted in which basic principals for data cleaning was discussed and an individualized plan to help each grantee through this process derived. In most cases, the grantee took on some cleaning, and handed it over to GSCN to complete due to limited time. Descriptive statistics were determined for all populations; counts and frequencies were used for categorical data, and means and standard deviations for Likert scaled data. Initial results were discussed in a preliminary findings discussion in order to get a sense of the type of analyses that would be of value to the grantees. Next, a data driven approach to analysis was taken, by first running univariate statistics to determine which variables exhibited significant relationships, then models run based on significant relationships. Associations between variables were determined using the chi-square test. These univariate analyses were used to determine which factors were related. Logistic regression was then used to evaluate these significant associations, while controlling for other significant factors found at the univariate level.

In the second year of the shared measurement pilot it will be important to take lessons learned from the 2016 pilot and make adaptations and strengthen specific components of the analysis and reporting processes. Overall, the analysis and data sharing process can be improved through enhancing structure and flow of the data between various partners. Greater capacity and sharing amongst grantees will facilitate a more unified approach, in addition to determining goals and research questions early on to help inform steps taken with the analysis and reporting.

Reflections on the Survey Tool

This section discusses highlights from the survey findings, focusing on potential and proposed changes to the survey tool.

Socio-demographics and Sampling Strategies

Respondents were more female (67.0%) than male (33.0%), African American (54.3%), and White (35.1%), with fewer respondent indicating race as 'other' (10.6%). Only 8% of respondents indicated they were Hispanic. Ages ranged fairly evenly across the three collapsed categories: 18-34 years (24.5%), 35-54 years (30.9%), 55 plus years (43.9%). In terms of income, over half (56%) of the respondents reported earning less than 100% of the poverty level when household size was considered. Various benefits received were reported: SNAP (55.5%) was the highest, followed by Medicaid/Medicare (52.6%), followed by Disability (32.9%).

The respondent characteristics were reflective of the communities and sites where data was collected, with higher representation of low-income and racial/ethnic minority populations. It is common to have an overrepresentation of females completing survey data, especially when the data collection sites are focused around food procurement. We anticipate that the distribution of male and female respondents will be similar in the 2017 pilot. Specific sites represented in the 2016 pilot communities included farmers markets, food pantries, grocery stores, housing developments, and other community locations. One factor that influenced the level of success the 2016 pilot communities had in collecting data was having an established relationship with the data collection site. The application review team for the 2017 pilot should consider this and selected partners should understand that establishing relationships with data collection sites and developing good working relationships (e.g., communication, timing), can take some time.

Table 1. Socio-demographic Characteristics

Variable	Battle Creek	Ypsilanti	Pontiac	Aggregate
Sex				
Female	112 (63.6%)	211 (73.0%)	169 (62.4%)	492 (67.0%)
Male	64 (36.4%)	78 (27.0%)	100 (36.9%)	242 (33.0%)
Race				
White	62 (35.2%)	120 (41.5%)	69 (27.0%)	251 (35.1%)
African American	97 (55.1%)	132 (45.67%)	160 (62.5%)	389 (54.3%)
Other	17 (9.7%)	33 (11.6%)	26 (10.2%)	76 (10.6%)
Ethnicity				
Hispanic	6 (3.5%)	28 (10.1%)	22 (8.7%)	56 (8.0%)
Non-Hispanic	157 (96.5%)	250 (89.9%)	230 (91.3%)	647 (92.0%)
Age				
18-34	40 (22.7%)	73 (25.4%)	66 (24.6%)	179 (24.5%)
35-54	56 (31.8%)	79 (27.5%)	91 (34.0%)	226 (30.9%)
55+	80 (45.5%)	135 (47.0%)	111 (41.4%)	321 (43.9%)
Income				
$10,000 or less	70 (39.8%)	104 (37.3)	108 (41.1%)	282 (39.3%)
$10,001 – 20,000	44 (25.0%)	80 (28.7%)	54 (20.5%)	178 (24.8%)
$20,001 and greater	62 (35.2%)	95 (34.1%)	101 (38.4%)	258 (35.9%)
Poverty				
100% Poverty or Less	85 (49.1%)	164 (59.0%)	147 (58.1%)	396 (56.3%)
Greater than 100%	88 (50.9%)	114 (41.0%)	106 (41.9%)	308 (43.8%)
Benefits				
SNAP	81 (46.0%)	129 (44%)	115 (40.9%)	325 (55.5%)
WIC	14 (8.0%)	32 (11%)	27 (9.6%)	73 (14.9%)
Unemployment	7 (4.0%)	14 (5%)	14 (5.0%)	35 (7.4%)
Disability	56 (31.8%)	47 (16%)	63 (22.4%)	166 (32.9%)
Medicaid/Medicare	86 (48.9%)	100 (34.%)	107 (38.1%)	293 (52.6%)
School lunch	18 (10.2%)	29 (10%)	34 (12.1%)	81 (16.7%)
TANF	3 (1.7%	4 (1%)	8 (2.9%)	15 (3.3%)

