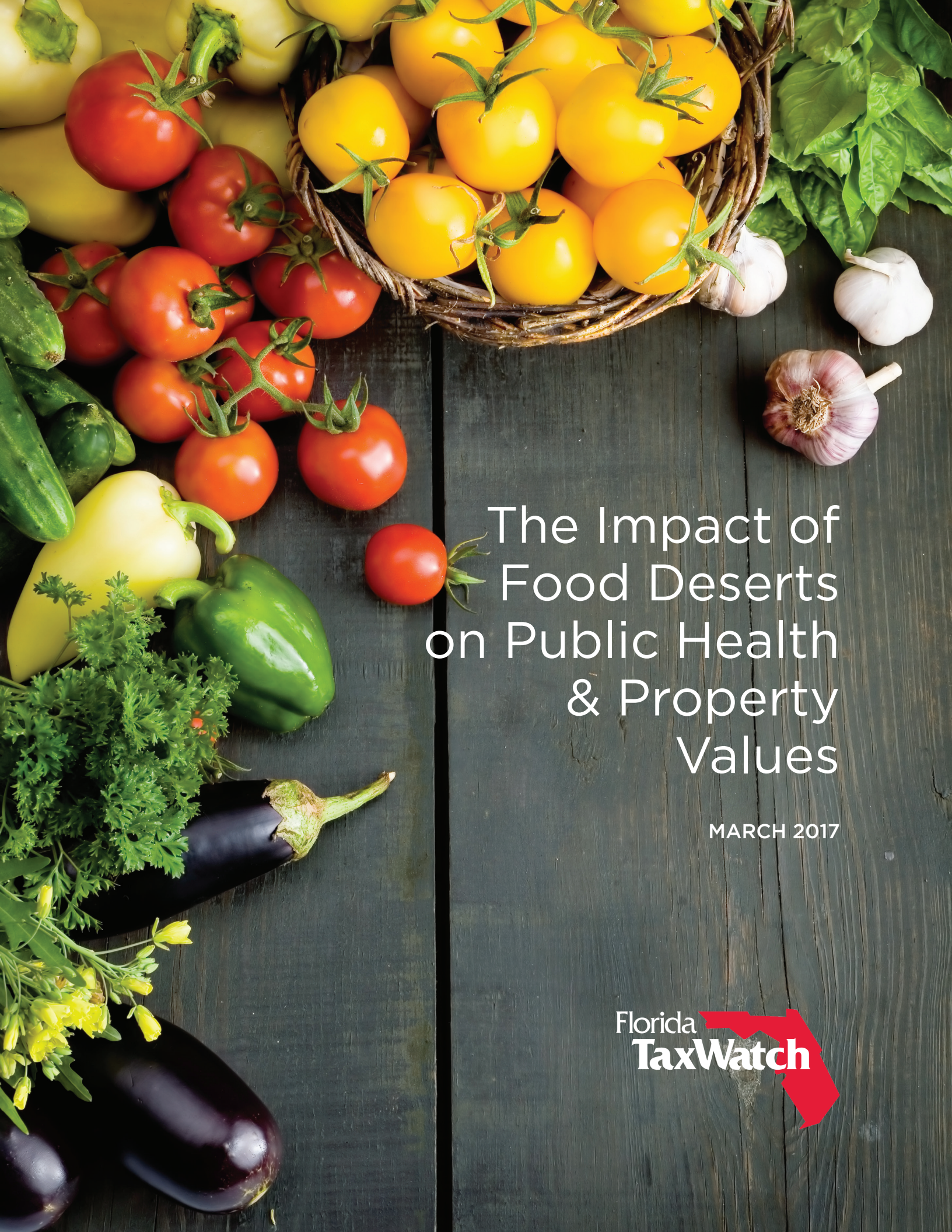

# The Impact of Food Deserts on Public Health & Property Values

MARCH 2017

Florida TaxWatch

106 North Bronough Street, Tallahassee, FL 32301 floridataxwatch.org o: 850.222.5052 f: 850.222.7476

Michelle A. Robinson
Chairman of the Board of Trustees

Dominic M. Calabro
President & Chief Executive Officer

Dear Fellow Taxpayer:

We all recognize how important good nutrition is to good health. Combined with regular exercise, a person's diet can help one reach and/or maintain a healthy weight and reduce the risk of chronic diseases like heart disease and some forms of cancer. For many Floridians, making smart choices about what they eat is difficult.

Many Floridians do not live near a full-service grocer, or do not have a vehicle or access to a vehicle to shop for groceries. Instead, they must rely on convenience stores and retailers that sell processed foods and foods that are laden with sugars and fats. These types of foods have been linked to increased risk of heart disease, obesity, diabetes and some forms of cancer.

In this research report, Florida TaxWatch collects and analyzes information that demonstrates the impacts of access to healthier foods in underserved communities on public health and economic development. It is our hope that this report will help educate our fellow taxpayers on the importance of access to healthy foods to both public health and the economic vitality of our communities.

