

Healthier Food Retail: Beginning the Assessment Process in Your State or Community

This document was developed by the Centers for Disease Control and Prevention's (CDC's) Division of Nutrition, Physical Activity, and Obesity (DNPAO). It provides public health practitioners with an overview of how to develop an assessment of their state's or community's food retail environment.

Introduction

Residents with better access to supermarkets and limited access to convenience stores may have lower levels or reduced risk of obesity,¹⁻³ as well as healthier diets, including higher intakes of fruits and vegetables.⁴⁻⁶ Healthier foods are typically sold at supermarkets and a variety of other retail venues within a community, including, farmers' markets and specialty food stores (e.g., fruit and vegetable markets). However, there are many neighborhoods and communities without access to supermarkets,⁷ with this being more likely for residents of rural, minority, and lower-income neighborhoods.¹ For residents in these areas, convenience stores and other small grocery or "corner" stores may be more common than supermarkets.⁸ These stores generally stock little or no produce,⁸ and what healthy food is available may have higher costs.^{9,10} This may result in limited access to healthier foods, which has been associated with poor dietary quality.¹¹

As a public health practitioner, you may want to implement policies or programs to improve healthier food retail in your state or community. First, it is necessary to assess the retail environment to understand the current landscape and the disparities in geographic accessibility to healthier foods. Assessments can also provide data on the quantity, pricing, and quality of healthier food within existing retail establishments. Assessment is part of a comprehensive strategy and can be tailored to address the specific questions you need answered. Once a state or community has these data, strategies can be designed that target underserved areas, addressing issues that are the largest barriers to retail access.



National Center for Chronic Disease Prevention and Health Promotion
Division of Nutrition, Physical Activity, and Obesity

Data Sources for Food Retail

A variety of data sources exist that can help you understand your state or community's food retail environment. Both public and commercial data sets are available and data may be combined from multiple sources. Data sets vary by types of stores (e.g., supermarkets, corner stores, or farmers' markets) and what they can be used to measure (e.g., proximity to grocery stores or number of farmers' markets). Data sets also vary by level of data (e.g., county or sub-county units).

- **County-level data:** Many publicly accessible data are available at the county-level and may help states identify areas of potential need; however, counties are relatively large and diverse geographic areas that may hide community level differences.
- **ZIP-code-level data:** ZIP code data are sometimes publicly available. Although ZIP codes are designed for mail delivery purposes, they may be helpful for both states and communities to get a broad overview of their retail food landscape. However they are typically larger than what is traditionally considered a neighborhood.
- **Block-, block group-, and tract-level data:** These data have been used as proxies for neighborhoods and are designed to be homogenous. Data at this level provide fairly local level information about what retail venues may be easily accessible. The level of census data useful to you may be influenced by a variety of factors, including population density of the assessment area
- **Address (Geocoded) data:** These data provide a specific location for a retail store, allowing it to be placed on a map. The location may be identified by address or geographic coordinates. It is the most detailed level of data that you can use, and may need to be purchased from commercial companies.

There are some important considerations for the level of the data.

- **Size of geographic unit:** The larger the geographic unit, the more the data may mask differences within that unit, making it difficult to determine where the underserved populations are.

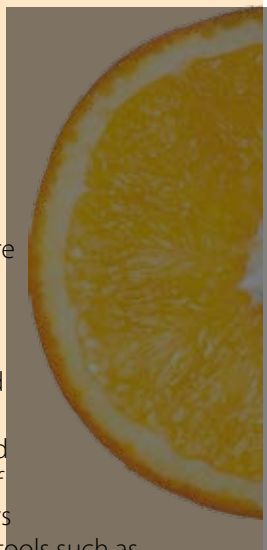


- **Boundaries of geographic unit:** With the exception of address or geocoded data, the boundaries of the geographic unit don't always correspond to shopping patterns. Creating buffer zones around geographic units may help approximate a more accurate shopping area. With specific locations for stores, you can create your own boundaries.
- **Use for state or community assessments:** If you are doing a state-level assessment, you may want to first look at county-level or other large geographic unit data. You can then map some regions or cities within the state in more detail as needed. The smaller geographic units, while desirable at a state level, may be more feasible for community or regional assessments.