Household income was skewed towards the lower end, with fairly even split across these lower categories (when compared to other national or state level data): $10,000 or less (39.3%), $10,001 – 20,000 (24.8%), $20,001 and greater (35.9%); thus, when non-collapsed results were reviewed for poverty level, distribution of poverty roughly would create an inverted U shape (see Table 2 below). The intent of the food access survey was to oversample low-income populations, while maintaining some diversity in income distribution for greater power in analysis. The data collection sites allowed for this oversampling of low-income individuals to occur, and should be replicated in the 2017 pilot. The inverted U shape reflects a higher proportion of respondents in the lowest income category and the highest income category. Equal representation across income categories would also allow for strong analysis, if this is to occur in the 2017 pilot.

Table 2. Full Descriptives – Poverty Level

Poverty Level	Frequency (Percent)
100% Poverty or Less	396 (56.3%)
101-133%	73 (10.4%)
134-150%	52 (7.4%)
151-200%	45 (6.4%)
201% and greater	138 (19.6%)

The socio-demographic items worked well in the pilot, and are the more "tried and true" items on the survey. While it would be easier to calculate percent of poverty level if respondents reported household income as a continuous variable, this was not done with this survey (and many others) because it impacts the degree to which respondents can accurately report this without ranges provided, and adds another level of sensitivity. We recommend maintaining the income categories used in the 2016 pilot for the 2017 pilot.

Perceived Food Access

Perceived food access was measured by four separate items, as follows:

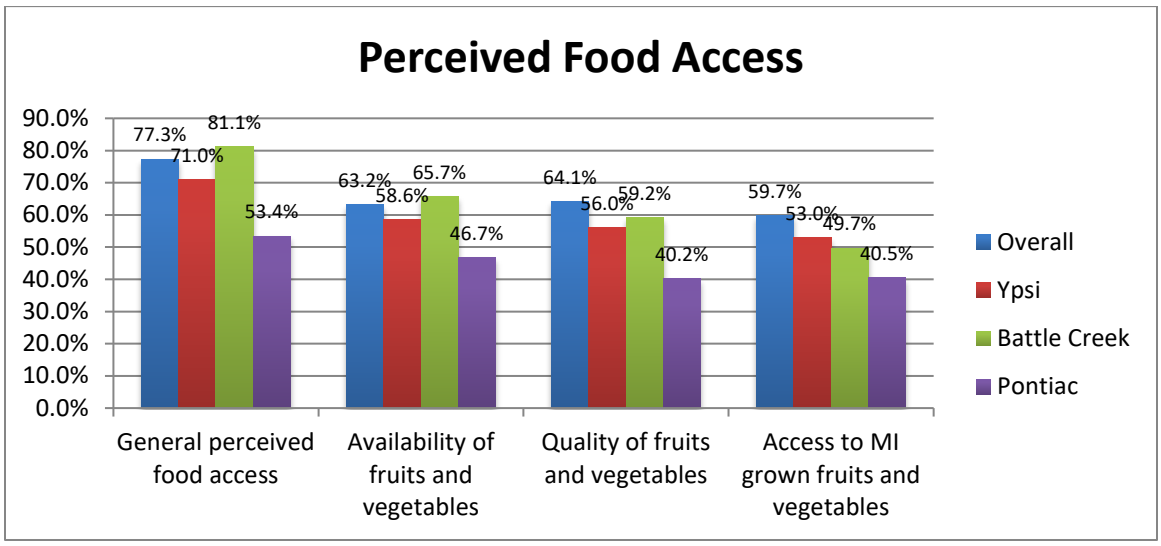
1. **General perceived food access** was determined by the item, "I have easy access to stores that meet my needs. Easy access means the store is located in your neighborhood, or another convenient location you can easily walk, bike, drive, or take the bus to."
2. **Availability of fruits and vegetables** was determined by the item, "It is easy to find fresh fruits and vegetables within my neighborhood."
3. **Quality of fruits and vegetables** was determined by the item, "The fruits and vegetables in my neighborhood are high quality."
4. **Access to MI grown fruits and vegetables** was determined by the item, "There is a large selection of Michigan-grown foods available in my neighborhood."

Overall, most respondents reported adequate food access to a store that meets their needs (77.3%), with somewhat fewer respondents indicating they had access to fruits and vegetables (63.2%), quality fruits and vegetables (64.1%), and MI grown fruits and vegetable (59.7%). These percentages reflect the proportion of respondents in the aggregate sample that that responded "always" and "often" to the items. In addition, when perceived food access was reported across the three pilot sites, Pontiac respondents reported lower perceived food access across all types. These percentages shown in Figure 3 included respondent reporting 'strongly agree' or 'agree' to the respective items.

Given the value of each of these slightly different approaches to assessing perceived food access, we recommend reconsidering the inclusion of all four of these on the food access survey moving forward. Access to MI grown fruits and vegetables is significantly different than the others, and may not be an essential part of assessing "food access" as a construct. However, the value of MI grown foods should be kept as a factor potentially influencing store selection. In order to determine the best set of items to assess perceived food access, we suggest the shared measurement team and advisory committee hold a detailed discussion about the meaning of this construct, and which aspects are a priority to assess, based upon preliminary qualitative data gathered from rural respondents. Since availability and quality of fruits and vegetables resulted in similar response patterns, perhaps only asking availability is necessary. One approach for the next iteration of the survey would be to include these two items:

1. I have easy access to stores that meet my needs. Easy access means the store is located in your neighborhood, or another convenient location you can easily walk, bike, drive, or take the bus to.
2. It is easy to find fresh fruits and vegetables within my neighborhood.

Figure 3. Perceived Food Access



Fruit and Vegetable Consumption

Fruit and vegetable consumption was assessed with two simple items that ask how many cups of each a respondent eats or drinks each day. Examples were provided for both fruit and vegetables for what counts as a cup. A 10-item screener was originally proposed for the survey but it was decided that this was too long and burdensome, and the two items selected. Unfortunately assessing dietary patterns is complicated and there are pros and cons to each method. There is no succinct "gold standard" set of questions. Although dietary screeners offer a more cost-effective, less burdensome way to obtain gross

estimates to rank individuals with regard to F/V intake, these methods are not recommended for assessing precise intake levels.[14]

The pros and cons of each method are described below:

2-item Screener		**DSQ 10-items**	
Pros	Cons	Pros	Cons
• Short, not burdensome • Easy to analyze • Provides a "glimpse" at these behaviors if dietary patterns is not a main outcome	• Respondents do not necessarily know what a cup is • Lower reliability and validity • Less variability in responses limiting power in analysis	• Can calculate cup equivalents for fruits and vegetables using an algorithm and NHANES data • Well validated and tested • Triggers sources of FV that the respondent may not have considered (e.g., salsa) • Allows comparison to NHANES data	• Seems long and repetitive to respondents • Rigid measurement tool; should ask items exactly how they are written

When cups of fruit and vegetables were collapsed into two categories, there was a fairly even split, with fewer individuals indicating they consumed the higher amount of fruit daily.