Sincerely,

Dominic M. Calabro

Dominic M. Calabro
*President & CEO*

# BACKGROUND

Good nutrition is an important part of leading a healthy lifestyle. Combined with physical activity, a person's diet can help one to reach and/or maintain a healthy weight, reduce the risk of chronic diseases (like heart disease and cancer), and promote overall health. Unhealthy eating habits contribute to obesity, heart disease, hypertension (high blood pressure), diabetes, osteoporosis, and certain types of cancer.[1] By making smart food choices, one can help protect one's self from these health problems.

U.S. Department of Health and Human Services reports that more than two in three adults and about one-third of children and adolescents aged six to 19 are considered to be overweight or obese. Among adults aged 20 and older, overweight and obesity affect more than three in four Hispanics and Blacks, and about two in three Whites.[2]

Florida is not immune from these issues. According to the United Health Foundation, Florida ranks 33rd among the 50 states in terms of the overall health of its residents. Specifically, Florida ranks:

- 14th in cancer-related mortality rate, with 182 reported deaths per 100,000 population;
- 15th in cardiovascular disease mortality rate (including heart disease and stroke), with 221 reported deaths per 100,000 population;
- 37th in the percentage of adults with diabetes (11.2 percent);
- 7th in the percentage of adults who are obese (26.2 percent);
- 32nd in the percentage of adults who do not engage in regular physical activity (23.7 percent);
- 24th in the percentage of adults who are smokers (17.6 percent);
- 41st in the percentage of adults who have had a heart attack (5.3 percent);
- 41st in the percentage of adults who have angina or coronary heart disease (5.4 percent);
- 37th in the percentage of adults who have high blood pressure (34.6 percent);
- 38th in the percentage of adults who have high cholesterol (40.3 percent); and
- 38th in the percentage of adults who have had a stroke (3.4 percent).[3]



1 President's Council on Fitness, Sports and Nutrition, "Eat Healthy: Why is it Important," retrieved from www.fitness.gov/eat-healthy/why-is-it-important/, June 13, 2016.

2 U.S. Department of Health and Human Services, "Overweight and Obesity Statistics," retrieved June 16, 2016.

3 United Health Foundation, "America's Health Rankings (2015)," retrieved from www.americashealthrankings.org/print/createreport, June 13, 2016.

## FOOD DESERTS & HEALTH

For many people, making smart food choices is not an option because healthful whole foods are not readily available. Those parts of the United States that are "vapid of fresh fruit, vegetables, and other healthful whole foods" have been defined by the USDA as "food deserts." This is largely due to a lack of grocery stores, farmers' markets, and healthy food providers.[4] Census tracts qualify as food deserts if they meet the following thresholds:

- "Low-access communities," where at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a supermarket or large grocery store (for rural census tracts, the distance is more than 10 miles); and
- "Low-income communities," which have poverty rates of 25 percent or greater or a median family income at or below 80 percent of the area median family income.

Low-income neighborhoods frequently lack full-service grocery stores and farmers' markets where residents can buy a variety of high-quality fruits, vegetables, whole grains and low-fat dairy products. Residents of low-income neighborhoods, especially those without reliable transportation, are generally limited to shopping at small neighborhood convenience and corner stores, where fresh produce and low-fat items are limited.[5]



In addition, low-income neighborhoods have more fast food restaurants, especially near schools. A 2008 California study shows that adults living in an area with a high ratio of fast food restaurants and convenience stores to grocery and produce stores are 20 percent more likely to be obese and 23 percent more likely to have diabetes than adults living in an area with a low ratio of these establishments.[6] Fast food consumption is associated with a diet that is high in calories and low in nutrients, and frequent consumption may lead to weight gain.[7] Overweight and obesity are risk factors for a number of diseases and other health problems, including type 2 diabetes, heart disease, high blood pressure, liver disease, osteoarthritis, cancer, and stroke.[8]

A 2009 U.S. Department of Agriculture (USDA) report to Congress found that 23.5 million people in the U.S. live in low-income areas (areas where more than 40 percent of the population has income at or below 200 percent of federal poverty thresholds) that are more than one mile from a supermarket or large grocery store.[9]

4 American Nutrition Association, "USDA Defines Food Deserts," Nutrition Digest, Volume 37, No. 4.

5 Food Research and Action Center, "Why Low-Income and Food Insecure People are Vulnerable to Obesity," June 16, 2016.

6 UCLA Center for Health Policy Research, "Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes," the California Center for Public Health Advocacy and PolicyLink, 2008.

7 Ibid.

8 Ibid.

9 United States Department of Agriculture, Economic Research Service, Report Number (AP-036), "Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences," 2009.

