OBESITY In the District of Columbia








Government of the District of Columbia
Department of Health
Center for Policy, Planning and Evaluation
Behavioral Risk Factor Surveillance System (BRFSS)

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January 2010

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Health

Office of the Director

February 18, 2010

Dear Residents,

In order for public health priorities and policies to be useful and effective, they should be based on data. Our mission as a department to promote health and wellness, prevent illness, and protect citizens from public health threats, is driven by information that comes from many sources. Most important among those is the community, the people we serve, and who serve with us. Together, we have determined that some of the greatest threats to our health are related to poor nutrition and a lack of regular physical activity. In the District, poor diet and physical activity account for 15% of all deaths. Changes in these two areas can have significant impact on the prevalence of disease like diabetes, hypertension and stroke which account for more than half of deaths in the District.

Awareness of the full scope of the obesity problem within the District, as well as understanding the impact of social and physical environments on healthy eating and active living is essential to the development of policies and programs designed to address obesity. This report provides a comprehensive assessment of food access and physical environments across the District and highlights the potential correlation between environment and health outcomes, in particular obesity, hypertension, and diabetes.

I am confident that the more people can be aware of the benefit of individual behavior and environmental changes we can all look to the future knowing that we will live longer lives less frequently complicated by preventable illness. Please join us as we work to reverse the situations that pose the greatest threats to our health.

Live well. Be well.

Sincerely,

Pierre N.D. Vigilance, MD, MPH
Director
District of Columbia Department of Health

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Executive Summary

In the United States an estimated 300,000 deaths per year may be attributed to obesity. The sixth most vital risk factor contributing to the overall burden of disease globally is excess body weight. Being either overweight or obese increases the risk for numerous chronic diseases. Hypertension and diabetes are two diseases in particular that are heavily influenced by diet and exercise. By increasing the level of physical activity and improving diets on a daily basis, hypertension and diabetes can be reversed and prevented.

In 2009, it is estimated that the nation will spend $75 billion in direct costs and $139 billion in indirect costs related to obesity. It is projected that employers will spend between 29%-117% more for medical expenses for an obese employee than employees of normal weight.

Dining out at restaurants, particularly in fast food restaurants, is associated with increased weight gain and obesity. Residents who live in areas with limited access to quality, affordable and nutritious foods may modify their food shopping routines and diets based on the food environment in their neighborhoods.

Routine exercise has been shown to reduce the risk of an array of diseases, including heart disease, stroke, colon cancer, diabetes, and high blood pressure. Regular physical activity also assists in maintaining healthy weight, bones, muscles and joints. Additional benefits of physical activity include the reduction of pain associated with arthritis, and lessened symptoms of anxiety and depression.

- Overall there are 22.2% of adults 18 and older who are obese, 28.6% with hypertension and 8.1% with Type 2 diabetes
- Women were more likely than men to consume the recommended five servings per day of fruits and vegetables (36% versus 29%, respectively)
- Men were more likely than women to participate in recreational exercise—82% versus 76%, respectively.
- African Americans (31%) and Hispanics (29%) were less likely to consume five or more servings of fruit and vegetables compared to *other race/ethnicities (38%) and Caucasians (35%).
- Overall 17.8% of students in grades 9-12 are overweight and 17.7% of students are obese.

Evidence provided throughout this report illustrates the District's ethnic and socioeconomic differences among its Wards. The disparities among one spectrum of the city to another was prevalent between Ward 3, where the mean income is $71,875 and 85% Caucasian in comparison to Wards 7 and 8, where mean incomes are $30,533 and $25,017 and 92% to 97% African American respectively. Also, there are striking differences in the prevalence of chronic diseases among racial/ethnic groups in the District.

(*Other race/ethnicities comprise primarily of Multiracial, Asian, Hawaiian, Pacific Islander, American Indian, and Alaskan Native)

Introduction

Two out of three American adults are either overweight or obese and an estimated 300,000 deaths per year may be attributed to obesity. [1, 2] This rate has increased significantly over the last 30 years and has reached epidemic proportions in the United States and the rest of the world. Since the 1980's, overweight and obesity rates among adults have nearly doubled, and in children, virtually tripled. [1]

Poor diet and lack of physical activity are the second leading preventable causes of death following smoking. [3] The ultimate equation to maintaining a healthy weight is related to balancing the number of calories consumed with the number of calories burned. Nevertheless, a number of factors can affect the caloric balance such as environment, genetics, disease, and drug use. Poor dietary patterns and obesity have been linked to the environment in low income areas, populated heavily by communities of color. The neighborhood differences in access to food may be an influence on these relationships.

Overall there are a variety of factors that contribute to and play a role in obesity. Americans are consuming about 300 more calories a day than they did 25 years ago, nutritious foods are more expensive than calorie dense, less nutritious ones; parks and recreation facilities are not considered safe or well maintained in many communities, school lunches do not meet nutrition standards and children are engaging in less physical activity at school. [1] In addition our youth are spending an enormous amount of time watching television and surfing the internet instead of engaging in sports and activities outside of the home. This change in habits contributes to decreased physical activity, and increased likelihood of obesity.

In 2000, health care costs due to obesity related illnesses were estimated at $117 billion. In 2009, it is estimated that the nation will spend $75 billion in direct costs and $139 billion in indirect costs related to obesity. It is projected that employers will spend between 29%-117% more for medical expenses for an obese employee than employees of normal weight. Obese individuals pay 36% more for health care and 77% more for medication when compared to individuals of normal weight. As the rates of obesity continue to increase, it is projected that by 2030, health care costs attributable to obesity could range from $860 billion to $956 billion. [4, 5]

These distressing statistics have major implications on the quality of life and healthcare cost associated with those who are overweight or obese. The health consequences associated with obesity are increased risk for coronary heart disease, type-2 diabetes, endometrial, breast, and colon cancers, hypertension, high cholesterol, stroke, liver and gallbladder disease, sleep apnea and respiratory problems, osteoarthritis, and gynecological problems, including infertility. [1, 6] The risk of diabetes mortality has been noted to substantially increase by obesity. Obesity has a downward effect on functional status, including work absenteeism, productivity, body pain and depression. [7] Studies show that obese adolescents tend to be obese adults and are generally diagnosed with the above mentioned health ailments.

Utilizing data from the 2007 Behavioral Risk Factor Surveillance System (BRFSS) and the Youth Risk Behavioral Surveillance System (YRBSS), this report will examine the following:

- Environmental risk factors, socioeconomic status, race, and education in relation to overweight and obesity in the District of Columbia.
- Relationship between the locality of food purchasing options (i.e. grocery store, convenience store, farmer's market, organic grocery store), prepared food purchasing options (dine-in restaurants, fast food restaurants, carry outs), health clubs, parks and recreation options, and other local fitness options in relation to obesity and fruit and vegetable consumption rates in the District by ward and ANC.

- Crime levels and physical activity in relation to obesity by ward.
- Fruit and vegetable consumption and calculated weight of adolescents in grades 9-12 and;
- Proximity of public and charter schools in the District to fast food, carry-out and convenience stores.

Reversing the obesity epidemic will require an all-inclusive and synchronized approach that uses- guiding principles and environmental changes to transform communities into places that sustain and promote healthy lifestyle choices for all residents.[6]

Methodology

Data for this report were collected using Google searches, Yelp, respective food site websites, and the District of Columbia government website. Keywords used for searches included fast food restaurants; grocery stores; convenience stores; farmer's markets; restaurants; health clubs in the District of Columbia. A list of locations was obtained from the District of Columbia Department of Health (DOH), Health Regulation and Licensing Administration, Bureau of Community Hygiene's Food and Safety Hygiene Inspection Services, for cross reference. All data are current as of May 2009. The following sections explain the data collection methods for each category in greater detail.

Unprepared Food Purchasing Options

The United States Department of Agriculture (USDA) recommends that individuals consume at least five servings of fruits and vegetables daily. In this report we look at the current food establishments that meet the criteria set by the USDA where residents can purchase fresh fruits and vegetables.

Data were collected primarily through Google searches that produced information from the yellow pages on the internet of options located within the District of Columbia. The results produced the following; Giant, Safeway, Murray's, Trader Joe's, Whole Foods, Harris Teeter, and YES Organic Market. These establishments were broken down into subcategories that included large and small scale grocery stores, organic food markets and farmer's markets.

- Large scale grocery stores were defined as an establishment that primarily sells food items to the public in addition to paper products, toiletries, cooking supplies, and pharmaceutical items.
- Small scale grocery stores were defined as an establishment that sells food items to the public and may not have paper products toiletries, and pharmaceutical items.
- Organic food markets were defined as a type of grocery store that markets itself as selling primarily organic food items.
- Farmer's markets were defined as an indoor or outdoor market generally set up in neighborhoods where farmers sell locally grown produce.

These establishments were then categorized as Category A. Category A options are facilities that provide fresh fruits and vegetables that residents should have access to in order to meet the USDA recommendations of 5-13 servings of fruits and vegetables daily.

Prepared Food Purchasing Options.

The prepared food purchasing options defined do not provide options that would allow residents to purchase fresh fruit and vegetables to meet the USDA recommendation of fruit and vegetable consumption.

Data obtained for prepared food purchasing options, were defined as food already in meal form intended for immediate consumption on or off site, was primarily collected through Google searches. This returned information from internet listings of the yellow book pages. Use of restaurant chain websites was used as a cross reference to ensure that all chain restaurants were included. This category was divided into four sub categories that include Dine-In restaurants, Traditional Fast Food restaurants, Healthy Fast Food restaurants, Convenience Stores, and Carry-outs as defined by Category B options.

- Dine-in restaurants were defined as an establishment that prepares and serves food to customers who intend to eat at the establishment; customers are typically waited on and pay the bill at the end of the meal.

- Traditional Fast food restaurants were defined as an establishment that prepares food quickly and specializes in entrees with low nutritional value and high caloric content. Customers pay for food immediately after ordering and have the option to eat in or take the food to go.

- Healthy fast food options were defined as an establishment that prepares food quickly, and specializes in preparing entrees with high nutritional value and low caloric and fat content. Customers pay for food immediately after ordering and have the option to eat in or take the food to go.

- Carry outs were defined as an establishment that allows customers to purchase food typically with high caloric and low nutritional content intended to be consumed outside of the location from which it was purchased.

- Convenience stores were defined as a small grocery store that primarily sells snack foods and sandwiches, soda, coffee, cigarettes and lottery tickets.

Recreation and Exercise
Data for recreation and exercise options were obtained from the District of Columbia Parks and Recreation website. This website included full listings for recreation centers, large, triangular, and un-staffed parks, aquatic facilities, and tennis courts. In addition, information regarding the location of health clubs, dance, yoga, and Pilates studios, and YMCA's within the District were obtained through Google searches that returned information from internet listings of the yellow pages online. Websites for chain health clubs were also used to verify location and ensure that all chain locations were incorporated in the data.

Crime Data
The crime data were obtained directly from the District of Columbia Metropolitan Police Department and approved by the Office of The Chief for use on this project.

Wards
An overview of each ward and detailed information was obtained from the District of Columbia Office of Planning website http://planning.dc.gov/planning/cwp/view,a,1400,q,646453.asp

Advisory Neighborhood Commissions (ANCs)
An overview of ANCs and detailed information was obtained from Council of the District of Columbia's website http://www.dccouncil.washington.dc.us/neighborhoods

Methodology

School Locations

School data were obtained from the District of Columbia data catalog which contains complete data regarding school information in the District of Columbia. Schools were divided into sub categories including charter schools, elementary schools, middle schools, high schools, education campuses, art centers, special education programs, and youth engagement centers as pre-defined by the District of Columbia school system. Due to the pre-defined grade level classification within the Charter school system, the Charter Schools could not be labeled in sub-categories such as elementary, middle, or high school.

Census Data

Census data were obtained from the U.S. Census Bureau website. Population estimates from the District of Columbia in 2007 were used.

Behavioral Risk Factor Surveillance System (BRFSS)

Data for overweight, obesity, fruit and vegetable consumption and physical activity for adults were obtained from the Behavioral Risk Factor Surveillance System (BRFSS) 2007 data. The BRFSS is a telephone survey conducted with randomly selected adults within households that are randomly selected from among all telephone-equipped households in the District of Columbia. The methodology for conducting BRFSS surveys is standardized by the CDC and described in the 2007 Annual Report. (http://doh.dc.gov/doh/frames.asp?doc=/doh/lib/doh/services/administration_offices/phsa/behavioral_risk/pdf/2007_brfss_annual_report_11_052809.pdf)

Variables and questions used for this report included BMI, fruit and vegetable consumption, and physical activity. BMI was calculated using the respondent's self reported height and weight. The fruit and vegetable consumption variable was created by combining the answers to the following questions:

- *How often do you drink fruit juices such as orange, grapefruit, or tomato?*
- *Not counting juice, how often do you eat fruit?*
- *How often do you eat green salad?*
- *How often do you eat potatoes not including French fries?*
- *How often do you eat carrots?*
- *Not counting carrots, potatoes, or salad, how many servings of vegetables do you usually eat?*

The physical activity variable was created by asking the following question: During the past month, other than your regular job, did you participate in any physical activities or exercise such as running, calisthenics, golf, gardening, or walking for exercise?

Youth Risk Behavioral Surveillance System (YRBSS)

Data for overweight, obesity, fruit and vegetable consumption, fruit juice consumption, soda consumption, and physical activity for youth under the age of 18 was obtained from 2007 District of Columbia Youth Risk Behavior Surveillance System (YRBSS)

- *In an average week when you are in school, on how many days do you go to physical education (PE) classes?*
- *During the past 12 months, on how many sports teams did you play? (Include any teams run*

by your school or community groups.)

- *During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice?*
- *During the past 7 days, how many times did you eat fruit?*
- *During the past 7 days, how many times did you eat green salad?*
- *During the past 7 days, how many times did you eat potatoes?*
- *During the past 7 days, how many times did you eat carrots?*
- *During the past 7 days, how many times did you eat other vegetables?*
- *During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pespi or Sprite?*

Quality Control

Data Lists

Use of multiple website through Google searches was utilized to double check the listings for food purchasing options and prepared food purchasing options to ensure that the majority of the locations were captured. Data were double checked to ensure that locations were captured and met the definition for inclusion in specific categories. Zip code matches from the United States Postal Service were also used for searches on restaurant websites to ensure that all locations were included in the search criteria. In addition, locations were obtained from the District of Columbia Health Regulation and Licensing Administration by the Food and Safety Hygiene Inspection Services under the DOH for cross reference. All data is current as of May 2009.

Crime Data

All crime statistics presented in this report are based on preliminary District of Columbia Index crime data and include homicide, sex abuse, robbery, assault with a dangerous weapon, arson, burglary, stolen auto, theft, and theft from auto.

The data do not represent official statistics submitted to the FBI under the Uniform Crime Reporting Program (UCR). All preliminary offenses are coded based on the District of Columbia Criminal code and not the FBI offense classifications. All statistics are subject to change due to a variety of reasons such as a change in classification, the determination that certain offense reports were unfounded, or late reporting. Any comparisons between Metropolitan Police Department (MPD) preliminary data as published here and the official crime statistics published by the FBI under the Uniform Crime Reporting Program may be inaccurate and misleading.

Behavioral Risk Factor Surveillance System (BRFSS)

Data were cleaned, edited, and weighted according to CDC BRFSS protocol. Analysis was conducted using SPSS and SAS and cross checked with data from the 2007 published BRFSS report to ensure data integrity.

Youth Risk Behavioral Surveillance System (YRBSS)

The YRBSS data were thoroughly cleaned and edited according to the CDC protocol to ensure quality and reliability of the data. Separate analyses were conducted and compared to the published YRBSS report to ensure data integrity.

Methodology

Geographic Information Systems (GIS) Mapping

All addresses for prepared food options, purchased food options, recreation options, healthy food purchase options and schools were obtained from the lists researched from each category to be mapped. The coordinates for the study addresses were retrieved from the website: http://geocoder. us/ that provided free web-access to an address geocoded. Addresses that weren't matched to the highest level where discarded to maintain accuracy in our analysis. In some cases the mismatch was due to malformed addresses, and required manual intervention. This was done to obtain a higher match rate. Particularly farmers' market locations which were on cross-sections and did not have a particular point address could not be geocoded and mapped.

The geocoded addresses were mapped using ArcMap 9.2 from ESRI. All maps used a uniform base map of the District of Columbia divided by wards. The wards were labeled within each map for clarity and better comparisons of distribution within the district. The ESRI shape files where downloaded from http://dcgis.dc.gov/ . The coordinates of the geocoded addresses were directly used to overlay the data with the Washington DC base map.

Obesity, physical activity and crime prevalence by ward were illustrated through adding layers for their prevalence figures onto the maps. To map schools by ward, each ward was extracted and all locations of prepared, purchased food options and schools were extracted by their respective ward. Each ward was divided by its respective Advisory Neighborhood Commissions (ANC). Charter Schools and Public middle and high school were then mapped for each ward and ANC. Category B options were mapped by ANC and Ward.

In some cases, the layers were categorized using the map symbology tool, to deliver greater impact. Diverse colors were used to represent different categories and different symbols were used for easier interpretation of the maps. Increasing intensity of colors was used to show prevalence layers for obesity, physical activity and crime in the District. Colors for mapping food options and schools were chosen carefully to make the illustrations as easy to interpret as possible.

Data Analysis

SAS 9.1, Cary, N.C. was used to conduct frequency and cross tabulation analyses. Variables used included BMI, race, sex, income, education, fruit and vegetable consumption, and physical activity. All variables were weighted using the final weight variable to adjust for a non random sampling method.

Limitations of the Data

Due to the large number of location listings for fast food, dine in, and carry out restaurants, verification of operation was not confirmed of the food locations during 2007. However, the collected data should accurately represent the locations available in the District of Columbia. Locations that exist as of June 2009 were not confirmed to be in operation during 2007.

When geocoding addresses, a less than 100% match rate occurred and some addressees needed to be manually corrected while others could not be included because cross streets and intersections could not be geocoded.

Methodology

Limitations of BRFSS data include sampling error that may occur with any sample survey population. Sampling error can cause the results of the District of Columbia BRFSS to vary from those that would have been obtained with a census of all adults living in telephone-equipped households. The results of this sample survey could differ from true figures because some households cannot be reached and others refuse to participate. Non-responding household may differ from participating respondents in terms of attributes relevant to the study. (BRFSS)

Data from the District of Columbia YRBSS is collected only within the DC Public School system and not within the DC Public Charter School system as of 2007. In addition YRBSS data is not available by ward due to increased risk of individually identifying students. Overall prevalence rates for the District of Columbia were used, and individual problem areas could not be identified.

DC Demographics

According to the 2000 Census, there are 572,059 people living in the District of Columbia. Of this population, 31% are white, 60% are Black or African American, 3% are Asian and about 4% are another race. Within the District, 7.9% of residents (of any race) are Hispanic. Of those residents in DC who are 25 or older, 78% have earned a high school degree or higher, 39% have earned a bachelor's degree or higher and 10% have earned a graduate or professional degree. The median household income is $40,127, and 16.7% of families and 20.2% of individuals live at or below the poverty level.

The District of Columbia has been divided into Wards and Advisory Neighborhood Commissions or ANC's. There are eight wards and 40 ANC's in the District. The ANC's are used to advise the District government on neighborhood issues related to zoning, health, police protection, social service programs, parks and recreation and sanitation issues. A map of the wards broken down by ANC's can be found in the appendix of this report.

Ward 1 is located in the Northwest quadrant near the center of the District. This is the smallest ward geographically, but the most densely populated ward with 73,364 residents at 41 persons per acre. This ward is predominantly residential and has experienced a significant increase in housing production as neighborhoods such as Columbia Heights, Adams Morgan, Lower Georgia Avenue and the U Street/Shaw/Cardozo area are becoming more desirable. Ward 1 is 32% white, 46% Black or African American, 18% other, and 24.7% Hispanic/Latino. The median income in Ward 1 is $36,902.

Ward 2 is located in the Northwest and Southwest quadrants of the city. With a population of 68,869, this ward contains the District's Central Business District, the National Mall, Georgetown University, George Washington University East Potomac Park, the Potomac River, the White House, and the Capitol. Ward 2 has the greatest number of historic landmarks and historic districts of any ward. Ward 2's residents are 65.4% white, 20% Black or African American, 12% other, and 10.2% Hispanic/Latino. The median income of Ward 2 is $44,742.

Ward 3 is located in the Northwest quadrant of the District and has a population of 73,718 residents. Residents in this ward are 84% white, 6% Black or African American, 5.7% Asian, and 7% Hispanic/Latino. Ward 3 is primarily residential and consists of Tenleytown and Friendship Heights neighborhoods and Wisconsin Avenue which feeds into the exclusive, high-end shopping area of Chevy Chase, MD. The median household income is $71,875, which is 79% above the District's median income.

Ward 4 is the most populated ward in the District with 74,092 residents. Of these residents, 18% are white, 71% are Black or African American, 8.5% other, and 12.5% Hispanic/Latino. Ward 4 has a diverse collection of neighborhoods stretching from the northeast neighborhoods of Lamond-Riggs to parts of the Chevy Chase community west of Rock Creek Park. Ward 4 stretches from its northern boundary of Eastern Avenue with Montgomery County, Takoma Park and Prince George's County in Maryland to its southern border with Ward 1 on Spring Road, Ward 5 to the East and Ward 3 to the West. The median income of Ward 4 is $46,408.

Ward 5 is located in the District's Northeast quadrant and has a population of 72,527 residents. Of these residents, 9.5% are white, 87% are black or African American, 3% are other, and 3% are Hispanic/Latino. Major transportation and commuter routes run through this ward including New York Avenue, North Capitol Street, Florida Avenue, Benning Road, Rhode Island Avenue, Michigan Avenue, South Dakota Avenue, and Bladensburg Road. Ward 5 is largely industrial and undergoing many improvements to in-

crease the quality of life. The median income in ward 5 is $43,433.

Ward 6 is located in all four quadrants of the District; Northwest, Southwest, Northeast, and Southeast. A portion of Ward 6 lies within the Central Business District. Capitol Hill, Chinatown, Union Station, Judiciary Square and Navy Yard are all located within Ward 6. The population of Ward 6 is 68,035 and consists of 32% white, 63% Black or African American, 3% other, and 3% Hispanic/Latino. The median income for Ward 6 is $41,554.

Ward 7 is the District's most Eastern ward There are 70,540 residents in Ward 7 comprised of 1% white, 97% Black or African American, and less than 1% other or Hispanic/Latino. Ward 7 is physically separated from downtown Washington D.C., bordered on the west by the Anacostia River, the north and east by Prince George's County, Maryland, and the south by Ward 8. Ward 7 contains four major commercial areas and 29 distinct neighborhoods. Some of the neighborhoods include Benning Ridge, Deanwood, Eastland Gardens, Fort Davis, Good Hope, Kenilworth, Lincoln Heights, Park Naylor and Twining. Ward 7 contains hundreds of vacant homes which have contributed to crime, illegal dumping, and neighborhood problems. The median income for this ward is $30,533.

Ward 8 is the District's more southern ward with 70,914 residents. The population of Ward 8 consists of 5% white, 92% Black or African American, and less than 2% other or Hispanic/Latino. St Elizabeth's Hospital, Bolling Air Force Base, the Blue Plans Wastewater Treatment Plant, and D.C. Village are all located within Ward 8. The median income in Ward 8 is $25,017 and 1 in 3 residents live at or below the poverty line.

*Disclaimer: Neighborhood names were used to provide reference of areas. Due to zoning and restructure changes some of the neighborhoods may no longer exist or within a particular Ward cited.

A full summary of statistics of District demographics by Ward can be viewed at the District of Columbia Office of Planning website http://planning.dc.gov/planning/cwp/view,a,1400,q,646453.asp

Section 1 - Adult Overweight and Obesity Introduction

How is Obesity Defined?

Obesity is defined as a body mass index (BMI) of 30 or greater. BMI is calculated from a person's weight and height and provides a reasonable indicator of body fatness and weight categories that may lead to health problems. Obesity is a major risk factor for cardiovascular disease, certain types of cancer, and diabetes. It is a serious medical disease that affects over a quarter of adults in the United States, and about 14% of children and adolescents. It is the second leading cause of preventable death after smoking. [8]

$$BMI = \frac{\text{(Weight in pounds)}}{\text{(Height in inches) x (Height in inches)}} \times 703$$

Causes of Overweight and Obesity

- Overweight and obesity result from an imbalance involving excessive calorie consumption and/or inadequate physical activity. [9]
- For each individual, body weight is the result of a combination of genetic, metabolic, behavioral, environmental, cultural, and socioeconomic influences. [9]
- Behavioral and environmental factors are significant contributors to overweight and obesity and present opportunities for actions and intervention designed for prevention and treatment. [9]

Obesity Trends

According to the BRFSS survey, the percentage of District adults who are of a healthy weight has slowly decreased, while the percentage of District adults who are either overweight or obese has slowly increased. (Figure 1)

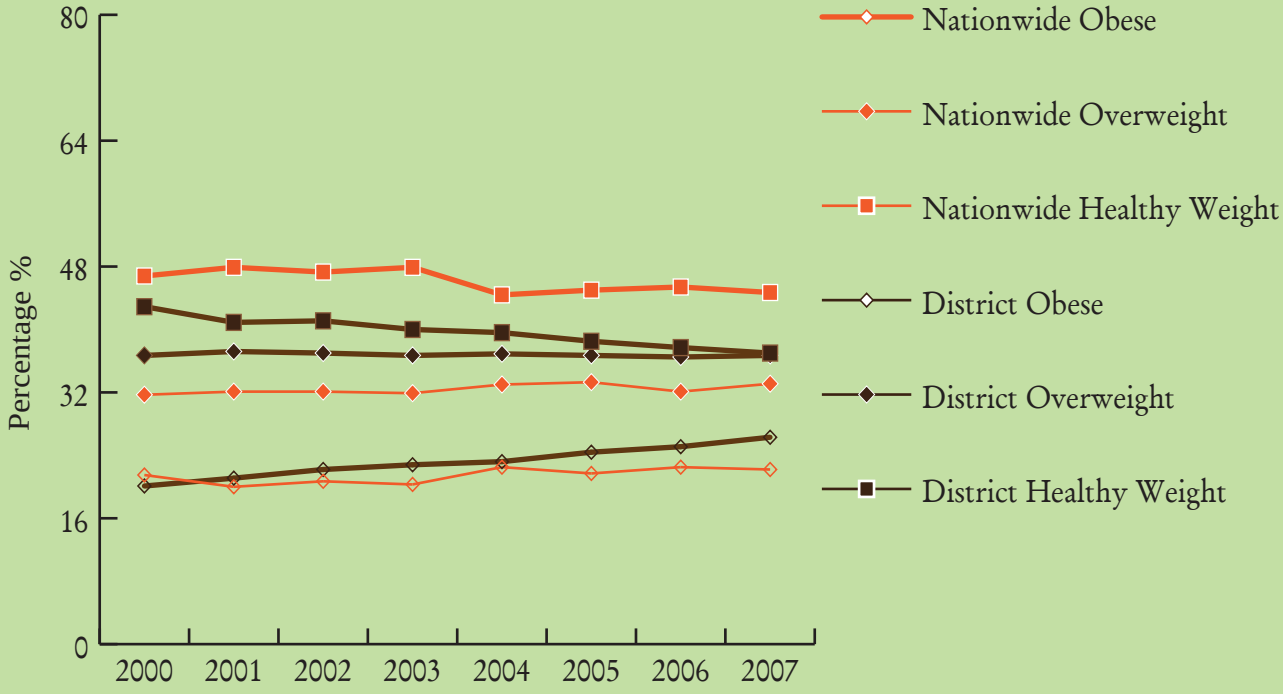
According to the 2007 DC BRFSS women were more likely than men to be of a healthy weight—46% versus 43%, respectively. While men were more likely than women to be overweight (38% versus 29%, respectively), women were more likely than men to be obese (25% versus 19%, respectively).

