Healthy Food Availability & Food Bank Network Report

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EXECUTIVE SUMMARY | HEALTHY FOOD AVAILABILITY & FOOD BANK NETWORK

The Seattle Sweetened Beverage Tax Ordinance 125324 requires the "4) identification and assessment of food deserts in the city and 5) [assessment of] the effectiveness and efficiency of the food bank network in the city." Input from the Sweetened Beverage Tax Community Advisory Board, the Seattle Sweetened Beverage Tax Evaluation City Review Team, community and research experts, and published studies shaped our approach to developing this report, which has five sections (Figure 1):

KEY FINDINGS

1. **What do we know about access to healthy food?** From an early almost exclusive focus on the physical distance to supermarkets – the original "food desert" – our understanding of access to healthy food has evolved to include five dimensions of access: *availability*, *accessibility/convenience*, *affordability*, *acceptability*, and *accommodation*.
2. **Which Seattle areas should we prioritize for increasing access to healthy food?** When we expand the assessment of food environments to include income, travel times to healthy food retailers, and how inundated an area is by retailers selling less healthy food, we find that healthy food priority areas are clustered near the southern boundary around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point). We also see pockets throughout Seattle including neighborhoods in the north end, where, although most of their neighbors are economically secure, low-income residents – especially those who rely on public transportation – may face challenges in accessing healthy food.
3. **How available is and what does healthy food cost in Seattle?** Larger food stores are more likely to carry healthy food items compared to smaller food stores. In lower-income neighborhoods and neighborhoods with a higher percentage of Black or Hispanic populations, there is a lower availability of large food stores and healthy foods. At the same time, when available, protein, milk, and vegetables tended to cost less in these neighborhoods than in high-income neighborhoods. In contrast, fruit was more expensive in lower-income neighborhoods than in high-income neighborhoods.
4. **Who and how many people experience food insecurity in Seattle?** In Seattle, about 13% of adults experience food insecurity (not having enough money for food). Seattle families with children experienced higher rates of food insecurity, from 22% of families with young children (Best Starts for Kids Survey) to 51% of low-income families with children (Seattle Shopping and Wellness Survey). While estimates vary across data sources, we saw consistent patterns showing that in general, people of color, lower-income, less educated, and those who identified as lesbian, gay, or bisexual more commonly reported experiences of food insecurity. Participation in SNAP/Basic Food continued to rise among one age group: older adults. Not until 300% of the Federal Poverty Level (FPL) do we see food insecurity begin to drop to a low level for Seattle adults; for people of color, it is at 400% FPL. In 2017, about 13,400 Seattle residents experienced food insecurity, yet made too much income to qualify for food assistance benefits. The estimate would be higher if it included people who, although receiving benefits, still experience food insecurity.
5. **How is the food bank network meeting the needs of its clients?** Seattle food bank survey respondents reported distributing more than 22,885,000 pounds of food each year. Food banks described an increase in need, reporting more visits from older adults, homeless, and people living further north and south. Among the 60% of food bank respondents who reported a rise in visits over the last year, 39% reported their funding remained the same or was reduced. To keep up with

demand, 65% of food bank respondents reported having to reduce the variety and 41% had to reduce the amount of food offered to each client. A majority (68%) of food banks reported having less than 10% of their budget for direct food purchases. Clients of food banks expressed the desire for consistent access to quality food such as fresh produce and proteins, and emphasized the importance of maintaining a sense of dignity at the food bank such as by creating experiences that replicate those at a grocery store. Food banks' reported hours of distribution revealed limited hours over the weekend and evenings, which may signal an additional gap in access. To more effectively serve clients, staff emphasized addressing operational needs such as sufficient staffing and space, more purchasing power, and investments in coordinated mobile systems to support procurement and delivery.

FINAL REMARKS

We hope the report is a resource for people and organizations interested in building equitable access to healthy food in Seattle. It provides a comprehensive and updated snapshot of what access to healthy food looks like in Seattle. This report concludes the report required by Ordinance 125324 to assess access to healthy food and the food bank network in Seattle.

Figure 1. Report of healthy food availability and the food bank network in Seattle

Section	Methods
1. What do we know about access to healthy food?	• Literature review of more than 175 articles, reports, and websites published over past 10 years
2. Assessment of food environments by neighborhood: which areas should we prioritize for increasing access to healthy food?	• Identified healthy food priority areas using measures of 1) income, 2) multi-mode travel times to healthy food retailers, and 3) inundation of less healthy retailers in an area
3. What is the price and availability of healthy food in Seattle stores?	• Surveyed a sample of 134 food stores across Seattle, plus all 23 food stores in the neighborhoods of High Point, Haller Lake, and South Park, to measure availability and price of 19 healthy food items
4. Who experiences food insecurity in Seattle? Who falls into the "food security gap"?	• Identified disparities and estimated rates of food insecurity by analyzing 5 survey datasets and review of community reports; estimate number of people who are food insecure and have incomes that do not qualify for Supplemental Nutrition Assistance Program (SNAP)
5. Meeting the need: what do we know about Seattle's food bank network?	• Interviewed 13 food bank staff; conducted 7 focus groups (3 English, 1 each in Vietnamese, Russian, Cantonese, and Spanish) with 47 food bank clients; surveyed 25 of 30 Seattle food banks

SECTION 1 | WHAT DO WE KNOW ABOUT ACCESS TO HEALTHY FOOD?

SUMMARY

To identify domains of access to healthy food, we reviewed over 175 scientific articles, reports, and websites published since 2007. To capture context specific to Seattle, we also reviewed non-academic local reports describing food access. We describe the history and evolution of the concept of "food desert" and discuss the multidimensional approaches to improving healthy food access in Seattle.

Key findings

Recent research on access to healthy foods in the United States has been conducted amid increasing concern about obesity and associated health outcomes, with particular attention to disparities in healthy food access related to income and race/ethnicity. To date, simply improving the *availability* of healthy food has not been enough to drive improvements in diet quality and health outcomes, or to close the healthy-eating gap between high- and low-income households. Our understanding of healthy food access has evolved from the original "food desert" concept (with an early and almost exclusive focus on physical distance between residents' homes and local supermarkets) to include multiple dimensions of access including *availability*, *accessibility/convenience*, *affordability*, *acceptability*, and *accommodation*. In the Seattle area and elsewhere, research on food access has gone beyond simple measures of store proximity to consider the extent to which healthy food choices are associated with *affordability*, transportation mode (*accessibility/convenience)*, type of grocery store (*accessibility/convenience, and accommodation)*, and a variety of personal and social factors.

SECTION 1 | WHAT DO WE KNOW ABOUT ACCESS TO HEALTHY FOOD?

OBJECTIVE

The purpose of this section is to review the literature on healthy food access so we can refine our understanding (a) of *multiple dimensions of healthy food access* in Seattle and (b) of the roles these dimensions may play in reducing disparities in nutritional quality and health outcomes.

In the 19th century, scientific interest in the relationship between diet and health was driven by concerns about malnutrition among impoverished populations. In the 21st century, concerns about widening disparities in nutrition-related diseases such as obesity and diabetes have rekindled this interest and focused attention on the role of physical access to healthy food[1]. Following a nationwide red alert about the health consequences of our rapidly spreading obesity epidemic, federal, state, and local governments embraced the notion that eliminating "food deserts"—locations with limited access to nutritious food, especially in low-income areas—would reduce low dietary quality and related health disparities.

In this context, the Seattle Sweetened Beverage Tax (Ordinance 125324) requires as part of the evaluation activities the "4) identification and assessment of food deserts in the city." As we prepared to address this requirement, we solicited input from City of Seattle staff in the Human Services Department and the Office of Sustainability and Environment, researchers at the UW Center for Public Health Nutrition, and other stakeholders. A message we heard repeatedly was that the United States Department of Agriculture (USDA) definition of "food desert" did not adequately capture the nuances and multiple domains of access to healthy food, an insight that set the stage for our review of the food access literature.

With the goal of understanding the evolution of scientific thinking about healthy food access, we queried the scientific search engine PubMed (https://www.ncbi.nlm.nih.gov/pubmed/) using the following terms, alone and in combination: food access, food insecurity, domains of access, food desert, food environment, inequality, disparities and inequity. We also read non-academic literature, primarily from government websites, pertaining to food access in Seattle and King County and reviewed sources identified by team members and experts in the field. Overall, we reviewed more than 175 articles, reports, and websites published after 2007. We chose 2007 as our cut-off because we found comprehensive historical reviews published in 2008 and later years.

RESULTS

DIMENSIONS OF FOOD ACCESS—MOVING TOWARD A MORE COMPREHENSIVE VIEW

Origins of the "food desert" concept

Introduced in Scotland in the early 1990s,[2] the term "food desert" was defined in the 2008 United States Farm Bill as *"an area…with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities."*[3,4] In a 2009 report[3] to Congress, the U.S. Department of Agriculture outlined a framework in which individual, social, and environmental characteristics – including access to supermarkets – might influence food choices, diet, and health outcomes. In this context, "food deserts" were proposed as a potential contributor to nutrition-related health disparities.

Disparities in access confounded with food insecurity

Neighborhoods with large communities of color often experience disproportionate rates of morbidity, mortality, and adverse health outcomes, and these outcomes have been associated with environmental characteristics such as residential segregation, poverty, and neighborhood deprivation—including fewer supermarkets.[2,5] One study found that African American neighborhoods had 48% fewer chain supermarkets than their white neighborhood counterparts and Hispanic neighborhoods had only 32% as many chain supermarkets as non-Hispanic neighborhoods.[6] In addition, disparities have been found in quality, variety, quantity, and price of healthy food, reflecting inequities across several domains of access.[2,7,8] Among communities of color, access to healthy food is often confounded with food insecurity (limited or uncertain access to adequate food). Elevated rates of food insecurity *and* limited access to supermarkets in their neighborhoods[2] have been reported for African American,[2,6,9,10] Latino[2], and Navajo[11,12] communities.

Government supports elimination of food deserts

Two years after the Farm Bill defined food deserts, the 2010 Healthy Food Financing Initiative (HFFI) made more than $400 million available to eliminate food deserts, primarily by retaining and increasing the supply of supermarkets in areas with limited food access.[13] The rationale went as follows: 1) some studies had shown that people made food choices based on what was immediately available in their neighborhoods,[2] 2) supermarkets and large grocery stores generally have lower prices and broader availability of healthy foods compared to smaller markets, 3) when given the option, low-income households may shop where food prices are lower,[3] and 4) the purchase and consumption of more healthy foods improve diet quality and improve health.

Operational definitions of food deserts

Generally, food deserts have been defined as low-income areas (census tracts, ZIP codes, or census block groups) with low access to supermarkets. The USDA's Economic Research Service recently replaced its Food Desert Locator with the Food Access Research Atlas, an on-line tool that identifies low-income census tracts and enables users to then identify areas with low food access by choosing one of two distances from the nearest supermarket, supercenter, or large grocery store. In urban areas, users choose between more than ½-mile and 1 mile away; in rural areas they choose between more than 10 miles and 20 miles away.

- Low-income census tracts are defined as those where either (a) >20% of the population is below the poverty level or (b) the tract's median family income (MFI) is ≤80% of the statewide MFI, based on the 2010 Decennial Census and 2006-2010 American Community Survey.[14–16]
- Low-access is determined by the Euclidian or "straight-line" distance between the centers of two grid cells, one containing population-level poverty estimate and the other the nearest supermarket.

Limitations of the food desert concept

Supermarket proximity alone does not adequately measure access to healthy food

After using the USDA tools for identifying food deserts, researchers have concluded that simple proximity to a supermarket does not fully capture the nuances of access to healthy food.[17] Using this measure alone can lead to inaccurate estimates of who does and does not have adequate access to

nutritious food.[18] Problems with using this metric may be due to its reliance on the following assumptions:

- People can and do shop primarily at the grocery store closest to home.
- Full-service supermarkets are the primary source for nutritious foods and meet the needs and food preferences of all residents.
- Mode of transportation to/from food stores is the same for all residents.[18,19]

Food deserts have limited association with diet and health outcomes

A 2012 systematic review concluded that proximity measures of supermarket availability were unrelated to dietary outcomes.[20] Another study concluded that "food swamps" (areas with a preponderance of stores selling fast food and junk food rather than healthy food options) were better than food deserts as predictors of neighborhood obesity rates.[21] And a report focusing on policy applications of food deserts found that choosing slightly different boundaries to represent the same geographic area (i.e., census tracts vs. ZIP codes vs. census block groups) yielded inconsistent correlations with the outcomes of interest.[19]

The exclusive focus of food desert research on access to chain supermarkets and grocery stores highlights these retail outlets as sources of fresh produce but ignores the fact that they also sell vast amounts of cheap, unhealthy foods. A study in the San Francisco Bay Area found that small markets contributed to community food security and provided culturally acceptable foods at relatively low prices. The researchers noted, however, that small, full-service stores were no panacea, as it was often difficult for these neighborhood markets to maintain quality at low profit margins.[22] Because the mix of foods sold in small and medium-sized stores is so heterogeneous, in-store assessments (as described in Section 3 of this report) may be the most accurate way to determine the availability of healthy foods.

As mentioned above, the 2010 Healthy Food Financing Initiative (HFFI) was designed to bring grocery stores and other healthy food retailers to underserved communities across America.[13] The HFFI "expands access to nutritious food in these communities through efforts such as developing and equipping grocery stores, small retailers, corner stores, and farmers markets selling healthy food."[23] However, multiple studies have found that introducing a new supermarket does little to change diet, increase access to nutritious food, or improve health among residents in the neighborhoods where these supermarkets have opened.[24–26] While this result does not discount the importance of providing access to healthy foods, it suggests that access, while necessary, is not sufficient to move the needle on healthy diets or health outcomes in surrounding communities. In the Seattle area as well, proximity to the nearest supermarket is not associated with diet quality (research described below).

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Broadening our conceptualization of food access

The physical environment in which people obtain and eat food is only one component of food access. In the real world, people's food choices are made in the (connected) contexts of policy, a broad set of food environments, and individual and social factors. Sections 3 and 5 provide details about various food environments in the City of Seattle, including the price and availability of healthy food at retail stores

and food banks throughout the city. Across all these settings, healthy food access can be limited by cost as well as capacity to address the risk of providing healthy, perishable foods.

Most sections of this report focus on the food environment and policy-backed supports to improve availability and access to food. However, policies that simply increase food access by introducing supermarkets do not improve dietary quality or health outcomes[27] and physical proximity to a supermarket does not assure utilization. Recent reviews have stressed that increasing access to healthy food is not enough to close the healthy-eating gap between high- and low-income families.[28] Individual and social factors also shape food choices and behaviors. For example, education and nutrition knowledge generally predict increased *preferences* for healthy foods,[26] although this can vary across populations.[29]

Individual and social factors also shape food choices and behaviors.

Introducing the five dimensions of healthy food access

To consider a broader conceptualization of healthy food access, researchers have retooled five dimensions of healthcare access and applied them to healthy food access (Box 1). These dimensions proved very useful in our assessments of the Seattle food environment, and we refer to them throughout this report. Although the first three dimensions – *availability, accessibility/convenience*[i]*,* and *affordability* – have been studied extensively,[20] *accommodation* and *acceptability* could have equal or greater impacts on healthy food choices. While we had limited capacity to assess all five dimensions for the entire food system serving Seattle's food insecure population, we were able to look at most dimensions in our assessment of the food bank network (Section 5).

Box 1. Dimensions of healthy food access[20,30]

- **Availability:** adequacy of supply of healthy food, such as number of places to purchase produce and presence of certain types of restaurants in neighborhoods
- **Accessibility/Convenience:** geographic location of food supply and ease of getting to that location (key measures are travel time and distance)
- **Affordability**: Food prices, people's perception of worth relative to food cost and ability to pay for food that is available (often measured by store audits or regional price indices)
- **Accommodation:** how well food sources accept and adapt to residents' needs (store hours, types of payment accepted, offerings of culturally relevant food items)
- **Acceptability:** Attitudes regarding attributes of the local food environment and whether the supply of products meets personal standards (measured by surveys, interviews, focus groups)

Researching food access in Seattle

Research focusing on food access in the City of Seattle and King County has gone beyond the food desert concept by introducing dimensions of *affordability* and vulnerability, testing different definitions of low-income, and replacing "as-the-crow-flies" distance estimates with calculations of travel times in four different modes.

Using the U.S. Department of Agriculture definition of food desert, the Food Access Research Atlas identifies areas of north and south Seattle as low-income and low-access based on the ½-mile Euclidian

[i] *To avoid confusion with the more general term "access," we revised the original dimension "accessibility" to "accessibility/convenience "*

(straight-line) distance from a supermarket, supercenter, or large grocery store. However, the Food Access Research Atlas does not factor in affordability or other components of healthy food access.

A 2012 study in King County measured access to supermarkets via four travel modes: walking, bicycling, riding transit, or driving within 10 minutes trip time for each mode. Food affordability was determined by stratifying seven supermarket chains as low-, medium-, and high-cost, and researchers tested different definitions of low-income (by census block groups) and vulnerability (which included lack of vehicle ownership) for households. Findings that fewer than 8% of low-income families lived within a 10-minute bus ride to a low- or medium-cost supermarket and more than 89% lived beyond a 10-minute walk to a low-cost supermarket[31] provide a more nuanced perspective on the constraints and choices involved in food access.

While this study considered domains of *accessibility*/*convenience* and *affordability*, studying only low- or medium-income block groups fails to address food access barriers faced by low-income households living in high-income areas.[19] Nationwide, an estimated 8.5 million low-income individuals live in moderate- and higher-income areas that are more than 1 mile from a supermarket.[32] A study in Portland identified an abundance of "food mirages," areas where supermarkets and grocery stores were plentiful, but healthful foods were unaffordable, especially in regions of gentrification.[18]

In "*Women in the Green Economy: Voices from Southeast Seattle*," Got Green reported that 67% of the women surveyed cited cost as the largest barrier to healthy food; 23% cited geographic accessibility as another barrier.[33] Women in the Delridge neighborhood surveyed for a "*Seattle Women and Food Access Report*" in 2014 emphasized that lower food prices and increased economic ability could help remove barriers to accessing healthy food; they also cited the importance of improving public transportation, and some women supported cooperative ownership for local grocery stores.[34]

The 2014 Seattle Obesity Study found that only one in three respondents bought most of the food for their household at the supermarket closest to home. And physical distance to a household's primary supermarket was not linked to diet quality. Instead, income, education, and shopping at high-cost (compared to medium- and low-cost) stores was the best predictor of diet quality (probably reflecting unmeasured confounding rather than a causal relationship between high-cost supermarkets and higher fruit and vegetable intake). Cost for essentially the same 100 commonly consumed and widely available market-basket foods differed substantially, from an average $224 at low-cost supermarkets to $393 at high-cost supermarkets.[17]

Also in the Seattle area, a 2018 longitudinal study focused on correlates of dietary behaviors among middle-aged Hispanic and white women living in low-income neighborhoods and found weak relationships between most aspects of the food environment and dietary behaviors. There were two notable exceptions, however: among Hispanic women, the presence of ethnic food stores was associated with higher fruit and vegetable consumption, while among white women, having fast-food restaurants in the neighborhood was associated with consumption of more soft drinks and a higher percentage of calories consumed from fat. Regarding the finding in Hispanic women, this could be related to the *accommodation* and *acceptability* dimensions of food access, i.e., access to culturally relevant and recognizable fruits and vegetables. In addition, education showed different relationships to healthy eating in the two groups of women. Among white women, higher education was associated with higher consumption of fruits and vegetables and lower consumption of soft drinks; among Hispanic women, however, higher education was associated with consumption of a greater percentage of calories from fat.[29] This study found that women of differing ethnic groups did not respond similarly to

environment conditions or educational attainment, underscoring the importance of understanding the roles of individual, social, and cultural factors in actual dietary behavior.

Improving measurement of food access

Over a decade of research on food deserts, scientific understanding of food access has evolved considerably and researchers have developed new measures to address some of the shortcomings of the food desert concept. One such metric is the Modified Retail Food Environment Index (mRFEI),[35] which combines the *food desert concept's* emphasis on an area's lack of access to healthy foods with the *food swamp concept's* focus on areas where healthy food options are inundated with unhealthy food options. Another improved measure, the Healthy Food Priority Area index (HFPAi), was developed to examine the food environment of Baltimore City.[5] Section 2 describes PHSKC's adaptation of the HFPAi to capture multiple dimensions of healthy food access in the City of Seattle.

DISCUSSION

Beyond food access

As concern about America's obesity epidemic grew, the food desert concept garnered a great deal of attention, interest, and governmental support, in part because it suggested a relatively straightforward solution in which a redistribution of supermarkets would improve food access, which would in turn lead to improvements in diet quality and health outcomes. Eliminating food deserts does not, however, appear to meaningfully improve either food access or health.[1] Cross-sectional evidence linking food deserts with residents' diet quality is weak and rigorous studies of newly introduced supermarkets in food deserts suggest that their presence does not result in improved dietary intake.

While the rationale behind the food desert concept had intuitive appeal, research has shown that framing food access as a function of the spatial distribution of supermarkets does not accurately describe people's actual food access behaviors. In addition, our literature review suggests that while education and nutrition knowledge predict preferences for healthy foods,[26] closing the healthy-eating gaps -- between high- and low-income families and between groups of different races/ethnicities -- may require interventions tailored to specific groups. Although a focus on food deserts can be framed as a food justice issue, this approach may have the unintended consequence of obscuring the need to focus on upstream causes of food insecurity such as poverty and the limitation it places on ability to meet basic needs.[27]

The food desert concept fails to capture the nuances of healthy food access and ignores underlying structural inequalities that shape the local food environment and an individual's or household's access to healthy affordable food.[5,20] Improving healthy food access requires careful consideration of multiple domains – *accessibility/convenience*, *affordability*, *accommodation*, *availability*, *acceptability*, and possibly others as well. Meaningful improvement of dietary quality and health outcomes are more likely to occur when policies include a focus on upstream causes of food insecurity and health inequities such as poverty, racism, and unequal opportunity.[27]

In conclusion, when addressing the issue of food insecurity in Seattle, it is important to consider the full spectrum of food access dimensions. Expanding our concept of food access beyond proximity-to-grocery-stores forces us to consider more broadly defined 'healthy food environments' and offers a meaningful context for understanding the barriers individuals and households face in accessing healthy food. In addition, Section 3 discusses disparities by race/ethnicity and income in the distribution of store

types across Seattle neighborhoods and Section 4 provides details about who in Seattle experiences food insecurity.

Limitations

This review aimed to provide a narrative summary of the current literature about neighborhood healthy food access. Unfortunately, research on this topic has struggled to define and delineate the aspects of healthy food access that impact diet quality. The evidence base is also limited by the absence of empirical tests of comprehensive models of diet quality that examine potential influences of various environmental, social, and individual factors on diet quality.

Our approach to examining the literature and its relevance to Seattle also has limitations, which include conducting a selective narrative review rather than a systematic review. We did not comprehensively evaluate study quality or extract data from the studies to conduct a quantitative synthesis. Given the general, non-academic audience for this report and interest in local information, we summarized studies to provide a qualitative synthesis of the current knowledge about food access. Our literature review emphasized public health research and practice. The PubMed search engine we used included biomedical literature, life science journals, and online books, so we could have missed relevant studies in health economics or social sciences research literature. Although the literature base is continually growing, we limited the end date of our review to November 2018 and might miss more recently published relevant articles.

Finally, because we did not include “student” or “campus” in our search terms, our review did not address food insecurity among college students. As reported in Section 2 of this report, food insecurity is high in Seattle’s University District (and among 18-24 year olds) and the University District is identified as meeting two of the three factors we used to define a healthy food priority area.

References

1. Block JP, Subramanian S V. Moving Beyond "Food Deserts": Reorienting United States Policies to Reduce Disparities in Diet Quality. *PLoS Med*. 2015;12(12):e1001914. doi:10.1371/journal.pmed.1001914
2. Walker RE, Keane CR, Burke JG. Disparities and access to healthy food in the United States: A review of food deserts literature. *Heal Place*. 2010;16(5):876-884. doi:10.1016/j.healthplace.2010.04.013
3. Ver Ploeg M, Breneman V, Farrigan T, et al. *Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences Report to Congress*.; 2009. https://www.ers.usda.gov/webdocs/publications/42711/12716_ap036_1_.pdf?v=0. Accessed August 29, 2018.
4. Johnson R. *CRS Report for Congress The 2008 Farm Bill: Major Provisions and Legislative Action Specialist in Agricultural Policy*.; 2008. www.crs.gov. Accessed September 4, 2018.
5. Misiaszek C, Buzogany S, Freishtat H. *Baltimore City's Food Environment: 2018 Report*. Baltimore, MD; 2018.
6. Powell LM, Slater S, Mirtcheva D, Bao Y, Chaloupka FJ. Food store availability and neighborhood characteristics in the United States. *Prev Med (Baltim)*. 2007;44(3):189-195. doi:10.1016/j.ypmed.2006.08.008
7. Lee RE, Heinrich KM, Medina A V, et al. A picture of the healthful food environment in two diverse urban cities. *Environ Health Insights*. 2010;4:49-60. http://www.ncbi.nlm.nih.gov/pubmed/20706621. Accessed August 21, 2018.
8. Kumar S, Quinn SC, Kriska AM, Thomas SB. "Food is directed to the area": African Americans' perceptions of the neighborhood nutrition environment in Pittsburgh. *Health Place*. 2011;17(1):370-378. doi:10.1016/j.healthplace.2010.11.017
9. Richardson AS, Boone-Heinonen J, Popkin BM, Gordon-Larsen P. Are neighbourhood food resources distributed inequitably by income and race in the USA? Epidemiological findings across the urban spectrum. *BMJ Open*. 2012;2(2):e000698. doi:10.1136/bmjopen-2011-000698
10. Larson NI, Story MT, Nelson MC. Neighborhood Environments: Disparities in Access to Healthy Foods in the U.S. *Am J Prev Med*. 2009;36(1):74-81.e10. doi:10.1016/J.AMEPRE.2008.09.025
11. Pardilla M, Prasad D, Suratkar S, Gittelsohn J. High levels of household food insecurity on the Navajo Nation. *Public Health Nutr*. 2014;17(1):58-65. doi:10.1017/S1368980012005630
12. O'Connell M, Buchwald DS, Duncan GE. Food access and cost in American Indian communities in Washington State. *J Am Diet Assoc*. 2011;111(9):1375-1379. doi:10.1016/j.jada.2011.06.002
13. Healthy Food Financing Initiative. USDA ACF Office of Community Services. https://www.acf.hhs.gov/ocs/programs/community-economic-development/healthy-food-financing. Published 2017. Accessed August 2, 2018.
14. About the Atlas. USDA Economic Research Service. https://www.ers.usda.gov/data-products/food-access-research-atlas/about-the-atlas.aspx#definitions. Published 2017. Accessed August 2, 2018.
15. VanderHeide J. An Alternative Method for Determining Geographies with Low Access to Healthy Food: Case Study Lowell, MA. 2015. https://sites.tufts.edu/gis/files/2016/01/VanderHeide_John_Nutr231_2015.pdf. Accessed August 2, 2018.
16. Documentation. USDA Economic Research Service. https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/. Published 2017. Accessed August 2, 2018.
17. Aggarwal A, Cook AJ, Jiao J, et al. Access to supermarkets and fruit and vegetable consumption. *Am J Public Health*. 2014;104(5):917-923. doi:10.2105/AJPH.2013.301763

18. Breyer B, Voss-Andreae A. Food mirages: Geographic and economic barriers to healthful food access in Portland, Oregon. *Heal Place*. 2013;24:131-139. doi:10.1016/j.healthplace.2013.07.008
19. Ver Ploeg M, Dutko P, Breneman V. Measuring food access and food deserts for policy purposes. *Appl Econ Perspect Policy*. 2015;37(2):205-225. doi:10.1093/aepp/ppu035
20. Caspi CE, Sorensen G, Subramanian S V, Kawachi I. The local food environment and diet: A systematic review. *Heal Place*. 2012;18(5):1172-1187. doi:10.1016/j.healthplace.2012.05.006
21. Cooksey-Stowers K, Schwartz M, Brownell K. Food Swamps Predict Obesity Rates Better Than Food Deserts in the United States. *Int J Environ Res Public Health*. 2017;14(11):1366. doi:10.3390/ijerph14111366
22. Short A, Guthman J, Raskin S. Food Deserts, Oases, or Mirages? *J Plan Educ Res*. 2007;26(3):352-364. doi:10.1177/0739456X06297795
23. Feroli C. USDA Announces New Partnership to Increase Rural Residents' Access to Healthy Food | USDA Rural Development. USDA Rural Development. https://www.rd.usda.gov/newsroom/news-release/usda-announces-new-partnership-increase-rural-residents'-access-healthy-food. Published 2017. Accessed August 2, 2018.
24. Drewnowski A, Moudon A V, Jiao J, Aggarwal A, Charreire H, Chaix B. Food environment and socioeconomic status influence obesity rates in Seattle and in Paris. *Int J Obes*. 2014;38(2):306-314. doi:10.1038/ijo.2013.97
25. Drewnowski A, Aggarwal A, Hurvitz PM, Monsivais P, Moudon A V. Obesity and supermarket access: Proximity or price? *Am J Public Health*. 2012;102(8):e74-80. doi:10.2105/AJPH.2012.300660
26. Allcott H, Diamond R, Dubé J-P. *The Geography of Poverty and Nutrition: Food Desserts and Food Choices Across the United States*.; 2018. doi:10.2139/ssrn.3095779
27. Rosenberg N, Cohen N. Let Them Eat Kale: The Misplaced Narrative of Food Access. *Fordham Urban Law J*. 2018;45(4). https://ir.lawnet.fordham.edu/ulj/vol45/iss4/5. Accessed November 15, 2018.
28. Rehm CD, Peñalvo JL, Afshin A, Mozaffarian D. Dietary Intake Among US Adults, 1999-2012. *JAMA*. 2016;315(23):2542. doi:10.1001/jama.2016.7491
29. Bowen D, Jabson J, Barrington W, et al. Environmental and Individual Predictors of Healthy Dietary Behaviors in a Sample of Middle Aged Hispanic and Caucasian Women. *Int J Environ Res Public Health*. 2018;15(10):2277. doi:10.3390/ijerph15102277
30. Andress L, Fitch C. Juggling the five dimensions of food access: Perceptions of rural low income residents. *Appetite*. 2016;105:151-155. doi:10.1016/J.APPET.2016.05.013
31. Jiao J, Moudon A V, Ulmer J, Hurvitz PM, Drewnowski A. How to identify food deserts: Measuring physical and economic access to supermarkets in King County, Washington. *Am J Public Health*. 2012;102(10). doi:10.2105/AJPH.2012.300675
32. Ver Ploeg M, Breneman V, Dutko P, et al. Access to Affordable and Nutritious Food: Updated Estimates of Distance to Supermarkets Using 2010 Data. *Econ Res Rep*. November 2012. https://ideas.repec.org/p/ags/uersrr/262227.html. Accessed August 21, 2018.
33. *Women in the Green Economy: Voices from Southeast Seattle*. https://gotgreenseattle.files.wordpress.com/2011/09/gotgreen-women-report-lowres-9-11.pdf. Accessed August 21, 2018.
34. *Women and Food Access*.; 2014. https://www.seattle.gov/Documents/Departments/SeattleWomensCommission/Women-and-Food-Access-Study-Final-Report_2014.pdf. Accessed August 21, 2018.
35. Children's Food Environment State Indicator Report, 2011. Centers for Disease Control and Prevention, Division of Nutrition Physical Activity and Obesity, Department of Health and Human Services. https://www.cdc.gov/obesity/downloads/ChildrensFoodEnvironment.pdf. Published

2011. Accessed June 1, 2018.

SECTION 2 | ASSESSMENT OF FOOD ENVIRONMENTS BY NEIGHBORHOOD: WHICH AREAS SHOULD WE PRIORITIZE FOR INCREASING ACCESS TO HEALTHY FOOD?

SUMMARY

This section identifies healthy food priority areas (HFPA) in Seattle – locations to prioritize for improving access to healthy, affordable food. The analysis goes beyond locating food deserts (distance to nearest supermarket in low-income areas) by including three of the five domains of access to healthy food described in Section 1: *affordability* (ability to pay), *accessibility/convenience* (location and ease of transport), and *availability* (adequacy of food supply). We identified areas that had higher poverty levels and looked for overlap with areas that had longer travel times to the four nearest healthy food retailers and/or areas inundated by retailers selling less healthy options than retailers selling healthy food (such as produce).

Key findings

While Delridge and areas in north and south Seattle are specified as food deserts according to United States Department of Agriculture, additional analyses show the following nuances:

- Areas with higher concentrations of poverty are located at the northern city boundary, pockets of areas around Greenwood and Sand Point, the University District, as well as from the Central District extending south into Southeast and West Seattle.
- People with longer travel times to healthy food retailers lived in areas by water, Eastlake, the corridor around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point), and the University District. Longer travel times are likely to impact lower-income households living in these areas more than wealthier households.
- One-way travel times to healthy options were almost four minutes longer for people living in areas with a profusion of food retailers selling less healthy options compared to areas with more balanced options for food (11 minutes vs. 7 minutes).
- The healthy food priority areas near the southern boundary around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point) overlapped on all three factors: lower income, longer travel times to healthy food retailers, and higher percentage of unhealthy food retailers. We also identified small areas across Seattle including neighborhoods in the north end, where, although most of their neighbors are economically secure, low-income residents – especially those who rely on public transportation – may face challenges in accessing healthy food.

SECTION 2 | ASSESSMENT OF FOOD ENVIRONMENTS BY NEIGHBORHOOD: WHICH AREAS SHOULD WE PRIORITIZE FOR INCREASING ACCESS TO HEALTHY FOOD?

OBJECTIVE

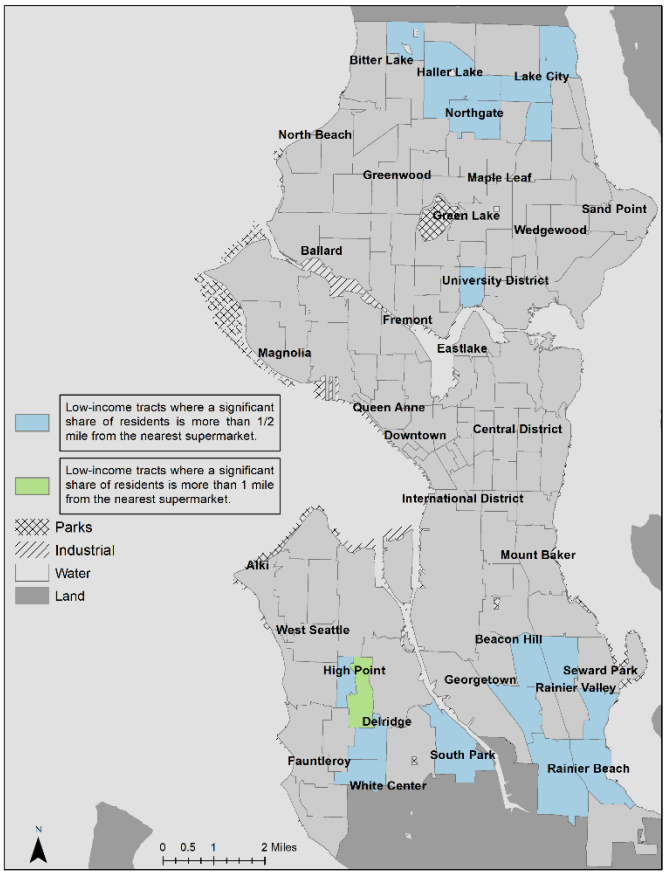
The objective of this section is to identify healthy food priority areas (HFPA) in Seattle – locations to prioritize for improving access to healthy, affordable food. The Seattle Sweetened Beverage Tax (Ordinance 125324) asks for the "identification and assessment of food deserts in the city." As reviewed in Section 1, assessing the food environment has evolved beyond the original food desert calculation of proximity to supermarkets. Concerns about using this metric include assuming people shop primarily at the supermarket closest to home or that supermarkets are the only place people shop for produce (which excludes other categories of retailers with produce sections, such as ethnic groceries, warehouses, and produce or farmer's markets). Similarly, people we consulted (local community and subject matter experts) about this work called for us to examine other known domains of access to healthy food. Of the five dimensions of food access introduced in Section 1, we found reliable data to look at three dimensions: *affordability* (ability to pay), *accessibility/convenience* (location and ease of transport), and *availability* (adequacy of food supply). We adapted methods of a recent report assessing inequities in the food environment in Baltimore[1] and identifying healthy food priority areas. The results from our analyses identify areas in Seattle where low-income households live and where access to healthy, affordable food and a healthy food environment is limited. We compare results to food desert locations identified by the USDA Food Access Research Atlas. We also compare results to areas where low-income households have limited food retail access, as identified by a 2013 report from the City of Seattle Office of Sustainability and Environment.

RESULTS

FOOD DESERT LOCATIONS, ACCORDING TO THE USDA FOOD ACCESS RESEARCH ATLAS

The term food desert refers to a low-income neighborhood with limited or no access to a supermarket. The USDA Food Access Research Atlas identifies Delridge as the only neighborhood that qualifies as a food desert using the 1-mile distance criterion. Using the ½-mile distance criterion, several other neighborhoods, predominately in North and South Seattle, are considered food deserts (Figure 1). At the end of this section, we discuss how the food deserts identified here compare to healthy food priority areas that emerged from our additional analyses. See addendum at the end of this section for detailed methods.

Figure 1. Food desert locations identified by USDA Food Access Research Atlas



Note: A food desert refers to a low-income neighborhood with limited or no access to a supermarket. The USDA Food Access Research Atlas (https://www.ers.usda.gov/data-products/food-access-research-atlas/) identifies Delridge as the only neighborhood that qualifies as a food desert using the 1-mile distance criterion. Using the ½-mile distance criterion, several other neighborhoods, predominately in North and South Seattle, are considered food deserts.

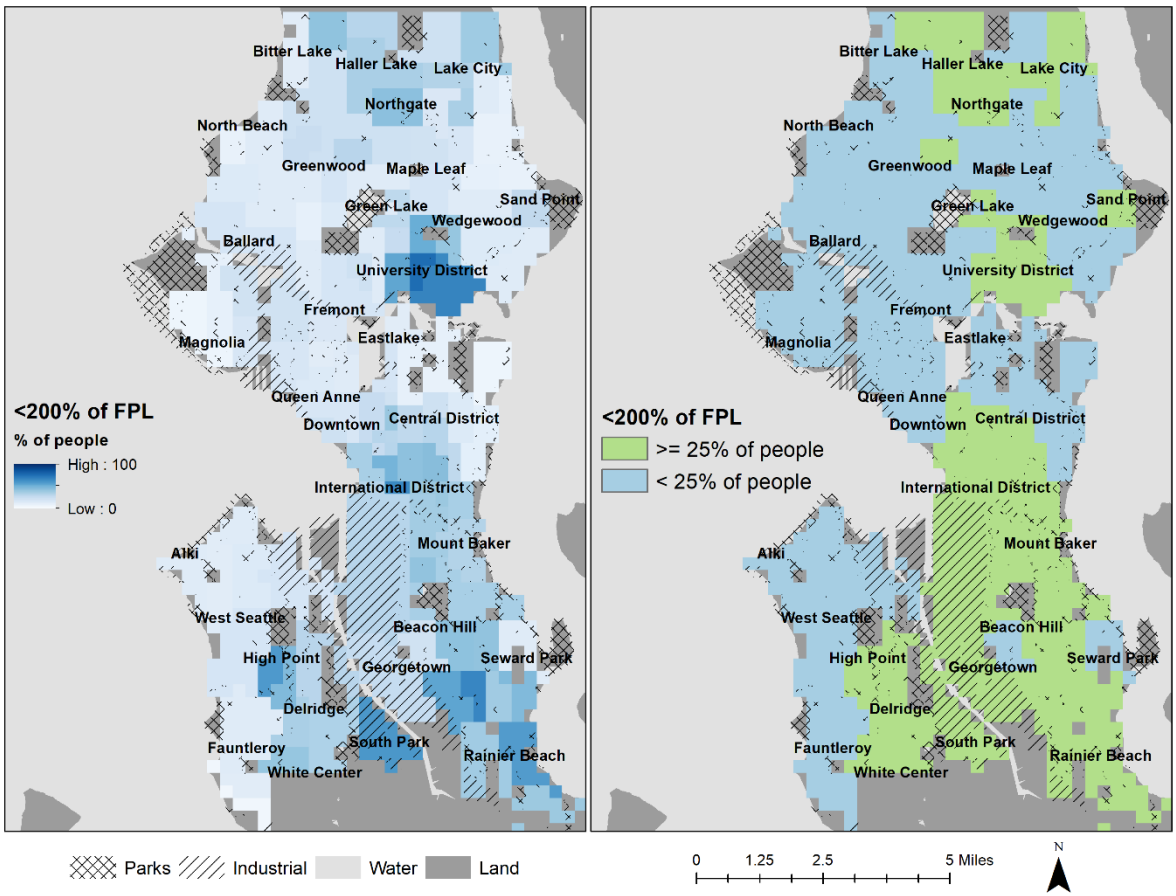
AREAS WITH HIGHER POVERTY LEVELS

While Section 3 of this report gives information about the price of food, another aspect of looking at the dimension of affordability is by looking at income. We used the American Community Survey data for 2012 through 2016 to analyze areas by percent of people living below 200% Federal Poverty Level (FPL). We selected 200% FPL because it is Washington state's cutoff for participation in the federal Supplemental Nutrition Assistance Program (SNAP). Figure 2 shows a map on the left with the distribution of percent of people living below 200% FPL. The darkest shaded areas have the highest percent of people living below 200% FPL. The map on the right shows areas where at least a quarter of people live below 200% FPL. We chose a cut point of 25% because it allows us to see predominantly low-income areas as well as areas with moderate concentrations of low-income households. We found that higher poverty areas are at the northern city boundary, pockets of areas around Greenwood and Sand Point, the University District, as well as from the Central District extending

…higher poverty areas are at the northern city boundary, pockets of areas around Greenwood and Sand Point, the University District, as well as from the Central District extending south into Southeast and West Seattle.

south into Southeast and West Seattle. We estimate that approximately 182,500 [95% CI, 95,800 – 262,200] people of all ages in the City of Seattle have a household income below 200% FPL.