Transportation is another important factor to consider when discussing the availability of healthy foods. Having access to a personal vehicle has a significant impact on the accessibility of affordable and nutritious food, as low-income families are less likely to have and use their own vehicle for regular food shopping. The USDA study also found that 5.7 million households are located more than one mile from a supermarket or large grocery store but lack access to a car.

## FOOD DESERTS & PROPERTY VALUES

Food deserts are proving to be not only a significant public health concern for many U.S. cities, but a significant economic development concern as well. Through the creation of jobs and by serving as "anchors" for other retail businesses, grocery stores and supermarkets are also likely to have a positive impact on surrounding property values.

We have all heard the old adage "the three most important words in real estate are location, location, location." There are numerous econometric studies that show property values increase with certain locational attributes of a neighborhood (e.g., access to light rail stations, proximity to open spaces or waterfronts, etc.).[10] These locational attributes are goods that have value (though they may not be priced into the market place), and homeowners are willing to pay more for a comparable home that is close to a desirable good (or far from an undesirable food) to enjoy lower costs to access that resource.[11]



One such study used a hedonic price analysis model[12] to estimate the improvement in home values that could be attributed to proximity to a full-service grocery store for homes in Oakland, California. The study concluded that, relative to a home that is more than a half-mile away from a supermarket and holding all other attributes of the home equal, a home that is within a half-mile of a full-service supermarket garners a $22,000 premium, while a home within a quarter-mile of a full-service supermarket enjoys a $30,000 boost in value.[13]

An August 2015 report by RealtyTrac examined home values and property taxes for 1.7 million homes, condos and co-ops in 188 zip codes with at least one Whole Foods store (and no Trader Joe's stores) and 2.3 million homes, condos and co-ops in 242 zip codes with at least one Trader Joe's store (and no Whole Foods stores).[14] RealtyTrac found that homes in close proximity to a Whole Foods store appreciated in value by 34 percent, consistent with the average appreciation for all zip codes nationwide. Homes located in zip codes with a Trader Joe's store saw a 40 percent increase in home values.[15]

10 Matthew Bomberg, "The Value of Food: The Impact of Supermarket Proximity on Home Values in Oakland," Policy Matters, University of California, Berkley, 9, no. 2 (Spring 2012).

11 Ibid.

12 A technique for valuing goods or attributes of goods that are not transacted in a market and therefore cannot be valued on the basis of price (such as supermarket proximity).

13 Supra, see footnote 10.

14 Jennnifer Von Pohlmann, "Better to Own Near Trader Joe's or Whole Foods?," RealtyTrac Newsroom and Media Center, August 11, 2015, retrieved September 21, 2016.

15 Ibid.

A 2006 doctoral dissertation looked at the impact of proximity to retail commercial uses within King County, Washington (Seattle), as an example of this issue. The study used an empirical statistical analysis to identify whether or not proximity to retail stores have a positive or negative impact (or no impact) on residential home values (when the homes are within 1,400 feet of retail sites) and found that, within a very close proximity, there are positive effects on home values.[16] The study shows that "As neighborhood layout becomes more integrated, the positive price effect of proximity increases..." meaning that urban environments with a mix of residential and retail use leads to both more shopping opportunities and higher residential values.

The evidence does suggest that proximity to a supermarket or full-service grocer increases home values. Endogeneity of the value of the home and the location of a supermarket or grocery store is of concern, because it cannot be shown with any certainty whether supermarket proximity increases home values, or whether supermarket developers seeking to locate near high spending power may consider prevailing home values as a factor in their location decisions.[17] Even if the causality is reversed, and it is in fact home values that determine where supermarkets and grocery stores are located, the increase in value represents not only increased wealth for the homeowners, but an increased property tax base for local governments and school districts.



16 John William Matthews, "The Effect of Proximity to Commercial Uses on Residential Prices," Ph.D. dissertation, Georgia State University and the Georgia Institute of Technology, May 2006.

17 Supra, see footnote 10.

# CASE STUDY: VENICE, FLORIDA

The City of Venice, Florida serves as the study area for this pilot project. Located in Sarasota County in Southwest Florida, the 2012 total population was 19,030, and is projected to increase to 19,876 by 2017. The population of Venice is mostly White (97.2 percent), which minimizes confounding based on race. The majority of residents are senior citizens (with a median age of 66.2 years), who are likely to be less physically active than a younger cohort. The household income is relatively consistent across census tracts, with a median of $48,679, and the median value of owner-occupied housing is $225,621. More than three-fourths (77.48 percent) of Venice residents are engaged in white collar occupations, with Sales and Office (33.5 percent) and Service (18.2 percent) being the predominant job types. The median number of vehicles per household is 1.7, and 31.3 percent of households have 2 or more vehicles.[18]

Venice has a small and manageable number of census tracts (11), one of which meets the USDA low-access and low-income thresholds and qualifies as a food desert.[19] The tracts' demographics break down as follows:

TABLE 1 - STUDY AREA CENSUS TRACT DEMOGRAPHICS

| TRACT | TOTAL POP. | POP. DENSITY | URBAN/ RURAL | RACIAL COMPOSTION | | | MEDIAN INCOME | MEDIAN HOME VALUE | LOW INCOME | LOW ACCESS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WHITE | BLACK | HISP. | | | | |
| **2203*** | **3,898** | **1,420** | **Urban** | **91.3** | **4.5** | **4.1** | **41,315** | **148,700** | **Yes** | **Yes** |
| 2302 | 3,923 | 3,414 | Urban | 97.7 | 0.0 | 2.6 | 43,292 | 46,300 | No | No |
| 2303 | 4,398 | 1,839 | Urban | 97.6 | 0.0 | 1.9 | 52,159 | 199,000 | No | No |
| 2304 | 2,266 | 2,072 | Urban | 98.3 | 0.0 | 2.4 | 48,544 | 305,400 | No | No |
| 2305 | 1,667 | 1,899 | Urban | 96.9 | 0.0 | 2.2 | 42,300 | 120,900 | No | No |
| 2401 | 2,919 | 1,510 | Urban | 96.9 | 0.0 | 3.5 | 54,750 | 330,600 | No | No |
| 2402 | 3,370 | 1,225 | Urban | 96.4 | 0.0 | 3.7 | 48,304 | 117,200 | No | No |
| 2507 | 5,307 | 2,375 | Urban | 95.4 | 0.0 | 3.2 | 41,595 | 122,900 | No | No |
| 2713 | 8,152 | 28 | Rural | 95.9 | 1.3 | 4.4 | 80,565 | 407,100 | No | No |
| 2714 | 4,622 | 714 | Urban | 97.4 | 0.0 | 1.9 | 55,059 | 274,500 | No | No |
| 2715 | 6,582 | 1,364 | Urban | 98.6 | 0.0 | 1.3 | 44,986 | 214,300 | No | No |

* *Identified as USDA Food Desert*

Florida TaxWatch used population data from the American Community Survey (ACS) and mortality data from the Florida Department of Health Death Count Query System to calculate age-adjusted death rates and age-specific, cause-specific death rates for the 11 census tracts located within the City of Venice. Detail of data sources, methodology, and results can be found in the Appendices.

18 CLRsearch.com, "Venice, Florida Demographics Summary," retrieved June 16, 2016. Note: A grocery store was built in the census tract food desert in November 2013, which affords future researchers an opportunity to evaluate the effectiveness of this "intervention" to see if access to healthy food translates to a change in behavior and improved public health.

19 Information provided by the City of Venice Planning & Zoning Department, June 14, 2016.

The results of this analysis provide evidence that persons residing in the USDA-designated food desert census tract 2203 have a higher rate of mortality in certain age groups due to heart disease and stroke than those living in designated non-food desert census tracts within the same area. Likewise, age-adjusted death rates in census tract 2203 are higher than the average for the City of Venice for all diseases evaluated. Specifically, our case study finds that:

- The heart disease death rate is significantly higher in the 65-74-year age group in the designated food desert census tract 2203 as compared to the 10 other census tracts. The average heart disease death rate per 100,000 for the 10 non-food desert census tracts is 169 while the rate in tract 2203 is 374.
- The heart disease death rate for the 55 to 64-year age group in tract 2203 is the 3rd highest rate among the 11 tracts, at 208 deaths per 100,000. Likewise, the heart disease death rate of 899 deaths per 100,000 for the 75 to 84-year group is 3rd highest in tract 2203.
- For cerebral vascular disease (stroke), the death rate of 317 deaths per 100,000 in the 75 to 84-year range is the highest in tract 2203 as compared to the other census tracts, which ranged from 85 to 290 deaths per 100,000.
- While tract 2203 does not have the highest age-adjusted death rate (AADR) for any condition, the AADRs for the diseases evaluated are consistently higher than the city-wide AADR. To illustrate, the AADR for heart disease is 140.3 deaths per 100,000 versus the city-wide rate of 117.3. Similarly, the AADRs for colorectal cancer, stroke, and diabetes are higher that the city-wide average.



Detailed results and tables are available in Appendix C, on page 13 of this report. Although the results of this study apply only to the City of Venice, the methodology developed for this analysis may be applied to other municipalities throughout Florida.

# RECOMMENDATIONS

Florida TaxWatch recommends the following:

- Using the methodology outlined in this research paper, interested stakeholders should select one or more urban areas with two or more USDA-designated food deserts, and one or more rural areas of Florida, for further study. Areas that contain two or more food deserts may be combined and stratified by income and race to yield more robust results.
- Public officials in the City of Venice should conduct an assessment of food insecurity among the vulnerable senior population residing in census tract 2203 to understand and mitigate the impacts of food insecurities on this population.
- Policymakers should consider exploring options for expanding the availability of healthy foods in food deserts to increase the health of all Floridians, reduce the cost burden on the healthcare system, and expand local property tax bases. These options include, but are not limited to:
    a. Reducing the high upfront costs to developers and supermarket and grocery store operators;
    b. Incentivizing developers and supermarket and grocery store operators to establish stores in existing food deserts;
    c. Streamlining land use, zoning and permitting regulations to eliminate barriers that make it more expensive or difficult to develop in urban areas; and
    d. Establish financial instruments that make grant and loan money available for food retail projects to increase the presence of grocery stores and supermarkets in areas that lack access to healthy food.