- By age, adults aged 55-64 were more likely to be overweight (38%), and adults aged 45-54 were more likely to be obese (29%).
- By race/ethnicity, while there were similar percentages of adults by race/ethnicity who were overweight, African Americans were much more likely to be obese (35%), as compared to 22% of Hispanics, 10% of adults of other race/ethnicities, and only 9% of Caucasians.
- As education increased, while there was almost no difference in the percent of adults who were overweight by education, there were significant differences in the percentage of adults who were obese. While only 13% of adults with a college degree were obese, 30% of adults with some college were obese, 36% of high school graduates were obese, and 37% of adults with less

than a high school degree were obese.

- As household income decreased, so did the percentage of adults who were considered obese.
- Adults in Wards 5, 7, and 8 were much less likely to be of a healthy weight compared to residents of all other Wards— 32%, 27%, and 29%, respectively. These Wards also had the highest rates of obesity—30%, 40%, and 42%, respectively. The obesity rates in Wards 7 and 8 (40% and 42%, respectively) are the highest compared to all demographic subgroups.

Figure 1. BMI for DC Adults



DC 2007 BRFSS

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (BRFSS)

Obesity

Table 1. 2007 BRFSS Obesity, Hypertension and Diabetes			
	Obesity	**Hypertension**	**Diabetes**
NATIONAL	**26.3**	**27.5**	**8.1**
DC TOTAL	**22.2**	**28.6**	**8.1**
GENDER			
Male	18.9	28.4	7.1
Female	25.1	28.7	8.9
AGE			
18-24	14.3	10.0	0.8
25-34	16.7	9.8	1.0
35-44	22.3	16.5	3.9
45-54	29.1	32.7	9.0
55-64	25.7	47.1	16.4
65+	23.9	62.3	20.2
RACE			
Caucasian	8.9	17.5	2.0
African American	34.9	41.0	13.9
Hispanic	21.8	18.1	4.9
Other	10.3	16.1	5.6
EDUCATION			
Less than High School	37.0	44.2	16.7
High School Graduate	36.0	41.6	14.1
Some College	29.7	35.2	10.4
College Graduate	13.0	19.4	3.7
INCOME			
Less than $15,000	38.5	46.7	18.0
$15,000-$24,999	32.9	41.2	12.0
$25,000-$34,999	32.1	41.5	10.6
$35,000-$49,999	25.5	28.5	9.6
$50,000-$74,999	23.4	32.8	8.6
75,000+	13.1	16.9	3.0
WARD			
Ward 1	18.8	30.9	6.0
Ward 2	12.5	32.2	8.2
Ward 3	11.7	20.9	3.5
Ward 4	22.0	28.3	8.1
Ward 5	30.1	39.6	12.5
Ward 6	19.1	26.0	6.3
Ward 7	39.9	42.0	13.8
Ward 8	41.9	40.9	18.3

Obesity

Overall there are 22.2% of adults 18 and older who are obese, 28.6% with hypertension and 8.1% with Type 2 diabetes. Table 1 displays the prevalence rates of obesity compared to the prevalence rates of hypertension and type 2 diabetes by ward in the District of Columbia.

- Overall females were more likely to be obese and suffer from hypertension and diabetes. (Table 1)
- Blacks were more likely to be obese, and suffer from hypertension and diabetes than any other race. (Table 1)
- Residents who have less than high school education were more likely to be obese and suffer from hypertension and diabetes. (Table 1)
- Residents who earn less than $15,000 per year were more likely to be obese and suffer from hypertension and diabetes. (Table 1)
- Ward 3 residents have the lowest rates of obesity, hypertension and diabetes whereas Wards 7 and 8 have the highest prevalence rates of obesity, hypertension and diabetes. (Table 1)

* Other race/ethnicities comprise primarily of Multiracial, Asian, Hawaiian, Pacific Islander, American Indian, and Alaskan Native and other

Obesity and Chronic Diseases

An estimated 300,000 deaths per year may be attributed to obesity. [1] As a key factor to preventive death in the United States, overweight and obesity pose a major public health challenge. Obesity increases the risk for co-morbid conditions primarily diabetes, hypertension, coronary artery disease, and some cancers. [2]

The sixth most vital risk factor contributing to the overall burden of disease globally is excess body weight. [10] Based on several population studies risk estimates indicate that at least two-thirds of the prevalence of hypertension can be directly attributed to obesity. Epidemiological evidence has helped to clarify the role of diet in preventing and controlling morbidity and premature mortality resulting from non-communicable diseases. [11]

Hypertension is the term used for elevated blood pressure. If your blood pressure is 135/85 or higher and you are under the age of 65, you have hypertension. Normal blood pressure is generally defined as less than 120/80mm Hg (millimeters of mercury pressure). High blood pressure is often called the "silent killer" as many individuals who have it do not know. When high blood pressure goes uncontrolled, stroke, heart attack, heart or kidney failure can result. The association between obesity and hypertension is well known, but the precise nature of the connection between the two disorders remains uncertain. [12]

Being obese, the body needs more blood in order to supply oxygen to and nourish the extra tissue. As weight is gained fat cells produce more chemicals which in turn add to the strain on the heart and pressure on the blood vessels. The direct correlation between obesity and hypertension provides logic that engaging in physical activity will also lower blood pressure. [10]

Diabetes Mellitus occurs when there are high levels of blood glucose from insufficient insulin production, insulin action, or both. Diabetes Mellitus is a group of diseases, of which the three most common are: (1) Type 1 diabetes, also known as insulin-dependent diabetes or juvenile-onset diabetes. Type 1 diabetes is a disease where the immune system destroys the cells that make insulin; (2) Type 2 diabetes, also known as non-insulin dependent diabetes or adult-onset diabetes. Type 2 diabetes is characterized by insulin resistance, in which the body's cells do not produce or use insulin properly; and (3) Gestational diabetes occurs during pregnancy and is intolerance to glucose. [13]

About 90% of type 2 diabetes is attributable to excess weight. Studies have found significant associations between overweight, obesity and diabetes. [14] Adults with a body mass index of 40 or higher had an increased risk of being diagnosed with diabetes (7.37 times greater). [15] Diabetes is the leading cause of kidney failure, blindness, and amputation in adults. Obesity is probably the most important factor in the development of insulin resistance. [16]

Diet, physical activity and nutrition are vital factors in the promotion and preservation of good health throughout an individuals' life. Fruit and vegetable consumption along with physical activity will reduce blood pressure in both overweight hypertensive and non-hypertensive individuals as well as reducing blood glucose levels in overweight and obese individuals with diabetes. Weight loss in individuals who are either overweight or obese reduces the risk factors for diabetes and cardiovascular disease (CVD).

Table 2. Overweight and Obesity by Diabetes Diagnoses				
Diabetes Status	Yes	Yes, During pregnancy	No, pre-diabetes or borderline	No
Total	355 (N)	27 (N)	3367 (N)	32 (N)
Neither Overweight or Obese	3.2	1.0	0.2	95.5
Overweight	7.8	0.6	1.0	90.6
Obese	17.8	0.8	79.9	1.5

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

Table 2. Overweight and Obesity by High Blood Pressure Diagnoses		
Has High Blood Pressure	Yes	No
Total	1278 (N)	2502 (N)
Neither Overweight or Obese	17.0	83.0
Overweight	31.1	68.9
Obese	46.3	53.7

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

- Overall District residents who have diabetes also have high rates of obesity at 17.8% compared to resident who are not overweight or obese at 3.2%. (Table 2)

- District residents who reported having high blood pressure also have high rates of obesity at 46.3% compared to those residents who are not overweight or obese. (Table 3)

Being either overweight or obese increases the risk for numerous chronic diseases. As BMI increases, so does the proportion of people with one or more co-morbid conditions. Even though diet and exercise are key determinants of weight, environmental factors beyond the control of individuals contribute to increased obesity rates.

Hypertension and diabetes are two diseases in particular that are heavily influenced by diet and exercise. By increasing the level of physical activity and improving diets on a daily basis, hypertension and diabetes can be reversed and prevented. Therefore, educating individuals on healthy eating and exercise are two major components that can save lives and increase quality of life.

Cost Associated with Obesity

Cost associated with overweight and obesity totals 117 billion in the United States. Direct cost is $61 billion and indirect cost is $56 billion. [5]

Direct cost include the cost of physicians and other professionals, hospital and nursing home services, the cost of medications, home health care and other medical equipment. Indirect costs include lost productivity that results from illness and death. [5]

- Type 2 diabetes cost related to overweight and obesity: cost is $98 billion (total)
- Osteoarthritis costs related to overweight and obesity: Total cost is $21.2 billion. Direct cost is $5.3 billion. Indirect cost is $15.9.
- Hypertension (high blood pressure) cost related to overweight and obesity: Direct cost $4.1 (17 percent of the total cost of hypertension).
- Gallbladder disease costs related to overweight and obesity: Total cost: $3.4 billion, Direct cost $3.2 billion, indirect cost: 187 million.
- Lost productivity cost related to obesity (BMI>30) among Americans ages 17-64 is $3.9 billion. This value considers the following annual numbers (for 1994).
    - Workdays lost related to obesity: 39.3 million
    - Physician office visits related to obesity: 62.7 million
    - Restricted activity days related to obesity: 239.0 million
    - Bed days related to obesity: 89.5 million

Source: Cost of obesity and overweight – http://www.nutristrategy.com/econcost.htm

Fruit and Vegetable Consumption

The District of Columbia ranks seventh among states with the lowest obesity rates. [1] Despite this positive statistic, several of the District's wards have disturbingly high rates of obesity. Poor nutritional intake combined with low physical activity levels are major risk factors for increasing obesity rates.

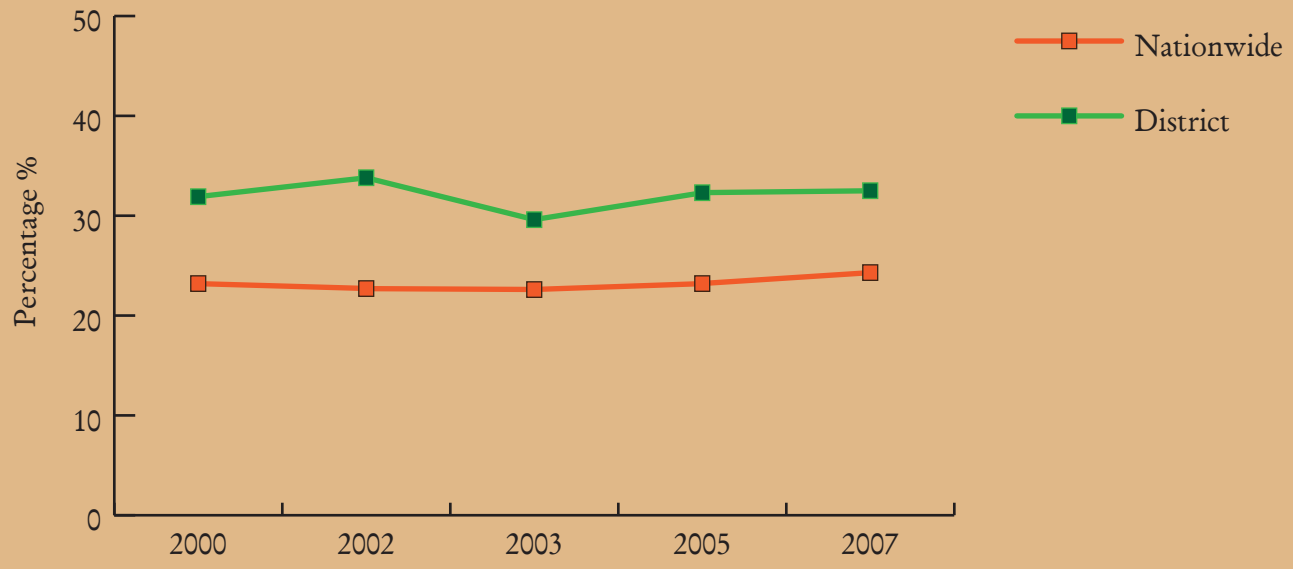
Fruits and vegetables contain essential vitamins, minerals, and nutrients necessary to keep the human body healthy. Consuming fruits and vegetables as a regular part of a balanced diet can help to maintain a healthy weight and prevent many diseases such as diabetes, cancer, cardiovascular disease, stroke, high cholesterol, and high blood pressure.

The USDA recommends that those consuming the traditional 2000 calorie diet eat 4 ½ cups or 5 servings of fruits and vegetables daily. Recent national trends for fruit and vegetable consumption have been declining. The decline could be due to the increased prices in fresh fruits and vegetables and increased awareness of pesticide use on non-organic produce items. [17]

According to the 2007 BRFSS national statistics, 24% of Americans consume 5 or more servings of fruits and vegetables per day and 76% of Americans consume less than five servings of fruits and vegetables per day.

Overall, one-third (33%) of District adults ate the recommended five or more servings of fruits and vegetables. This was the highest BRFSS percentage of all states, as nationwide the average is 24%. Since 2003, there has been an increase in the percent of District adults who eat at least five fruits and vegetables per day. (Figure 2)

Figure 2. Consumption of at Least 5 Fruits and Vegetables Per Day for DC Adults



2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

Table 4. BRFSS 2007 Fruits and Vegetables Consumption by Demographics			
	N	Less than 5 per day (%)	5 or more per day (%)
TOTAL	3819	67.5	32.5
GENDER			
Male	1457	71.2	28.8
Female	2362	64.2	35.8
AGE			
18-24	112	65.3	34.7
25-34	526	66.1	33.9
35-44	691	70.9	29.1
45-54	675	65.8	34.2
55-64	811	67.5	32.5
65+	944	66.3	33.7
RACE			
Caucasian	1788	64.7	35.3
African American	1554	69.5	30.5
Hispanic	212	71.2	28.8
Other	189	62.3	37.7
EDUCATION			
Less than High School	305	71.3	28.7
High School Graduate	561	71.6	28.4
Some College	628	71.2	28.8
College Graduate	2315	64.3	35.7
INCOME			
Less than $15,000	307	68.1	31.9
$15,000-$24,999	395	71.4	28.6
$25,000-$34,999	264	73.4	26.6
$35,000-$49,999	390	65.5	34.5
$50,000-$74,999	481	69.0	31.0
75,000+	1585	64.6	35.4

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

- Women were more likely than men to consume the recommended five servings per day 36% versus 29%, respectively. (Table 4)

- Adults aged 35-44 were less likely than all other age groups to consume five or more servings per day, at 29%. (Table 4)

- Adults of other race/ethnicities (38%) and Caucasians (35%) were more likely to consume five or more servings than African Americans (31%) and Hispanics (29%). (Table 4)

- As education increased, so did the percentage of adults who consumed the recommended five servings of fruits and vegetables per day; 29% of adults with less than a high school degree consumed five or more servings, compared to 36% of college graduates. (Table 4)

- Adults with a household income of $75,000 and above, and those with a household income of $35,000-$49,999, were more likely than all other household income subgroups to consume five or more servings per day—35% for each. (Table 4)

- Sixteen percent of adults did not drink any juice per day, 41% drank less than one serving of juice per day, 30% drank one to less than two servings of juice per day, and 13% drank two or more servings of juice per day. (Table 4)

- Less than half of adults, 44%, ate fruit (not including juice) less than once per day and another 4% never ate fruit. Twenty-nine percent of adults ate fruit one to less than two times per day, 15% ate fruit two to less than three times per day, and only 9% of adults ate fruit three or more times per day. (Table 4)

- District adults were less likely to eat green salad, as 65% ate green salad less than once per day, 22% ate green salad one to less than two times per day, and only 6% ate green salad two or more times per day compared to 8% who did not eat any green salad. (Table 4)

Table 5. Overweight and Obesity by Fruit Consumption

Fruit and Vegetables Consumption	N	Neither overweight or obese	Overweight	Obese
Consume 5< times per day	2411	63.5	69.6	70.8
Consume 5 or more times per day	1252	36.5	30.4	29.2

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

- Overall respondents who are neither overweight or obese are more like to consume 5 or more fruit and vegetables daily (36.5%) compared to those who are overweight at 30.4% and those resident who are obese at 29.2%. (Table 5)

Dine-In,Traditional Fast Foods, Convenience stores and Carry-outs

Dining out at restaurants, particularly in fast food restaurants, is associated with increased weight gain and obesity. [18] Residents who live in areas with limited access to quality, affordable and nutritious foods may modify their food shopping routines and diets based on the food environment in their neighborhoods. Several Wards within the District have easier access to fast food restaurants, carry-out and convenience stores but limited access to large scale grocery stores, organic food and farmer's markets.

Figure 3 shows the distribution of convenience stores, carry-out and traditional fast food locations within the District and figure 4 shows the distribution of dine-in-restaurant options available within the District. Wards 2 and 6 are considered the business district of Washington DC, and are the least populated wards. The business district is comprised of local and federal government buildings , museums, colleges (George Washington University) and historical landmarks (Capital, Monument and the White House). The variety of food options located in the surrounding areas accommodates an enormous fraction of employees and/or visitors in the city.

Since the majority of working citizens spend a greater portion of their time at their workplace, their surrounding food environment plays an integral role on their overall health. The clustering of category B food options located within the business district perpetuates some of the unhealthy eating behaviors among adults who visit or work within the city. (Category B options are defined as establishments that do not provide fresh fruits and vegetables that residents would have access to in order to meet the USDA recommendations of 5-13 servings of fruits and vegetables daily such as carry-outs, traditional fast food and convenience stores).

Figure 5 shows the distribution of convenience stores and carry-out locations in relation to fruit and vegetable consumption rates.

Figure 6 shows the distribution of fast food locations by ward in the District of Columbia divided into two different categories, Traditional and Healthy Fast Food options. Outside of the business district, there are very few healthy fast food options for residents who reside in Wards 4 and 8. Ward 4 has an obesity rate of 22.0% and the least amount of healthy fast food options than any other ward; while Ward 8 has an even distribution of traditional and healthy fast food options, they also have the highest rate of obesity at 41.9% than any other ward and more carry-out than fast food.

Figure 3. Category B Options by Adult Obesity Prevalence

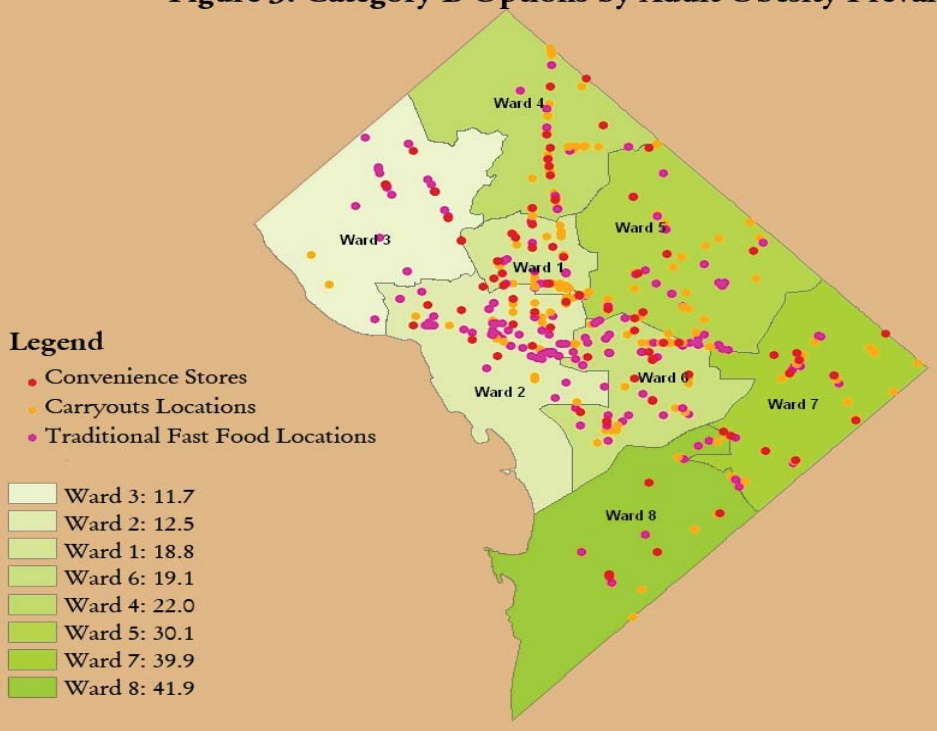


Figure 4. Dine - In Restaurants (Category B Option) by Adult Obesity Prevalence

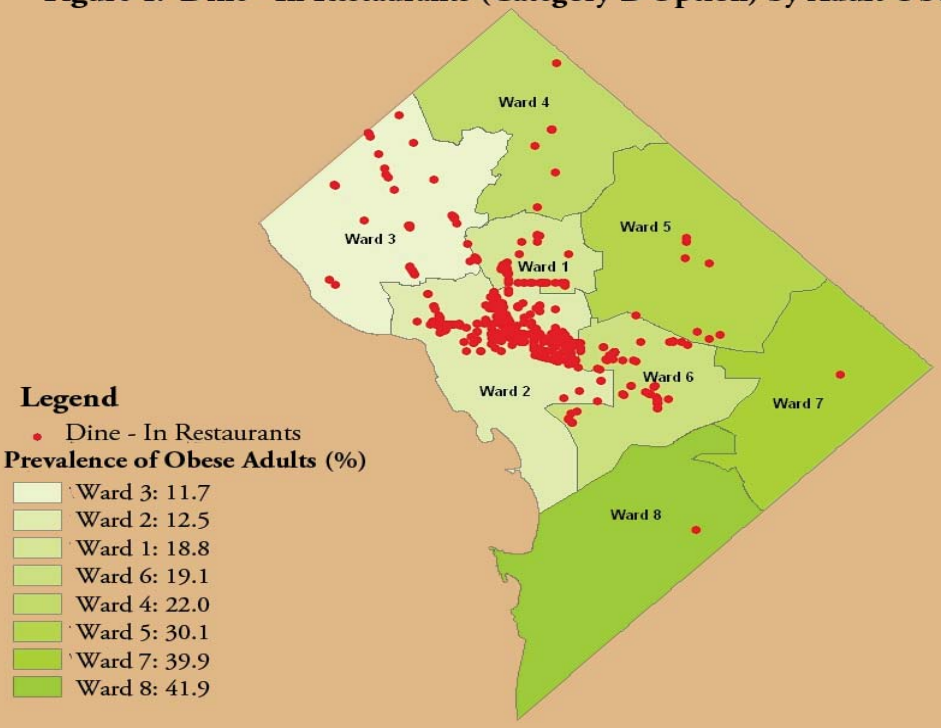


Figure 5. Convenience Stores and Carryout Locations by Adult Fruit Prevalence

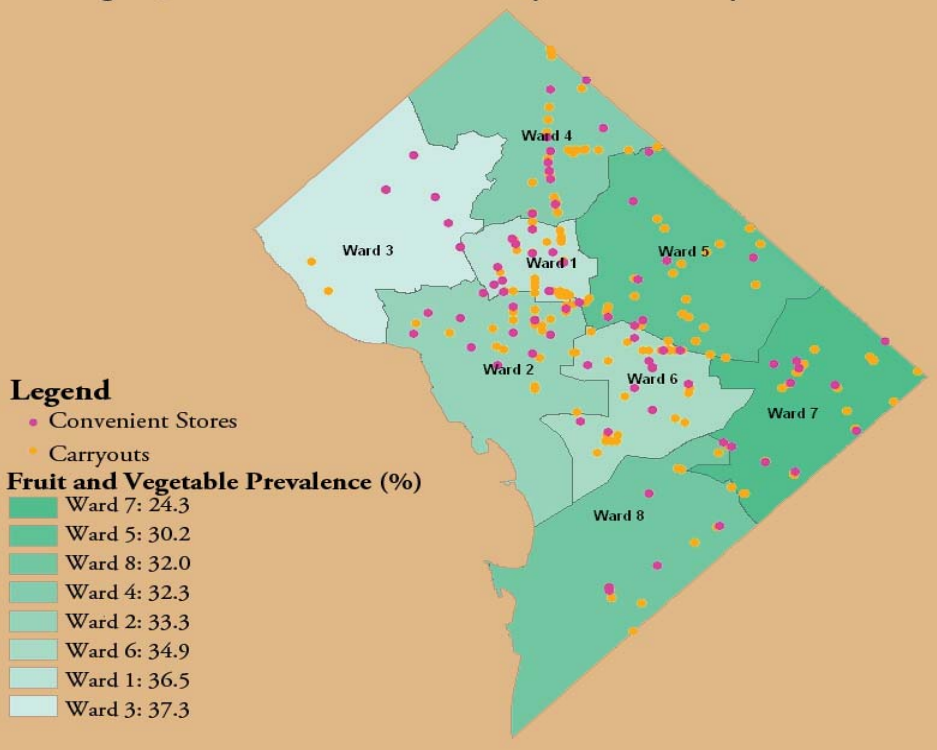
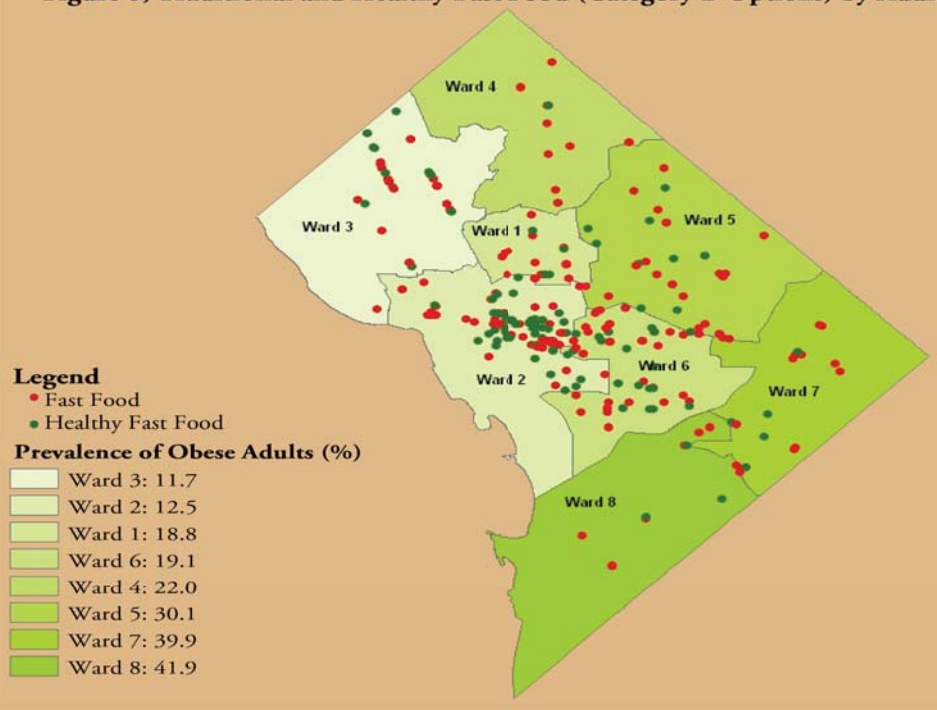


Figure 6, Traditional and Healthy Fast Food (Category B Options) by Adult Obesity Prevalence



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps
*2007 BRFSS Obesity Prevalence and Fruit and Vegetable Consumption

Table 6 provides a more detailed comparison of fruit and vegetable consumption and obesity by ward in relation to the number of locations where residents can purchase fresh produce. Wards 1, 2 and 3 have the highest prevalence rate of fruit and vegetable consumption whereas Wards 5, 7 and 8 have the lowest prevalence rate of fruit and vegetable consumption in comparison to all wards.

