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Low-Income and Low-Foodstore-Access Census Tracts, 2015–19

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Low-Income and Low-Foodstore-Access Census Tracts, 2015–19

Alana Rhone, Ryan Williams, and Christopher Dicken

Abstract

Limited access to foodstores or other sources of healthy and affordable food may impede the ability of some people living in the United States to eat a healthy diet. Income, vehicle access, and distance to the nearest foodstore may be barriers to food access for some. This report updates estimates of low-income and low-foodstore-access census tracts—as found in USDA, Economic Research Service's Food Access Research Atlas—using a 2019 directory of foodstores and 2014–18 American Community Survey data on household vehicle access and family income. The number of census tracts classified as low income (LI), based on the poverty rate and median income, decreased by 2 percent from 2015 to 2019. The number of census tracts classified as low access (LA) decreased for two out of three measures solely based on distance. For the fourth measure accounting for vehicle access, the number of LA census tracts shrank by 6.4 percent from 2015 to 2019. This decrease largely reflects higher levels of vehicle access across all U.S. housing units relative to 2015. Overlapping LI and LA tracts resulted in decreases in the number of low-income, low-access (LILA) tracts for two measures and increases in two measures. Overall, 33.2 percent of low-income individuals—those who have annual family income at or below 200 percent of the Federal poverty threshold for family size—lived more than 1 mile from the nearest supercenter, supermarket, or large grocery store. Furthermore, 33.6 percent of households participating in the USDA Supplemental Nutrition Assistance Program (SNAP) lived more than 1 mile from a foodstore in 2019 compared with 34.2 percent in 2015.

Keywords: supermarkets, grocery stores, low income, food access, low access, food deserts, low income and low access, census tracts, healthy and affordable food, foodstore, U.S. Department of Agriculture, USDA, Economic Research Service, ERS.

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Contents

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A report summary from the Economic Research Service *June 2022*

Low-Income and Low-Foodstore-Access Census Tracts, 2015–19

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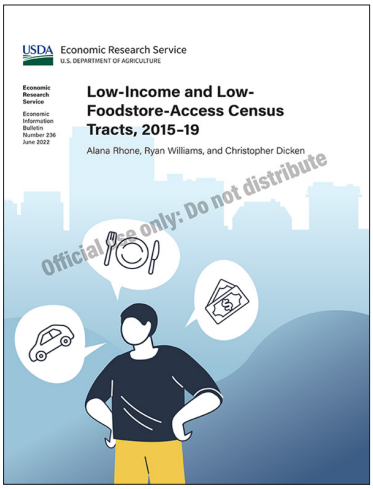
What Is the Issue?



Limited access to foodstores and other sources of healthy and affordable food may constrain people in the United States who are trying to achieve a healthy diet. Distance, lack of transportation, and/or limited resources can impact peoples' choices of stores to shop for food, their frequency of shopping, and the time and money it takes to travel to the nearest store. In 2019, 11 to 27 percent of the U.S. population lived in low-income (LI) and low-access (LA) census tracts. The Food Access Research Atlas (FARA) is a web-based mapping tool that allows users to investigate access to foodstores at the census-tract level. A census tract is a small statistical subdivision of a county that usually contains between 1,200 and 8,000 people. Individuals may use FARA to understand foodstore access in communities, examine the consequences for limited food access, and target interventions to improve access. Because FARA is a key tool for individual researchers, regular data updates help ensure users have access to the latest available data. Accordingly, this report updates previously reported 2015 data estimates with new 2019 estimates. Subsequently, it compares those estimates to assess changes over time in stores by store type and for low-income and low-access census tracts across four different measures of low income and low access (LILA). The report then breaks down these changes into shares that can be explained by changes in tract income versus changes in store access.

What Did the Study Find?

Low-income and low-access census-tract statuses are measured separately, with the overlap of both LI and LA tracts comprising low-income, low-access (LILA) tracts. Low-income status is given to census tracts that have a poverty rate of at least 20 percent or a median family income at or below 80 percent of the metropolitan area or State median income level. The study found:

- The number of census tracts classified as LI decreased from 30,870 in 2015 to 30,287 in 2019—by approximately 2 percent.

Low-access status is measured four ways for census tracts. Three of these measures are solely based on proximity to the nearest store, demarcated by using different distance thresholds for urban (0.5 or 1 mile) and rural (10 or

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20 miles) areas. The fourth measure of low-access (LA Vehicle Access and 20 miles)—which is equally applied to urban and rural areas—calculates the number of households without a vehicle located more than 0.5 mile from the nearest store, as well as the number and percent of people residing more than 20 miles from the nearest store. The ERS researchers found that the number of census tracts classified as LA decreased for the 0.5- (urban) and 10-mile (rural) and 1- (urban) and 20-mile (rural) measures, as well as for tracts without vehicle access or measuring more than 20 miles from a store. The time comparison showed:

- The number of census tracts classified as LA by the 1- and 10-mile measure increased slightly from 27,527 in 2015 to 27,548 in 2019.

Overlapping the LI and LA tract data found decreases from 2015 to 2019 in the number of LILA tracts for two measures and increases in the number of LILA tracts for two measures:

- With the 0.5- and 10-mile definition, there was a decrease of 309 LILA tracts (1.5 percent).
- With the 1- and 10-mile definition, there was an increase of 48 LILA tracts (0.5 percent).
- With the 1- and 20-mile definition, there was an increase of 35 LILA tracts (0.4 percent).
- With the LILA vehicle access and 20-mile definition, there was a decrease of 743 LILA tracts (6.8 percent).

In 2019, 40 percent of the U.S. population lived more than 1 mile from a foodstore; 30 percent lived within 0.5 miles; and 30 percent lived between 0.5 and 1 mile away. Analysis of the 2019 data by subpopulation showed minimal changes from the 2010 and 2015 estimates of distance to the nearest foodstore:

- Most racial and ethnic minorities lived closer to foodstores than White individuals. These estimates likely mirrored differences in the ethnic and racial composition in urban and rural areas.
- People with low incomes were closer to foodstores than those with moderate and high income at the 20th, median (0.69 mile to the nearest foodstore for low-income versus 0.88 mile to the nearest food store for moderate/high incomes), and 80th percentiles.
- Supplemental Nutrition Assistance Program (SNAP)-participating households were more likely than non-SNAP-participating households to be within 0.5 miles of the nearest foodstore and less likely to be more than 1 mile from the nearest store.

How Was the Study Conducted?