Cups of Fruit	
1 cup and below	330 (44.4%)
Over 1 cup	583 (55.6%)
Cups of Vegetables	
1 cup and below	279 (37.5%)
Over 1 cup	465 (62.5%)

Those that reported consuming more than 1 cup of fruit also tended to report consuming more than one cup of vegetables per day (73.7%).

Fruit	Veg	
	1 cup and below	Over 1 cup
1 cup and below	206 (74.1%)	122 (26.3%)
Over 1 cup	72 (25.9%)	342 (73.7%)

In a nationally representative sample from 2007-2010, mean intake for fruit for adults ages 19 and over was just over one cup a day.[15] Compared to national guidelines, 75% of adults were not meeting

[14] Yaroch AL, Tooze J, Thompson FE, Blanck HM, Thompson OM, Colón-Ramos U, et al. Evaluation of three short dietary instruments to assess fruit and vegetable intake: The National Cancer Institute's food attitudes and behaviors survey. J Acad Nutr Diet. 2012 Oct;112(10):1570–7.

[15] National Cancer Institute. Usual dietary intakes: food intakes, US population, 2007–10. Available at http://appliedresearch.cancer.gov/diet/usualintakes/pop/2007-10/#findings

recommendations.[14] Similarly, for vegetables, adults reported consuming just under 2 cups a day on average. Compared to national guidelines, 87% of adults were not meeting recommendations.[14] While the questions in our study do not allow us to precisely calculate the number of people meeting USDA food pattern recommendations, which range from 1 to 2.5 cups per day for fruit and 1 to 4 cups per day for vegetables, depending on sex, age and activity level, we can use the percent of respondents reporting consumption of over one cup per day as a proxy. The aggregate data across the three communities showed that 56% of respondents reported consuming over one cups of fruit a day and 63% reported consuming over one cup of vegetables a day, which is much higher than 13% and 25% of people meeting recommendations for vegetables and fruit, respectively, in the National Cancer Institute data. These inflated fruit and vegetable intake findings are most likely a result of using a simple two items and self-report of intake being biased and/or inaccurate[16]. However, this is not unlike other studies that use similarly brief measures[17]. It is important to balance survey burden and feasibility with the rigor and accuracy of more extended measures, and for the purposes of the shared measurement food access pilots, these results are meaningful for analysis and comparison across populations. Given the brevity of the fruit and vegetable consumption items, we suggest also including an item on perceived health status in the 2017 pilot.

Food Shopping Location

They survey tool asked if the respondent was the primary shopper, for which 84% indicated they were. In order to assess food shopping behaviors among participants, the survey included an item that asked about the frequency (never-always) with which participants obtained food from the following locations in the past month:

- Supermarket or large/mid-size grocery store (Walmart, Meijer, Kroger)
- Warehouse club store (Sam's Club or Costco)
- Small grocery store
- Convenience store (7-11, gas station)
- Dollar Store (Dollar General, Family Dollar)
- Drugstore (CVS, Rite Aid)
- Health food store/co-op
- Food pantries, food bank, or soup kitchens

Specific to the growing season (May-October), frequency of obtaining food from a farmers' market or directly from a farm and a household or community garden were also included in the survey. The majority of respondents reported obtaining food from supermarkets (67.5%), dollar stores (40.0%), food pantries (30.3%), farmers markets (29.6%), and small grocery stores (27.2%). Across respondents, the average number of store types that people reported that they 'often' or 'always' obtained food from was 2.59.