Availability and Access

Availability most often refers to the physical location or proximity of food retail outlets. Sometimes the term is also used to describe the presence of healthier foods within stores. Access is a broader, more general concept that includes availability as well as the cost and quality of foods. However, you will see the words availability and access frequently used interchangeably.

Remember, when data sets show you the availability of stores or where they exist, it does not necessarily reflect whether healthier foods are also present (available), affordable, and of good quality at the identified locations. Assumptions are often made about access to healthier food based on knowledge and surveys of different types of stores. Practitioners or researchers may use assessment tools such as direct observation of various types of retail venues or in-store inventory audits in order to more fully understand healthier food retail access in a state or community. More information on these tools is provided later in this document.



Public Data Sets

Public use data sets may be used by anyone and are available free of charge. Below are a few examples of public data sets that can be used to assess general food retail.

- » **Name:** **United States Department of Agriculture Food Atlas.** **Web site:** <http://www.ers.usda.gov/foodatlas/>. **Level of data:** County-level. **Type of retail included:** Supermarkets or large grocery stores; supercenters or club stores; convenience stores; farmers' markets. **Description:** The Atlas

provides food environment indicators to examine factors related to food choices and diet quality. It also provides an overview of a community's ability to access healthy food. USDA Food Atlas has 168 indicators that are related to the food environment, including indicators on health and well-being, and community characteristics. Regarding retail, the Food Atlas provides indicators in the areas of access and proximity to grocery stores, availability of food stores, and local foods.

- » **Name:** **County Health Rankings.** **Web site:** <http://www.countyhealthrankings.org/>. **Level of data:** County-level. **Type of retail included:** Healthy food outlets, defined as all grocery stores as well as produce stands or farmers' markets. **Description:** This database ranks each county within the 50 states according to its health outcomes and the multiple health factors that determine a county's health. The county health rankings have an indicator under the "built environment" section called access to healthy food.
- » **Name:** **Policy Map, from The Reinvestment Fund.** **Web site:** <http://www.policymap.com/>. **Level of data:** Block group-level data. **Type of retail included:** Supermarkets. **Description:** Policy Map offers on-line mapping capabilities based on more than 10,000 indicators related to demographics, real estate, city crime rates, health, schools, housing affordability, employment, energy, and public investments. They have data available from a supermarket study on food access; a subset of this data is available for free. A subscription is required for detailed information.
- » **Name:** **United States Census Bureau's County and ZIP Code Business Patterns data.** **Web site:** <http://www.census.gov/econ/cbp/index.html>. **Level of data:** ZIP code-level, County-level, and Metropolitan and Micropolitan Statistical Areas. **Type of retail included:** Various business establishments, as defined by the North American Industry Classification System. **Description:** The US Census Business Patterns data provides the number of establishments, number of employees, and payroll data by industry, according to the 2007 North American Industry Classification System. These data can be used to track which ZIP codes, metropolitan areas, and counties have retailers located within their boundaries.
- » **Name:** **Agriculture Marketing Service (AMS), United States Department of Agriculture.** **Web site:** <http://apps.ams.usda.gov/FarmersMarkets/>. **Level of data:** Geocoded data available. **Type of retail included:** Farmers' markets. **Description:** This is based on AMS's most current listing of farmers' markets throughout the United States. A national map and a spreadsheet of the geographic coordinates of farmers' market locations in the United States are provided.

Commercial Data Sets

Commercial data directories can be purchased to identify the address and geographic coordinates of various types of retail stores, including food stores. References to some commonly-used commercial datasets, including those below, are found in published literature.^{7,12,13}

- Dun & Bradstreet, Inc.
- InfoUSA, Inc.
- National Establishment Time Series
- TD Linx

The provision of information about commercial data sources is for informational purposes only. It does not imply that CDC endorses any particular product over another or that CDC guarantees the quality of these products.