Figure 2. Income <200% Federal Poverty Level in Seattle



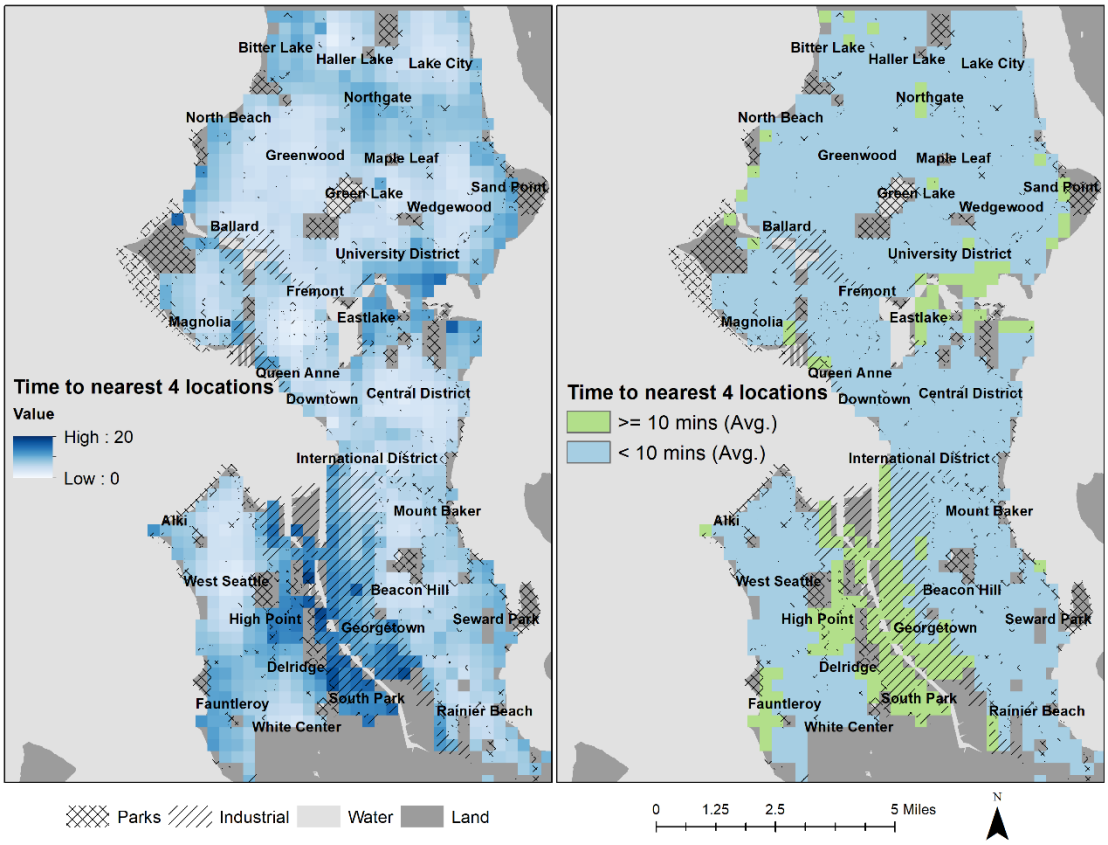
Note: At left, we see areas (census tracts) with least to most percent of people living below 200% FPL, which is the cutoff for income eligibility for Supplemental Nutrition Assistance in Washington State. At right, we see areas where more than a quarter of people are living below 200% FPL. Areas with higher concentrations of poverty are located at the northern city boundary, pockets of areas around Greenwood and Sand Point, the University District, as well as from the Central District extending south into Southeast and West Seattle. Source: American Community Survey (2012-2016).

ACCESSIBILITY/CONVENIENCE: AREAS WITH LONGER TRAVEL TIME TO HEALTHY FOOD RETAILERS

Figure 3 shows one-way travel time (walking, driving, or using public transit) to the four nearest healthy food retailers. We chose four instead of one retailer because studies show people do not necessarily shop at the food retailer closest to home[2]. Based on previous work, we identified areas with poorer access to healthy food as places that had one-way travel time of 10 minutes or more[3]. The highlighted areas with longer travel times are largely areas along the water, Eastlake, the corridor around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point), and the University District. Citywide, the average one-way travel time was just over 7 minutes, ranging from about 1.6 minutes to about 18 minutes.

The highlighted areas with longer travel times are largely areas along the water, Eastlake, the corridor around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point), and the University District.

Figure 3. Average travel time to the nearest four healthy food retailers in Seattle (2015-2018)



Note: At left, we see areas (.25 mile x .25 mile grid) with shortest to longest average one-way travel times (driving, walking, and public transit) to the four nearest healthy food retailers. At right, we see areas where it takes at least 10 minutes to travel to the four nearest healthy food retailers. These areas are generally concentrated along the water, including Eastlake, the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point), and the University District. Sources: King County Public Health Food Permit records categorized by the University of Washington Urban Form Lab (2015) ; City of Seattle list of farmers market locations (2017); online web searches of food retailers (2018); Open Trip Planner (2018); Open Street Map (2018); General Transit Feed Specification (2018).

AVAILABILITY: AREAS INUNDATED BY RETAILERS SELLING LESS HEALTHY OPTIONS THAN RETAILERS SELLING HEALTHY FOOD (SUCH AS PRODUCE)

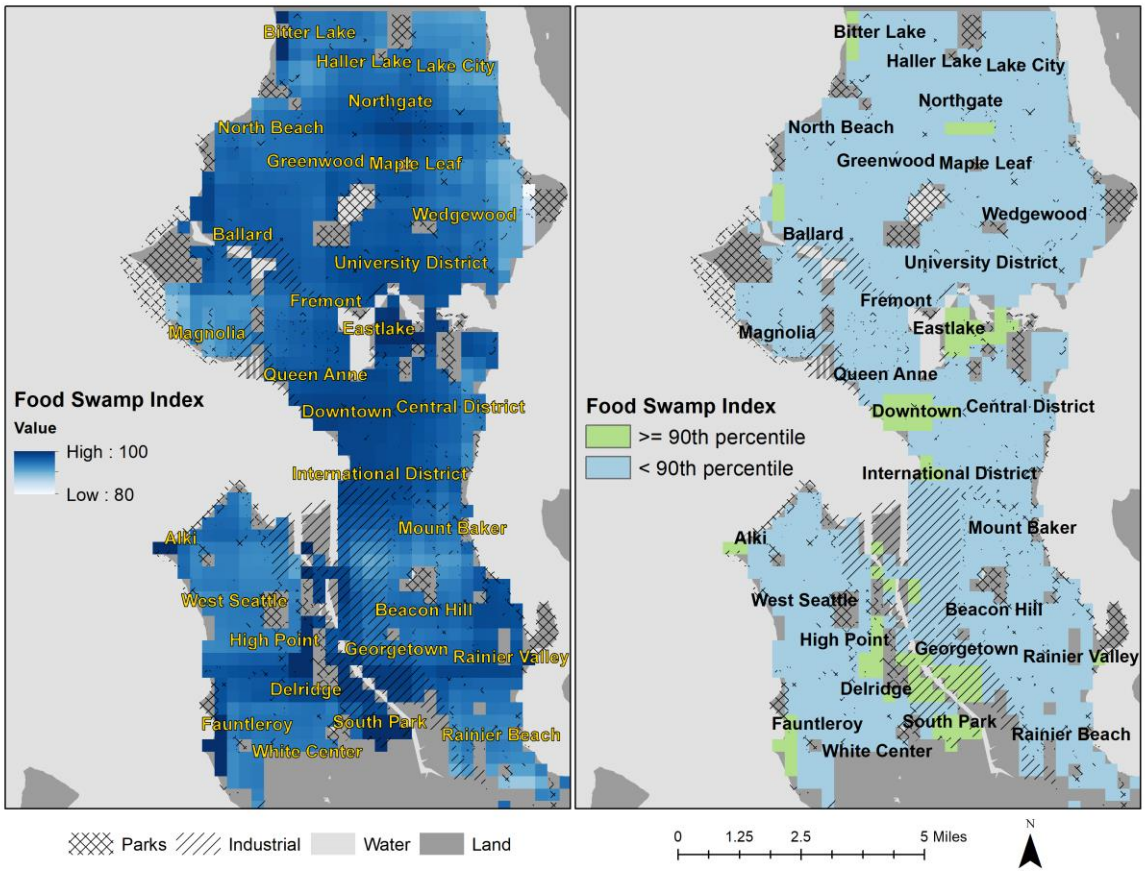
The third dimension of access to healthy food is about availability of food options. Studies show that being surrounded by fast food and less healthy food options in your neighborhood contributes to health inequities, even if you live in a neighborhood with retailers that sell produce.[4] Neighborhoods with a preponderance of stores selling fast food and less healthy food options rather than healthy food options are called "food swamps," which is a better predictor of neighborhood obesity rates than food deserts.[4] We measured food swamp scores by taking all the food retailers in an area, and calculating what percent don't have a produce section.[5,6] Food retailers that don't have a produce section are categorized as "less healthy food retailers", while those with a produce section are categorized as "healthy food retailers". Areas with the

Travel times to healthy food retailers were almost 4 minutes longer for areas with the highest food swamp scores (at the 90th percentile) than in areas below (11 minutes vs. 7 minutes).

highest food swamp scores are more inundated by food retailers that don't offer a produce section than other areas. So, a measure of 100% means that all food retailers in that area sell less healthy food (or none have a produce section). We found that most of the retail outlets in Seattle's food environment fall in the "less healthy" category, as reflected by food swamp scores that ranged from 80% – 100%, with an average of 95% (Figure 4). Areas in Seattle with the highest food swamp scores (at the 90th percentile) are generally located at the western edges of the city, Eastlake, downtown, and the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point). Areas with the lowest (healthiest) scores (for example, adjacent to Magnuson Park near Sand Point) are typically areas with relatively few nearby food retailers of any type. Food swamp scores did not differ substantially between low-income or wealthier areas.

When we looked at how travel times are related to food swamps, we saw that one-way travel times to healthy food retailers were almost 4 minutes longer for areas with highest food swamp scores (at the 90th percentile) than in other areas (11 minutes vs. 7 minutes).

Figure 4. Food swamps in Seattle (2015-2018)



Note: We measured food swamp scores by examining all the food retailers within a 2.25 mile x 2.25 square around each location in Seattle (.25 mile x .25 mile grid), and calculating what percent don't offer a produce section. A high food swamp score indicates an area inundated by retailers offering more options for unhealthy food than healthy food, such as produce. Areas in Seattle with the highest food swamp scores (at the 90th percentile) are generally located at the western edges of the city, Eastlake, downtown, and the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point). Sources: King County Public Health Food Permit records categorized by the University of Washington Urban Form Lab (2015); City of Seattle list of farmers market locations (2017); online web searches of food retailers to classify whether retailers from the categorized food permit database offered produce (2018).

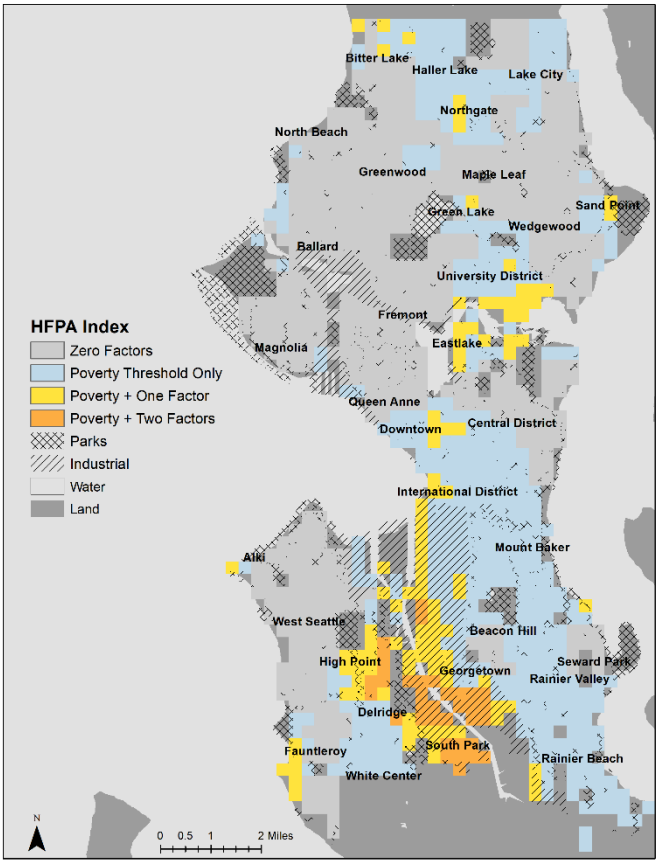
HEALTHY FOOD PRIORITY AREAS

To identify healthy food priority areas (HFPA), we looked for overlap in areas where we saw higher poverty areas (where at least 25% of people were living under 200% FPL) and at least one other dimension of access to healthy food (travel times exceeding 10 minutes or having a food swamp score at the 90th percentile) (see Figure 5). We found that healthy food priority areas located near the southern boundary around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point) overlapped on all three factors: lower income, longer travel times to healthy food retailers, and higher percentage of unhealthy food retailers. Perhaps unsurprisingly, more than half of the geographical areas with at least one additional factor beyond income is zoned as predominately industrial. The HFPA index also identified small areas including neighborhoods in the north end, where, although most of their neighbors are economically secure, low-income residents – especially those who rely on public transportation – may face challenges in accessing healthy food.

The healthy food priority areas near the southern boundary around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point) overlapped on all three factors: lower income, longer travel times to healthy food retailers, and higher percentage of unhealthy food retailers.

We also identified small areas including neighborhoods in the north end, where, although most of their neighbors are economically secure, low-income residents – especially those who rely on public transportation – may face challenges in accessing healthy food.

Figure 5. Healthy food priority areas in Seattle

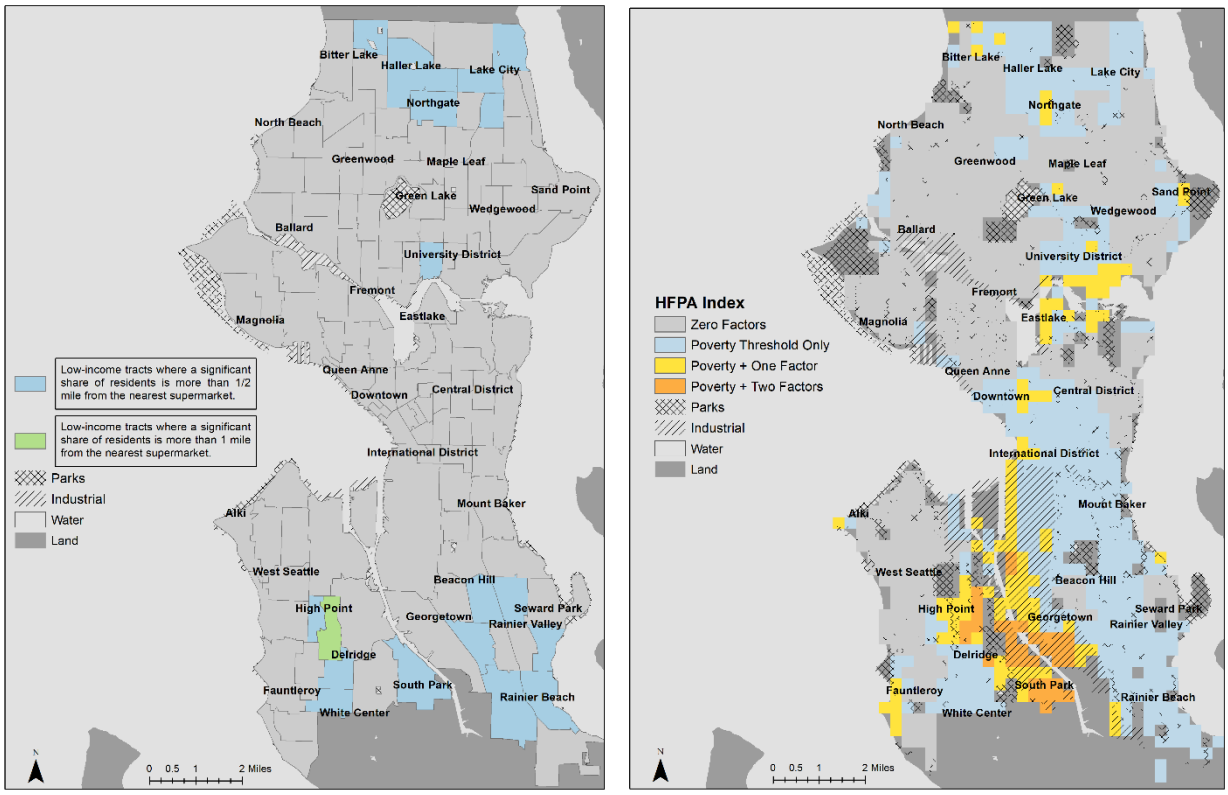


Note: The healthy food priority area (HFPA) index is constructed from three true/false factors: (1) more than 25% percent of population is below 200% of the federal poverty level, (2) average travel time to the nearest 4 healthy food establishments is greater than 10 minutes, and (3) food swamp score is above the 90th percentile. The final HFPA index is calculated by summing the travel time and food swamp components where the poverty component is true. The healthy food priority areas near the southern boundary around the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point) overlapped all three factors: lower income, longer travel times, and higher percentage of unhealthy food retailers. The HFPA index also identified small areas including neighborhoods in the north end, where, although most of their neighbors are economically secure, low-income residents – especially those who rely on public transportation – may face challenges in accessing healthy food.

DISCUSSION

In identifying healthy food priority areas, we adapted emerging best practices about how to systematically assess food environments and highlight inequities in access to healthy food in the City of Seattle. We looked at three dimensions of healthy food access: *affordability* (by selecting census tracts where more than a quarter of the population reported income below 200% FPL), *accessibility/convenience* (by calculating multi-modal travel times to four healthy food retail locations), and *availability* (by taking into account the extent to which the supply of unhealthy foods "swamps" impact local food retail environments). When we compare locations identified by the USDA food desert map to healthy food priority areas (Figure 6), we see some similarities:

Figure 6. Comparison of USDA food desert map[7,8] and HFPA map of Seattle

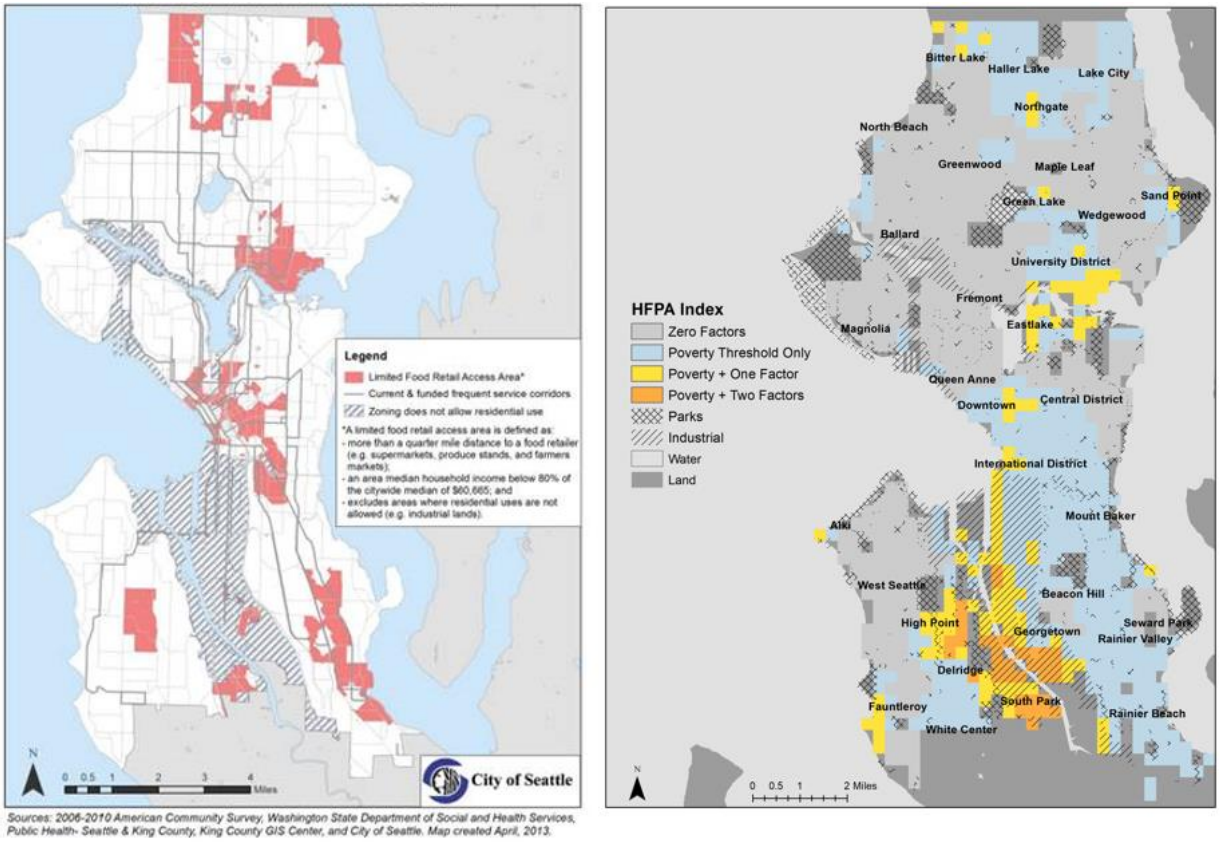


Both maps highlight areas near the northern city boundary, the southern half of the city, and University District as locations where low-income residents may experience challenges in food access. When we look across the three HFPA factors of poverty, travel time, and food swamps, we see that the map of Seattle's healthy food priority areas offers a more nuanced perspective than the USDA map, and could be used to guide further inquiries as well as refine programs and policies to improve healthy food access in Seattle.

Compared to the 2013 mapping project to help the Seattle Office of Sustainability and Environment identify areas where low-income households have limited food retail access, the HFPA map offers the following enhancements (see Figure 7):

- Expands healthy food retailers beyond supermarkets, farmers markets, and produce stands to include additional food retail outlets (grocery stores and warehouses) classified as healthy based on the literature. [9]
- Uses local knowledge and interactive matching to further classify small grocery stores, ethnic and otherwise, as healthy food retailers if these establishments had a produce section.
- Focuses on travel time along transportation networks using multiple modes (walking, driving, or public transit) to the nearest four healthy food retail outlets.
- Uses population with incomes below 200% FPL ($50,200 for household of four in 2018) rather than 80% of area median income ($80,250 for household of four in 2018) and tailors income criteria (>25% of area population with income below 200% FPL rather than a larger percentage) to include smaller low-income communities living in areas that are predominantly higher income.

Figure 7. Comparison of OSE food access map and HFPA map of Seattle



Our HFPA results are consistent with the 2013 report in identifying the Duwamish waterway (including Georgetown, South Park, Delridge, and High Point) as areas with limited food retail access. Areas along the north city boundary identified as having limited food retail access in the 2013 report coincide with areas meeting the poverty threshold only or poverty *and* one additional factor in our HPFA analysis. However, the neighborhood district of southeast Seattle (along Rainier Avenue) – identified by the prior mapping project as a limited food retail access area – meets only the poverty threshold for our index. This difference may reflect new businesses selling produce in the area since the 2013 report and existing

businesses that previously had not been classified as offering produce (such as ethnic grocery stores). Likewise, our approach identifies small pockets throughout Seattle, such as the area near Magnuson Park, as low-income locations with limited food access, which are not identified in the 2013 report. The University District is another area we identified as meeting the poverty threshold *and* the threshold for one additional factor of the HFPA index. We note in Section 4, (a) young adults are at higher risk for food insecurity than older adults and (b) food insecurity among college students is associated with impaired academic performance and failure to graduate.[10] The 2013 mapping project excluded the University District because while many college students have no income, those who have access to other financial resources or support are likely to have access to healthy food.[11–13]

With additional resources, a reasonable next step would be to validate these results by working with residents and organizations in priority areas to learn if the results presented here match their experiences. Additionally, this work on access could be complemented by examining other dimensions of healthy food access – *accommodation* (hours of operation, types of payment allowed, culturally relevant offerings) and *acceptability* (attitudes about whether food meets personal standards).

We hope this updated assessment to identify healthy food priority areas will (a) complement the City's efforts to understand food access among low-income Seattle residents, including affordable housing residents[8], (b) inform the upcoming update of the Seattle Food Action Plan, and (c) inform the planning process for the Human Service Department's food-and-meals Request for Proposals. In addressing healthy food access, strategies should involve a comprehensive approach, which includes securing and strengthening the hunger safety net through Food Banks and emergency food operations. However, solutions aimed solely at bolstering the safety net may not adequately address all aspects of healthy food access. Therefore, strategies should also include evidence-based approaches with consideration to factors influencing access to healthy food such as: affordability, location and convenience, as well as the adequacy of the healthy food supply — factors described in Section 1 and included in the healthy food priority areas analysis outlined in this section.

Limitations

This analysis is not without limitations and there are several that should be noted:

- We were limited in our ability to further disaggregate the categorized food permit database. Our approach to identifying healthy food retailers was based on the standard practice of classifying establishment type based on categorizations used in previous studies. While we did not have resources to verify actual presence of healthy food in each food retailer, we used local knowledge and searches of local databases that led us to categorize several more retailers as having produce sections and thus as healthy food retailers. Had we not manually re-coded the retailers, the analyses would have led to findings showing some Seattle areas as having longer average travel times to healthy food retailers and higher food swamp scores.

- The food retail environment is dynamic and although our 2015 categorized food permit database is three years old, it represents the most recent categorized food permit database available to the study team. While it provides a snapshot of food retailers at a point in time, it does not capture recent closures/openings. Additional work described in Section 3 of this report was consistent with our findings in identifying South Park and High Point as healthy food priority areas. In our analysis, Haller Lake was classified as having short travel times to the nearest four healthy food retailers and a food swamp score on the lower end of the range. However, after this report's analysis, two

healthy food retailers have closed and one new healthy food retailer has opened in Haller Lake, which on balance does not substantively affect this original classification.

- We were unable to capture the price of healthy items as a component of access—although sensitivity analyses removing more expensive food retailers[14] (e.g. Whole Foods, PCC, and Metropolitan Market) suggested substantially similar results to those presented here. See Section 3 for more details about price and availability of healthy food across Seattle store types.

ADDENDUM – DETAILED METHODS FOR SECTION 2

METHODS

Identifying healthy food priority areas

We identified healthy food priority areas by constructing a three-component index that incorporates information about 1) income relative to the Federal Poverty Level (FPL), 2) travel time to nearby healthy food retailers, and 3) an assessment of the balance of healthy and less healthy food offerings in the local food environment. After generating each component, we applied a threshold to transform each component from a continuous measure to a binary one (0 or 1). We constructed the final index by first identifying areas that met our low-income criterion and, within those areas, adding the other two components with equal weight. Higher scores on the HFPA index can be used to identify areas to be considered for policy and programmatic priority.

Before constructing the index, however, we needed to *identify healthy and less healthy food retailers in Seattle*. We started with a 2015 census of King County Public Health Food Permit records that the University of Washington Urban Form Lab (UFL) had categorized into establishment types such as "supermarket," "grocery store with produce section," and "convenience store," as shown in Table 1 below. Hereafter, we refer to these categorized records as the "categorized food permit database." This is the same data set used to identify stores for the retail audit component of the Seattle Sweetened Beverage Tax evaluation.

We extended the categorized food permit database by geolocating records with a valid address but missing longitude and latitude coordinates and condensing retailers with multiple food permits (for example, a supermarket can have more than one food permit for each department such as bakery/deli and meat/seafood) into a single record. We dropped records for retailers, such as stadiums, where access was contingent on paying an admission fee (except warehouse-type stores such as Costco). We also omitted retailers located outside a one-mile buffer of the city boundaries. We included this buffer in the analysis to reduce "edge effects" on our calculations. Finally, all establishments coded as a grocery store – ethnic or otherwise – were assessed using information available online (e.g., Yelp and Google reviews) to identify stores with a produce section that might be included in the "healthy" classification.

Building on prior work[3] and feedback from the UW Center for Public Health Nutrition, we made one further modification to our extended version of the categorized food permit database. In an effort to capture the healthfulness of food options at different kinds of retail outlets, we categorized each food retail outlet in Seattle, based on type of establishment, as "healthy" or "less healthy" (Table 1). While one can argue for the healthfulness of fish and meat markets and many restaurants, our criterion for a healthy food retail establishment was that it offer an assortment of fresh fruits and vegetables. This criterion is motivated by research evidence[15–17] linking fruit and vegetable consumption to healthy outcomes and federal dietary guidelines for increased fruit and vegetable consumption.[17] We also added farmers markets to the list of healthy food retail establishments as they feature similar produce selections relative to the other establishments classified as healthy. These 18 farmers-market locations are from the 2017 City of Seattle list. Our final dataset included 3,927 food retailers, 132 of which we classified as healthy.

Table 1. Classification of healthfulness of food retail establishments based on establishment type*		
Healthy	**Less healthy**	
Supermarket	Restaurant	Dessert
Grocery Store w/ produce section	Quick Service	Tavern/Pub
Warehouse w/ produce section	Coffee Shop	Food/Drugstore Combo
Farmers Market	Bakery/Deli	Specialty Food Store
Produce Market	Fast Food	Grocery Store w/o produce
	Convenience Store	section
	Fish/meat market	Warehouse w/o produce section

**Sub-categorization distinctions between "ethnic" and "traditional" have been omitted for this chart.*

Constructing the index

Factor 1. Below 200% of the Federal Poverty Level (FPL)

The first component of the HFPA index comes from income levels by census tract as assessed by the American Community Survey (2012-2016). An area was considered eligible for HFPA status if more than 25% of the area's population reported household income below 200% of FPL. We chose a cut point of 25% because it enabled us to capture both predominantly low-income areas and moderate concentrations of low-income households in predominantly high-income areas. We selected 200% FPL as a useful metric in part because it serves as Washington state's cutoff for participation in the federal Supplemental Nutrition Assistance Program (SNAP).

Factor 2. Travel time to healthy food retailers

The second component of the HFPA index assesses travel time to healthy food retailers (defined in Table 1 above) by examining multi-modal travel times to these locations. First, we converted the area of the city into a grid of .25 mile x .25 mile cells (each about the size of a 4 block x 4 block area in the heart of downtown Seattle). This "rasterization" process (cells arranged in grid with rows and columns commonly used in Geographic Information Systems) allowed us to create a spatially continuous measure of travel time which we generated using Open Trip Planner (OTP), Open Street Map, and General Transit Feed Specification (GTFS) data from King County Metro Transit. To account for the fact that people don't necessarily shop at the food retailer closest to home[2], we calculated the travel times between each of the city's 1450 valid grid cells and the *four nearest healthy food locations* for *three different modes of travel*: driving, walking, and public transit. To account for transit-schedule variability, we averaged the public transit times over several estimates depending on time of day and day of week. Once travel times by each of the three modes were generated for the four closest healthy food locations for each grid cell, we computed a mode-averaged score where we used the walk time if it was the fastest of the three. Otherwise, we averaged the driving-time and public-transit-time estimates, weighted by census-tract-level ACS estimates of vehicle availability. We created the final travel-time estimate for each grid cell by averaging the four composite travel-time estimates. Informed by previous work[3], we used one-way trip distance greater than 10 minutes as our threshold for this component.

Factor 3. Food swamp index

The third component of our index captures the proportion of all retail food outlets in the nearby food environment that offers "less healthy" options:

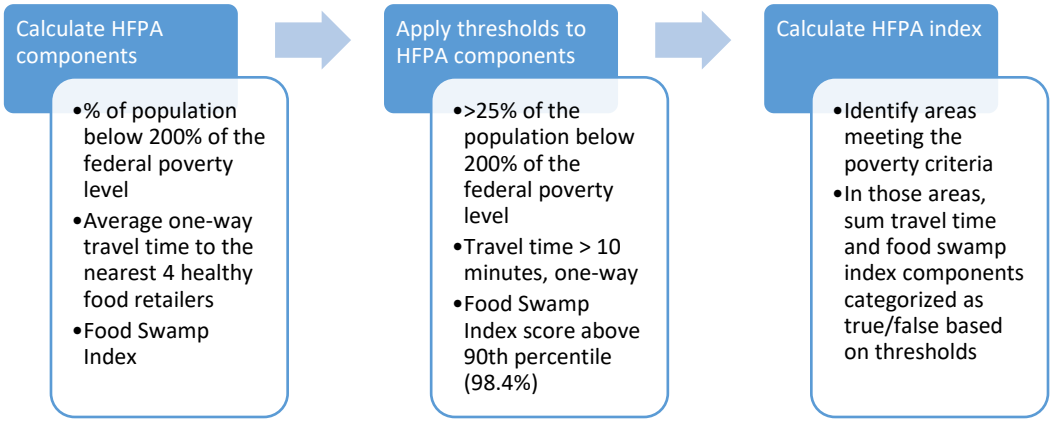
$$food\ swamp\ index = \frac{(\#\ Less\ Healthy\ Food\ Retailers)}{(\#\ Total\ Food\ Retailers)} \times 100$$

We computed this "food swamp" index for each grid cell (same grid as the travel-time analysis) using a 2.25 mi x 2.25 mi "moving window." That is, for each grid cell, the metric was calculated by examining all retail food locations that fall within the window centered on the grid cell of interest. Once the calculation was completed, the next grid cell was assessed and the window was re-centered accordingly. We used a 2.25 mi x 2.25 mi window because it corresponds with the median size of Seattle's "health reporting areas," geographic units used by Public Health-Seattle & King County (PHSKC) to report health outcomes and demographic data. Unlike some similar studies, we included taverns and bars as food establishments because a review of the coding scheme for the categorized food permit data suggested that many of these locations do sell food. To reduce estimate instability, we excluded any grid cell with fewer than 10 food establishments in the 2.25 mi x 2.25 mi window. For this component, we identified all grid cells with a food swamp index score above the 90th percentile (98.4%) as the threshold for contributing to the final healthy food priority area index.

Calculating Seattle's healthy food priority area index

We combined all three components by summing the equally weighted travel time and food swamp index components categorized as true/false (0 or 1) in grid cells that met the conditions specified by the income component (>25% of the area's population with income below 200% FPL). To ensure standardization, we excluded any grid cell where any of the three components were missing (190 were excluded – mainly marinas and water areas, which should not impact any analyses or conclusions). Figure 1 summarizes the process for calculating the HFPA index.

Figure 1. Calculating the healthy food priority area (HFPA) index



References

1. Misiaszek C, Buzogany S, Freishtat H. *Baltimore City's Food Environment: 2018 Report*. Baltimore, MD; 2018.
2. Drewnowski A, Aggarwal A, Hurvitz PM, Monsivais P, Moudon A V. Obesity and supermarket access: Proximity or price? *Am J Public Health*. 2012;102(8):e74-80. doi:10.2105/AJPH.2012.300660
3. Jiao J, Moudon A V, Ulmer J, Hurvitz PM, Drewnowski A. How to identify food deserts: Measuring physical and economic access to supermarkets in King County, Washington. *Am J Public Health*. 2012;102(10). doi:10.2105/AJPH.2012.300675
4. Cooksey-Stowers K, Schwartz M, Brownell K. Food Swamps Predict Obesity Rates Better Than Food Deserts in the United States. *Int J Environ Res Public Health*. 2017;14(11):1366. doi:10.3390/ijerph14111366
5. Mui Y, Jones-Smith JC, Thornton RLJ, Pollack Porter K, Gittelsohn J. Relationships between Vacant Homes and Food Swamps: A Longitudinal Study of an Urban Food Environment. *Int J Environ Res Public Health*. 2017;14(11):1426.
6. *Census Tract Level State Maps of the Modified Retail Food Environment Index (MRFEI)*.
7. Food Access Research Atlas. USDA Economic Research Services . https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas.aspx. Accessed December 6, 2018.
8. Memorandum. Seattle Department of Transportation (SDOT) & Office of Sustainability and the Environment (OSE). http://seattle.legistar.com/View.ashx?M=F&ID=6576193&GUID=2096C66B-355D-4486-9C67-51C0B23FDA52. Published 2018.
9. Rundle A, Neckerman KM, Freeman L, et al. Neighborhood food environment and walkability predict obesity in New York City. *Environ Health Perspect*. 2009;117(3):442-447. doi:10.1289/ehp.11590
10. Phillips E, McDaniel A, Croft A. Food Insecurity and Academic Disruption Among College Students. *J Stud Aff Res Pract*. June 2018:1-20. doi:10.1080/19496591.2018.1470003
11. Tippett R. Impact of Off-Campus College Students on Local Poverty Rates. UNC | Carolina Demography, Carolina Population Center. https://demography.cpc.unc.edu/2015/03/09/impact-of-off-campus-college-students-on-local-poverty-rates/. Published 2015. Accessed January 17, 2019.
12. Bishaw A. When Off-Campus College Students are Excluded, Poverty Rates Fall in Many College Towns. United States Census Bureau. https://www.census.gov/newsroom/blogs/random-samplings/2013/07/when-off-campus-college-students-are-excluded-poverty-rates-fall-in-many-college-towns.html. Published 2013. Accessed January 17, 2019.
13. Benson C, Bishaw A. Small and Large College Towns See Higher Poverty Rates. United States Census Bureau. https://www.census.gov/library/stories/2018/10/off-campus-college-students-poverty.html. Published 2018. Accessed January 17, 2019.
14. Mahmud NK, Monsivais P, Drewnoski A. *The Search for Affordable Nutrient Rich Foods: A Comparison of Supermarket Food Prices in Seattle-King County*. Seattle, WA; 2009. http://depts.washington.edu/uwcphn/reports/cphnbrf2.pdf.
15. Lim SS, Vos T, Flaxman AD, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380(9859):2224-2260. doi:10.1016/S0140-6736(12)61766-8
16. Murray CJL, Abraham J, Ali MK, et al. The State of US Health, 1990-2010: Burden of diseases, injuries, and risk factors. *JAMA*. 2013;310(6):591. doi:10.1001/jama.2013.13805
17. *2015-2020 Dietary Guidelines for Americans*. 8th ed. US Department of Health and Human

Services, US Department of Agriculture; 2015.
https://health.gov/dietaryguidelines/2015/guidelines/. Accessed December 4, 2018.

SECTION 3 | WHAT IS THE PRICE AND AVAILABILITY OF HEALTHY FOOD IN SEATTLE STORES?

SUMMARY

During May through July 2018, we conducted in-store surveys in a sample of 134 food stores in Seattle, plus 23 food stores in the three priority neighborhoods to measure the availability and price of 19 healthy food items. The primary objective of this assessment was to assess the price and availability of healthy food in Seattle by neighborhood characteristics, such as income level and race/ethnicity composition, in order to assess whether differences in healthy food availability and the price of healthy foods exist in these neighborhood contexts. A secondary objective was to conduct a pilot study of in-store healthy food availability in a census (rather than a sample) of stores in three priority neighborhoods: Haller Lake, High Point, and South Park. Analyses are weighted to be representative of the types of stores in each neighborhood.

Key findings

Availability:

- Lower-income neighborhoods and neighborhoods with more Black or Hispanic residents had fewer supermarkets and superstores and more small stores, such as convenience stores.
- There was lower availability of healthy foods in lower-income neighborhoods and neighborhoods with more Black or Hispanic residents.
- Mean healthy food availability scores varied by Seattle City Council District, with Council District 5 scoring the lowest, and Council District 6 scoring the highest.

Price:

- The price of healthy foods tended to be lower in lower-income neighborhoods and neighborhoods with more Black or Hispanic residents. When available, protein, milk, grains, and vegetables tended to be less expensive in lower-income neighborhoods and neighborhoods with more Black or Hispanic residents as compared to prices of these foods in neighborhoods of higher income and fewer Black or Hispanic residents. However, statistical confidence intervals around many of these estimates overlapped, indicating that the price differences are likely not statistically significant.

Pilot census study:

- The categorized food permit data base[i] was only moderately accurate in identifying food stores--indicating a dynamic food environment in Seattle, with many food stores closing, opening, and moving during a relatively short period of time.
- Despite the inaccuracies, the overall conclusions drawn using the census and in-stores assessments would be similar to those drawn using existing data and scoring methods developed in Section 1 of this report for two out of the three priority neighborhoods.
- Decision-makers will need to weigh the trade-offs in accuracy with the cost of in-person data collection and the potential need to repeat data collection frequently in the context of a rapidly changing city.

[i] *Public Health Food Permit records categorized by University of Washington Urban Forum Lab (UFL) researchers under the direction of Dr. Anne Vernez Moudon, hereafter referred to as "categorized food permit database."*

SECTION 3 | WHAT IS THE PRICE AND AVAILABILITY OF HEALTHY FOOD IN SEATTLE STORES?

OBJECTIVE

This section of the report speaks primarily to two of the five dimensions of food access—*availability* and *affordability*.

Our primary objective was to examine availability and price of healthy foods in Seattle according to neighborhood characteristics of income and race and ethnicity in order to assess whether differences in healthy food availability and the price of healthy foods exist in these neighborhood contexts. A secondary objective was to conduct a pilot study of in-store healthy food in a census (rather than a sample) of stores in three priority neighborhoods.

We conducted in-store healthy food availability and price assessments, which are complementary to the work by the Evaluation Team to develop a healthy food priority area (HFPA) index described in Section 2, which uses only pre-existing data to characterize the food environment in Seattle. Specifically, city-wide, we are able to combine the in-store assessment of healthy food availability with census demographic information to objectively assess inequities in healthy food availability and price. In addition, we assess whether the information gained from the intensive primary data collection in three priority neighborhoods provides valuable information beyond what could be inferred from preexisting secondary data sources.

RESULTS

HEALTHY FOOD AVAILABILITY AND PRICES IN SEATTLE ACCORDING TO NEIGHBORHOOD CHARACTERISTICS

Development of our tool to conduct in-store healthy food assessments

To assess healthy food availability, we developed an abbreviated in-store healthy food assessment survey that was based on the widely-used Nutrition Environment Measures Survey for Convenience Stores (NEMS-CS), which is often considered a gold standard for in-store healthy food availability assessment.[2] We collected the availability and prices for 19 individual healthy food items within five categories of fruit, vegetables, grains, proteins, and milk. We used the healthy food scoring algorithm from the NEMS-CS to assign points for each of these healthy foods (see Table 1 for the foods included and the points assigned for each food).

The final list of food items was based on input from Seattle Human Services Department, Seattle Office of Sustainability and Environment, Seattle City Councilmembers, and the SBT Community Advisory Board. We refer to our newly developed survey tool as the Seattle Healthy Food Survey (Appendix B). See addendum at the end of this section for detailed methods.