Table 6. Category A and B Option in relation to Obesity and Fruit and Vegetable Rates

Ward	**Number of Grocery Stores, Organic Food and Farmer's Markets *(Category A)*	*Consumes 5 or more Fruits or Vegetables per day (%)	*Prevalence of Obesity (%)	**Traditional fast foods *(Category B)*	**Number of Carry-outs *(Category B)*	**Number of Convenience Stores *(Category B)*
1	10	36.5	18.8	18	29	13
2	14	33.3	12.5	57	25	14
3	14	37.3	11.7	24	2	5
4	4	32.3	22.0	11	38	10
5	7	30.2	30.1	28	31	8
6	7	34.9	19.1	40	28	12
7	4	24.3	39.9	13	20	10
8	3	32.0	41.9	8	14	8
Total	62	32.5%	22.2%	199	187	80

* 2007 Behavioral Risk Factor Surveillance (BRFSS) survey results
** Numbers for Category A and B options are current as of May 2009, DOH, Food and Safety Hygiene Inspection Services (DC FSHIS).
---Category A and B verification was done using DOH FSHIS, DC Atlas and Google maps
---List does not incorporate liquor stores that may also serve as an avenue for individuals to purchase unhealthy foods (i.e. sodas and snacks).

On the 2007 BRFSS survey District adults were asked if they would support or oppose legislation mandating restaurants to provide nutritional information such as calories, fat, sodium and carbohydrates on menus and menu signs; 79% say they would support this legislations. (Table 7)

- Demographic subgroups that were more likely to support the legislation included: women (83%); young adults (over 80% for adults aged 18-34); African Americans and Hispanics (over 85%); adults with a high school degree (88%); and adults with a household income of $25,000-$49,999 (over 89%) and District adults in Ward 7 and 8 were most likely to support such legislation as 88% of Ward 7 adults and 91% of Ward 8 adults supported the legislation.

Table 7. Attitudes Towards Legislation Mandating the Provisions of Nutritional Information by Demographics and Ward			
	N	Support	Oppose
TOTAL	3826	79.4	13.7
GENDER			
Male	1460	74.9	17.4
Female	2366	83.2	10.4
AGE			
18-24	114	86.0	11.8
25-34	542	80.7	13.9
35-44	699	78.1	14.6
45-54	679	78.2	14.5
55-64	807	79.3	13.2
65+	925	78.7	12.0
RACE			
Caucasian	1785	70.1	20.5
African American	1562	85.7	8.7
Hispanic	211	87.1	10.3
Other	190	76.1	15.7
EDUCATION			
Less than High School	297	82.1	10.4
High School Graduate	549	87.8	7.2
Some College	632	81.5	13.3
College Graduate	2334	75.6	16.3
INCOME			
Less than $15,000	311	83.0	10.9
$15,000-$24,999	396	85.2	10.5
$25,000-$34,999	266	88.5	6.6
$35,000-$49,999	385	84.6	9.8
$50,000-$74,999	483	79.9	13.9
75,000+	1596	74.7	17.7
WARD			
Ward 1	277	78.9	14.2
Ward 2	267	71.9	20.4
Ward 3	639	73.8	17.9
Ward 4	516	80.6	10.9
Ward 5	332	74.7	15.5
Ward 6	393	73.8	19.8
Ward 7	355	88.2	8.2
Ward 8	244	91.3	5.0

Source: Center for Policy, Planning and Evaluation, 2007 District of Columbia Behavioral Risk Factor Surveillance System (BRFSS)

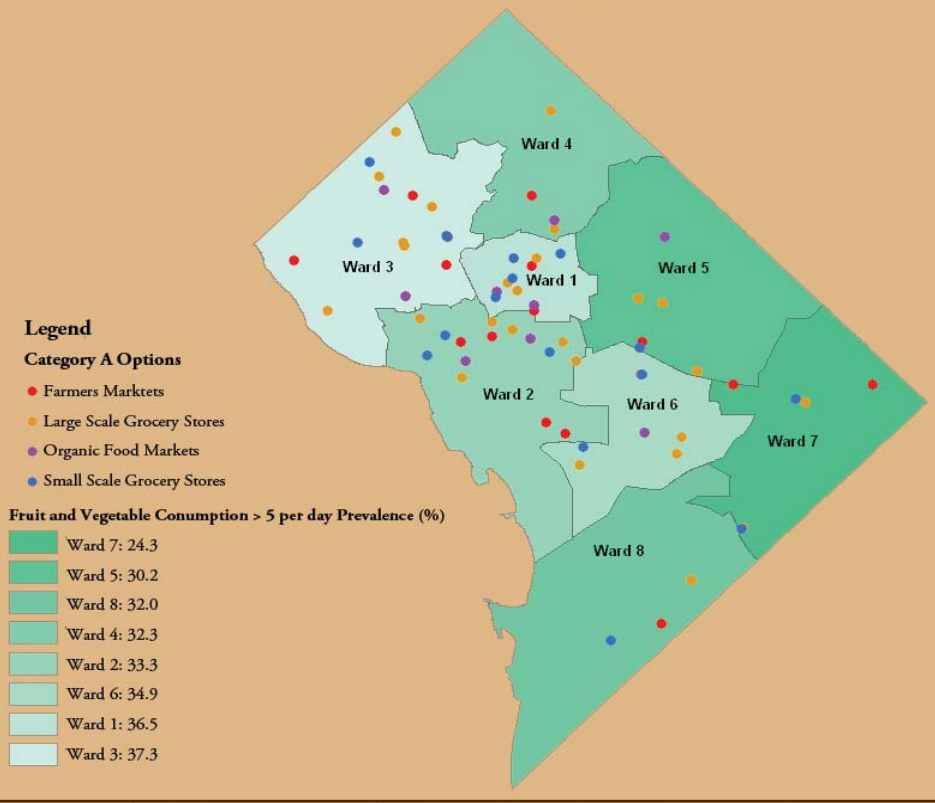
Large and small scale grocery stores and Organic and farmer's markets

Poor dietary patterns and obesity are predictable risk factors for chronic disease and have been associated with neighborhood deprivation and minority composition. [18] Environmental factors such as, lack of access to a large scale grocery store, increased cost of healthy foods, low cost of unhealthy foods and lack of access to safe places to exercise has contributed to the increase in obesity rates within the District. Neighborhood disparities in access to food may have a major influence on these relationships and health disparities in the District of Columbia. [18]

Figure 7 shows the prevalence of fruit and vegetable consumption in relation to the large and small scale grocery stores, organic food and farmer's markets in the District of Columbia by ward. Wards 3, 1 and 6 (37.3%, 36.5% and 34.9%) respectively had the highest prevalence of fruit and vegetable consumption compared to Wards 7, 5 and 8 (24.3%, 30.2% and 32.0%) respectively which have the lowest prevalence rate of fruit and vegetable consumption.

Figure 8 shows the prevalence of obesity in relation to the large and small scale grocery stores, organic food and farmer's market locations by ward. Wards 3, 2 and 1 respectively had the lowest rates of obesity and have ten or more category A options for residents to purchase fresh fruits and vegetables than any other ward. (Table 3) However, Wards 4, 7 and 8 have the least amount of category A options for residents.

Figure 7. Category A Options by Prevalence of Adult Fruit Consumption



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps; *2007 BRFSS Obesity Prevalence and Fruit and Vegetable Consumption

Figure 8. Category A Options by Adult Obesity Prevalence

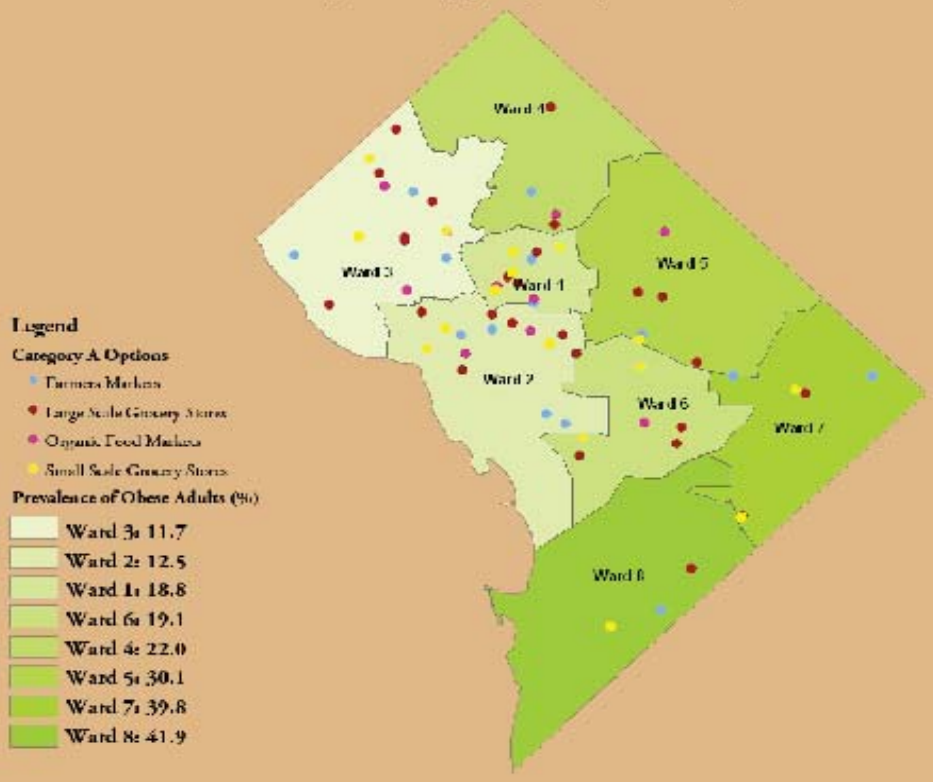


Table 8. Distribution of Category A Options in Relation to the District's Population

Ward	Large Scale Grocery Store	Small Scale Grocery Store	Organic Market	Farmer's Market	Population
1	2	4	2	2	73334
2	5	3	2	4	68827
3	5	3	2	3	73753
4	2	0	1	1	75001
5	3	1	1	2	71604
6	3	2	2	0	68087
7	2	2	0	1	70539
8	1	1	0	1	70915

Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

Impact

To further evaluate the potential health impact that may be associated with residents who lack access to quality, affordable, and nutritious healthy food options within the District of Columbia, we examine each option in further detail by Ward and ANC. The Advisory Neighborhood Commissions (ANC) which are designed to advise the District government on neighborhood related issues such as zoning, health, police protection, social service programs, parks and recreation and sanitation issues could be utilized in terms of policy development that can decrease the environmental factors contributing to obesity.

WARD 1

The high fruit and vegetable consumption and low obesity rates in Ward 1 may be attributed to several existing category A food options that are in close proximity to residential neighborhoods. Since Ward 1 is the smallest ward geographically, residents are more likely to travel a short distance to purchase fresh produce.

Figure 9 show the distribution of category A food options within Ward 1. ANC 1A and 1C have the most category A options than any other ANC within Ward 1.

ANC 1B in particular has a staggering amount of category B options that overshadow the category A options located within this ANC. (Figure 10) This could be attributed to universities such as Howard University which is located within ANC 1B. Since college students primarily do not have the financial means to afford quality and nutritious foods they are more likely to purchase inexpensive foods that can be purchased from fast food, carryout and convenience stores. There are five category B food options located within less than ½ mile of the Howard University campus.

Figure 9. Distribution of Category A Options in Ward 1

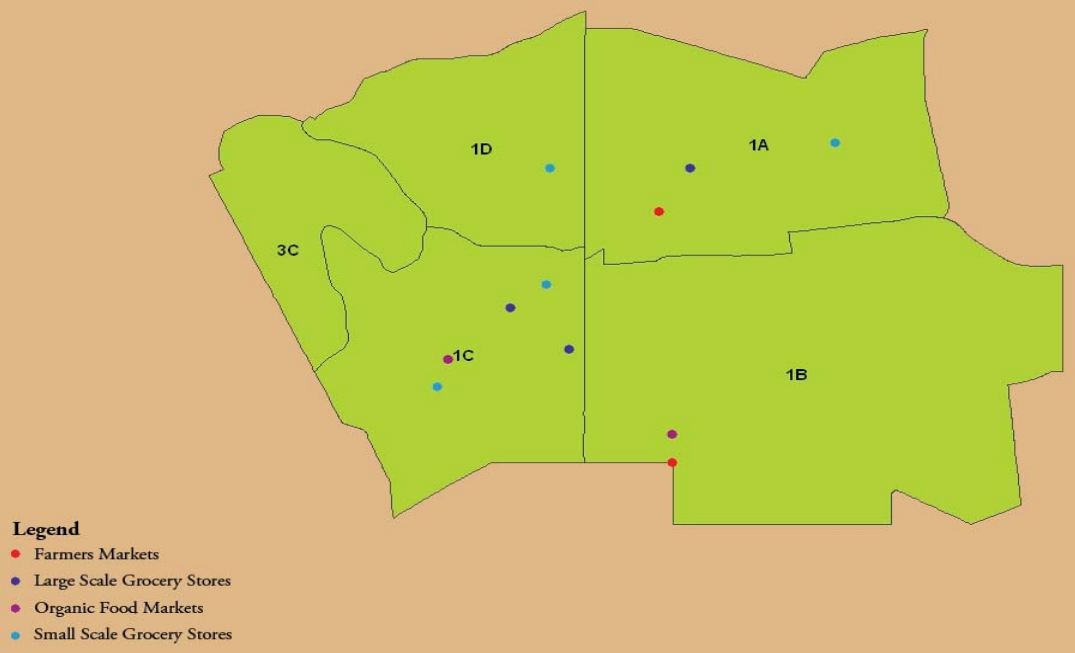
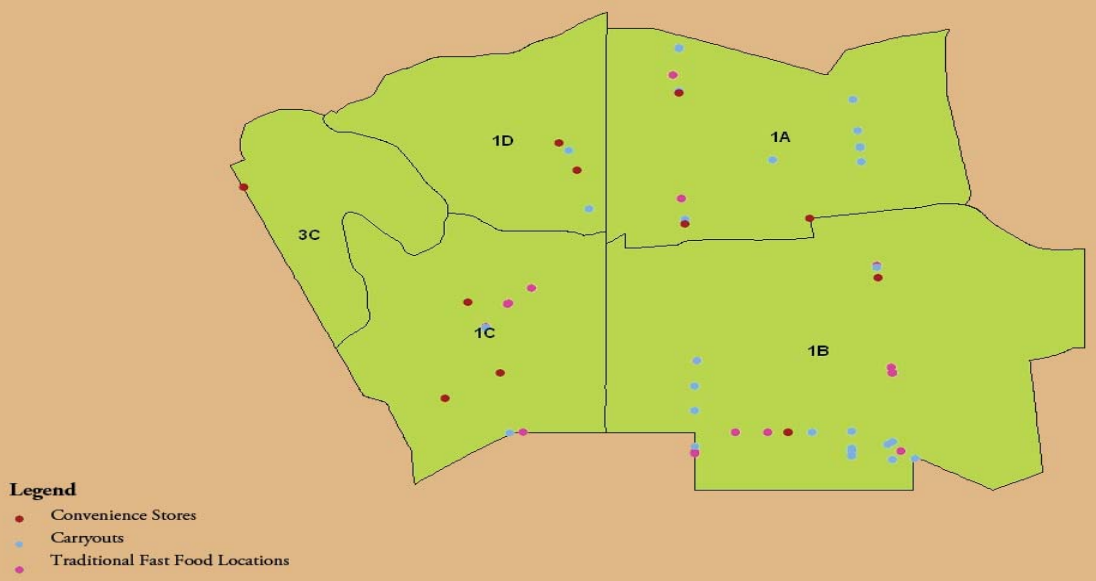


Figure 10. Distribution of Category B Food Options in Ward 1



**Due to zoning changes ANC 3C is now located in Ward 1
*Target™ which is not included on the map for Ward 1 could be categorized as a small scale grocery store because of its grocery sections that has frozen foods , dairy products and other items that you would find in a large scale grocery. This grocery store does not have fresh fruits and vegetables.

Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps
*2007 BRFSS Obesity Prevalence and Fruit and Vegetable Consumption

WARD 2

In the District of Columbia, Ward 2 ranks 2nd in low obesity rates (12.5%), and 2nd in high physical activity rates (89.6%) but 4th in fruit and vegetable consumption (32.3%). Residents within this ward have at least fourteen (14) category A options to purchase fresh produce. Even though there appears to be a great variety of category A options within this ward, the low fruit and vegetable consumption rates could be attributed to the variety of options that are located within the business district as opposed to what is actually available within the surrounding neighborhood areas.

ANC 2A encompasses the Washington Monument, Lincoln Memorial, White House, George Washington University, The State Department in addition to other very prominent federal historical landmarks. ANC 2A is predominantly comprised of federal and historical landmarks and the majority of the food options are located within a ½ mile from aforementioned locations. Immediate food options may be cafeterias or street vendors, which serve hot dogs, sodas, chips and other category B food and/or snacks. When employees want to grab a quick and inexpensive lunch they may be more likely to patronize the street vendors. (Figures 11 and 12)

ANC 2B, 2F and 2E which are also located in a primary business district have an overwhelming amount of category B options compared to other ANCs within this Ward. ANC 2B and 2F comprise of locations such as the Verizon Center, Chinatown, FBI, Department of Commerce and the Wilson Building, locations that are surrounded by a staggering amount of category B food options in addition to dine-in restaurants. ANC 2E is comprised of the Georgetown, Burleith and Hillandale areas. Georgetown has a mix of shopping options and residential areas that allow residents access to a variety of category A and category B options within their ANC.

Figure 11. Distribution of Healthy Food Options in Ward 2

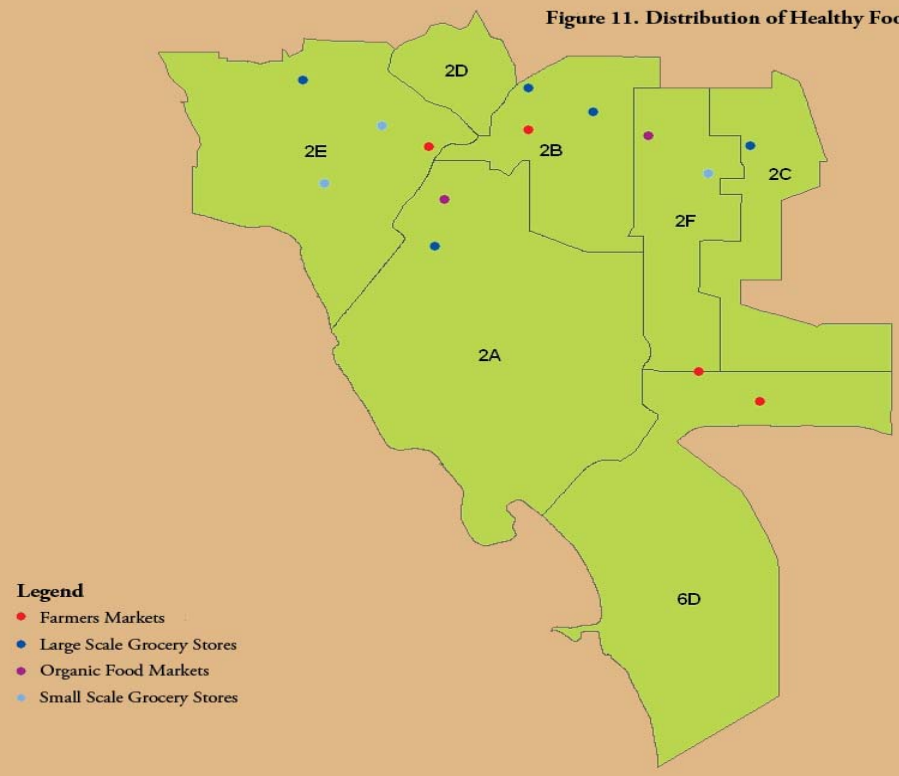
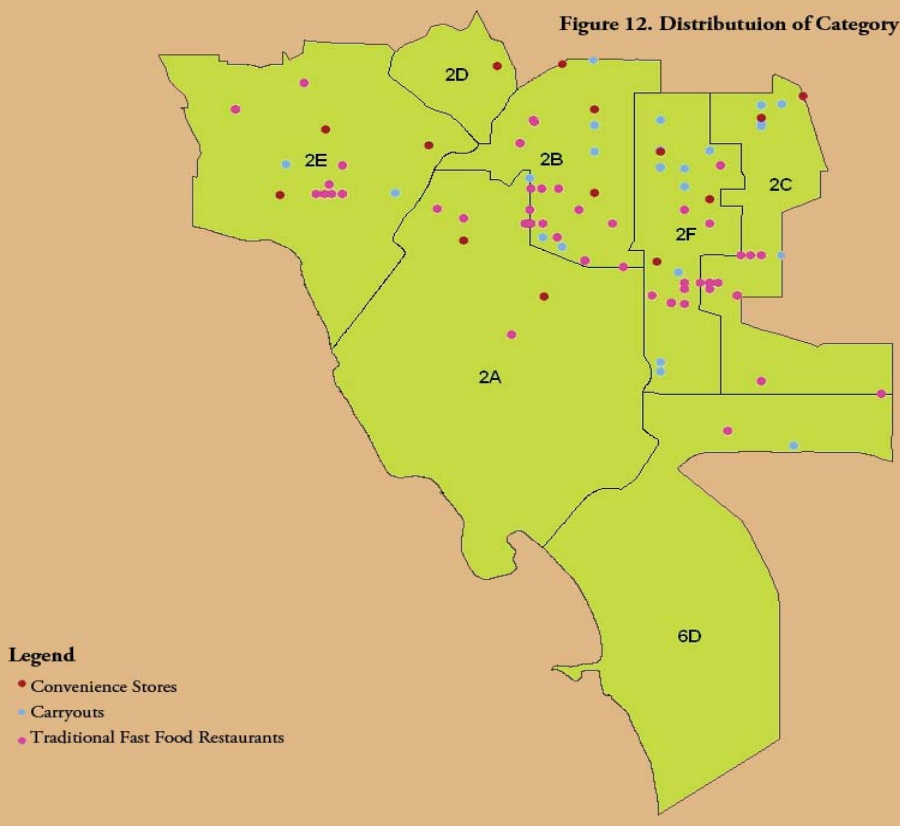


Figure 12. Distributuion of Category B Options in Ward 2



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

*Due to re-zoning segments of 6D is a part of Ward 2.

WARD 3

Ward 3 is considered the most prosperous area of Washington, DC where the median household income is more than $71,000. With a population of 73,718 Ward 3 residents not only have access but can afford to purchase quality and nutritious foods from at least fourteen (14) locations such as large and small scale grocery stores and farmers and organic food markets. (Figure 13)

Overall there is an equal distribution of category A and B options within Ward 3. This balance does not limit residents to purchasing food from the corner stores, but actually quality stores within their neighborhoods. Since there are not a lot of category B options such as fast-food, convenience stores and carry-outs, residents may be more likely to shop at their local grocery store for healthy foods and patronize the fast-food, convenient stores and carry-outs on rare occasions. In addition the residents of Ward 3 have the financial means to sustain their purchase of quality and nutritious foods.

Ward 3 has the highest fruit and vegetable consumption and physical activity rates as well as the lowest obesity rates within the District. The lack of category B options could be attributed to the residents playing a vital role in business development within their communities, by encouraging development of establishments that will enhance their community as well as their overall health and well-being. (Figure 14)

Figure 13. Distribution of Category A Food Options in Ward 3

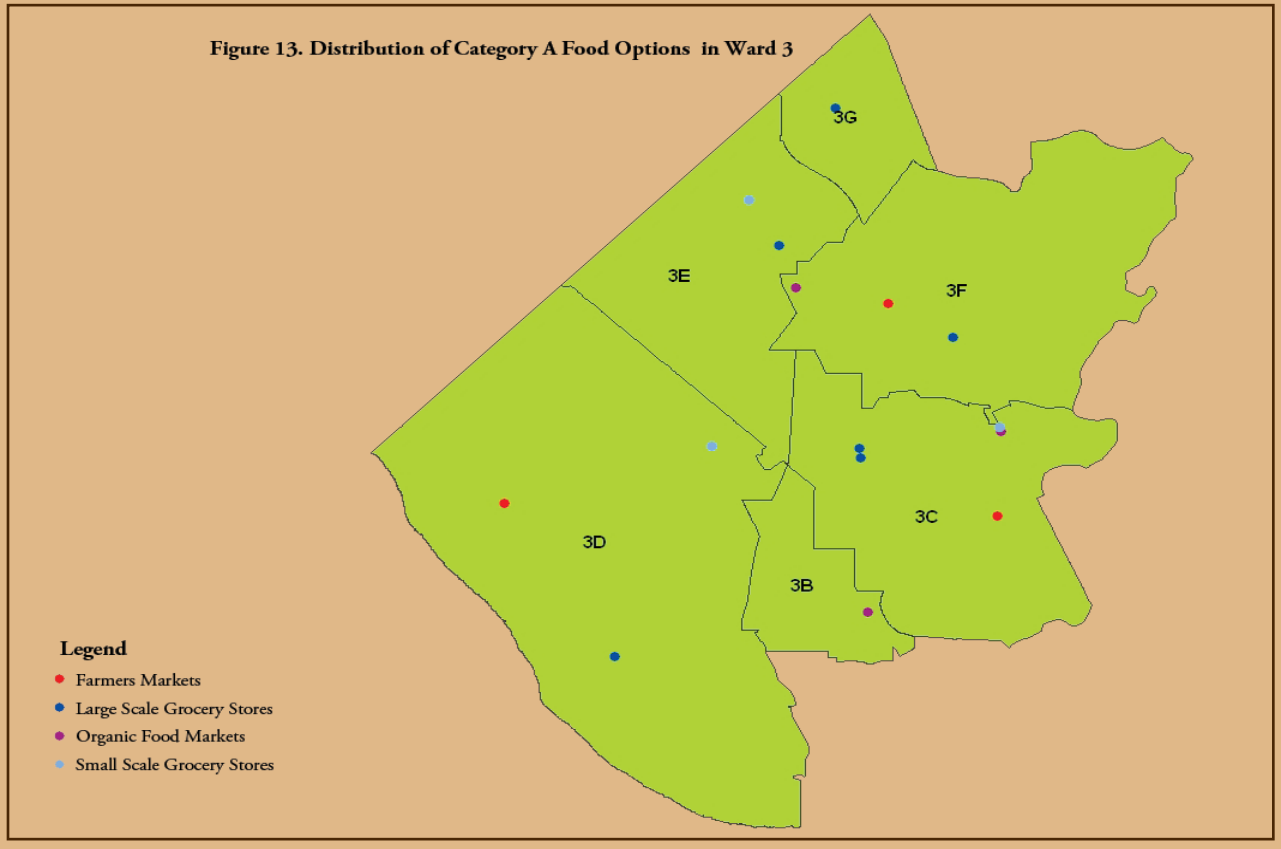
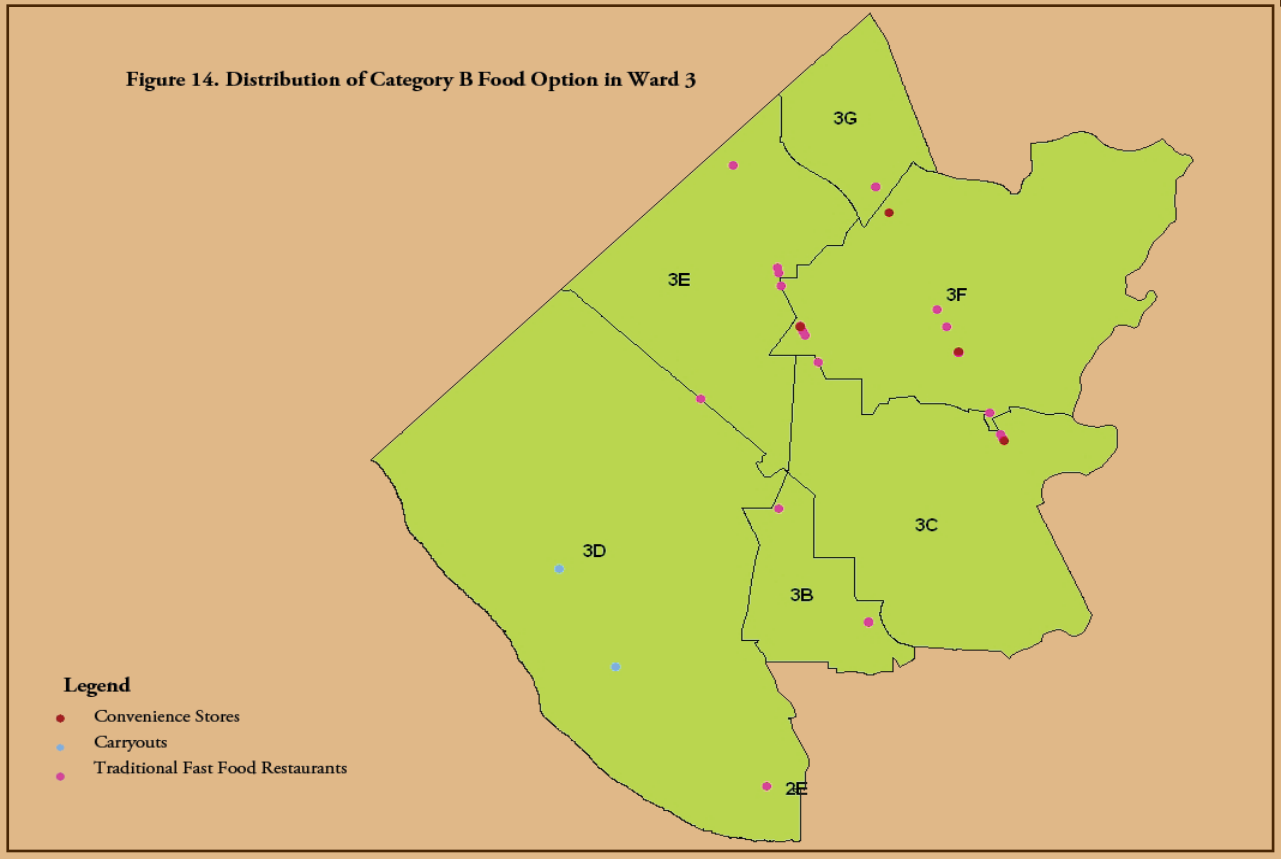


Figure 14. Distribution of Category B Food Option in Ward 3



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

* Due to re-zoning segments of ANC 3G are located within Ward 4 and segments of 3C are located within Ward 1

WARD 4

Ward 4 is the most populated ward within the District with over 74,000 residents and a household median income of $46,000. Figure 15 shows category A options afforded to residents within Ward 4. ANC 4C overall has the bulk of category A options where residents can purchase nutritious foods, whereas ANC 4B has one option and 3G, 4A and 4D have no options for residents to purchase nutritious foods.