Considerations When Using Food Retail Data Sets

Public and commercial data sets are important for understanding the food retail environment. However, they have several limitations that should be kept in mind.

- Commercial datasets may be prohibitively expensive depending on the size of the area being studied.
- Commercial datasets are proprietary; therefore, companies provide only general information on how the data were collected and verified.
- Public and commercial datasets can have a time lag from when the data were collected and when you obtain or use the data.
- Public and commercial datasets can have data validity concerns, including issues with accurate geocoding and overcounting and undercounting of what stores actually exist.^{14,15} Misclassification of store types also can occur.

Combining several of the datasets from different companies or public data sources improves accuracy¹⁴ but can be labor intensive and costly. For these reasons, it may be more feasible to collaborate with a partner who has purchased these data already. While they will not be able to give you the data, they may be able to work with you on projects or analyze the data sets for you.



Defining Underserved

A food desert has been defined as an “area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities.”¹⁷ When using data for an assessment, you will need to define the specific parameters to designate an area as underserved or low-access. Examples can be found in the 2009 USDA Congressional Report on food deserts⁷; at <http://www.policymap.com> in their data from The Reinvestment Fund’s Supermarket Study of Low Access Areas; or on the USDA Food Deserts Web site with the definition developed by USDA, Department of Treasury and Department of Health and Human Services at <http://apps.ams.usda.gov/fooddeserts/foodDeserts.aspx>. Generally, the definition of underserved can vary significantly depending on the context of the area being assessed. Common definitions may use one or more of the following variables:

- Distance to the nearest supermarket or grocery store.
 - » Underserved often defined as greater than one mile urban or greater than ten miles rural.
- Low-income or poverty status.
- Household vehicle ownership.
- Race/ethnicity.

Depending on your state or community’s context, you will need to decide with your stakeholders the best variables to use for defining your underserved or low-access communities.



Direct Observation of Store Locations

To address data validity concerns, you may want to capture the most accurate and up-to-date view of locations of stores and include other venues not typically included in public or commercial data such as mobile vending. Validated instruments and methods have been developed for systematic direct observation or on-site verification of what stores actually exist.^{14,15}

Other Sources for Data

Other sources you may want to consider are

- State or local departments of health or agriculture: States and communities may collect food store data to comply with food safety regulations or inform decisions in their locales. Be sure to check with your state or local departments of health or agriculture to see if they have data sets available.

- Offices for Women, Infants and Children (WIC) Program and Supplemental Nutrition Assistance Program (SNAP): Data on these stores can provide an indication of where low-income residents have retail access. With recent changes to the WIC minimum stocking requirements, WIC-approved stores are now required to carry a certain amount of healthier foods.¹⁶ Your state's offices for WIC and SNAP benefits may have listings of all WIC- and SNAP-approved stores. If those are not available, the federal SNAP Web site has a retail locator program that maps out the closest SNAP-approved stores to a given address (<http://www.fns.usda.gov/snap/>), and the USDA Food Atlas (mentioned above) includes measures of WIC and SNAP stores available at the county level.
- USDA Food Desert Web site: The USDA has a Web site discussing food deserts and their identification. Included on this page is a list of census tracts which are considered a food desert per the definition they provide. Available at <http://apps.ams.usda.gov/fooddeserts/foodDeserts.aspx>.
- National Collaborative on Childhood Obesity Research (NCCOR) Catalog of Surveillance Systems: A web tool that provides a catalog of existing surveillance systems that contain data relevant to childhood obesity research, including local, state, and national systems. Includes information on some of the commercial datasets listed above, as well as other systems that might help your assessment. Available at <http://www.nccor.org/>.