Table 1. Products included in the Seattle Healthy Food Survey	
Healthy food items[1]	**Total points available in survey**
Fruit	**3**
Apples	1
Bananas	1
Oranges	1
Vegetables	**5**
Broccoli	1
Carrots	1
Green lettuce	1
Tomatoes	1
Yellow onions	1
Grains	**7**
100% whole wheat bread	2
White bread	1
Frosted Flakes cereal	1
Original Cheerios cereal	2
Rice (white or brown)	1
Protein	**6**
Canned beans (black, kidney, or garbanzo)	2
Eggs	2
Lean fresh ground meat	2
Milk	**4**
1% Milk	1
2% Milk	1
Fat-free milk	2
Whole milk	0

[1]*We additionally collected the availability and prices of five junk food products and sweets, which are not included in this analysis: Lays potato chips, Pringles potato chips, Reese's peanut butter cups, Oreos, and Little Debbie Honey Buns. These items received no points in the Healthy Food Survey scoring tool and were not included in the market basket.*

Comparison of NEMS-CS to Seattle Healthy Food Survey to assess healthy food availability in Seattle food stores

We tested how well our newly developed healthy food availability survey, which we call the Seattle Healthy Food Survey, performed as compared to the NEMS-CS by conducting both our survey and the NEMS-CS survey in 23 stores. The same research assistant conducted both surveys in each store on the same day, back-to-back.

Figure 2 illustrates the relationship between the total scores for healthy food availability for the Seattle Healthy Food Survey and the NEMS-CS. The two tools were highly correlated with a Pearson's correlation coefficient of 0.875 (Table 2). This strong relationship between the two measures supports the proposition our Seattle Healthy Food Survey measures the availability of healthy food similarly to the NEMS-CS.

Figure 2. Scatterplot of Seattle Healthy Food Survey total score versus NEMS-CS availability total score

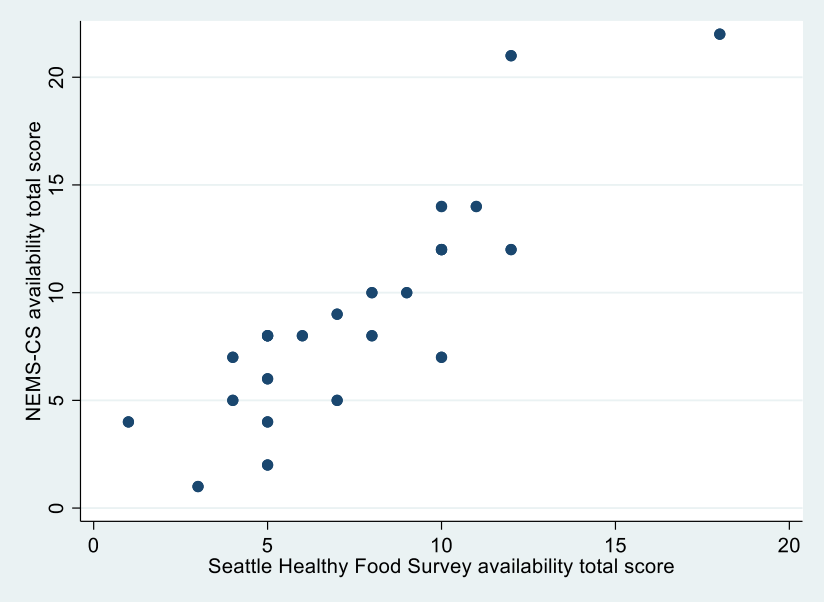


Table 2. Descriptive statistics of NEMS-CS score and Seattle Healthy Food Survey score in the 23 priority area stores surveyed with both tools		
N = 23	**NEMS-CS availability score**	**Seattle Healthy Food Survey availability score**
Mean (StDev)	9.1 (5.3)	7.6 (3.8)
Median	8	7
Range	1-22	1-18
Correlation	0.875	

Stores Identified in the Food Permit Database versus SBT Retail Audit: Weighting our sample stores to be representative of the distribution of food stores in Seattle

In Seattle, the categorized food permit database contains 493 food stores citywide; we surveyed 27% (n=134) of these food stores using the Seattle Healthy Food Survey as part of the Sweetened Beverage Tax (SBT) retail audit sample.

Table 3 displays the percent of each store type present citywide in Seattle compared to their representation in the SBT retail audit sample of food stores. This table illustrates the degree to which the SBT retail audit sample is representative of the store types in all of Seattle. Compared to Seattle, the SBT retail audit sample contains more supermarkets (17.2% versus 11.8% citywide), more warehouses/superstores (5.2 % versus 1.4% citywide), more grocery stores (21.6% versus 17.4% citywide), and more drug stores (12.7% versus 8.9% citywide). The SBT retail audit sample contains fewer small stores than are present citywide in Seattle (43.3% versus 60.5% citywide). This means that small stores are under-represented in the SBT retail audit sample, while larger stores are over represented in the sample, compared to the distribution of all food stores in Seattle. These findings are

not surprising since we used quotas (as described in the Baseline SBT Evaluation Report)[1] to obtain a sample that had an adequate number of each store type distributed geographically throughout the City.

Table 3 additionally displays the proportion of each food store type in both the food permit database and the SBT retail audit sample by 1) neighborhood median household income (low, medium, high), 2) neighborhood percent Black/Hispanic (low, medium, high) residents and 3) Council District.

In the food permit database, 45.4% (n=224) of all Seattle food stores are in the lowest-income neighborhoods, 37.5% (n=185) of stores are in the middle-income neighborhoods, and 17% (n=84) are in the highest-income neighborhoods. Meaning, there is a higher number of food stores in lower-income neighborhoods as compared to middle- and higher-income neighborhoods. However, the types of stores within each neighborhood differ. There are more small stores (n=149, 66.5%) in the lower-income neighborhoods, compared to the middle (n=105, 56.8%) and higher income neighborhoods (n=44, 52.4%). Conversely, there are more grocery stores and supermarkets in the middle and higher income neighborhoods, as compared to the lower-income census tract. There are also fewer supermarkets and more small stores in neighborhoods with the highest percentage of Black or Hispanic residents. In terms of Council Districts, Districts 2 and 7 had a larger share of stores compared to the other districts.

Weighting our sample stores to be representative of the distribution of food stores in Seattle

To account for these differences in our food availability and food prices analyses below, we create four different weights to adjust our sample so that it is representative of the distribution of store types in Seattle 1) citywide and then within 2) each tertile of income (low, medium, high) and 3) each tertile of race/ethnicity (low, medium, high). For analyses by Council District, we weight the stores to be representative within Council District. (See addendum for details of post-estimation weights)

Table 3. Comparison of Seattle food stores in the categorized food permit database to the SBT retail audit store sample

	All Seattle stores in categorized food permit database	SBT retail audit store sample
	N = 493	N = 134
	N (%)	N (%)
Store type		
Supermarket	58 (11.8)	23 (17.2)
Warehouse /Superstore	7 (1.4)	7 (5.2)
Grocery	86 (17.4)	29 (21.6)
Small store	298 (60.5)	58 (43.3)
Drug store	44 (8.9)	17 (12.7)
Median household income in census tract		
$14,155 - $63,077 (lowest income group, n=25 census tracts/neighborhoods)	224 (45.4)	61 (45.5)
Supermarket	20 (8.9)	10 (16.4)
Warehouse /Superstore	3 (1.3)	3 (4.9)
Grocery	34 (15.2)	12 (19.7)
Small store	149 (66.5)	27 (44.3)
Drug store	18 (8)	9 (14.8)
$65,772 - $88,706 (middle income group, n=26 census tracts/neighborhoods)	185 (37.5)	47 (35.1)

Table 3. Comparison of Seattle food stores in the categorized food permit database to the SBT retail audit store sample		
	All Seattle stores in categorized food permit database	**SBT retail audit store sample**
	N = 493	**N = 134**
	N (%)	**N (%)**
Supermarket	27 (14.6)	9 (19.2)
Warehouse /Superstore	4 (2.2)	4 (8.5)
Grocery	30 (16.2)	9 (19.2)
Small store	105 (56.8)	19 (40.4)
Drug store	19 (10.3)	6 (12.8)
$91,005-$159,652 (highest income group, n=20 census tracts/neighborhoods)	84 (17)	26 (19.4)
Supermarket	11 (13.1)	4 (15.4)
Warehouse /Superstore	0 (0)	0 (0)
Grocery	22 (26.2)	8 (30.8)
Small store	44 (52.4)	12 (46.2)
Drug store	7 (8.3)	2 (7.7)
Percent Black or Hispanic in census tract		
0.79%-6.34% (lowest % Black or Hispanic, n=20 census tracts/neighborhood)	80 (16.2)	26 (19.4)
Supermarket	15 (18.8)	6 (23.1)
Warehouse /Superstore	0 (0)	0 (0)
Grocery	15 (18.8)	8 (30.8)
Small store	44 (55)	8 (30.8)
Drug store	6 (7.5)	4 (15.4)
6.42%-15.31% (middle % Black/Hispanic, n=21 census tracts/neighborhoods)	170 (34.5)	40 (29.9)
Supermarket	23 (13.5)	7 (17.5)
Warehouse /Superstore	2 (1.2)	2 (5)
Grocery	32 (18.8)	6 (15)
Small store	92 (54.1)	21 (52.5)
Drug store	21 (12.4)	4 (10)
15.74%-50.99% (highest % Black/Hispanic, n=30 census tracts/neighborhoods)	243 (49.3)	68 (50.8)
Supermarket	20 (8.2)	10 (14.7)
Warehouse /Superstore	5 (2.1)	5 (7.4)
Grocery	39 (16.1)	15 (22.1)
Small store	162 (66.7)	29 (42.7)
Drug store	17 (7)	9 (13.2)
Council Districts		
1	51 (10.3)	17 (12.7)
2	111 (22.5)	41 (30.6)
3	75 (15.2)	15 (11.2)
4	50 (10.1)	10 (7.5)
5	55 (11.2)	15 (11.2)

Table 3. Comparison of Seattle food stores in the categorized food permit database to the SBT retail audit store sample		
	All Seattle stores in categorized food permit database	SBT retail audit store sample
	N = 493	N = 134
	N (%)	N (%)
6	58 (11.8)	19 (14.2)
7	93 (18.9)	17 (12.7)

Availability and price of healthy foods in Seattle

We surveyed 134 food stores spread throughout the City of Seattle to assess healthy food availability and price. (See appendix for full details of store sampling and data collection protocol)

Of all stores, 96% (n=128) carried at least one of the products measured in the Seattle Healthy Food Survey.

Table 4 displays healthy food availability score (range 0-25 points) and price per pound of healthy foods by store type. All results have been weighted to be representative of the distribution of all food stores in Seattle.

Healthy food availability score

Larger stores (warehouses, supermarkets, grocery stores) had higher availability of healthy foods, compared to smaller stores (drug stores, small stores). On average, warehouses/superstores had the highest availability score (20.6 [95% CI=17.86, 23.29]), followed closely by supermarkets (19.0 [95% CI=15.90, 22.09]) and then grocery stores (16.2 [95% CI=14.10, 18.31]). Drug stores and small stores had a substantially lower healthy food availability scores as compared to the larger store types (9.5 [95% CI=8.76, 10.18] and 6.8 [95% CI=5.49, 8.08], respectively). Despite carrying no fruit, vegetables, or meat, drug stores had a higher availability score than small stores; this is largely due to the fact that drug stores consistently carried some eggs, beans, milk, and grains. The availability of foods in small stores ranged widely; 75% (n=39) of all small stores carried milk, 69% (n=36) carried grains, 56% (n=29) carried fresh fruit, 50% (n=26) carried proteins, and 25% (n=13) carried fresh vegetables. Only one small store carried fresh meat.

Price per pound of healthy food

Mean prices of healthy food (per pound) are displayed in Table 4. For most food categories, as would be expected, prices were generally lower in larger stores (supermarkets and warehouses/superstores) as compared to relatively smaller stores (grocery, small and drug stores). For meat, small stores had the lowest mean price, but only one small store had any meat, so this should not be inferred to reflect general pricing at small stores. Rather, a better conclusion is that small stores generally did not carry meat. Grocery stores had a lower average price on meat compared to supermarkets, warehouses, and superstores; however, the confidence intervals overlap indicated that this difference is not likely to be statistically significant. For milk, drug stores had a similarly low price compared to supermarkets, while small stores had the highest prices for milk. Within store type, price per pound tended to be highest for meat and milk (per gallon) and lower for fruits and vegetables.

Table 4. Average healthy food availability score and price per pound of healthy foods in Seattle by store type								
Store type	**Seattle Healthy Food Survey availability score**	**Mean price ($)**						
		Fruit per pound	**Vegetables** per pound	**Grain** per pound	**Meat** per pound	**Eggs** per pound	**Beans** per pound	**Milk** per gallon
	Mean score (95% CI) N	Mean $/lb. (95% CI) N	Mean $/lb. (95% CI) N	Mean $/lb. (95% CI) N	Mean $/lb. (95% CI) N	Mean $/lb. (95% CI) N	Mean $/lb. (95% CI) N	Mean (95% CI) N
Supermarket	19.0 (15.90, 22.09) N=23	1.58 (0.98, 2.17) N=22	1.69 (1.57, 1.81) N=21	2.41 (2.04, 2.79) N=23	5.78 (5.17, 6.39) N=18	1.34 (1.11, 1.56) N=18	1.24 (1.12, 3.67) N=19	3.41 (2.70, 4.13) N=20
Warehouse/superstore	20.57 (17.86, 23.29) N=7	1.46 (0.77, 2.16) N=7	1.92 (1.18, 2.66) N=7	1.90 (1.71, 2.09) N=7	5.45 (4.69, 6.21) N=6	1.71 (0.58, 2.84) N=6	0.91 (0.77, 1.05) N=7	2.88 (2.26, 3.51) N=7
Grocery	16.21 (14.10, 18.31) N=29	1.99 (1.35, 2.63) N=26	1.97 (1.63, 2.30) N=28	2.39 (1.80, 2.99) N=26	4.95 (4.02, 5.89) N=20	2.12 (1.80, 2.44) N=25	1.57 (1.42, 1.73) N=23	4.17 (3.67, 4.67) N=25
Small store	6.81 (5.49, 8.08) N=52	2.77 (2.41, 3.13) N=29	2.35 (1.48, 3.21) N=13	2.29 (1.88, 2.70) N=36	3.99 (n/a) N=1	2.72 (2.42, 3.01) N=28	2.11 (1.78, 2.44) N=24	5.18 (4.68, 5.68) N=39
Drug store	9.47 (8.76, 10.18) N=17	N/A	N/A	2.59 (1.73, 3.44) N=17	N/A	1.76 (1.47, 2.04) N=17	1.71 (1.53, 1.89) N=10	3.34 (3.10, 3.59) N=17

Fruit includes apples, oranges, bananas
Vegetables includes broccoli, carrots, green lettuce, tomatoes, onions
Grains includes 100% whole wheat bread, white bread, frosted flakes cereal, original cheerios cereal, rice (white or brown)
Milk includes, in this order, fat-free milk, 1% milk, 2% milk, whole milk. The mean milk price is drawn from fat-free milk if available, then 1% milk, then 2% milk, then whole milk.

Table 5 displays the healthy food availability score and price per pound of healthy foods by neighborhood median household income and percent Black or Hispanic, across the sample of stores surveyed in Seattle. Results are weighted to match the distribution of store types in each tertile.

Healthy food availability score by median household income

Neighborhoods with higher median household income levels had higher mean healthy food availability scores compared to middle- and lower-income neighborhoods (12.80 [95% CI=11.04, 14.55] in the highest income group, vs. 10.98 [95% CI=9.67, 12.29] in the middle income group, vs. 8.58 [95% CI=7.57, 9.62] in the lowest income group).

Healthy food availability score by race/ethnicity

When comparing by race/ethnicity, neighborhoods with more Black or Hispanic residents had lower healthy food availability scores, on average (9.29 [95% CI=8.19, 10.40]in the highest % Black or Hispanic group, vs. 11.05 [95% CI=9.73, 12.36] in the middle % Black or Hispanic neighborhoods, vs. 11.90 [95% CI=9.92, 13.89] in the lowest % Black or Hispanic neighborhoods).

Price per pound of healthy food by median household income

Average price per pound of grains, vegetables, meat, and beans were less expensive in the lowest neighborhood income group compared to the highest neighborhood income group; but in many cases, the confidence intervals overlap, indicating that differences are likely not statistically significant. Fruit tended to be more expensive in the lowest income neighborhoods.

Price per pound of healthy food by race/ethnicity

Prices were lower for fruit, vegetables, grains, meat, and eggs in neighborhoods with more Black or Hispanic residents. Although, similar to results by neighborhood-level income, the confidence intervals on the estimates are overlapping in many cases, indicating that prices may not be statistically significantly different. Milk and beans had higher average prices in neighborhoods where more Black or Hispanic residents reside; however, here again, the differences are likely not statistically significant.

This means that while higher-income areas and areas with fewer Black or Hispanic residents have greater access to healthy foods, the prices in these areas also tended to be higher, on average.

Table 5. Average healthy food availability score and price per pound of healthy foods in Seattle according to neighborhood income and race tertiles								
Census tract median household income & percent Black or Hispanic	**Seattle Healthy Food Survey availability score** N = 128	**Mean price ($)**						
		Fruit per pound N = 84	**Vegetables** per pound N = 69	**Grain** per pound N = 109	**Meat** per pound N=43	**Eggs** per pound N=90	**Beans** per pound N=76	**Milk** per gallon N = 108
	Mean score (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)
Median household income in Census tract (**weighted**[1])								
$0 - $63,077 (lowest income group)	8.58 (7.57, 9.62)	2.46 (2.04, 2.87)	1.63 (1.39, 1.86)	2.24 (1.91, 2.56)	4.98 (4.07, 5.90)	2.13 (1.96, 2.30)	1.78 (1.49, 2.08)	4.46 (4.06, 4.85)
$65,772 - $88,706 (middle income group)	10.98 (9.67, 12.29)	2.36 (1.99, 2.74)	2.35 (1.97, 2.72)	2.15 (1.82, 2.49)	4.96 (4.23, 5.68)	2.27 (1.97, 2.57)	1.80 (1.49, 2.10)	4.59 (4.10, 5.08)
$91,005-$159,652 (highest income group)	12.80 (11.04, 14.55)	2.10 (1.76, 2.44)	2.10 (1.61, 2.59)	2.81 (2.38, 3.24)	5.97 (5.16, 6.79)	2.50 (2.16, 2.83)	1.87 (1.75, 1.99)	4.52 (4.12, 4.92)
Percent Black or Hispanic in Census tract (**weighted**[1])								
0%-6.34% (lowest % Black or Hispanic)	11.90 (9.92, 13.89)	2.40 (2.06, 2.74)	1.92 (1.74, 2.10)	2.56 (2.0, 3.12)	6.15 (5.52, 6.79)	2.67 (2.39, 2.96)	1.67 (1.38, 1.97)	4.27 (3.72, 4.82)
6.42%-15.31% (intermediate % Black or Hispanic)	11.05 (9.73, 12.36)	2.40 (2.01, 2.78)	2.45 (1.91, 2.98)	2.71 (2.43, 3.07)	5.97 (5.11, 6.82)	2.37 (2.10, 2.63)	2.00 (1.72, 2.28)	4.53 (4.20, 4.86)
15.74%-50.99% (highest % Black or Hispanic)	9.29 (8.19, 10.40)	2.31 (1.91, 2.72)	1.78 (1.45, 2.11)	2.10 (1.80, 2.40)	4.53 (3.93, 5.13)	2.14 (1.90, 2.38)	1.73 (1.48, 1.99)	4.72 (4.25, 5.18)

[1]*Post-estimation weights adjust results to the categorized food permit database distribution of store types within either the income categories or the percent Black or Hispanic categories. Finite population correction and, as appropriate, sub-population sizes are adjusted for.*

Fruit includes apples, oranges, bananas
Vegetables includes broccoli, carrots, green lettuce, tomatoes, onions
Grains includes 100% whole wheat bread, white bread, frosted flakes cereal, original cheerios cereal, rice (white or brown)
Milk includes, in this order, fat-free milk, 1% milk, 2% milk, whole milk. The mean milk price is drawn from fat-free milk if available, then 1% milk, then 2% milk, then whole milk.

Table 6 displays the healthy food availability score and price per pound of healthy foods by Council District, across the sample of stores surveyed in Seattle. The analyses by Council District are weighted by the proportion of store types present in each Council District.

Healthy food availability score

Mean healthy food availability score varied from 7.69 (95% CI: 5.63, 9.75) in Council District 5, to 13.48 (10.90, 16.02) in Council District 6.

Price per pound of healthy food

No single Council District had the highest or lowest price on all the food categories by pound and the majority of confidence intervals overlapped, indicating few statistically significant differences across Districts in the price of food.

Table 6. Average healthy food availability score and price per pound of healthy foods in Seattle by Council District (using post-estimation weights)

Council Districts	Seattle Healthy Food Survey availability score N = 128	Mean price ($)						
		Fruit per pound	**Vegetables** per pound	**Grain** per pound	**Meat** per pound	**Eggs** per pound	**Beans** per pound	**Milk** per gallon
	Mean score (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)	Mean $/lb. (95% CI)
1 (Stores N=17)	9.14 (8.13, 10.17)	2.65 (2.39, 2.92)	1.89 (1.72, 2.10)	2.41 (1.96, 2.86)	5.78 (5.25, 6.31)	2.35 (2.17, 2.53)	1.98 (1.69, 2.27)	4.66 (4.02, 5.30)
2 (Stores N =41)	7.91 (6.82, 9.0)	2.33 (1.81, 2.85)	1.70 (1.25, 2.16)	2.06 (1.66, 2.47)	4.23 (3.30, 5.15)	2.17 (1.85, 2.49)	1.86 (1.44, 2.28)	4.61 (4.18, 5.04)
3 (Stores N =15)	12.58 (10.11, 15.05)	2.11 (1.69, 2.53)	1.70 (1.56, 1.83)	2.48 (1.87, 3.09)	5.37 (4.35, 6.39)	2.05 (1.77, 2.31)	1.63 (1.11, 2.14)	4.04 (3.39, 4.68)
4 (Stores N =10)	13.15 (10.56, 15.74)	2.11 (1.62, 2.59)	3.40 (2.42, 4.38)	3.29 (2.93, 3.65)	7.70 (7.21, 8.20)	2.85 (2.65, 3.05)	1.89 (1.80, 1.97)	4.20 (3.42, 4.99)
5 (Stores N =15)	7.69 (5.63, 9.75)	2.63 (2.14, 3.12)	1.78 (1.55, 2.01)	1.53 (0.87, 2.20)	5.51 (4.96, 6.05)	2.02 (1.79, 2.26)	1.33 (1.23, 1.42)	4.69 (3.86, 5.52)
6 (Stores N =19)	13.48 (10.90, 16.02)	1.82 (1.33. 2.31)	2.03 (1.67, 2.39)	2.97 (2.55, 3.40)	6.06 (5.46, 6.67)	2.50 (2.25, 2.75)	1.92 (1.39, 2.48)	4.57 (3.93, 5.21)
7 (Stores N =17)	11.26 (9.49, 13.03)	2.55 (1.93, 3.18)	2.56 (1.84, 3.27)	2.37 (1.92, 2.81)	4.90 (4.09, 5.71)	2.42 (1.93, 2.91)	1.77 (1.63, 1.90)	5.06 (4.41, 5.71)

PILOT STUDY OF FULL CENSUSES OF FOOD STORES AND IN-STORE HEALTHY FOOD AVAILABILITY IN THREE PRIORITY NEIGHBORHOODS

We also conducted a full census of food stores in Haller Lake (within Council District 5), High Point (within Council District 1), and South Park (within Council District 1), to understand if a full census of all stores would add value for characterizing the food environment, above and beyond what could be learned from traditional food environment analyses based on the food permit database or beyond taking just a sample of stores in these priority neighborhoods. To assess the value-added of the census, we examined three questions: 1) how accurate is the categorized food permit database in identifying the overall number and types of food stores? 2) would these neighborhoods be picked up in our HFPA index (Section 2)? and 3) does the in-store assessment of healthy food availability give a different

assessment of healthy food availability compared to a "food swamp" score based on the categorized food permit database?

1. How accurate is the categorized food permit database? The ground-truthing (i.e. the in-person drive-by to assess and categorize food stores and restaurants) revealed that the categorized food permit database provided only a moderately accurate count of food stores compared to what was physically verifiable during the ground-truthing. The positive predictive value for all store types was 0.70, meaning that 70% (n=39) of the stores listed in the categorized food permit database were confirmed in the ground-truthing (Appendix C); its sensitivity was 0.54, meaning that the categorized food permit database successfully identified 54% of all stores and restaurants present (39 of 72) in these three neighborhoods. (See addendum at the end of this section for detailed methods of the ground-truthing and the calculation of positive predictive value and sensitivity).

The categorized food permit database indicated there were three healthy food stores (defined as superstores, supermarkets, produce and farmers markets) across all three neighborhoods, while the ground-truthing indicated there was only one healthy food store across these three neighborhoods. For less-healthy food stores (defined as grocery stores, drug stores, small stores, and all restaurants/quick service/fast food), the categorized food permit database indicated there were 53 unhealthy food stores, while the ground-truthing indicated there were 71 of these stores. A food swamp is defined as an area where there are relatively more fast-food and junk-food retail establishments and relatively fewer healthy food alternatives.[7] When using a crude food swamp score (unhealthy retailers divided by total retailers) for all three neighborhoods combined, the food permit database indicated these areas were less of a food swamp (53 out of 56 = 94.6) compared to ground-truthing (71 out of 72 = 98.6).

Table 7. Total count of healthy versus less healthy food stores and restaurants in the categorized food permit database versus those identified via ground-truthing in South Park, High Point, and Haller Lake

Number of healthy and less healthy stores	South Park	High Point	Haller Lake	Overall
Number of **healthy** food stores from categorized food permit database	0	0	3	**3**
Number of **healthy** food stores from ground-truthing exercise/census	0	0	1	**1**
Number of **less healthy** food stores from categorized food permit database	18	8	27	**53**
Number of **less healthy** food stores from ground-truthing exercise	23	10	38	**71**

2. Would these neighborhoods be picked up in the HFPA scoring method (Section 2)? South Park and High Point would have been flagged as a potential healthy food priority area, while Haller Lake would not. Haller Lake meets the threshold for poverty, but based on the categorized food permit database, would not have met the travel time or food swamp criteria. The discrepancy may be driven by the recent closure of two supermarkets in this area.

Table 8. Healthy food priority area indicators for South Park, High Point, and Haller Lake			
	South Park	**High Point**	**Haller Lake**
Score on poverty indicator	57.5%	45.17%	31.93%
Binary indicator	*1*	*1*	*1*
Score on travel times	14.14 min	10.77 min	6.29 min
Binary indicator	*1*	*1*	*0*
Score on food swamp	98.81	96.14	94.87
Binary indicator	*1*	*0*	*0*
Total score	**3**	**2**	**1**

3. Does the in-store assessment of healthy food availability give a different assessment of healthy food availability compared to the assessment using the categorized food permit database? We surveyed 23 food stores (88% survey rate) as part of the census in these neighborhoods; four of these stores had already been included as part of our original SBT retail audit sample. Table 9 shows the average healthy food availability score in each of these neighborhoods; healthy food is availability is low in these areas, recalling that the average supermarket in Seattle scores 19 points. Also for comparison, the middle income group and intermediate group of proportion Black or Hispanic population both had a mean score of approximately 11 points (Table 5). The in-store healthy food assessment is consistent with the findings of the HFPA score using the categorized food permit database for one out of the three priority neighborhoods (South Park and High Point). Haller Lake would have been misclassified—seemingly having short travel times to the nearest healthy food and a food swamp score on the lower end of the spectrum (Table 8). High Point would have been flagged for having 2 indicators, but would not have been flagged for having all 3 indicators.

Table 9. Healthy food availability scores and price per pound for healthy food for food stores in the Haller Lake, South Park, and High Point neighborhoods, coded by survey and permit database status										
Store		**Store type**	**Seattle Healthy Food Survey availability score** Mean (95% CI) N	**Fruit** Mean price/lb. (95% CI) N	**Vegetables** Mean price/lb. (95% CI) N	**Grain** Mean price/lb. (95% CI) N	**Meat** Mean price/lb. (95% CI) N	**Eggs** Mean price/lb. (95% CI) N	**Beans** Mean price/lb. (95% CI) N	**Milk** Mean price/lb. (95% CI) N
South Park										
South Park Chevron	**C**	Small store	6.75 (4.03, 9.47) N=4	$2.54 (-18.84, 23.83) N=2	$1.29 (n/a) N=1	$1.81 (-0.55, 4.17) N=2	N/A	2.65 (n/a) N=1	2.20 (n/a) N=1	$4.99 (4.99, 4.99) N=3
South Park Grocery	**C**	Small store								
Fruteria Sandoval	**C P**	Small store								
Seaport Food Mart	**C P**	Small store								
High Point										
Walgreen's	**C S**	Drug store	8.43 (5.71, 11.14) N=7	$4.03 (3.81, 4.25) N=5	$1.87 (-9.56, 13.29) N=2	$1.99 (1.23, 2.75) N=6	N/A	2.31 (1.30, 3.33) N=4	1.98 (1.60, 2.38) N=4	$4.29 (3.19, 5.38) N=6
Delridge Arco AM/PM	**C**	Small store								
High Point Mini Market	**C**	Grocery								
M & J Mini Mart	**C**	Small store								
Cottage Grove Mart	**C**	Small store								
Rocky's Shell	**C P**	Small store								
Super-24 Food Store	**C P**	Small store								
Haller Lake										
Cash & Carry	**C S**	Grocery	7.41 (4.43, 10.40) N=12	$3.24 (1.95, 4.53) N=8	$1.88 (-1.14, 4.90) N=3	$1.91 (1.24, 2.60) N=9	2.99 (n/a) N=1	2.32 (1.61, 3.04) N=6	1.70 (1.0, 2.40) N=2	$3.80 (2.64, 4.96) N=8
Plutos on Aurora	**C S**	Small store								
European Foods	**C**	Small store								
7-Eleven Store #2360	**C**	Small store								
Haller Lake Food Shop	**C**	Small store								
7-Eleven Store #27901	**C**	Small store								
Aurora Mini Mart	**C**	Small store								
Northgate Shell	**C**	Small store								
Asian Food Center	**C P**	Small store								
Addis Market	**C P**	Small store								
Ebenezer Tienda Latina	**C P**	Small store								
Northgate Way 76	**C P**	Small store								
Northgate Chevron	**D**	Small store								
Tobacco Street	**D P**	Small store								
K-Smoke Mart	**D P**	Small store								

C = Stores surveyed for census

S = Stores surveyed in SBT sample

P = Stores not in the categorized food permit database

D = Stores that declined participating in the survey

Note that not listed in this table, are stores that were included in the permit database, but not present during ground-truthing.

DISCUSSION

Availability and price by neighborhood characteristics

We surveyed 27% (n=134) of all food stores in Seattle as part of the SBT retail audit sample using our Seattle Healthy Food Survey tool to assess in-store healthy food availability. We tested our Seattle Healthy Food Survey against a widely used gold-standard tool and found that it performs well (Pearson's correlation=0.875). This adds additional understanding to the Seattle's retail food environment in combination with other aspects of food availability, food insecurity, and opportunities to improve healthy food access.

In Seattle, lower-income neighborhoods and neighborhoods with more Black or Hispanic residents, had fewer large food stores and more small stores. Consistent with this finding, we found lower availability of healthy foods for lower-income neighborhoods and neighborhoods with more Black or Hispanic residents.

At the same time, when available, protein, milk, grains and vegetables tended to be less expensive in neighborhoods with lower-income or more Black or Hispanic residents (in contrast, fruit was more expensive in lower-income neighborhoods and milk was more expensive in neighborhoods with more Black or Hispanic residents). It should also be noted that although average prices were higher, the confidence intervals around many of these estimates overlapped, indicating that the price differences are likely not statistically significant. The tendency for higher prices in neighborhoods with higher income and fewer Black or Hispanic residents could be due to retailers pricing foods differently or stocking brands with different price points, depending on the surrounding neighborhood's demographic composition. It could also be that maintaining a higher variety of foods costs stores money and this is reflected in the pricing of the foods they carry.

As was anticipated, we found that larger food stores provide neighborhoods with greater access to healthy foods. Warehouses/superstores had the highest mean availability score, followed closely by supermarkets, and then grocery stores. Drug stores and small stores had substantially lower mean scores as compared to these larger store types.

Relatedly, supermarkets and warehouse/superstores offered these healthy foods - fresh fruits and vegetables, eggs, and beans - at lower prices as compared to grocery and small stores (no drug stores surveyed carried any fresh produce), making them the more affordable options for most of the measured foods.

Unexpectedly, grocery and small stores offered meat at cheaper prices as compared to the larger stores (no drug stores surveyed carried any meats). Milk prices also varied unexpectedly, with the lowest cost milk in warehouse/superstores, then drug stores, supermarkets, grocery, and small stores. Grains were similarly priced at all stores, with the exception of warehouse/superstore, where they were markedly cheaper.

Pilot census of healthy food availability in all stores in three priority neighborhoods

With a focus on the High Point, Haller Lake, and South Park neighborhoods in Seattle, we found that the categorized food permit database was only moderately accurate in identifying food stores present in these neighborhoods. Some of the inaccuracy is likely due to the fact that the categorized food permit database is from 2015; however, this represents the most recent categorized version available to the team and therefore, reflects what would normally be available to researchers or policymakers. The inaccuracy of the categorized food permit data base would lead to these neighborhoods scoring

somewhat better on a crude food swamp measure than would be the case based on the ground-truthed information. Only one of these neighborhoods (South Park) were identified as particularly poor food environments on our HFPA index; a second neighborhood, High Point, would be flagged if we used 2 out of 3 indicators on the HFPA as indicating potential risk for being a HFPA.

An in-store healthy food availability assessment revealed that the in-store availability was low and is consistent with the findings using the categorized food permit database and the HFPA index for South Park and High Point. The lack of healthy food in Haller Lake would not have been detected if relying only on the categorized food permit database. Two of these neighborhoods—South Park and High Point—were counted as having zero healthy food stores in the categorized food permit database and they also had zero healthy food stores identified in ground-truthing. The third neighborhood—Haller Lake—was counted as having three healthy food stores per the categorized food database, however two stores had closed in the interim and at the time of the in-person census, only one healthy food store remained. Comparing the categorized food permit database to the in-person census revealed what seems to be a fairly rapid turnover in food establishments.

Policymakers will have to weigh the costs of intensive in-person, in-store surveying of food environments with the information gained from this exercise. While the in-person survey did reveal the inaccuracies of the categorized food permit database and the fairly rapid turnover of stores, conclusions would have been largely similar had we relied on secondary data for two of the three neighborhoods (if the more lenient threshold of 2 of 3 indicators were used). Another consideration for policymakers would be the potential need to repeat the in-person data collection fairly frequently in this context of what seems to be high turnover. This is likely context-specific since Seattle may be changing more rapidly than cities across the US.

Considerations for future work could include developing reliable tools to categorize the publicly-available PHSKC food permit database such that it provides researchers, program-implementers, and policy makers with more timely, usable data about the presence and makeup of food stores in Seattle. This may be a more affordable option than relying on ground-truthing methods to validate these lists; ground-truthing can be time-intensive, and requires a substantial amount of driving hours.

Additionally, there may be opportunities to assess how neighborhoods with low healthy food accessibility (as measured by the Seattle Healthy Food Survey and the Healthy Food Priority Area indices in Section 2) are served by the SBT revenue-funded food access programs, aimed at increasing healthy food accessibility for lower-income families. There may be opportunities to target low healthy food availability neighborhoods identified in this report with these healthy food access programs.

Limitations

This study has limitations that should be noted. Although we surveyed a large sample of food stores citywide, we have only a sample of stores rather a census of stores in most Seattle neighborhoods. Additionally we are aware that individuals do not necessarily always shop for food in their neighborhoods or even at the stores most proximal to their home, so there are limits to characterizing access to food, healthy or otherwise, based only on the food stores within a given neighborhood; furthermore, we did not survey popular stores such as Whole Foods, Trader Joe's, or PCC, as our original

sample was drawn for the SBT retail audit, and these stores tend to devote little shelf space to sugary beverages.

Our ground-truthing exercise estimated the accuracy of the categorized food permit database for grocery-type food stores at 71%, due mostly to an undercount of total stores. The low sensitivity and positive predictive values of this database likely indicates in part that the Seattle food store landscape changes quickly. Because we created our post-estimation weights using the distribution of food stores citywide in the categorized food permit database, our assessment of healthy food availability is potentially an under-count, and our weights may not reflect the true universe of stores in a given area if that neighborhood has changed their store type-makeup since 2015.

Although we had originally proposed to compare how well our sample of stores captured in the SBT retail audit might capture the food environment in the three priority neighborhoods, we realized that this would not be a meaningful comparison for two main reasons. First, our sampling strategy was not designed to be representative of such a small area. And two, we picked these neighborhoods precisely because we suspected limited numbers of food stores, which was indeed the case. With only 23 food stores spread across all three neighborhoods, even a 50 or 75% sample would still be a small number of stores. For these reasons, we do not compare how our sample performed compared to the entire census of stores in these areas.

We were not able to measure all healthy food items present in food stores. Though our Seattle Healthy Food Survey performed well compared to the longer gold-standard NEMS-CS survey, our survey only measured three fruit, and five vegetables. It is possible stores carried additional healthy fresh foods (e.g., more culturally relevant heathy foods) that this survey did not capture, and we did not capture any potentially healthy foods sold in prepared food stores.

This report section concludes the City-approved scope of work to assess the price and availability of healthy food items in Seattle.

ADDENDUM – DETAILED METHODS FOR SECTION 3

METHODS

Overview

To assess and describe the price and availability of healthy foods across Seattle, the Evaluation Team: 1) developed and validated an abbreviated measurement tool for in-store healthy food availability, 2) conducted in-store assessments of healthy food availability and prices in 134 food stores in Seattle, 3) created and applied post-estimation weights to make sure the sample of stores was representative of the distribution of stores in Seattle within tertile groups of key neighborhood characteristics (income and race/ethnicity), and finally 4) assessed mean healthy food availability and price per pound of healthy foods according to neighborhood median income level and neighborhood proportion of people who are Black or Hispanic (two populations for which prior literature has documented disproportionately low access to healthy foods).

To obtain a more comprehensive assessment of healthy food availability in food stores and to assess the added value of a full census of stores in three low-income Seattle neighborhoods believed to have limited food access – hereafter called "priority neighborhoods" -- the Evaluation Team conducted a pilot census of food stores and in-store healthy food availability. Specifically, we 1) conducted an in-person street-by-street drive-by ("ground-truthing") to ensure that all food stores were identified, 2) compared our ground-truthed sample to the Public Health Food Permit records categorized by the University of Washington Urban Form Lab (UFL) researchers under the direction of Dr. Anne Vernez Moudon, hereafter referred to as "categorized food permit database" to determine accuracy of the categorized food permit database, 3) assessed whether the ground-truthing would offer different conclusions compared to the healthy food priority area (HFPA) index created in Section 2, and 4) conducted in-store food availability measurement in all stores.

Primary data source

Primary data include: 1) in-store healthy food availability and price assessments in all food stores, excluding restaurants and including only stores that sell primarily unprepared foods and beverages, such as supermarkets, superstores, grocery stores, drug stores, and small stores (convenience, gas stations) in the SBT retail audit sample of stores throughout Seattle, and 2) a census of all food establishments and a survey of all food stores identified via a "ground-truthing" exercise in three priority Seattle neighborhoods.

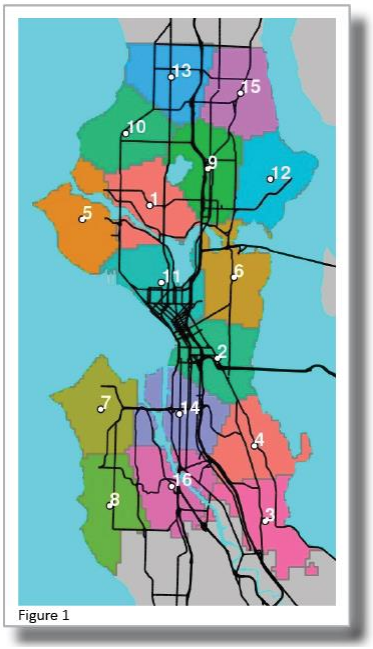


Figure 1

SBT retail audit store sampling design

To assess healthy food availability in the City of Seattle, we capitalized on our ongoing, in-store retail audit that is a key part of the Sweetened Beverage Tax (SBT) Evaluation.[1] Specifically, we used the same sample of stores and added in-store healthy food availability and price components to our existing in-store audit. Our original sample of stores was identified prior to passage of the SBT, in the fall of 2017 based on a list of all permitted, permanent food establishments in 2015, maintained by PHSKC. The UFL at the University of Washington previously created algorithms to classify each of these businesses into meaningful food store or restaurant categories (supermarkets, grocery stores, corner stores, counter-service restaurants, etc.). We used this classification to categorize stores and restaurants.

We aimed for a geographically balanced sample of food stores (supermarkets, grocery stores, drug stores, corner stores, gas stations), coffee shops, and counter-service restaurants in Seattle. When selecting our store sample, we obtained geographic balance by dividing our study area into 16 equal-sized areas, mapping all the food establishments based on their address locations, then selecting a quota of stores from each store type within each of the 16 areas (figure 1).

Responding to interest expressed by the City of Seattle and the SBT Community Advisory Board, we also worked with community liaisons and consulted lists of "minority-owned businesses" to identify small stores owned by people of color and added these to the sample derived from the process described above.

In-store healthy food assessments throughout Seattle

The abbreviated in-store healthy food assessment was based on the widely-used Nutrition Environment Measures Survey for Convenience Stores (NEMS-CS), which is often considered a gold standard for in-store healthy food availability assessment.[2] The final list of food items was based on input from Seattle Human Services Department, Seattle Office of Sustainability and Environment, City Councilmembers, and the SBT Community Advisory Board. We refer to our newly developed survey tool as the Seattle Healthy Food Survey (Appendix B). We measured the availability and prices of fruit, vegetables, grains, proteins, milk, sweets, and junk foods. Specifically, we collected the availability and prices for 19 individual healthy food items, and six sweets or junk food items (see Table 1 for the list of all healthy foods included in the assessments).

Data collectors attended one six-hour training, then practiced data collection in the field until 90% raw agreement on responses was achieved. All surveys were conducted between May 21 and July 20, 2018. We paused data collection the week of July 4 to minimize capturing holiday-specific sales.

Trained data collectors conducted in-store food assessments using the Seattle Healthy Food Survey in all food stores in the SBT retail audit store sample, including warehouses, superstores, supermarkets, grocery stores, drug stores, and small stores. We did not conduct the Seattle Healthy Food Survey in any restaurants (e.g., traditional restaurants, quick-service restaurants, coffee, or beverage shops).