In Ward 4 there are a string of category B options along the Georgia Avenue area through ANC 4A, 4B, 4C and 4D. (Figure 16) The category A options located within ANC 4C appear to be located within the more affluent areas of Ward 4 such as Columbia Heights sections of Petworth, Sixteenth Street Heights and Crestwood. ANC 4D which comprise of the additional segment of Petworth has no category A options for their residents but a variety of carry-out options.

Ward 4 has the highest overweight rate (39.2%) within the District. These high rates may be attributed to the lack of category A options available to residents and the amount of category B options that are provided to those residents who live outside of the ANC 4C area. Interventions are needed to prevent higher rates of obesity in this ward within the upcoming years.

Figure 15. Distribution of Category A Food Options in Ward 4

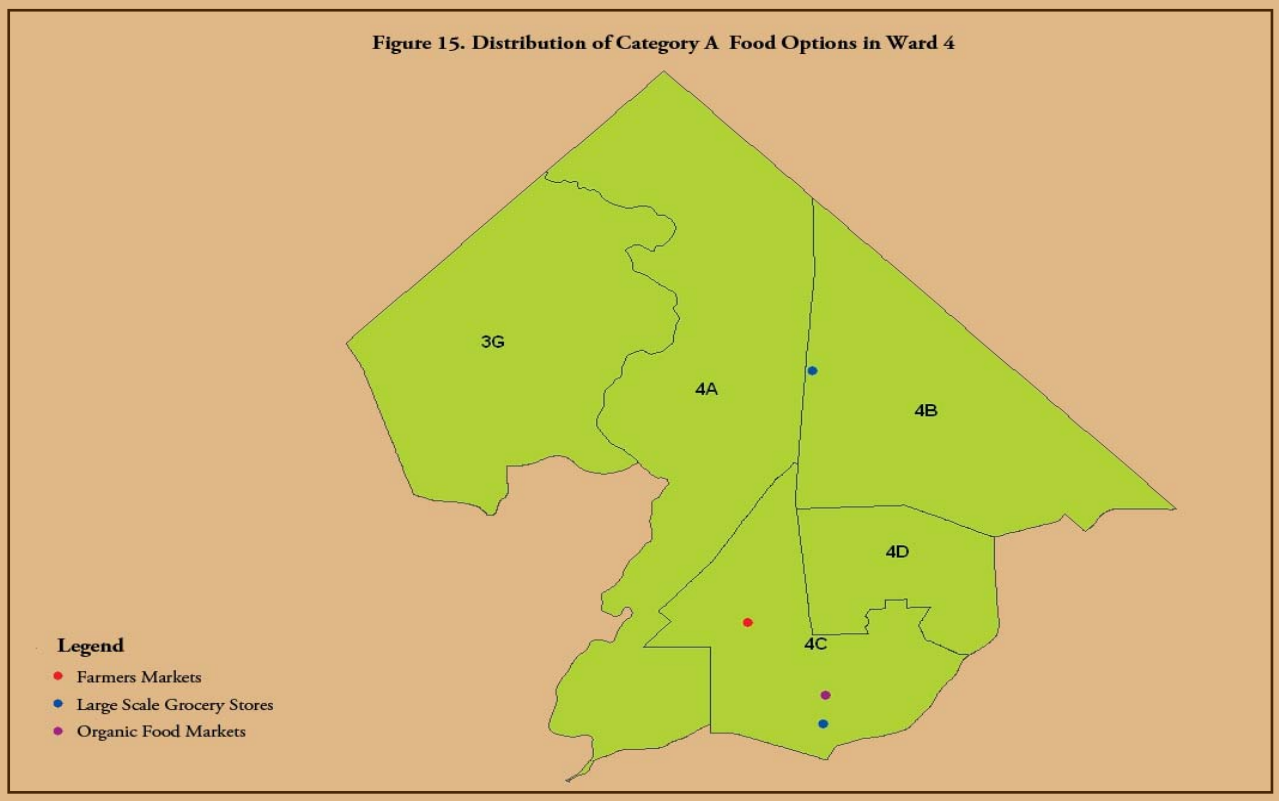
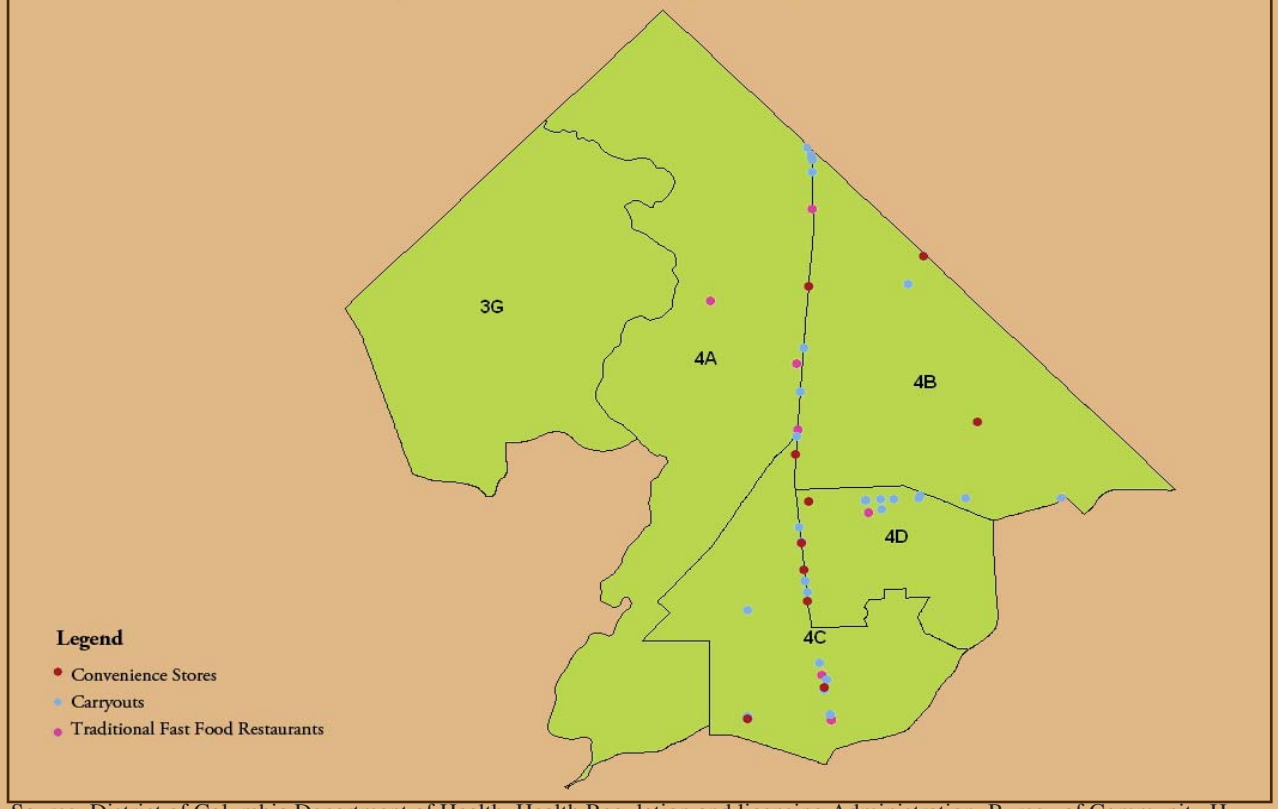


Figure 16. Distribution of Category B Food Option in Ward 4



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps
*Due to re-zoning segments of 3G is now a part of Ward 4

WARD 5

Ward 5 ranks 3rd highest in obesity followed by Wards 7 and 8. There is an estimated sixteen ANC stated neighborhoods that are located within Ward 5 and only six category A options, whereas Ward 3 has about fourteen category A options to service an estimated nineteen ANC neighborhoods.

Ward 5 has an obesity rate of 30.1% and a fruit and vegetable consumption rate of 30.2%. The high obesity and low fruit and vegetable consumption rates could be attributed to past development around Ward 5, which was primarily utilized to build the cities industrial and technological base. Thus, category B options flourished in this area.

Figures 17 and 18 show the distribution of category A options in comparison to category B options within Ward 5. ANC 5A has over six neighborhoods and the residents within these communities only have access to one category A option which is an organic food market but over ten of category B options; where there are no category A options quick, cheap and convenient options are very appealing to residents.

ANC 5B has more category A and B options than any other part of the ward. The general saturation of the ward with mainly category B options provides residents with more cheap and easily accessible options which may account for the high rate of obesity in this ward. ANC 5B comprises the Arboretum, Brentwood, Carver, Langdon, Langston, Ivy City, Trinidad and segments of Brookland areas.

Figure 17. Distribution of Category A Food Options in Ward 5

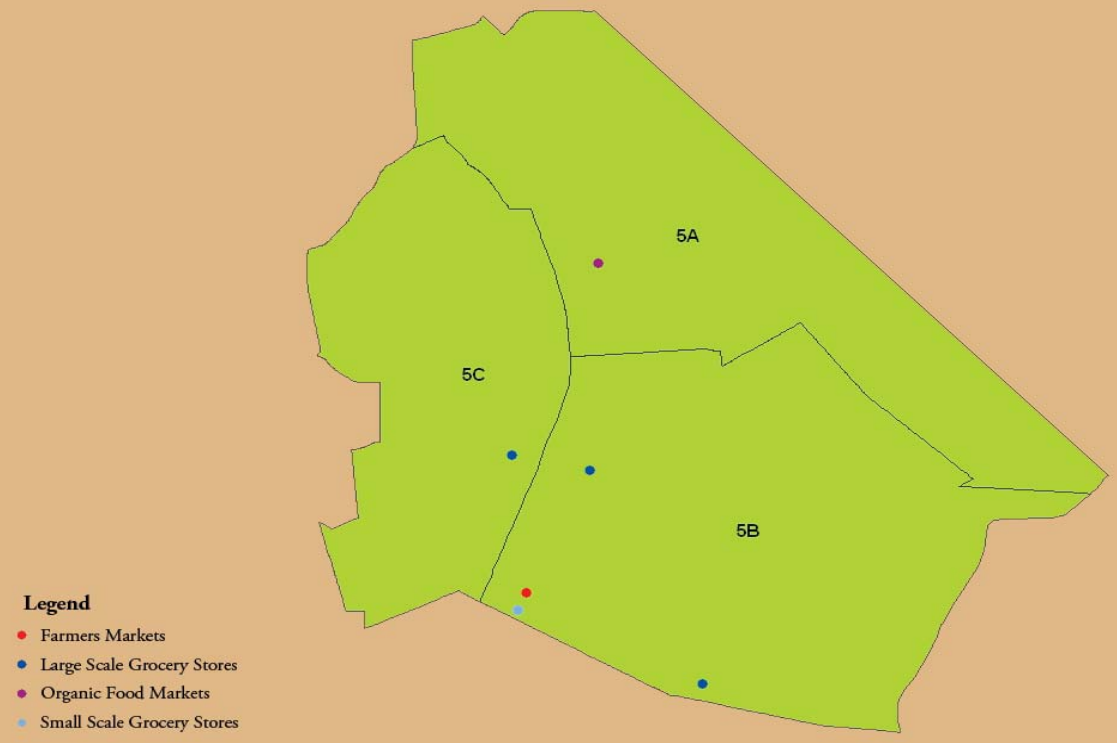
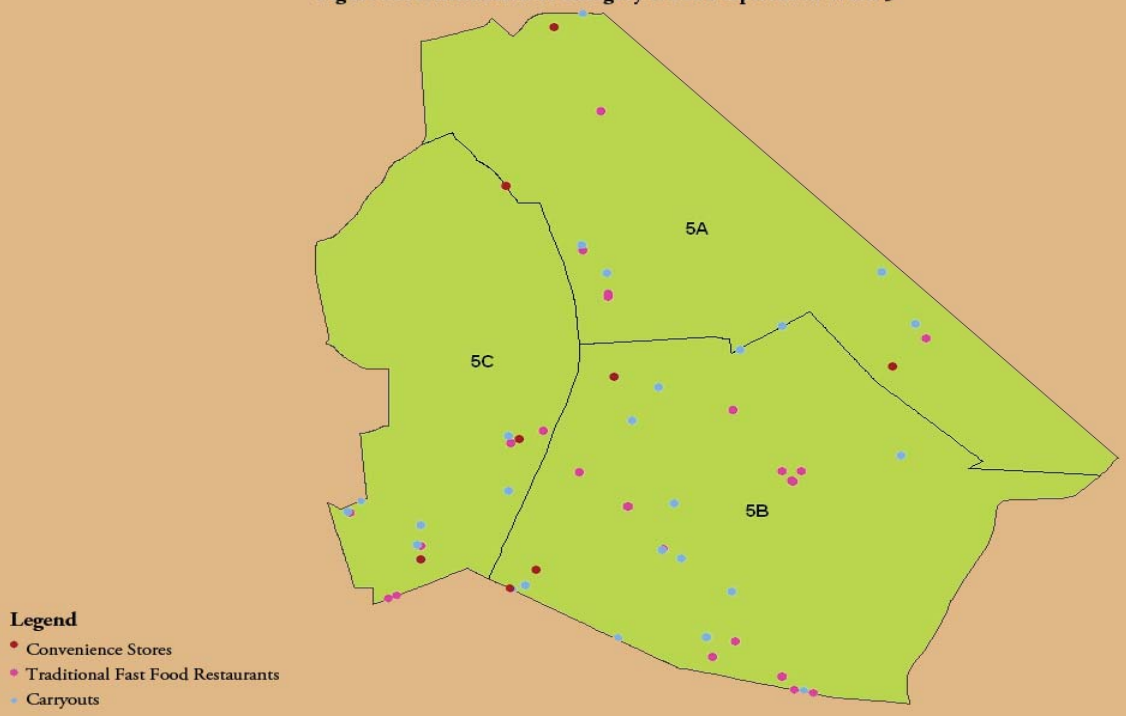


Figure 18. Distribution of Category B Food Options in Ward 5



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

WARD 6

Ward 6 ranks 5th highest in obesity followed by Wards 8, 7, 5 and 4 respectively and rank 2nd in low hypertension rates. Ward 6 is the least populated ward within the District and shares a portion of the business district with Ward 2. Even though there are seven category A options for residents within this Ward, there is a remarkable difference in comparison with the number of category B options. (Figures 19 and 20)

ANC 6A, currently does not have any category A options but has over fifteen category B options within this ANC. The lack of category A options does not provide residents with the appropriate nutrition necessary to maintain or enhance their quality of life.

The areas of ANC 6B comprise of Barney Circle, Capitol Hill and Eastern Market. Areas such as Eastern Market have several dine-in restaurants, convenience stores, carry-outs and traditional fast food restaurants. This ANC has two large scale grocery stores and an organic food market.

ANC 6C is comprised of areas Near Northeast, Penn Quarter and Union Station. Federal and local government buildings in this area are the Department of Labor, Metropolitan Police Headquarters, DC Superior Court, DC Department of Health, DC Public Schools Headquarters, Tax and Revenue and the Veterans of Foreign War Memorial. With the vast number of federal and local government employees that commute to this area at least 5 days a week there is an overwhelming variety of category B options available to employees and visitors. Union Station for example is utilized by visitors and employees of various agencies and offices and has a cluster of category B options within its location. This ANC also has a large and small scale grocery store and farmers market.

ANC 6D is a primarily business district that is comprised of the Department of Labor, Library of Congress, Food and Drug Administration (FDA), the United States Department of Health and Human Services and the Hart Senate Building. This may account for the cluster of category B options as opposed to category A options located within this ANC.

Figure 19. Distribution of Category A Food Options in Ward 6

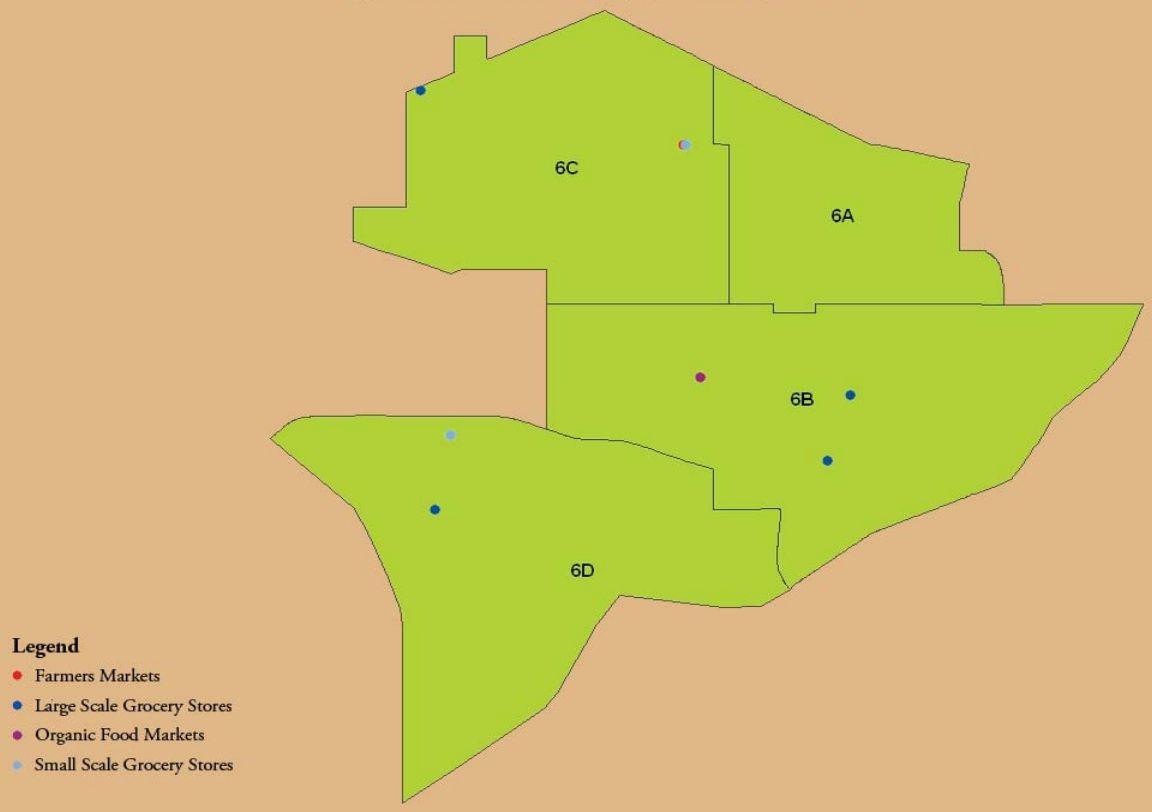
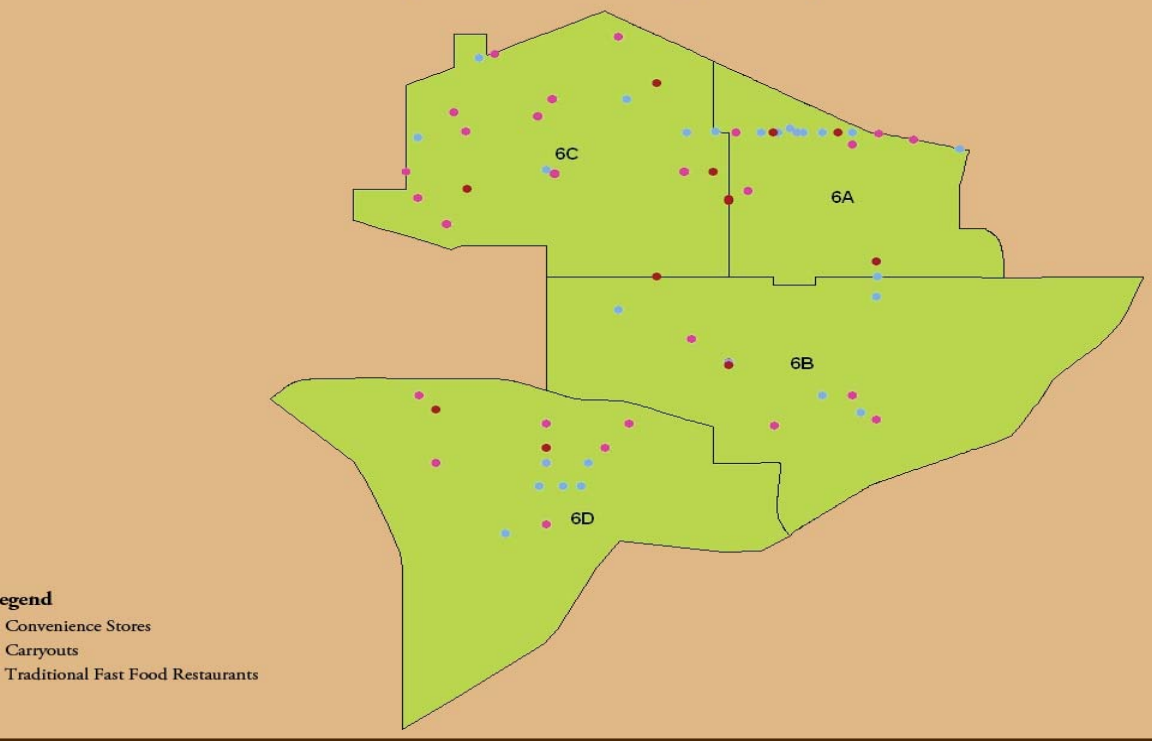


Figure 20. Distribution of Category B Food Options in Ward 6



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

WARD 7

Ward 7 is comprised of 97% African American residents with one of the lowest median incomes in the District of about $31,000. Currently this Ward has two large scale grocery stores, one small scale grocery store and a farmers market. The two large scale grocery stores are located on the opposite ends of the ward which deprives residents who live within the midpoint of the ward of category A options within walking distance to purchase fresh produce. In addition, this community has at least twenty (20) carry-outs, ten (10) convenience stores, thirteen (13) traditional fast food restaurants and three (3) healthy fast food restaurants. This has a major impact on the health of the residents since typically when there is more access to high calorie foods, residents are more inclined to purchase those foods that are less expensive and in close proximity to stretch their budgets. This ward has several shopping centers with vacancies (32%) that could be utilized to develop more grocery stores or other options that will provide fruits and vegetables that are necessary for healthy living.

Ward 7 ranks number 1 in low fruit and vegetable consumption and 2nd in low physical activity rates. Ward 7 also ranks number 1 in hypertension and heart attacks and ranks 2nd in high obesity and diabetes rates. (Table 1)

Figures 21 and 22, shows the distribution of category A and B food options within Ward 7 and its corresponding ANCs. The number of category B options within Ward 7 far exceeds the category A options. ANC 7A and 7D have the highest number of category B options, providing residents with options that are not conducive to good health and overall quality of life.