Updated estimates of LILA census tracts are based on a list of foodstores from 2019. This list is generated from two independent directories of stores—TDLinx (a proprietary source) and the Store Tracking and Redemption System (STARS), which has a directory of stores authorized to accept SNAP benefits. Income and vehicle-access data are from the U.S. Department of Commerce, Bureau of the Census 2014–2018 American Community Survey, and population data are from the U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census. Methods for estimating foodstore access for the U.S. population and aggregating these estimates to census tracts are similar to those used in Rhone et al. (2017), Ver Ploeg et al. (2012), and published in the Food Access Research Atlas (USDA, ERS, 2013). Because census tract boundaries in this report are identical to those used in the previous version of FARA, the new 2019 estimates can be compared with the 2015 estimates to understand which tracts changed in low-income, low-access status, or both across the years.

Low-Income and Low-Foodstore-Access Census Tracts, 2015–19

Introduction

Limited access to supermarkets, supercenters, grocery stores, or other sources of healthy and affordable food may impede the ability of some people living in the United States when trying to achieve a healthy diet (Rhone et al., 2017). The Food Access Research Atlas (FARA), developed by USDA's Economic Research Service (ERS), is a web-based mapping tool that allows users to investigate access to foodstores at the census-tract level using different measures, including distance to store, income, and vehicle access. With the help of FARA, policies such as the Healthy Food Financing Initiative (HFFI) identify and target communities that have limited food access by providing loans and grants to develop local grocery stores and other healthy food retailers. This report summarizes how foodstore access has changed from 2015 to 2019, including changes in the number of stores by store type, and the number and share of low-income and low-access census tracts across four different measures of low-income and low-access status. It then breaks these changes down into shares that can be explained by changes in tract income versus changes in store access. These updated estimates, with additional data and access measures, have been added to the mapping tool and can be downloaded from the FARA website.

Data and Methodology

The methods used here for estimating foodstore access for the U.S. population are similar to those used in Rhone et al. (2017) and Ver Ploeg et al. (2012). Estimates were aggregated to the census tract level, which aligns with earlier versions of the FARA. (USDA, ERS, 2017). Further, the same 2010 census-tract boundaries were used.

Consistent with previous reports, the researchers used supermarkets, supercenters, and large grocery stores as proxies for the complete set of stores selling a wide variety of healthy foods at affordable prices (USDA, 2009). Information on the location of supermarkets, supercenters, and large grocery stores was obtained from two directories—Store Tracking and Redemption System (STARS), which has stores authorized to accept SNAP (Supplemental Nutrition Assistance Program) benefits, and stores in TDLinx, a Nielsen directory. The term "foodstore" will be used throughout the report to collectively refer to the three store types, except where store types are independently discussed. The TDLinx store list is a running list of stores open on June 15 of each year. The directory of SNAP-authorized stores is extracted from the STARS[1] database, which is maintained by the USDA's Food and Nutrition Service (FNS). For this analysis, the directory only included authorized stores in the system as of June 15, 2019.

As in the 2017 report, this report excluded military commissaries and warehouse club stores, such as Sam's Club, Costco, and BJ's. Although such stores offer a wide variety of foods and accept SNAP benefits, military commissaries are only accessible to a select group of individuals and club stores are only available to those who pay an annual membership fee, which may be a barrier for people with income constraints. Drug stores, dollar stores, and convenience stores were also excluded. Even though some of these store types sell a variety of fruits and vegetables, their offerings vary widely. Excluding these types of food retailers from our store directory is likely to result in an overestimate of the number of people lacking access to nutritious food. However, the USDA, Food and Nutrition Service's estimates show 84 percent of SNAP redemptions were at supermarkets, supercenters, and large grocery stores in 2019 (USDA, FNS, 2020).

Spatial analysis, string matching, and manual review methods were used to merge the STARS and TDLinx datasets to construct a combined-store directory. This combined directory encompasses all the supercenters, supermarkets, and large grocery stores from each dataset, with duplicates eliminated to avoid double counting. This matching process identified STARS and TDLinx stores within a 1/3-mile radius of one another or within the same ZIP Code. An automated string-matching algorithm was used to identify exact or similar store name-address matches, which were subsequently verified manually. Foodstores from either the STARS or TDLinx systems—without a match in the other system—were included in the final combined directory, totaling 45,233 foodstores in the 2019 merged directory. Most foodstores (36,425) were in both data sources. Of the remaining stores, 5,170 were exclusive to TDLinx and 3,638 were found only on the STARS list.

Data on population and characteristics were obtained from the U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census. Information on income and household vehicle availability was obtained from the Census Bureau 2014–18 American Community Survey (ACS). Population data were from the

[1] STARS superstores/supercenters are very large supermarkets, "big box" stores, superstores, and food warehouses primarily engaged in retail sale of a wide variety of grocery and other store merchandise. STARS supermarkets are establishments commonly known as supermarkets, foodstores, grocery stores, and food warehouses primarily engaged in retail sale of an extensive variety of grocery and other store merchandise, with 10 or more checkout lanes with registers, barcode scanners, and conveyor belts. A STARS large grocery store carries a wide selection of the four staple food categories. About 110 STARS stores were not classified in any of these 3 categories, but upon matching to a store in TDLinx and further inspection through Google Maps and store websites, these stores appeared to be full-service grocery stores with all major grocery departments and weekly sales fliers. TDLinx uses more expansive and different store classifications than STARS. TDLinx stores include those in the following subcategories: Grocery–Conventional; Grocery–Limited Selection; Grocery–Supercenter; Grocery–Natural/Gourmet; Grocery–Warehouse and Mass Merchandisers such as Target, Big Kmart, etc.

2010 Census because ACS data for these characteristics—though available at the census tract level—are less precise. Population counts, occupied housing unit counts, and other population characteristics (i.e., age, race, and ethnicity) from the 2010 Census were allocated to 0.5-kilometer-square grids (Rhone et al., 2017; Ver Ploeg et al., 2012).[2] For income and vehicle access, tract level 2014–2018 share estimates of housing units without vehicles and the share of individuals below 200 percent of poverty were multiplied by the 2010 housing-unit counts and population counts, respectively, to estimate the number of households without vehicles and the number of people with income at or below 200 percent of the poverty level.[3] These numbers and shares were then similarly aggregated down to the 0.5-kilometer-square grid level to provide a fuller picture of population distribution within a census tract so access and populations could be described. From here, the methods to estimate distance to the nearest foodstores for the overall population and for subgroups have been the same as in previous reports.

Finally, to estimate whether a tract is low income, 2014–2018 ACS tract data were used to directly measure whether the tract: (1) has a poverty rate of 20 percent or greater; (2) is at or below 80 percent of the greater Metropolitan Statistical Area (MSA) median family income or the State's median family income; or (3) has a median family income at or below 80 percent of the State's median family income if outside of a MSA (Community Development Financial Institutions Fund, 2000). This was the same measure of low-income census tracts used for eligibility for the U.S. Department of Treasury's New Markets Tax Credit (NMTC), and we have used this measure in previous versions of FARA.