Priority neighborhoods store census

The Evaluation Team additionally identified three priority neighborhoods—Haller Lake, High Point, and South Park—to conduct a census of all stores, identifying, counting, and listing all food stores and all restaurants found within the neighborhood boundaries (in contrast with the sample in the SBT retail audit work which was planned to be geographically balanced across the city as a whole, rather than comprehensive of any given Seattle neighborhood). We surveyed all food stores in these three neighborhoods to measure the availability and price of healthy foods. The Evaluation Team selected these three low-income, limited food access neighborhoods by consulting a variety of sources. First, we used the USDA Food Access Research Atlas, to identify neighborhoods with limited supermarket access (defined as a census tract with at least 500 people, or 33 percent of the population, living more than ½ mile from the nearest supermarket, supercenter, or large grocery store, calculated from the geographic center of each census block-level ½-kilometer grid cell).[3] We additionally referenced the May 2013 Mapping Food Access in the City of Seattle report produced by the City of Seattle Office of Sustainability and Environment,[4] and conferred with City Councilmembers. After identifying potential areas, we defined neighborhood boundaries using the Seattle Department of Neighborhood's neighborhood boundaries.[5]

To ensure that we captured all retail food outlets in these priority areas, we conducted a traditional ground-truthing exercise in the three priority neighborhoods. Ground-truthing involves canvassing all

streets within the neighborhood boundaries to enumerate all observed food stores. Two data collectors drove all streets in each of the three neighborhoods, recording the store name, store address, and store type, for every observed food establishment. We secondarily used the information gathered in the ground-truthing to assess the sensitivity and specificity of the categorized food permit database.

In these three neighborhoods, trained data collectors surveyed all food stores (a census rather than a sample) using *both* the Seattle Healthy Food Survey and the NEMS-CS gold-standard tool. By surveying this set of stores with both tools, we are able to determine how well our shorter Seattle Healthy Food Survey performs as compared to the NEMS-CS gold-standard tool. The full NEMS-CS tool was not used through our SBT store audits because it would have added considerable length and burden to the audit and captured some additional but less relevant information. Understanding the performance of our abbreviated tool allows us to assess the degree to which we can confidently conclude that our own abbreviated tool can be used as a valid assessment of healthy food availability. This is important since we used our own tool in the larger SBT retail audit store sample.

Secondary data source

Secondary data include: 1) the 2015 Public Health Food Permit records categorized by the University of Washington Urban Form Lab (UFL), and 2) 2016 US Census and American Community Survey (ACS) data for the city of Seattle.

2015 categorized food permit database

As above, the categorized food permit database includes all permitted food establishments in King County. For the purpose of this analysis, we excluded all stores outside of the city of Seattle, as well as all stores with duplicate permits (e.g., if the same store had one permit for the grocer, and one for the bakery section, we only counted it as one permitted establishment). We used this categorized food permit database as the sampling frame for the SBT retail audit store sample. We also used it to identify stores and restaurants in the priority neighborhoods, to compare against the ground-truthed assessment of stores and restaurants. Finally, we use this categorized food permit database to create post-estimation weights for our stores that we use in the analyses of healthy food availability and price by neighborhood characteristics (described further below).

2016 US Census Boundary Files and American Community Survey (ACS)

2016 US Census Boundary Files provided census tract boundaries and 2012-2016 ACS provided aggregate demographic characteristics for all Seattle census tracts, including proportion of the population in each of five race and ethnic groups and median household income.

Census tract boundary files

Census tract boundary files were used to identify census tracts in Seattle and to identify the census tract location of each store in the categorized food permit database.

Variables

Healthy food availability score

The first outcome of interest is the availability of healthy foods in different stores throughout Seattle by neighborhood characteristics wherein those stores are located. We developed a guide to score the availability of healthy foods available in a store as measured by the Seattle Healthy Food Survey based on the NEMS-CS gold-standard tool's scoring guide. Each healthy food item receives at least one point if it is available, with healthier items receiving more points than their less healthy counterparts (see Table 1 for available points by food item and within each food category). All unhealthy junk foods receive zero points and are therefore not included in the healthy food availability score. Each store receives an

overall availability score out of 25 total points, which is the sum of all points earned for each healthy food product in that store.

Healthy food price

The second outcome of interest is the price of healthy foods in Seattle. To assess the price of healthy foods we calculate the mean price per pound of food by food category. We express mean price as price per pound, with the exception of milk, which we express as mean price per gallon. Mean food prices are calculated by food category, as grouped in Table 1, with the proteins further separated into individual foods since the average price of the three items in this group were quite different and many times stores had only one of these protein foods.

Neighborhood income

We created tertiles (three groups of approximately equal size based on the distribution of values in the data, i.e. census tracts in the lowest third of the distribution, the middle third, and the highest third) of median household income based on the distribution of census-tract level median household income from the 2016 American Community Survey.

Neighborhood race/ethnic composition

We used data from the American Community Survey to determine the proportion of the population in each census tract that was either non-Hispanic Black or Hispanic, which we used to create tertiles of census-tract level proportion of the population that is either non-Hispanic Black or Hispanic. We focused on the proportion of the population that was either Black or Hispanic since previous literature has noted consistent inequities in food environments comparing neighborhoods with higher population proportions of Black or Hispanic populations to neighborhoods with lower population proportions of Black and Hispanic individuals. Similar to neighborhood income, we grouped census tracts into tertiles of proportion Black or Hispanic.

Table 1. Products included in the Seattle Healthy Food Survey

Healthy food items[1]	Total points available in survey
Fruit	**3**
Apples	1
Bananas	1
Oranges	1
Vegetables	**5**
Broccoli	1
Carrots	1
Green lettuce	1
Tomatoes	1
Yellow onions	1
Grains	**7**
100% whole wheat bread	2
White bread	1
Frosted Flakes cereal	1
Original Cheerios cereal	2
Rice (white or brown)	1
Protein	**6**
Canned beans (black, kidney, or garbanzo)	2
Eggs	2

Lean fresh ground meat	2
Milk	**4**
1% Milk	1
2% Milk	1
Fat-free milk	2
Whole milk	0

[1]We additionally collected the availability and prices of five junk food products and sweets, which are not included in this analysis: Lays potato chips, Pringles potato chips, Reese's peanut butter cups, Oreos, and Little Debbie Honey Buns. These items received no points in the Healthy Food Survey scoring tool and were not included in the market basket.

Statistical analysis

Primary objective/analysis

Our primary objective is to assess healthy food availability and prices by Seattle neighborhood characteristics, including Seattle City Council District, neighborhood median income, and neighborhood race/ethnic composition.

To do so, first we assessed the performance of our Seattle Healthy Food Survey by comparing it to the established NEMS-CS. Specifically, we used Pearson's correlation to assess criterion validity of our newly developed tool to the established NEMS-CS tool in the 23 stores where both survey tools were used.

After confirming the performance of our newly developed tool, we then estimated, in our full sample of stores, the healthy food availability scores and healthy food prices by: 1) Seattle City Council District, 2) census tract-level median household income tertiles, 3) proportion of the population that is Black or Hispanic, in tertiles.

It was important to apply post-estimation weights based on store types to these analyses since we know that store type is correlated with the healthfulness, availability, and price of foods sold (e.g., supermarkets tend to have all the foods and generally at lower prices than small stores).

We created three sets of weights, the purpose of which is to adjust measures up or down such that we achieve universe "store type" representativeness in our final analyses. To achieve this, we created post-estimation weights to ensure that the stores in the SBT retail audit store sample were proportionally representative by neighborhood characteristic. Post-estimation weights adjust results to the universe's distribution of store types within 1) three income categories (census tracts with lowest, middle, and highest incomes), 2) three percent Black or Hispanic categories (census tracts with lowest, middle, and highest percentages), and 3) the seven Council Districts. In addition, finite population correction is accounted for in analyses and, as appropriate, sub-population sizes are adjusted for. These weights ensure that the sample of stores included in the availability and price analyses are representative of the makeup of food stores in each census tract tertile or each Council District.

For all availability scores and food prices, we present the post-estimation-weighted average healthy food availability score and average price per pound of healthy foods separately by Council District, neighborhood income tertiles, and tertiles of neighborhood race/ethnic composition (proportion Black or Hispanic).

Secondary objective/analysis

A secondary goal of this study was to conduct a pilot study of three priority neighborhoods, in which we surveyed all the stores (rather than a sample) and assessed in-store healthy food availability and price

across all stores in the three priority neighborhoods. We calculated the average healthy food availability and average healthy food prices for the stores included in full census.

In addition, we compare the in-store healthy food availability and prices to the findings from our HFPA assessments in Section 2, which uses the same categorized food permit database to create a HFPA index based on a combination of estimates of neighborhood poverty, travel times time to healthy food locations, and the ratio of unhealthy to total food retail outlets ("food swamps").

In secondary analyses, we additionally assessed the accuracy of the categorized food permit database for these three priority neighborhoods. Data collectors drove 112 miles to ground-truth the Haller Lake, High Point, and South Park neighborhoods in order to capture all food stores and restaurants in these neighborhoods. To determine the accuracy of the categorized food permit database, we calculated the positive predictive value and sensitivity (Box 1) of all individual food stores and restaurants in the database, in comparison to all individual food stores and restaurants found in the ground-truthing exercise.

Box 1. Positive predictive value and sensitivity

Positive predictive value of the categorized food permit database was defined as the probability that stores listed in the categorized food permit database were both located by data collectors while ground-truthing and still in operation:[6]

$$positive\ predictive\ value = \frac{\text{true positives}}{\text{true positive + false positives}}$$

Sensitivity was defined as the probability that stores identified in the ground-truthing exercise were also listed in the categorized food permit database:[6]

$$sensitivity = \frac{\text{true positives}}{\text{true positives + false negatives}}$$

We defined "true positives" as stores listed in the categorized food permit database *and* confirmed during ground-truthing. We defined "false positives" as stores that were in the database, but not physically there during ground-truthing (e.g., stores that closed or moved) and "false negatives" as stores missing from the list, but physically there during ground-truthing (e.g., new stores identified).[6]

References

1. Chan N, Chen R, Jones-Smith J, et al. *The Evaluation of Seattle's Sweetened Beverage Tax. Baseline Report: Pre-Implementation of the Tax*. Seattle; 2018. http://www.seattle.gov/Documents/Departments/CityAuditor/auditreports/SBTBaselineReport.pdf.
2. Glanz K, Sallis JF, Saelens BE, Frank LD. Nutrition Environment Measures Survey in stores (NEMS-S): development and evaluation. *Am J Prev Med*. 2007;32(4):282-289. doi:10.1016/j.amepre.2006.12.019
3. Unites States Department of Agriculture Agricultural Marketing Service. Food Access Research Atlas. https://www.ers.usda.gov/data-products/food-access-research-atlas/. Published 2015.
4. Urban FoodLink. *Mapping Food Access in the City of Seattle*. Seattle; 2013.
5. Seattle Department of Neighborhoods. Neighborhood Planning. https://www.seattle.gov/neighborhoods/programs-and-services/neighborhood-planning.
6. Caspi CE, Friebur R. Modified ground-truthing: An accurate and cost-effective food environment validation method for town and rural areas. *Int J Behav Nutr Phys Act*. 2016;13(1):1-8. doi:10.1186/s12966-016-0360-3
7. Rose D, Nicholas Bodor J, Swalm C, C. Rice J, A. Farley T, Hutchinson P. *Deserts in New Orleans? Illustrations of Urban Food Access and Implications for Policy*. Ann Arbor, MI, USA; 2009.

SECTION 4 | A. WHO EXPERIENCES FOOD INSECURITY IN SEATTLE?
B. WHO FALLS INTO THE "FOOD SECURITY GAP"?

SUMMARY

To understand who in Seattle experiences food insecurity (defined as not having enough money for food), we analyzed data from five different surveys of Seattle residents. We also estimated the number of people in Seattle who fall into the "food security gap" – lower-income Seattle residents who do not qualify for nutrition assistance programs like U.S. Department of Agriculture Supplemental Nutrition Assistance Program (SNAP), but who cannot reliably afford healthy food due to competing basic needs such as housing, health care, and child care. The findings provide context for the assessment of the Seattle food bank network (Section 5).

Key findings

Although rates of food insecurity differed by data source, patterns of disparity were similar across all data sources. Food insecurity was highest among those with the lowest income and lowest educational attainment. In general, people of color experienced food insecurity at higher rates than white populations; and households in which the primary language spoken was *not* English were more likely than English-speaking households to experience food insecurity (the exception was Chinese-speaking households). Although no gender differences were found among adults or school-age children, rates of food insecurity were two times higher among individuals who identified as lesbian, gay, or bisexual (LGB) than among those who identified as heterosexual. Food insecurity increased with grade level for children in 8th, 10th, and 12th grades; and tended to be higher among young adults compared to adults in their mid-40s and older. We also found that participation in SNAP/Basic Food, and by inference food insecurity, continues to rise in Seattle for one age group – older adults. Not until 300% of the Federal Poverty Level (FPL) do we see food insecurity begin to drop to a low level for Seattle adults; for people of color, it is at 400% of the FPL. We estimated that 13,420 Seattle residents in 2017 fell into the "food security gap," defined as residents not eligible for food assistance benefits yet lacked enough money to buy the food they needed. This estimate would be higher if it included people who, although receiving benefits, still experience food insecurity.

OBJECTIVE

While there are different ways to ask a person if they have experienced food insecurity, surveys often use some form of this statement, "In the past year, the food that we bought just didn't last, and we didn't have money to get more." To understand the scope of this inequity, we first turned to survey data and local community reports for information about who in Seattle is experiencing food insecurity, and how that picture has changed over time. Secondly, we took a closer look at the group of people who, while experience food insecurity, also make too much money to qualify for nutrition assistance programs. The findings provide context for the assessment of the food bank network in Seattle (Section 5). The findings will also inform Seattle's (a) Office of Sustainability and Environment in planning the expansion of eligibility for the Fresh Bucks program and upcoming update of the Food Action Plan, and (b) Human Services Department in preparing their Request for Proposals for Food and Nutrition planning.

SECTION 4A. WHO EXPERIENCES FOOD INSECURITY IN SEATTLE?

To look at food insecurity among adults, youth, families with children, and SNAP-eligible adults accessing services, we analyzed and compared data from five surveys. See addendum at the end of this section for detailed methods and more information about each survey:

- Behavior Risk Factor Surveillance System (BRFSS) survey of adults,
- Healthy Youth Survey (HYS) of public school students in 8th, 10th, and 12th grades,
- Best Starts for Kids Health Survey (BSK) of parents/caregivers of young children (infants through fifth grade),
- Surveys of low-income families through the Seattle Shopping and Wellness Survey (SeaSAW) of low-income families with children age 7-17 and
- Surveys from the University of Washington Center for Public Health Nutrition (CPHN) of low-income adults eligible for the Supplemental Nutrition Assistance Program (SNAP) who were using health care, food bank, or healthy food programs funded through the Partnership to Improve Community Health.[i]

Looking across multiple data sources helps us detect patterns in disparities across ages; from infants and children through teenagers and adults. The findings below show how the patterns change by Seattle City Council District, economic security, education, race/ethnicity, primary language, gender, sexual orientation, and age.

RESULTS

Comparing food insecurity results across surveys

Despite differences in questions and populations sampled, patterns of disparity in food insecurity across all the surveys were similar.

Despite differences in questions and populations sampled, patterns of disparity in food insecurity across all the surveys were similar (see methods addendum for a description of the survey questions). Since the samples and the questions in each survey were so different, the estimated rates of food insecurity across samples varied considerably. For example, overall estimates of food insecurity were highest for the low-income families participating in the 2017 Seattle Shopping and Wellness Survey (SeaSAW), surveys of SNAP-eligible adults participating in healthy

[i] *For more information see https://www.kingcounty.gov/depts/health/partnerships/pich/grant.aspx.*

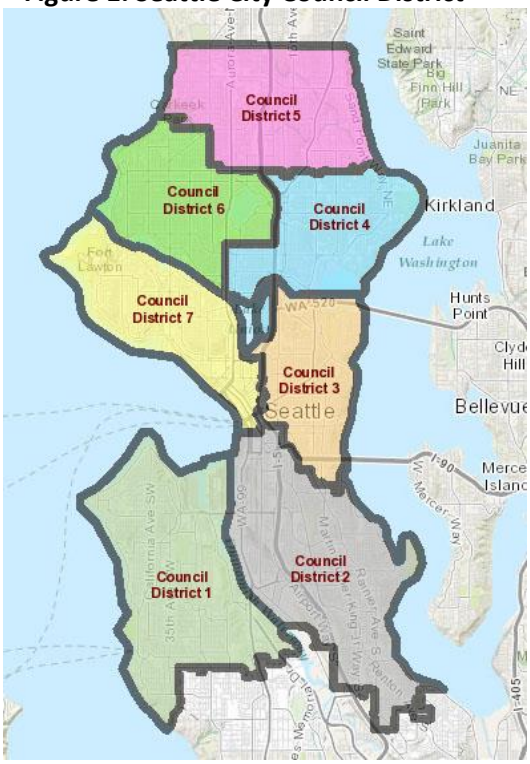
food programs (51% and 48%), and for families raising young children (22%). Food insecurity rates among adults (13%) and school-age youth (11%) were lower overall. Looking at comparable data across surveys, we present the results by the following demographic categories: place (Council District, see Figure 1), economic security (income and Federal Poverty Level), education, race/ethnicity, primary language, gender, sexual orientation, and age.

Food insecurity by place (Chart 1)

Among adults, food insecurity did not differ significantly across Seattle City Council Districts. Among school-age youth, food insecurity in District 2 (15%, Southeast/Georgetown) was higher than the Seattle average (11%); and food insecurity in District 4 (5%, Northeast) was lower than all districts except in District 6 (8%, Northwest). Youth food insecurity was also lower in District 6 than in District 1 (13%, West Seattle/South Park) and District 2 (15%).

Across the adult and youth surveys, food insecurity estimates for each Council District were very similar (within 1%) with the exception of District 1, where the adult estimate was 4% lower than the estimate for youth, and District 4, where the city's lowest food insecurity rate for school-age youth (5%) was juxtaposed with the city's highest rate of adult food insecurity (15%), a difference likely driven by the University of Washington student population.

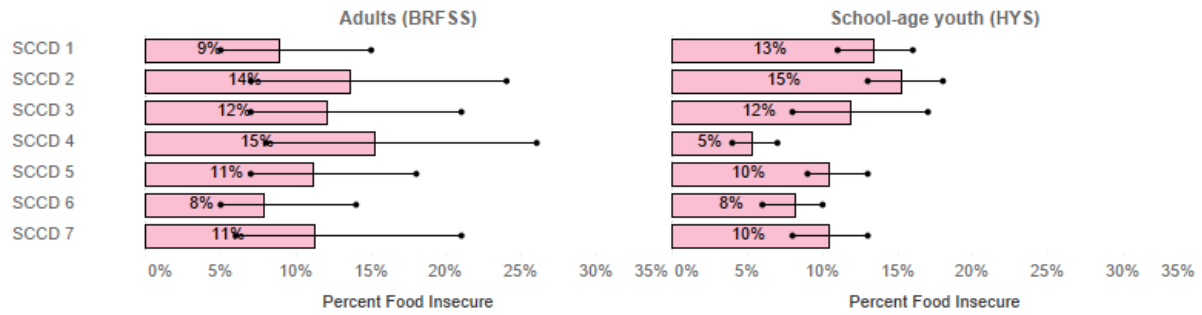
Figure 1. Seattle City Council District



Source: Office of the City Clerk

Chart 1. Food insecurity for adults and school-aged children by Council District

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016)



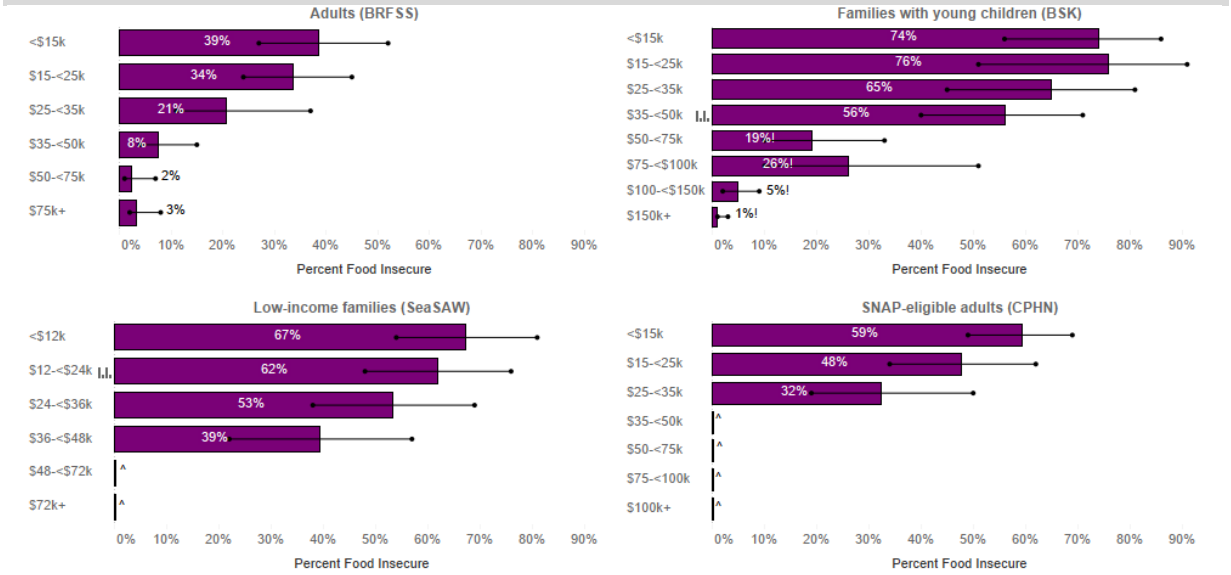
Food insecurity by economic security (Chart 2)

Across all data sources, food insecurity was inversely related to economic security. At all income levels, rates of food insecurity were highest among families with young children. Among families raising young children, more than half with annual income below $50,000 reported experiencing food insecurity.

At all income levels, food insecurity was highest among families with young children. Among families raising young children, more than half with annual income below $50,000 reported experiencing food insecurity.

Chart 2. Seattle food insecurity by household annual income

(BRFSS, 2011-2013; BSK, 2016-2017; SeaSAW, 2017; CPHN, 2014-2017)



^ Too few cases to protect confidentiality and/or report reliable estimates
! Interpret with caution; sample size is small, so estimate is imprecise

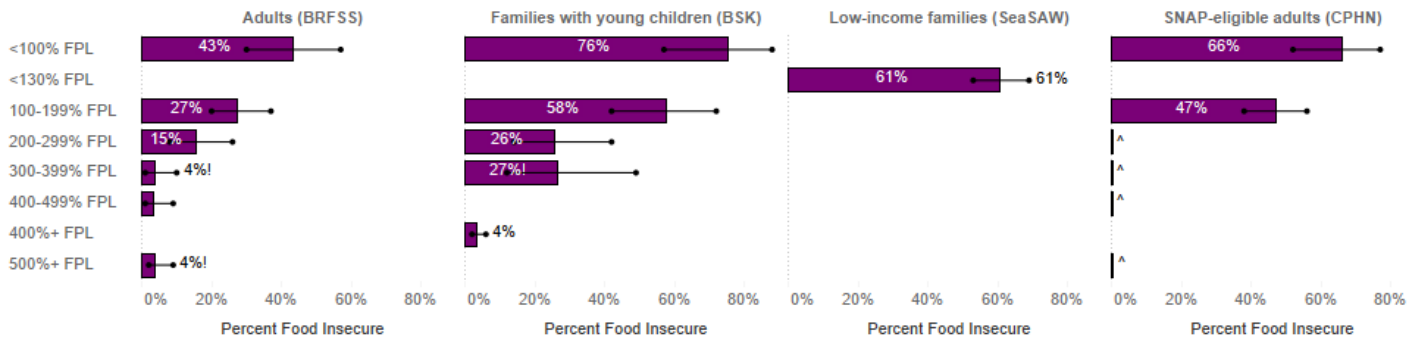
Food insecurity by Federal Poverty Level[ii] (Chart 3)

Across all samples, the highest levels of food insecurity were reported by respondents who met SNAP/Basic Food's eligibility criteria of incomes below 200% of the FPL, identifying a food security gap among SNAP-eligible populations. Not until we reach 300% of the FPL for adults and 400% of the FPL for families with young children do we see food insecurity nearly disappear. In 2018, the poverty guideline for a 2-person household (e.g. one adult and one child) was $16,460, 300% of the FPL would be $49,380 and 400% of the FPL would be $65,840. For a 4-person household (e.g. two adults and two children), the 2018 poverty guideline was $25,100; a household earning $75,300 would be at 300% of the FPL and $100,400 at 400% of the FPL.

At both 200-299% of the FPL and 300-399% of the FPL, more than one in four families raising young children reported food insecurity. Families in these income brackets would not qualify for food assistance through SNAP, suggesting that they would fall into the broader food security gap (up to 399% of the FPL) discussed in Section 4B below.

Chart 3. Seattle food insecurity by Federal Poverty Level

(BRFSS, 2011-2013; BSK, 2016-2017; SeaSAW, 2017; CPHN, 2014-2017)



^Too few cases to protect confidentiality and/or report reliable estimates

! Interpret with caution; sample size is small, so estimate is imprecise

[ii] *We use Federal Poverty Level to refer to the poverty guidelines. The poverty guidelines are a version of the federal poverty measure. They are issued each year in the Federal Register by the Department of Health and Human Services (HHS). The guidelines are a simplification of the poverty thresholds, produced by U.S. Census Bureau, for use for administrative purposes — for instance, determining financial eligibility for certain federal programs. The poverty guidelines do not vary by the age of adults or number of children in a family/household. They do vary by geography—Alaska and Hawaii have separate guidelines. For more information see https://aspe.hhs.gov/2018-poverty-guidelines.*

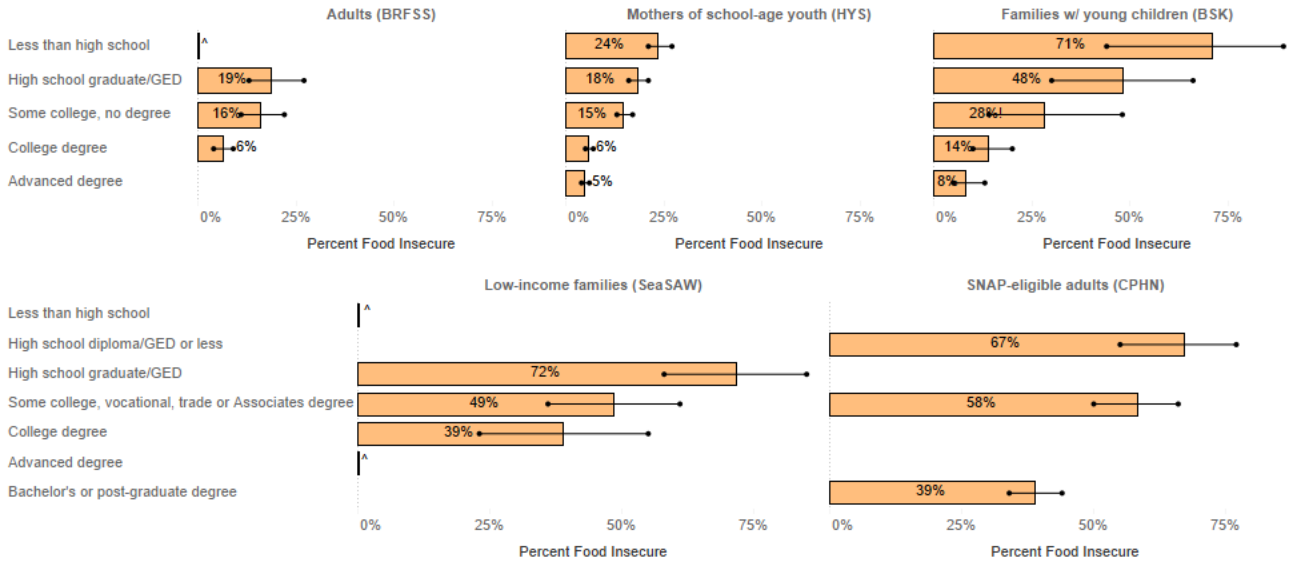
Food insecurity by education (Chart 4)

Across all data sources, food insecurity was highest among adults with lowest education levels.

Across all data sources, food insecurity was highest among adults with lowest educational levels. Since the HYS does not collect data on family income, maternal education is used as a proxy for family socioeconomic status. When we analyzed HYS food insecurity by participation in the Free and Reduced Price Meal Program as a rough validity check, the results closely mirrored our findings by maternal education, with 21% of students who receive free school meals reporting food insecurity, compared to 6% of students who did not receive free school meals (data not shown). Among school-aged youth, "not eating breakfast" was also inversely related to maternal education (data not shown).

Chart 4. Seattle food insecurity by adult parent/caretaker education

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016; BSK, 2016-2017; SeaSAW, 2017; CPHN, 2014-2017)



! Interpret with caution; sample size is small, so estimate is imprecise

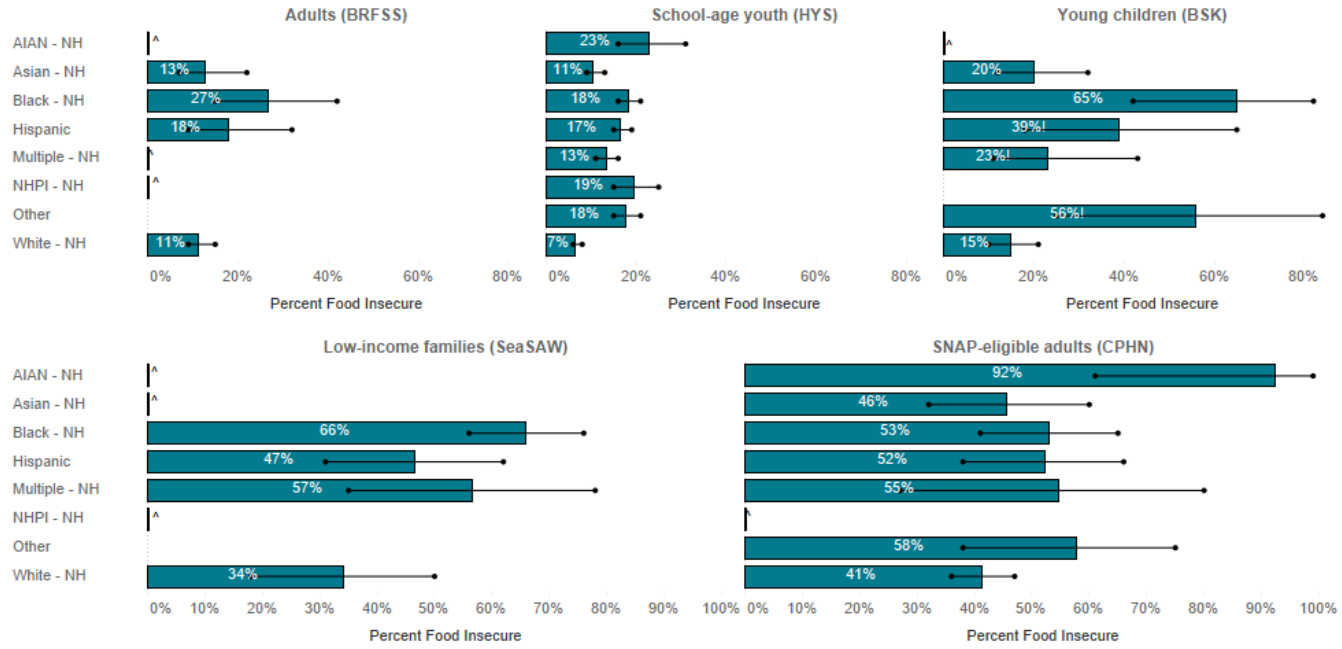
^ Too few cases to protect confidentiality and/or report reliable estimates

Food insecurity by race/ethnicity (Chart 5)

In general, people of color experienced higher rates of food insecurity than white populations, except for Asian respondents who generally reported similar rates of food insecurity to white respondents. Among school-aged youth and SNAP-eligible adults, food insecurity rates were highest for American Indian/Alaska Native (AIAN) respondents. While the other surveys we examined lacked sufficient data to report reliable estimates of food insecurity among AIAN respondents in Seattle, studies with larger samples have found high rates of food insecurity among AIAN households, both rural and urban, supporting our findings.[1,2] Similar to the findings among school-aged youth, students of color were more likely to have not eaten breakfast compared to white students (data not shown).

Chart 5. Seattle food insecurity by race/ethnicity

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016; BSK, 2016-2017; SeaSAW, 2017; CPHN, 2014-2017)



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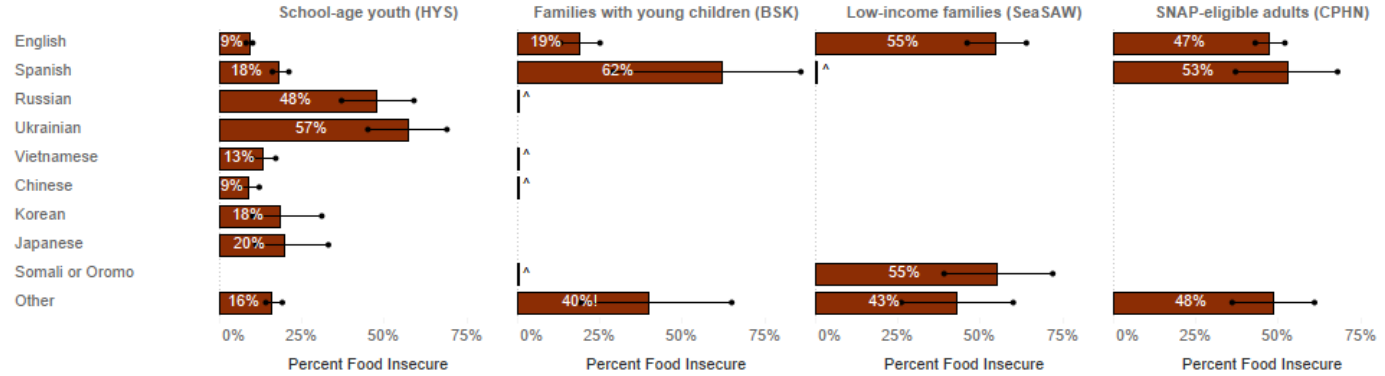
^ = Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total<50. HYS and SeaSAW: suppressed if cell total < 10)

Food insecurity by primary language (Chart 6)

With the exception of Chinese-speaking households, school-aged youth from households in which the primary language spoken was *not* English were more likely than those from English-speaking households to experience food insecurity. As with food insecurity, there were large, though not all statistically significant, differences in eating breakfast by primary language spoken at home, with students from English- and Chinese-speaking households more likely to have eaten breakfast compared to students from other non-English speaking households (data not shown). There were no differences by primary language in the sample of SNAP-eligible adults.

Chart 6. Seattle food insecurity by primary language spoken at home

(HYS, 2012, 2014, 2016; BSK, 2016-2017; SeaSAW, 2017; UW CPHN, 2014-2017)



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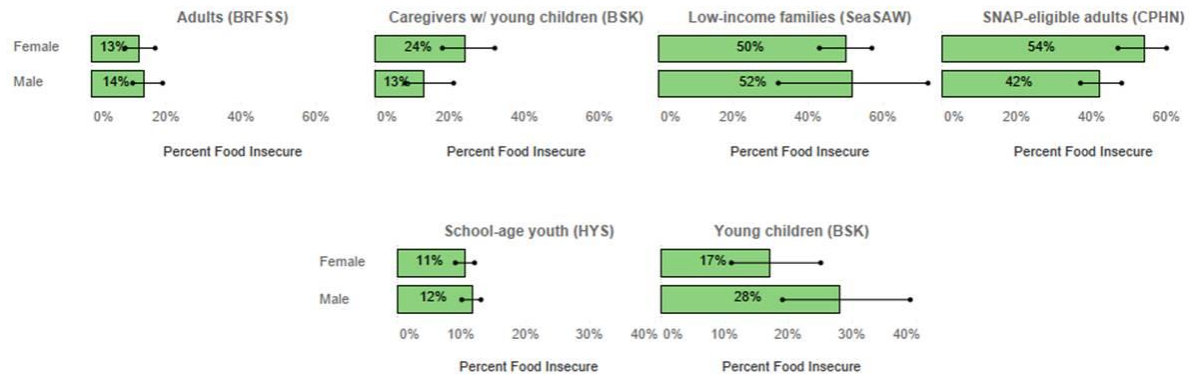
Food insecurity by gender (Chart 7)

No significant gender differences in food insecurity were found for adults, school-age children, or young children.

Chart 7. Seattle food insecurity by gender

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016; BSK, 2016-2017; SeaSAW, 2017; UW CPHN, 2014-2017)



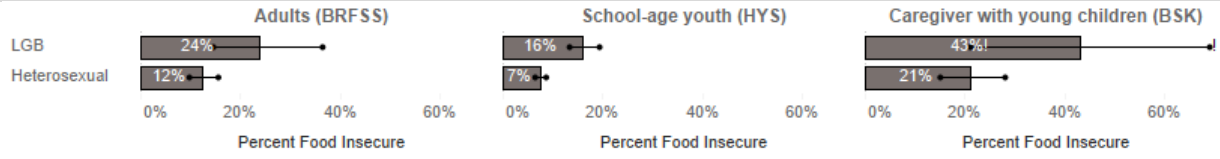
Food insecurity by sexual orientation (Chart 8)

Across all data sources, rates of food insecurity were two times higher among individuals who identified as lesbian, gay, or bisexual (LGB) than as heterosexual. As with food insecurity, lesbian, gay, and bisexual students were significantly more likely than heterosexual students (37% vs. 26%) to report not eating breakfast (data not shown).

Across all data sources, rates of food insecurity were two times higher among individuals who identified as lesbian, gay, or bisexual (LGB) than as heterosexual.

Chart 8. Seattle food insecurity by sexual orientation

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016; BSK, 2016-2017)

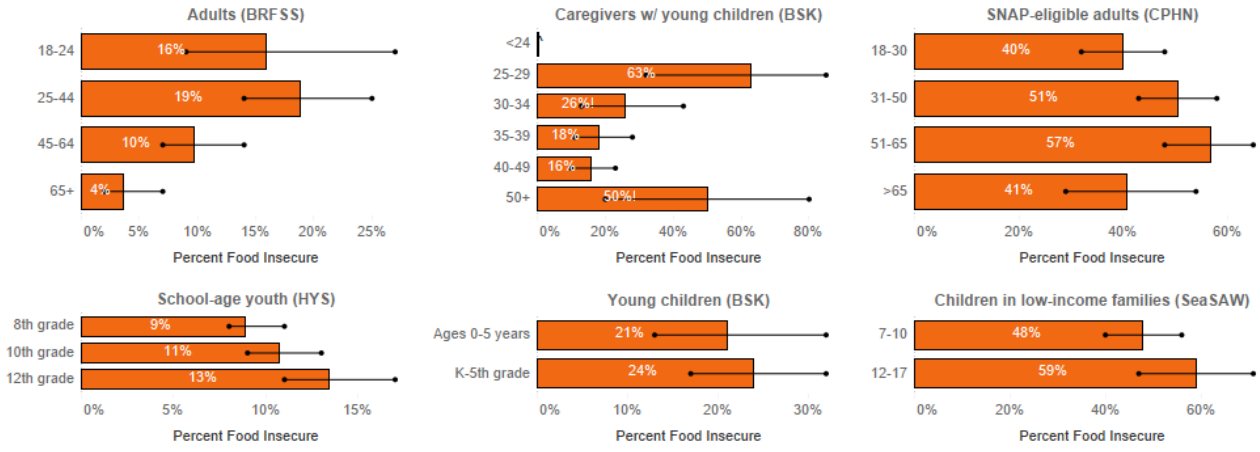


Food insecurity by age (Chart 9)

Among school-age youth, food insecurity increased with age and was significantly higher for 12th graders compared to 8th graders. According to the 2011-2013 averaged BRFSS data, food insecurity for Seattle adults declined with age, with respondents 65 years and older showing the lowest rates. In more recent data for adults raising children in Seattle, food insecurity followed a similar (decreasing) age gradient until age 50+, where the rate jumped to 50% (perhaps not surprising as this group is likely to include older adults with fixed incomes raising grandchildren). Because the food insecurity rate for older adults in King County almost doubled from 2010 to 2013 and BRFSS food insecurity data were unavailable after 2013, we followed SNAP/Basic Food trends by age to see if this pattern continued in Seattle (see Chart 10 below).

Chart 9. Seattle food insecurity by age/grade groups

(BRFSS, 2011-2013; HYS, 2012, 2014, 2016; BSK, 2016-2017; SeaSAW, 2017; UW CPHN, 2014-2017)



^ Too few cases to protect confidentiality and/or report reliable estimates

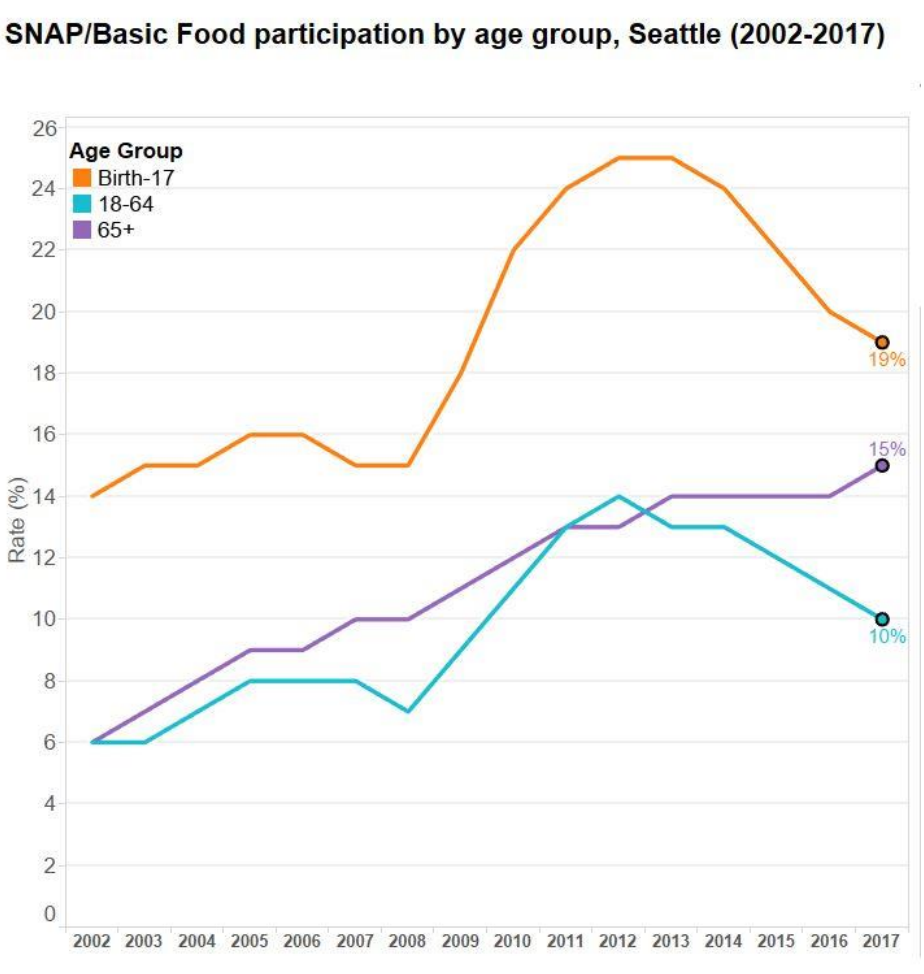
! Interpret with caution; sample size is small, so estimate is imprecise

Trends by age group for SNAP/Basic Food participation (Chart 10)

In the years after the Great Recession, use of SNAP/Basic Food (formerly Food Stamps) benefits in Seattle decreased for all age groups except older adults (age 65+ years). While the rates of SNAP/Basic Food participation in Seattle for children and 18-64 year-old adults peaked between 2012 and 2013 and have since declined to pre-Recession levels, rates for older adults rose before and during the Great Recession, plateaued from 2013 to 2016, and rose again in 2017. In addition, the number of unduplicated older-adult SNAP/Basic Food clients has increased each year. By 2017, more than one in seven older adults in Seattle participated in the SNAP/Basic Food program (see Chart 10).