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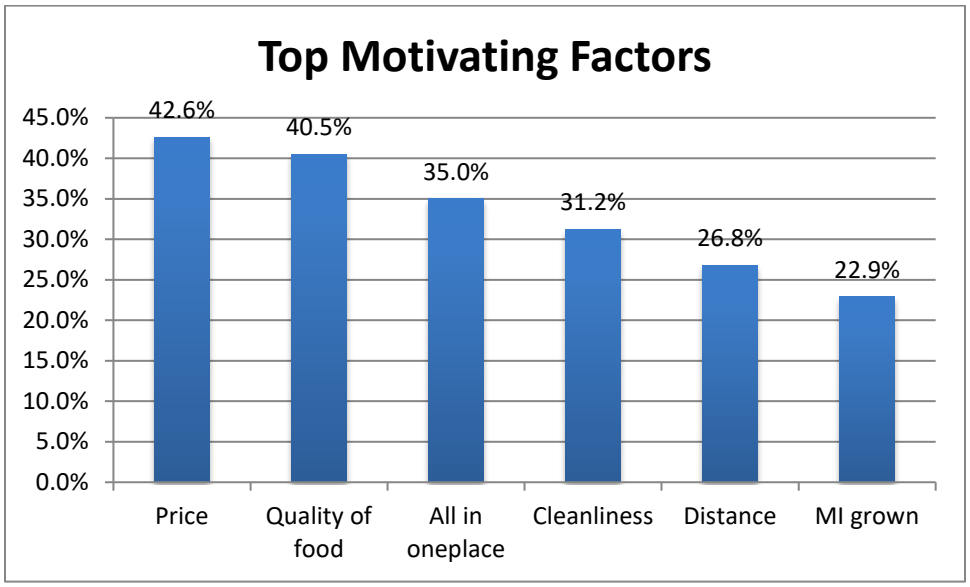
[16] Thompson, F.E. and Subar, A.F., 2008. Dietary assessment methodology. *Nutrition in the Prevention and Treatment of Disease*, *2*, pp.3-39.

[17] Serdula, M.K., Gillespie, C., Kettel-Khan, L., Farris, R., Seymour, J. and Denny, C., 2004. Trends in fruit and vegetable consumption among adults in the United States: behavioral risk factor surveillance system, 1994–2000. *American Journal of Public Health*, *94*(6), pp.1014-1018.

The delineation of store-type was something that was considered in great detail during the development and testing of this survey tool. From the results, it appears that all of these options worked well in this survey (i.e., were understood). However, some contradictory findings emerged in the case of dollar stores and convenience stores. Individuals who shopped for food at these locations tended to report greater perceived food access than those who shopped at these locations less often. This may partially be explained by the fact that those who shopped at dollar stores and convenience stores also shopped at multiple other locations, so this may not be the only source informing food access. Perhaps further exploration into this can be carried out in future rounds of data collection. One method would be to include a trigger if someone reports shopping at these locations (i.e., dollar stores, drugstores, convenience stores), that they are invited at random to an additional short interview following the survey. During this interview, we can ask questions about what in particular they are shopping for at these locations and how this influences their perceptions of access. We may find that these store types differ in rural communities, in terms of what foods are offered and the role that particular store types play in the community. These unique aspects of rural food access should be considered and potentially explored in preliminary interviews (cognitive or key informant) to discern how to best ask this item.

Motivating Factors

In addition to where respondents were obtaining food, we also included an item on the factors that are motivating people in their selection of where to shop for food. The top motivating factors that respondents considered when selecting where to obtain their food included:



Some of the less popular motivating factors included: 'foods from my culture' (5.3%), 'foods that meet my dietary restrictions' (7.5%), 'Organic, sustainable' (9.5%), 'locally-owned store' (11.2%), 'customer service' (12.4%), and 'safety' (12.5%). We recommended retaining all of the motivating factors as some of the less popular items demonstrated unique relationships with other variables (e.g., those that shopped for food at farmers markets tended to value organic and sustainably raised foods).