Using Census Bureau ACS estimates, the number of low-income (LI) census tracts decreased from 30,870 in 2015 to 30,290 in 2019 (table 3), which may reflect higher median family incomes from 2015 to 2019. Median household income rose from $55,775 in 2015 to $65,712 in 2019 (U.S. Department of Commerce, Bureau of the Census, ACS, 2020).

To estimate if a tract is low access, the number and share of people more than 0.5 or 1 mile (urban areas) from a foodstore or 10 or 20 miles (rural) was estimated based on the location of foodstores relative to the grids.[4] Urban census tracts are areas with more than 2,500 people, and rural areas are sparsely populated areas with fewer than 2,500 people. These estimates were aggregated at the tract level for all grids within a tract. The same criteria for demarcating low access used in the previous FARA were applied for each of the four measures of low income and low access (LILA):

LILA 0.5 and 10 miles: LI census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 0.5 miles from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 10 miles if in a rural area.

LILA 1.0 and 10 miles: LI census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 1.0 mile from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 10 miles if in a rural area.

[2] Estimates of access by age, race, ethnicity, and SNAP participation status are provided on the FARA mapping tool but are not summarized in this report.

[3] Access estimates by individual income are not presented here but are available on the FARA mapping tool. Access estimates by tract-level income are presented in this report. We are not able to downcast median income to the grid cells, so our definition of "low income" for individuals differs from our definition of low income for census tracts. For individual income, we use the share at or below 200 percent of poverty to get closer to the more inclusive tract-level definition of low income.

[4] As with previous versions of these estimates, both number and share are used to determine low-access status to accommodate tracts with (1) low populations but where a substantial portion of the tract has low access and (2) with a large number of people who are low access but with only a small share of the total tract population. In addition, in the original food desert locator, which only had 1- and 10-mile demarcations, stakeholders of the Atlas responded that those demarcations were either too long or too short. As a result, the 0.5 mile- and 20-mile measures were added.

LILA 1.0 and 20 miles: LI census tracts where a significant number (at least 500 people) or share of the population (at least 33 percent) is more than 1.0 mile from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 20 miles if in a rural area.

LILA Vehicle Access[5] and 20 miles: LI census tracts where a significant number of housing units (at least 100) do not have a vehicle and are more than 0.5 mile from the nearest supermarket, supercenter, or large grocery store; or low-income census tracts where a substantial number or share of people (at least 500 or 33 percent) are more than 20 miles from the nearest store.

These measures are estimated and mapped to give researchers and other data users additional ways to consider food-access limitations for census tracts. Because census tract boundaries have not changed since 2015, we are able to directly compare the number of 2015 census tracts that are low income, low access, and both low income/low access with 2019 data. Table 1 shows the data source of each population characteristic used in this report, as well as the geographic level in which the estimates are drawn.

Table 1
Sources for demographic and economic data

Data	Data Source	Source geographic level
Store directory	2019 TDLinx and 2019 STARS	Latitude and longitude coordinates
Total population	Census 2010	Block
Housing units	Census 2010	Block
Vehicle access	ACS, 2014-2018	Block group
Income	ACS, 2014-2018	Block group and tract

STARS = Store Tracking and Redemption System.
Note: U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census counts of the total population and number of housing units are used even though 2014–2018 U.S. Department of Commerce, Bureau of the Census American Community Survey (ACS) estimates are available for both. The researchers used the decennial estimates instead because of high standard errors in the ACS estimates. Income and vehicle access data are not available from the decennial census, so we use the most recent version of ACS data, 2014–2018. Census tract boundaries are the same for both years.
Source: Compiled by USDA, Economic Research Service.

[5] Vehicle availability is defined in the American Community Survey as the number of passenger cars, vans, or trucks with a capacity of 1 ton or less kept at the home and available for use by household members. The number of available vehicles includes those vehicles leased or rented for at least 1 month, as well as company, police, or Government vehicles that are kept at home and available for nonbusiness use. This indicator was applied equally to both urban and rural census tracts.

Number of Foodstores, 2015 and 2019

The total number of supercenters, supermarkets, and large grocery stores in the USDA, ERS directory increased from 44,243 stores in 2015 to 45,233 in 2019, or by approximately 2 percent (table 2). There has also been a steady increase in the total number of stores from 2010 to 2019. There was a significant gain in stores from 2010 to 2015. The extent to which this gain reflects real increases in the number of stores or changes in the matching methodology and improvements in the STARS data classifications is uncertain. When only using the TDLinx store directory data—which have consistently defined store classifications over time—before matching the data to the STARS directory, the researchers observed an increase of about 682 stores in the "supermarket" channel (from 40,913 to 41,595) between 2015 and 2019. When only looking at SNAP stores—before matching to TDLinx—the researchers saw a decrease of 274 stores in the 3 large-store categories (from 40,337 to 40,063) from 2015 to 2019. According to the USDA, FNS 2019 Year End Report, the number of authorized stores had decreased by 4 percent since 2015 (USDA, FNS, 2020). The decrease in SNAP stores could also be due to changes in how SNAP stores were classified; between 2015 and 2019, improvements to the classifications and calculations for SNAP store types were made in the STARS database.

Even though the number of supermarkets and large grocery stores increased, the number of supercenters declined by 522 stores. The observed increase in supermarkets and large grocery stores and decrease in supercenters may be due to retailer competition across price, quality, and convenience. Supermarkets still outnumbered other types of large foodstores and made up most stores across all census tracts in 2019, accounting for 77 percent of the total number of stores. Large grocery stores—the store type that increased the most—nearly doubled across all census tracts from 2015 to 2019.