In 2017, King County re-instated the three month time-limit on SNAP assistance for unemployed adults who are able-bodied and without dependents. The limit had been waived in 2008 as a way to support many adults experiencing extended unemployment during the Great Recession. These policy changes and economic conditions may be contributing to the increase in 2008 and declining adult participation we see in 2017.[3,4]

Chart 10. Trends in SNAP/Basic Food participation by age in Seattle



Data source: Washington State Department of Social and Health Services
Communities Count, 10/2018

Food insecurity and participation in food assistance programs

High proportions of low-income families and adults participating in food assistance programs report food insecurity. Among Seattle SNAP-participating low-income families surveyed for the SeaSAW study, 66% reported being food insecure, while the CPHN surveys show that more than half of adults participating in SNAP (56%) were food insecure. Similarly, 68% of WIC-participating Seattle families reported being food insecure (SeaSAW, 2017) and 63% of Seattle SNAP-eligible adults participating in food banks/pantries were food insecure (CPHN, 2014-2017). These data could indicate that food assistance programs are reaching the intended people. It could also suggest that a food security gap exists even among those receiving food-assistance benefits.

Access to fresh fruits and vegetables

SeaSAW and the BSK Health Survey included questions about access to fresh produce and elicited different patterns of results. Among the general population of Seattle families with young children (BSK sample, in which 22% reported food insecurity), 85% said they were “usually” or “often” able to find affordable fresh fruits and vegetables in their neighborhoods. When we look at responses from low-income Seattle families completing an initial survey for the Seattle Shopping and Wellness Study (SeaSAW), 58% reported that within the past 12 months it had “often” or “sometimes” been hard to buy fresh fruits and vegetables, slightly higher than this sample’s 51% food insecurity rate. Although the samples and questions from the two different surveys are not directly comparable, the high level of access to affordable fresh produce among BSK survey respondents suggests that the BSK question could have been interpreted as a broader inquiry about neighborhood availability of fresh produce rather than the family’s ability to buy fresh produce.

SECTION 4B. WHO FALLS INTO THE FOOD SECURITY GAP?

"My daughter is small in comparison to other kids her age…She is healthy but underweight and it is a struggle to be low income and provide healthy food options for her. I think with low income families or those families that fall in between making slightly too much to not be able to receive any services, it is a struggle to provide children a well-rounded life…"

-Seattle parent responding to 2016 BSK Health Survey

Here, we estimate the number of people in Seattle who fall into the "food security gap," which we define as lower-income Seattle residents *who do not qualify* for nutrition assistance programs like U.S. Department of Agriculture Supplemental Nutrition Assistance Program (SNAP)/Basic Food in Washington, but cannot reliably afford food due to competing basic needs such as housing, health care, and child care. See addendum at the end of this section for detailed methods.

"We work hard as a family but now it seems that even with a decent job, we still can't afford to [live] like we should be living. We still can't afford groceries and we don't qualify for food stamps. Rent keeps going up…"

-Seattle parent responding to 2016 BSK Health Survey

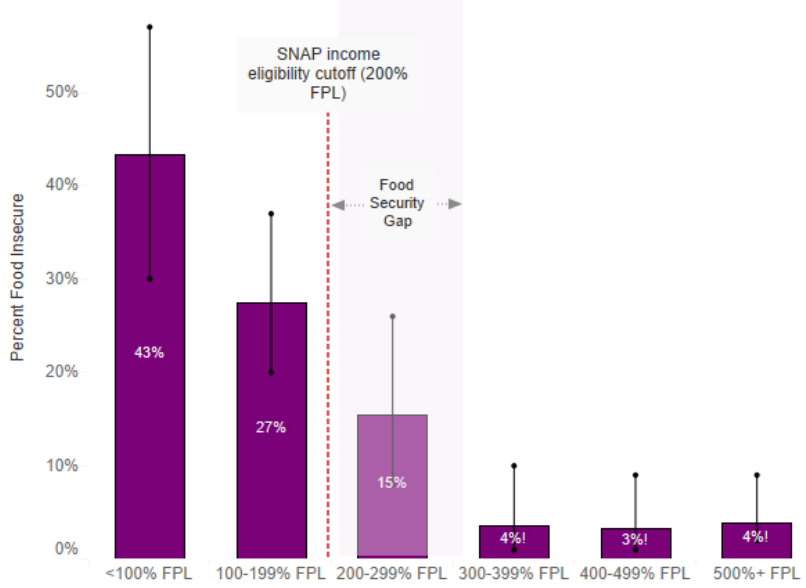
RESULTS

Households in Washington state are eligible for SNAP benefits if they earn less than 200% of the FPL and meet Federal program requirements and citizenship or alien status requirements.[iii] To establish an income ceiling or cut-point for estimating the food security gap, we looked at data to find the income level at which people no longer experienced food insecurity. While some respondents at the highest income levels reported experiencing food insecurity, we saw a large drop-off, which started at 300% of FPL for the general population but differed for people of color. Specifically, BRFSS survey data show that the income level at which rates of food insecurity drop off for Seattle adults was 300% of the FPL (Chart 11), while it was 400% of the FPL for people of color (Chart 12).

[iii] *See https://www.dshs.wa.gov/esa/community-services-offices/basic-food for Basic Food eligibility criteria. Legal immigrants who are not eligible for federal Basic Food solely due their immigration status may be eligible for the state Food Assistance Program (https://www.dshs.wa.gov/esa/community-services-offices/state-food-assistance-program-fap).*

Chart 11. Food insecurity by income, Seattle adults

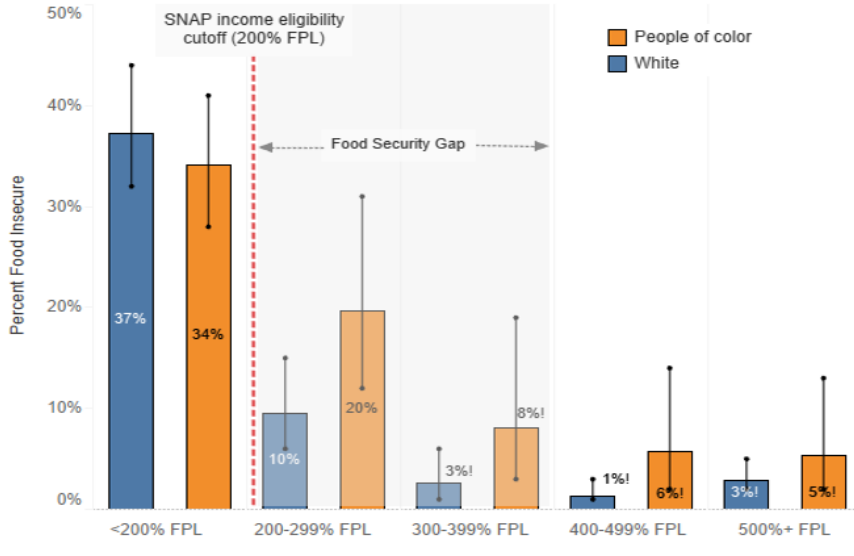
(BRFSS, 2011-2013)



Among people of color, food insecurity rates were higher overall and at all income levels greater than 200% FPL (Chart 12). (We used King County data for racial/ethnic analyses due to small sample sizes in Seattle data.) About 8% of people of color in King County[iv] with incomes at 300-399% were food insecure. Unlike for white respondents, food insecurity rates remained at or above 5% at higher income levels.

Chart 12. Food insecurity by income and race/ethnicity, King County adults

(BRFSS, 2011-2013)



[iv] *Sample sizes were insufficient to disaggregate by race in Seattle.*

We used 400% FPL as the cut-point in the final estimate of the number of people in the food security gap in Seattle. Increasing the cut-point to 400% FPL allowed us to account for racial differences and to accommodate findings of a drop-off in food insecurity for families with young children at 400% FPL (Chart 3).

At the 200-299% FPL, we estimate 10,400 Seattle residents experienced food insecurity in 2017. At the 300-399% FPL, we estimate an additional 3,000 food insecure residents in 2017. Altogether, we estimate 13,420 Seattle residents experienced food insecurity yet made too much income to qualify for SNAP in 2017.[v]

We estimate 13,420 Seattle residents experienced food insecurity yet made too much income to qualify for SNAP in 2017.

DISCUSSION

In the absence of annual survey data on food insecurity since 2013, we triangulated across multiple data sources, finding consistency in food insecurity patterns by place, race/ethnicity, economic security, educational attainment, and sexual orientation. The major inconsistency in the data by Council District was in District 4 (Northeast Seattle), which reported both the city's highest rate of adult food insecurity and the lowest rate of food insecurity among school-age youth. This apparent paradox may reflect the high concentration of young adults[vi], many of whom are students in the University District and earning little or no income, paired with prosperous neighborhoods (Windermere, Hawthorne Hills, Laurelhurst, Wallingford) whose children attend the local schools.

While the patterns of findings were very similar across data sources, the actual estimates of food insecurity varied considerably, with the highest estimates coming from the SeaSAW survey of low-income families with children, the CPHN survey of SNAP-eligible adults, and the BSK survey of families with young children. We would expect high estimates of food insecurity in samples selected for low income families or adults (SeaSAW and CPHN). The high level of food insecurity in the BSK sample may stem in part from the economic burden of raising children and in part from the wording of the question. Unlike the questions in the other surveys, which limited the time frame for recalling food insecurity to the past 12 months, the BSK survey question expanded the recall frame dramatically to "since this child was born," which could have been as long as 10 years ago.

Across all surveys, we found disparities by race/ethnicity, education, and sexual orientation, and extremely high levels of food insecurity among respondents at the lowest levels of economic security. In all samples, the highest levels of food insecurity were reported by respondents at poverty levels that meet eligibility criteria for SNAP; and food insecurity was uniformly high in the samples of low-income families and low-income adults participating in food assistance programs such as SNAP, suggesting that current benefits might not be sufficient to meet basic needs in these groups and identifying a food security gap among SNAP-eligible populations that was not addressed in Section 4B.

SNAP benefits target households with the most need and are equal to the cost of the US Department of Agriculture's Thrifty Food Plan (a diet plan intended to provide adequate nutrition at a minimal cost). Households with no net income receive the maximum monthly SNAP benefit, based on household size. For all other eligible households, the monthly SNAP benefit is the difference between the maximum

[v] *Numbers may not add up to the total due to rounding.*

[vi] *High concentrations of 15-19 year olds and 20-24 year olds in Council District 4 confirmed in downloadable Neighborhood Profiles at http://seattlecitygis.maps.arcgis.com/apps/MapSeries/index.html?appid=3eb44a4fdf9a4fff9e1c105cd5e7fe27.*

benefit, for the household size, and the household's expected contribution (30% of the household's net income).[5,6] In fiscal year 2017, the annual average SNAP/Basic Food benefits per Seattle client[vii] was $1,159, approximately $97 per month (or about $24 per week). Based on work from the Center on Budget and Policy Priorities, on average, low-income families report an additional $4-9 per week would be needed to meet food needs. A $30 increase in monthly benefits is estimated to increase spending on groceries, including vegetables, increase time preparing food, decrease spending on fast food, and decrease food insecurity.[7]

Furthermore, at both 200-299% of the FPL and 300-399% of the FPL – poverty levels that do not qualify for food assistance through SNAP – more than one in four families raising young children reported food insecurity, and would fall into the broader food security gap (up to 399% of the FPL) discussed in Section 4B. As suggested by the differing estimates of the food security gap by race/ethnicity, belonging to multiple at-risk groups in Seattle (low economic security; people of color; households with children; low educational attainment; lesbian, gay, or bisexual; non-English-speaking) may amplify unmeasured disadvantages related to food insecurity.

…more than one in four families raising young children reported food insecurity, but make too much (200-399% of the FPL) to qualify for food assistance through SNAP.

Finally, using annual data on SNAP/Basic Food participation as a proxy for food insecurity, we suspect that, as with SNAP/Basic Food participation, food insecurity among Seattle's older adults may be continuing an ascent that began more than 15 years ago and is not occurring in any other age group. For those living on a fixed income in a city experiencing an economic and population boom, increased costs of health care and housing could further increase the risk of food insecurity for Seattle's older adults.

After a four-year hiatus, the Behavioral Risk Surveillance System (BRFSS) has resumed asking the key question about food insecurity, which will be included in the 2018 and 2019 surveys. Public Health – Seattle & King County will update data about food insecurity when 2018 and 2019 data are released from the Department of Health. In addition to updating data about food insecurity, Public Health – Seattle & King County will continue to track food insecurity in older adults, and follow what appears to be a continuing shift in the distribution of school-age poverty – one of the upstream causes of food insecurity – out of Seattle and into South Region school districts.

Limitations

Limitations of BRFSS data

The recovery from the Great Recession (2007-2009) was protracted and delayed; we included 2011-2013 BRFSS data to capture the aftereffects of the recession and its impact on food insecurity. Unfortunately, the BRFSS question about running out of food and not having money to buy more was not asked in Seattle between 2013 and 2017, so the 2011-2013 BRFSS average is the most current local population-level data on food insecurity. Although including 2010 data would have increased the sample size for analysis, we chose not to include 2010 data, as food insecurity in 2010 differed significantly from 2011 and later years (data not shown). Because the 2012 BRFSS only asked the food security question

[vii] *SNAP/Basic Food clients are typically households – "assistance units" of people who live together and whose resources are counted to determine eligibility.*

from September to December, the sample size for the 2012 survey year was small. Review of quarterly trends in food insecurity from past years' data showed slight seasonal variation in which the first quarter prevalence of food insecurity was higher than in later quarters; therefore, food insecurity for 2012 may be underestimated and may contribute to an underestimate for the 2011-2013 period. The food insecurity question was last asked in 2013 and will be included in 2018 and 2019 BRFSS surveys. With changes in Seattle demographics and increased cost of living in recent years, estimates from 2011 to 2013 BRFSS data may underestimate the current state of food insecurity in Seattle. PHSKC will update this analysis when 2018-19 data on food insecurity become available.

As noted in the detailed methods in the addendum at the end of this section, by combining three years of data, we were able to generate stable, cross-sectional estimates for food insecurity for that time period. However, this meant we were unable to examine trends or changes within demographic subgroups over time. Despite increasing sample sizes by combining multiple years of data, sample sizes for stratified analyses were relatively small for some variables, as reflected by wide confidence intervals. Point estimates for these variables should be interpreted with caution. BRFSS results were suppressed in instances where sample size was less than 50 total respondents.

The BRFSS surveys adults 18 and older, whereas the ACS and OFM population estimates include all individuals. To estimate the food security gap, we made the assumption that food insecurity prevalence is similar among adults and youth younger than 17, which is supported by the analysis of HYS data. While food insecurity was higher among families with children than without children in 2010, this gap closed between 2011 and 2013, due to increasing rates of food insecurity among older adults and adults who were not in a partner relationship.[8] Because this difference had disappeared by 2013, we did not stratify our analysis of 2011-2013 BRFSS data by the presence of children.

We based the food security gap calculation on Washington state's 200% FPL SNAP eligibility criteria but did not take into account other eligibility criteria (e.g. dependents, work requirements, citizenship status), as this information was not available in the BRFSS data.

As noted in the detailed methods in the addendum below, the BRFSS income estimates are imprecise because BRFSS collects broad income categories rather than exact household income. Until 2011, the top income category was "$75,000+." Starting in 2012, the BRFSS added additional income categories "$75,000 to <$100,000" and "$100,000+." As such, the income approximation is different for 2011 vs. 2012-13. This affects the precision of the estimated income-to-poverty ratio, particularly for larger families and those with incomes above the top income range.

Lastly, the BRFSS has been conducted via cell phone and landline since 2009. While the landline survey asks about the number of household members, the cell-phone survey did not do so initially. For cell-phone respondents with missing information on household size, we imputed the number of household members based on marital status, assigning unmarried respondents a household size of one and married respondents a household size of two.

Limitations of HYS data

The comprehensiveness of the HYS data is dependent on schools that opt to participate in the survey. However, the participation of Seattle schools in HYS was relatively high from 2012 to 2016. Participation in HYS is voluntary and responses are based on self-report, which can be subject to recall or response bias. The question about free/reduced price lunch was first asked in 2016, so our analysis for this variable did not combine three years of data.

Estimates of food security by Council Districts were based on mapping of participating HYS schools that fell within Council District geographies. The numbers of schools and students represented in each school are not necessarily equally distributed across Council Districts.

Although the HYS data is more current than the BRFSS data, it is possible that the combined data from 2012, 2014, and 2016 may underestimate the current state of food security among Seattle's school-aged youth, given the fast pace of demographic change in the region. The "no-breakfast-today" measure might not accurately reflect food insecurity among 8th through 12th graders, since some schools may have piloted some form of "breakfast after the bell" program during the 2012 to 2016 period. Washington State's "Breakfast after the bell" House Bill 1508 (https://www.governor.wa.gov/news-media/new-law-offers-breakfast-after-bell-program-hungry-students) was signed into law March 2018 and does not go into effect until the 2019-20 school year.

It is conceivable that students attending public schools in Seattle could live outside the school district boundaries. Seattle Public Schools posts annual enrollment reports online. Table 1C of the annual report includes combined counts of students who are out of district or whose attendance area is unknown. In 2016 the total numbers of out-of-district or unknown-attendance-area students were 53 for grades 6-8 and 154 for grades 9-12.

Limitations of SeaSAW data

Because of small sample size and uneven geographic distribution of participants, SeaSAW data could not be examined by Council Districts. In addition, use of a convenience (non-random) sample precludes generalization of SeaSAW results to the overall Seattle population of low-income families. The data analyzed for this report are from all Seattle respondents who completed a baseline survey and is not limited to families currently participating in SeaSAW.

Limitations of UW CPHN data

The data of SNAP-eligible adult came from three evaluation studies with differing sampling methods ranging from a convenience sample to a stratified random sample. For the pooled Seattle estimates presented, the data were predominantly from a convenience sample of SNAP-eligible adults receiving some type of service and would not be generalizable to all SNAP participants. Income data were available for participants surveyed through two of the three evaluation projects. Estimates by Council District were not possible due to small sample sizes.

Limitations of survey questions (overall)

Modern definitions of food insecurity increasingly include references to nutrition and healthy food. For example, the United Nations' Committee on World Food Security defines food security as "the condition in which all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[9] However, the standard food-insecurity questions – for the surveys analyzed here and for many surveys across the country (for example, "running out of food and not having money to buy more") — are rooted in concerns about scarcity rather than nutrition and improved health outcomes. In the current analysis, two surveys did include questions about access to healthy food, but they were not directly comparable, and one left considerable latitude for interpretation. Removing barriers to accessing and choosing healthy food should be able to both reduce hunger *and* improve health. Our

ability to evaluate progress on these fronts require both coordination and validation of assessment tools.

Limitations of existing survey data

The surveys included as data sources in this report do not capture Seattle's homeless residents very well. As food insecurity is likely to be high in this population, food insecurity in Seattle may be higher than seen in survey estimates.

Limitations of estimating the food security gap

The analysis does not address the food security gap that exists among low-income residents who experience food insecurity even while receiving food-assistance benefits, as described in Section 4A above.

ADDENDUM – DETAILED METHODS FOR SECTION 4A

METHODS

Data sources

To estimate food insecurity in Seattle for . . .

- **. . . adults**, we combined the three most recent years of available data (2011 to 2013) on food insecurity from the annual Behavioral Risk Factor Surveillance System (BRFSS).
- **. . . school-aged youth (8th, 10th, and 12th graders)**, we combined 2012, 2014, and 2016 data for Seattle Public Schools from the bi-annual Washington Healthy Youth Survey (HYS). As a validation on the food security question, we also examined whether school-aged youth ate breakfast.
- **. . . families with children in fifth grade and younger**, we used data from the 2016-2017 Best Starts for Kids (BSK) Health Survey.
- … **low-income families with children age 7-17,** we report analyses from the 2017 Seattle Shopping and Wellness (SeaSAW) Child Cohort survey described in the SBT Evaluation Baseline Report to the City of Seattle. [10]
- … **SNAP-eligible adults accessing services**, we report combined analyses of three surveys from the University of Washington Center for Public Health Nutrition evaluations of: nutrition-support programs SNAP-Ed (2016), Fresh Bucks (2014, 2015, 2017), and healthy food access strategies funded through the Partnership to Improve Community Health (2016). See Appendix D for details of these data sources.

In the absence of BRFSS data on food insecurity after 2013, we looked at trends using annual unduplicated client counts of Basic Food participation (which includes both the federally funded Supplemental Nutritional Assistance Program [SNAP] and the state's Food Assistance Program [FAP]), which generally tracks food insecurity. The Washington State Department of Social and Health Services (DSHS) posts these data online for three age groups: children from birth to 17 years, adults from 18 to 64 years, and adults age 65 and older.

Outcomes of interest

Each survey asked slightly different questions about food insecurity.

- **For adults**, the BRFSS food insecurity question was: "The food that [I/we] bought just didn't last, and [I/we] didn't have money to get more. Was that often, sometimes, or never true for you in the last 12 months?" The analyses combined responses for "*often*" and "*sometimes*" to capture any level of food insecurity.
- **For school-aged youth,** the HYS food insecurity question asked, "How often in the past 12 months did you or your family have to cut meal size or skip meals because there wasn't enough money for food?" with response options of "*almost every month*," "*some months but not every month*," "*only 1 – 2 months*," and "*did not have to skip or cut the size of meals*." Response options were combined to create a binary variable reflecting any level of need to skip or cut meal sizes compared to not having to skip or cut meal sizes. We also analyzed the HYS question, "Did you eat breakfast today?" as a rough validation of the food insecurity question. While students might not eat breakfast for a variety of reasons, for some students not eating breakfast reflects not having enough food for breakfast. For consistency with the food insecurity items, we tabulated the proportion reporting "*no breakfast*."

- **For families with children in fifth grade and younger,** the BSK Health Survey question asked, "Since this child was born, how often has it been very hard to get by on your family's income – hard to cover basics like food?" The response options, "*all of the time*," "*most of the time*", or "*some of the time*" were combined to create a binary variable reflecting food insecurity. In addition, to analyze access to affordable produce we analyzed responses to the question: "How often can you find affordable fresh fruits and vegetables in your neighborhood?" The response options "*usually*" or "*always*" were combined to create a binary variable.
- **For low-income families with children,** the SeaSAW question about food insecurity asked respondents, to "Please tell us whether the statement was often true, sometimes true, or never true for your household: Within the past 12 months the food we bought just didn't last and we didn't have money to get more." A second question, with the same response options focused on healthy foods: "Within the past 12 months we found it hard to buy healthy foods like fresh fruits and vegetables." For both questions, response options *"often true"* and *"sometimes true"* (versus "*never true"*) were combined to create affirmatives for food insecurity and difficult access to healthy foods.
- **For SNAP-eligible adults accessing services**, the UW Center for Public Health Nutrition (UW CPHN) surveys asked the same question used in the BRFSS (see above).

Analyses

We analyzed each data set by demographic breakdowns, many of which were shared across data sources. Results were considered significantly different if their confidence intervals, where available, did not overlap – a conservative approach.

- **For Seattle adults (BRFSS data)**, we analyzed food insecurity by King County region, Council District, race/ethnicity, age groups, gender, income levels, poverty levels, educational attainment, and sexual orientation.
- **For school-aged youth in Seattle (HYS data),** we analyzed food insecurity and "breakfast today" by King County region, Council Districts, race/ethnicity, primary language spoken at home, gender, maternal education as a proxy for household socioeconomic status[11], sexual orientation, and participation in free or reduced-price lunches at school (FRL data available only for 2016).
- **For Seattle families with young children (BSK survey data),** we analyzed food insecurity by: King County region, family income, respondent's education level, race/ethnicity, language spoken at home, child gender, respondent gender and sexual orientation, child age, and respondent age.
- **For Seattle low-income families with children (SeaSAW data)**, Seattle Children's Study Team members analyzed baseline survey responses from Seattle respondents about food insecurity and difficulty purchasing healthy food from the Seattle Shopping and Wellness (SeaSAW) study by family income, adult householder education, child race and age, and participation in food support programs.
- **For SNAP-eligible adults accessing services (UW CPHN data)**, UW CPHN Study Team members analyzed food insecurity data combined across the three evaluations for Seattle respondents by family income, education level, race/ethnicity, primary language spoken, gender, age, and participation in food assistance programs.

Combining multiple years of data for both BRFSS and HYS data allowed us to provide more reliable snapshots of food insecurity in Seattle for specific time periods. However, we were unable to use these averaged estimates to report on overall trends or changes over time within subgroups. To look at

change over time we used annual SNAP/Basic Food participation as a proxy for food insecurity by age groups (the only demographic breakdown available).

BRFSS, HYS, and BSK analyses were conducted using Stata/IC 15.0. For BRFSS data, raking sampling weights created by Public Health – Seattle & King County (PHSKC) were applied to construct Seattle population estimates and account for complex survey design and nonresponse. HYS data for King County were weighted to school-district total enrollment by grade and sex; to account for differential participation among school districts across survey years, the final weights were adjusted to sum to total public-school enrollment, by grade and sex, for the county. BSK Health Survey responses were weighted based on age, region, respondent's highest level of education, and child's race/ethnicity.

With the BRFSS data, which are available by ZIP Code, we approximated Council Districts using ZIP Codes that fell within each Council District excluding portions of ZIP Codes that fell outside Seattle city boundaries. With the HYS data, we approximated Council Districts using schools in the dataset that were located within each Council District's geographic boundaries. For the BSK Health Survey, we used birth certificate data and school directories to create the survey sample and geocoded respondent addresses to identify those living in Seattle.

To learn more about food insecurity from low-income families, Seattle Children's research team analyzed baseline survey data on demographic characteristics and participation in food-support programs among families reporting food insecurity in the Seattle Shopping and Wellness (SeaSAW) study. [For more details about the study see Section 2: Child Cohort Survey: Health Behaviors in the *Evaluation of Seattle's Sweetened Beverage Tax Baseline Report: Pre-implementation of the Tax*.] [10] The study enrolled families with incomes below 312% of the Federal Poverty Level with a 7-10 or 12-17 year-old child who had ever consumed sugary beverages (parents reported on food habits of younger children, while the older children reported directly on their own eating habits).

To address a data gap on food insecurity among low-income populations eligible for food assistance programs, UW CPHN research team analyzed Seattle-specific data collected from three prior evaluation studies with this population between 2014 and 2017. The sample includes SNAP recipients or individual eligible for participation in food assistance programs. For details about data sources, including characteristics of the samples and links to the methodology of the individual evaluations, see Appendix D.

ADDENDUM – DETAILED METHODS FOR SECTION 4B

METHODS

As described in Section 4A, we used 2011-2013 data from the Washington State Behavioral Risk Factor Surveillance System (BRFSS) to look at the demographic characteristics of Seattle adults reporting food insecurity. To estimate rates of food insecurity at different poverty levels, we approximated household income based on the income ranges collected in BRFSS. Table 1 shows the income approximations used for this analysis.

Table 1. Approximate household income from BRFSS income categories

BRFSS Income Category	Income Approximation†	
	2011	2012-13
<$10,000	$10,000	$10,000
$10,000 to < $15,000	$12,500	$12,500
$15,000 to < $20,000	$17,500	$17,500
$20,000 to < $25,000	$22,500	$22,500
$25,000 to < $35,000	$30,000	$30,000
$35,000 to < $50,000	$42,500	$42,500
$50,000 to < $75,000	$62,500	$62,500
$75,000+*	$75,000	n/a
$75,000 to < $100,000**	n/a	$87,500
$100,000+**	n/a	$100,000

†Where applicable, we assigned approximate income to the median value of the income range

** top income category in 2011*

*** income categories included starting in 2012*

As a standard of practice, the poverty levels are expressed as a ratio of household income to the federal poverty level. Each year the federal poverty guidelines specify the poverty level for an individual and an amount to add for each additional household member.[viii] Using this formula, we calculated the poverty guideline[ix] for each BRFSS respondent based on the survey year and number of household members. We then calculated the income-to-poverty ratio by dividing each respondent's household income (as approximated in the table above) by their poverty guideline; we express this ratio as a percentage of the federal poverty level (FPL).

For example, the poverty guideline for a family of four in 2011 was $22,350 ($10,890 for an individual plus $3,820 for each additional person). The income-to-poverty ratio for a 2011 BRFSS respondent with income in the range "$25,000 to less than $35,000" (approximated as $30,000) and four total household members is $30,000/$22,350 x 100% = 134% FPL.

[viii] See https://aspe.hhs.gov/prior-hhs-poverty-guidelines-and-federal-register-references for federal poverty guidelines based on household size.

*[ix] Each year the U.S. Census Bureau updates the federal poverty thresholds and poverty guidelines, a simplified version of thresholds. The poverty thresholds are used for statistical purposes (e.g. to estimate the number of people in poverty) whereas the guidelines are used to determine eligibility for programs and benefits such as SNAP. Since the BRFSS does not collect information about the ages and relationships of all household members, we were unable to calculate the poverty thresholds and instead used the federal poverty **guidelines** when estimating food insecurity rates. Therefore, the food gap analysis incorporates both the poverty thresholds (from the American Community Survey) and the poverty guidelines, which we consider sufficiently similar for our purpose of estimating the number of Seattle residents in the food security gap. For more information about the federal poverty measures, see https://aspe.hhs.gov/poverty-guidelines.*

Establishing the food security gap cut point

To determine the size of the "food security gap" we estimated how many people in Seattle were experiencing food insecurity but had incomes too high to qualify for SNAP benefits (also known as Basic Food in Washington state). Households in Washington state are eligible for SNAP benefits if they earn less than 200% FPL and meet certain other criteria.[x] We grouped BRFSS respondents by income-to-poverty range (i.e. <100% FPL, 100-199% FPL, 200-299% FPL, etc.) and calculated survey-weighted estimates of the percent of adults in each range who reported food insecurity (Chart 2).

We then identified the income cut point above which the prevalence of food insecurity fell below 5%; this cut point represented the upper limit of our food security gap estimate. In the 2011-13 period, 15% of Seattle adults (95% CI: 8%-26%) with incomes between 200-299% FPL reported food insecurity, compared to 4% of adults with incomes 300-399% FPL (95% CI: 1%-10%). The reported food insecurity rate remained below 5% at higher income levels. Based on these findings, we initially identified 300% FPL as the upper end income cut point for our food security gap estimates (Table 2).

Table 2. Food insecurity by income level (FPL)

Federal Poverty Level (FPL)	Seattle Adults (BRFSS, 2011-2013)	
	%	95% CI
<100% FPL	43%	(30, 57)
100-199% FPL	27%	(20, 37)
200-299% FPL	15%	(8, 26)
300-399% FPL	4%	(1, 10)
400-499% FPL	3%	(1, 9)
500%+ FPL	4%	(2, 9)

While this cut point worked as intended when applied to the overall population, it yielded different distributions when applied separately to non-white and non-Hispanic white groups. Among non-white King County residents, food insecurity rates were higher overall and at all income levels greater than 200% FPL (Chart 3). Among non-white respondents in King County[xi] with incomes at 300-399% FPL, 8% were food insecure (95% CI: 3%-19%); food insecurity rates were also at or above 5% for non-white residents earning 400-499% FPL and 500+% FPL. In contrast, among non-Hispanic white adults in King County, only 3% (95% CI: 1-6%) of those at 300-399% FPL experienced food insecurity, suggesting that a more realistic income cut point for the food security gap may be higher for non-white adults than for non-Hispanic white adults. Therefore, we adjusted the food security gap income cut-point to 400% of FPL.

[x] See https://www.dshs.wa.gov/esa/community-services-offices/basic-food for Basic Food eligibility criteria. Legal immigrants who are not eligible for federal Basic Food solely due their immigration status may be eligible for the state Food Assistance Program (https://www.dshs.wa.gov/esa/community-services-offices/state-food-assistance-program-fap).

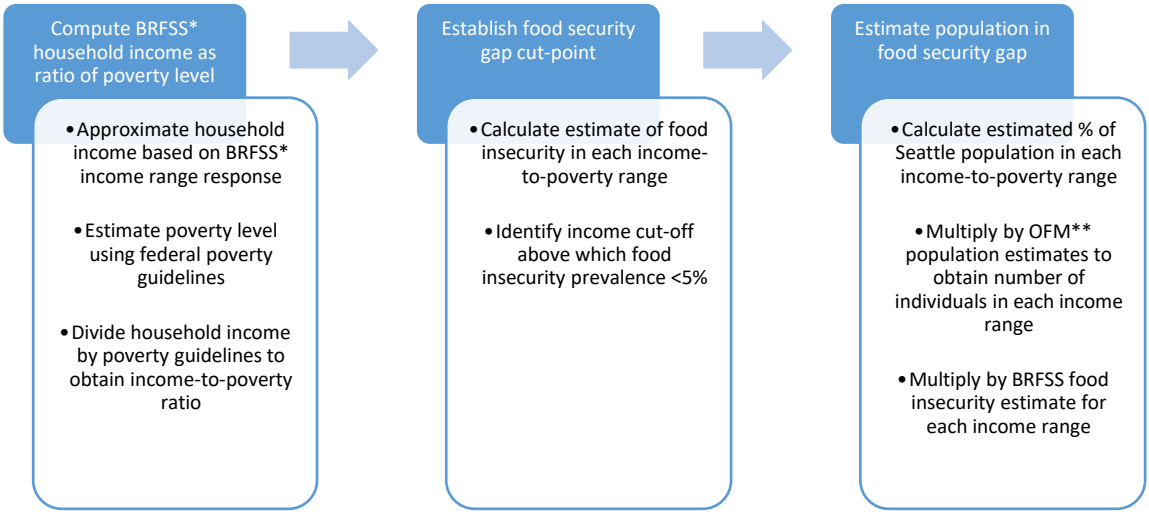
[xi] Sample sizes were insufficient to disaggregate by race in Seattle.

Table 3. Food insecurity by income and race/ethnicity, King County adults (2011-2013)				
Federal Poverty Level (FPL)	Whites		People of Color	
	%	95% CI	%	95% CI
<200% FPL	37	(32, 44)	34	(28, 41)
200-299% FPL	10	(6, 15)	20	(12, 31)
300-399% FPL	3	(1, 6)	8	(3, 19)
400-499% FPL	1	(1, 3)	6	(2, 14)
500%+ FPL	3	(2, 5)	5	(2, 13)

Estimating the number of people in the food security gap

To estimate the number of people in the food security gap, we obtained American Community Survey (ACS) 2017 one-year estimates to calculate the proportion of people in Seattle in each income-to-poverty range. We then applied these proportions from the ACS to the 2017 Washington State Office of Financial Management (OFM) small area preliminary population estimates for Seattle to obtain the total number of individuals in each income range. Finally, we multiplied these population estimates by the BRFSS food insecurity estimates for each income range to calculate the approximate number of people experiencing food insecurity in each income range in 2017, with recalculated margins of error (see Figure 2).

Figure 2. Steps in computing food security gap estimate



**BRFSS = Behavioral Risk Factor Surveillance System*

***OFM =Washington State Office of Financial Management*

References

1. Waxman E. Mapping food insecurity and distress in American Indian and Alaska Native communities | Urban Institute. https://www.urban.org/urban-wire/mapping-food-insecurity-and-distress-american-indian-and-alaska-native-communities. Published 2016. Accessed December 4, 2018.
2. Jernigan VBB, Huyser KR, Valdes J, Simonds VW. Food Insecurity among American Indians and Alaska Natives: A National Profile using the Current Population Survey-Food Security Supplement. *J Hunger Environ Nutr*. 2017;12(1):1-10. doi:10.1080/19320248.2016.1227750
3. Bolen E, Rosenbaum D, Dean S, Keith-Jennings B. More Than 500,000 Adults Will Lose SNAP Benefits in 2016 as Waivers Expire | Affected Unemployed Childless Individuals Are Very Poor; Few Quality for Other Help. Center on Budget and Policy Priorities. https://www.cbpp.org/research/food-assistance/more-than-500000-adults-will-lose-snap-benefits-in-2016-as-waivers-expire. Published 2016. Accessed December 24, 2018.
4. Able Bodied Adults without Dependents - ABAWD | DSHS. Washington State Department of Social and Health Services. https://www.dshs.wa.gov/esa/community-services-offices/able-bodied-adults-without-dependents-abawd. Accessed January 22, 2019.
5. Keith-Jennings B. A Quick Guide to SNAP Eligibility and Benefits. Center on Budget and Policy Priorities. https://www.cbpp.org/blog/a-quick-guide-to-snap-eligibility-and-benefits. Published 2014. Accessed December 24, 2018.
6. Nchako C, Cai L. A Closer Look at Who Benefits from SNAP: State-by-State Fact Sheets. Center on Budget and Policy Priorities. https://www.cbpp.org/research/a-closer-look-at-who-benefits-from-snap-state-by-state-fact-sheets#Washington. Published 2018. Accessed December 24, 2018.
7. Anderson PM, Butcher KF. The Relationships Among SNAP Benefits, Grocery Spending, Diet Quality, and the Adequacy of Low-Income Families' Resources. *Cent Budg Policy Priorities*. 2016;14. https://www.cbpp.org/research/food-assistance/the-relationships-among-snap-benefits-grocery-spending-diet-quality-and-the#_ftn1. Accessed August 8, 2018.
8. Households that ran out of food, King County (2010, 2011, 2013). Communities Count. http://www.communitiescount.org/index.php?page=food-hardship-insecurity. Accessed November 15, 2018.
9. Food Security | International Food Policy Research Institute. http://www.ifpri.org/topic/food-security. Accessed December 4, 2018.
10. The evaluation of Seattle's Sweetened Beverage Tax | Baseline report: pre-implementation of the tax. https://www.seattle.gov/Documents/Departments/CityAuditor/auditreports/SBTBaselineReport.pdf. Published 2018. Accessed August 1, 2018.
11. Richardson S, Bensley L, Hawkins V. Healthy Youth Survey Data Analysis & Technical Assistance Manual. Washington State Department of Health. https://www.doh.wa.gov/portals/1/Documents/Pubs/210-088_HYSDataAnalysisManual.pdf. Published 2013. Accessed December 6, 2018.