# APPENDIX A

## *DATA SOURCES*

### The Food Access Research Atlas[20]

The U.S. Department of Agriculture's Food Access Research Atlas ("Atlas") presents a spatial overview of food access indicators for low-income and other census tracts using different measures of supermarket accessibility. The Atlas also provides food access data for populations within census tracts, and offers census tract-level data on food access that can be downloaded for community planning or research purposes. This permits users to create maps showing food access indicators by census tract using different measures and indicators of supermarket accessibility, view indicators of food access for selected subpopulations, and download census-tract-level data on food access measures. The Atlas is used to determine the food desert status of the census tracts in the study area.

### American Community Survey[21]

The U.S. Census Bureau defines census tracts as small, relatively permanent subdivisions of a county or equivalent entity, the purpose of which is to provide a stable set of geographic units so that statistical comparisons can be made from one census to the next. Census tract boundaries generally follow visible and identifiable features and have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people.[22] Population data for each census tract within the City of Venice, subdivided by age groups, are obtained from the American Community Survey (ACS) via the American Fact Finder portal.



The ACS is a series of monthly samples used to produce annually updated estimates for census tracts formerly surveyed via the decennial census long-form sample. The ACS obtains 2 million interviews per year across the United States and Puerto Rico. Data are available annually for large metropolitan areas. For smaller areas, such as census tracts, population estimates are based on 5 years of data.[23] For example, census tract population estimates for 2013 are based on data collected from 2008 to 2012. The ACS population estimates by census tract are used in this study.

20 www.ers.usda.gov/data/fooddesert/, retrieved June 13, 2016.

21 http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_B01001&prodType=table, retrieved August 30, 2016.

22 www.census.gov/geo/reference/gtc/gtc_ct.html, retrieved June 13, 2016.

23 www.census.gov/content/dam/Census/library/publications/2008/acs/ACSGeneralHandbook.pdf, retrieved August 20, 2016.

## Florida Department of Health's Death Count Query[24]

The census tract is the geographic unit of analysis used by the USDA for food desert designation. Thus, in order to evaluate the health implications of residing within a designated food desert, health data for individual census tracts must be available.

The following datasets were evaluated for feasibility in determining the relationship between food deserts and diet-related health effects:

- U.S. Centers for Disease Control Behavioral Risk Factors Surveillance System;[25]
- Florida Department of Health Chronic Disease Datasets;[26]
- Agency for Health Care Administration Hospital Discharge Datasets;[27]
- University of Florida Bureau of Economic and Business Research Datasets;[28] and
- Florida Department of Health Death Count Query System.
- Aside from the Florida Department of Health's Death Count Query system, none of these datasets collects census tract specific information. As a result, this analysis relies solely on mortality data as incidence and prevalence information for diet-related diseases is not available at the census tract level.

## USA.com

USA.com is a searchable website tool that assimilates publically available information from various government sources to provide an overview for both large and small geographic areas. Florida TaxWatch collated information from this website to provide mean income, racial demographic information, age profiles, population density, and other information for the City of Venice. In addition, information is provided for the 11 census tracts that comprise the City in Table 1.



24 www.floridacharts.com/FLQUERY/Death/DeathCount.aspx.

25 www.cdc.gov/brfss/data_tools.htm, retrieved September 8, 2016.

26 www.floridacharts.com/charts/ChronicDiseases/default.aspx Retrieved September 8, 2016.

27 Personal communication.

28 www.bebr.ufl.edu/data/tags/34, retrieved September 8, 2016.

# APPENDIX B

## *ASSESSMENT METHODOLOGY*

Population data from the ACS and mortality data from the Florida Department of Health Death Count Query System are used to calculate age-adjusted death rates and age-specific, cause-specific death rates for the 11 census tracts located within the City of Venice. In 2010, owing to the decennial census, some of the census tract boundaries changed. The Florida Department of Health Death Count Query System uses the 2010 census tract boundaries, retrofitted to the boundaries for the years 2007, 2008, and 2009 collection years. For this reason, the study period ranges from 2007 to 2014.