Figure 21. Distribution of Category A Food Options in Ward 7

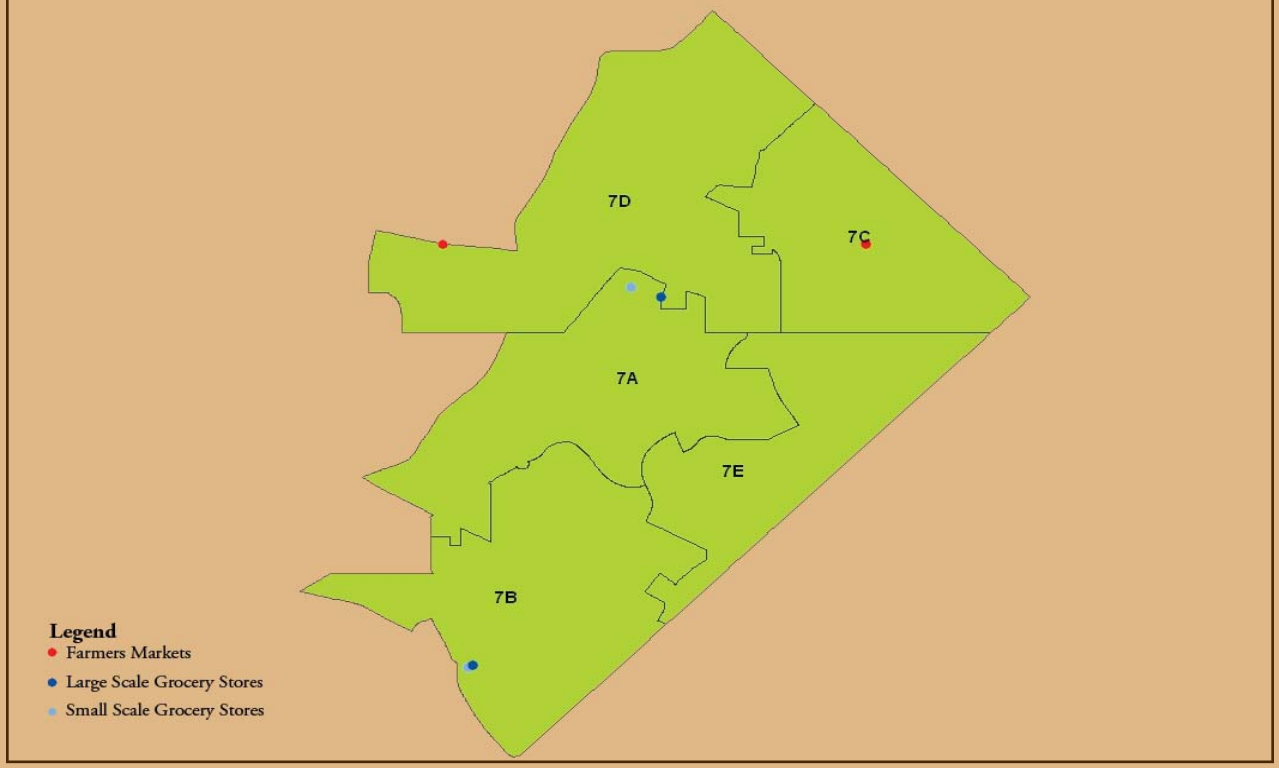
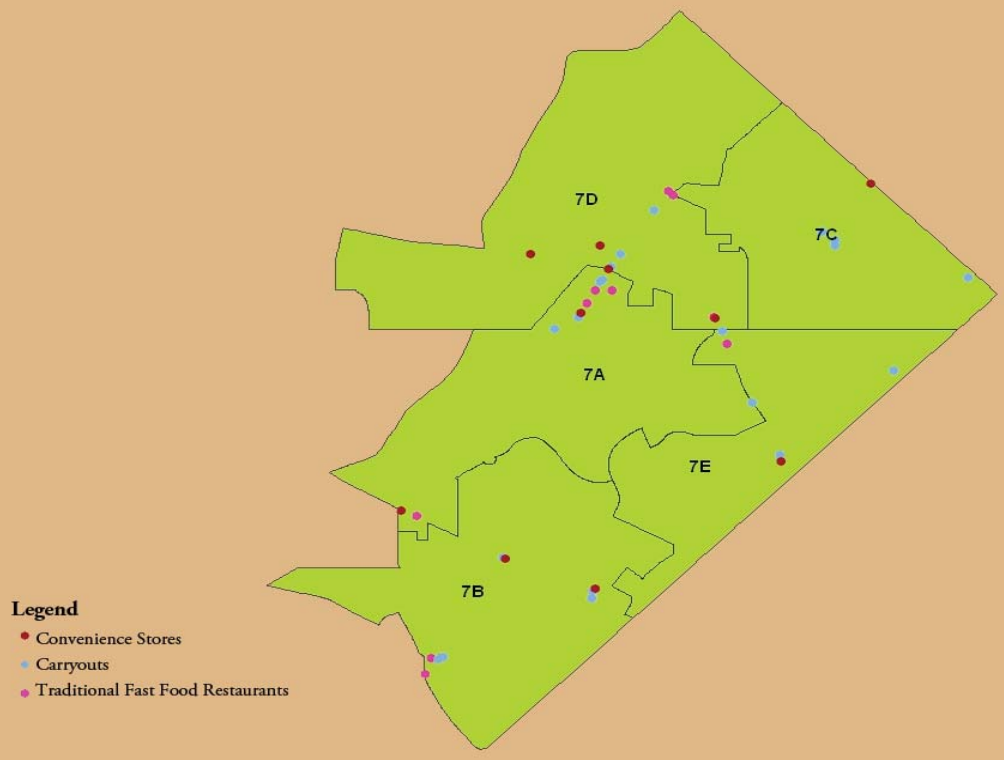


Figure 22. Distribution of Category B Food Options in Ward 7



Source: District of Columbia Department of Health, Health Regulation and licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

WARD 8

With the lowest median income of about $25,000 and one in three residents living at or below the poverty line, Ward 8 is lacking adequate resources. Though ward 8 has an intermediate rate of fruit and vegetable consumption of 32%, this area provides residents with only one large and small scale grocery store and one farmer's market. Ward 8 also has the highest rate of obesity at 41.9% ranks number 1 in low physical activity and high rates of diabetes, and ranks 2nd in hypertension rates.

In 2007, after nine years of having no large scale grocery store within its ward; Ward 8 opened its doors to a new large scale grocery store. Prior to the opening of this grocery store, residents could only do the following:

(a) purchase groceries from their small scale grocery store;
(b) purchase groceries from a large scale grocery store located in another Ward; or
(c) travel to another state such as Maryland which is on the border of the District to purchase groceries from large scale grocery stores in that state.

Ward 8 has the least number of category A options compared to all District wards. ANCs such as 8A and 8C have no category A options but a mixture of category B options such as fast-food restaurants, convenience stores and carry-outs. The ward covers such areas as Anacostia, Fairlawn, Fort Station, Hillsdale, Barry Farms, Bolling Air Force Base, Congress Heights and St. Elizabeth's Hospital. (Figures 23 and 24)

The lack of business development overall in Ward 8 may be attributed to high rates of violent crimes within this area. Ward 8 has the most reported cases of homicide, sexual abuse, and assault with a deadly weapon (ADW) than any other ward. Crime and poverty may be the key factor that business developers take into consideration when exploring locations for community development.

Figure 23. Distribution of Cateogry A Food Options in Ward 8

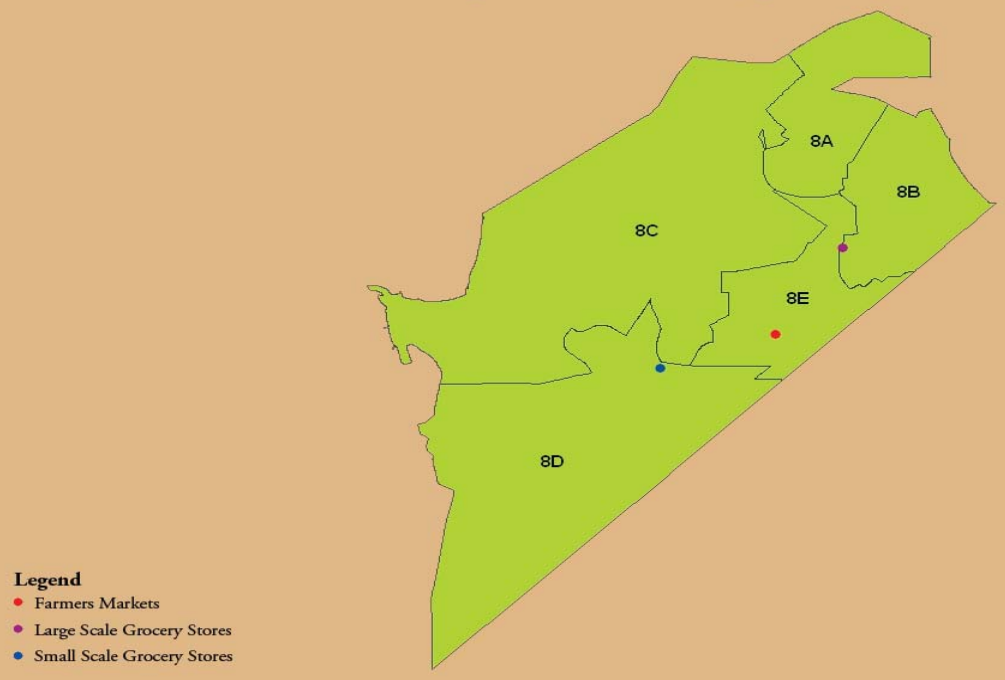
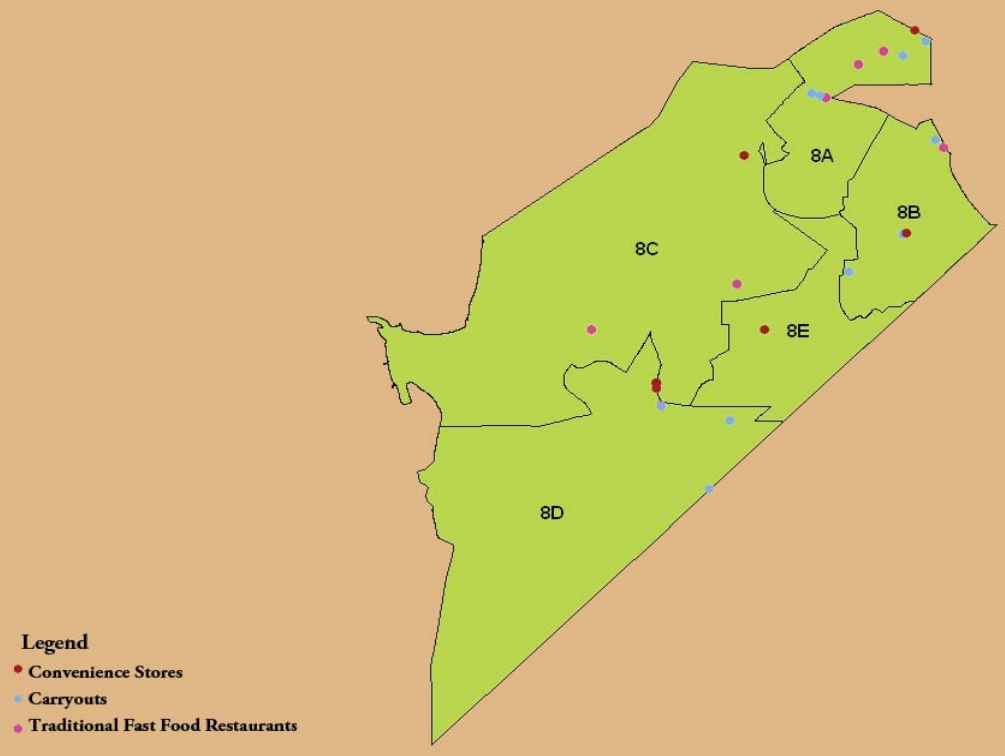


Figure 24. Distribution of Category B Food Options in Ward 8



Source: District of Columbia Department of Health, Health Regulation and Licensing Administration, Bureau of Community Hygiene Food and Safety; District of Columbia Atlas and Google Maps

Health Impact

Based on ethnic and socioeconomic differences among the communities within Washington, DC; Ward 3 which is the most prosperous area of the District has category A options that provide residents with access to grocery stores large and small, organic food and farmers markets options that are located primarily within all of its ANCs. Ward 3 residents are more educated and predominately Caucasian based on Census and BRFSS data.

With a low obesity rate of 11%, highest fruit and vegetable consumption rate of 37.3% and physical activity rate of 89.8% Ward 3 is the model for the city. With regard to positive health impact, Ward 3 has the lowest rates of arthritis, diabetes, hypertension, asthma and 2nd lowest rate of tobacco use and heart attacks. Residents of this ward also have the highest percentage of healthcare coverage and flu vaccinations than any other ward.

Ward 8 which is the poorest ward in the city and predominately African American lacks all of the resources that are available to Ward 3 residents. Ward 8 has the least amount of category A options and has the highest rates of obesity, tobacco use, heart attacks, asthma, diabetes and 2nd highest rate of hypertension. Residents of this ward also have the lowest physical activity; fruit and vegetable consumption and second lowest healthcare coverage rates. This highlights the effects of socioeconomic status on health outcomes.

Physical Activity

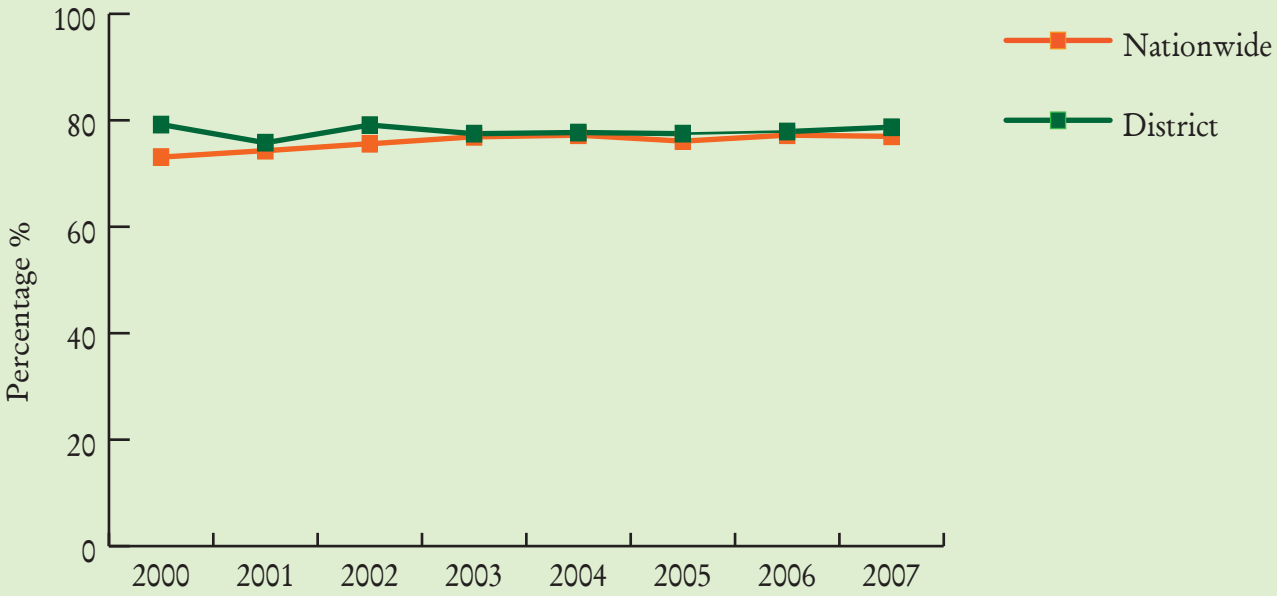
Routine exercise has been shown to reduce the risk of an array of diseases, including heart disease, stroke, colon cancer, diabetes, and high blood pressure. Regular physical activity also assists in maintaining healthy weight, bones, muscles and joints. Additional benefits of physical activity include the reduction of pain associated with arthritis, and lessened symptoms of anxiety and depression. [19]

Recommended physical activity defined by the Centers for Disease Control (CDC) for adults is 2 hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity (i. e. , brisk walking) every week and muscles-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) or 1 hour and 15 minutes (75 minutes) of vigorous intensity aerobic activity every week and muscle-strengthening activities on 2 or more days a week that work all major muscle groups. [20]

Adults and Physical Activity

Respondents who participated in the 2007 BRFSS survey were asked if they participated in any physical exercise other than at their regular job in the past month. Overall, 79% of adults engaged in some form of physical exercise outside of work in the previous month, leaving 21% who engaged in no physical exercise outside of work (slightly higher than the 20% goal for Healthy People 2010). The percentage of adults who participated in physical exercise is slightly higher than the national BRFSS average of 77%. Over the past eight years, there has been almost no change in the level of physical activity by District adults. (Figure 25)

Figure 25. DC Adults who Participated in any Physical Exercise



Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

Physical Activity

Table 9. 2007 BRFSS, Physical Activity by Demographics			
	N	Yes	No
Total	3955	78.7	21.3
Gender			
Male	1510	81.5	18.5
Female	2442	76.3	23.7
Age			
18-24	116	75.3	24.7
25-34	550	84.0	16.0
35-44	709	82.5	17.5
45-54	698	77.6	22.4
55-64	831	79.3	20.7
65+	988	66.9	33.1
Race			
Caucasian	1830	92.7	7.3
African American	1627	69.6	30.4
Hispanic	221	67.4	32.6
Other	196	81.9	18.1
Education			
Less than High School	328	56.7	43.3
High school graduate	582	61.9	38.1
Some College	650	74.3	25.7
College graduate	2382	89.8	10.2
Income			
Less than $15,000	328	55.5	44.5
$15,000- $24,999	409	61.5	38.5
$25,000- $34,999	272	71.7	28.3
$35,000- $49,999	401	77.5	22.5
$50,000- $74,999	496	82.9	17.1
$75,000	1623	91.3	8.7

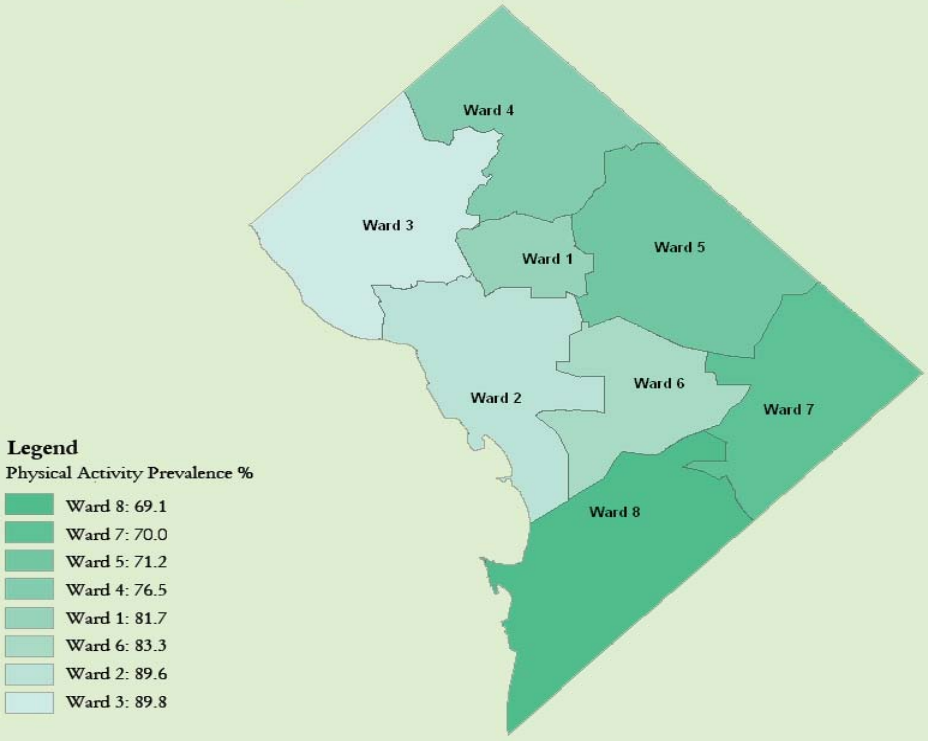
*Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DCBRFSS)

- Men were more likely than women to participate in recreational exercise—82% versus 76%, respectively. (Table 8)

- Adults aged 25-34 and 35-44 were more likely than all other age groups to participate in physical activity outside of work—84% and 83%, respectively, compared to 75% of 18-24 year-olds, 77% of 45-54 year-olds, 79% of 55-64 year-olds, and 67% of adults aged 65 and older. (Table 8)

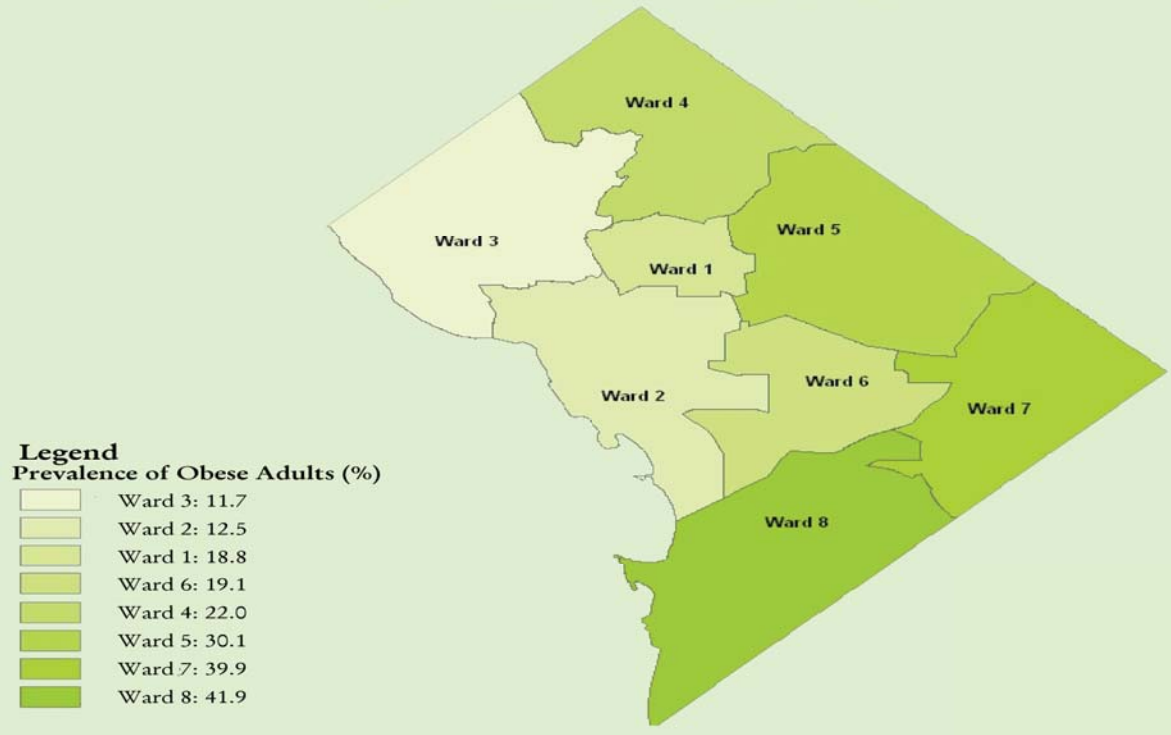
- Caucasians were the racial/ethnic subgroup more likely to participate in recreational exercise, compared to all demographic subgroups; 93%, of Caucasians compared to 82% of adults of other race/ethnicities, 70% of African Americans, and 67% of Hispanics. (Table 8)

Figure 26. Prevalence of Physically Active Adults by Ward



Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

Figure 27. Adult Obesity Prevalence by Ward



Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

Physical Activity

Figure 26 and 27 shows the distribution of physical activity and obesity within the District. Figure 28 shows the distribution of recreational options available within the District. The District of Columbia Parks and Recreation (DPR) centers are evenly distributed through each ward. Like non-government facilities DPR also has a fee associated for individuals who choose to join their fitness centers. Recreational options excluding DPR facilities are predominately located within Ward 2 and are surrounded by the business district and more likely utilized by employees who work in the surrounding areas.

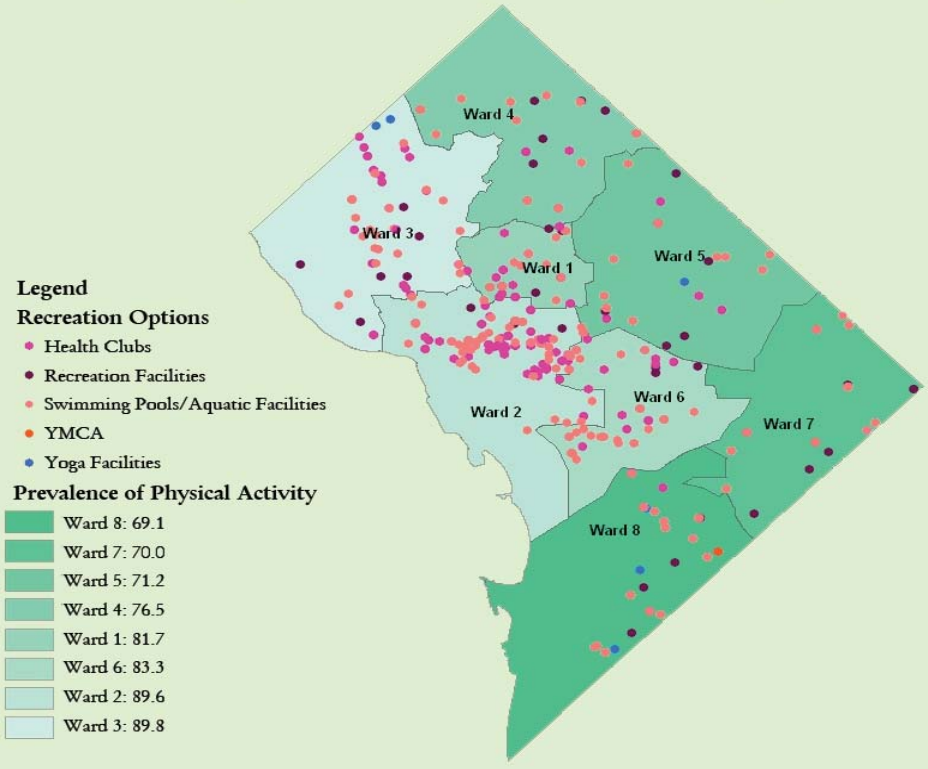
Table 10. Overweight and Obesity by Physical Activity
Exercise in the past 30 days

Exercise in past 30 days	Yes	No
	3054 (N)	730 (N)
Neither Overweight or Obese	83.5	16.5
Overweight	81.7	18.3
Obese	66.5	33.5

Source: 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS)

- Residents who are obese were least likely to participate in physical activity within the last 30 days (33.5%) compared to those who were not overweight or obese at 16.5%. (Table 9)

Figure 28. Recreation Options by Physical Activity Prevalence



*Source: District of Columbia Department of Parks and Recreation
* Health Recreation options within the city provided by DOH and google maps
* 2007 BRFSS Physical Activity Prevalence

Physical Activity

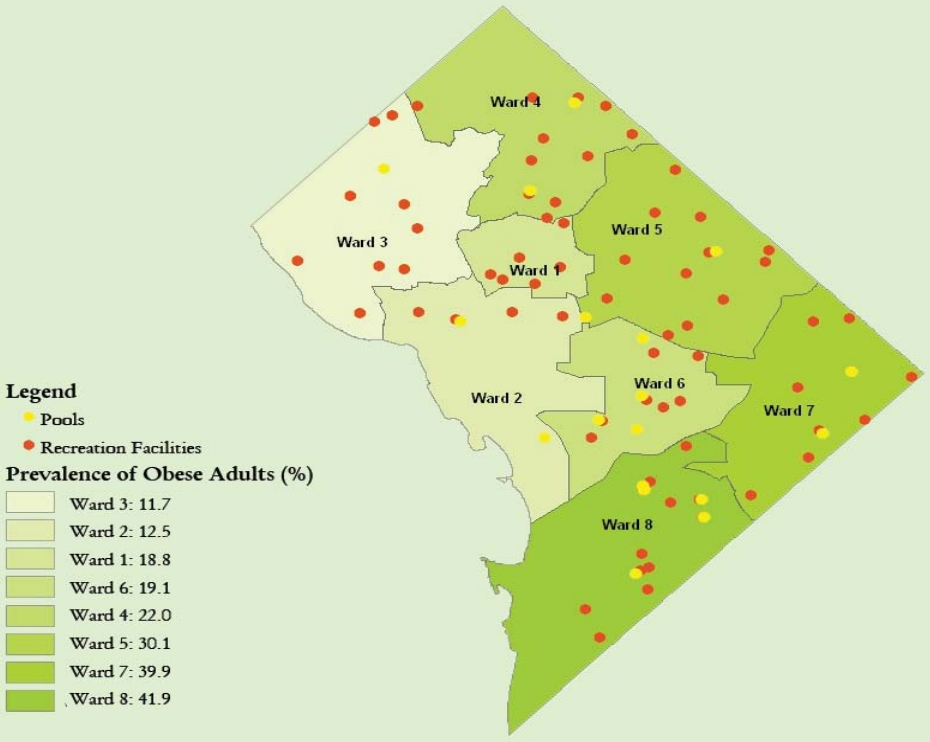
Figures 28 and 29, show the prevalence of obesity and physical activity in comparison to recreation options available within the District. Ward 3 has the lowest obesity (11.7%) rates and highest physical activity rates (89.8%) among all wards, whereas Ward 8 has the highest rates of obesity (41.9%) and the lowest rates of physical activity (69.1%). Ward 3 has a higher median income, comprises of 87% Caucasian and some of the lowest chronic disease rates within the District; whereas Ward 8 has the highest poverty rate within the District is 85% African American, and has some of the highest rates of chronic diseases in the city.