Geographic Information System (GIS) Mapping

When starting your assessment, mapping retail availability is often the first step. GIS mapping is a tool to use to accomplish this. GIS is a system that can manage, analyze, and represent data that are linked to location (geocoded data). For assessment of healthier food retail, GIS can be used to map the locations of a variety of food retail options. The resulting GIS maps can be used either as a first step to help states or communities identify, visualize, and track potentially underserved areas, a tool to optimize placement of new resources to support healthy eating, or a tool to inform decision makers where intervention is necessary.

Working with Partners

To create GIS maps, many state and local public health practitioners will need to work with partners with mapping expertise. Let your mapping expert know the purpose of your assessment so that they can better compile the data you need. They also may have access to the geocoded data sets necessary for mapping. Here are some places to look for GIS expertise:

- City or county planning offices
- Universities, particularly the urban planning or agriculture departments
- The state departments of health or agriculture

If you are unable to find partners in your state or region, you can contact your CDC project officer for help in identifying an appropriate person to assist you.

Software

There are many types of software available that help geocode data, develop and create maps, or both. ESRI's ArcGIS is one of the most common softwares and has both geocoding and mapping capabilities. Other common software are EpilInfo, SAS, Instant Atlas, or MapInfo.

Map Features

When developing your data analysis plan and maps, there are a few considerations you need to think through or your GIS partner will walk you through.

- Geographic Boundaries: You will need to determine what geographic areas are important for your assessment and are to be displayed on your map. Important considerations are what level of detail is scientifically based and what is important for your stakeholders to see. Displaying data at the census block group- or tract-level can potentially show the most differences in access to retail, and can potentially provide the most scientifically-based information from which to take action. Or, you may want your map to display differences in access by ZIP codes

or congressional districts, depending on what will resonate the most with your stakeholders. Your project may also benefit by a combination; such as, showing variations in access across the whole state by county, and then mapping some regions or cities within the state in more detail.

- **Geographic Features:** You will also need to consider what geographic features (i.e., lakes, parks, interstates, mountain ranges) you would like on the maps. GIS offers many features that can be added in to your maps to best represent your state or region. You should determine the level of detail you need on your map to make your assessment and to help your stakeholders easily identify geographic locations.

Assessments of In-store Availability, Cost, and Quality

To better understand whether retail stores contribute good quality healthier foods at affordable prices to geographical areas, a more in-depth assessment can be conducted. The following assessments and tools are examples of ways to look at in-store availability, cost, and quality of healthier foods in your area. These are most feasible at the community-level.

- **Market basket audits:** These audits measure the food available within a store, and can also evaluate cost and quality of the food. Two examples are:
 - » *Nutrition Environment Measures Survey for Stores:* The measures in this survey include type and location of food outlets, availability of healthier and less-healthy options, and pricing. Available at <http://www.med.upenn.edu/nems/>.
 - » *USDA Economic Research Service Food Store Survey Instrument:* This instrument is part of the Community Food Security Assessment Toolkit. It assesses the availability and affordability of food in retail outlets. Available at <http://www.ers.usda.gov/Publications/EFAN02013/>.
- **Linear shelf space:** This method measures the actual space used on shelves for various types of food in stores.⁵
- **Store owner survey or interview:** In addition to objective assessments of store availability of healthier foods, other helpful information can be obtained directly from store owners. Store owners can be asked about the products they carry, their customers, and other questions. If they are willing, reviewing the store's supply inventories, such as looking at purchasing records, can provide details on a store's supply of healthier foods.

- » A sample store owner interview guide can be found at the Healthy Eating Research Corner Store Working Group Web site, from the Creating Healthy Corner Stores Program in Washington, D.C. Available at <http://healthycornerstores.org/resources/surveys/>.

Other resources that can provide ideas for measuring various aspects of food retail access can be found in a review article¹⁸ and these other resources.

- NCCOR Measures Registry. Available at <http://www.nccor.org>.
- Measures of the Food Environment provided by the National Cancer Institute (NCI). Available at <https://riskfactor.cancer.gov/mfe/>.
- Healthy Corner Stores Network Resources page. Available at <http://healthycornerstores.org/resources/tools-resources/>.