### Mortality Data

Four aggregate causes of death are evaluated to assess the relationship between USDA food desert designation and deleterious health impacts: heart disease; diabetes mellitus; colorectal cancer; and cerebral vascular disease (i.e., stroke). The Florida Death Count Query System allows users to run queries to sort and combine deaths based on consistent groupings and rankings outlined by the National Center for Health Statistics (NCHS).[29] Depending on the level of aggregation desired, users may choose to extract information for 358 causes of death, 113 causes of death, or the 50 top rankable causes of death. Mortality causation is based on the 10th revision of the International Statistical Classification of Diseases (ICD-10), a medical classification system developed by the World Health Organization and used worldwide to classify disease for tracking and medical billing purpose. Table 2 below presents aggregate diseases, associated ICD-10 codes, and the death database query mode used to abstract the data.



TABLE 2 - AGGREGATED DISEASES, ICD-10 CODE, AND QUERY MODE

| AGGREGATE DISEASE | ICD-10 CODES | QUERY MODE |
|---|---|---|
| Diabetes mellitus | E10-E14 | Top 50 rankable causes of death |
| Heart Disease | I00-I09, I11, I13, I20-I51 | Top 50 rankable causes of death |
| Cerebrovascular diseases (Stroke) | I60-I69 | Top 50 rankable causes of death |
| Colorectal Cancer | C18 - C20 | 358 causes of death |

Diabetes mellitus includes type 1 and type 2 diabetes at all levels of complications. Heart diseases include pericardium diseases and acute myocarditis (I30-I31, I40), heart failure (I50), other forms of heart disease (I26-I28, I34-I38, I42-I49, I51), acute rheumatic fever and chronic rheumatic heart disease (I00-I09), hypertensive heart disease (I11), hypertensive heart and renal disease (I13), acute myocardial infarction (I21-I22), other acute ischemic heart disease (I24), atherosclerotic cardiovascular disease (I25.0), all other chronic ischemic heart disease (I20, I25.1-I25.9) and acute and sub-acute endocarditis (I33). Colorectal cancer includes cancers of the colon (C18) rectosigmoid junction and rectum

29 FloridaCHARTS.com, "Data Dictionary: Death Query," www.floridacharts.com/FLQUERY/Documents/CodebookDEATHQUERY.pdf, retrieved August 30, 2016.

(C19-C20), and anus and anal canal (C21). Cerebrovascular diseases (stroke) include subarachnoid hemorrhage (I60), intracerebral and other intracranial hemorrhage (I61-I62), cerebral infarction, stroke, not specified as hemorrhage or infarction (I64), and other cerebrovascular diseases and their sequelae (I67, I69).

Total deaths for the above conditions are analyzed from 2007 to 2014 for seven age groups (15 to 24-years, 25 to 34-years, 35 to 44-years, 45 to 54-years, 55 to 64-years, 65 to 74-years, and 85-years or greater) for the 11 census tracts in the City of Venice. Because census tract boundaries are designed to keep populations small, there are relatively few deaths reported in each of the study years. In order to improve the robustness of the study, death counts were combined across the eight study years for each of the age categories.

## Population Estimates by Census Tract

ACS population estimates by census tract are available for 2009 to 2014. To estimate population data for 2007 and 2008, a linear "best-fit" trend is developed based on the population estimates from 2009 through 2014. Yearly populations from 2007 to 2014 are then combined to develop the total study period population for each census tract.

## Calculation of Age-Adjusted Death Rates



Age-adjusted death rates (AADRs) are calculated to allow for comparison between groups with different age distributions. When calculating an age-adjustment rate, a "standard" distribution of population age is used to adjust rates (Table 3). The rates produced by the age-adjustment methodology reflect what the rates would be if the study population had the same age distribution as the standard population distribution. Per the National Center for Health Statistics recommendation, the U.S. 2000 standard population is used to calculate the age adjusted rates. The AADR is calculated based on total recorded deaths in each age group for each disease between 2007 and 2014. The population used for each age group is the aggregate of the population in that age group across the same period.

TABLE 3 - AGE PROPORTIONS USED TO CALCULATE AGE-ADJUSTED DEATH RATES

| AGE | POPULATION PROPORTION | AGE | POPULATION PROPORTION |
|---|---|---|---|
| <1 | 0.013818 | 45-54 | 0.134834 |
| 1-4 | 0.055317 | 55-64 | 0.087247 |
| 5-14 | 0.145565 | 65-74 | 0.066037 |
| 15-24 | 0.138646 | 75-84 | 0.044842 |
| 25-34 | 0.135573 | 85+ | 0.015508 |
| 35-44 | 0.162613 | | |

The following is used to calculate the age-adjusted death rate per 100,000 population:

$$\sum \left( \frac{\text{Number of deaths in an age group}}{\text{Population of that age group}} \right) \text{X} \ \text{Age group proportion} \ \text{X} \ 100{,}000$$

## Calculation of Age-Specific Death Rates

Age-specific death rates (ASDRs) are used to compare death rates in a specific age group across census tracts. The ASDR is calculated based on total recorded deaths in each age group for each disease between 2007 and 2014. The population used for each age group is the aggregate of the population in that age group across the same period.