Figure 30 shows the distribution of recreation and community centers in relation to physical activity within the District. Throughout the city the District of Columbia Parks and Recreations (DPR) has a balanced number of recreational facilities within each ward. As a result there is no lack of options and other factors may be contributing to high obesity rates within wards 4, 5, 7 and 8.

With the exception of Ward 1, all DPR and Community Centers have swimming pools that are free and accessible to all residents. However, there are some community centers that require residents to either live within the immediate area or be a guest of a resident.

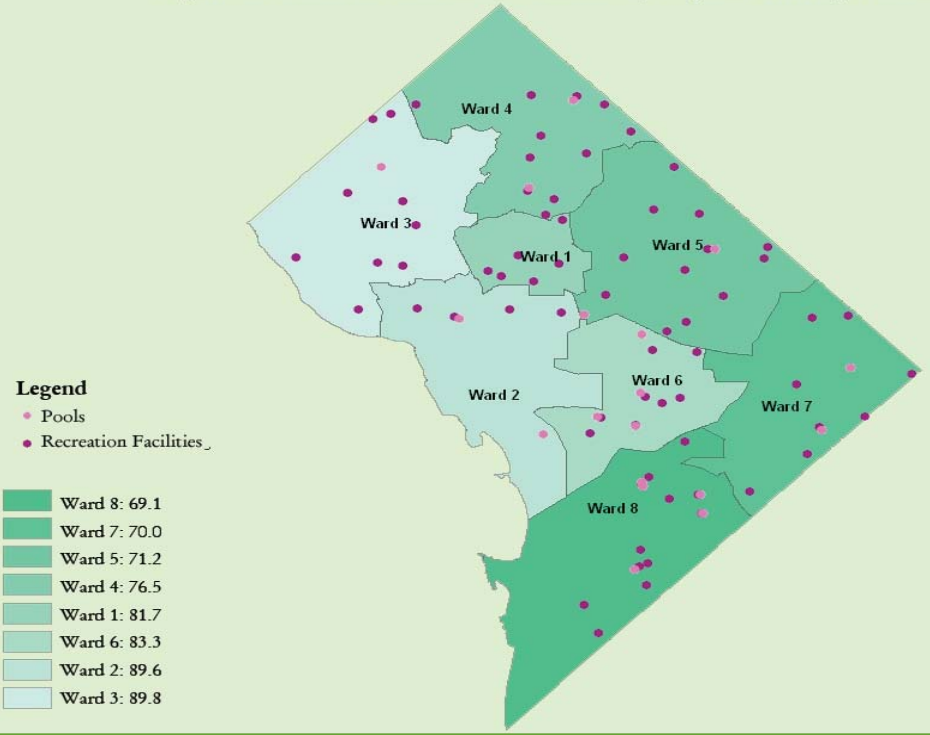
Overall physical activity has exceptional health consequences. Swimming is a great form of exercise especially for those individuals who are obese as it limits the amount of stress placed on ones limbs. Swimming has a positive effect on the body because it allows the individual to use his/her arms, legs and lungs and also increases the capacity to utilize the entire body at one time. Walking alone can improve blood pressure, lower body fat and decrease BMI. While it is encouraging that the residents in various wards are meeting the physical activity requirements, not enough of them are engaging in activities that have been shown to increase the quality of life and decrease the likelihood of developing chronic illnesses like hypertension and diabetes.

Figure 29. Parks and Recreation Facilities by Adult Obesity Prevalence



*Source: District of Columbia Department of Parks and Recreation
* 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS) Physical Activity

Figure 30. Parks and Recreation Facilities by Physical Activity Prevalence



*Source: District of Columbia Department of Parks and Recreation
* 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS) Adult Physical Activity

Physical Activity in Relation to Crime in the District

The District of Columbia has had a long standing history of high crime rates. In 1991, the number of homicides in the District reached 479, which was the highest ever recorded in the region. The District of Columbia was nick-named the "murder capital" in the country because of the high numbers of homicides in the early 1990s. Since then Washington DC has become a much safer place. Nevertheless, apprehension about crime persists and the city must continue to address issues of public safety to continue to attract a diverse population. Table 10 outlines the trends in violent crime and property crime in the District from 1995 to 2007. [21]

Table 11. Crime Trends, 1995-2007

Year	Violent Crime	Change	Property Crime	Change
1995	2,661.4	-	9512.1	-
1996	2,469.8	-7.1%	9426.9	-0.9%
1997	2,024.0	-18%	7814.9	-17%
1998	1,718.5	-15%	7117.0	-8.9%
1999	1,627.7	-5.3%	6439.3	-9.5%
2000	1,507.9	-7.4%	5768.6	-10.4%
2001	1,602.4	6.3%	6139.4	6.4%
2002	1,632.9	1.9%	6389.4	4.1%
2003	1,624.9	-0.5%	5863.5	-8.2%
2004	1,371.2	-15.6%	4859.1	-17.1%
2005	1,380.0	0.6%	4489.8	-7.6%
2006	1,508.4	9.3%	4653.8	3.7%
2007	1,414.3	-6.2%	4913.9	5.6%
1995	**2,661.4**	**-**	**9512.1**	**-**
2007	**1,414.3**	**-46.9%**	**4913.9**	**-48.3%**

Source: District of Columbia Metropolitan Police (MPD)

Table 11 shows the number of reported crime offenses in 2007. Ward 2 has the highest number of reported crime offenses with 6258 cases, Ward 3 has the least number of reported crime offenses and Ward 1 has the highest theft incidents while Ward 8 has the highest number of homicides, sex abuse and assault with a deadly weapon (ADW) offenses.

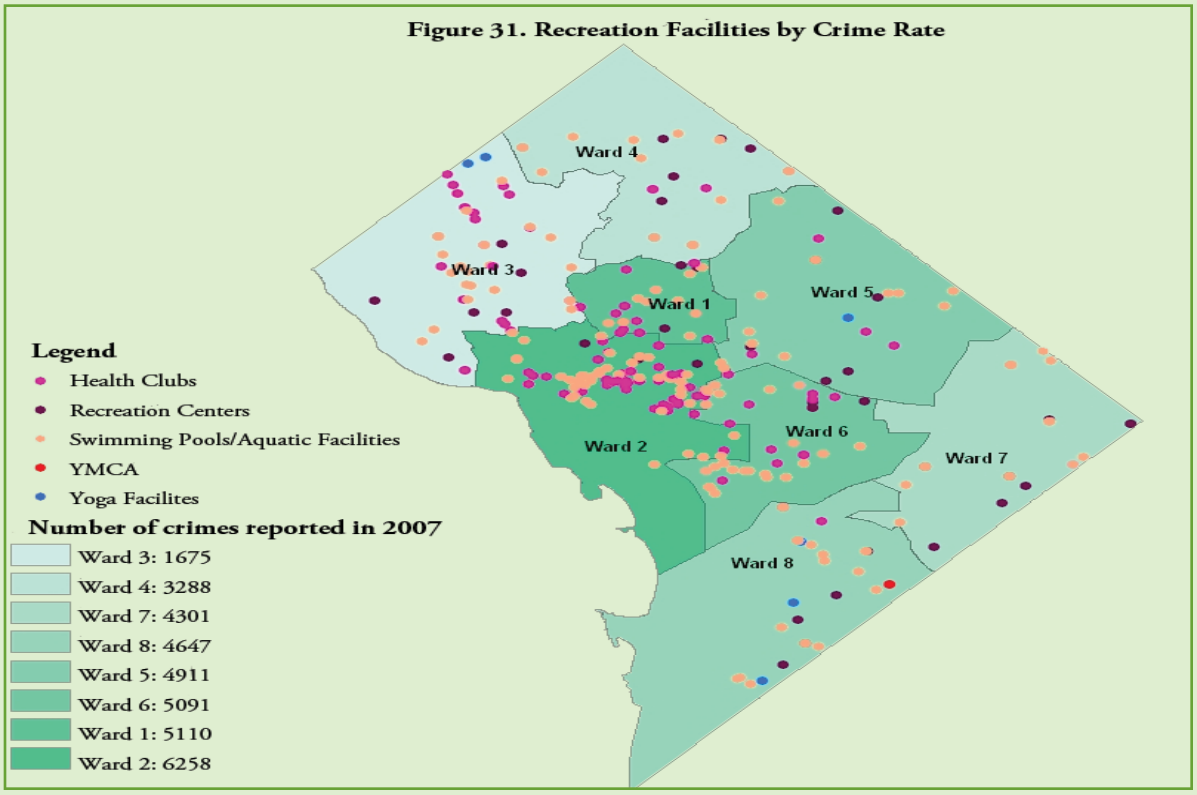
Table 12. 2007 Crime Offenses by Ward

Offense	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8	UNK	Total
Homicide	13	7	0	12	23	28	35	63	0	181
Sex Abuse	48	36	8	39	65	41	56	104	8	405
Robbery	785	579	87	549	576	594	548	708	35	4461
ADW	395	284	29	311	515	439	482	721	28	3204
Arson	2	4	0	7	4	19	4	10	1	51
Burglary	580	568	156	376	605	670	368	625	21	3969
Stolen Auto	998	2781	784	700	950	1294	644	667	64	8882
Theft	1526	1482	484	512	1110	1193	838	624	55	7824
Theft f/Auto	763	517	127	782	1063	813	1326	1125	65	6581
Total	5110	6258	1675	3288	4911	5091	4301	4647	277	35558

Source: District of Columbia Metropolitan Police (MPD)

Figure 16, shows the distribution of recreational facilities in relation to crime. Understanding the determinants of physical activity, crime must be taken into account in determining whether additional resources are necessary to ensure residents safety around facilities that are known to be high in crime activity.

Figure 31. Recreation Facilities by Crime Rate



*Source: District of Columbia Department of Parks and Recreation
* 2007 District of Columbia Behavioral Risk Factor Surveillance System (DC BRFSS) Adult Physical Activity
* 2007 District of Columbia Metropolitan Police Crime Data

Physical Activity

Overall Ward 3 has the lowest levels of violent and property crimes within the District. Ward 2 has the highest crime offenses, primarily offenses such as auto theft and robbery. Since a portion of Ward 2 has an active nightlife of entertainment in areas of Chinatown, Georgetown, Dupont Circle and Logon Circle, the crowds in these areas may attract and increase opportunities for property crimes.

While each crime committed and reported is serious some crimes are not considered severe enough to deter residents from participating in physical activity nor does it deter residents or visitors from being outdoors. Ward 2 ranks 2nd in high physical activity rates and the high rates in property thefts appear to not have a negative impact on individuals desire nor decision to exercise.

Ward 8 has the lowest rates of physical activity and highest rates of violent crime offenses such as homicides, assault with a deadly weapon and sex abuse. Therefore, violent crimes and the potential negative impact and safety concerns could prevent residents who want to exercise from using the available facilities.

Section 2 Adolescent Overweight and Obesity Introduction

During the past thirty years the rates of childhood overweight in the United States has tripled. Children who are obese are more likely to acquire risk factors for cardiovascular disease (CVD), such as high cholesterol or high blood pressure. In addition, children who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. Obese adolescents are more likely than children of normal weight to become overweight or obese adults, and therefore more at risk for associated adult health problems, including heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis. Healthy lifestyle habits, including healthy eating and physical activity, can lower the risk of becoming obese and developing associated diseases. [22]

What is BMI for children?
Body Mass Index (BMI) is a number calculated from a child's weight and height. BMI is a reliable indicator of body fat for most children and teens. [23]

BMI is used as a screening tool to identify possible weight problems for children. CDC and the American Academy of Pediatrics (AAP) recommend the use of BMI to screen for overweight and obesity in children beginning at 2 years of age. [23]

Although the BMI number is calculated the same way for children and adults, the criteria used to interpret the meaning of the BMI number for children and teens are different from those used for adults. For children and teens, BMI age- and sex-specific percentiles are used for two reasons:

- The amount of body fat changes with age.
- The amount of body fat differs between girls and boys.

The CDC BMI-for-age growth charts take into account these differences and allow translation of a BMI number into a percentile for a child's sex and age. [23] For adults, on the other hand, BMI is interpreted through categories that do not take into account sex or age. [23]

Note: *Category A options are facilities that provide fresh fruits and vegetables that residents should have access to in order to meet the USDA recommendations of 5-13 servings of fruits and vegetables daily*

Category B options are prepared food purchasing options such as traditional fast-food restaurants, carry-outs and convenience stores that do not provide residents with fresh fruits and vegetables that meet the USDA recommendations of fruit and vegetable consumption.

Youth Risk Behavior Surveillance System
Survey Results

Data from the 2007 District of Columbia Youth Risk Factor Surveillance Survey (DC YRBSS) found that 17.8% of high school youth (9th -12th grade) were overweight in the District and 17.7% were obese. Males were more likely to be overweight at 19.6 % and females at 15.8%. Thirty percent of the youth were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard for a total of at least 60 minutes per day on five or more of the days before the survey. It is important to note, the YRBSS data did not include any information from private and charter schools within the District.

Overall 17.8% of students in grades 9-12 are overweight and 17.7% of students are obese. Since 2005 obesity rates among youth grades 9-12 have increased by 7.1%. In females obesity rates have increased by 7.5% and in males by 6.6%. (Table 13)

Table 13. Percentage of students who were Overweight or Obese in the District of Columbia

	2003		2005		2007	
	Overweight	Obese	Overweight	Obese	Overweight	Obese
Male	16.3	15.5	21.6	13.0	15.8	19.6
Female	17.5	11.4	19.8	8.3	19.9	15.8
Total	16.9	13.4	20.7	10.6	17.8	17.7

Overall 30.2% of high school student's grades 9-12 participated in some sort of physical activity for at least 60 minutes or more on at least 5 or more days within the week prior to the survey. This has increased by 12% since 2005. Also, overall physical activity rates have increased considerably among males by 11.4% and females by 11.8% since 2005. (Table 14)

Table 14. Percentage of students participating in some sort of physical activity for at least 60 minutes for 5 or more of the 7 days before the survey

	2005	2007
Male	22.5	33.9
Female	14.2	26.0
Total	18.2	30.2

In 2007, 44.8% of students stated they participated in physical activity for one or more days during an average school week. These rates appeared to have declined during school year 2005 but slightly increased for males in 2007 and declined for females. (Table 15)

Table 15. Percentage of students who went to PE classes for one or more days during an average school week

	2003	2005	2007
Male	57.9	44.7	49.1
Female	49.2	42.8	41.5
Total	53.3	43.6	44.8

In 2007, 16.3% of students attended Physical Education (PE) class for a period of five days or more which is a decrease from 2003 by 2.5%. Physical Education among males has been steadily declined since 2003. (Table 16)

Table 16. Percentage of students who went to PE classes for five days during an average school week

	2003	2005	2007
Male	20.7	18.0	16.9
Female	17.1	14.8	16.4
Total	18.8	16.3	16.3

In 2007, 50.3% of students participated in one community or school sport activity within 12 months of the survey. Sports activities over the past several years have seen a steady increase among males and females. (Table 17)

Table 17. Percentage of student who played on at least one community or school sports team during the 12 months before the survey

	2003	2005	2007
Male	53.2	54.7	60.3
Female	37.8	35.5	40.7
Total	45.3	44.8	50.3

In 2007, 19% of student's grades 9-12 stated that they consume at least five or more fruit and vegetables within a week of the survey. Fruit and vegetable consumption among males and females have declined since 2003. (Table 18)

Table 18. Percentage of students who ate fruits and vegetables five or more times per day during the 7 days before the survey

	2003	2005	2007
Male	22.6	21.8	20.9
Female	20.2	17.6	17.3
Total	21.3	19.6	19.3

In 2007, 81% of students drank 100% fruit juices at least one or more times within one week of the survey. Male fruit juice consumption rates have declined since 2005 by 3.7% and female fruit juice consumption has increased by 2.1% since 2005. (Table 19)

Table 19. Percentage of students who drank 100% fruit juices one or more times during the seven days before the survey

	2003	2005	2007
Male	82.3	83.4	79.7
Female	81.1	80.8	82.9
Total	81.6	82.1	81.2

In 2007, 30% of students drank at least one can, bottle or glass of soda or pop at least one time within one week of the survey. Males were more likely than females to drink a can or bottle of soda or pop. (Table 20)

Table 20. Percentage of students who drank a can, bottle, or glass of soda or pop at least one time per day during the seven days before the survey

	2007
Male	31.6
Female	29.1
Total	30.3

Impact

Currently the District ranks 9th among all states with high overweight and obesity rates among adolescents ages 10-17. Over the past several years physical education may not have been offered within the DC Public Schools system where children spend the majority of their time. During the 2007 school year several schools may not have had a structured physical education program or only provided sports which allow some students to engage in some form of exercise on a daily basis as opposed to those students who do not participate in any sports.

As technology advances so does the likelihood of children becoming less mobile with internet and video games. Therefore even though there has been an increase among males engaging in sports there are not enough of young males engaging in some form of physical activity. In addition females over the past several years have increased their physical activity but the rates of overweight and obesity among females have continued to rise (table 13). This could be attributed to females engaging in some form of sports, and like the males, the school did not provide physical education prior to the 2007 survey period.

If children are provided with the knowledge and benefits of maintaining a healthy diet and engaging in physical activity along with access to more Category A food options, the rates of overweight and obesity may decline in that population. Children with knowledge and access can grow up to be informed adults who are more likely to engage in healthy behaviors. This will reduce chronic illnesses like diabetes and hypertension, and increase life expectancy.

* Since the completion of the 2007 YRBS survey all DCPS have implemented a curriculum that encompasses physical activity, good nutrition and health.

Advertisements

As the battle against childhood obesity heightens, the concerns of food advertising geared toward children have come under scrutiny. There are a variety of techniques used by companies to market their products and deliver their promotional messages to children such as television, radio, print as well as packaging, in-store or restaurant displays, event sponsorship, sweepstakes and the internet. Several studies show that in 2006 cross-promotions linked foods and beverages to approximately 80 movies, television shows and animated characters that appeal primarily to children. [24]

Nearly two-thirds, - $102 billion is spent on advertising to children, with carbonated beverages and quick service restaurant food and breakfast cereal accounting for those expenditures. Approximately 96 percent of the marketing for carbonated beverages is directed at adolescents, and 96 percent of the marketing for cereal was focused on children ages 12 and under. [24]

Listed below are the types of food products in ads targeting children and teens:

- 34% are for candy and snacks,
- 28% are for cereal,
- 10% are for fast foods
- 4% are for dairy products,
- 1% is for fruit juices,
- 0% are for fruits and vegetables

Impact

The media plays an integral role in promoting category B options as opposed to category A food options to young children who are most impressionable. In an effort to engage young children the food and beverage industry utilize celebrities or cartoon characters to help them promote their product. By utilizing celebrities or cartoon characters advertisers hope this will heighten the attention of their ads. Most children between the ages of 8-12 years old watch a significant amount of television and are more likely to be affected by food and beverage marketing. Youth at this age are easily influenced and are more likely to be persuaded in their future purchases of food and beverages.

In December 2006, ten (10) of the top food companies in the United States announced a new Children's Food and Beverage Advertising Initiative, which includes a commitment to devote at least 50% of all advertising to healthier foods or to messages that encourage fitness or nutrition. More studies are needed to determine whether this commitment was actually upheld. [24]

Schools and Surrounding Category B Options

The District of Columbia public school system is comprised of a complex network of traditional public schools and independent public charter schools. In all, there are 60 different Local Education Agencies (LEAs) and 224 school campuses serving over 73,000 PK-12 students in the District. The District of Columbia Public Schools (DCPS) is the largest LEA serving approximately 45,000 students. In 2007, the Public Education Reform Amendment Act passed by the Council of the District of Columbia gave the Mayor responsibility for managing DCPS and launching dramatic reforms in education. Additionally, the D.C. Public Charter School Board oversees 59 additional LEAs, which are also publicly funded, on 95 campuses. [25]

School nutrition is an important component of children's healthy eating habits. Children spend at least six and a half hours per day in school, and up to nine hours when including before and aftercare school programs; therefore, what the school provides for breakfast, lunch, and snack, plays an integral role in their daily food intake. The Child Nutrition and Women, Infants and Children (WIC) Reauthorization Act of 2004 required all school districts receiving federal funds to support their school meal programs to develop a local school wellness policy by the start of the 2006-2007 school year, covering nutrition and physical activity policies. In addition, all DCPS and public charter schools are required to follow the School Lunch Standards, which were developed in concert with the United States Dietary Guidelines for Americans. [25]

Physical activity is crucial and an integral part of a child's education. The DCPS Local Wellness Policy requires that health and physical education be administered for K-8 students, 45 minutes, two days per week. DCPS students must participate in the equivalent of one year of physical education for graduation. [25] LEAs are required to develop and implement a curriculum that meets the Office of the State Superintendent of Education's Physical Education and Health Education Standards. These standards cover nutrition, emotional health, alcohol, tobacco and other drugs, safety skills, sexuality and reproduction, and other health related behaviors. [26]

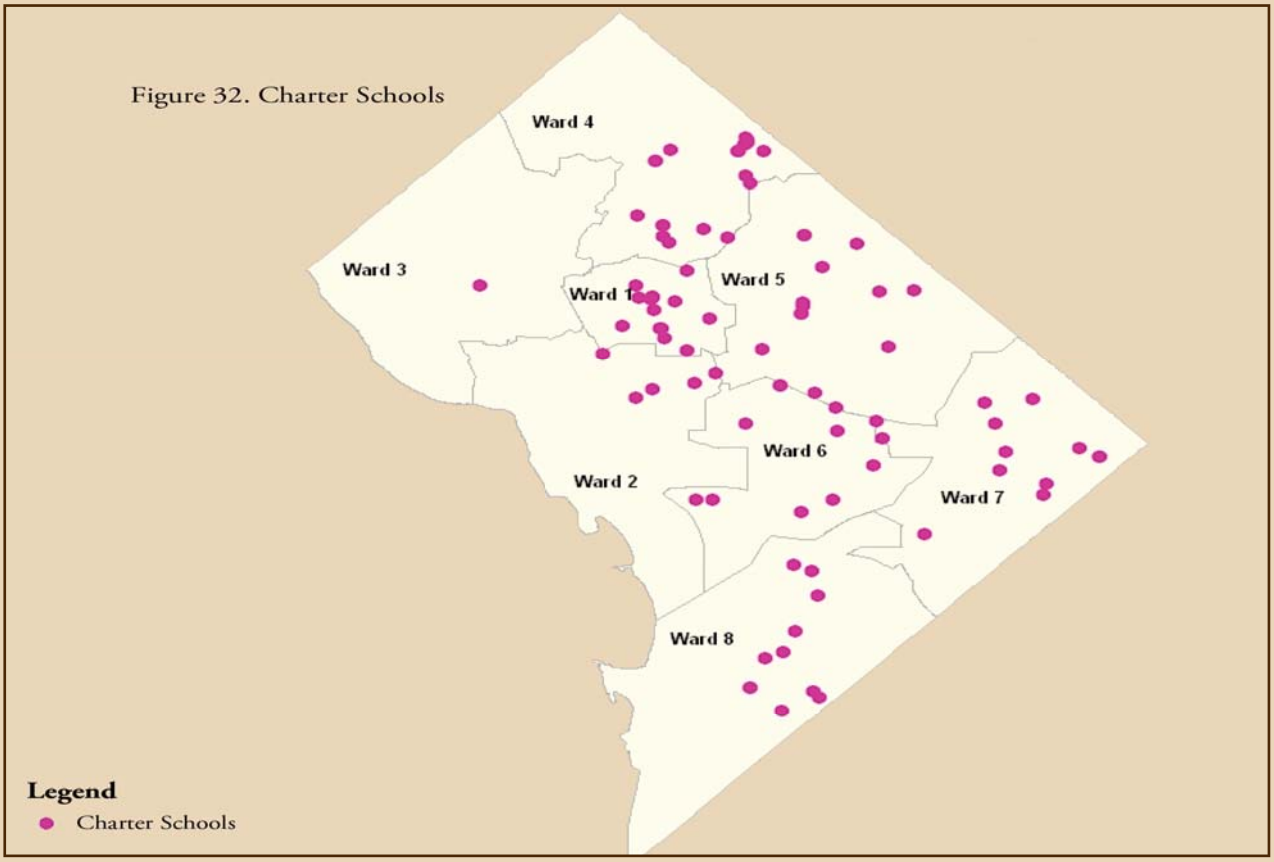
In an attempt to evaluate unhealthy eating habits leading to high risk behaviors for obesity among adolescents in the District, DCPS and public charter schools were mapped in comparison to unhealthy prepared food locations such as convenience stores, traditional fast food locations and carry-outs. The prepared food options are characterized in this report as "Category B" options. The eight wards of the District were divided into ANC subdivisions to provide a more detailed account of schools in close proximity to category B food options.

Analysis in this section focuses on:

- DCPS and public charter, middle and high schools in close proximity to category B options;
- Category B options located within less than ½ miles from the DCPS or public charter schools.

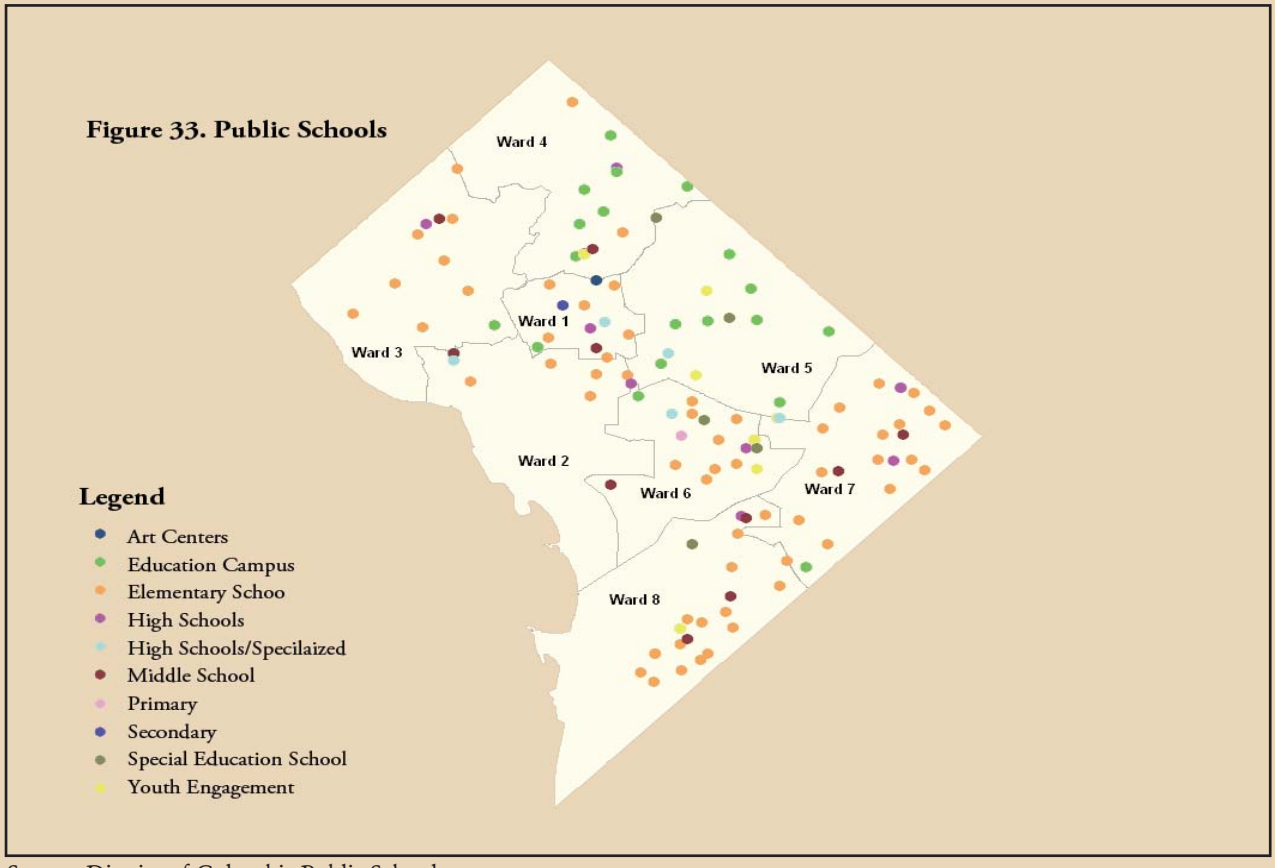
Some public charter schools have a mixture of elementary and middle schools and were included if they contained grades six and beyond to make them comparable to DCPS. Elementary schools were otherwise excluded from the analysis. Education campuses, which serve PK-8 students, were included in the analysis, but not presented within the map figures.