Chart 1 Table. Food insecurity by Council District										
	Adults (BRFSS, 2011-2013)		**School-aged youth** (HYS, 2012, 2014, 2016)		**Families with Children** (BSK, 2016-2017)		**Low-Income Families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (CPHN data, 2014-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Seattle and King County										
Seattle overall	13%	(11, 16)	11%	(10, 12)	22%	(17,29)	51%	(45,58)	48%	(43,53)
King County overall	13%	(12, 15)	12%	(11, 12)	30%	(26,33)	n/a	n/a	n/a	n/a
Council District					n/a					
1-WSeattle, SouthPark	9%	(5, 15)	13%	(11, 16)						
2-SoEast, Georgetown	14%	(7, 24)	15%	(13, 18)						
3-Central	12%	(7, 21)	12%	(8, 17)						
4-Northeast	15%	(8, 26)	5%	(4, 7)						
5-North	11%	(7, 18)	10%	(9, 13)						
6-Northwest	8%	(5, 14)	8%	(6, 10)						
7-PioneerSq-Magnolia	11%	(6, 21)	10%	(8, 13)						

CI = 95% Confidence Interval; n/a = data not analyzed by Council District

Chart 2 Table. Food insecurity by household income									
Household income	**Adults** (BRFSS, 2011-2013)		**Families with Children** (BSK, 2016-2017)		**SNAP-eligible adults** (CPHN, 2014-2017)		**Household income** (SeaSAW only)	**Low-Income Families** (SeaSAW, 2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**		**%**	**95% CI**
<$15k	39%	(27 ,52)	74%	(56, 86)	59%	(49,69)	<$12k	67%	(54,81)
$15-<25k	34%	(24 ,45)	76%	(51, 91)	48%	(34,62)	$12-<24k	62%	(48,76)
$25-<35k	21%	(11 ,37)	65%	(45, 81)	32%	(19,50)	$24-<36k	53%	(38,69)
$35-<50k	8%	(4 ,15)	56%	(40, 71)	^	^	$36-<48k	39%	(22,57)
$50-<75k	2%	(1 ,7)	19%	(10, 33)	^	^	$48-$72k	^	^
$75k+	3%	(2 ,8)	n/a	n/a	^	^	$72k+	^	^
$75-<100k	n/a	n/a	26%	(10, 51)	^	^			
$100-<150k	n/a	n/a	5%	(2, 9)	n/a	n/a			
$150k+	n/a	n/a	1%	(1, 3)	n/a	n/a			

CI = 95% Confidence Interval; n/a=this income level not available for survey or confidence intervals not available for these data

^Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total<50. HYS, SeaSAW and UW CPHN data: suppressed if cell total < 10)

Chart 3 Table. Food insecurity by Federal Poverty Level (FPL)								
Federal Poverty Level (FPL)	**Adults** (BRFSS, 2011-2013)		**Families with Children** (BSK, 2016-2017)		**Low-Income Families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (CPHN data, 2014-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
<100% FPL	43%	(30 ,57)	76%	(57, 88)	n/a	n/a	68%	(52,77)
<130% FPL	n/a	n/a	n/a	n/a	61%	(53,69)	n/a	n/a
100-199% FPL	27%	(20 ,37)	58%	(42, 72)	n/a	n/a	48%	(38,56)

200-299% FPL	15%	(8 ,26)	26%	(14, 42)	n/a	n/a	^	^
300-399% FPL	4%	(1 ,10)	27%	(12, 49)	n/a	n/a	^	^
400-499% FPL	3%	(1 ,9)	n/a	n/a	n/a	n/a	^	^
400%+ FPL	n/a	n/a	4%	(2, 6)	n/a	n/a	n/a	n/a
500%+ FPL	4%	(2 ,9)	n/a	n/a	n/a	n/a	^	^

CI = 95% Confidence Interval; n/a=this FPL not available for survey or confidence intervals not available for these data

^Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total<50. HYS, SeaSAW and CPHN data: suppressed if cell total < 10)

Chart 4 Table. Seattle food insecurity by adult and parent/caretaker education

Education Level	**Adults** (BRFSS, 2011-2013)		**School-aged youth** (HYS, 2012, 2014, 2016)[a]		**Families with young children** (BSK, 2016-2017)[b]		**Low-Income Families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (CPHN data, 2014-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Less than HS	^	^	24%	(21, 27)	71%	(44, 89)	^	^	n/a	n/a
HS/GED or less	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	67%	(55,77)
HS grad/GED diploma	19%	(13, 27)	18%	(16, 21)	48%	(30, 66)	72%	(58,85)	n/a	n/a
Some college, vocational, or trade	16%	(11, 22)	15%	(13, 17)	28%	(14, 48)	49%	(36,61)	58%	(50,66)
4 yr college degree	6%	(4, 9)	6%	(5, 7)	14%	(10, 20)	39%	(23,55)	n/a	n/a
Advanced degree	n/a	n/a	5%	(4, 6)	8%	(5, 13)	^	^	n/a	n/a
4 yr college or advanced degree	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39%	(34,44)

[a] Maternal education level; [b] Respondent education level; CI = Confidence Interval

^Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total<50. HYS, SeaSAW and CPHN data: suppressed if cell total < 10); n/a = this education level not available for survey or confidence intervals not available for these data

Chart 5 Table. Seattle food insecurity by race/ethnicity

Race/ ethnicity	**Adults** (BRFSS, 2011-2013)		**School-aged youth** (HYS, 2012, 2014, 2016)*		**Families with Children** (BSK, 2016-2017)		**Low-Income Families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (UW CPHN data, 2014-17)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
AIAN NHˇ	^	^	23%	(16, 31)	^	^	n/a	n/a	92%	(61,99)
Asian NHˇ	13%	(7, 22)	11%	(9, 13)	20%	(12, 32)	^	^	46%	(32,60)
Black NHˇ	27%	(15, 42)	18%	(16, 21)	65%	(42, 82)	66%	(56,76)	53%	(41,65)
Hispanic	18%	(9, 32)	17%	(15, 19)	39%	(18, 65)	47%	(31,62)	52%	(38,66)
Multiple	^	^	13%	(11, 16)	23%	(11, 43)	57%	(35,78)	^	^
NHPI NHˇ	^	^	19%	(15, 25)	^	^	n/a	n/a	^	^
Other NH	n/a	n/a	18%	(15,21)	56%	(25,84)	n/a	n/a	58%	(38,75)
White NHˇ	11%	(9, 15)	7%	(6, 8)	15%	(10, 21)	34%	(18,50)	41%	(36,47)

ˇ NH=non-Hispanic; NHPI=Native Hawaiian/Pacific Islander; AIAN=American Indian/Alaska Native;
n/a = no data available; CI = 95% Confidence Interval

^ Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total < 50. HYS, SeaSAW and UW CPHN data: suppressed if cell total < 10)

Chart 6 Table. Seattle food insecurity by primary language spoken at home								
Language	**School-Aged youth** (HYS, 2012, 2014, 2016)		**Families with Young Children** (BSK, 2016-2017)		**Low-income families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (UW CPHN data, 2014-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
English	9%	(8, 10)	19%	(13, 25)	55	(46,64)	47%	(43,52)
Spanish	18%	(16, 21)	62%	(29, 86)	^	^	53%	37,68)
Russian	48%	(37, 59)	^	^	n/a	n/a	n/a	n/a
Ukrainian	57%	(45, 69)	n/a	n/a	n/a	n/a	n/a	n/a
Vietnamese	13%	(10, 17)	^	^	n/a	n/a	n/a	n/a
Chinese	9%	(6, 12)	^	^	n/a	n/a	n/a	n/a
Korean	18%	(10, 31)	n/a	n/a	n/a	n/a	n/a	n/a
Japanese	20%	(11, 33)	n/a	n/a	n/a	n/a	n/a	n/a
Somali / Oromo	n/a	n/a	^	^	55	(39,72)	n/a	n/a
Other	16%	(14, 19)	40%	(19, 65)	43	(26,60)	48%	(36,61)

CI = 95% Confidence Interval

**Too few cases to protect confidentiality and/or report reliable estimates (BSK: suppressed if n<50.)*

n/a = this language not available for survey or confidence intervals not available for these data

Chart 7 Table 1. Seattle food insecurity by gender for adults								
Gender	**Adults** (BRFSS, 2011-2013)		**Parents/Caregivers of Young Children** (BSK, 2016-2017)		**Low-income families** (SeaSAW, 2017)		**SNAP-Eligible Adults** (CPHN, 2014-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
Male	14%	(11 ,19)	13%	(8, 21)	52	(32,72)	42%	(37,48)
Female	13%	(9 ,17)	24%	(18, 32)	50	(43,58)	54%	(47,60)

CI = 95% Confidence Interval

Chart 7 Table 2. Seattle food insecurity by gender for school-aged youth and young children				
Gender	**School-aged youth** (HYS, 2012, 2014, 2016)		**Young Children** (BSK, 2016-2017)	
	%	**95% CI**	**%**	**95% CI**
Male	12%	(10, 13)	28%	(19, 39)
Female	11%	(9, 12)	17%	(11, 25)

CI = 95% Confidence Interval

Chart 8 Table. Seattle food insecurity by sexual orientation						
Sexual Orientation	**Adults** (BRFSS, 2011-2013)		**School-aged youth** (HYS, 2012, 2014, 2016)		**Parents/Caregivers of Young Children** (BSK, 2016-2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
LGB	24%	(15, 36)	16%	(13, 19)	43%	(21, 69)
Heterosexual	12%	(10, 16)	7%	(6, 9)	21%	(15, 28)

Chart 9 Table 1. Seattle food insecurity by age								
Age	**Adults** (BRFSS, 2011-2013)		**Parents/Caregivers of Young Children** (BSK, 2016-2017)		**Children in low-income families** (SeaSAW, 2017)		**SNAP-Eligible adults** (UW CPHN, 2014-2017)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
7-10	n/a	n/a	n/a	n/a	48	(39,72)	n/a	n/a
12-17	n/a	n/a	n/a	n/a	59	(47,71)	n/a	n/a
18-24	16%	(9, 27)	^	^	n/a	n/a	n/a	n/a
18-30	n/a	n/a	n/a	n/a	n/a	n/a	40%	(32,48)
25-29	n/a	n/a	63%	(32, 85)	n/a	n/a	n/a	n/a
30-34	n/a	n/a	26%	(13, 43)	n/a	n/a	n/a	n/a
31-50	n/a	n/a	n/a	n/a	n/a	n/a	51%	(43,58)
35-39	n/a	n/a	18%	(11, 28)	n/a	n/a	n/a	n/a
25-44	19%	(14, 25)	n/a	n/a	n/a	n/a	n/a	n/a
40-49	n/a	n/a	16%	(10, 23)	n/a	n/a	n/a	n/a
45-64	10%	(7, 14)	n/a	n/a	n/a	n/a	n/a	n/a
50+	n/a	n/a	50%	(20, 80)	n/a	n/a	n/a	n/a
51-65	n/a	n/a	n/a	n/a	n/a	n/a	57%	(48,65)
65+	4%	(2, 7)	n/a	n/a	n/a	n/a	41%	(29,54)

n/a = no data for age group in survey or confdience internval not avaiable for these data; CI = 95% Confidence Interval

^ = Too few cases to protect confidentiality and/or report reliable estimates. (BRFSS and BSK: suppressed if marginal total<50

Chart 9 Table 2. Seattle food insecurity by grade for school-aged youth and young children						
Age/Grade	**School-aged youth** (HYS, 2012, 2014, 2016)		**Young Children** (BSK, 2016-2017)		**Children in low-income families** (SeaSAW, 2017)	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
0-5	n/a	n/a	21%	(13,32)	n/a	n/a
K-5th grade	n/a	n/a	24%	(17,32)	n/a	n/a
7-10	n/a	n/a	n/a	n/a	48	(39,72)
12-17	n/a	n/a	n/a	n/a	59	(47,71)
8th grade	9%	(8, 11)	n/a	n/a	n/a	n/a
10th grade	11%	(9, 13)	n/a	n/a	n/a	n/a
12th grade	13%	(11, 17)	n/a	n/a	n/a	n/a

n/a = no data for age group in survey or confdience internval not avaiable for these data; CI = 95% Confidence Interval

SECTION 5 | MEETING THE NEED: WHAT DO WE KNOW ABOUT SEATTLE'S FOOD BANK NETWORK?

SUMMARY

The objectives of the Food Bank Network Assessment are to assess 1) to what extent the city's food bank network is able to serve the population experiencing food insecurity and 2) what opportunities exist for the food bank network to improve equitable access to healthy food. This assessment addresses four of the five dimensions of access to healthy food: *accessibility/convenience*, *accommodation*, *availability*, and *acceptability*. The fifth dimension, *affordability*, is not applicable.

We conducted key informant interviews with staff from Seattle food banks and focus group discussions with clients to gather insight on needs and potential opportunities for improvement. We administered the Food Bank Network Survey to collect measures of impact, access, and operational capacity of food banks. A total of 13 staff members participated in interviews, 47 clients attended discussion groups, and 25 out of 30 food banks responded to the survey. Qualitative data were audio-recorded and transcribed when participant consent was given, otherwise detailed notes were taken. We coded these notes and the transcribed narrative using Dedoose and analyzed them for themes. We summarized and analyzed quantitative data using Stata 13 and Tableau 10.5.

Key findings

Seattle food bank survey respondents (n=25) reported distributing 22,885,225 pounds of food each year. Food banks described an increase in need, reporting more visits from older adults, homeless, and people living further north and south. Among the 60% of food bank respondents who reported a rise in visits over the last year, 39% reported their funding remained the same or was reduced. To keep up with demand, 65% of food bank respondents reported having to reduce the variety and 41% had to reduce the amount of food offered to each client. A majority (68%) of food banks reported having less than 10% of their budget for direct food purchases. Clients of food banks expressed the desire for consistent access to quality food such as fresh produce and proteins, and emphasized the importance of maintaining a sense of dignity at the food bank such as by creating experiences that replicate those at a grocery store. Food banks' reported hours of distribution revealed limited hours over the weekend and evenings, which may signal an additional gap in access. To more effectively serve clients, staff emphasized addressing operational needs such as sufficient staffing and space, more purchasing power, and investments in coordinated mobile systems to support procurement and delivery.

SECTION 5 | MEETING THE NEED: WHAT DO WE KNOW ABOUT SEATTLE'S FOOD BANK NETWORK?

OBJECTIVE

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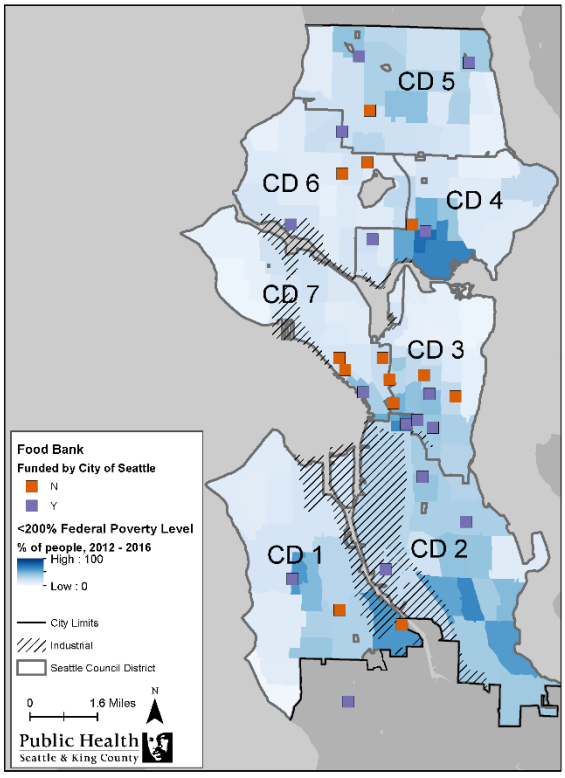
Defining the food bank network

At the time of this report we identified 34 food banks that could be considered a part of the broader Seattle food bank network. For the purposes of this assessment we focused only on the 30 that met specific inclusion criteria. Food banks included in this assessment had to be 1) actively operating, 2) distributing food on-site more than once a month, and 3) either located within the City of Seattle boundaries or known to serve many Seattle residents.

Figure 1: Food Banks in Seattle



Data for basemap comes from the 2012-2016 American Community Survey. Data on location, classification, and funding status of food banks provided by City of Seattle: OSD & HSE. Current as of Fall 2018. The inclusion criteria for displaying an organization as a Food Bank for this map are: (1) Member of the Seattle Food Committee, (2) Open more than once a month for on-site distribution, and (3) Be in the Seattle boundaries or serve a large number of Seattle residents. Fall 2018 PH-SKC APDE.

We distinguished between a food bank and food pantry based on frequency of operation, thereby excluding food pantries that only distributed food on-site once a month or less. Our list primarily included members of the Seattle Food Committee (SFC) due to their representation of food banks and programs serving those in need of supplemental food in Seattle. The SFC works with food distributors and other service providers to coordinate and maximize the efficiency of Seattle's emergency food system. Since some food banks distribute out of multiple fixed locations we counted each active building site separately. The network of 30 food banks included in this assessment does not capture the additional food programs and smaller pantries that are also providing food throughout Seattle. Figure 1 shows the locations of the 30 food banks and status of City funding, overlaid onto a base map of the percentage of people below 200% of the Federal Poverty Level. Given that food banks operate as an emergency food resource, this base layer was identified as the best proxy for food insecurity and included instead of the healthy food priority areas (HFPA) described in Section 2. While HFPA's highlight the need for strategies that increase access to healthy food, they do not adequately represent where food banks should be located. The food bank network list can be viewed in Appendix E – Item 1, which also lists those omitted from this assessment and reason for exclusion.

RESULTS

Findings presented here focus primarily on the needs, operational demands, and impact of food banks in Seattle based on three components of primary data collection: key informant interviews, client focus group discussions, and the Food Bank Network Survey. Primary data collection consisted of interviewing 13 food bank staff, conducting 7 focus groups (3 English, 1 each in Vietnamese, Russian, Cantonese, and Spanish) with 47 food bank clients, and surveying 25 of 30 Seattle food banks.

See addendum at the end of this section for detailed methods. For detailed analyses and discussion on food insecurity and access to healthy food in Seattle, please refer to Sections 2, 3, and 4 of this report.

THE FOOD BANK NETWORK'S ABILITY TO MEET NEEDS

Context on how the food bank network operates

The food bank network in Seattle consists of sites throughout the city where perishable and/or non-perishable food items are distributed free of charge during designated hours. Twenty-nine food banks are currently members of the Seattle Food Committee which meets twice monthly to strategize and collaborate on collective emergency food system efforts. Food banks can provide food in a number of ways but the primary on-site distribution model is called Client Choice. The standard design of this model has clients progress through an ordered line, making selections from a set number of items by category. Some food banks apply this model through a grocery store design, where their physical layout resembles a store and members walk through as if they were shopping. It is also possible for food banks to operate as a food pantry, providing prepacked bags or boxes of non-perishable food. Most food banks (67%) also provide additional food through backpack programs, no-cook bags, or prepared meals.

Most food banks in Seattle are low-barrier in terms of eligibility, meaning there is little documentation required to receive food. Based on our survey responses, the majority (94%) do not require any proof of income requirements, though many ask for proof of address (71%) and/or identification (65%). Seventy-seven percent of survey respondents in Seattle have a designated service area defined by zip codes, but of those, only 31% turn people away or refer them if they do not reside within that service area. Typically, if a client is homeless, they will be asked to report the most applicable zip code – often of the shelter or encampment.

In addition to being a food resource, food banks often serve as a convenient site for clients to connect with other needed resources. The majority of survey respondents report providing this link in some way, either through on-site service delivery, enrollment assistance, or referrals. Many food banks provide items such as infant toddler supplies, pet food, hygiene kits, and support through a Community Connector position that provides social service navigation. The Community Connectors at Food Banks Pilot Program came into fruition in August 2017 after Seattle food Bank leadership submitted a proposal that was approved by Seattle City Council. Food banks already contracted with HSD to provide food services were eligible to apply. Eleven food bank agencies have designated Community Connector(s) that are city-funded to provide on-site assistance to food bank clients and help them navigate, as well as enroll in, social services programs such as housing, employment, and job readiness.

Impact of food banks in Seattle

The impact of Seattle's food bank network should not be understated. Throughout the year, the average Seattle food bank:

- Distributes 995,010 pounds of food
- Serves 15,403 individuals
- Is visited 54,649 times
- Provides 18,655 to-go lunches
- Provides 1,893 sit-down meals

"There's a sense of community. These are hard times and I've been a part of this community. This is the only time I see some of these people. There's always conversation, we can gripe about the hard times. The community dinners are a social thing you don't always get elsewhere."

-Food bank client (Council District 6)

During focus group discussions, clients described ways food banks are having a tremendous impact on their life, such as freeing up limited income for other needs, and providing them with a sense of security. Some also talked about their food bank as a place of community and connection with others, where they feel respected and treated well by staff. Food insecurity is often an ongoing occurrence for clients, and the food bank's presence helps to mitigate the stress of this experience. Others described needing the food bank especially during financial emergencies such as a divorce, medical expense, loss of employment, or loss of housing. Some stated that the food bank helps to cover 50% or more of their food needs and offers a chance to have fresh produce. Clients who referenced a current or recent experience of homelessness, emphasized the value of no-cook bags or meals that do not require access to a kitchen.

Limited capacity to meet increasing need

Despite the positive impact food banks in Seattle have, there are limitations in their ability to meet the needs of all residents experiencing food insecurity. Sixty percent (60%) of food bank respondents reported an increase over the last year in the number of individuals using the food bank, demonstrating a rise in demand. Survey respondents estimate that the amount of food received from one visit lasts an individual an average of 3.3 days and that many of their food bank clients must visit multiple food banks to get their needs met.

"We're seeing an increase from the rising cost of rent and healthcare, aging population, more people experiencing homeless, immigrants not eligible for food benefits or reticent to enroll in benefits due to fear of deportation."

-Food bank staff

The need for food banks is also highlighted by our estimation of food insecurity and the food security gap. Most recent BRFSS estimates (2011 to 2013) tell us that 13% (95% CI: 11-16) of Seattle adults report experiencing food insecurity, which is significantly higher than the reported 7% in 2010 (95% CI: 5-10).[1] As expected, food insecurity has the biggest impact on residents in lower-income brackets. Thirty-nine percent (39%) (95% CI: 27-52) of respondents earning less than $15,000 a year reported food insecurity compared to 3% (95%CI: 2-8) of those earning $75,000 a year or more. Among low-income (<312% FPL) Seattle families participating in the child cohort (SeaSAW) study, more than half (51%) reported food insecurity; a slightly higher percentage (58%) reported that it was hard for them to buy healthy food. Examining the food security gap, we learned that an estimated 10,442 individuals face food insecurity in Seattle, yet do not quality for SNAP benefits. The number of visits to King County food banks for 2018 (2,202,879) is 63,740 more than it was in 2008 (2,139,139) at the peak of the recession and the number of older adults (55+) using food banks has increased.[2]

Staff described noticing increases in specific demographics at their food bank, particularly among clients experiencing homelessness or housing insecurity, as well as older adults. In addition to an increasing number of food bank visits by older adults in King County, this is also seen in the rates of basic food participation. Among Seattle residents ages 65+, basic food participation has more than doubled from 5,920 people in 2008 to 10,964 people in 2017.[3] As described in Section 4 of this report, by using our annual data on Basic Food participation as a proxy for food insecurity, we suspect that, as with Basic Food participation, food insecurity among Seattle's older adults may be continuing an ascent that began more than 15 years ago and is not occurring with any other age group. For those living on a fixed income in a city experiencing an economic and population boom, increased costs of healthcare and housing could exacerbate the risk of food insecurity. Food bank staff in Seattle are also seeing increased number of clients traveling from further south, some whom have recently had to move outside of the city limits. Staff attribute this change to a lack of resources for homeless and older adults, as well as changes in the cost of living and housing affordability in Seattle.

"Our limited hours can make it stressful or feel competitive for visitors. We're open 8 hours a week to serve 1,000 visitors which makes it difficult to replenish food or offer personalized attention. Expanding hours would improve access but require more staffing and potentially more food. Our home delivery program has had a waitlist for years. We don't have capacity to meet the need of home-bound folks experiencing hunger in our neighborhood."

-Food bank staff

The capacity of many food banks has not kept up with demand. As a result of resource constraints, well over half of all food banks (65%) reported having to reduce the variety of food offered and 41% reported having to reduce the volume. Sixty percent (60%) saw a rise in people utilizing their food bank over the last year and among those that reported a rise in visits to their food bank, many (39%) have seen their funding levels stay the same or decrease. Within the last year, the majority (84%) of survey respondents reported having difficulties securing predictable and long term funding, finding opportunities to apply for, and funding for non-food operational expenses. Most survey respondents (79%) also experienced difficulty managing labor-intensive fundraising activities and events. When food bank staff were asked if they were interested in expanding their food distribution, the majority (82%) said they would like to. However, in order to do so many noted requisite operational resources, namely staffing, vehicles, food donations, funding, and space.

IN THEIR OWN WORDS: WHAT IS MOST IMPORTANT TO CLIENTS

Individuals who rely on local food banks shared what is and is not working well. Three primary messages were echoed throughout our discussions with clients: the importance of dignity, availability of quality food, and convenient access.

A dignified experience

It was clear during discussions that the atmosphere in which food is provided is as important as the food itself. Clients were quick to share the impact food bank staff and volunteers have by creating a sense of community and treating them like customers. The physical space was also a frequent topic, with clients describing how much more welcoming a food bank seems when it is spacious, clean, and organized. Staff echoed this from their perspective, pointing out that the buildings themselves cannot be welcoming, comfortable, or respectful when they are in poor condition.

Experiences at the food bank are especially positive when the distribution process is orderly and allows clients to make their own selections. Clients made this clear; dignity goes hand in hand with having choice over food items. Those who had been through a grocery store design, described a process that felt less alienating. In situations where food limits or other rules need to be communicated, clients note that this too can be done in a dignified way. They suggested using simple and large graphics so that everyone can still understand the message regardless of language, literacy, or vision capabilities. This change, clients said, could have prevented situations where they had been confused and felt ashamed after being asked to put items back.

> **"Just the whole grocery style, having more dignity, not being alienated. Being able to pick out what you want and not feel like you're just some number in a line or the next person that they're waiting for. It's a lot more dignified than being handed a box"**
>
> – Food bank client (Council District 4)

Consistent availability of quality food

Another high priority for food bank clients was that the food be consistently safe to eat and include nutritious options. Overall, clients were very grateful and positive about food options available in food banks, pointing out that many improvements had already been made in recent years. However, many also brought up challenges with food safety, particularly long expired items, rotting produce, or moldy baked goods. This was especially frustrating in the context of carrying heavy bags home only to find much of the food inedible. Some described having to choose between the risk of food sickness and hunger, a choice that is especially difficult when living outside. Clients want to see consistent availability of staples like eggs, potatoes, tomatoes, and canned goods. There is also a strong emphasis on the value of healthy foods like fresh fruits, vegetables, and low-sodium proteins. Multiple clients also brought up a request for cooking necessities, like oil, spices, and dish soap. This was confirmed by survey results where staff ranked their most frequent requests from clients. In order, these included proteins (meat, meat alternatives), dairy (milk, butter, cheese), fresh produce, eggs, prepared/non-cook foods and oils.

Convenient access

Lastly, clients focused on the importance of easy access, emphasizing a need for low barrier eligibility, expanded hours of operation, and home deliveries. One group highlighted their appreciation for minimum eligibility requirements, in particular not requiring proof of address or qualifying zip code. Older adults in particular wanted to highlight what a difference it made to have chairs provided while waiting in line. Most also thought their food bank had close proximity to bus routes allowing them to get to the food bank easily. However, access to food banks could be improved in different ways. Anyone experiencing a physical limitation or bringing food for a large family faced significant obstacles getting home with food if walking or taking multiples buses. Clients were enthusiastically supportive of home delivery programs where they existed, while those that did not have them requested their food bank start one. Clients also valued having a weekly schedule with consistent days of operation, and varied distribution hours to accommodate the different times of day people were available. Some pointed out that food had actually been easier to get when experiencing

> **"You know what was unpleasant? When there were no chairs, benches, and there were crowds, and we had to stand outside, sometimes under the rain. And there are a lot of disabled people. The fact that they placed chairs and benches is a really big deal, a great help. Now you can sit and move with the line. When there were crowds it was not good, it was really uncomfortable."**
>
> -Food bank client (Council District 5)

homelessness or unemployment. Limited food bank hours made it more difficult once they found a job, yet they were still struggling to cover the cost of food. Many noted that weekend access was lacking and hours that extended before and after rush hour were also helpful.

WHERE DO WE SEE GAPS IN ACCESS?

Seventy-one percent (71%) of survey respondents reported having to turn people away, although infrequently. The most common reason for this was due to the distribution site being closed. Potential gaps in access to food banks can be seen in how hours of distribution fall across days of the week and time of day by Council District. It is important to note that the hours which food banks are distributing food is not the only measure of access, capacity, or impact. This was the indicator we had the most complete data for but it is a one-dimension snapshot of access. Total hours of distribution does not take into account other important aspects of access like amount of food, quality of food, or number of people served. Additionally, while reporting data at the Council Districts helps to provide more detail, we recognize that these particular geographic boundaries may not accurately capture which food banks are the most convenient. The results from this gap analysis provide an important, though incomplete picture of access.

> **"It's useful to be open on Friday because basically, I know at least from Friday until maybe Tuesday or Wednesday I will have food. Most places are not open on the weekends so from Friday [on], you want to ensure you can make it at least through the weekend if not a little longer."**
>
> -Food bank client (Council District 3)

Access by day of the week across Seattle and Council Districts

Examining hours of distribution across days of the week allows for a detailed picture of access. As seen in Table 1, Saturday through Tuesday have the lowest total number of food bank hours open for distribution. Weekends offer very few opportunities anywhere for residents to get food, with no hours available anywhere on Sunday.

Table 1: Total hours of on-site distribution each week: by day of week across Council Districts

	Seattle Council District							
Day of week	One	Two	Three	Four	Five	Six	Seven	Grand Total
Monday	2	0	11	7	3	5	6	34
Tuesday	6	3	7	8	0	8	8	40
Wednesday	9	10	21	0	3	9	10	61
Thursday	10	9	16	9	2	5	10	60
Friday	7	7	13	9	0	0	9	44
Saturday	4	8	0	1	7	0	0	19
Sunday	0	0	0	0	0	0	0	0
Grand Total	37	36	67	33	15	27	41	256

Total hours of distribution are broken down by Seattle Council District vs. Time of Day. The color corresponds to total hours of distribution.

Hours of Distribution

0 21

Access by time of day across Seattle and Council Districts

We see additional gaps in access, when examining distribution hours by time of day across Council Districts. As seen in Table 2, the most common distribution hours are midday (11 - 2 PM), with the fewest hours available during the evening (5 - 8 PM). Analysis of this data by Council District reveals there are very minimal hours open during the morning (8 – 11 AM) for those in Districts 4, 5, and 6. Only a few hours are open for food distribution each week during the afternoon (2-5 PM) in Districts 1 and 5 and very few options exist in the evenings for clients who live in Districts 1, 2, 3, 5 and 7.

Table 2: Total hours of on-site distribution each week: by time of day across Council Districts

	Seattle Council District							
Time of Day	One	Two	Three	Four	Five	Six	Seven	Grand Total
Morning (7 - 11 AM)	10	6	14	3	4	0	14	51
Midday (11 - 2 PM)	22	24	30	11	9	9	14	118
Afternoon (2 - 5 PM)	3	6	22	11	1	12	10	64
Evening (5 - 8 PM)	2	2	1	8	2	7	4	24
Grand Total	37	36	67	33	15	27	41	256

Total hours of distribution are broken down by Seattle Council District vs. Time of Day. The color corresponds to total hours of distribution.

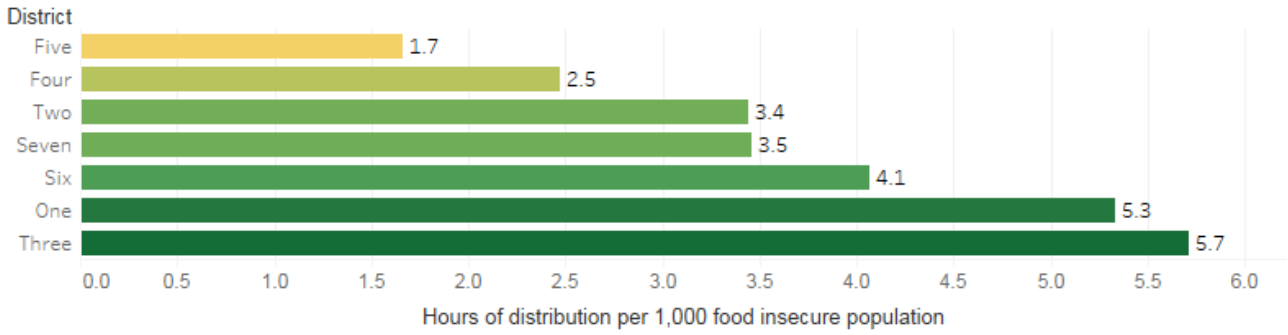
Hours of distribution

Comparing Council Districts by distribution availability and level of adult food insecurity

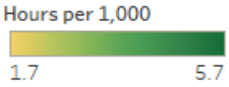
Figure 2 shows how Council Districts rank by the number of food bank hours available per 1,000 adult residents experiencing food insecurity in each District. This helps to see whether food bank resources align with need. This measure does not account for close proximity to food banks over District boundaries. Geographically, we see the fewest hours of food bank distribution according to need in Districts 5, followed by Districts 4 and 2. District 5 only has 1.7 hours per 1,000 adults experiencing food insecurity, compared to District 3 which has over 3 times the number of hours.

Since food bank clients do not shop within Council Districts this ranking does not perfectly represent access. Food banks that are physically located in one Council District have defined service areas that include zip codes of another District. This is not to say that Council Districts with more resources are oversaturated as it is important to consider the context of locations. For example, we know District 3 includes the downtown area, with a high concentration of resources and foot traffic making it a convenient area for many accessing food banks. However, this does show strong support for the conclusion that those who are food insecure and live in District 5 or 4 will likely have more difficulty finding an open food bank near them.

Figure 2: Hours of on-site distribution available per 1,000 food insecure adult (18+) population by Council District



Total hours of distribution per 1,000 food insecure population for each Council District. The color corresponds to total hours of distribution per 1,000 food insecure population.



OPPORTUNITIES TO IMPROVE EQUITABLE ACCESS TO QUALITY FOOD

There are existing opportunities where access could be made more equitable, and overall effectiveness and efficiency of the network improved. The recommendations provided here reflect the priorities expressed by food bank clients and staff. They are the key findings that were consistently found throughout our analyses but will not necessarily have the same significance for each distinct food bank.

Improving coordination across the food bank network

Some noted the network as a whole could be more efficient by increased coordination. Food banks could align policies so that they are consistent in eligibility requirements and visit limits. Staff noted that food banks should either have fewer geographic limits but more visitation limits (food banks accept all zip codes but only one visit per week) or allow more visitation access per service area. This would help to ensure that hours of operation and location are accessible across the city. Some note that collaborating as a network would be useful to collectively focus on the root causes of hunger and collaborate on a system-wide solution. This starts with more inter-agency communication, touring each other's facilities, and sharing ideas.

Improving cultural relevancy of healthy food

Providing food that is more culturally relevant to the service population is an important way food banks can improve equitable access and reduce waste. Increased discretionary funds for food purchasing would allow food banks to more easily attain food items in good condition and that reflect the preferences of their service population. Heavy reliance on outside donations or food rescue can pose challenges by reducing selection, quality, and consistent availability. One of the top reasons food banks report having to throw out spoiled food is because it was not a popular item. Staff also struggle to secure nutritionally dense non-cook foods, to

> **"I would say it's less having enough food than it's having the right kind of food. And when you rely on the donations, that's hard. Which is why we say purchasing budget, because that's what gives the organization the autonomy. When you rely on whatever service and Food Lifeline and grocery stores you're at their mercy to get whatever they have."**
>
> -Food bank staff

offer homeless clients who don't have access to a kitchen. Food banks would like to increase or start offering certain categories of food, while decreasing others as shown in Table 3 and 4. While food banks in Seattle make concerted efforts to stay aware of client needs, preferences, and dietary restrictions this can be difficult when client populations are continually changing. More consistent surveying of clients would allow for closer monitoring of what foods people are requesting.

Table 3. Top categories food banks want to increase

Category	Percent want to increase
Oils, dressings, sauces	88%
Spices	82%
Fresh fruits veg	77%
Eggs	77%
Dairy	71%
Tofu, meat alternatives	71%
Nuts, nut butters	65%

Table 4. Top categories food banks want to decrease

Category	Percent want to decrease
Processed breads	53%
Soda, sugary drinks	47%
Baked pastry/ dessert	47%

Increasing client choice

Food banks can provide a more dignified experience for clients by offering as much choice as possible. Some are trying to do this in different ways; shifting to a grocery store shopping model, using preference cards, or offering vouchers to a local Co-op. The majority of survey respondents (68%) provide food onsite through a standard Client Choice model, while some (28%) apply a Client Choice model through a grocery store design. Only one food bank provided food through the Pre-Packed model. Staff and clients state that this re-design is improving morale by providing more dignity and choice, though making this change requires significantly more space and a different layout. While many food banks would like to transition to this model, they need the square footage and/or a remodel to do so.

"Would love to initiate a grocery store model but we are limited by space constraints. As service numbers continue to grow, we are also straining to meet the demand for fresh proteins, especially meat and dairy options."

-Food bank staff

Investments in operational costs

Staff have identified specific changes needed at their specific food bank, such as changing their distribution model, expanding hours, or increasing the volume of food. Capacity to create changes to improve food access relies on funding to cover fundamental operational expenses like personnel and space, as well as refrigeration, and vehicles. When asked where they would allocate additional funding, food bank staff focused on four major funding priorities: staffing, better food selection, changing distribution models, and increased space. Food selection and distribution models are addressed above. This section focuses on the costs of staffing and space.

Staffing

Food banks have an average of 3 paid full-time staff members and 1.5 part-time staff members. Over a quarter (27%) of survey respondents operate without full-time staff. Food banks utilize volunteers, reporting an average of 52 volunteers each week. Although volunteers are an incredible asset for food banks, it is challenging to rely on inconsistent volunteer labor. As many food banks noted, skilled staff recruitment and retention is especially difficult with low wages. The majority (78%) of survey respondents would like to increase their staffing capacity, especially staff who are committed for a longer period of time and can provide specific types of expertise. Common staffing needs include volunteer coordinators, development managers, operations managers, event planners, drivers, warehouse managers, and procurement support. Food banks serve a diverse population with many non-English speaking clients, in particular Vietnamese, Spanish, Mandarin, Cantonese and Russian, and struggle to ensure that information is translated and that they have a way to provide their input as customers. Positions like the community connector are desired, especially multilingual staff to communicate with clientele.

"Staffing's huge. Our goal is to be open seven days a week eventually, but it's always good to have two staff members on hand. My hugest challenge is finding staff—if you interview or put an ad out, you're going to pay less than half of Seattle's median income. You will not make Amazon money."

-Food bank staff

Building space

When asked about challenges with operations, staff repeatedly brought up space constraints. Many described running out of space to store food and to process clients. This has limited the capacity to accept more food, provide on-site resource connections, and to convert to a grocery store model. Having more space would increase capacity, but it would also create a more trauma-informed experience. According to staff, when the distribution space is crowded it can be very stressful for clients. Due to Seattle's economic boom and the high demand for space, staff report that existing sites and parking space are in jeopardy.

Mobile and targeted food distribution

Many food banks recognize an opportunity to expand their reach and become more responsive, resourceful, and efficient through their delivery systems. As many emphasized, more coordination across the network of food banks would be useful to align their policies and match access to need. Most procure and deliver food through third-party delivery or staff utilizing their own vehicles. However, many also report relying on volunteers who utilize their own vehicles. The majority of food banks are distributing food to or from off-site locations through various modes such as home delivery, mobile pop-up food banks, satellite locations, or another agency.

This does not mean distribution sites should be eliminated but that better transportation systems are a critical part of accessibility. Food banks can more easily deliver food in targeted ways; directing food to where it is most needed. Staff state they rely on volunteers and rented vehicles, lacking consistent access to transport. Home delivery programs that deliver to home-bound clients are especially popular among older adults but often have a waitlist. Some staff believe that increased mobility is necessary for a targeted response and to increase food rescue. These systems would allow staff to identify the best, most convenient locations for delivery so that food is brought closest to those whose needs and obstacles are greatest. As need continues to shift to new parts of the city, this is one way that food banks can be better equipped to respond.

"Maybe it doesn't have to necessarily be that everyone goes the extra mile of getting [food] exactly to [a client's] door. Maybe it is just getting it someplace that is much more convenient for them. So maybe that's a mobile Food Bank out in a parking lot, maybe that is finding a way to get them groceries - getting it through their faith community or at a local community center something like that."

-Food bank staff

"How can we be reflective and thoughtful about the work that we do so that it is less reactive and more strategic, more intelligent, more root-cause focused and more authentic? That's where we struggle. How do you keep up with the day to day demands, the needs that we have just to get the work done, and then at the same time, create the space that we need as a community to come together to have the important conversations about - with these next dollars, what do we do? Where is that right investment? Where are there holes? What do we need to be doing differently? How do we do a better job in having conversations with our customers? How do we do better at involving them in the planning of our work? I think that's our biggest challenge."

-Food bank staff

DISCUSSION

This assessment aimed to shed light on the ways the food bank network in Seattle could be improved to provide more equitable access for residents experiencing food insecurity. To do this we relied on both quantitative and qualitative data in order to capture the impact food banks are having in Seattle and ways they can better serve those facing food insecurity. While many food banks are experiencing an increase in demand, they feel limited in their ability to adequately meet this demand with current levels of funding and capacity. Results from this assessment confirms findings from the food insecurity analyses, identifying growing need among older adults and those experiencing homelessness – a population often not captured by population-based datasets.

While exploring gaps in access across Council Districts we identified geographic areas where residents may have less access to food bank resources. We should also keep in mind that food banks themselves have disparate access to resources depending on the neighborhood. Neighborhood assets such as volunteers who have time to give, local businesses to host fundraisers or provide donations, and grocery stores to participate in food rescue, are not found in all neighborhoods. The finding showing limited hours on evenings and weekends may be worth exploring. Without further assessment, it is not clear if clients would come if food banks were to expand hours on evenings and weekends, times when school-meal programs are limited and individuals working traditional workweek schedules have more time to get to the food bank.

Key findings are as follows:

- Equitable access involves giving clients choice over their food and consistently providing food that is good quality and relevant to needs.
- Foods banks would be able to increase food and target distribution more efficiently with better coordinated mobile systems to support procurement and delivery.
- Food banks need adequate staffing and space to better serve Seattle residents. These operational costs are fundamental to functioning efficiently and effectively.

Limitations

The findings of this assessment are subject to a number of limitations. First, the data collected came from convenience samples and were not representative samples. However, we would have expected much lower participation rates had we not had the ongoing collaboration and support from food bank staff, the City of Seattle Human Services Department, the Seattle Food Committee, the SBT Community Advisory Board, and others. Our response rate for the comprehensive survey was 75%, which demonstrates that not all food banks are represented in the survey results. An additional four food banks participated in an abbreviated version, bringing our total response rate to 93%. Key informant interviews gathered information from staff members who represented 48% of the food banks on our list, thus not capturing all food bank perspectives. The same occurred with our focus group discussions which targeted specific populations and may not have captured opinions representative of all food bank clients. Participants who were able to attend a focus group discussion are also likely to have been the individuals with more resources available to attend, such as time and transportation.

Second, our data is subject to social desirability bias as food bank staff may want to describe their food bank positively (or alternatively as having deficits in order to encourage more support) and food bank participants may not want to provide negative feedback. This was especially apparent in certain focus groups where participants expressed feeling like they have no right to complain about a free resource. In these cases, the facilitator was trained to encourage honest, constructive feedback about the food bank. In one focus group a manager of the food bank chose to attend the discussion. Although the manager directly encouraged to the group to be honest, this may have impacted participants' willingness to provide a candid critique.

Third, the gap analysis used the total number of hours open for distribution per Council District. It is important to consider that this is only one measure and does not capture many other aspects of access. Some food bank staff emphasized that a need for new hours may not be equally relevant to each food bank. The gap analysis compared results by Council District but this does not capture which food banks are the most convenient to clients; residents do not access food banks exclusively in their Council District and some food banks are located close to the boundary of two council districts.

Finally, without responses from all food bank providers, we were unable to expand the gap analysis to examine pounds of food distributed, individuals served, square footage of food banks, staffing capacity, and operating budgets.

NEXT STEPS

This report completes the scope of work specified in the Sweetened Beverage Tax (Ordinance 125324). Food bank providers suggested that future assessments should include 1) mapping density of zip codes served based on designated service areas and 2) updating the gap analysis with 2018 BRFSS data on

food insecurity rates. They also expressed hope that next steps will include allocating funds towards the needs identified through this assessment with modifications according to the profile of each food bank.

ADDENDUM – DETAILED METHODS FOR SECTION 5

METHODS

Sample, Data Collection, Variables, and Descriptive Analysis

The Food Bank Network Assessment relied on three components of primary data collection: key informant interviews, client focus group discussions, and the Food Bank Network Survey.

Key informant interviews

We interviewed 13 food bank staff members between June 28 and August 15, 2018. We conducted two two-hour group discussions in person, as well as four one-hour individual interviews over the phone. To obtain our sample of interviewees we sent an email to the Executive Director and/or Manager for each food bank on the SFC list inviting them to participate. The invitation provided a brief summary of the Food Bank Network Assessment, purpose of the interview, and eligibility criteria. Interviewees did not need to be in a specific leadership position, but were required to: 1) be currently employed at the Seattle-based food bank they intended to represent and 2) have at least three years of working experience in a Seattle-based food bank. Thirteen food banks agreed to participate which included representation of all seven council districts. The remaining food banks either did not respond or declined to participate due to schedule conflicts or ineligibility. Demographic data for the key informant sample are summarized in Appendix E – Item 2.