The following is used to calculate the age-specific death rate per 100,000 people:

$$\left( \frac{\text{Number of deaths in an age group}}{\text{Population of that age group}} \right) \text{X} \ 100{,}000$$

# APPENDIX C

## *ASSESSMENT RESULTS*

### Age-Specific Death Rate

Tables 4 and 5 present the age-specific rolling death rates for heart disease and cerebrovascular disease (stroke), respectively. As shown in Table 4, the heart disease death rate is significantly higher in the 65-74-year age group in the designated food desert census tract 2203 as compared to the 10 other census tracts. The average heart disease death rate per 100,000 for the 10 non-food desert census tracts is 169 (range 112 – 201) while the rate in tract 2203 is 374.

The heart disease death rate for the 55 to 64-year age group in tract 2203 is the 3rd highest rate among the 11 tracts, at 208 deaths per 100,000 (with a range across all census tracts of 31 to 280 deaths per 100,000). Likewise, the heart disease death rate of 899 deaths per 100,000 for the 75 to 84-year group is 3rd highest in tract 2203 (range 448 to 1188 deaths per 100,000.

TABLE 4 - HEART DISEASE AGE-SPECIFIC ROLLING DEATH RATE (2007 TO 2014)

| TRACT | AGE 55-64 | AGE 65-74 | AGE 75-84 | AGE 85+ |
|---|---|---|---|---|
| **2203^** | **207.8** | **373.8** | **898.7** | **3009.4** |
| 2302 | 213.4 | 200.7 | 580.9 | 2730.4 |
| 2303 | 81.0 | 138.1 | 544.4 | 3182.6 |
| 2304 | 31.4* | 112.1* | 448.3 | 2755.6 |
| 2305 | 79.1* | 214.3 | 452.8 | 7595.6 |
| 2401 | 128.0 | 64.9* | 660.7 | 2976.2 |
| 2402 | 86.7* | 125.8 | 842.4 | 2504.0 |
| 2507 | 279.9 | 273.0 | 1187.7 | 9427.4 |
| 2713 | 77.8 | 251.8 | 930.9 | 9697.4 |
| 2714 | 90.6 | 170.3 | 651.1 | 2275.3 |
| 2715 | 132.1 | 141.1 | 676.9 | 2583.1 |

*^ Identified as USDA Food Desert;*
** indicates that death rate is based on fewer than 5 reported deaths and may be unstable.*

As shown in Table 5, for cerebral vascular disease (stroke), the death rate of 317 deaths per 100,000 in the 75 to 84-year range is the highest in tract 2203 as compared to the other census tracts, which ranged from 85 to 290 deaths per 100,000.

Despite combining death counts across study years, there are very few deaths attributed to diabetes and colorectal cancer. The Florida Department of Health indicates that rates based on fewer than five deaths are considered unstable, so these conditions were not evaluated. Likewise, stroke deaths could not be evaluated in many of the age groups due to the low number (fewer than five) of deaths. Therefore, not all age categories are shown and Tables 4 and 5 and rates based on less than five cases are noted.

TABLE 5 - STROKE AGE-SPECIFIC ROLLING DEATH RATE (2007 TO 2014)

| TRACT | AGE 75-84 | AGE 85+ |
|---|---|---|
| **2203^** | **317.2** | **376.2*** |
| 2302 | 121.6 | 862.2 |
| 2303 | 254.0 | 871.0 |
| 2304 | 112.1* | 648.4 |
| 2305 | 84.9* | 3666.8 |
| 2401 | 90.1* | 1229.3 |
| 2402 | 289.6 | 1064.9 |
| 2507 | 156.3 | 1257.0 |
| 2713 | 214.8 | 2610.8 |
| 2714 | 122.1 | 695.2 |
| 2715 | 141.4 | 492.0 |

*^ Identified as USDA Food Desert;*
** Indicates that death rate is based on fewer than 5 reported deaths and may be unstable.*

## Age Adjusted Death Rates



Results of the age adjusted death rate analysis are presented in Table 6. While tract 2203 does not have the highest AADR for any condition, the AADRs for the diseases evaluated are consistently higher than the city-wide AADR. To illustrate, the AADR for heart disease is 140.3 deaths per 100,000 versus the city-wide rate of 117.3. Similarly, the AADRs for colorectal cancer, stroke, and diabetes are higher that the city-wide average.