Figure 32. Charter Schools



Source: District of Columbia Public Charter Schools

Figure 33. Public Schools



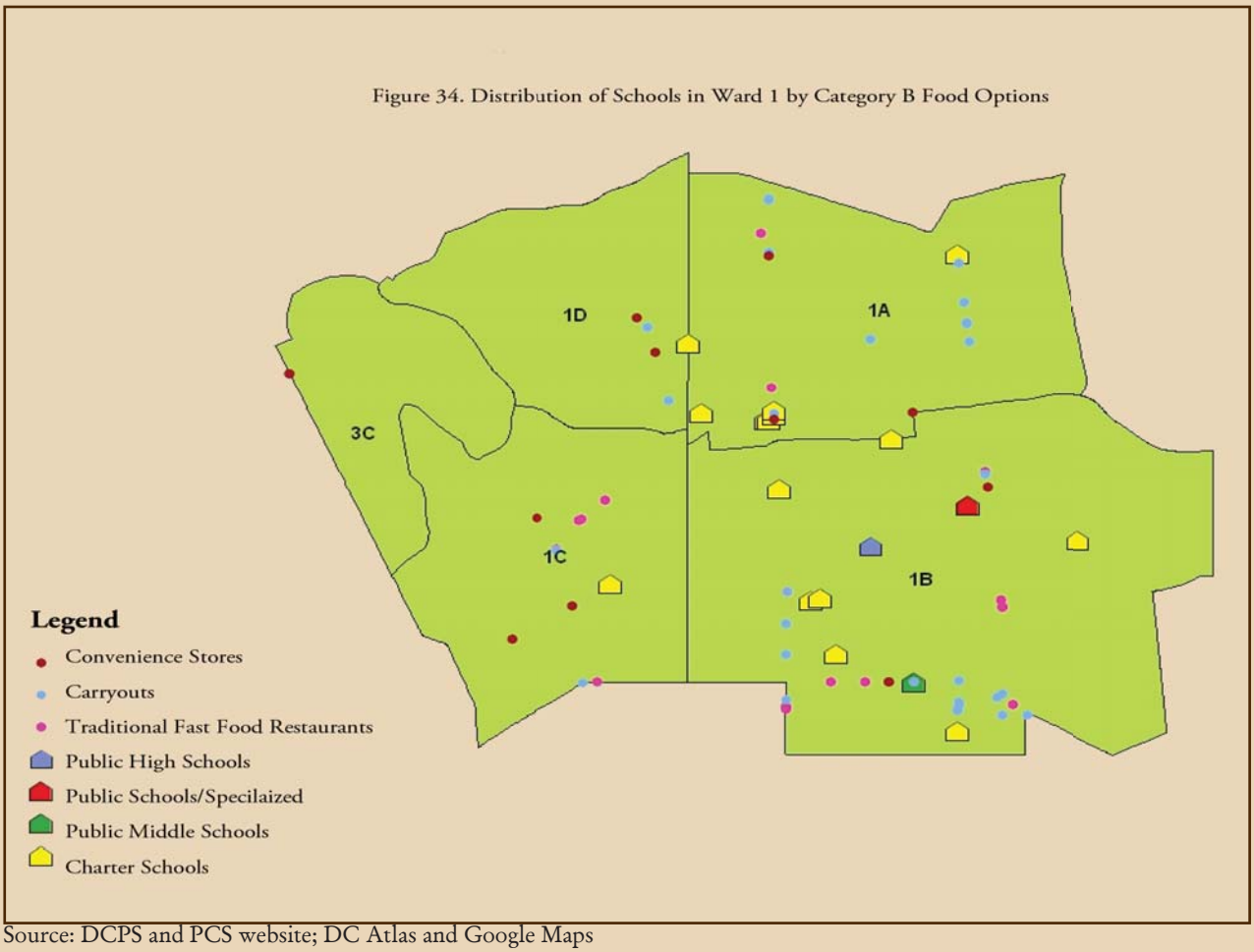
Source: District of Columbia Public Schools

Ward 1

Figure 34 shows the distribution of charter and public middle and high schools in Ward 1. Table 21 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Cardoza which is located within ANC 1B has a total of fourteen category B options located within less than ½ mile of the school. Capitol City Upper Charter School located in ANC 1A and Shaw Middle School located in ANC 1B have four category B options located within 0.1 miles from the school. (Table 20)

Figure 34. Distribution of Schools in Ward 1 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 21. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 1 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Capital City Lower School	1A		X	2	4	2	2	**10**
Capital City Upper School	1A		X	4	1	4	2	**11**
E.L. Haynes	1A		X	2	4	2	0	**8**
Columbia Heights Education Campus	1A	X		2	3	0	4	**9**
Next Step/El Proximo Paso	1A		X	3	1	2	2	**8**
YouthBuild LAYC	1A		X	3	2	3	0	**8**
Benjamin Banneker SHS	1B	X		0	4	1	0	**5**
Cardozo SHS	1B	X		1	3	2	8	**14**
Shaw MS at Garnet-Patterson	1B	X		4	3	1	1	**9**
Booker T. Washington	1B		X	1	4	6	0	**11**
Maya Angelou Shaw Campus	1B		X	3	2	2	2	**9**
Meridian PCS	1B		X	2	2	4	1	**9**
Oyster-Adams Bilingual (Adam)	1C	X		1	2	2	1	**6**

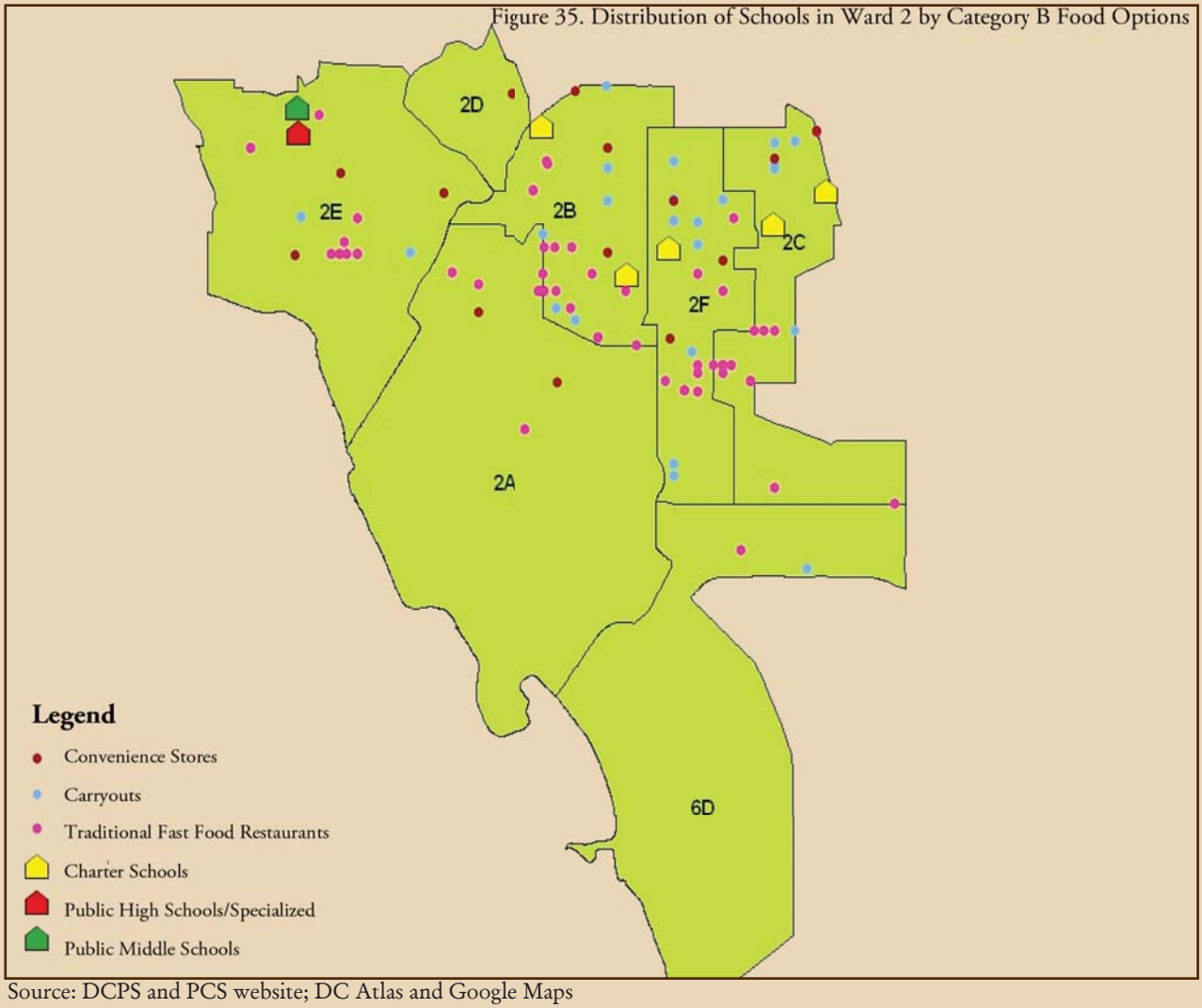
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 2

Figure 35 shows the distribution of charter and public middle and high schools in Ward 2. Table 22 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

City Collegiate Charter School located in ANC 2B has three category B options located 0.1 miles of the school. Duke Ellington School of the Arts located ANC 2E has only one category B option located 0.2 miles from the school. Also, Hardy Middle School located in ANC 2E has only one category B options located within one 0.4 miles in close proximity to the school.

Figure 35. Distribution of Schools in Ward 2 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 22. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 2 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Francis-Stevens Education Campus	2A	X		0	2	0	4	**6**
Schools Without Walls	2A	X		1	3	3	1	**8**
City Collegiate	2B		X	3	0	2	2	**7**
The School for Arts and Learning	2B		X	2	4	0	1	**7**
Center City Shaw Campus	2C		X	0	3	3	2	**8**
WILL Academy	2C		X	1	2	5	0	**8**
Duke Ellington School of the Art	2E	X		0	1	0	0	**1**
Hardy Middle School	2E	X		0	0	0	1	**1**

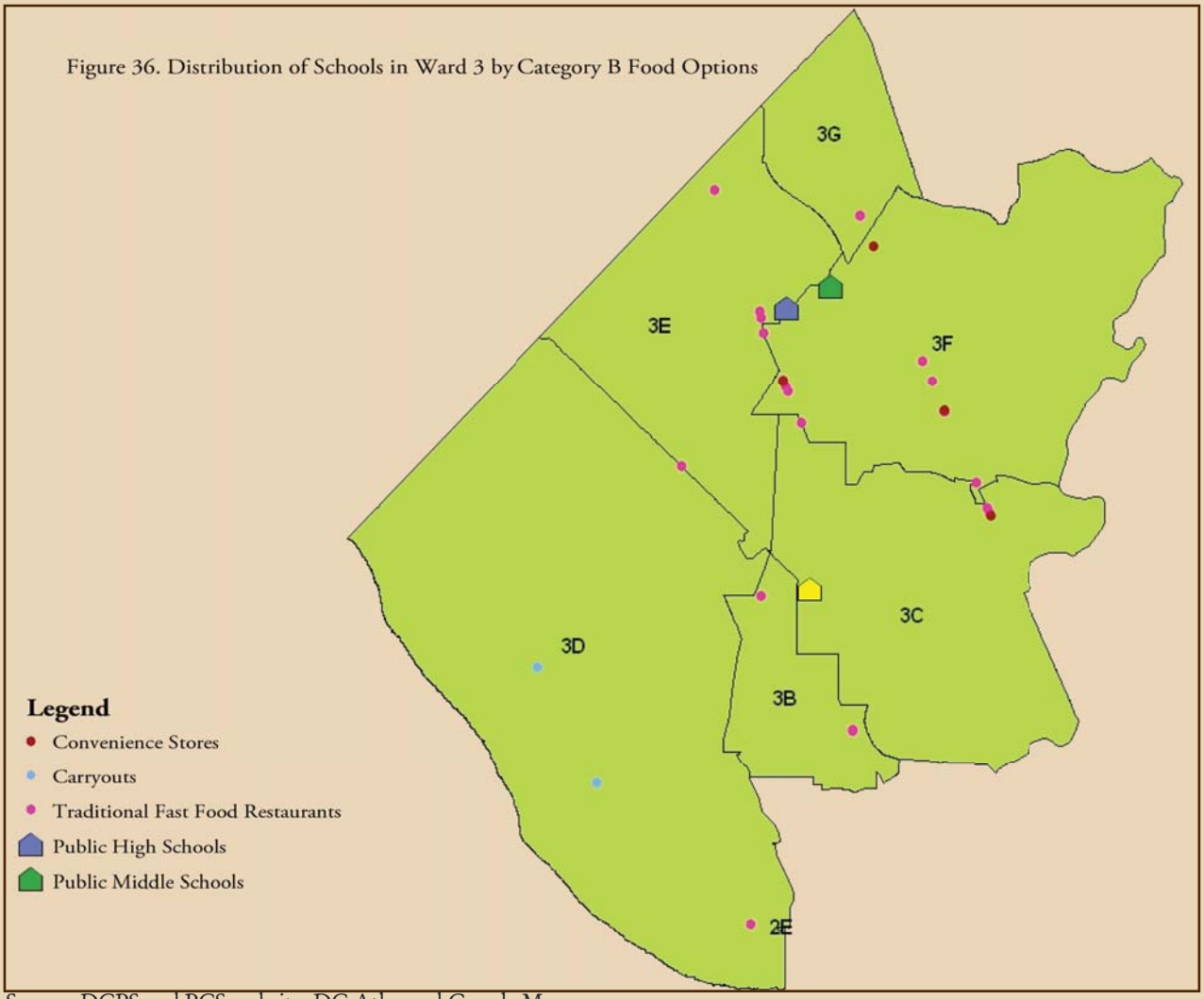
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 3

Figure 36 shows the distribution of charter and public middle and high schools in Ward 3. Table 23 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Wilson Senior High School located within ANC 3F has five category B options located within less than ½ mile of the school and Alice Deal Middle School located in ANC 3E only has three category B options located less ½ mile from the school.

Figure 36. Distribution of Schools in Ward 3 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 23. Schools Less than ½ mile from Category B Options by Ward and ANC

Ward 3 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Alice Deal Middle School	3E	X		0	0	3	0	**3**
Wilson Senior High School	3F	X		0	3	2	0	**5**

Source: DCPS and PCS website; DC Atlas and Google Maps

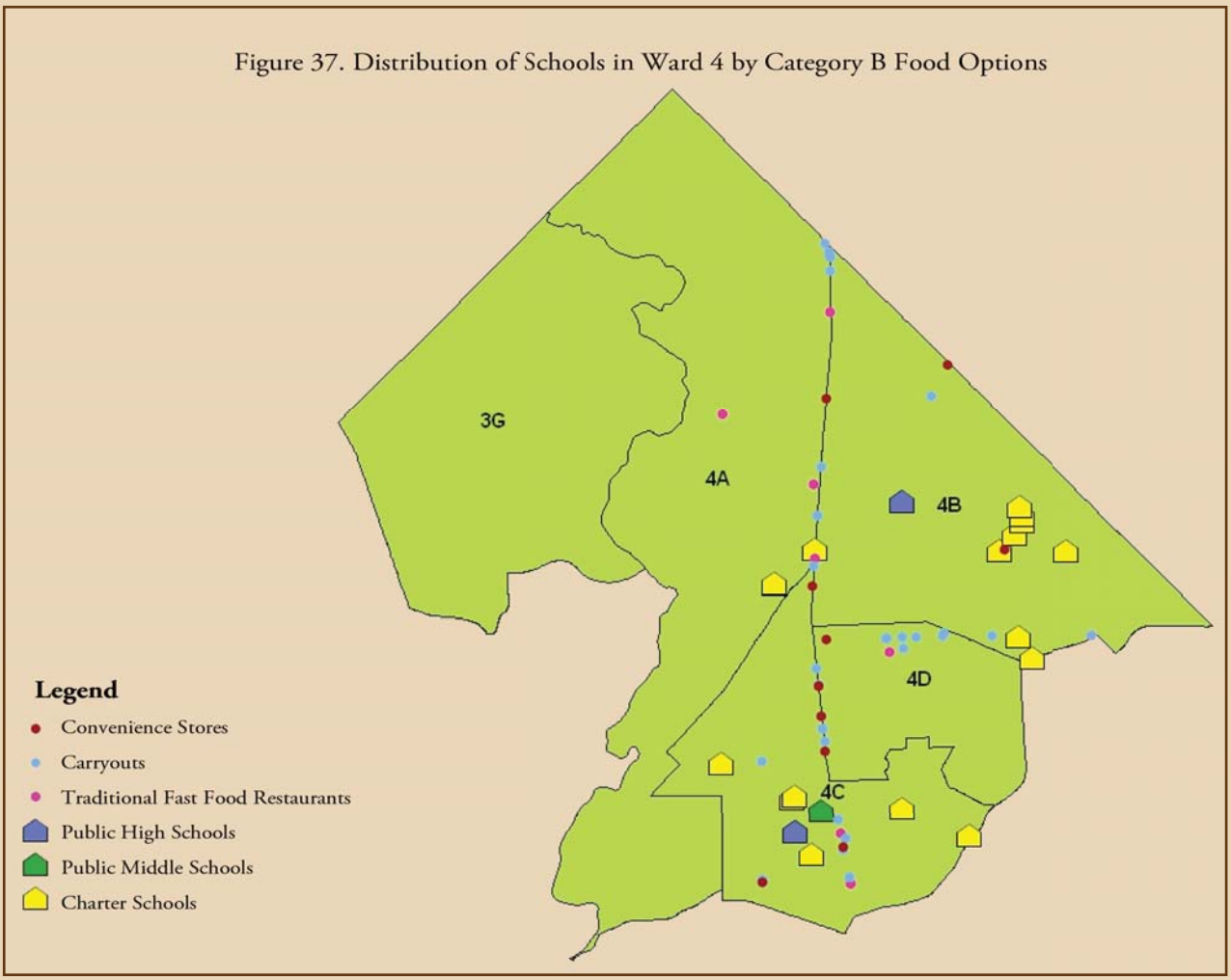
Ward 4

Figure 37 shows the distribution of charter and public middle and high schools in Ward 4. Table 24 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Truesdell Education Campus located in ANC 4D has fifteen category B options located within less than ½ mile from the school, with seven category B options located 0.2 miles from the school. Raymond Education Campus located in ANC 4C has fourteen category B options within less than ½ mile from the school, with seven category B options located within 0.4 miles from the school. Also, Paul Public Charter School located within ANC 4B has at least ten category B options located within less than ½ miles from the school, with six options located 0.3 miles within close proximity of the school.

Ideal Peabody Campus and KAMIT Institute for Magnificent Achievers Public Charters Schools located within ANC 4B only have one option located within 0.1 miles in close proximity to the schools.

Figure 37. Distribution of Schools in Ward 4 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 24. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 4 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Center City Brightwood Campus	4A		X	2	2	1	1	**6**
Community Academy Online	4A		X	0	3	0	3	**6**
Brightwood Education Campus	4A	X		1	1	1	3	**6**
Ideal North Capitol Campus	4B		X	0	1	0	2	**3**
Ideal Peabody Campus	4B		X	1	0	0	0	**1**
KAMIT Institute for Magnificent Achievers	4B		X	1	0	0	0	**1**
Paul Public Charter School	4B		X	0	1	6	3	**10**
Roots Main Campus	4B		X	0	0	2	3	**5**
Young America Works	4B		X	0	1	1	1	**3**
Coolidge Senior High School	4B	X		0	1	0	1	**2**
LaSalle-Beckus Education Campus	4B	X		0	0	0	4	**4**
Takoma Education Campus	4B	X		0	0	1	2	**3**
Whittier Education Campus	4B	X		0	1	0	4	**5**
Center City Petworth Campus	4C		X	0	0	3	4	**7**
McFarland Middle School	4C	X		0	4	3	2	**9**
Raymond Education Campus	4C	X		0	2	5	7	**14**
Roosevelt Senior High	4C	X		0	3	5	2	**10**
Washington Latin High School	4C		X	0	3	0	0	**3**
Washington Latin Middle School	4C		X	0	2	2	2	**6**
West Education Campus	4C	X		0	0	6	1	**7**
Truesdell Education Campus	4D	X		0	7	5	3	**15**

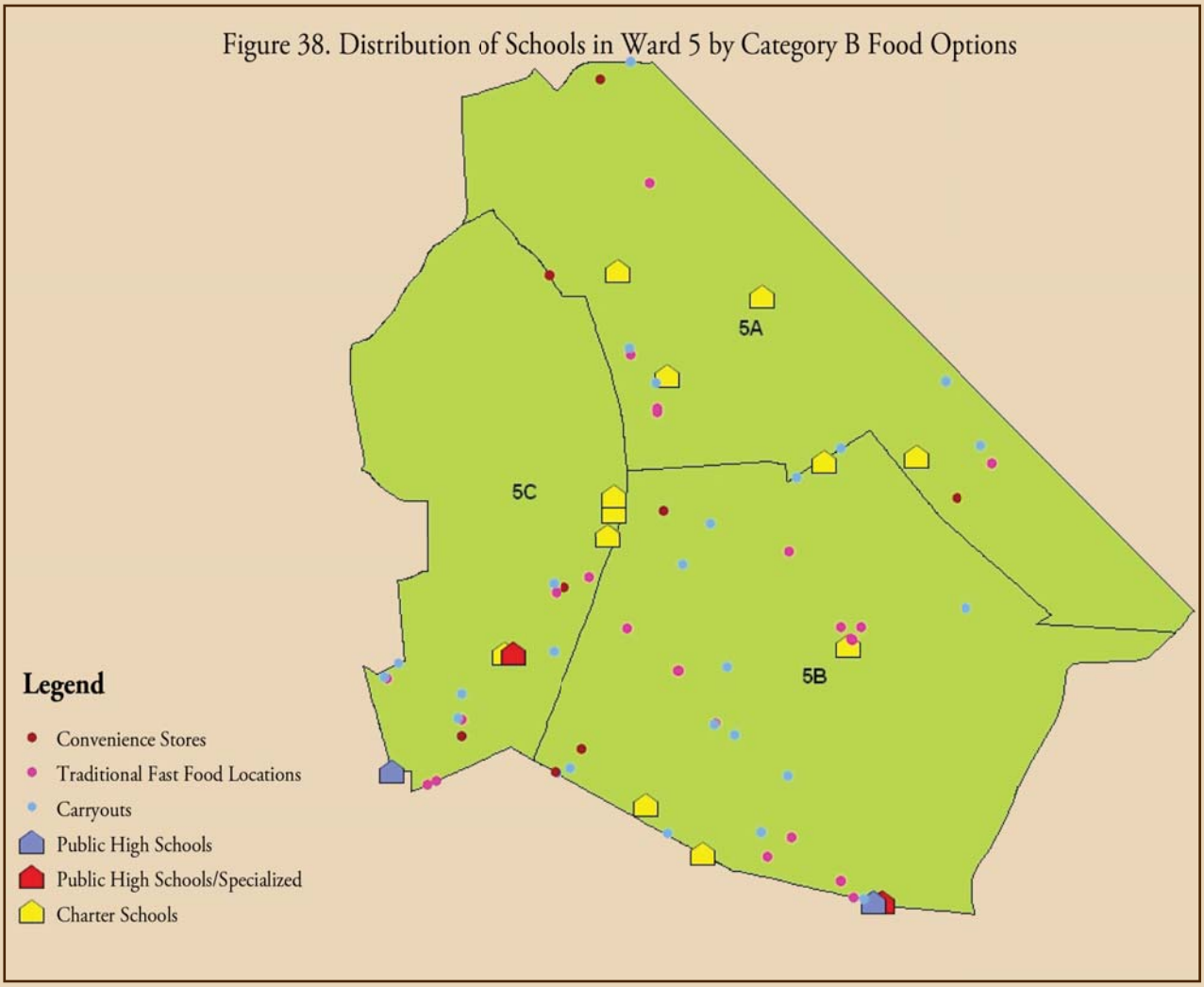
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 5

Figure 38 shows the distribution of charter and public middle and high schools in Ward 5. Table 25 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Wheatly Education Campus has twelve category B options located within less than ½ mile of the school seven of which are located 0.3 miles in close proximity to the school. Potomac Lighthouse Charter School located within ANC 5A and Center City Trinidad Campus located within ANC 5B have eight category B options located less than ½ mile in close proximity to the schools. Washington Math, Science and Technology Public Charter School located within ANC 5B has three category B options located within 0.1 miles in close proximity to the school. Also, Brookland Education Campus Public School located within ANC 5A has no category B options located within less than ½ mile from the school.