Transportation

Mode of transportation for getting groceries was asked in terms of frequency (never-always) with these items:

- I drive my own car
- I ride with a friend or family member
- I borrow a car
- I take the bus
- I take a taxi or uber
- I walk or ride my bicycle
- Other

A respondent was coded as utilizing a form of transportation if they answered "often" or "always" on a five point Likert scale. When the number of modes selected by individuals was tallied, the majority of respondents selected only one option (67.4%), some selected two options (16.0%), and fewer selected three or more options (5.2%). Therefore we plan to retain the Likert scale options for mode of transportation with a few updates to the modes of transportation for further clarity:

- ❍ I drive my own car
- ❍ I ride with a friend or family member
- ❍ I borrow a car
- ❍ I take public transit like a bus, train
- ❍ I take a taxi or app-based ride like Uber, Lyft
- ❍ I walk
- ❍ I ride my bicyle
- ❍ Other _____

In addition, distance and time traveled to get groceries was asked. Responses on the item asking about 'miles' was not as useful as responses asking about 'minutes' traveled. The table below shows the relationship between responses to "time" and "distance" traveled and based upon the results yielded from these two variables, it is apparent that time traveled garners more meaningful information. More specifically, the variable "distance" traveled was not significantly correlated with other variables in the survey, rendering it somewhat useless, while "time" traveled was significantly related to several variables, providing interpretations. It is recommended to only ask about minutes in the future, as respondents may find it difficult to accurately report distance in miles.

Distance Traveled	Time Traveled						
	Less than 5 mins	5-10 mins	10-20 mins	20-30 mins	30-45 mins	More than 45 mins	Total
Less than 1 mile	26	32	11	2	2	1	74
1-3 miles	27	114	64	17	6	1	229
3-5 miles	4	95	103	30	2	5	239
5-10 miles	3	27	59	17	4	3	113
10-25 miles	1	2	20	11	8	0	42
More than 25 miles	0	0	1	2	0	4	7
Total	61	270	258	79	23	14	706

Food Insecurity

During the development of core constructs and items for this food access survey, food insecurity was included, but ended up on the "optional" list of potential items that communities could include in their assessments. The two items assessing food insecurity were included in the Ypsilanti survey, and proved to be very useful in interpretations, since they were significantly related to other variables in the analysis (e.g., perceived food access), as well as useful in informing strategies to address underserved populations. These two items, shown below, allow respondents to be classified as food secure or insecure.

- Within the past 12 months we worried whether our food would run out before we got money to buy more. Was that often, sometimes, or never true for you in the last 12 months?
    - Never true; Sometimes true; Often true; I don't know
- Within the past 12 months the food we bought just didn't last and we didn't have money to get more. Was that often, sometimes, or never true for you in the last 12 months?
    - Never true; Sometimes true; Often true; I don't know

Alternatively, the six-item USDA food insecurity module could be used in future iterations of the survey. The benefit of the six-item tool is that is classifies respondents into: high or marginal food security, low food security, and very low food security (18- and 10- item versions also exist). Complementary to assessing food insecurity, GSCN has also developed and tested items to assess hunger coping. These scales include: financial coping (e.g., borrowing money to buy food), trade-offs (e.g., not paying other bills to afford food), and restrictions (e.g., limiting food to last longer). Hunger coping items may be of interest to future implementers of the survey if food insecurity is a central focus.