Key informant interviews and discussions were facilitated by a PHSKC researcher. They began with a reminder of the purpose of the interview, a description of how the data would be used, as well as an opportunity to ask questions before providing consent. Each interview was audio recorded with permission and focused on the following topic areas: Food bank services and clientele, client needs, and food bank needs. The complete topic guide can be viewed in Appendix E – Item 3.

Our primary aim in gathering qualitative data from the client and staff perspective was to explore ways food banks are addressing food insecurity and identify what opportunities exist for improvement. Recorded audio files were transcribed and when necessary, translated through Datagain Services. Audio files were deleted once the transcription was complete. Detailed notes were typed by a PHSKC researcher. Notes from interviews and discussions were double coded using Dedoose software and analyzed for major themes. Key informant interviews were double coded by MSW candidate interns and the focus group discussions were double coded by two PHSKC staff.

The initial list of codes was created through an iterative process of development. The lead researcher first reviewed transcripts and created a codebook. Two coders separately applied these codes and met continually with the facilitator to make needed revisions until a refined codebook was agreed on by all. Since codes represent analytic categories from which to view and organize all narrative text, this process allows for the identification of all possible categories at the level of detail necessary. Coders independently re-applied the codes from the final codebook. Key themes were identified by the lead researcher and were shared with the Seattle Food Committee to collect feedback prior to finalization. Demographic information was analyzed through Stata, producing univariate summary statistics (Observations, Mean, Median, Standard Deviation, Minimum and Maximum), as well as one-way frequency tables.

Focus group discussions

Seven focus group discussions were held between August 16 and September 5, 2018, and a total of 47 food bank clients participated. Food banks were invited based on their location, space availability,

service population demographics, and service capacity. In making this consideration, we sought to attain a diverse group of food banks to capture varied perspectives and experiences.

We sent an email to the Executive Director and/or Manager of each food bank and invited them to participate in hosting a focus group discussion. The invitation provided a brief summary of the Food Bank Network Assessment and purpose of the discussion. Of the nine food banks invited, seven agreed to participate. One food bank declined due to a lack of time availability and one did not respond. Most food banks identified a priority population to recruit based on age and/or language spoken. This resulted in four non-English speaking groups (Vietnamese, Russian, Cantonese, and Spanish) and three English-speaking groups. Twenty-three percent (23%) of focus group participants identified their housing status as homeless, 83% did not have any full-time employment, and 70% were receiving basic food assistance (SNAP). Only 17% of participants had at least one child in the household, the majority (62%) were over the age of 59, while 26% were under the age of 30. Demographic data for the focus group sample are summarized in Appendix E – Item 4.

Food bank staff recruited clients for the focus groups discussions, with support from PHSKC. PHSKC offered staff a flier to assist with recruitment, as well as a $200 honorarium to the food bank for their support. A copy of the topic guide was shared with food banks prior to the discussion to ensure that questions were appropriate. Some minor modifications were made as a result, including asking some questions one-on-one rather than in the group. This modification created a more comfortable setting for what some staff identified as potentially sensitive topics regarding their need for and use of services.

PHSKC provided refreshments and gift card incentives ($30 to Safeway) for participants. Four of the discussions were facilitated by a trained bilingual facilitator and three by a PHSKC researcher. These discussions also began with an explanation of the purpose and how the data would be used, as well as answering participant questions before they gave consent. Five discussion groups were audio recorded with permission and detailed notes were taken for two discussion groups where participants did not want to be recorded.

Questions focused on the following topic areas: Food bank services utilized, impressions of food bank experience, client needs, ease of access, and impact. The topic guide used for potentially sensitive topics and demographics can be viewed in Appendix E – Item 5 and the group discussion topic guide can be viewed in Appendix E – Item 6.

Seattle Food Bank Network Survey

Seventeen food bank respondents completed the Seattle Food Bank Network Survey and an additional eight completed some portion of it, a total of 25 or an 83% response rate. Only one survey was collected per food bank. The full version of the online survey was open from September 18 to October 26, 2018. An abbreviated survey was available from November 9 to November 21, 2018 to collect essential data from the remaining food banks missing from the sample. All 30 food banks considered to be within the Seattle food bank network received an email inviting them to participate, sent to the Executive Directors and/or Food Bank Manager. The invitation provided a brief summary of the Food Bank Network Assessment, purpose of the survey, and the survey link.

The Food Bank Network Survey was designed using input from various stakeholders including food bank representatives, Seattle Human Services Department, SBT Community Advisory Board, UW Center for Public Health Nutrition, Seattle Office of Sustainability & Environment and Seattle City Councilmembers. Scientific literature and grey literature were also reviewed, and the survey tool was informed by The San

Diego County Food Pantry Capacity Survey,[4] the USDA Healthy Pantry Assessment Toolkit[5] and the survey developed by Tarasuk et al.[6] The survey tool was piloted by nine different food bank staff members. The pilots took place over the phone and participants were asked to describe how they interpreted and thought through each survey question. These pilots helped identify where questions were confusing and response options were incomplete, as well as where functionality of the online survey could be improved. The complete survey can be viewed in Appendix E – Item 7.

The Food Bank Network Survey data were collected and managed using REDCap electronic data capture tools[7] hosted at the UW Institute of Translational Health Sciences. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry, 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 importing data from external sources. REDCap at ITHS is supported by the National Center For Advancing Translational Sciences of the National Institutes of Health under Award Number UL1 TR002319.

Survey data were extracted from RedCap and analyzed in Stata to perform a descriptive analysis. Open-ended responses were collated and examined for recurring themes. Continuous variables were summarized using frequencies and proportions, while categorical variables were summarized using univariate summary statistics (Observations, Mean, Median, Standard Deviation, Minimum, and Maximum), as well as one- and two-way frequency tables. Results reported here are based only on the data received from the survey respondents and therefore not representative of all 30 food banks.

Gap analysis

For the gap analysis included in this section we used data on the number of hours open for food distribution and population of adult food insecurity by Council District. Hours of operation for all 30 food banks was attained through the survey, as well as cross checking the SFC food bank directory and food bank websites. The total number of hours food banks are open for on-site distribution were calculated for each Council District. This included the limited number of hours where food bank distribution is restricted to specific populations based on age, disability, or families with children. Total hours were examined across Council Districts, day of the week, and time of day. This analysis also compared total hours to the estimated population count of adult food insecurity by Council District. The district-level population counts of adult (18+) food insecurity was calculated using the percent of adults experiencing food insecurity reported by the 2011-2013 Behavioral Risk Factor Surveillance Survey (BRFSS) data, applied to 2017 Washington State Office of Financial Management population estimates of people over 18. More information on these estimates is provided in Section 4 of this report.

References

1. Public Health Seattle-King County. Food insecurity (adults), King county (Average: 2010-2013). https://www.kingcounty.gov/depts/health/data/community-health-indicators/behavioral-risk-factor-surveillance-system.aspx?shortname=Food insecurity Published 2018. Accessed August 1, 2018.
2. Washington State Department of Social and Health Services. Client Counts and Direct Service Expenditures: Economic Services Total; Basic Food Program. http://clientdata.rda.dshs.wa.gov/Home/ShowReport?reportMode=0. Accessed November 1, 2018.
3. United States Department of Agriculture; Food and Nutrition Service. Food Distribution Program Tables (The Emergency Food Assistance Program). https://www.fns.usda.gov/pd/food-distribution-program-tables. Accessed November 1, 2018.
4. Schumann MJ, Trull C, Noack C. 2015 Food and Function: An Assessment of the Capacity of Food Pantry Programs in San Diego County. Caster Family Center for Nonprofit and Philanthropic Research, University of San Diego. 2015. https://digital.sandiego.edu/npi-foodsecurity/1
5. Regional Nutrition Education and Obesity Prevention Centers of Excellence; Western Region at Colorado State University. Healthy food pantry assessment toolkit. https://snaped.fns.usda.gov/library/materials/healthy-food-pantry-assessment-toolkit. Accessed November 1, 2018.
6. Tarasuk V, Dachner N, Hamelin AM, Ostry A, Williams P, Bosckei E, Poland B, Raine K. A survey of food bank operations in five Canadian cities. BMC Public Health. 2014;14(1);1234. doi: 10.1186/1471-2458-14-1234
7. Paul A. Harris, Robert Taylor, Robert Thielke, Jonathon Payne, Nathaniel Gonzalez, Jose G. Conde, Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009 Apr;42(2):377-81.

APPENDIX A | EVALUATION TEAM STRUCTURE AND TEAM BIOGRAPHIES

APPENDIX A | EVALUATION TEAM STRUCTURE AND TEAM BIOGRAPHIES

SEATTLE'S SWEETENED BEVERAGE TAX EVALUATION TEAM STRUCTURE

The Seattle Office of the City Auditor established a contract with Public Health – Seattle & King County to complete the evaluation outlined in Section 5B of the Sweetened Beverage Tax Ordinance. The Sweetened Beverage Tax (SBT) Evaluation Team is comprised of academic researchers and public health practitioners which includes national experts on policy evaluation, food policy, obesity, sugary beverages and beverage taxes, dietary assessment, and assessment of beverage purchasing. Each organization listed here contributed to the overall study design and led different components of the report on healthy food availability and the food bank network: Public Health – Seattle & King County coordinated the research efforts, served as the point of contact with the City of Seattle, and led the work for all sections except section 3 on price and availability of healthy food in Seattle stores; the University of Washington co-led and coordinated the SBT Evaluation Team's overall research efforts, served as the point of contact for national academic research advisors, and led the study on price and availability of healthy food in Seattle stores; Seattle Children's Research Institute contributed to the design, analysis, and interpretation of findings. The Office of the City Auditor contributed to the study design, monitored progress, and served as the point of contact with the City Review Team (comprised of staff representing City Council, City Budget Office, Finance and Administrative Services, Executive Office, and City Departments, such as the Human Services Department and the Office of Sustainability and Environment) to review the methods and reports from the SBT Evaluation Team.

BIOGRAPHIES

Kaylin Bolt, M.P.H., M.S.W., M.Ed., is a Social Research Scientist at Public Health – Seattle & King County in the Assessment, Policy Development and Evaluation unit. She received her bachelor's degree in Psychology from Calvin College, and her Master of Public Health and Social Work from Washington University in Saint Louis, as well as her Master of Education from the University of Missouri-Saint Louis. Ms. Bolt has held researcher and evaluator roles on projects funded by the Washington State Department of Health, Gates Foundation, NIH, CDC, Bloomberg Foundation, Robert Wood Johnson Foundation, and the Kellogg Foundation. She has worked primarily in public health research, program design and evaluation, most often through a mixed-methods approach.

For this study, Ms. Bolt's role was to oversee the Food Bank Network Assessment efforts. In all components of the Food Bank Network Assessment, Ms. Bolt led the development of data collection tools (survey design, topic guides), implementation, analysis and synthesis of results.

Louise Carter, Ph.D., is a social research scientist at Public Health – Seattle & King County in the Assessment, Policy Development and Evaluation unit. She holds a Bachelor's Degree in History from Wellesley College and a Ph.D. in Developmental Psychology from the University of Minnesota. She has worked as an academic researcher, a journalist, and as communications director for a policy research center at the University of Washington's Evans School of Public Affairs. She also helped a Microsoft team put together an on-line resource on pregnancy, parenting, and child health. Her role as lead/coordinating writer for this report was informed by research on childhood obesity that she conducted with colleagues at the University of Washington.

Daniel Casey, M.P.H, is an epidemiologist at Public Health – Seattle & King County in the Assessment, Policy Development and Evaluation unit. He received his B.A. from the College of William and Mary and his Master of Public Health from the University of Washington. For this report, he developed, executed, and drafted the healthy food priority area analysis and provided cartography support for the rest of the report.

Nadine Chan, Ph.D., M.P.H., is the Assistant Chief of the Assessment, Policy Development, and Evaluation unit at Public Health – Seattle & King County and Clinical Assistant Professor of Epidemiology at the University of Washington School of Public Health and Community Medicine. She has published, led, and co-led studies evaluating cross-sector strategies to improve health equity. Her work includes mixed-method studies of complex policy and program interventions, including conducting natural experiments, to study changes in policies, systems, and environments and their impacts on health outcomes (e.g., evaluations of the King County menu labeling policy, the Partnerships to Improve Community Health initiative, Communities Putting Prevention to Work Initiative, and launch of the evaluation for the Best Starts for Kids Initiative.) As the Assistant Chief of Assessment, Policy Development, and Evaluation at Public Health - Seattle & King County, Dr. Chan provides oversight of a nationally recognized team of researchers responsible for community assessment and evaluation, and who routinely analyze population-level datasets and administrative program data. Dr. Chan's work has been funded by the Centers for Disease Control, Robert Wood Johnson Foundation, King County, and City of Seattle. Dr. Chan received her undergraduate degree in cell biology from the University of California at Berkeley, masters and doctoral degrees from the University of Washington School of Public Health and Community Medicine, and completed a post-doctorate fellowship on cancer prevention disparities at the University of California in San Francisco.

For this study, Dr. Chan co-leads the Evaluation Team with Dr. Jesse Jones-Smith and is the point of contact between the City of Seattle Office of the Auditor and the Evaluation Team. Dr. Chan coordinates and monitors the contracted research efforts; convenes and documents weekly Evaluation Team meetings; writes, reviews, and presents reports to the Office of the City Auditor as requested; serves as the point of contact with the SBT Community Advisory Board and the City Review Team; directly oversees the Public Health staff members working on the SBT evaluation, and contributes to the study design, writing and review of reports, publications, and presentations.

Roxana Chen, Ph.D., M.P.H., is an Affiliate Assistant Professor in the Department of Health Services at the University of Washington and social research scientist at Public Health – Seattle & King County. Dr. Chen received her Master of Public Health in Behavioral Sciences and Health Promotion at the University of Illinois at Chicago and her Ph.D. in Health Services from the University of Washington. Her areas of research include chronic disease disparities and cross-sectoral strategies between health and housing to improve health. She has expertise in community-based participatory research and using mixed methods to evaluate community and population-level interventions.

Dr. Chen attends weekly SBT Evaluation Team meetings and contributes to reports and publications about the SBT. For this report, Dr. Chen analyzed population-level data to estimate food insecurity among adults and school-aged youth in Seattle, and contributed to the writing of the section on food insecurity in Seattle. She also provided input on other components of the healthy food availability and food bank network assessments.

Jessica Jones-Smith, Ph.D., M.P.H., R.D., is an obesity epidemiologist and Associate Professor in the Department of Health Services (primary) and Epidemiology (joint) and a core faculty member of the Nutrition Sciences Program at the University of Washington School of Public Health. She holds an MPH in Public Health Nutrition from the University of California, Berkeley and a Ph.D. in Nutrition Epidemiology from the University of North Carolina at Chapel Hill. She completed a postdoctoral fellowship at the University of California, San Francisco and spent 4 years as an Assistant Professor at Johns Hopkins Bloomberg School of Public Health before arriving at the University of Washington. Dr. Jones-Smith studies social, environmental, and economic causes and correlates of obesity risk. Specifically, her research focuses on investigating distal drivers of nutrition-related health inequities and follows three main lines: 1) investigating community and individual economic resources as causal factors in obesity-related health status; 2) evaluating the obesity-related impacts of health and social policies; and 3) documenting disparities in nutrition-related diseases based on socioeconomic factors and race/ethnicity, across the lifespan and in numerous populations. Dr. Jones-Smith has previously used a natural experiment approach to evaluate how increased economic resources stemming from the opening of Native American-owned casinos has impacted the weight related-health outcomes of Native American mothers and children. She has also recently evaluated the impacts of the economic recession on children's BMI, the impact of a nationwide advocacy campaign on obesity-related legislation, and the impacts of the WIC package change on healthy food availability in Baltimore City. Her current approach combines public health nutrition and epidemiologic methods with econometric techniques to study these topics.

Dr. Jones-Smith co-leads the overall evaluation with Dr. Nadine Chan and directly leads the SBT evaluation's store audit component and co-leads the norms and attitudes component, and leads the food availability and pricing portion of the food access assessment, including leading study design, overseeing data collection and manuscript/report writing. She facilitates the weekly all-team meetings. She contributes to drafting, reviewing and editing study reports and documents. She is the main point of contact for external scientific advisors.

Melissa Knox, Ph.D., is a Senior Lecturer in the Department of Economics at the University of Washington and a Research Affiliate at the Center for Studies in Demography and Ecology at UW. Dr. Knox received her Ph.D. in Economics from the University of California, Berkeley and was a Research Associate at the Daniel J. Evans School of Public Policy and Governance before joining the Department of Economics. Her research focuses on using natural experiments and other econometric approaches to investigate the causal impact of health policies on household behavior, health care utilization, and health. Her research frequently concentrates on detecting the effects of these policies on the well-being of socially disadvantaged populations. She has previously studied Mexico's health care sector, measuring the impact of that country's health care reform on a variety of health and labor market outcomes.

Dr. Knox provides input on research design and data analysis, mainly for the adult survey and retail audit components of the evaluation. She also contributes to report writing for the project.

Vanessa M. Oddo, Ph.D., M.P.H., is an Acting Assistant Professor in the Department of Health Services at the University of Washington School of Public Health. Dr. Oddo received her Master of Public Health in Public Health Nutrition from Tufts University and her Ph.D. in Nutrition from the Johns Hopkins Bloomberg School of Public Health. She uses epidemiologic methods to investigate determinants of

obesity. Her main line of research investigates the role of employment status and working conditions on obesity and cardiovascular disease risk.

Dr. Oddo co-leads the adult survey of norms and attitudes. She coordinates the data collection and analyses for the adult survey. She is also responsible for leading report and manuscript writing for the adult survey component of the evaluation, in collaboration with Dr. Jones-Smith and the SBT Evaluation Team. In addition, she provides input on the retail audit component of the SBT evaluation.

Mary Podrabsky, M.P.H., R.D., is a Research Coordinator at the University of Washington Center for Public Health Nutrition (UW-CPHN), and Clinical Instructor in the Nutritional Sciences Program. She has a Bachelor of Science degree in Food, Nutrition and Institution Management from Washington State University, and completed her dietetic internship at Rush Medical Center in Chicago, IL. Ms. Podrabsky received her Master of Public Health – Nutritional Sciences degree from the University of Washington. She is skilled in a variety of qualitative and quantitative research methods and in her position at UW-CPHN, she has served as Research Coordinator and Project Manager for more than 20 nutrition and physical activity policy and environment-related research and evaluation projects.

Ms. Podrabsky provides input on various aspects of evaluation implementation, as well as oversight of UW project budget and contract administration.

Brian E. Saelens, Ph.D., is a Professor of Pediatrics and Psychiatry & Behavioral Sciences at the University of Washington and Principal Investigator at Seattle Children's Research Institute. Dr. Saelens is trained as a clinical/health psychologist, with a bachelor's degree in Psychology from Cornell University and a master's and Ph.D. from the State University of New York at Buffalo. Dr. Saelens' research interests include pediatric obesity treatment and prevention. His work examines strategies to improve the efficacy and reach of family-based weight management interventions for youth with already elevated weight status. He also explores how environmental factors and policies influence physical activity and eating behaviors in children and adults. He collaborates with community partners and local public health practitioners to help implement policy, systems, and environment change around healthy eating and active living in South King County. Dr. Saelens is a member of the King County Children and Youth Advisory Board for the Best Starts for Kids initiative. His research and evaluation work has been funded by the National Institutes of Health, CDC, USDA, and the Robert Wood Johnson Foundation. He has authored over 200 peer-reviewed scientific publications.

Dr. Saelens leads the child cohort component of Seattle's Sweetened Beverage Tax (SBT) evaluation and is responsible for leading report writing and other dissemination products for the child cohort component. He attends weekly Evaluation Team meetings. For this report, he contributed to the study design, data interpretation, and review of the final report.

Abigail Schachter, M.P.H., is an epidemiologist at Public Health – Seattle & King County in the Assessment, Policy Development and Evaluation unit. She holds a Bachelor's Degree in Psychology from Harvard University and a Master of Public Health in Health Behavior and Health Education from the University of Michigan. For this evaluation, Ms. Schachter's role was to conduct the food security gap analysis and write the food gap section of the report. She also attended weekly SBT Evaluation Team meetings and contributed to the writing and review of the food security section of the report.

Myduc Ta, Ph.D., M.P.H., is an epidemiologist at Public Health – Seattle & King County in the Assessment, Policy Development and Evaluation unit. Dr. Ta received her undergraduate degree in biochemistry and cell biology from the University of California, San Diego; a Master of Public Health degree with an emphasis in epidemiology from the University of California, Los Angeles; and a doctoral degree in epidemiology from the University of North Carolina at Chapel Hill. She completed a post-graduate CDC public health surveillance systems fellowship at the National Institute for Occupational Safety and Health in Morgantown, WV and post-doctoral training in applied epidemiology as a CDC Epidemic Intelligence Service (EIS) Officer. As a former (class of 2008) CDC EIS Officer assigned to the Washington state Department of Health Non-infectious Conditions Epidemiology unit, Dr. Ta conducted quantitative and field investigations in the areas of: chronic disease risk factors (nutrition and physical activity), injury, and environmental health. In her current position she provides epidemiologic data analysis expertise and knowledge of surveillance systems in support of programmatic work on healthy eating and active living, youth health and well-being, and injury and violence prevention. This includes leading the analysis for a component of Public Health's menu labeling evaluation and co-leading population-level data analysis to support final reporting for the CDC Community Transformation Grant.

For this study, Dr. Ta oversaw the healthy food availability assessment that includes the following components: literature review of food access and summary of food assistance programs, mapping the food environment, and food insecurity and food security gap analyses. She led the development of the design and analysis plan, consulted on analyses of the population-level food insecurity and food security gap estimation, and provided input on the healthy food priority area analysis and food bank network assessment. Dr. Ta attends weekly SBT Evaluation Team meetings, provides population-level data to inform other SBT evaluation components, contributes to writing and reviewing of this report, and served as the practicum site supervisor for Ms. Yang.

Lina Pinero Walkinshaw, M.P.H., is a Research Scientist at the University of Washington Center for Public Health Nutrition (UW CPHN). She received her bachelor's degree in Sociology, Anthropology, and Spanish from Carleton College, and her Master of Public Health from the Community Oriented Public Health Practice program at the University of Washington. Ms. Pinero Walkinshaw has expertise in managing and conducting primary data collection efforts, and is skilled in qualitative and quantitative study implementation and data analysis. Her work focuses primarily on research and evaluation of policies and programs to support food access, food security, and health equity as it relates to nutrition.

In coordination with Dr. Jones-Smith, Ms. Pinero Walkinshaw manages the retail audits portion of the SBT evaluation, and the food availability and pricing portion of the food access assessment. She provides input on study design, develops data collection protocols, manages retail audit (i.e. store survey) data collection, conducts analyses of retail audit, food availability and pricing data, and assists with report and manuscript writing. In addition, she provides input on the other evaluation components.

Alicia Yang, R.D., is a practicum intern at Public Health – Seattle & King County in the Assessment, Policy Development, and Evaluation unit. She is a Master of Public Health candidate at University of Washington. She holds a Bachelor of Science degree in Food and Nutritional Sciences from Seattle Pacific University and completed her dietetic internship at Golden Gate Dietetic Internship. She attended weekly SBT Evaluation Team meetings, was responsible for conducting and summarizing the literature review on dimensions of food access as well as researching and synthesizing information on

principle food assistance programs and initiatives. Ms. Yang contributed to drafting the report sections on dimensions of food access and food assistance programs. In addition, she supported data analysis activities on food insecurity among adults.

ACKNOWLEDGMENTS

This report is dedicated to the people who experience food insecurity, especially the many food bank network participants who made time to share their diverse perspectives with us. The Evaluation Team is especially grateful for the tremendous help we received from community and subject matter experts listed below.

The assessment of the food bank network relied on generous participation of food banks in Seattle, the Seattle Food Committee, Frank Miranda, Sabrina Jones, Christina Wong (SBT Community Advisory Board), Joe Gruber, and Jennifer Muzia to inform and develop data collection materials, pilot test surveys, host focus group conversations; University of Washington graduate student interns Kayla Cody and Edsel Blanche, to conduct outreach and data coding; focus group facilitators: Sharissa Tojok (Cantonese facilitator), Kim Tran (Vietnamese facilitator), Lenny Orlov (Russian facilitator), and Gabriel Perez (Spanish facilitator); and DataGain Services for transcribing audio recordings.

We appreciate the many food stores that were included in this study and for his help as a community liaison with Somali grocers for the retail audits, we would like to thank Mr. Abdullahi Jama. We would like to thank the City of Seattle staff who worked closely with the Evaluation Team to develop the study design or provided data support, including Natalie Thomson, Leslie Stewart, Liz Fikejs, Carol Cartmell, Bridget Igoe, Sharon Lerman, Priya Saxena, Katie Clemens, Fahima Mohamed, Brian Rosete, Pamela Calderon Maskara. From the University of Washington Urban Form Lab, Dr. Anne Vernez Moudon and Dr. Phil Hurvitz provided their list of categorized food businesses in King County. From Public Health – Seattle and King County, we would like to thank Alastair Matheson, Sara Jaye Sanford, Mariko Toyoji, and Lin Song for their analytic support, Gloria Albetta for copy-editing, and Joie McCracken (Hsu) for managing the production of this report.

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APPENDIX B | SEATTLE HEALTHY FOOD SURVEY

Data Tracking

Business ID - 6mo	_____
Enter Store ID	_____
Business Name	_____ (Type name from your store list. If store name has changed, record new name on your store list.)
Business Address, Full	_____ (Type address from your store list. If it's a new store, enter address from store building or Google.)
Business City	◯ Seattle ◯ Kent ◯ Auburn ◯ Federal Way ( )
Data Collection Date	_____ ( )
Data Collector Name	_____ ( )
Audit Start Time	_____ ( )
Survey Completion Code	◯ Completed ◯ Partially Completed ◯ Not Started ◯ Not Eligible ( )
Survey Disposition Code	◯ Temporarily not accessible ◯ Not safe ◯ Asked to leave / Observation not allowed by staff ◯ Not accessible for audit (i.e. only clerk-assisted ◯ Does not meet study criteria (describe in notes) ◯ Store closed permanently ( )
Did this store receive a $10 cash incentive?	◯ Yes ◯ No ( )
Cash incentive receipt: Take photo of receipt, upload here	( )

Groceries

Business ID - 6mo

_____

Produce

Banana

◯ 1 lb
◯ Each
◯ None
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type

◯ Reduced price
◯ Buy #x get #x
◯ Buy #x for $priceTOTAL
◯ Buy #x for $priceEACH
◯ Other

Sale Price

_____

Buy #xx

_____

Get #xx

_____

For $xx.xx

_____

Minimum purchase required?

◯ Yes
◯ No

Red Delicious Apple

◯ 1 lb
◯ Each
◯ None
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Orange, cheapest	◯ 1 lb ◯ Each ◯ None ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Yellow Onions	◯ 1 lb ◯ Each ◯ None ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Tomatoes (cheapest)	◯ 1 lb ◯ Each ◯ None ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____

Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Carrots, 1lb bag (cheapest)	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Broccoli, 1 bunch (cheapest)	◯ 1 lb ◯ Each ◯ None ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No

Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Green leaf lettuce, 1 head/bunch (cheapest)	◯ Yes lettuce head/bunch ◯ No lettuce at all ◯ No lettuce head/bunch, yes bag/box of lettuce ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Bakery

White Bread (cheapest), 1 loaf

◯ Yes
◯ No
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type

◯ Reduced price
◯ Buy #x get #x
◯ Buy #x for $priceTOTAL
◯ Buy #x for $priceEACH
◯ Other

Sale Price

_____

Buy #xx

_____

Get #xx

_____

For $xx.xx

_____

Minimum purchase required?

◯ Yes
◯ No

Whole Wheat Bread (cheapest), 1 loaf

◯ Yes
◯ No
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type

◯ Reduced price
◯ Buy #x get #x
◯ Buy #x for $priceTOTAL
◯ Buy #x for $priceEACH
◯ Other

Sale Price

_____

Buy #xx

_____

Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Eggs

White Eggs (cheapest), 1 dozen	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Meat

Ground meat fresh, >80% lean (cheapest) 1lb	◯ Yes ◯ No (Hierarchy: beef -> chicken/turkey -> pork | Has to be MORE than 80% lean)
Type	◯ Beef ◯ Chicken/turkey ◯ Pork

Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Cereal

Frosted Flakes Cereal, 15 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____

For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Original Cheerios Cereal, 12 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Rice

Rice, unseasoned 1lb/16oz (cheapest)	◯ Yes rice 1lb container ◯ Yes rice but no 1lb container ◯ No rice (Heirarchy: Brown rice -> white rice, bag -> box | Always pick 1lb unless there is none)
Rice Type	◯ Brown Rice ◯ White Rice
Rice Packaging	◯ Bag ◯ Box
Rice Package Size in POUNDS (lbs)	_____

Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

"Canned Beans, Unseasoned whole beans (no green beans)"

Canned Beans, cheapest small can (14.5 - 15.5 oz)	◯ Yes ◯ No (Heirarchy: Black -> kidney -> garbanzo)
Bean type	◯ Black beans ◯ Kidney beans ◯ Garbanzo beans
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____

Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
groceries time stamp	_____ ( )

Snacks

Business ID - 6mo

_____

Chips

Lay's Regular Potato Chips, Salted 2.75 oz

◯ Yes
◯ No
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type

◯ Reduced price
◯ Buy #x get #x
◯ Buy #x for $priceTOTAL
◯ Buy #x for $priceEACH
◯ Other

Sale Price

_____

Buy #xx

_____

Get #xx

_____

For $xx.xx

_____

Minimum purchase required?

◯ Yes
◯ No

Lay's Regular Potato Chips, Salted 10 oz

Might be called Family Size

◯ Yes
◯ No
( )

Price

_____
(9999 = Not able to obtain price)

Sale

◯ Yes
◯ No

Sale Type

◯ Reduced price
◯ Buy #x get #x
◯ Buy #x for $priceTOTAL
◯ Buy #x for $priceEACH
◯ Other

Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Pringles Regular Potato Chips, Salted 2.36 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Pringles Regular Potato Chips, Salted 5.2 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)

Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

"Cookies, Original Oreos"

Cookies, Original Oreos 2 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____

Minimum purchase required?	◯ Yes ◯ No
Cookies, Original Oreos 14.3 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Little Debbie Honey Buns

Little Debbie Honey Buns 3 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____

Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
Little Debbie Honey Buns 10.6 oz	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No
Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No

Reese's Peanut Butter cups

Reese's Peanut Butter cups 1.5 oz (2pk)	◯ Yes ◯ No ( )
Price	_____ (9999 = Not able to obtain price)
Sale	◯ Yes ◯ No

Sale Type	◯ Reduced price ◯ Buy #x get #x ◯ Buy #x for $priceTOTAL ◯ Buy #x for $priceEACH ◯ Other
Sale Price	_____
Buy #xx	_____
Get #xx	_____
For $xx.xx	_____
Minimum purchase required?	◯ Yes ◯ No
snacks time stamp	_____ ( )

APPENDIX C | GROUND TRUTHING

APPENDIX C | DETAILED DESCRIPTION OF GROUND-TRUTHING OF THE FOOD ENVIRONMENT OF 3 PRIORITY NEIGHBORHOODS

The accuracy of the categorized food permit database versus an on-the-ground ground-truthing exercise. Data collectors drove 112 miles to ground-truth the Haller Lake, High Point, and South Park neighborhoods. In ground-truthing, data collectors identified a total of 72 eligible food establishments; 39 in Haller Lake, 23 in South Park, and 10 in High Point. The 2015 categorized food permit database included only 56 stores across these three neighborhoods. In addition to finding more stores than listed in the database (i.e. "false negatives"), data collectors were not able to find many stores that the database listed as present (i.e. "false positives").

Table 1 below displays the number of true positives, false negatives, false positives, and positive predictive value and sensitivity of the categorized food permit database across all stores types in the database, as well as only the stores types included in the SBT retail audit sample (which did not include traditional restaurants). The positive predictive value for all store types was 0.70, meaning that 70% (n=39) of the stores listed in the categorized food permit database were confirmed in the on-the-ground ground-truthing. The positive predictive value for only store types included in the SBT retail audit sample was slightly higher at 0.72, meaning that 72% of the stores listed in the database (n=28 true positives) were confirmed in ground-truthing. The categorized food permit database's sensitivity was 0.54 for both all store types and SBT retail audit store types-only, meaning that the categorized food permit database successfully identified 54% of all stores present (n=72) in these three neighborhoods.

These low positive predictive values and sensitivities are the result of high numbers of false positives (n=17 stores that were in the database, but not physically there during ground-truthing) and false negatives (n=33 stores missing from the database, but physically there during ground-truthing). The false positives could be the result of stores closing or moving, while the false negatives could be the result of new stores opening. Data collectors asked all 33 false negative stores when they opened; 11 (33%) verified that they had opened since 2015. The remaining 22 (67%) stated that they had opened prior to 2015; it is unclear why these 22 stores were not listed in the categorized food permit database.

At the neighborhood level, the categorized food permit database was most accurate in the High Point neighborhood, correctly identifying 80% of all stores present (positive predictive value=1.00; sensitivity=0.80). In Haller Lake, the categorized food permit database correctly identified 56% of all stores present (positive predictive value=0.70; sensitivity=0.56), and in South Park the database correctly identified 39% of all stores present in the neighborhood (positive predictive value=0.50; sensitivity=0.39).

Table 2 stratifies by store type the number of true positives, false negatives, false positives, and positive predictive value and sensitivity of all stores in the categorized food permit database. The categorized food permit database has higher accuracy for grocery-type food stores, as compared to prepared foods (grocery-type food stores positive predictive value=0.83, sensitivity=0.71; prepared foods positive predictive value=0.68, sensitivity=0.51). This means that the database successfully identified 71% of all grocery-type food stores in the neighborhoods, and 51% of all prepared foods. The database only successfully identified 17% of all coffee shops in the neighborhoods (positive predictive value=0.25, sensitivity=0.17). These results may mean that analyses conducted using the categorized food permit database underestimate the availability of both healthy and unhealthy food stores in Seattle.

Table 1. Accuracy of the 2015 categorized food permit database compared to an in-person on-the-ground assessment ("ground-truthing") of all food establishments in three Seattle neighborhoods—Haller Lake, High Point, and South Park.[1]

		Public Health food establishment permit database, all store types categorized by the UW Urban Form Lab				Public Health food establishment permit database, only store types included in the SBT Evaluation Sample List			
		Neighborhood				Neighborhood			
		Overall	**Haller Lake[2]**	**High Point**	**South Park**	**Overall**	**Haller Lake[2]**	**High Point**	**South Park**
All stores in database	*Number of stores in permit database, pre-ground-truthing*	***56***	*30*	*8*	*18*	***39***	*20*	*6*	*13*
True positives[3]	Stores on the list and confirmed during ground-truthing	**39**	22	8	9	**28**	16	6	6
False positives	Stores that are on the list, but not physically there during ground-truthing *(e.g., stores that closed or moved)*	**17**	8	0	9	**11**	4	0	7
False negatives	Stores missing from the list, but physically there during ground-truthing *(e.g., new stores identified)*	**33**[4]	17	2	14	**24**	11	2	11
Positive predictive value	True positives / (true positives + false positives)	**0.70**	0.73	1.00	0.50	**0.72**	0.80	1.00	0.46
Sensitivity	True positives/ (true positives + false negatives)	**0.54**	0.56	0.80	0.39	**0.54**	0.59	0.75	0.35

[1]Food banks, farmers markets, and catering companies, as well as stores categorized as "closed" by the UW Urban Form Lab, were excluded from this analysis.

[2]One store was categorized as both a false positive and false negative. It was a false positive because it was not at the location listed on permit list; it was also coded as false negative because a store with this exact name from the permit list was found at a different address, within Haller Lake, than the permit list had specified.

[3]True positives include exact matches (exact name, address, and store type match), close matches (exact address and store type matches, but names that differ while suggesting the same store, e.g., Haller Lake Food Shop and Haller Lake Market), and lenient matches (exact address and store type matches, but store type names are different while suggesting the same products for sale, e.g., South Seattle Market and M&J Mart).

[4]Data collectors called all 33 of these stores to determine when they opened; 11 of these 33 stores confirmed that they had opened since 2016.

Table 2. Accuracy of the 2015 categorized food permit database by store type in three Seattle neighborhoods—Haller Lake, High Point, and South Park.						
Store type	**# of stores in permit database, pre-ground-truthing**	**True positives[1]**	**False positives[2]**	**False negatives[3]**	**Positive predictive value[4]**	**Sensitivity[5]**
Grocer-type food stores	**18**	**15**	**3**	**6**	**0.83**	**0.71**
Supermarkets	2	0	2	0	0	N/A
Warehouse/superstore	1	1	0	0	1.00	1.00
Grocery stores	1	1	0	1	1	0.50
Small stores	13	12	1	5	0.92	0.71
Drug stores	1	1	0	0	1.00	1.00
Prepared foods	**34**	**23**	**11**	**22**	**0.68**	**0.51**
Fast food	5	5	0	0	1.00	1.00
Quick-service	12	7	5	12	0.58	0.37
Traditional restaurants	17	11	6	10	0.65	0.52
Coffee	**4**	**1**	**3**	**5**	**0.25**	**0.17**

[1]Stores on the list and confirmed during ground-truthing

[2]Stores that that are on the list, but not physically there during ground-truthing (e.g., stores that closed or moved)

[3]Stores missing from the list, but physically there during ground-truthing (e.g., new stores identified)

[4]True positives / (true positives + false positives)

[5]True positives/ (true positives + false negatives)

APPENDIX D | DATA SOURCES OF UW CPHN SNAP-ELIGIBLE DATA

APPENDIX D | DATA SOURCES OF UW CPHN SNAP-ELIGIBLE DATA

The table below summarized each of the three data sources pooled for the analysis of food insecurity among Seattle SNAP-eligible participants. Details about the methods for each survey comprising the data source are available from links to published report or peer reviewed journal articles provided in the "Citations" column. For the Seattle-specific analyses, the sample was predominately a convenience sample of SNAP-eligible adults accessing some type of service (e.g. healthcare, food bank, or Fresh Bucks nutrition incentive).