TABLE 6 - AGE ADJUSTED DEATH RATE BY CENSUS TRACT PER 100,000 (2007 TO 2014)

| TRACT | COLORECTAL CANCER | CEREBROVASCULAR DISEASES | DIABETES MELLITUS | HEART DISEASE |
|---|---|---|---|---|
| **2203^** | **15.5** | **32.5** | **18.2** | **140.3** |
| 2302 | 10.5 | 23.6 | 20.4 | 126.8 |
| 2303 | 6.2 | 26.9 | 6.2 | 112.1 |
| 2304 | 16.3 | 20.6 | 9.6 | 77.6 |
| 2305 | 8.4 | 60.7 | 9.1 | 159.1 |
| 2401 | 10.7 | 28.3 | 17.1 | 96.8 |
| 2402 | 15.2 | 31.9 | 14.7 | 129.9 |
| 2507 | 20.3 | 40.1 | 24.8 | 261.5 |
| 2713 | 15.2 | 54.3 | 9.5 | 224.1 |
| 2714 | 9.2 | 23.3 | 15.8 | 93.5 |
| 2715 | 12.5 | 20.7 | 9 | 110.1 |
| Venice | 11.9 | 28.7 | 13.7 | 117.3 |

*^ Identified as USDA Food Desert*

## DATA UNCERTAINTIES

The main sources of uncertainty include population estimates for census tracts, cause of death determination error, and the relatively small proportion of census tract 2203 population that is both low-income and greater than one mile from a grocery store.

Regarding population estimates, the ACS survey population estimates are the best available existing population estimates. The ACS attempts to limit uncertainty by using a five-year average to develop census tract population estimates; however, there is still some degree of uncertainty. For example, in census tract 2203, the total population is estimated to be 3762 people in 2014, with a margin of error of +/- 361 people.[30] Because the margin of error is similar across census tract populations, and because the total population of the 11 census tracts in Venice is similar, it is unlikely, however, that this source of error significantly impacts the study results.

The DOH death query database reports deaths as they are listed on the death certificates; however, certifiers are sometimes uncertain as to the cause of death, particularly when several organ systems may be involved or the deceased is elderly.[31] Studies that have compared cause of death listed on death certificates to autopsy results indicate up to a 24 percent error rate in the cause of death.[32] While there has been an effort to train certifiers regarding death certificate accuracy, there are still errors in reporting. Because errors in cause of death are likely to be consistent across census tracts, any effect on results would likely be uniform and would not be expected to significantly impact the study results.



The USDA definition for a food desert stipulates that at least 25 percent of the population of a census tract must have a median family income at or below 80 percent of the area median family income and live further than one mile from a grocery store. For census tract 2203, a review of the data indicates that 608 of the approximately 4000 people (15.2 percent) living in this tract meet both of these criteria. While the precise impact of this proportion cannot be quantified, it is interesting to note that, despite a possible dilution effect, tract 2203 exhibited higher heart disease and stroke age-specific death rates for some age groups than the other census tracts.

It should be noted that Venice contained only one USDA designated food desert, which made it impossible to pool data. In addition, the total number of deaths by census tract and the large proportion of White residents in the study area preclude an analysis by race. Finally, the mortality database does not include income information, so the effect of this confounder could not be evaluated.

30 http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk, retrieved September 11, 2016.

31 http://www.cdc.gov/nchs/nvss/death_certification_problems.htm, retrieved September 11, 2016.

32 Sehdev A, Hutchins GM. Problems With Proper Completion and Accuracy of the Cause-of-Death Statement. Arch Intern Med. 2001;161(2):277-284. doi:10.1001/archinte.161.2.277.

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## MARCH 2017

As an independent, nonpartisan, nonprofit taxpayer research institute and government watchdog, it is the mission of Florida TaxWatch to provide the citizens of Florida and public officials with high quality, independent research and analysis of issues related to state and local government taxation, expenditures, policies, and programs. Florida TaxWatch works to improve the productivity and accountability of Florida government. Its research recommends productivity enhancements and explains the statewide impact of fiscal and economic policies and practices on citizens and businesses.

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| | |
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| Dominic M. Calabro | *President & CEO* |
| Robert E. Weissert, Esq. | *Executive Vice President & Counsel to the President* |

### PROJECT TEAM

| | | |
|---|---|---|
| Bob Nave | *VP of Research* | Co-Author |
| Allison Wiman | *Research Analyst* | Co-Author |
| Chris Barry | *Director of Publications* | Design, Layout, Publication |

### CONTRIBUTORS

| | | | |
|---|---|---|---|
| Kurt Wenner | *VP of Research* | James McGivern | *Neil S. Crispo Fellow* |
| Elle Piloseno | *Research Analyst* | Allie Pass | *Sen. Ken Plante Memorial Intern* |
| Kyle Baltuch | *Economist* | Ryan Janson | *Sen. Ken Plante Memorial Intern* |

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TaxWatch research is done under the direction of Dominic M. Calabro, President, CEO, Publisher & Editor.

The findings in this Report are based on the data and sources referenced. Florida TaxWatch research is conducted with every reasonable attempt to verify the accuracy and reliability of the data, and the calculations and assumptions made herein. Please feel free to contact us if you feel that this paper is factually inaccurate.

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106 N. BRONOUGH ST., TALLAHASSEE, FL 32301 O: 850.222.5052 F: 850.222.7476