Appendix A. Food Access Survey Metafile

Item	Response Option	Sources	Further Changes with Cognitive Interviews
Sociodemographics and Other Characteristics			
1. What is your age?	• Between 18 and 24 • Between 25 and 34 • Between 35 and 44 • Between 45 and 54 • Between 55 and 64 • Between 65 and 74 • 75+	• Michigan Behavioral Risk Factor Surveys (MiBRFS)	
2. Are you male or female?	• Male • Female	• California Health Interview Survey (CHIS)	
3. Are you Hispanic, Latino/a, or Spanish origin?	• 0 = No • 1 = Yes • Don't know	• BRFSS	
4. Please tell me which one or more of the following you would use to describe yourself. • White • Black or African American • Asian • American Indian or Alaska Native • Other Pacific Islander • Native Hawaiian • Other (specify)	• Check all that apply	• BRFSS	

5. Below is a list of income categories. Which category represents the total combined income of all members of your household who are <u>14 years of age or older</u> during the last year? If you need assistance calculating your response, please ask for assistance. This includes money from things such as jobs, net income from business, pensions, social security payments, and other money income received. Was it…	• Zero • $5,000 or less • $5,001 – 10,000 • $10,001 – 15,000 • $15,001 – 20,000 • $20,001 – 25,000 • $25,001 – 30,000 • $30,001 – 35,000 • $35,001 – 50,000 • $50,001 - $75,000 • More than $75,000 • Don't know • Refused	• Hunger in America Modified	
6. What is your best estimate of your household's total annual income from all sources before taxes in [insert year]?	• $_____	• California Health Interview Survey (CHIS) http://healthpolicy.ucla.edu/chis/design/Documents/chis2013adultquestionnaire.pdf •	
7. How many adults (ages 19 and older) live in your household? Please include yourself.	• Open ended	• New	
8. How many children less than 18 years of age live in your household?	• Open ended	• MiBRFS	
9. What is the zip code where you live most of the time?	• Open ended • I don't know my zip code. • I don't want to provide my zip code.	• Hunger in America (Modified)	

Food Assistance, Food Sufficiency/Insecurity			
10. Do you currently receive any of the following benefits? a. EBT/Bridge Card (SNAP) b. WIC (Women, Infants, Children) c. Unemployment Benefits d. Disability Benefits e. Medicaid f. Free/reduced lunch for your kids (National School Lunch Program) g. Temporary Assistance for Needy Families (TANF) h. Visit food pantries, food bank, or soup kitchens	• Check all that apply	• Modified from a GSCN survey	• Add "none" as an option
Perceived Neighborhood Food Availability			
Please tell me how much you agree or disagree with the following statements:			
11. It is easy to find fresh fruits and vegetables within my neighborhood.	• 0 = Strongly disagree • 1 = Disagree • 2 = Neither agree nor disagree • 3 = Agree • 4 = Strongly agree • I don't know	• 2013 MiBRFS • Mujahid MS, Diez Roux AV, Morenoff JD et al. (2007) Assessing the measurement properties of neighborhood scales: from psychometrics to ecometrics. Am J Epidemiol 165, 858–867. • Moore LV, Diez Roux AV, Nettleton JA et al. (2008) Associations of the local food environment with diet quality – a comparison of assessments based on surveys and geographic information systems: the Multi-Ethnic Study of Atherosclerosis. Am J Epidemiol 167, 917– 24.	
12. The fruits and vegetables in my neighborhood are high quality.			

		• Gustafson, A. A., Sharkey, J., Samuel-Hodge, C. D., Jones-Smith, J., Folds, M. C., Cai, J., & Ammerman, A. S. (2011). Perceived and objective measures of the food store environment and the association with weight and diet among low-income women in North Carolina. Public Health Nutrition, 14(06), 1032–1038. • http://www.appliedresearch.cancer.gov/mfe/instruments/gustafson_perceived_food_env_vars.pdf	
13. There are a large variety of Michigan-grown foods available in my neighborhood.		• Modified from above items • April: Has this been cognitively tested? Will respondents understand what "variety " is?	
Shopping Patterns and Factors Influencing Shopping Patterns			
Primary shopper: 14. I am the primary food shopper in my household. The primary food shopper(s) is the person(s) who does the grocery shopping most often. ("X" ONE BOX)	• Yes • No • Don't know	• Food Attitudes and Behaviors (FAB) Survey	• Change language to "I do most of the food shopping in my household." • Add "I don't know" option?
15. In the past month, how often did the primary food shopper get food from the following places: a. Supermarket or large?/mid-size grocery store	• Never • 1 time last month • 2-3 times last month • 1 time per week • More than one time per week • Don't know	• Family Life, Activity, Sun, Health, and Eating (FLASHE)/FAB (Modified)	• change "the primary shopper" to "you or your household" • "Where do you or your household get your food from? How often did you go