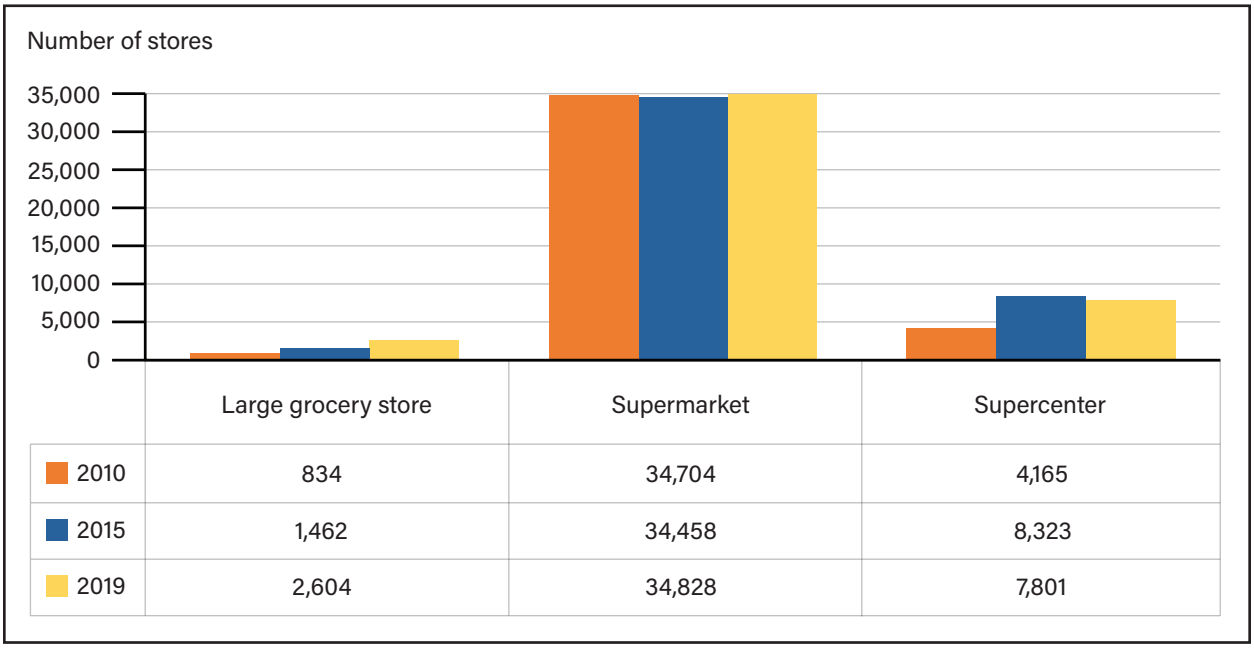
Table 2
Number of stores by store type, 2015 and 2019

	2015		2019	
Store Type	Number	Percent	Number	Percent
Large grocery store	1,462	3.3	2,604	5.8
Supermarket	34,458	77.9	34,828	77.0
Supercenter	8,323	18.8	7,801	17.2
Total	44,243	100.0	45,233	100.0

Source: USDA, Economic Research Service using combined store data for each year from TDLinx and Store Tracking Redemption System (STARS).

The number of large grocery stores has steadily increased between 2010 and 2019 (figure 1). Between 2010 and 2015, there was a significant increase in supercenters, followed by a slight decrease in 2019. Since 2010, supermarkets have been the majority store type.

Figure 1
Number of stores by store type in all census tracts, 2010, 2015, and 2019



	Large grocery store	Supermarket	Supercenter
2010	834	34,704	4,165
2015	1,462	34,458	8,323
2019	2,604	34,828	7,801

Source: USDA, Economic Research Service using combined store data for each year from TDLinx and Store Tracking Redemption System (STARS).

Changes in Distance and Other Indicators of Food Access, 2015 and 2019

The number of census tracts classified as low income decreased from 30,870 in 2015 to 30,290 in 2019, a 2-percent change (table 3). This reflects improvements in household income, whereas from 2010 to 2015, the number of LI census tracts increased (Rhone et al., 2017). The number of low-access (LA) census tracts decreased from 2015 to 2019 for each measure of low access except the "LA 1- and 10-mile" measure, where a significant number or share of the population is more than 1.0 miles from the nearest supermarket, supercenter, or large grocery store if in an urban area or more than 10 miles if in a rural area. Almost the same number of tracts were low access using the 1- and 20-mile demarcations—24,709 in 2019 compared with 24,710 in 2015 (table 3). Decreases also occurred in the share of low-access tracts using the 0.5- and 10-mile definitions in addition to the LILA vehicle access and 20-mile definition. These estimates show improvements in the proximity of foodstores to the total population, regardless of income. The number of low-access tracts for the LA 1- and 10-mile measure marginally increased from 27,527 census tracts in 2015 to 27,548 in 2019, a 0.07-percent change. The slight increase could be a result of grocery store closings in an area. In addition, the increase in low-access census tracts can be attributed to the increase in census tracts that have a significant number or share of people that live more than 1 mile away from the nearest grocery store in urban areas. The number of census tracts where a significant number or share of people lived more than 10 and 20 miles from the nearest grocery store decreased.

Vehicle availability remains an important measure of how readily a household can access a foodstore. Most households drive their own vehicle to do their regular food shopping (Ver Ploeg et al., 2017). When vehicle availability and proximity to a foodstore are considered together (LILA Vehicle Access and 20-mile definition), estimates have shown a slight decrease in the share of low-access tracts, from 22.9 percent in 2015 to 21.5 percent in 2019 (table 3). The Census Bureau, American Community Survey (ACS) has shown that the share of housing units without vehicles decreased from 9.2 percent of all housing units in 2015 to 8.6 percent in 2019 (U.S. Department of Commerce, Bureau of the Census, ACS, 2020). Not all of these households are far from a foodstore, but the share of housing units without a vehicle that were more than 0.5 mile from a store also decreased from 4.2 percent of all housing units in 2015 to 4.0 percent in 2019.

Table 3

Low-income and low-access (LILA) census tracts across four measures of low access, 2015 and 2019

Access measure	LILA 1 and 10		LILA 0.5 and 10		LILA 1 and 20		LILA vehicle access and 20 miles	
	2015	2019	2015	2019	2015	2019	2015	2019
Low-Income (LI)								
Number	30,870	30,287	30,870	30,287	30,870	30,287	30,870	30,287
Percent	42.6	41.8	42.6	41.8	42.6	41.8	42.6	41.8
Low Access (LA)								
Number	27,527	27,548	49,725	49,521	24,710	24,709	16,638	15,574
Percent	38.0	38.0	68.6	68.3	34.1	34.1	22.9	21.5
Low-Income and Low Access (LILA)								
Number	9,245	9,293	20,556	20,247	8,105	8,140	10,869	10,126
Percent	12.7	12.8	28.3	27.9	11.2	11.2	15.0	14.0
Total tract count: 72,531 populated tracts								