Comprehensive Food Environment Assessments

Assessing the food retail environment may provide one piece of a more comprehensive community food environment assessment. A more comprehensive study could include factors such as food production and distribution systems, transportation systems, food security, consumer perceptions, and state and local policies. Two resources that provide more detailed information on assessing the retail environment as well as many other food environment factors are:

- *The USDA Community Food Security Assessment Toolkit:* This report provides a toolkit of standardized measurement tools for assessing various aspects of community food security. Available at <http://www.ers.usda.gov/Publications/EFAN02013/>.
- *What's Cooking in Your Food System? A Guide to Community Food Assessment:* This guide is aimed at informing and supporting the development of Community Food Assessments as a tool for increasing community food security and creating positive change. Available at http://foodsecurity.org/pub/whats_cooking.pdf.



Methodological Considerations

As you embark on your assessment, keep in mind that your work could add to the growing knowledge base in this area. Also, remember that measurement that aims to be reliable and valid can provide stronger data and lead to more appropriate decision making. Use sound methods for testing and document your methodology well. Use reliable and valid tools when available, or include reliability and validity testing as part of any tools that you develop specific for your state or community. Information on reliability and validity testing of instruments is available on both the NCCOR Measures Registry and NCI Measures of the Food Environment web pages mentioned above.

State and Community Examples

Several states and communities have undertaken assessments of their food retail environment and reported their findings. Some examples with publicly available documents are provided below.

The assessments in Illinois, Louisiana, and New York City were facilitated by The Food Trust at <http://www.thefoodtrust.org/>. The Food Trust is a nonprofit organization that developed a comprehensive approach to increasing availability of healthier food in Pennsylvania, a framework they have implemented in other states.¹⁹

- **Illinois** – Map of underserved supermarket areas throughout Illinois as well as their state assessment report are available.
 - » Map: Available at <http://www.thefoodtrust.org/php/programs/super.market.campaign.php#illinois>.
 - » Report: *Stimulating Supermarket Development in Illinois: Healthier People, Healthier Communities, and a Healthier Economy*. Available at <http://www.commerce.state.il.us/NR/rdonlyres/1C40652A-90FD-4606-823A-68B786463273/0/ilreport.pdf>.
- **Louisiana** – A thorough report on the state's assessment of their food retail environment.
 - » Report: *Retail Study Group: Recommendations for a Louisiana Healthy Food Retail Financing Program*. Available at http://prc.tulane.edu/uploads/Report_Healthy_Food_Retail_Study_Group_final_27Feb2009.pdf.
- **Washington** – The report describes opportunities to improve access to healthy foods in Washington State, and includes maps of farmers' market and grocery store availability across the state.
 - » Report: *Opportunities for Increasing Access to Healthy Foods in Washington*. Available at http://depts.washington.edu/waaction/tools/featured_resources/access_report.html.

- **New York City, New York**: Findings from their city assessment are available in this report, which includes several maps of variables indicating greatest needs in terms of supermarket access.
 - » Report: *The Need for More Supermarkets in New York*. Available at <http://www.thefoodtrust.org/php/programs/super.market.campaign.php#newyork>.
- **Baltimore, Maryland**: The city of Baltimore has a Food Policy Task Force that issued a final report of recommendations that includes research on the food retail environment.
 - » Report: *Baltimore City Food Policy Task Force Final Report and Recommendations*. Available at <http://cleanergreenerbaltimore.org/uploads/files/Baltimore%20City%20Food%20Policy%20Task%20Force%20Report.pdf>.

Need assistance?

Contact your state's CDC project officer, who can facilitate requests for technical assistance or tailored guidance.

Need more information?