Data Source	Year/s	Language	Sample	Location	Data Source Purpose	Notes	Citations
Fresh Bucks/PICH Evaluation	2014, 2015, 2017	English, a few other languages but not consistently	This is a convenience sample of Fresh Bucks program participants.	Seattle/King County location determined by recruitment site (e.g., if they shopped at a Seattle vs. non-Seattle farmers market).	Fresh Bucks evaluation, funded by City of Seattle OSE in 2014 and PICH 2015-2017	Some individuals in these two datasets across years may be repeats. When recruiting and surveying at markets, a few individuals let us know they had done surveys with us in prior years.	Center for Public Health Nutrition. (2014). 2014 Fresh Bucks Evaluation. Seattle, WA. Retrieved from http://www.freshbuckseattle.org/wp-content/uploads/2016/07/2014-Fresh-Bucks-Evaluation-FullReportFINAL.pdf
HFAP/PICH Evaluation	2016	English & Spanish	This is a combination of (1) a convenience sample of Fresh Bucks, PICH Farm Stand, or PICH Good Food Bag program participants, and (2) a convenience sample of non-program	Seattle/King County location determined by zip code.	Healthy Food Access Programs evaluation, funded by PICH		Bradford, V., Quinn, E., Walkinshaw, L.P., Rocha, A., Chan, N., Saelens, B., & Johnson, D. (2018). Fruit and Vegetable Access Programs and Consumption in Low-Income Communities. *Journal of Hunger and Envionmental Nutritio*. https://doi.org/10.1080/19320248.2018.1498819

Data Source	Year/s	Language	Sample	Location	Data Source Purpose	Notes	Citations
			participants, e.g., individuals recruited at community sites.				
SNAP-Ed Evaluation	2016	English & Spanish	This is a stratified random sample of SNAP recipients in Seattle and King County.	Seattle/King County location determined by zip code.	Washington State SNAP-Ed Farmers Market Access Evaluation, funded by WA DOH/USDA	These Seattle and King County data are a subset of a statewide sample.	Walkinshaw, L. P., Quinn, E. L., Rocha, A., & Johnson, D. B. (2018). An Evaluation of Washington State SNAP-Ed Farmers' Market Initiatives and SNAP Participant Behaviors. *Journal of Nutrition Education and Behavior*, *50*(6), 536–546. https://doi.org/10.1016/j.jneb.2018.01.003
							Ritter, G., Walkinshaw, L. P., Quinn, E. L., Ickes, S., & Johnson, D. B. (2018). An Assessment of Perceived Barriers to Farmers' Market Access. *Journal of Nutrition Education and Behavio*. https://doi.org/10.1016/j.jneb.2018.07.020

APPENDIX E | FOOD BANK NETWORK ANALYSIS APPENDIX ITEMS

APPENDIX E | FOOD BANK NETWORK ANALYSIS APPENDIX ITEMS

ITEM 1 – FOOD BANK NETWORK LIST

Council District	Food Bank	Website
1	Paradise of Praise	http://www.paradiseofpraise.org/
	West Seattle Food Bank	http://www.westseattlefoodbank.org/
	Providence Regina House	https://washington.providence.org/supportive-housing/regina-house/
	White Center Food Bank *Not technically in Seattle but assigned to D1 and included in survey data collection because serves many who live in Seattle.	https://www.whitecenterfoodbank.org/
2	El Centro de la Raza	http://www.elcentrodelaraza.org/
	Rainier Valley Food Bank	http://www.rvfb.org/
	St. Vincent de Paul	http://svdpseattle.org/
	Asian Counseling & Referral Service	https://acrs.org/
3	Jewish Family Service	http://www.jfsseattle.org/
	Byrd Barr Place	https://byrdbarrplace.org/
	YWCA	https://www.ywcaworks.org/
	The Food Bank at St. Mary's	https://www.thefbsm.org/
	Seattle Indian Center	http://seattleindian.org/
	Cherry Street Food Bank	http://www.northwestharvest.org/cherry-street-food-bank
4	FamilyWorks	https://www.familyworksseattle.org/
	Blessed Sacrament	http://www.blessed-sacrament.org/outreach/
	University District Food Bank	http://www.udistrictfoodbank.org/
5	North Helpline: Lake City	http://www.northhelpline.org/
	North Helpline: Bitter Lake	
	Epic Life Church - The Giving Room	http://epiclifechurch.org/
6	Bethany Community Church	http://www.churchbcc.org
	Phinney Ridge Lutheran Church	http://prlc.org/
	Greenwood Food Bank	https://www.familyworksseattle.org/
	Ballard Food Bank	http://www.ballardfoodbank.org/
7	Puget Sound Labor Agency	http://www.pugetsoundlaboragency.org/
	Immanuel Community Services	http://www.icsseattle.org/
	Pike Market Senior Center	http://www.pmfb.org/
	Queen Anne Food Bank at Sacred Heart	https://www.qafb.org/
	The Salvation Army	https://northwest.salvationarmy.org/northwest_division/cure-hunger/
Excluded from map, gap analysis, and staffing averages	Chicken Soup Brigade *Excluded because food distribution occurs primarily through delivery and requires pre-determined eligibility based on income, residence, and health/ diagnoses.	http://www.lifelong.org/chicken-soup-brigade/
Excluded from Assessment	Highline Area Food Bank *Excluded because food distribution occurs outside of city limits.	https://highlineareafoodbank.org/
Excluded from Assessment	Spiritual Miracles Food Bank *Excluded because food distribution occurs outside of city limits.	
Excluded from Assessment	Filipino Community of Seattle *Excluded because food distribution is through a small operation and not member of SFC.	https://www.filcommsea.org/

Excluded from Assessment	Salvation Army White Center *Excluded because food distribution occurs outside of city limits and is restricted to White Center residents.	http://www.tsawhitecenter.org/

ITEM 2 - KEY INFORMANT INTERVIEW DEMOGRAPHIC SUMMARY

Position Title	Total # of years at food bank	Total # of years at a Seattle food bank	Race / Ethnicity	Gender
6 Executive Directors 6 Managers or Coordinators	.5 to 17 years (average of 6)	5 to 20 years (average of 9)	100% White / Caucasian (13 total)	55% female (7) 46% males (6)

ITEM 3 - KEY INFORMANT TOPIC GUIDE

Introductions & Opener	
1.	**Can you state your name, your position title and how long you have been with _____ Food Bank?**
Food Bank Services and Clientele	
2.	**Great, and can you briefly describe the services and programs you offer?** *Prompt: Backpack programs, food delivery, other programs or services?*
3.	**Can you describe the population your food bank serves?** *Prompts: Demographic breakdown? Languages spoken? Immigrant / refugee status? Are there eligibility requirements? Do most clients live nearby? Housing status? Age? Family sizes?*
4.	**How has your service population changed over time? (At your individual food bank but also feel free to speak to the Seattle area at large.)** *Prompts: Have demographics changed? Language of clients? Number of clients or demand? How have their needs changed (food or non-food)? Family sizes?*
5.	**What do you see as being the strengths of what___ food bank provides and how it provides it? What do you think the strengths are of the food bank network as a whole in Seattle?** *Prompts: What is going well?*
Food Bank Client Needs	
6.	**How easy do you think it is for current or potential clients to access your food bank?** (This includes transportation, location, hours, language support services, outreach and awareness of food bank.) *Prompts: What makes it easy or difficult?* (Follow up: **Across Seattle, how easy do you think it is for people to access food banks? Are there areas more or less easy to access than others?)**
7.	**What do you think would make the food bank more accessible? (What about the food bank network?)**
8.	**For the frequency and quantity of food that is distributed by your food bank, how well are you able to meet your community's food security needs? (How well do you think the network is able to do this?)** *Prompts: What gets in the way? What makes it difficult? What would you need to better meet those needs?*

9.	**Now thinking about nutrition and dietary needs, how well do you think you are able to meet your community's nutritional needs? (How well do you think the network is able to do this?)** *Prompts: What gets in the way? What makes it difficult? What would you need to better meet those needs?*
10.	**From what you know about the demographics of your community, how well do you think you are able to meet your client's cultural identify and food preference needs? (How well do you think the network is able to do this?)** *Prompts: What gets in the way? What makes it difficult? What would you need to better meet those needs?*
11.	**How does your food bank stay aware of client's needs?** *Prompts: What type of data is collected and how frequently? How are those findings used?*
Food Bank Needs	
12.	**What is the biggest struggle for your food bank? (What would you say the biggest struggle is for the network as a whole?)** *Prompts: What are the areas where you feel your food bank could improve?* *What do you need to be able to do that? What are some things that are currently not funded at your food bank that you wish were?*
Food Banks and Root Causes	
13.	**Can you briefly describe your food bank's direct service strategy for helping people get to a place where they no longer need to rely on food banks for food, for example: case management, referrals to supportive services (housing, job training, etc.)?** *Prompts:* *ASK if no strategies: Why not?* *ASK if implementing strategies: How effective do you think these strategies are? Why or why not? What would make them more effective?*
14.	**Can you briefly describe your food bank's involvement in any policy efforts aimed at addressing root causes of hunger, such as housing, health care, wages, anti-poverty efforts?** *Prompts:* *ASK if not engaged in policy efforts: Why not?* *ASK If engaged in policy efforts:* *How successful do you think these policy efforts are? Why or why not? What would make them more successful?*
Closing Question	
15.	**How do food banks in Seattle currently collaborate?** *Prompts: What opportunities do you think there are to further these collaborations?*

ITEM 4 - FOCUS GROUP DISCUSSION DEMOGRAPHIC SUMMARY

Age	Frequency	Percentage (%)	Cum. (%)
29 and under	12	25.53	25.53
30-44	2	4.26	29.79
45-59	4	8.51	38.3
60-74	18	38.3	76.6
75+	11	23.4	100
Total:	**47**	**100**	

Household Size	Frequency	Percentage (%)	Cum. (%)
1 or 2	34	72.34	72.34
3 or more	13	27.66	100
Total:	**47**	**100**	

Number of children (<18 yrs) in household	Frequency	Percentage (%)	Cum. (%)
At least 1	8	17.02	17.02
Did not answer	3	6.38	23.4
No children	36	76.6	100
Total:	**47**	**100**	

HH Income: Receive Social Security Disability (SSI, SSDI)	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.35	4.35
No	32	69.57	73.91
Yes	12	26.09	100
Total:	**46**	**100**	

HH Income: Full-time employment	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	39	82.98	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

HH Income: Part-time employment	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	39	82.98	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

HH Income: TANF	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	39	82.98	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

HH Income: Unemployment	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	42	89.36	93.62
Yes	3	6.38	100
Total:	**47**	**100**	

HH Income: Child Support	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	45	95.74	100
Total:	**47**	**100**	

HH Income: General Assistance (GAU)	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	42	89.36	93.62
Yes	3	6.38	100
Total:	**47**	**100**	

HH Income: Veterans Pension / Disability	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	45	95.74	100
Total:	**47**	**100**	

HH Income: Social Security Disability (SSI, SSDI)	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	37	78.72	82.98
Yes	8	17.02	100
Total:	**47**	**100**	

HH Income: None	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	31	65.96	70.21
Yes	14	29.79	100
Total:	**47**	**100**	

Housing: Own	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	40	85.11	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

Housing: Rent, Subsidized (SHA, LIHI)	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	24	51.06	53.19
Yes	22	46.81	100
Total:	**47**	**100**	

Housing: Rent, Unsubsidized	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	40	85.11	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

Housing: Senior housing	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13

No	42	89.36	91.49
Yes	4	8.51	100
Total:	**47**	**100**	

Housing: Homeless	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	35	74.47	76.6
Yes	11	23.4	100
Total:	**47**	**100**	

If Homeless: Shelter	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	40	85.11	87.23
Yes	6	12.77	100
Total:	**47**	**100**	

If Homeless: Encampment	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	44	93.62	95.74
Yes	2	4.26	100
Total:	**47**	**100**	

If Homeless: Vehicle	Frequency	Percentage (%)	Cum. (%)
Did not answer	1	2.13	2.13
No	45	95.74	97.87
Yes	1	2.13	100
Total:	**47**	**100**	

Receive basic food (SNAP / Food stamps)	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
No	12	25.53	29.79
Yes	33	70.21	100
Total:	**47**	**100**	

Race / Ethnicity	Frequency	Percentage (%)	Cum. (%)
AIAN	2	4.26	4.26
Asian or Asian American	20	42.55	46.81
Black	4	8.51	55.32
Did not answer	1	2.13	57.45
Hispanic	9	19.15	76.6
Other	2	4.26	80.85
White	9	19.15	100
Total:	**47**	**100**	

Gender Identity	Frequency	Percentage (%)	Cum. (%)
Did not answer	2	4.26	4.26
Female	20	42.55	46.81
Male	23	48.94	95.74
Non-binary	2	4.26	100

Total:	**47**	**100**	

Variable	Obs	Mean	SD	Min	Median	Max
Age	47	55.787	21.768	20.000	63.000	88.000
Household size	45	2.511	2.312	0.000	2.000	11.000
Children in household	44	0.455	1.109	0.000	0.000	4.000
Number years going to food bank	44	5.105	5.998	0.200	3.000	28.000

ITEM 5 - FOCUS GROUP DEMOGRAPHIC SLIP AND INTERVIEW GUIDE

Below are some questions we would like to know! Filling it out is optional, so you don't have to answer any questions if you don't want to. These are also anonymous, so don't write your name on this form. If you would like to fill it out in private or need help filling out the form feel free to ask.

Thank you!

1. How old are you? _____ (years)

2. How many people are in your household? _____

3. How many children are in your household? (Under 18 years old) _____

4. What is your housing situation?

☐ Rent, Subsidized (examples: SHA, LIHI)
☐ Rent, Unsubsidized
☐ Own
☐ Currently Homeless

If currently homeless, where have you most recently been staying?

☐ Encampment
☐ On the Street
☐ Shelter
☐ Vehicle/RV/Boat
☐ With Friends or Family
☐ Other: _____

5. What sources of income does your household have? (Check all that apply)

☐ Full-time employment
☐ Part-time employment
☐ TANF

☐ Unemployment
☐ Child Support
☐ No Income
☐ Social Security Disability (SSI, SSDI)
☐ Veterans Pension / Disability
☐ Social Security Retirement
☐ General Assistance (GAU)
☐ Other : _____

6. Does your household receive Basic Food (SNAP, Food Stamps)?

☐ Yes
☐ No

7. How do you describe yourself? Select all that apply.

☐ American Indian or Alaska Native
☐ Asian or Asian American
☐ Black or African-American
☐ Hispanic or Latino / Latina
☐ Native Hawaiian or other Pacific Islander
☐ White or Caucasian
☐ Other: _____

8. What zip code do you live in? _____ (If you aren't sure, list the city)

9. Which language is usually spoken at home? _____

10. Do you currently identify as….?
☐ Female
☐ Male
☐ Non-binary
☐ Other: _____

11. How long have you been coming to this food bank? _____

ITEM 6 - FOCUS GROUP DISCUSSION TOPIC GUIDE

Food Bank Services Utilized (Asked in one-on-one setting.)	
Individual 1.	**What types of programs do you currently use that help you get food?**

	Prompts: List examples of programs available. Backpack programs, summer lunch, food pantry, food delivery, SNAP, TANF, WIC, FMNP, Fresh Bucks, summer meals, or other resources. If multiple are available: **Which of those programs have worked the best for you?** *Prompts: How so?*
Individual 2.	**How has your need for help getting food changed over time?** *Prompts: Has it become greater or less? Why has it changed in that way?*
Individual 3.	**How long does a typical food box or bag from a visit to ___ food bank last?** *Prompts: Do you eat most of it, half or less than half?*

Group Introductions & Opener

(Asked in group setting.)

Let's go around the room and share how long you've lived in the area, and your favorite food.

Impressions of Food Bank Experience

Group 1.	I'm going to ask you some questions now that are just about your experiences with the food bank here. **What are some things that you like about _____ food bank?** *Prompt: What are some of the best things?*
Group 2.	**What are some things you don't like or would want to change about the food bank here?** *Prompt: What makes you say that? Why would you like to change that?*
Group 3.	**When you come to the food bank do you feel like you can get everything you need in terms of food?** *Prompts: Why or why not? What is missing? Is the amount enough? Are the types of foods that you need or want available? Do you ever need to supplement with other meal programs (like a local church or soup kitchen)?*
Group 4.	**I want everyone to think about your most positive experiences coming here to get food. What made it go so well?** *Prompts: Was it the interactions you had, the types of food available, other services you got help with, how easy the process was? What makes you say that? What made it [positive] for you?*
Group 5.	**Now I want you think about your most frustrating or negative experiences coming here to get food. What make it frustrating?** *Prompts: Was it the interactions you had, the types of food available, other services you got help with, how easy the process was? What makes you say that? What made it [a negative experiences] for you?*

Food Bank Client Needs

Group 6.	**What would make it easier to get the food you need from this food bank specifically?**
Group 7.	**Now thinking outside of just this food bank, what do you need for you to get the food you need?**

	Prompt: What do you think would need to change?
Group 8.	**How do you feel about the options of food that are available at this food bank?** *Prompts: How would you change the type of food options you get here? Can you receive or pick nutritious / healthy options? Can you pick items that you prefer to cook with?*
Group 9.	**Besides the food this food bank offers, how do you feel about other services or programs they have here?** *Prompts: Do they connect people to other resources? Anything missing that you'd like to see?*
Ease of Access	
Group 10.	**How easy is it to get to this _____ Food Bank for you?** *Prompts: Is there good public transportation / parking? How easy is it to get here during the scheduled hours? How would you change the schedule and hours? How could this be made better?*
Impact	
Group 11.	**What kind of impact does this food bank have on you or others in the community?** *Prompts: Let's imagine that this food bank were to close for three months for building renovations, how would that impact those that use this food bank?* ***[SAY: And I want to make sure I say right away, that there are no plans for this food bank to close.]*** *What would people do to fill that gap? Are there other food banks close by that people would be able to go to?*
Closing Question	
Group 12.	**Are there any things that I missed or didn't ask about that you'd like to share now? Or anything you thought of and didn't get a chance to share?** **Thank you so much for your time.** [Remind when results will be shared, distribute gift cards.]

REDCap

ITEM 7 - SEATTLE FOOD BANK NETWORK SURVEY

Seattle Food Bank Network Survey

Public Health-Seattle King County is conducting a Food Bank Network Assessment, as a part of the Sweetened Beverage Tax Evaluation that is funded by the City Ordinance 125324. The goal of the Food Bank Network Assessment is to improve equitable access to quality food through our food bank network. Information provided through this survey will be key to understanding food bank network capacity. Participation is voluntary.

1. Name of food bank:

_____

2. Contact name: (For any follow up questions and to share results)

_____

3. Contact email:

_____

4. Physical address of food bank:

_____

5. Year that agency was founded in Seattle:

_____

6. Year agency began providing food assistance in Seattle:

_____

7. Which of the following best describes your food bank?

◯ Stand-alone food bank (exclusively intended for food distribution)
◯ Stand-alone food bank (exclusively intended for food distribution but share space with other service agency/ies)
◯ Operated by multi-service agency
◯ Operated by place of worship (church, synagogue, mosque, etc.)
◯ Operated by health center
◯ Other

8. What on-site distribution model does your food bank utilize primarily?

This is only for non-prepared food that you distribute ON-SITE from the address you provided.

◯ CLIENT CHOICE [Standard design]: Members progress through a specific line or order to select a set number of items by food category
◯ CLIENT CHOICE [Grocery store design]: Space is designed to resemble grocery store; members typically walk through the food bank more freely than client choice to select a set number of items by food category
◯ PRE-PACKED: Members pick up boxes or bags of food items already selected, ready for pickup
◯ OTHER: Please describe in next field

Please specify:

_____

9. Do you distribute food (prepared and/or non-prepared) to or from locations other than the address you provided?

◯ Yes
◯ No

How do you distribute food to or from off-site locations?

Select all that apply.

☐ Mobile pop-up distribution (i.e. in a parking lot, apartment building, etc.)
☐ Satellite location(s) (fixed locations where your food bank operates)
☐ Another agency (you provide food for their distribution but your food bank staff is not operating this distribution)
☐ Home delivery (prepared, packaged, to-go meals)
☐ Home delivery (bags of mostly non-prepared food)
☐ Other (please specify in next field)
☐ None

Please specify:

_____

10. What additional food-related services or programs does your food bank provide?

Select all that apply.

- ☐ Backpack program
- ☐ Prepared, packaged, to-go meals (i.e. sack lunches)
- ☐ Prepared, served, sit-down meals
- ☐ Special options for those with limited / no cooking options i.e. (non-perishables or no-cook bags)
- ☐ Store food for other programs (non-prepared or prepared)
- ☐ Commercial kitchen (commercial-grade facility, licensed for the safe preparation of food)
- ☐ Onsite garden (that provides produce for members)
- ☐ Summer meals program
- ☐ Other (please specify in next field)
- ☐ None

Please specify:

_____

11. On average, how many prepared, served, sit-down meals (perishable) do you provide per month?

This includes Summer Meals program.
Please provide your best estimate.

_____

12. On average, how many prepared, packaged, to-go meals (perishable) do you distribute per month?

Please provide your best estimate.

_____

13. What has been particularly SUCCESSFUL about your food distribution models and delivery systems (on and off-site)?

14. What has been particularly CHALLENGING or needs to change about your food distribution models and delivery systems (on and off-site)?

15. Do you currently provide any on-site nutrition education or resources at your food bank?

Select all that apply.

- ☐ Visible nutrition education posters
- ☐ Recipe handouts
- ☐ Offering samples with recipe
- ☐ Cooking classes / demos by your staff (or volunteers, students, community members)
- ☐ Cooking Classes / demos through another organization (WSU Extension, Solid Ground, etc.)
- ☐ On-site Nutritionist or Registered Dietitian (who provides counseling and education to members
- ☐ Other (please specify in next field)
- ☐ None

What "Other" on-site nutrition education or resources do you provide?

List below.

_____

Which organizations do you partner with to provide cooking classes / demos?

List below.

_____

On average, how many hours per week is a Nutritionist or Registered Dietitian available to members onsite?

_____

16. Do you currently provide DIRECT DELIVERY of any of these additional services or resources at your food bank?

Select all that apply.

- ☐ Case management
- ☐ Community Connector
- ☐ Healthcare services
- ☐ Job support (training / job skills / resume)
- ☐ GED / Post-secondary education program
- ☐ Utilities assistance
- ☐ Housing programs
- ☐ Rental assistance / diversion services (to prevent loss of housing)
- ☐ Childcare
- ☐ Free mailbox services
- ☐ Hygiene kits
- ☐ Transportation assistance (ORCA LIFT, regional reduced fare, VLRF, etc)
- ☐ Clothing bank
- ☐ Infant / toddler supplies (formula, diapers, etc)
- ☐ Pet food and /or pet supplies
- ☐ Other (please specify in next field)
- ☐ None

Please specify:

_____

17. Do you currently provide assistance with ENROLLMENT (applications / sign-up) for any of these additional services at your food bank?

Select all that apply.

- ☐ Other food programs (SNAP, Fresh Bucks, etc.)
- ☐ WIC
- ☐ Health insurance
- ☐ Job support programs (training / job skills / resume)
- ☐ GED / Post-secondary education programs
- ☐ Utilities assistance programs
- ☐ Housing programs
- ☐ Rental assistance / diversion services (to prevent loss of housing)
- ☐ Childcare assistance services
- ☐ Free mailbox services
- ☐ Transportation assistance programs (ORCA LIFT, regional reduced fare, VLRF, etc)
- ☐ Other (please specify in next field)
- ☐ None

Please specify:

_____

18. Do you currently provide any INFORMATION or REFERRALS to any of these additional services at your food bank?

Select all that apply.

- ☐ Other food banks or pantries
- ☐ Other food programs (SNAP, Fresh Bucks, etc.)
- ☐ Other meal programs
- ☐ WIC
- ☐ Healthcare services
- ☐ Health Insurance
- ☐ Job support programs (training / job skills / resume)
- ☐ GED / Post-secondary education program
- ☐ Utilities assistance
- ☐ Housing programs
- ☐ Rental assistance / diversion services (to prevent loss of housing)
- ☐ Childcare assistance services
- ☐ Free mailbox services
- ☐ Hygiene kits
- ☐ Transportation assistance (ORCA LIFT, regional reduced fare, VLRF, etc)
- ☐ Clothing bank
- ☐ Infant / toddler supplies (formula, diapers, etc.)
- ☐ Other (please specify in next field.)
- ☐ None

Please specify:

_____

19. What has been particularly SUCCESSFUL about your on-site resources (services, programs, enrollment and referrals)?

This does NOT include direct food distribution or delivery.

20. What has been particularly CHALLENGING or needs to change about your on-site resources (services, programs, enrollment and referrals)?

This does NOT include direct food distribution or delivery.

21. Any additional comments or concerns you would like us to know about the services your food bank provides?

Please share in the space below.

_____

SECTION 2: Service Population

In this section you will be asked about the people you serve.

Please provide your best estimates.

22. What is the estimated total number of UNDUPLICATED households (unique households) that utilize your food bank each month?

_____

23. What is the estimated total number of DUPLICATED households that utilize your food bank each month?

_____

24. What is the estimated total number of UNDUPLICATED individuals (unique members) that utilize your food bank each month?

_____

25. What is the estimated total number of DUPLICATED individuals that utilize your food bank each month?

_____

26. Compared to one year ago, how would you say the number of unduplicated individuals and households utilizing your food bank has changed?

◯ Increased
◯ Decreased
◯ Stayed the same

What do you think drove or contributed to that change?

_____

27. Compared to one year ago, how would you say the number of duplicated individuals and households utilizing your food bank has changed?

◯ Increased
◯ Decreased
◯ Stayed the same

What do you think drove or contributed to that change?

_____

28. Does your food bank collect and report race / ethnicity information on your service population?

IF YES: Provide the percentage that identify by each of the categories that appear below.

◯ Yes ◯ No

Percent that identify as BLACK:

_____

Percent that identify as WHITE:

_____

Percent that identify as NATIVE HAWAIIAN / PACIFIC ISLANDER:

_____

Percent that identify as AMERICAN INDIAN / ALASKAN NATIVE:

_____

Percent that identify as HISPANIC:

_____

Percent that identify as ASIAN:

Percent that identify as MULTIPLE RACE / ETHNICITY:

Percent that identify as OTHER / UNKNOWN:

29. Using your best estimate, indicate what percentage of service population this past year is represented by each of the following:

Note these are not mutually exclusive, so they mostly likely will NOT add up to 100%.

	Notknown	0%	1-4%	5-24%	25-49%	50-74%	75-100%
Veterans or active duty military	○	○	○	○	○	○	○
Homeless or housing insecure ○ (i.e. sleeping outside, car, shelter or with friends)	○	○	○	○	○	○	
Families with children	○	○	○	○	○	○	○
Disabled	○	○	○	○	○	○	○
Seniors (Over 55)	○	○	○	○	○	○	○
Limited or non-English speaking ○	○	○	○	○	○	○	

30. If your food bank serves individuals whose primary language is not English, please select the TOP FIVE most common.

- ☐ Amharic
- ☐ Arabic
- ☐ Cantonese
- ☐ Cambodian / Khmer
- ☐ Korean
- ☐ Laotian
- ☐ Mandarin
- ☐ Oromo
- ☐ Russian
- ☐ Spanish
- ☐ Somali
- ☐ Thai
- ☐ Tagalog
- ☐ Tigrinya / Tigrigna
- ☐ Vietnamese
- ☐ Other (please specify in next field)
- ☐ None

Please specify:

31. Any additional comments or concerns you would like us to know about the characteristics or demographics of your food bank service population?

Please share in the space below.

32. What is the estimated annual operating budget for your food bank?

Does NOT include other services or programs in your agency.

_____

33. Compared to one year ago, how has the total funding for your food bank changed?

This only refers to revenue / funds and does NOT include in-kind donations / food.

◯ Increased
◯ Decreased
◯ Stayed the same

What contributed to this change in funding?

(i.e. grant ended, got new funding from_____, etc.)

_____

34. Please identify the percent of your funding that comes from each of these sources.

This only refers to revenue / funds and does NOT include in-kind donations / food.

The total selected should be approximately 100%.

	0%	1-9%	≥10%	≥20%	≥30%	≥40%	≥50%	≥60%	≥70%	≥80%
Private grants (e.g. foundations)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
United Way of King County	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Individual Donations	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Corporate Donations	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
City of Seattle	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Federal / state grants	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Special fundraising events	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Other(s) (please specify in next field)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Please specify:

_____

35. How often does your food bank face the following funding challenges?

Select all that apply.

	Never	Occasionally	Frequently
Difficulty securing predictable, long term funding,			
Difficulty finding funding opportunities to apply for			
Difficulty finding time and resources to fill out grant applications			
Difficulty managing fundraising activities and events			
Difficulty finding funding for operational expenses (not food)			
Difficulty finding funding sources that would allow us to purchase food			
Difficulty maintaining diversified funding streams			
Other (please specify in next field.)			

Please specify:

_____

36. On average, how many paid, full-time staff members (including Americorps) are employed at your food bank whose primary time is dedicated to food bank related activities?

"Full-time" defined as ≥30 hours per week.
"Primary time" defined as over 50%.
"Food bank related activities" includes working in leadership / management, direct distribution, kitchen, delivery / driving, warehouse, procurement, outreach, advocacy, fundraising, development, etc.

_____

37. On average, how many paid, part-time staff members (including Americorps) are employed at your food bank whose primary time is dedicated to food bank related activities?

"Part-time" defined as < 30 hours per week.

_____

38. Would you like to increase staffing capacity at your food bank? (If you had the necessary resources: space, funds, staff to train and supervise.)

◯ Yes
◯ No

Complete this statement by selecting your TOP PRIORITY.

◯ Are committed for a longer period of time
◯ Can provide more hours per week
◯ Can provide specific tasks, positions or expertise (please specify in next field)
◯ Other (please specify in next field)

Please list the positions or expertise you would like to hire and describe how this would help you.

Please specify:

_____

39. On average, how many volunteers support your food bank related activities each week?

_____

40. On average, how many total volunteer hours are provided at your food bank each week?

_____

41. Would you like to increase volunteer capacity at your food bank? (If you had the necessary resources: space, funds, staff to train and supervise.)

◯ Yes
◯ No

Complete this statement by selecting your TOP PRIORITY.

◯ Are committed for a longer period of time
◯ Can provide more hours per week
◯ Can provide specific tasks, positions or expertise (please specify in next field)
◯ Other (please specify in next field)

Please list the positions or expertise you would like to find in your volunteers and describe how these would help you.

Please specify:

_____

42. When picking up food or distributing food, what transportation do you most frequently use?

Please rank your TOP THREE.

	Most frequent	2nd most frequent	3rd most frequent
Donor delivery			
Third party delivery (e.g. Food Lifeline, Operation Sack Lunch, NW Harvest, Solid Ground)			
Staff use their own vehicle			
Staff use a rented or agency vehicle			
Staff use a shared vehicle (with other agency or food bank)			
Volunteers use their own vehicle			

Volunteers use a rented or agency vehicle

Volunteers use a shared vehicle (with other agency or food bank)

---

43. What is the estimated square footage of your food bank's operation space?

This includes storage, processing / sorting, cooking, office, bathroom and distribution space.

_____

44. Please identify the number of refrigeration units you have from the types listed below.

	0	1	2	3	4	5	6	7+
Household (domestic) ◯ refrigerator Typically freezer combo.	◯	◯	◯	◯	◯	◯	◯	
Commercial reach-in refrigerator	◯	◯	◯	◯	◯	◯	◯	◯
Commercial walk-in refrigerator	◯	◯	◯	◯	◯	◯	◯	◯
Commercial open-air refrigerator	◯	◯	◯	◯	◯	◯	◯	◯

45. Please identify the number of freezer units you have from the types listed below.

If any are refrigerator combos, please include them again here, even if reflected on previous answers.

	0	1	2	3	4	5	6	7+
Household (domestic) freezer Typically refrigerator combo.								
Commercial reach-in freezer								
Commercial walk-in freezer								
Household (domestic) chest freezer								
Commercial chest Freezer								

46. On average, how many bags or boxes of food does your food bank distribute per month?

Does NOT include prepared meals (i.e. sack lunches or meal programs).
Please provide your best estimate.

_____

47. On average, how many pounds of food does your food bank distribute per month?

Does NOT include prepared meals (i.e. sack lunches or meal programs).
Please provide your best estimate.

_____

48. Where does your food come from?

Please identify the percentage (poundage) of your food that comes from each of these sources, based on a typical year.

The total selected should be approximately 100%.

	0%	1-9%	≥10%	≥20%	≥30%	≥40%	≥50%	≥60%	≥70%	≥80%
Northwest Harvest (donated)										
Northwest Harvest (purchased, SmartBuys)										
TEFAP / EFAP										
Food Lifeline (donated and/or grocery rescue										
Food Lifeline (purchased and/or Bulk buy)										
Miscellaneous grocery rescue & gleaning (NOT including Food Lifeline)										
Community donations / Food Drives / Events										
P-Patches and farmers markets										
Direct purchasing										
Other(s) (please specify in next field)										

Please specify:

_____

49. In general, what percent (poundage) of these foods categories are being distributed?

Does NOT include prepared meals (i.e. sack lunches or meal programs).

The total selected should be approximately 100%.

	0%	1-4%	≥5%	≥10%	≥15%	≥20%	≥25%	≥30%	≥35%	≥40%
Fresh fruits & vegetables	○	○	○	○	○	○	○	○	○	○
Other fruits & vegetables (canned or frozen)	○	○	○	○	○	○	○	○	○	○
Canned soups (stews, chili, etc.)	○	○	○	○	○	○	○	○	○	○
Meat, poultry, seafood (frozen, canned, fresh, processed)	○	○	○	○	○	○	○	○	○	○
Other protein (tofu, beans, nuts, nut butter)	○	○	○	○	○	○	○	○	○	○
Dairy (milk, yogurt, cheese, etc.)	○	○	○	○	○	○	○	○	○	○
Eggs	○	○	○	○	○	○	○	○	○	○
Grains & pastas	○	○	○	○	○	○	○	○	○	○
Bakery items (pastries, bread)	○	○	○	○	○	○	○	○	○	○
Processed items & snacks (chips, crackers, granola bars, cereal, etc.)	○	○	○	○	○	○	○	○	○	○
Soda & sugary drinks	○	○	○	○	○	○	○	○	○	○
Pre-made and deli items	○	○	○	○	○	○	○	○	○	○
Other (miscellaneous)	○	○	○	○	○	○	○	○	○	○

50. How would you like to change the amount you are distributing of the following categories?

	Start distributing	Increase	Decrease	Stay the same
FRESH fruits & vegetables	○	○	○	○
FROZEN fruits & vegetables	○	○	○	○
CANNED fruits & vegetables	○	○	○	○
Canned soups (stews, chili, etc.)	○	○	○	○
Meat, poultry, seafood (frozen, canned, fresh, processed)	○	○	○	○
Tofu and other meat-alternatives	○	○	○	○
Dried & canned beans	○	○	○	○
Nuts & nut butters	○	○	○	○
Dairy (milk, yogurt, cheese, etc.)	○	○	○	○
Eggs	○	○	○	○
Grains & pastas	○	○	○	○
Whole grain breads (includes: loaves, buns, tortillas, pita, naan, etc.)	○	○	○	○
Non-whole grain breads ○ (includes: same as above)	○	○	○	
Baked pastry / dessert items	○	○	○	○
Processed items & snacks (chips, ○ crackers, granola bars, cereal, etc.)	○	○	○	
Soda & sugary drinks	○	○	○	○
Dried spices	○	○	○	○
Oils, dressings, sauces, condiments	○	○	○	○
Pre-made and deli items	○	○	○	○
Baby food / formula	○	○	○	○
Pet food	○	○	○	○
Prepared meals (i.e. sack lunches and meal programs)	○	○	○	○
Other(s) (please specify in next field)	○	○	○	○

Please specify:

_____

51. Which categories or specific items are most requested or desired by members?

_____

52. Of all the food you receive, on average, what percent do you throw out or compost because it is (or becomes) unfit for consumption?

Provide your best estimate.
Do NOT include food offered but that you decline.

_____

53. What are the most common causes for why food you receive needs to be thrown out or composted?

Rank your TOP THREE.

	Most common	2nd most common	3rd most common
Food arrived unsafe to consume from the source (already was spoiled, dented, past expiration, etc.)			
Food arrived unsafe to consume because we lacked transport capacity to pick up when fresh (vehicles / drivers)			
Food arrived safe to consume but spoiled because we lacked sorting capacity (e.g. staff or staff time)			
Food arrived safe to consume but spoiled because we lacked refrigeration or freezer space			
Food arrived safe to consume but spoiled because we lacked the schedule and hours to redistribute in time			
Food arrived safe to consume but spoiled because it was not a popular item and wasn't selected			
Other (please specify in next field)			

Please specify:

_____

54. Based on the amount of food provided on a typical distribution day, how many DAYS do you estimate one visit to last an individual?

Does NOT include prepared meals (i.e. sack lunches or meal programs).

_____

55. What percentage of your members do you estimate also visit other food banks?

◯ 0%
◯ 1-4%
◯ 5-24%
◯ 25-49%
◯ 50-74%
◯ 75-100%
◯ Don't know

What is this estimate based on? (i.e. anecdotal, data tracking, etc.)

_____

56. What is your food bank's approach to members accessing other food banks?

_____

57. Would you be interested in expanding your food distribution if you had the necessary food and operational resources?

(This could mean an increase in the AMOUNT OF FOOD distributed and/or increase the NUMBER OF INDIVIDUALS served.)

◯ Yes
◯ Yes, if we had_____(please select from next field)
◯ No

Please specify:

Select all that apply.

☐ More space (to store, sort, distribute food)
☐ More refrigeration capacity
☐ More freezer capacity
☐ More shelves / racks for food storage
☐ More staffing / volunteers (to store, sort, distribute food)
☐ More funds to purchase more food
☐ More funds to pay for necessary operational costs
☐ More capacity for additional distribution hours
☐ More drivers to make the deliveries or pickups
☐ More vehicles to make the delivery or pickups
☐ More food donations to do so
☐ Other (please specify in next field)

Please specify:

_____

You indicated that you would expand your food distribution if you had more food donations.

Would you be interested in receiving more donations from any of the following?

Select all that apply.

☐ Restaurants
☐ Grocers or food distributors
☐ Donations (food drives)
☐ Other (please specify in next field)

Please specify:

_____

58. Indicate your level of agreement with this statement:

◯ Strongly agree
◯ Agree
◯ Slightly agree
◯ Slightly disagree
◯ Disagree
◯ Strongly Disagree

59. Indicate your level of agreement with this statement:

◯ Strongly agree
◯ Agree
◯ Slightly agree
◯ Slightly disagree
◯ Disagree
◯ Strongly Disagree

60. Within the last year, has your food bank had to make any of the following adjustments due to resource constraints?

Select all that apply.

☐ Reduce the selection of certain foods / variety available
☐ Reduce the amount of food given
☐ Reduce hours of operation
☐ Reduce staff or hours
☐ Prioritize who to serve
☐ Turn people away
☐ Other (please specify in next field)
☐ None

Please specify:

_____

61. Any additional comments or concerns you would like us to know about the sufficiency of the resources your food bank has to operate?

Please share in the space below.

62. Please note any requirements your food bank has for new members at their initial screening /sign-up?

Check all that apply.
This does NOT include separate home delivery requirements.

☐ Require I.D.
☐ Require proof of address
☐ Require proof of income
☐ Other (please specify in next field)
☐ No requirements

Please specify:

_____

63. Do you have a designated service area (defined by zip codes) for your food bank?

◯ Yes and we turn people away / refer them if not in our service area
◯ Yes but we only restrict access to federally funded foods if individual is outside service area
◯ Yes but we do not turn people away
◯ No we do not have a specific service area

64. How often does your food bank staff typically have to turn people away for ANYreason?

◯ Never
◯ Rarely
◯ Occasionally
◯ Regularly
◯ Frequently

When your food bank has to turn people away, what is the most common reason?

◯ Did not have required material
◯ Closed for holidays
◯ Not a distribution day
◯ Ran out of food
◯ Not TEFAP eligible
◯ Outside zip code requirements
◯ Other (please specify in next field)

Please specify:

_____

65. What zip codes are being served by your food bank?

☐ 98101	☐ 98102	☐ 98103	☐ 98104	☐ 98105	☐ 98106	☐ 98107	☐ 98108
☐ 98109	☐ 98110	☐ 98111	☐ 98112	☐ 98113	☐ 98114	☐ 98115	☐ 98116
☐ 98117	☐ 98118	☐ 98119	☐ 98121	☐ 98122	☐ 98124	☐ 98125	☐ 98126
☐ 98127	☐ 98129	☐ 98131	☐ 98133	☐ 98134	☐ 98136	☐ 98138	☐ 98139
☐ 98141	☐ 98144	☐ 98145	☐ 98146	☐ 98148	☐ 98154	☐ 98155	☐ 98158
☐ 98160	☐ 98161	☐ 98164	☐ 98165	☐ 98166	☐ 98168	☐ 98170	☐ 98174
☐ 98175	☐ 98177	☐ 98178	☐ 98181	☐ 98185	☐ 98188	☐ 98190	☐ 98191
☐ 98194	☐ 98195	☐ 98198	☐ 98199	☐ Others (please specify in next field)			

Please specify:

_____

66. On average, how many days a month is your food bank open for on-site fooddistribution?

Does NOT include mobile food bank or home delivery.

67. In general, when is your agency open for food distribution on-site?

	Monday	Tuesday	Wed.	Thursday	Friday	Saturday	Sunday
Closed	☐	☐	☐	☐	☐	☐	☐
7 - 8 a.m.	☐	☐	☐	☐	☐	☐	☐
8 - 9 a.m.	☐	☐	☐	☐	☐	☐	☐
9 - 10 a.m.	☐	☐	☐	☐	☐	☐	☐
10 - 11 a.m.	☐	☐	☐	☐	☐	☐	☐
11 a.m. - 12 p.m.	☐	☐	☐	☐	☐	☐	☐
12 - 1 p.m.	☐	☐	☐	☐	☐	☐	☐
1 - 2 p.m.	☐	☐	☐	☐	☐	☐	☐
2 - 3 p.m.	☐	☐	☐	☐	☐	☐	☐
3- 4 p.m.	☐	☐	☐	☐	☐	☐	☐
4 - 5 p.m.	☐	☐	☐	☐	☐	☐	☐
6 - 7 p.m.	☐	☐	☐	☐	☐	☐	☐
7 - 8 p.m.	☐	☐	☐	☐	☐	☐	☐

68. In general, is the schedule you provided above consistent throughout the month? (i.e.

"Meaning, the days and hours open are the same every week.)

◯ Yes
◯ No

Please clarify below how the schedule varies.

(i.e. "Our food bank is only open on the 3rd Monday of the month, but is open every Thursday and Friday.)

69. How frequently are individuals or households permitted to shop / receive food at your food bank?

◯ Multiple times per week
◯ Once per week
◯ 2-3 times per month
◯ Once per month
◯ Less than once per month

70. Do you think your schedule (days and hours open) is meeting the needs of your service community?

◯ Yes, definitely
◯ Yes, mostly
◯ Somewhat
◯ No, mostly not
◯ No, definitely not

What changes to your schedule do you think are needed?

What prevents your food bank from making these changes?

71. Is the food bank physically accessible by persons whose walking ability is limited?

◯ No, not accessible
◯ Yes, but limited or from alternative entry
◯ Yes, fully accessible main entrance and exit

72. Do you have parking spots available onsite for members? (In a lot or free street parking.)

◯ Yes, we have enough parking spots
◯ Yes, but not enough parking spots to meet member need
◯ No, we have no parking spots

How many parking spots are typically available for members?

_____

73. Indicate your level of agreement with this statement:

◯ Almost always true
◯ Usually true
◯ Occasionally true
◯ Usually not true
◯ Almost never true

74. How do you make people aware of your food distribution and delivery programs?

Select all that apply.

☐ Active in-person outreach (i,e. door to door, visiting agencies)
☐ Permanent signage outside building
☐ Printed posters or fliers at other agencies
☐ Website
☐ Newsletters
☐ Local paper
☐ Word of mouth
☐ Other (please specify in next field)

Please specify:

_____

75. Accessibility involves many things. We want to know about things that you think would MOST HELP your members fully utilize and connect to your food bank. What would make your food bank more accessible to members?

Please rank the TOP THREE.

	1st priority	2nd priority	3rd priority
Increase / start home delivery			
Increase / start mobile food bank site			
Increase options for transportation (more public transit / parking)			
Change location			
Change physical building structure (space, layout, ADA design)			
Have consistent language support services for non-English speaking individuals			
Other (please specify in next field)			

Please specify:

_____

76. Does your food bank regularly (every 1 to 3 years) collect input from food bank members on needs and preferences through any of the following?

- ☐ Survey(s)
- ☐ Group discussion(s)
- ☐ Formal one-on-one conversation(s)
- ☐ Informal one-one-one conversation(s)
- ☐ Short screening during sign-up
- ☐ Other
- ☐ None

77. Which of the following does your food bank currently have or do?

Select all that apply.

- ☐ Is involved with an advocacy or policy-oriented coalition.
- ☐ Sends key government officials updates at least annually
- ☐ Has a nutrition policy. (i.e. guidelines to determine which foods are purchased, or accepted / refused as donations)
- ☐ Has a food purchasing budget.
- ☐ Has an ethical purchasing policy or guidelines.
- ☐ Is involved in community organizing efforts.
- ☐ Is involved with grassroots campaigning.

78. Indicate your level of agreement with this statement:

- ◯ Strongly agree
- ◯ Agree
- ◯ Slightly agree
- ◯ Slightly disagree
- ◯ Disagree
- ◯ Strongly Disagree

79. What actions or unique role does your food bank take in helping members become food-secure so that they no longer need to utilize the food bank?

80. How often are these statements true for your food bank?

Almost always true Usually true Occasionally true Usually not true Almost never true

Food options that are healthy and nutritious

Food options for those with dietary limitations

Food options that meet cultural preferences

Connection to additional needed services / resources

Food options for non-English language speakers

A location(s) that is convenient to get to and find

A food distribution process that is respectful and dignified

A space that is easy to navigate for members who may be experiencing a physical impairment or medical condition (that makes mobility challenging)

A space that is easy to navigate for members who may be experiencing a social, emotional or behavioral disorder (that makes social interactions and / or crowds challenging)

81. If you were to allocate funding and resources to changing things at your food bank, what would you prioritize? Select your TOP THREE priorities.

Food amount Food types
Distribution model(s)
Delivery systems for pickups / deliveries
Staffing
Scheduling
Space
Refrigeration and freezers
Location
Parking
Other (please specify in next field)

Please specify:

82. What things would you like to see the food bank network as a whole do better in order to equitably reduce food insecurity in the City of Seattle?

83. Any additional comments or concerns you would like us to know about the impact of your food bank or the food bank network in Seattle?

Please share in the space below.

81. Any additional comments or concerns you would like us to know about the impact of your food bank or the food bank network in Seattle?

Please share in the space below.