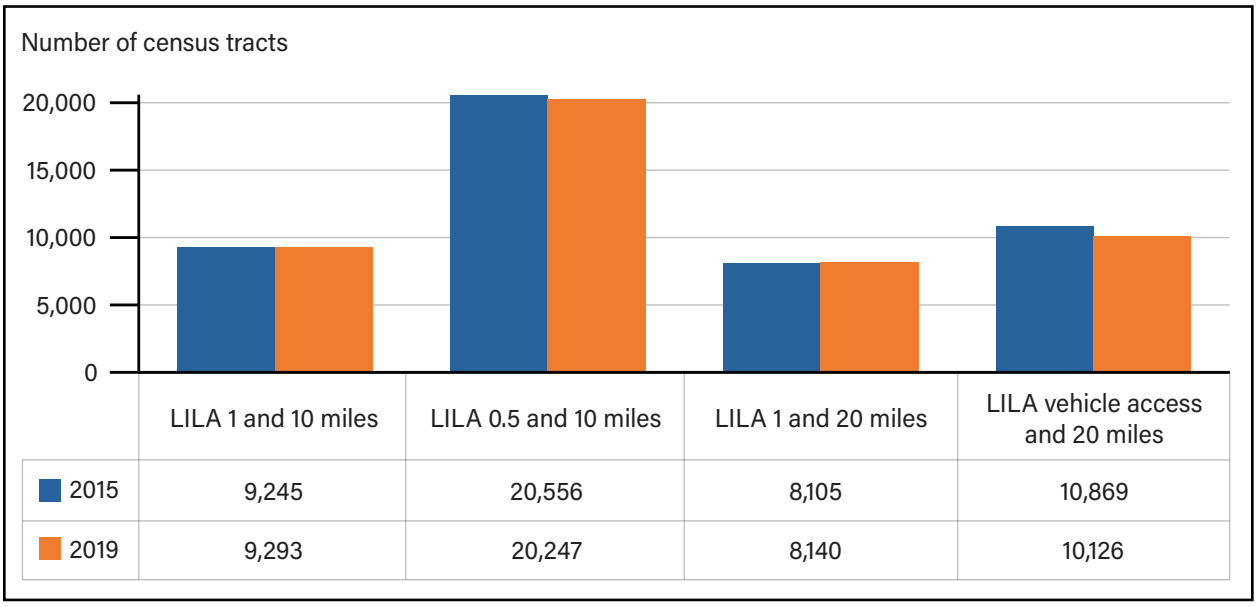
Notes: LILA at 1 and 10 miles = Low-income census tracts where a significant number or share of the population is more than 1 mile (urban areas) or more than 10 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA at 0.5 and 10 miles = Low-income census tracts where a significant number or share of the population is more than 0.5 mile (urban areas) or more than 10 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA at 1 and 20 miles = Low-income census tracts where a significant number or share of the population is more than 1 mile (urban areas) or more than 20 miles (rural areas) from the nearest supermarket, supercenter, or large grocery store. LILA using vehicle access and 20 miles = Low-income census tracts where a significant number of households do not have a vehicle and are more than 0.5 mile from the nearest foodstore; or a significant number or share of the population are more than 20 miles from the nearest foodstore, regardless of vehicle availability.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census data and 2014–2018 American Community Survey data.

When the low-income and low-access estimates are combined, results show small increases in the number of LILA census tracts for two measures: LILA 1 and 10 miles and LILA 1 and 20 miles (figure 2). For those two measures, the increase in the number of LILA tracts may be attributed to more low-access tracts rather than to the low-income status of tracts. The drop in the number of LILA 0.5- and 10-mile census tracts—as well as of LILA vehicle-access and 20-mile tracts—is due to a decrease in the number of low-income census tracts, along with a decrease of people experiencing low access and housing units without a vehicle that are more than 0.5 mile from a foodstore.

Table 3 also illustrates the variation across the four proximity measures in the degree to which low-access census tracts are also low income. For the LILA vehicle-access and 20-mile category in 2019, approximately 65 percent of the low-access tracts are also low income. The overlap for the other three measures is between 33 and 41 percent. This observation is unsurprising given the correlation between income and vehicle ownership.

Figure 2
Number of low-income and low-access (LILA) census tracts, 2015 and 2019

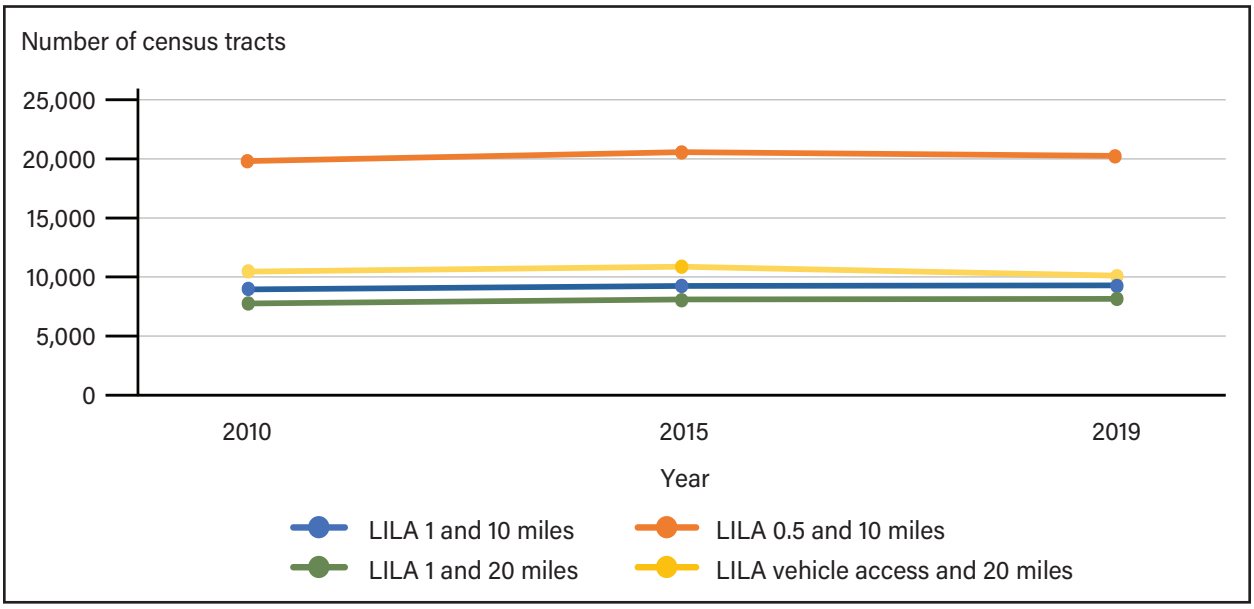


	LILA 1 and 10 miles	LILA 0.5 and 10 miles	LILA 1 and 20 miles	LILA vehicle access and 20 miles
2015	9,245	20,556	8,105	10,869
2019	9,293	20,247	8,140	10,126

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census data and 2014–2018 American Community Survey data.

From 2010 to 2019, there was little change in the number of LILA census tracts (figure 3). From 2010 to 2015, all LILA measures saw an increase in LILA census tracts.