Visit the CDC DNPAO website to learn more information about the division and our funded state programs:
<http://www.cdc.gov/obesity/>



References

1. Larson N, Story M, Nelson M. Neighborhood environments: disparities in access to healthy foods in the U.S. *Am J Prev Med*. 2009;36(1):74–81.
2. Powell LM, Auld MC, Chaloupka FJ, O'Malley PM, Johnston LD. Associations between access to food stores and adolescent body mass index. *Am J Prev Med*. 2007;33(4 Suppl):S301–S307.
3. Morland K, Diez Roux AV, Wing S. Supermarkets, other food stores, and obesity: the atherosclerosis risk in communities study. *Am J Prev Med*. 2006;30(4):333–339.
4. Rose D, Richards R. Food store access and household fruit and vegetable use among participants in the US Food Stamp Program. *Public Health Nutr*. 2004;7(8):1081–1088.
5. Bodor JN, Rose D, Farley TA, et al. Neighbourhood fruit and vegetable availability and consumption: the role of small food stores in an urban environment. *Public Health Nutr*. 2008;11(4):413–20.
6. Morland K, Wing S, Diez Roux A, Poole C. Neighborhood characteristics associated with the location of food stores and food service places. *Am J Prev Med*. 2002;22(1):23–29.
7. United States Department of Agriculture. *Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences*. United States Department of Agriculture Economic Research Service. AP-036. 2009. Washington DC: United States Department of Agriculture, 2009. Available at <http://www.ers.usda.gov/Publications/AP/AP036/AP036.pdf>. Accessed February 3, 2011.
8. Bolen E, Hecht K. *Neighborhood Groceries: New Access to Healthy Food in Low-income Communities*. California Food Policy Advocates; 2003. Available at <http://www.cfp.net/Grocery.PDF>. Accessed February 3, 2011.
9. Kaufman P, MacDonald J, Lutz S, Smallwood D. *Do the Poor Pay More for Food? Item Selection and Price Differences Affect Low-Income Household Food Costs*. Washington (DC): U.S. Department of Agriculture: Economic Research Center; 1997.
10. Fulp RS, McManus KD, Johnson PA. Barriers to purchasing foods for a high-quality, healthy diet in a low-income African American community. *Fam Community Health*. 2009;32(3):206–217.
11. Franco M, Roux AV, Glass TA, Caballero B, Brancati FL. Neighborhood characteristics and availability of healthy foods in Baltimore. *Am J Prev Med*. 2008;35 (6):561–567.
12. Moore LV, Roux AV. Associations of neighborhood characteristics with the location and type of food stores. *Am J Public Health*. 2006; 96(2):325–331.
13. Neckerman KM, Bader MDM, Richards CA, et al. Disparities in the food environments of New York City public schools. *Am J Prev Med*. 2010;39(3):195–202.
14. Liese AD, Colabianchi N, Lamichhane AP, et al. Validation of three food outlet databases: completeness and geospatial accuracy in rural and urban food environments. *Am J Epidemiol*. 2010;172(11):1324–1333.
15. Sharkey JR, Horel S. Neighborhood socioeconomic deprivation and minority composition are associated with better potential spatial access to the ground-truthed food environment in a large rural area. *J Nutr*. 2008;138 (3):620–627.
16. Background: Revisions to the WIC Food Packages. U.S. Department of Agriculture Food and Nutrition Service Web site. Available at <http://www.fns.usda.gov/wic/benefitsandservices/revisionsfoodpkg-background.htm>. Accessed January 13, 2011.
17. Food, Conservation, and Energy Act of 2008, S 7527, 110th Cong, 2nd Session (2008).
18. Ohri-Vachaspati P, Leviton L. Measuring the food environment: a guide to available instruments. *Am J Health Promot*. 2010;24(6):410–26.
19. Karpyn A, Manon M, Treuhaft S, Giang T, Harries C, McCoubrey K. Policy solutions to the 'grocery gap'. *Health Affair*. 2010;29(3):473–80.

Links to non-Federal organizations are provided solely as a service to our users. These links do not constitute an endorsement of these organizations or their programs by CDC or the Federal Government, and none should be inferred. CDC is not responsible for the content of the individual organization Web pages found at these links.