Figure 38. Distribution of Schools in Ward 5 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 25. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 5 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Brookland Education Campus	5A	X		0	0	0	0	**0**
Browne Education Campus	5A	X		0	0	2	2	**4**
Elsie Whitlow Stokes Community Freedom	5A		X	0	2	0	1	**3**
Friendship Woodbridge Academy	5A		X	0	1	1	3	**5**
Luke Moore Academy Senior High	5A	X		2	0	1	0	**3**
Mary McLeod Bethune	5A		X	0	0	1	3	**4**
Potomac Lighthouse Charter School	5A		X	0	1	3	4	**8**
Center City Trinidad Campus	5B		X	1	0	2	5	**8**
Tree Life Charter School	5B		X	0	0	1	2	**3**
Washington, Math, Science and Technology	5B		X	3	0	0	0	**3**
Burroughs Education Campus	5B	X		0	0	1	2	**3**
CHOICE Academy	5B	X		1	1	3	1	**6**
Lagdon Education Campus	5B	X		0	2	1	1	**4**
Noyes Education Campus	5B	X		2	0	1	1	**4**
Phelps Architecture, Construction and Engineering High School	5B	X		2	0	2	0	**4**
Spingarn Senior High School	5B	X		2	0	2	0	**4**
Wheatley Education Campus	5B	X		0	3	7	2	**12**
Hope Community Tolson Campus	5C		X	0	1	1	3	**5**
Hyde Leadership Academy	5C		X	0	1	1	5	**7**
Dunbar Senior High	5C	X		0	1	5	3	**9**
Emery Education Campus	5C	X		1	3	2	1	**7**
McKinley Technology High School	5C	X		0	0	2	2	**4**
Shaed Education Campus	5C	X		0	2	4	1	**1**
William Doar Edgewood Campus	5C		X	0	1	5	3	**9**

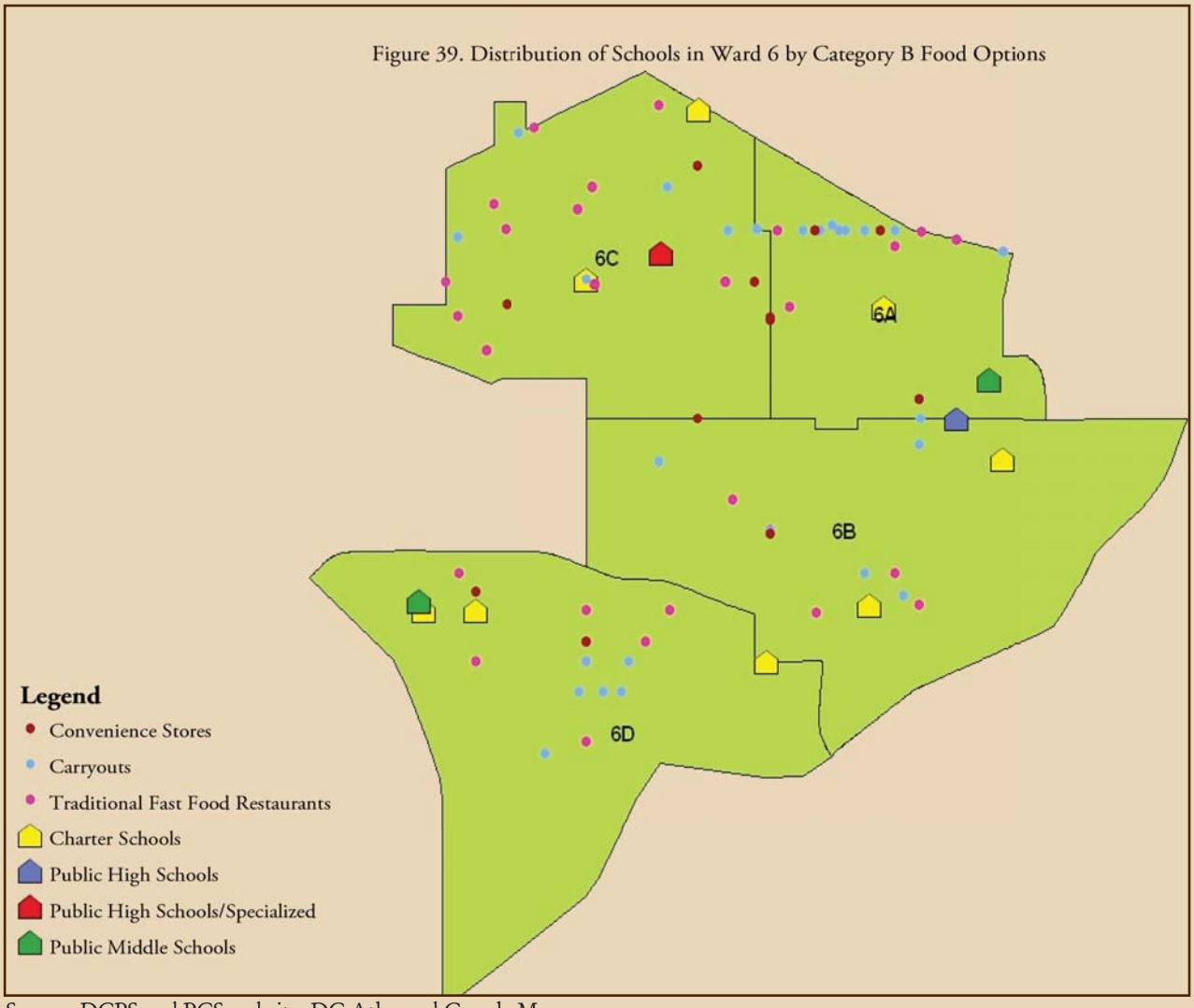
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 6

Figure 39 shows the distribution of charter and public middle and high schools in Ward 6. Table 26 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Center City Capitol Hill Campus located within ANC 6B and Two Rivers Middle School located within ANC 6C have four options located within 0.1 miles from the school. Also, Options Public Charter School located within ANC 6A and Cesar Chavez Capitol Hill Campus Charter School have at least ten category B options located within less than ½ mile to the school.

Figure 39. Distribution of Schools in Ward 6 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 26. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 6 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
Eastern Senior High School	6A	X		1	3	0	0	**4**
Eliot-Hine Middle School	6A	X		0	0	2	1	**3**
Options Charter School	6A		X	0	1	5	3	**9**
Youth Engagement Academy	6A		X	0	0	2	2	**4**
Center City Capitol Hill Campus	6B		X	4	0	0	0	**4**
Ceasar Chavez Capitol Hill Campus High School	6B		X	2	0	6	2	**10**
Friendship Chamberlain Campus	6B		X	3	3	1	0	**7**
Two River Middle School	6C		X	4	2	2	0	**8**
Stuart-Hobson Middle School	6C	X		1	1	4	2	**8**
Walker-Jones Education Campus	6C	X		0	1	1	1	**3**
Jefferson Middle School	6D	X		0	2	1	1	**4**

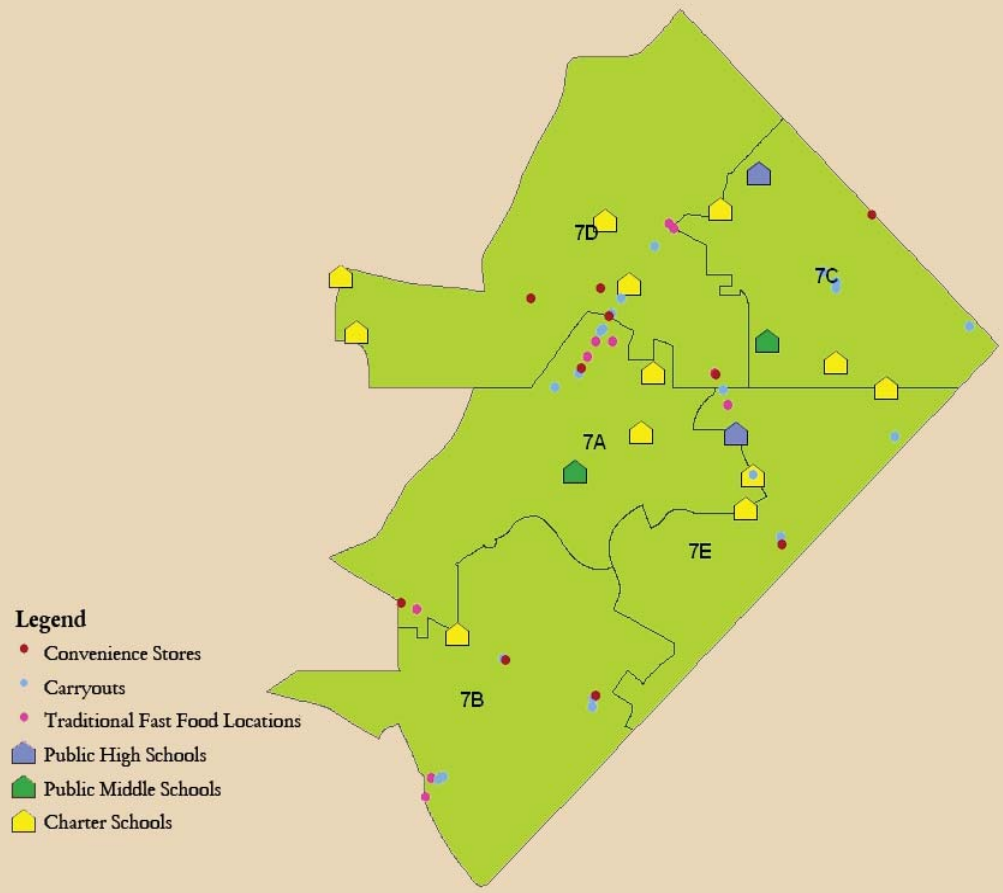
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 7

Figure 40 shows the distribution of charter and public middle and high schools in Ward 7 Table 27 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Friendship Collegiate Academy located within ANC 7D has eleven category B options within less than ½ mile of the school. Also, SEED Public Charter School located within ANC 7A, Sousa Middle Public School located within ANC 7A and Maya Angelou Evans Campus located within ANC 7C have no category B options located within less than ½ mile of the schools.

Figure 40. Distribution of Schools in Ward 7 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 27. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 7 Schools	ANC	Public Schools	Charter Schools	0.1 Miles	0.2 Miles	0.3 Miles	0.4 Miles	Total
KIPP-DC Key Academy	7A		X	0	0	1	1	**2**
SEED	7A		X	0	0	0	0	**0**
Sousa Middle School	7A	X		0	0	0	0	**0**
Winston Education Campus	7B	X		0	0	2	3	**5**
Arts and Technology Academy	7C		X					
Integrated Design and Electronic Academy (IDEA)	7C		X	0	0	3	0	**3**
Kelly Miller Middle School	7C	X		0	0	0	4	**4**
Maya Angelou Evans Campus	7C		X	0	0	0	0	**0**
Ronald Brown Middle School	7C	X		0	1	0	1	**2**
Woodson Academy at Ron Brown	7C	X		0	1	0	0	**1**
Cesar Chevez Parkside Campus	7D		X	0	0	0	1	**1**
Friendship Collegiate Academy Woodson Campus	7D		X	1	4	2	4	**11**
Friendship Junior Academy Blow Pierce Campus	7D		X	3	2	3	1	**9**
Thea Bowman Preparatory Academy	7D		X	0	0	5	1	**6**
Howard Road Academy G Street Campus	7E		X	0	1	1	0	**2**
HD Woodson Senior High School	7E	X		0	0	2	4	**6**

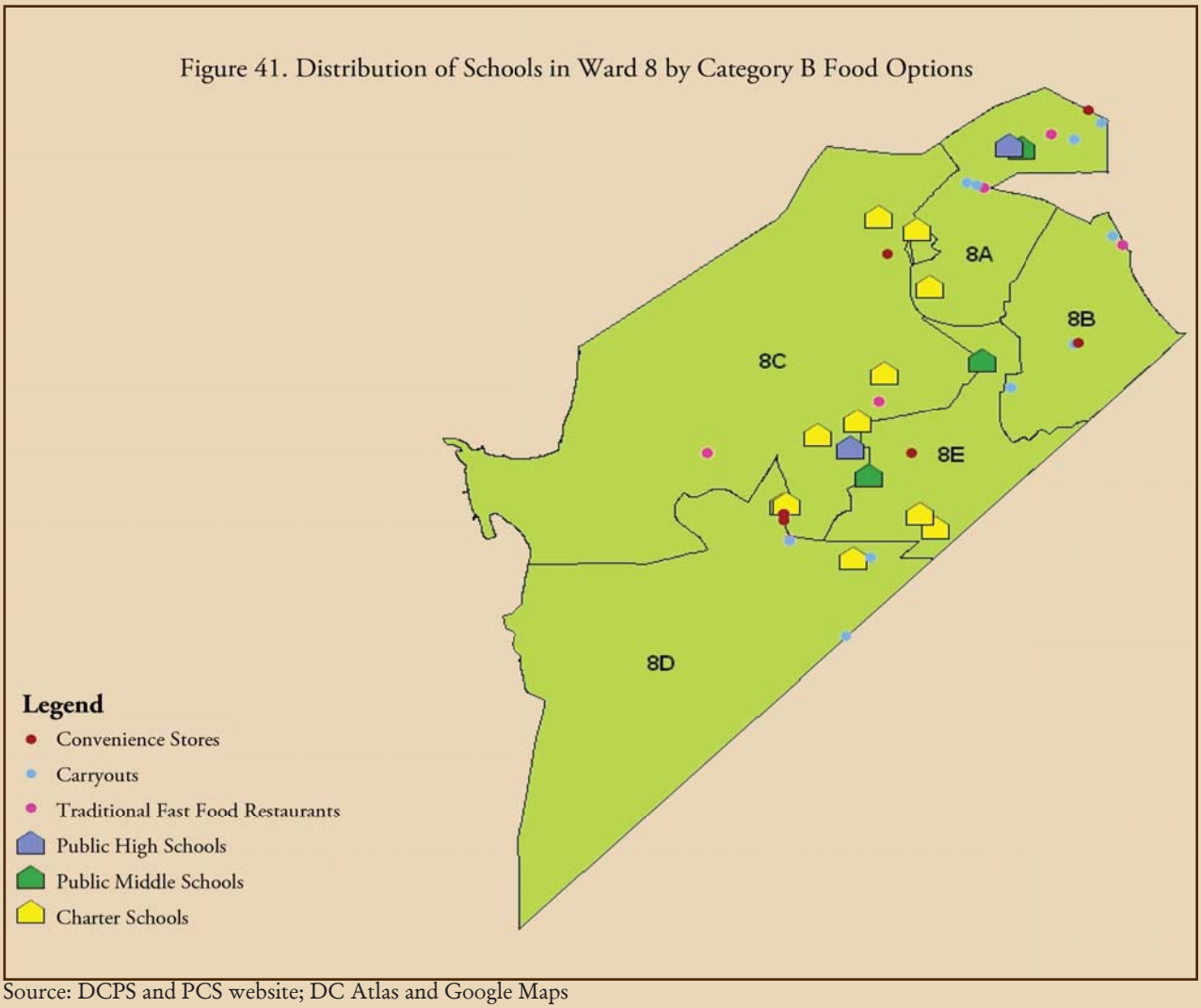
Source: DCPS and PCS website; DC Atlas and Google Maps

Ward 8

Figure 41 shows the distribution of charter and public middle and high schools in Ward 8. Table 28 shows the number of category B options that are located within less than ½ mile from public and charters schools in the District by Ward and ANC.

Friendship Tech Prep located within ANC 8C has four category B options within 0.2 miles from the school while Kramer Middle School also located within ANC 8A has one option within 0.4 miles from the school. Johnson Middle School located within ANC 8E has no category B options within less than ½ mile from the school.

Figure 41. Distribution of Schools in Ward 8 by Category B Food Options



Source: DCPS and PCS website; DC Atlas and Google Maps

Table 28. Schools Less than ½ mile from Category B Options by Ward and ANC								
Ward 8 Schools	**ANC**	**Public Schools**	**Charter Schools**	**0.1 Miles**	**0.2 Miles**	**0.3 Miles**	**0.4 Miles**	**Total**
Anacostia Senior High School	8A	X		0	0	2	1	**3**
Kramer Middle School	8A	X		0	0	0	1	**1**
Howard Road Academy Main Campus	8C		X	0	0	1	2	**3**
Friendship Southeast Campus	8C		X	5	1	1	0	**7**
Friendship Tech Prep	8C		X	0	4	1	0	**5**
Thurgood Marshal Academy	8C		X	2	1	0	0	**3**
Ballou Senior High School	8C	X		0	1	0	5	**6**
Achievement Preparatory Academy	8E		X	1	0	0	1	**2**
Hart Middle School	8E	X		0	1	0	1	**2**
Johnson Middle School	8E	X		0	0	0	0	**0**
National Collegiate Preparatory	8E		X	1	0	0	1	**2**

Source: DCPS and PCS website; DC Atlas and Google Maps

Impact

Public and Charter Schools located within the District that have eliminated junk-food and carbonated beverages from the schools vending machines or within meals and snacks in an effort to tackle the obesity problem may encounter undermining efforts due to the clustering of category B options in close proximity (less than ½ mile) of the schools. A study from Harvard's School of Public Health with similar findings, begs the question of whether fast-food companies intentionally locate their restaurants near schools to make them easily accessible to young people, who conceivably are their key customers; patterns that most likely exist in urban areas. [27]

Additionally, category B options clustered within walking distance of elementary, middle and high schools, may be a pattern that exists in urban areas and contributing to the nation's obesity epidemic.

As children begin middle school they are more likely to not be accompanied by a parent or guardian who may have in the past deterred the morning or evening purchases of category B options. Excluding special needs children, students are not always provided with private transportation to and from school each day therefore, they either walk or utilize public transportation to get to school. Those factors contribute to the overwhelming access to category B foods located within less than ½ mile from the schools.

Consequently, it is vital that students obtain the necessary education regarding the negative health impact of consuming an excess amount of category B options to make informed decision regarding future food purchases. Thus, school policies prohibiting off-campus category B purchases being brought to school and zoning requirements to limit category B establishments in close proximity to schools is one way to combat rising obesity rates among children while increasing their quality of life.

Where Does DC Begin

There is no one solution to combating the obesity epidemic but it most certainly will require a multi-disciplinary proactive approach, requiring key District stakeholders including government, businesses, the healthcare delivery system and communities. Two key components to the obesity epidemic are social behavior and the environment.

Elements of social behavior and environmental aspects of children and adults that prevent them from obtaining proper nutrition and exercise include:

- Working caregivers who do not have time to cook healthy nutritious meals
- Inability to afford healthy and nutritious foods
- Children not obtaining healthy meals at school
- Traditional Fast-food restaurants, carry-out and convenience stores surrounding schools
- No sustained physical education and activity within schools
- Excess amounts of sedentary activity among youth
- Unsafe exercise environments
- Parents or guardians who are drug or alcohol dependent

Good nutrition, dietary and exercise habits should begin in childhood and continue through adulthood. A child not obtaining the adequate knowledge needed to make informed decisions about dietary habits and physical activity contributes to the high overweight and obesity rates among children in the District. Positive and steady examples are needed to effect change in children's daily eating habits.

Over the years many residents living within under-resourced communities have become accustomed to the lack of grocery stores, organic and farmers markets and have relied on traditional fast-food, carry-out and convenience stores that are quick, convenient and cheap. Access to quality and affordable grocery stores, organic and farmers markets and exercise facilities are promising starts but by no means guarantee a decrease in obesity rates. While it is vital to develop communities with more grocery stores, organic and farmers markets, the efforts will be undermined if the behaviors of the residents within the communities are not addressed. Educating residents that lack the knowledge of dietary and physical activity benefits for overall good health is a pivotal point in reversing disparities. Without proper education, residents cannot begin to understand or make informed decisions regarding the benefits of staying fit and eating a healthy diet. Ensuring that parents, guardians and teachers have this critical information will translate to the child who is then equipped with the knowledge to promote healthy behavior changes; and vice versa if children are provided with adequate education regarding nutrition and physical activity they are more likely to convey knowledge learned to their parent or guardian.

Evidence provided throughout this report illustrates the District's ethnic and socioeconomic differences among its Wards. The disparities among one spectrum of the city to another was prevalent in Ward 3, where the mean income is $71,875 and 85% Caucasian in comparison to Wards 7 and 8, where mean incomes are $30,533 and $25,017 and 92% to 97% African American respectively. Also, there are striking differences in the prevalence of chronic diseases among ethnic groups in the District.

There is mounting evidence on how environment makes a difference in a person's overall health. Evidence regarding the influence of neighborhoods on health is apparent in the widening disparities among

the socioeconomically deprived, which is reflected in the District's landscape and neighborhood environments. The communities representing higher mean incomes have access to better resources that aide in their overall health while the lower income communities lack access and/or quality of resources.

Several factors have led to an increased understanding of the remarkable sensitivity of health with the social environment and to what are known as the social determinants of health; safe environment, access to quality and affordable nutritious foods, adequate income, secure housing, higher level of education and social support within communities are associated with better health and well-being. Adding to this notion, it is also believed that in lower income areas grocery stores, organic and farmers markets compete with other financial priorities such as clothing, transportation and housing.

Dietary goals to prevent chronic disease emphasize eating at least five servings of fresh fruits and vegetables daily. Many social determinants impact on good nutrition, access to grocery stores, organic and farmers markets, education, housing, and income. This is further complicated by the increased price of healthier food options and scarce availability within the lower income areas of the District. Assessing the social determinants in relation to the impact of obesity rates raises questions for health systems and health workers. It can be daunting for health workers to educate individuals regarding appropriate diet and nutrition only to discharge them into the conditions where traditional fast-food restaurants, carry-outs and convenience stores predominate.

Developing appropriate goals and objectives to address obesity in the District in addition to finding suitable evaluation methods, on the basis of the types of questions asked and the potential audience for the evaluation results is the first challenge. No single program will achieve the ultimate goal of eliminating obesity, but the goals and objectives developed for a particular program should logically reflect the impending impact of that program. These goals and objectives will be addressed in the District of Columbia Obesity State Plan.

Recommendations for Addressing Obesity

State, and local jurisdictions, in addition to community partners, have implemented strategies to address the obesity epidemic in the nation. Through legislation and partnerships, the District will begin taking the necessary steps toward reversing high rates of overweight and obesity within its communities. Listed below are evidence-based strategies promoted by the CDC intended to improve and enhance overall healthy lifestyle to prevent or reduce overweight and obesity. [32] These intervention programs, if adopted, would contribute significantly to improvement of health and wellness of residents of the District of Columbia.

	Nutrition	Physical Activity	Screening
Access	• Development of more grocery stores, organic and farmers markets within deprived communities • Provide incentives to food retailers to locate in and/or offer healthier food and beverage options in underserved areas • Increase the food choices in vending machines that meet healthy nutrition standards	• Improve safety in areas where people are or could be physically active • Enhance traffic safety in areas where persons are or could be physically active	
Point of Purchase or Promotion	• Improve availability of healthier food and beverage options in public service venues • Improve mechanisms for purchasing foods from farms	• Provide employees with incentives or discounts when they sign-up for wellness programs	
Price	• Improve availability of affordable healthier food and beverage options in public service venues • Encourage Use of Farmers and organic markets and decrease prices at organic markets		

Social Support and Services	• Limit advertisements of less healthy food and beverage options. • Support the ban on transfat and through policy change and discourage consumption of sugar-sweetened beverages. • Support menu labeling through policy change • Support breastfeeding through policy change and maternity care • Communities should be proactive in community coalitions or partnerships to address obesity	• Require physical education in schools • Increase the amount of physical activity in PE programs in schools • Increase opportunities for extracurricular physical activity • Improve infrastructure to support walking	• Support BMI screenings through policy change by requiring growth and development screening for students within the DC school systems.

Recommendations

Recommended questions for inclusion in the District of Columbia Behavioral Risk Factor Surveillance System Survey (BRFSS)

In order to enhance data collection regarding obesity in the District, and effectively evaluate the progress of program initiatives related to physical activity and nutrition, additional BRFSS questions have been recommended (See Appendix)

Appendix

Physical Activity Guidelines

Being physically active is one of the most vital steps that Americans of all ages can take to improve their health. Below are guidelines that have been provided by United States Department of Health and Human Services and United States Department of Agriculture for all Americans to follow. [33]

Key Guidelines for Children and Adolescents

- Children and adolescents should do 60 minutes (1 hour) or more of physical activity daily.
- Aerobic – Most of the 60 or more minutes a day should be either moderate – or vigorous – intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week.
- Muscle strengthening: As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days of the week.
- Bone-strengthening: As part of their 60 or more minutes of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days of the week.

It is important to encourage young people to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.

Key Guidelines for Adults

- All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.
- For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.
- For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate- intensity, or 150 minutes a week of vigorous- combination of moderate- and vigorous – intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.

Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

Key Guidelines for Older Adults

- When older adults cannot do 150 minutes of moderate-intensity aerobic activity a week because of chronic conditions, they should be as physically active as their abilities and conditions allow.
- Older adults should do exercises that maintain or improve balance if they are at risk of falling.

Appendix

- Older adults should determine their level of effort for physical activity relative to their level of fitness.
- Older adults with chronic conditions should understand whether and how their conditions affect their ability to do regular physical activity safely

Appendix

Dietary Food Guide

Many Americans are consuming more calories while ignoring the proper nutrients needed to sustain good health. Keeping the number of calories consumed at a minimum is vital but more importantly meeting the nutrient recommendations provides major health benefits. [34]

KEY RECOMMENDATIONS

- Consume a variety of nutrient-dense foods and beverages within and among the basic food groups while choosing foods that limit the intake of saturated and trans fats, cholesterol, added sugars, salt, and alcohol.
- Eat more dark green vegetables, orange vegetable, legumes, fruits, whole grains and low-fat milk and milk products
- Eat less refined grains, total fats, sodium, added sugars and calories

Key Recommendations for Specific Population Groups

Adults

- Consume two cups of fruit and two-and-a-half cups of vegetables per day for a 2,000 - calorie intake
- Consume three or more ounce-equivalents of whole-grain products per day. At least half of grain intake should come from whole grains
- Consume three cups per day of fat-free or low-fat milk or milk products
- Increase dietary intake of calcium, potassium, fiber, magnesium, and vitamins A, C and E.

Children and Adolescents

- At least half of grains consumed should be whole-grain. Children ages two to eight should consume two cups per day of fat-free or low-fat milk or milk products and children age nine and older should drink three cups per day.
- Increase dietary intake of calcium, potassium, fiber, magnesium, and vitamin E.

Specific Populations

- People over age 50. Consume vitamin B12 in its crystalline form (i.e., fortified foods or supplements).
- Women of childbearing age who may become pregnant. Eat foods high in heme-iron and/or consume iron-rich plant foods or iron-fortified foods with an enhancer of iron absorption, such as vitamin C-rich foods.
- Women of childbearing age who may become pregnant and those in the first trimester of pregnancy. Consume adequate synthetic folic acid daily (from fortified foods or supplements) in addition to food forms of foliate from a varied diet.
- Older adults, people with dark skin, and people exposed to insufficient ultraviolet band radiation (i.e., sunlight). Consume extra vitamin D from vitamin D-fortified foods and/or supplements.

Appendix

Recommended questions for inclusion in District of Columbia Behavioral Risk Factor Surveillance System Survey (BRFSS)

1. *How often do you drink water?*
   - 1 Per day
   - 2 Per week
   - 3 Per month
   - 4 Per year
   - 5 Never
   - 7 Don't know/Not sure
   - 9 Refused

2. *How often do you drink coffee, tea or hot chocolate?*
   - 1 Per day
   - 2 Per week
   - 3 Per month
   - 4 Per year
   - 5 Never
   - 7 Don't know/Not sure
   - 9 Refused

3. *During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not include diet soda or diet pop)*
   - _ _ days
   - 88 None/Did not drink soda or pop during the past 7 days
   - 77 Don't know/Not sure
   - 99 Refused

4. *How many times within the past two weeks did you eat out at a traditional fast food restaurant or carry-out such McDonalds Wendy's Burger King, Danny's or Yums?*
   - _ _ days
   - 88 Did not eat out at any traditional fast food restaurants or carry-out
   - 9 Refused

5. *Were you provided any resources or follow-up regarding recommendation to lose weight such as visiting a nutritionist?*
   - 1 Yes
   - 2 No
   - 7 Don't know/Not sure
   - 9 Refused

6. *Was the information provided positive or negative health impact of not losing weight?*
   - 1 Yes
   - 2 No
   - 7 Don't know/Not sure

9 Refused

7. Would you support menu labeling?

1 Yes
2 No
7 Don't know/Not sure
9 Refused

8. Would menu labeling make a difference in your future food purchases?

1 Yes
2 No
7 Don't know/Not sure
9 Refused

9. What is the main reason you do not engage in any physical activity?

01 Crime
02 Too busy
03 Strain on heart
04 Disability
05 Hate to exercise
06 Can't afford gym membership
07 Don't know how to exercise
08 Lack of motivation
09 Chronic health condition
10 Other
77 Don't know/Not sure
99 Refused

10. Where do you exercise?

01 Private gym (cost associated)
02 School gym or facility
03 Parks and recreation facility
04 Parks
05 Sidewalks
06 At home
07 Other
77 Don't know/Not sure
99 Refused

11. Specifically what type of exercise do you engage in?

01 Running or jogging
02 Brisk walking
03 Sports
04 Bicycling
05 Aerobics
06 Swimming

07 Water Aerobics
08 Jump Rope
09 Heavy Gardening
10 Other
77 Don't know/Not sure
99 Refused

12. What method of transportation do you use to get to work (i. e. walk, drive, biking or public transportation)?

1 Walk
2 Drive
3 Biking
4 Public transportation
7 Don't know/Not sure
9 Refused

**Question formulation subject to change

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