Figure 3
Number of low-income and low-access (LILA) census tracts, 2010, 2015, and 2019



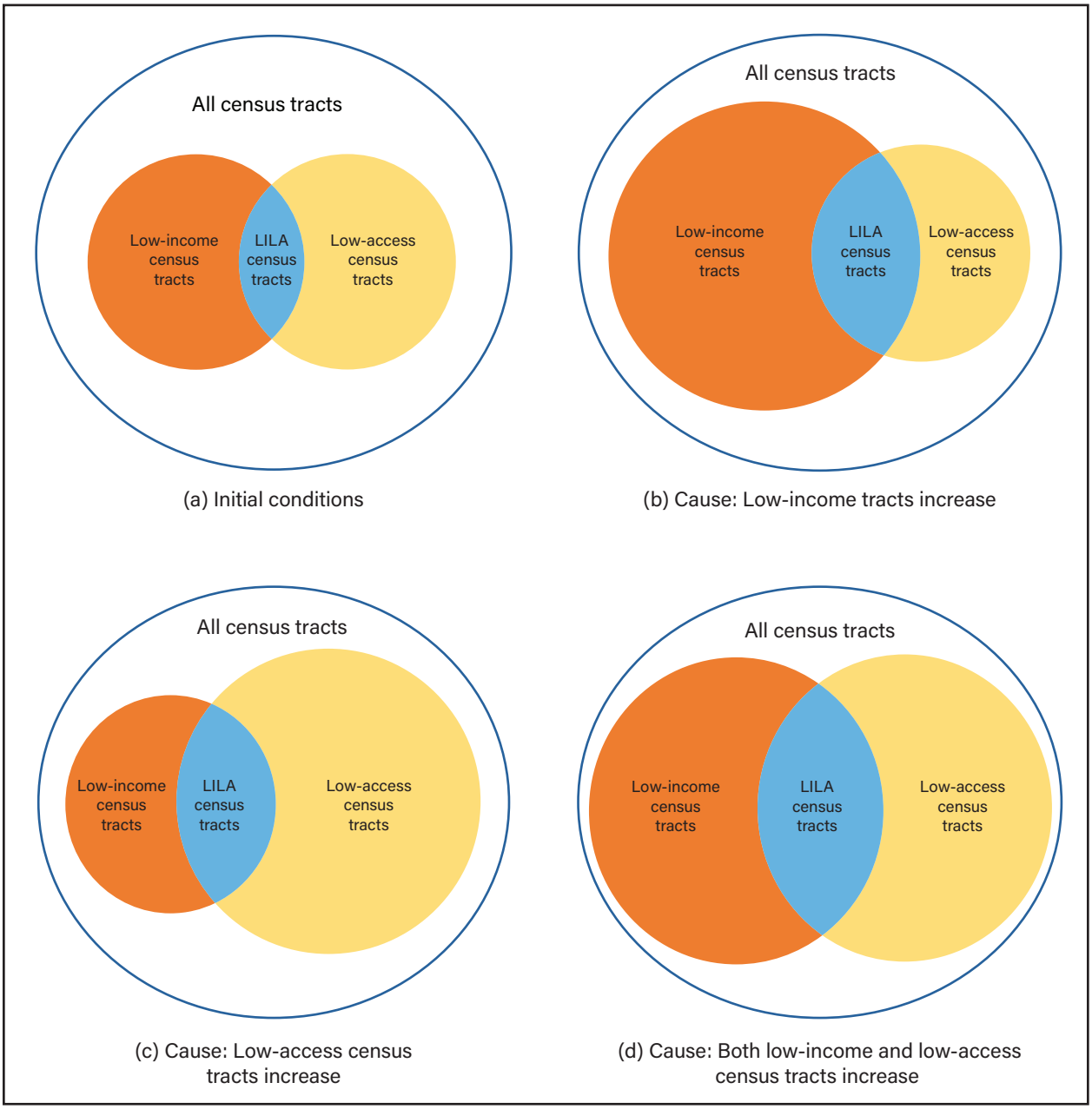
LILA = Low income and low access.
Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census data and 2014–2018 American Community Survey data.

Changes in Low-Income, Low-Access Tracts Between 2015 and 2019

The number of LILA census tracts increased between 2015 and 2019 for two measures—LILA 1 and 10 miles and LILA 1 and 20 miles. Given the definition of LILA, which relies on both income and access criteria, there are various ways the number and proportion of LILA census tracts could change over time. Figure 3 presents a series of Venn diagrams illustrating a starting point (diagram "a") as well as three possible scenarios under which the number of census tracts classified as LILA increases. This section identifies how each of these potential causes—an increase in the number of low-income census tracts, an increase in the number of low-access census tracts, or an increase in both—contributes to the increase in LILA tracts observed between 2015 and 2019 (tables 3 and 4).

Table 4 compares 2015–2019 changes in LILA status for four low-access measures (LILA 1 and 10, etc.), with one of four outcomes for each: (1) LILA in both years, (2) LILA in 2015 but not in 2019, (3) not LILA in 2015 but LILA in 2019, and (4) not LILA in either 2015 or 2019. For tracts where LILA status changed, we indicated whether it was a change in low-income status, low-access status, or both.

Figure 4
Possible scenarios for an increase in low-income, low-access (LILA) census tracts



Source: USDA, Economic Research Service.

The majority of the 72,531 populated tracts[6] did not change status—that is, they were either LILA in 2019 or not previously LILA in 2015. This holds true for each of the four measures of low access, with no changes to LILA status for populated tracts between 65,000 and 69,000. Even though tracts that are not LILA make up the majority of all tracts, tracts that are LILA in both years account for 23 percent of all tracts using the 0.5- and 10-mile demarcations and for 8–10 percent of tracts using the other three measures (table 4).

Table 4
Changes in decomposition in low-income, low-access (LILA) tracts for four low-access measures, 2015 and 2019

	LILA 1 and 10		LILA 0.5 and 10		LILA 1 and 20		LILA vehicle	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
LILA in both 2015 and 2019	6,770	9.3	16,675	23.0	6,013	8.3	7,036	9.7
LILA in 2015 but not in 2019:								
Not low income in 2019, but low access 2019	1,481	2.0	2,942	4.1	1,220	1.7	710	1.0
Not low access in 2019, but low income 2019	834	1.1	840	1.2	737	1.0	2,634	3.6
Not low access nor low income 2019	160	0.2	99	0.1	135	0.2	489	0.7
Tracts no longer LILA	2,475	3.4	3,881	5.4	2,092	2.9	3,833	5.3
LILA in 2019 but not in 2015:								
Not low income in 2015, but low access in 2015	1,450	2.0	2,768	3.8	1,167	1.6	642	0.9
Not low access in 2015, but low income in 2015	932	1.3	731	1.0	853	1.2	2,100	2.9
Not low access nor low income 2015	141	0.2	73	0.1	107	0.1	348	0.5
New LILA tracts	2,523	3.5	3,572	4.9	2,127	2.9	3,090	4.3
Net change in LILA tracts	48	0.1	-309	-0.4	35	0.0	-743	-1.0
Not LILA in 2015 or 2019	60,763	83.8	48,403	66.7	62,299	85.9	58,572	80.8
Total tract count: 72,531 populated tracts								

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census data and 2014–2018 American Community Survey data.