b. Warehouse club store (such as Sam's Club or Costco) or Discount Superstore (such as Wal-Mart) c. Small family-owner grocery store d. Convenience store (e.g., 7-11) e. Dollar Store (e.g., Family Dollar) f. Drugstore (e.g., Walgreens) g. Farmers Market/ fruit/vegetable market h. Health food store/co-op			to the following places in the past month?" o Take out "family owned"; not necessary and may not always be true
16. Which of the following are most important to you in deciding where you grocery shop? (select your top three choices): a. Availability of Michigan grown foods b. Availability of foods from my culture or other specific items I need c. Availability of organic, sustainable or ethically raised products d. Availability of a variety of goods (e.g., opportunity for one stop shopping) e. Distance from home or work f. Quality of items g. Price of items h. Where my friends or family shop i. A clean store j. A store where I feel safe and comfortable shopping	• Select top 3 choices	• Modified from: Hirsch, J. A., & Hillier, A. (2013). Exploring the role of the food environment on food shopping patterns in Philadelphia, PA, USA: a semiquantitative comparison of two matched neighborhood groups. International journal of environmental research and public health, 10(1), 295-313.	• Change question wording from "which of the following" to "what is most important" • Need to differentiate between safety and comfort/customer service • Decision to ADD "Foods that meet diet restrictions" as additional answer choice
17. Please report how much you agree or disagree with the following statements: I have easy access to stores that meet	• 0 = Strongly disagree • 1 = Disagree • 2 = Neither agree nor disagree	• New; modified from 2013 BRFS	• Need consistent description of "neighborhood"

my needs. Easy access means the store is located in your neighborhood, or another convenient location you can easily drive or take the bus to.	• 3 = Agree • 4 = Strongly agree • I don't know		• Change description of neighborhood to align with Q6 – "easily walk, bike, drive or take the bus to"
Dietary Patterns			
The next section asks two questions about what you eat or drink each day. The first question asks about cups of fruits and the second asks about vegetables. The following box has examples of how much counts as one cup of fruit. One cup of fruit could be: 1 large banana 1 large orange, 8 large strawberries, 1 medium pear, 2 large plums, 32 seedless grapes, 1 cup (8oz.) of 100% fruit juice 18. About how many cups of FRUIT (including 100% pure fruit juice) do you eat or drink each day? (select one) The following box has examples of how much counts as one cup of vegetables. One cup of vegetables could be: 3 broccoli spears, 5 in. long, 1 cup of cooked leafy greens, 2 cups of lettuce or raw greens, 12 baby carrots, 1 medium potato, 1 large ear of corn, 1 large raw tomato 19. About how many cups of VEGETABLES (including 100% vegetable juice) do you eat or drink each day? (select one)	• Never • 1 time last month • None • 1/2 cup or less • 1/2 cup to 1 cup • 1-2 cups • 2-3 cups • 3-4 cups • 4 cups or more	• FAB	• This originally was the 10-item fruit and vegetable screener from the Self-Administered Dietary Screener Questionnaire

Transportation			
20. How often is transportation a problem for you in getting fresh fruits and vegetables? Would you say . . .	• 0 = Never • 1 = Rarely • 2 = Sometimes • 3 = Often • 4 = Always • Don't know	2013 MiBRFS	
21. How often does the distance from your home to a full service grocery store make it difficult for you to buy the variety and quality of fresh fruits and vegetables you would like?	• 0 = Never • 1 = Rarely • 2 = Sometimes • 3 = Often • 4 = Always • Don't know	• 2015 MiBRFS	