Net increases of new LILA tracts for the 1- and 10- mile and 1- and 20-mile measures reflect the general increase in LILA tracts since 2015, consistent with table 3. Changes in access explain the net increase in LILA for these two measures. Access worsened in more tracts than it improved in 2019, which led to the net increase.

By contrast, income across the four measures improved in 2019 by a significant number and share of census tracts. This has been consistent with the decrease in low-income tracts shown in table 3. By 2019, there was a net increase of 48 new LILA tracts using the 1- and 10-mile definition—2,475 tracts that were LILA in 2015 but not in 2019, and 2,523 tracts that became LILA between 2015 and 2019 (table 4). Of those that became LILA tracts, 1,450 were already low access in 2015 but then also became low income by 2019. Far fewer tracts—932—were already low-income tracts in 2015 but became low access by 2019. Only 141 tracts under

[6] A small number of census tracts have no people living in them.

these distance parameters had both their LI and LA status worsen in 2019. For tracts that were LILA in 2015 but not in 2019, 1,481 saw their incomes improve, 834 saw their access improve, and 160 experienced both improved access and income.

The LILA 0.5- and 10-mile measure, as well as the vehicle-access and 20-mile measure, showed access and income changes that explain the changes in LILA status for census tracts no longer considered LILA tracts. Of the 3,090 tracts that became LILA using the vehicle-access and 20-mile measure in 2019, 2,100 were low income but not low access in 2015, but they became low access by 2019. There were 642 low-access tracts that were not low income in 2015 but became low income by 2019. Of the 3,833 tracts that were LILA in 2015 but not in 2019—as defined by the LILA vehicle access and 20-mile measure—the majority (2,634) changed status because access improved. Income improved for 710 tracts, and 489 experienced both improved access and income. Of the four low-access measures, the LILA vehicle-access and 20-mile measure illustrated the greatest change in the access segment of the low-income and low-access measure. This observation in change is likely due to a decrease in the number of housing units without vehicles that are more than 0.5 mile from a store.

Individuals and Households in Low-Income and Low-Access Census Tracts

Some individuals living in a census tract designated as LILA may have no difficulty accessing healthy and affordable food, despite living in a tract where many residents are low income and live relatively far from a foodstore. The same applies to vehicle access. Two neighbors who are equidistant from a foodstore or other source of healthy food may have dissimilar access if one regularly uses a car and the other does not.

Table 5 illustrates these distinctions by summing the total number of people and housing units in LILA census tracts (column 1) and also the number of people and housing units that are low access only for each of the low-access measures (column 3). For the three proximity-only measures—1- and 10-mile , 0.5- and 10-mile, and 1- and 20-mile measures—about half of the population that resides in LILA tracts (column 1) had limited access to a foodstore in 2019 (column 3). An estimated 18.8 million of the 39 million individuals in LILA census tracts, or 6.1 percent of the U.S. population, had limited access to a foodstore using the 1- and 10-mile definition. An estimated 53.6 million of the 82.1 million individuals in LILA census tracts, or 17.4 percent of the U.S. population, had limited access to a foodstore at 0.5 and 10 miles. An estimated 17.1 million of the 34.9 million individuals in LILA tracts—or 5.6 percent of the U.S. population—had limited access to a foodstore at 1 and 20 miles.

Of the 16.8 million housing units in LILA vehicle access and 20-mile census tracts, an estimated 1.9 million—or 1.7 percent of all housing units—are far from a foodstore and do not have a vehicle (vehicle access is measured on the household level). An estimated 298,000 individuals are more than 20 miles from a foodstore.

For the three proximity-only measures, it is important to note that not all people who are low access (for example, more than 1 mile from a foodstore) are low income or without a vehicle. Many of these people likely own cars or have the means to afford alternatives, such as grocery delivery, to overcome distance barriers, at least in areas where such services are offered.

Table 5

Population and housing units (HU) and shares in low-income/low-access (LILA) tracts and in tracts that are low access but not low income (LI) in 2019, across four measures of low access (LA)

	Number of people in tract	Percent of total U.S. population	Number of LA population in tract	Percent of total U.S. population
Low-income and low-access census tract				
LILA 1 and 10 miles	39,074,974	12.7	18,894,581	6.1
LILA 0.5 and 10 miles	82,164,473	26.6	53,683,731	17.4
LILA 1 and 20 miles	34,975,682	11.3	17,186,456	5.6
	Number of people/ HU in tract	Percent of total U.S. population/HU	Number LA population/ HU in tract	Percent of total U.S. population/HU
LILA vehicle access and 20 miles				
Housing units	16,872,528	14.5	1,970,071	1.7
Population	43,646,621	14.1	297,931	0.1
Total U.S. population	308,745,538			
Total U.S. housing units (HU)	116,716,292			

[1]Column 1 is the number of housing units (HU) in LILA vehicle-access and 20-mile tracts; column 3 is the number of HU without a vehicle that are more than 0.5 mile from a store.

[2]Column 1 is the number of people in LILA tracts using the vehicle-access and 20-mile measure; column 3 is the number of people more than 20 miles from a foodstore in LILA vehicle-access and 20-mile tracts.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census 2010 Decennial Census data and 2014–2018 American Community Survey data.

Distance to Foodstores by Subpopulation Characteristics

Overall, in 2019, 40 percent of the U.S. population lived more than 1 mile from a foodstore and 30 percent lived within 0.5 mile of a foodstore. Thirty percent lived between 0.5 and 1 mile from a foodstore in 2015 (table 6). Like Rhone et al. (2019) and Ver Ploeg et al. (2012), the researchers found most racial and ethnic minorities lived closer to foodstores than White residents. These estimates likely mirrored differences in the ethnic and racial composition in urban and rural areas—racial and ethnic minorities tend to live in urban and more densely populated areas than White people. Therefore, they are more likely to live closer to a foodstore. Senior citizens were slightly more likely than other age groups to be more than 1 mile from a foodstore and tended to live farther from foodstores. Working-age adults were more likely to be within 0.5 mile of a foodstore.

Individuals and households with fewer resources tended to live closer to the nearest foodstore than those with more resources. A smaller share of low-income individuals (33 percent) than moderate- and high-income individuals (41 percent) were more than 1 mile from a foodstore. This finding held throughout the distribution by distance—people with low income were closer to foodstores than those with moderate and high incomes at the 20th, median (0.69 mile for low versus 0.88 mile for moderate and high income), and 80th percentiles. This finding may contradict a common narrative of poor foodstore access among low-income populations, but it is consistent with previous research (Rhone et al., 2019; USDA, 2009; Ver Ploeg et al., 2012; Wilde et al., 2014). This may demonstrate a problem in focusing only on low-income areas. It could be possible that low-access areas tend to be in low-income areas, but not all low-income areas have limited access. These counterintuitive results may be driven by population density—low-income individuals tend to live in more crowded areas. In 2019, SNAP-participating households were more likely than non-SNAP-participating households to be within 0.5 mile of the nearest foodstore and less likely than non-SNAP households to be more than 1 mile from the nearest foodstore. Most households without a vehicle (54 percent of them) lived within 0.5 mile of a foodstore, but over 2 million households without vehicles lived more than 1 mile from the nearest foodstore. Accessing a store was likely to be difficult for these households. In contrast, 41 percent of households who owned a vehicle lived more than 1 mile from a foodstore.

Table 6

Foodstore access for selected population characteristics, 2019

Population characteristics	Distance to nearest foodstore at the:			Nearest foodstore is:						
	20th percentile	Median	80th percentile	Less than 0.5 mile		0.5 mile to 1 mile		More than 1 mile		Total
	Miles	Miles	Miles	Million	Percent	Million	Percent	Million	Percent	Million
All individuals	0.31	0.88	2.20	93.5	30.3	92.3	29.9	122.8	39.8	308.7
Race										
White	0.44	0.93	2.65	58.5	26.2	64.9	29.1	100.0	44.8	223.5
Black	0.31	0.69	1.39	14.3	37.0	13.0	33.5	11.4	29.5	38.9
Asian	0.31	0.62	1.12	6.8	46.7	4.7	32.6	3.0	20.7	14.6
Native Hawaiian or Other Pacific Islander	0.31	0.69	1.32	0.2	39.8	0.1	32.1	0.1	28.1	0.5
American Indian or Alaska Native	0.44	0.98	5.10	0.7	27.0	0.7	24.0	1.4	48.9	2.9
Other and multiple races	0.31	0.62	1.24	12.8	45.5	8.6	30.9	6.6	23.6	28.1
Hispanic ethnicity										
Hispanic	0.31	0.62	1.12	23.2	46.0	15.9	31.5	11.3	22.5	50.4
Non-Hispanic	0.44	0.93	2.43	70.3	27.2	76.4	29.6	111.4	43.2	258.2
Age										
Children (age 17 or less)	0.44	0.88	2.17	21.8	29.4	22.4	30.2	29.9	40.4	74.1
Working age	0.31	0.88	2.17	60.2	31.0	57.9	29.8	76.1	39.2	194.2
Seniors (65 or older)	0.44	0.93	2.37	11.5	28.6	11.9	29.7	16.7	41.7	40.2
Income										
Low-income people	0.31	0.69	1.76	16.2	36.7	13.3	30.2	14.6	33.2	44.2
Moderate/high-income people	0.44	0.88	2.20	77.3	29.2	78.9	29.9	108.1	40.9	264.4
All households	0.31	0.88	2.17	36.3	31.1	34.8	29.8	45.5	39.0	116.7
Household vehicle ownership										
Does not own vehicle	0.31	0.44	1.12	5.5	54.0	2.6	25.7	2.0	20.2	10.2
Owns vehicle	0.44	0.88	2.24	30.7	28.9	32.1	30.2	43.4	40.9	106.4
Household SNAP participation status										
SNAP households	0.31	0.69	1.81	5.2	36.3	4.3	30.1	4.8	33.6	14.4
Non-SNAP households	0.31	0.88	2.20	31.0	30.4	30.4	29.8	40.7	39.8	102.2

SNAP = Supplemental Nutrition Assistance Program

Notes: Foodstore = supermarket, supercenter, or large grocery store. Low income = annual family income is at or below 200 percent of the Federal poverty threshold for family size. Moderate and high income = annual family income is above 200 percent of the Federal poverty threshold for family size.

Source: Compiled by USDA, Economic Research Service.

Conclusion

Some U.S. households and some neighborhoods have limited access to stores offering a wide variety of healthy food items, such as supermarkets, supercenters, and grocery stores. Access-related challenges like low income and vehicle unavailability can make it harder for people living in the United States to have a healthy diet and lifestyle. This report updates previous estimates of low-income areas, low-access areas, household vehicle access, family income, and distance to foodstores by subpopulation characteristics, along with data on the location of supermarkets, supercenters, and large grocery stores.

The total number of grocery stores grew from 2015 to 2019. When low-income and low-access (LILA) measurements are separated, the number of census tracts classified as low income decreased from 2015 to 2019, reflecting improvements in household income during 2015–19. The number of low-access tracts decreased for three food access measures (LA 0.5 and 10 miles, LA 1 and 20, and LA using vehicle access and 20 miles), the exception being the LA 1- and 10-mile measure. When LI and LA are joined, the LILA 1- and 10-mile as well as the LILA 1- and 20-mile measures show increases in the number of census tracts that are low income and low access. For those two measures, the increase in the number of LILA tracts may be attributed to more people in urban areas living more than 1 mile away from the nearest grocery store rather than to the tract's low-income status or access changes in rural areas. These findings suggest proximity to a healthy retailer may be a greater barrier than income and resource constraints for people living in two LILA census tracts. Across the LILA 0.5- and 10-miles measure and LILA vehicle-access and 20-mile measure, income and food-store access improved over the 4-year period, resulting in a decrease in LILA census tracts between 2015 and 2019. In addition, improvements in the vehicle-access measure in 2019 illustrate an increase in vehicle availability for households and a decrease since 2015 in the number of households without vehicles located more than 0.5 mile from the nearest store.

In 2019, 40 percent of the U.S. population lived more than 1 mile from a foodstore and—for the overall U.S. population—the median distance to the nearest foodstore was 0.88 miles. Most racial and ethnic minorities lived closer to foodstores than White residents. Furthermore, individuals and households with fewer resources tended to live closer to the nearest foodstore than those with more resources. This includes low-income individuals, households participating in USDA's Supplemental Nutrition Assistance Program (SNAP), and households without a vehicle.

Although beyond the scope of this report, these findings raise some questions for further study. First, this report and many others focus on foodstores, but much less research has been devoted to studying dollar stores and other combination stores in LILA census tracts, especially in rural areas where they may be the only option for healthy food. Expanded study of such combination stores may offer additional insights into food access in rural areas. Second, since there have been no major changes in the boundaries of LILA census tracts, future research could examine the areas where foodstores are opening and closing to generate a fuller account of whether these changes are widely dispersed or geographically clustered.

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